# Volume 5: Subbasin Data – "B" Subbasins

## Loop 303/White Tanks ADMPU Area Hydrologic Analysis in Maricopa County, Arizona

Flood Control District of Maricopa County

Version 1.2/ September 2009
HDR Project No. 079902
FCD Contract No. 2007C031

Registered Professional Engineer (Civil)
CERTIFICATE NO.
35571
LINDA A.
POTTER
9/4/09
Expires 12/31/09

B01

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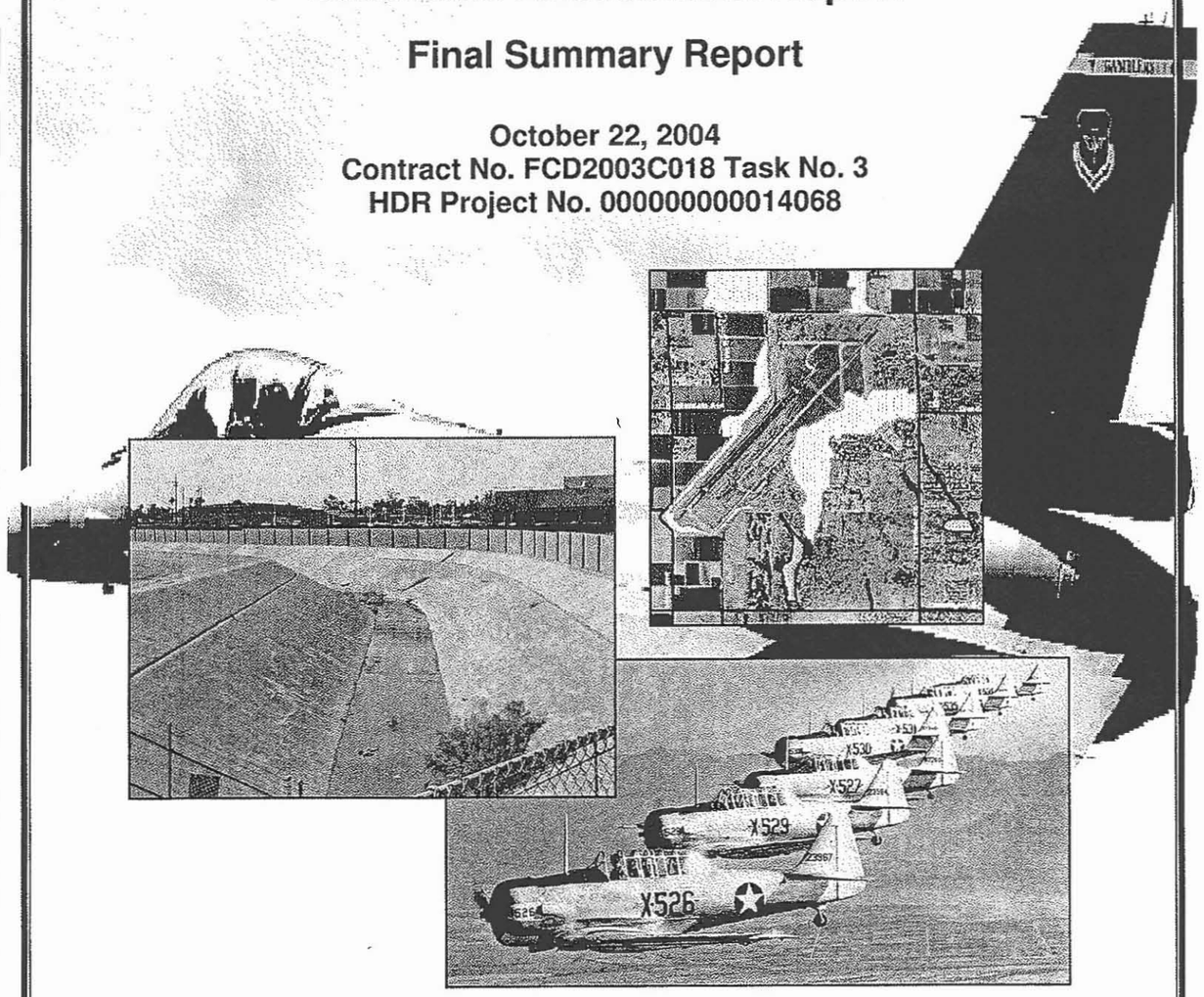
For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B02

# Luke Air Force Base Outfall Candidate Assessment Report

## Final Summary Report

October 22, 2004
Contract No. FCD2003C018 Task No. 3
HDR Project No. 000000000014068




HDR

- South of the 'Munitions Road" crossing, the unlined channel will become wider and intercept a major drainage way from the west.

- Before reaching the new box culvert at Camelback Road (by others), the widened unlined channel will become wider still and form an on-line detention basin just upstream of the Camelback Road box.

Hydrology for Alternative 2A: Exhibit 5

A 2650' channel conveyance system was analyzed for Alternative 2A to capture on-site flows from the east along Litchfield Road and convey the discharge north to the Dysart Drain. The U.S. Army Corps of Engineers HEC-RAS 3.1.1 was used in the design. This channel is concrete-lined and was analyzed to have a capacity of 1426 cfs, which was obtained from the existing HEC-1 model for the Loop 303/White Tanks ADMP. The water surface elevation for the Dysart Drain at the channel tie-in was taken from the HEC-2 output file per NBS/Lowry Consultants study, dated May 30, 1994. A concrete-lined channel with 2:1 side slopes, a design water depth of 5', and a 15' bottom width would have sufficient capacity to meet discharge requirements.

A second channel would be placed south of and parallel to Super Sabre Street. This 4600' channel would begin west of Litchfield Road at the pump station outfall channel and would converge with Bullard Wash west of Bullard Avenue. The discharge for this channel increases from upstream to downstream. The beginning discharge is 263 cfs and the final discharge is 460 cfs. In order to meet the discharge requirements, an earthen-lined channel with 4:1 side slopes, a design water depth of 4', and a 10' wide bottom would be required. A 2-12'x5' box culvert was analyzed for the crossing at Bullard Avenue.

Bullard Wash channel improvements would begin west of the Super Sabre Street and Bullard Avenue intersection and would follow the existing flow path south to Camelback Road. The channel improvements at Bullard Wash consists of a 8750' earthen channel with 4:1 side slopes, a design water depth of 5 feet, and a 40' bottom width. A 2-12'x6' box culvert would be required for the crossing at Bullard Wash and the proposed Munitions Road.

Hydrology Alternative 2B: Exhibit 6

A channel conveyance system was analyzed for Alternative 2B to capture on-site flows from the east along Litchfield Road and convey the flows south to Bullard Wash. This 8000' channel would begin southeast of the intersection at Litchfield Road and Thunderbird Road and would continue south past Super Sabre Street and would then turn west, crossing Litchfield Road and Bullard Avenue tying into the Bullard Wash improvements. This channel is concrete-lined along Litchfield Road and earthen along Super Sabre to the Bullard Wash Connection. The channel was analyzed with a beginning capacity of 1425 cfs. The capacity increases as it picks up the flow from the pump station and storm water collection system as it parallels Super Sabre. A concrete-lined channel with 2:1 side slopes, a design water depth of 5' and 20' bottom width meets capacity requirements along Litchfield Road. An earthen-lined channel with 4:1 side slopes, a design water depth of 6', and a 40' wide bottom would be required along Super Sabre. A 5-12'x5' box culvert is required at the Litchfield Road crossing and a 6 -12'x4' box culvert is required at the Bullard Avenue crossing.

Bullard Wash channel improvements would begin west of the Super Sabre Street and Bullard Avenue intersection and would follow the existing flow path south to Camelback Road. An earthen channel with 6:1 side slopes, a design water depth of 6 feet, and a 40' bottom would be sufficient for the discharge requirements. A 6-12'x6' box culvert would be required for the crossing with Bullard Wash and the proposed Munitions Road.

### 3.2.3 Alternative 3

Alternative 3 is the "Perimeter – Closed Conduit" alternative. This alternative is similar to alternative 2, except that the Litchfield Road and Super Sabre Street concrete open channels are replaced with a large storm drain (either pipe or box culvert). To maximize the efficiency of the storm drains they have been sized for pressure flow, with the hydraulic grade line below pavement sub-grade.

Hydrology for Alternative 3A: Exhibit 7

This alternative is identical to Alternative 2A, except that the Litchfield Road and Super Sabre Street open channels are replaced with box culvert. The Litchfield Road box culvert is 2650' in length and a 3-12'x6' box culvert was analyzed to meet the required discharge capacity of 1426 cfs. The Super Sabre Street box culvert is 4600' in length and a 2-12'x4' box culvert was analyzed to meet the required discharge capacity. The Bullard Wash improvements are identical to Alternative 2A.

Hydrology for Alternative 3B: Exhibit 8

This alternative is identical to Alternative 2B, except that the Litchfield Road channel and Super Sabre Street channel is replaced with a box culvert. This box culvert is 8000' in length and is a 5-12'x5' box. The Bullard Wash improvements are identical to Alternative 2B.

### 3.2.4 Alternative 4: Exhibit 9

Alternative 4 is the "On-Site" alternative. This alternative is a combined storm drain, open-channel system which collects and conveys storm water from Litchfield Road to Super Sabre Street, through the base and generally along the centerline of the floodplain. The alternative consists of:

- Flows from the depressed area of the future Litchfield Road underpass (as well as associated portions of watershed areas 201 and 226) will be collected at a new pump station, which will drain north to the Dysart Drain.
- The 72" outfall pipe from the existing pump station at the southeast corner of the AFB will be directed west, outfalling to the Bullard Wash.
- A in-field drainage structure comprised of box culvert and open channel sections will capture flows generated from the in-field outfalling to the Bullard Wash.

Hydrology for Alternative 4

This alternative is a combined storm drain, open-channel system which collects and conveys storm water generated from northern portions of subbasin 223 to Super Sabre Street. A 3200' 10'x4' box culvert located south of Thunderbird Road, aligned east-west, was analyzed to convey the storm water generated from northern portions of subbasin 223 west to the runway infield area. This box culvert was analyzed with a capacity of 150 cfs. A 1900' concrete-lined channel, aligned northwest-southeast, with 2:1 side slopes, a 10' wide bottom, and a 5' design water depth was analyzed to convey the runoff from through the infield area to another box culvert. A 2-10'x4' box culvert, aligned north-south, would then take the storm water 2000' south past Super Sabre Street and tie-in to Bullard Wash. This segment would have a design capacity of 460 cfs. The Bullard Wash improvements would be identical to Alternative 2A.

## 3.3 Constraints

Several constraints were identified that were taken into consideration during the development and ranking of the alternatives. They include;

Right-of-way

While Litchfield Road has few utility conflicts, there is essentially no right-of-way available for placement of an open channel between the west curb line and the Luke AFB fence at the west property line. Likewise, there is little or no available right of way for an open channel between the east back of curb and the property fence north of Glendale. South of Glendale however, there is vacant land that could serve to accommodate an open channel. Along Litchfield Road, a large storm drain could be placed under the pavement or on base property just east of the east property line, running through open areas and parking lots.

Along the southern boundary of the base, a storm drain could be placed in or near the Super Sabre alignment, however there is no available right-of-way for an open channel. The base is planning to acquire 150 feet of right-of-way along the southern boundary to buffer future development. This area if available could serve to accommodate an open channel.

alternatives run with the grade to the north and are shorter in distance that the 2B and 3B alternatives.

## 3.5 Recommended Alternative

The recommended alternative was selected at Progress Meeting #2, which was attended by all the major stakeholders. It consists of the Super Sabre channel portion of Alternative 2A and the closed conduit to the Dysart Drain portion of Alternative 3A. A modification to the Super Sabre portion is concrete lining the channel, rather than the recommended earth-lined channel. While the concrete lined channel will increase the initial project cost, it will be easily maintained, will not be a security concern, and will require a smaller footprint and therefore less right-of-way impact. Because the channel will be located within the fenced boundary of the base, there is no real multi-use opportunity for the public; however the base has indicated the desire to construct a running track parallel to the channel. In addition the flow from subbasin 201 would be conveyed to the Dysart Drain by increasing the existing capacity of the outfall. This would be accomplished by replacing the existing pipes (4-30"RCP) that drain the local low-elevation point, an on-base detention basin, with an 8'x5' RCBC.

Draft Final Alternative: Exhibit 10

The Draft Final Alternative is a variation of the Super Sabre channel portion of Alternative 2A and the closed conduit to the Dysart Drain portion of Alternative 3A. A modification to the Alternative 2A Super Sabre portion is that the channel will be concrete lined instead of earth lined. The Bullard Wash improvements will be identical to Alternative 2A.

### 3.5.1 Draft Final Alternative Hydrology and Hydraulics

Subbasin 226 was subdivided into smaller subbasins, and several new refined flow rates are a result of the subdivision, as previously discussed in the hydrology section. In order to decrease the total flow arriving at Litchfield Road, two stormwater pipes are proposed east of Litchfield Road, one at Lalomai Road and one at Kachina Road, each with a design flow of 416 cfs. These two pipes begin at Glendale Road and drain into the Dysart Drain. The pipe located parallel to

Lalomai Road consists of two sections: a 1223' long 78" concrete pipe from Glendale Avenue to approximately Thunderbird Road and a 1327' long 84" concrete pipe from approximately Thunderbird Road to the Dysart Drain. The proposed pipe located parallel to Kachina Road is a 2630' long 84" concrete pipe. The remainder of the flow from Subbasin 226 and the flow from portions of Subbasin 223 drain into a proposed stormwater system at Litchfield Road that empties into the Dysart Drain. This proposed system consists of three segments: 1) a 2-barrel 54" RCP 600' in length; 2) a 2-barrel 12'x 5' RCBC 1670' in length; and 3) a 2-barrel 12'x 6' RCBC 1100' in length.

Several storm drain laterals and catch basins will be added perpendicular to Kachina and Lalomai Roads. These drainage laterals will tie-in with the large pipes to be located along Kachina and Lalomai Roads. A drainage ditch would be located on the north side of Glendale Road and would provide drainage to the proposed storm drain along Lalomai Road. There would also be several laterals that would tie into the drainage system located along Litchfield Road. Several small laterals would connect to the drainage system from the west side of Litchfield Road. There would also be a long lateral located along Glendale Road that would drain into the Litchfield drainage system. Another drainage lateral system would be located along Thunderbird Road that would drain to the Litchfield drainage system.

The open channel system along Super Sabre Road is similar to the system described in Alternative 3A. The channel begins west of Litchfield Road and south of Super Sabre Road at the new box culvert. This box culvert provides drainage from the pump station outfall located north of the box. The upstream channel invert will match the box culvert invert. The channel will run east past Bullard Avenue and will tie-in with the Bullard Wash improvements. Lateral connections from the north will tie-into the Super Sabre channel throughout its length.

B03

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For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B04

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For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B05

## This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B06

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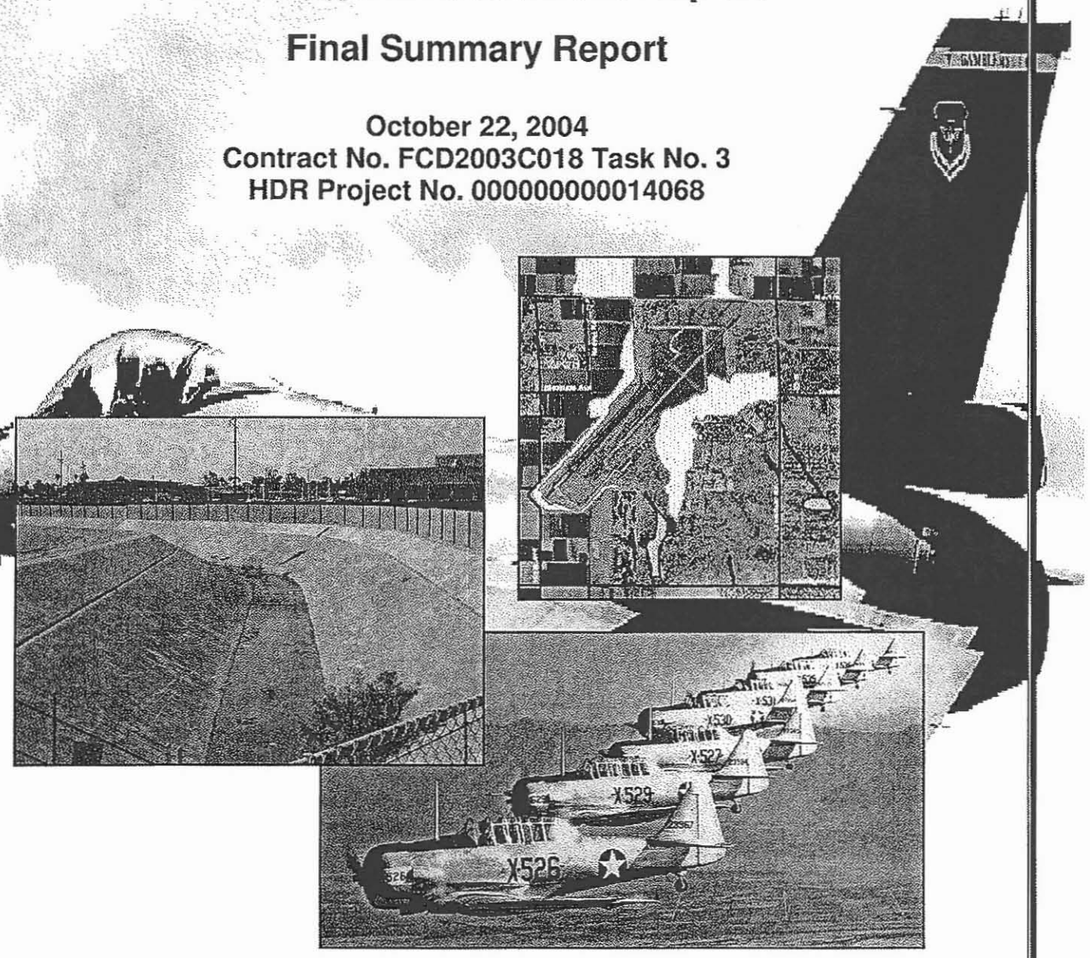
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B07

# Luke Air Force Base Outfall Candidate Assessment Report

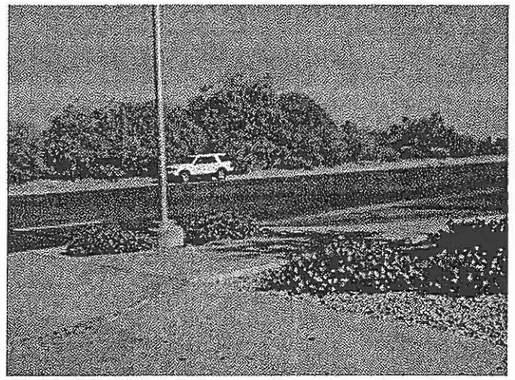
## Final Summary Report

October 22, 2004
Contract No. FCD2003C018 Task No. 3
HDR Project No. 000000000014068

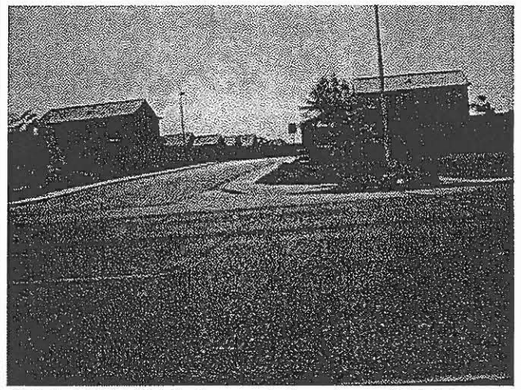



HDR

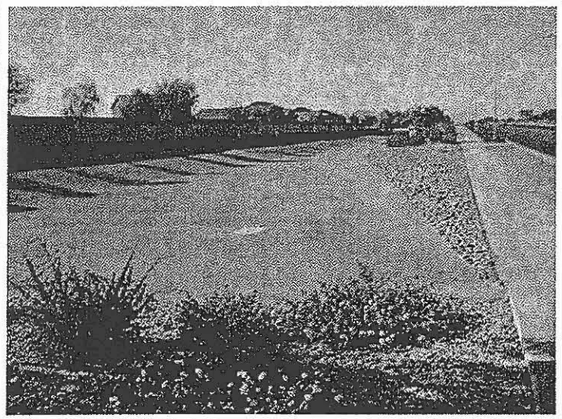
**Luke AFB Site Visit Photographs 6/25/04**



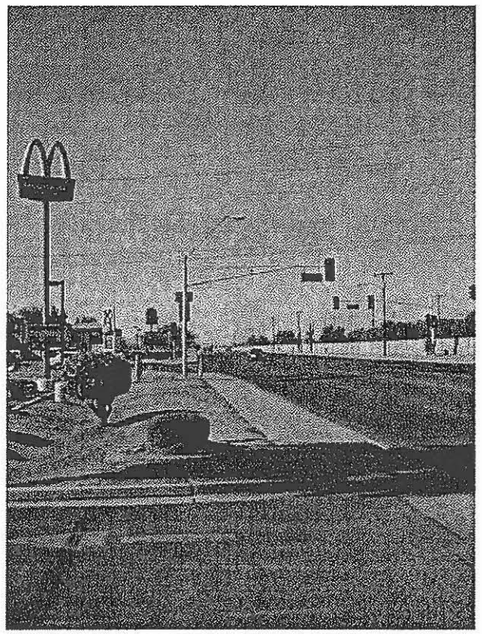
5) Litchfield Rd facing northwest; wash outlet onto Litchfield Rd south of Luke AFB



6) Litchfield Rd facing east; housing subdivision on the opposite side of the road from wash outlet (picture 5) where water overflows road



7) Litchfield Rd facing south drainage on the opposite side of the road from picture 5



8) Litchfield Rd. facing south; intersection of Glendale Rd.

B08

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For information on this sub-basin, reference the hydrology model
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B09

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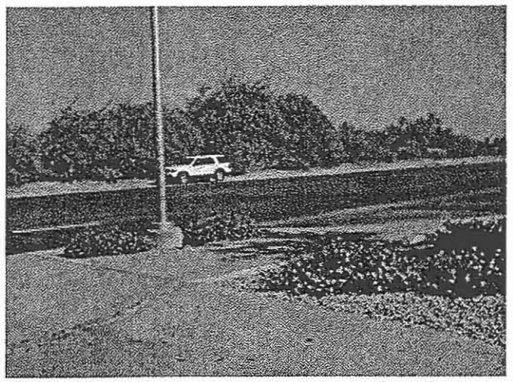
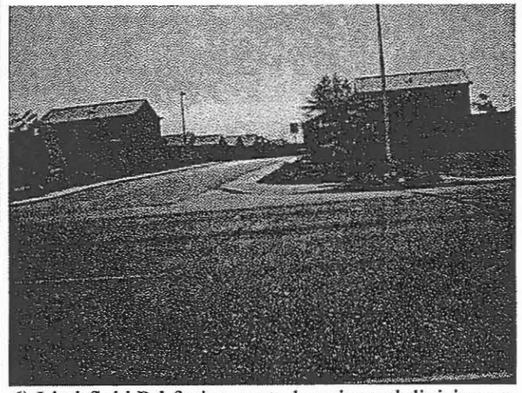
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B10

**Luke AFB Site Visit Photographs 6/25/04**



5) Litchfield Rd facing northwest; wash outlet onto Litchfield Rd south of Luke AFB



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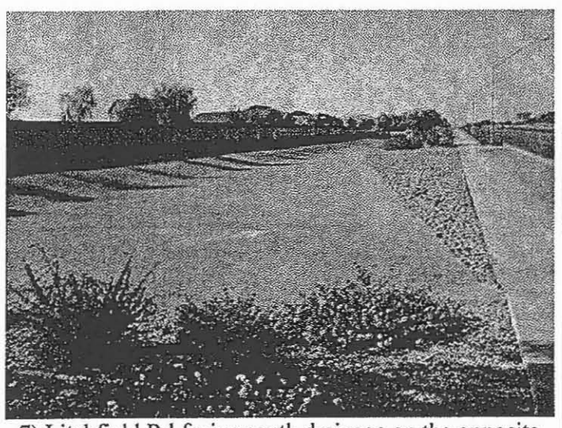

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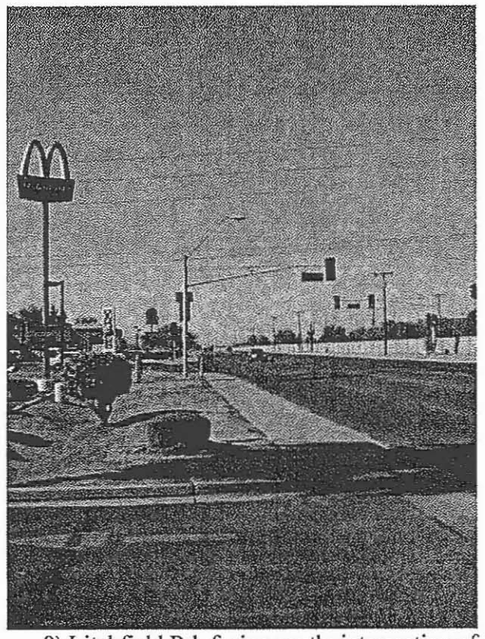


8) Litchfield Rd. facing south; intersection of Glendale Rd.

B11

# DRAINAGE REPORT
# FOR
# LITCHFIELD PARK DETENTION FACILITY

June, 1989

Revised March, 1990

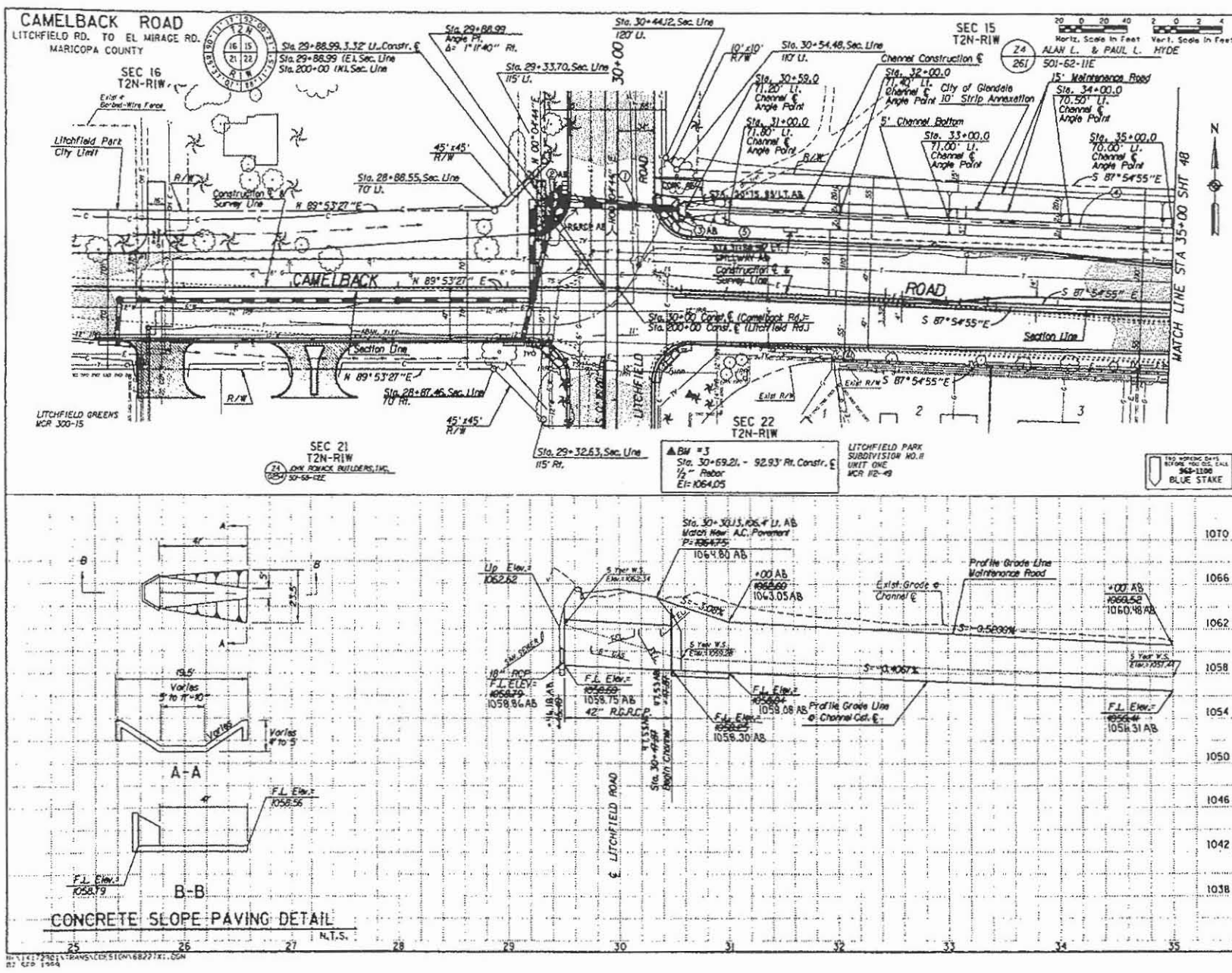
COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE
4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
TELEPHONE (602) 264-6831

be designed such that the 100-year outflow does not exceed the existing 92 cfs. Additionally, the detention volume provided by the existing dam in the 100-year event is 77.3 Acre feet, and the volume provided by the designed detention facility in the 100-year event is 88.7 Acre feet.

The HEC-1 modeling for the proposed condition reflects a developed land use within the property. It was assumed that the future onsite land use is to consist of Housing, Commercial, and park space. The curve number for this area was weighted to reflect this. The HEC-1 Models show that flow releases from the proposed basin with future condition land use, do not exceed the existing flow releases from the Dam. Refer to table 3 for a summary of the flows. Therefore, it can be concluded that the detention facility will create no adverse condition on the downstream side of the project, while providing the necessary detention for the future land use.

The detention facility is designed as a dual purpose future park facility, with a sloped or terraced bottom to concentrate the low flow. Final design of the channel into the detention facility, including hydraulics, cross-section, alignment, and configuration are beyond the scope of these improvements, and should be addressed with any future improvements. This is done to allow greater flexibility for future improvements.

The outlet from the detention basin is through a 42" pipe. The pipe allows the detention basin to drain through a drainage corridor, while limiting the outflow. The detention basin is designed for the 100-year storm event per the FCDMC standards and regulations. In an event in excess of the 100 storm, the pipe will continue to outlet flow as the freeboard on the detention basin is used. As the freeboard is exceeded, the flow will sheetflow out of the basin to the South. Since the area of overflow ranges from 80 feet to 300 feet wide, and the detention basin is designed for the 100-year storm, an emergency overflow spillway is not required.







| F.H.W.A. REGION | STATE | PROJECT NO. | SHEET NO. | TOTAL SHEETS | RECORD DRAWING |
|---|---|---|---|---|---|
| 9 | AZ. | 68227 | 47 | 94 | JANUARY 2001 |

Horiz. Scale in Feet 20 0 20 40 — Vert. Scale in Feet 2 0 2 4

Z4 261 ALAN L. & PAUL L. HYDE 501-62-11E

## CONSTRUCTION NOTES

### REMOVALS

### RELOCATIONS

### NEW CONSTRUCTION

1. Sta. 29+45.40, 80' Lt. to Sta. 30+47.87, 83' Lt. - Install 108 L.F. of 42" R.G.R.C.P.
2. Sta. ~~29+45.40~~ 80' Lt. - Construct Drop Inlet Headwall per MAG Std. Det. 501-5, Lip Depression=0' with 12 L.F. Handrail, See Detail 9, Sheet 16 HEADWALL EXTENDED VERTICALLY TO MATCH FIELD GRADE AB
3. Sta. ~~30+47.87~~ 71' Lt. - Construct Outlet Headwall w/ 2:1 embankment slope per MAG Std. Det. 501-3 30+47.53 AB
4. Sta. 30+59 to Sta. 35+00 - Construct Concrete Lined Drainage Channel 1341 S.Y.
5. Sta. 30+59 to Sta. 30+84 - Construct 147 S.Y. Concrete Slope Paving, See Detail this Sheet

### PAVEMENT QUANTITIES

1. Aggregate Base (Maintenance Rd.) 170 TONS

### NOTES

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 1 | AS BUILTS | RMS | 03-24-01 |

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION

CAMELBACK ROAD
LITCHFIELD ROAD TO EL MIRAGE ROAD
PROJECT NO. 68227

| | BY | DATE |
|---|---|---|
| DESIGNED | MEM | 09/99 |
| DRAWN | GJC | 09/99 |
| CHECKED | MEM | 09/99 |

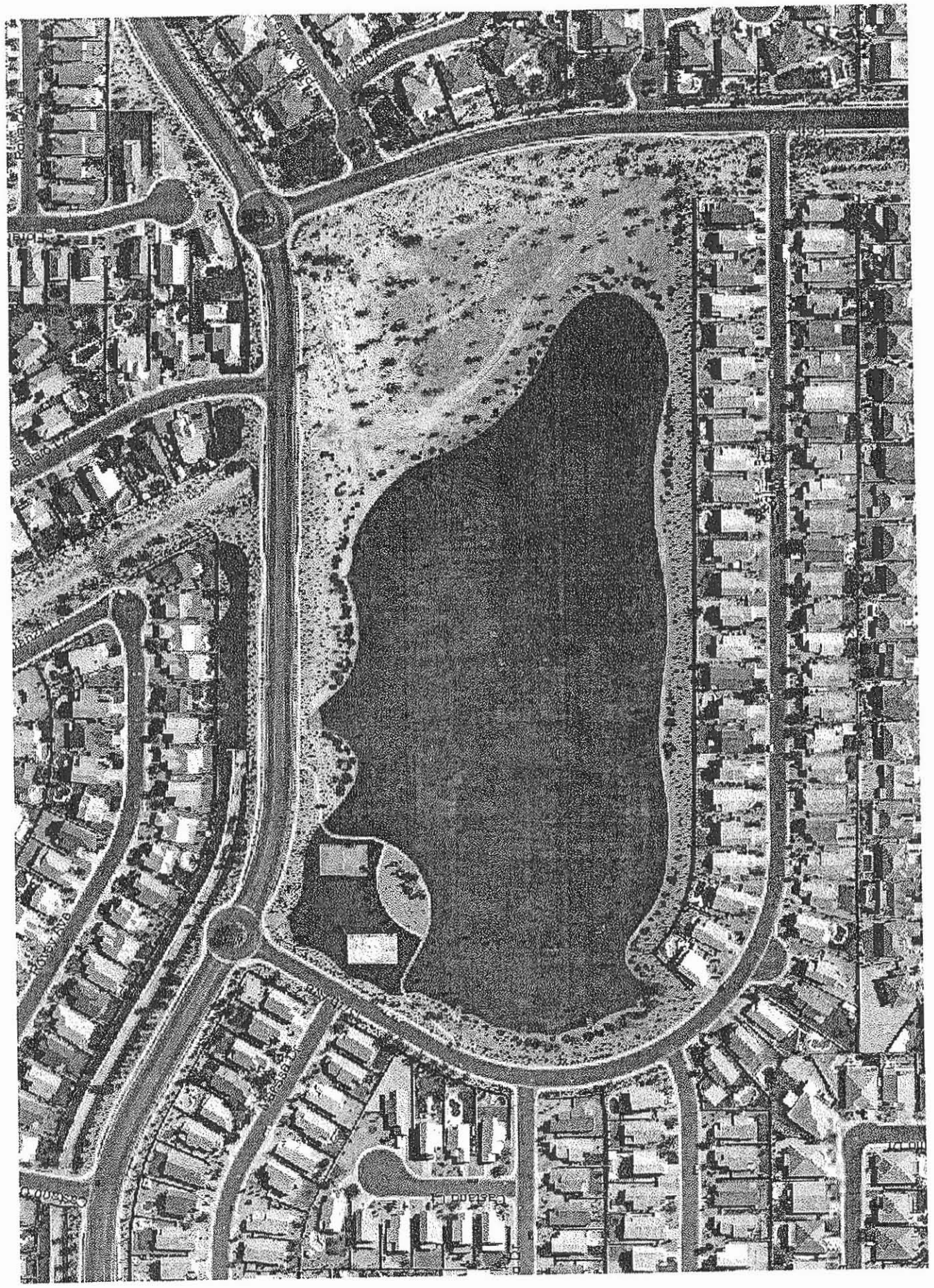
CELLA BARR ASSOCIATES

DRAINAGE CHANNEL PLAN
STA. 25+00.00 TO 35+00.00

SHEET 47 OF 94

TRACS NO.

Litchfield to AFR
B16B11
B17B19
B18B19



B11

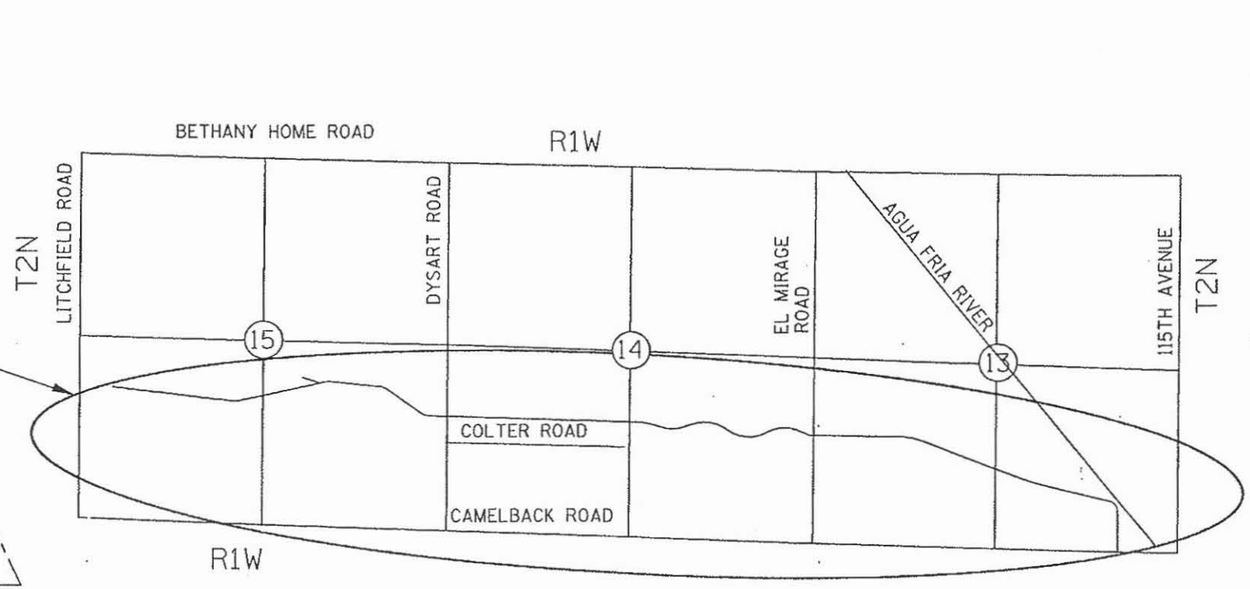
# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PLANS FOR THE CONSTRUCTION OF:

## COLTER CHANNEL

PROJECT NO. 93-08

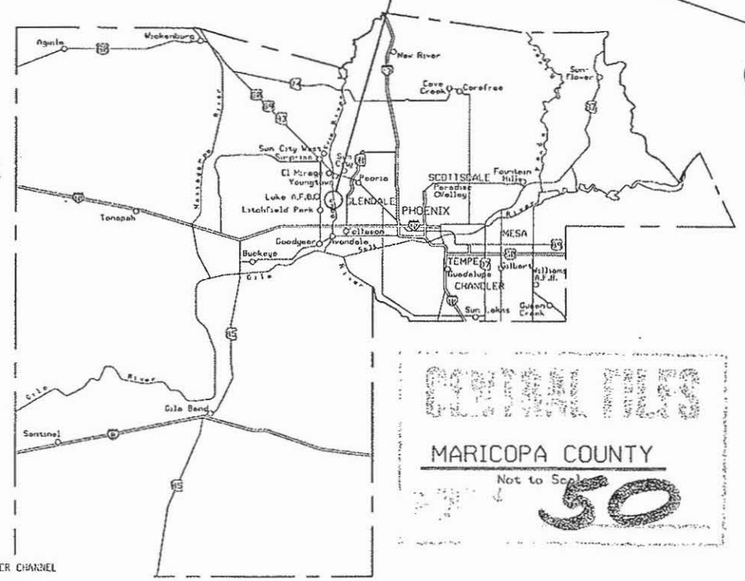
B11, B12, B14, B15




VICINITY MAP

Not to Scale

PROJECT LOCATION




MARICOPA COUNTY

Not to Scale

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION

Director — 8-31-93 DATE

UTILITY INFORMATION:

Joseph C. Jason, P.E. — 8-24-93 DATE
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Bob Prince — 8-26-93 DATE
BOB PRINCE
VALLEY UTILITIES - TIERRA BUENA WATER

AS-BUILT

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

CHIEF ENGINEER AND GENERAL MANAGER — 9-10-93 DATE

BOARD OF DIRECTORS OF THE FLOOD CONTROL DISTRICT

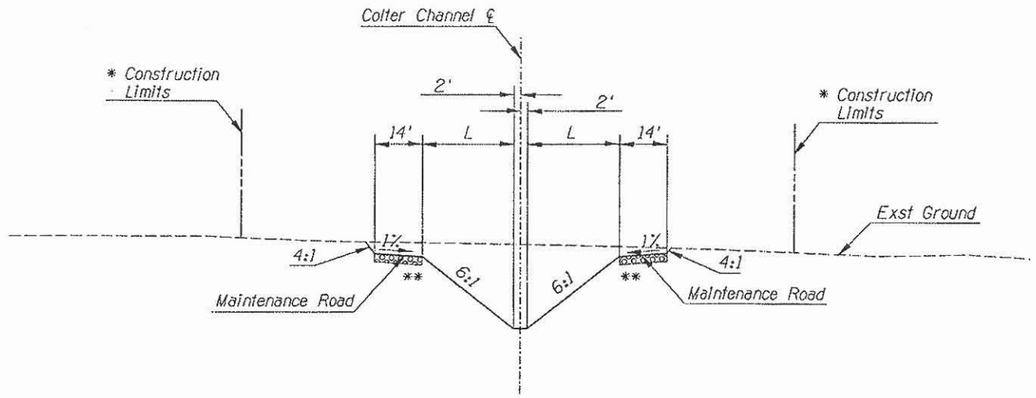
JIM BRUNER - CHAIRMAN

| | |
|---|---|
| DISTRICT 1 | TOM RAWLES |
| DISTRICT 2 | JIM BRUNER |
| DISTRICT 3 | BETSEY BAYLESS |
| DISTRICT 4 | EDWARD KING |
| DISTRICT 5 | MARY ROSE GARRIDO WILCOX |

CENTRAL FILES

50

COLTER CHANNEL
AS BUILT
FCD 93-08 470



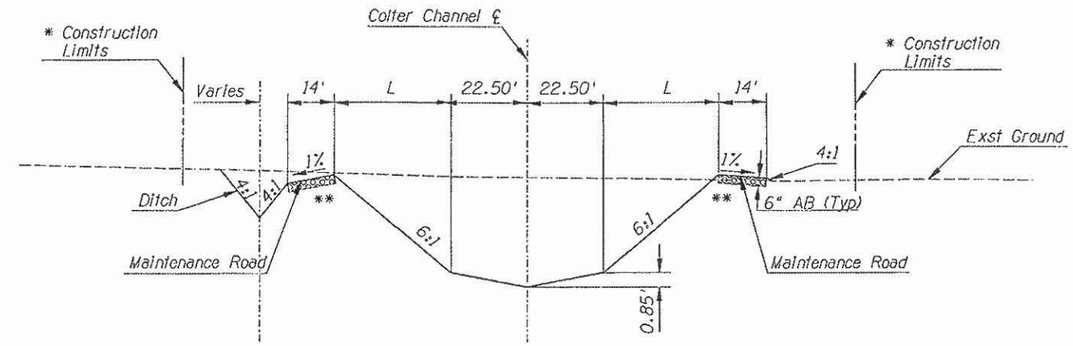

TYPICAL SECTION
STA 9+20 TO STA 12+50

| STA | L |
|---|---|
| 9+20 TO 12+50 | 26.40' |

* Construction Limits Vary, See Plan Sheets For Limits of Right-of-Way

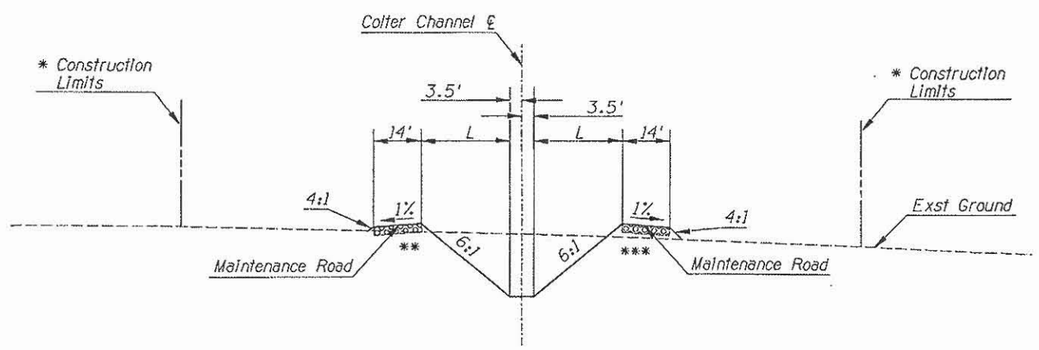
** Scarify 6" And Compact To 90% In Cut Areas

*** Compact All Fill Areas To 90%



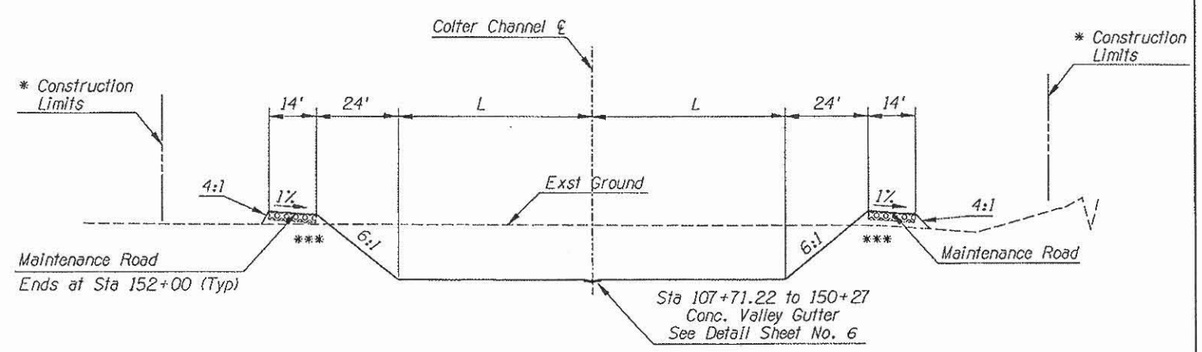

TYPICAL SECTION
STA 26+90 TO STA 107+62

| STA | L | DITCHING |
|---|---|---|
| 26+90 TO 31+00 | 27.90' | No Ditch |
| 31+00 TO 36+50 | 27.90' | Ditch |
| 37+00 TO 43+00 | 35.70' | Ditch |
| 43+50 TO 50+00 | 27.90' | Ditch Ends 51+00 |
| 51+50 TO 60+50 | 39.90' | Ditch Begins 57+00 |
| 61+00 TO 107+62 | 33.90' | Ditch Ends 81+20 |




TYPICAL SECTION
STA 13+00 TO STA 26+40

| STA | L |
|---|---|
| 13+00 TO 23+20 | 25.50' |
| 24+70 TO 26+40 | 28.50' |




TYPICAL SECTION
STA 108+87 TO STA 157+70

SCALE:
1" = 20' Horiz
1" = 4' Vert

| STA | L |
|---|---|
| 108+87 TO 119+00 | 57.00' |
| 120+00 TO 126+00 | 84.00' |
| 127+00 TO 157+70 | 89.00' |

Sta 152+00 To 157+70
Left Bank Terminates At Intersection
Of 6:1 With Existing Ground

90907 GEORGE F. COTTON ARIZONA U.S.A.

CRSS Civil Engineers Inc. Phoenix, Arizona

| | BY | DATE |
|---|---|---|
| DRAWN | MEM | 6-93 |
| DESIGN | GW | 6-93 |
| CHECKED | JFM | 6-93 |
| APPROVED | GKC | 6-93 |
| SUBMITTED BY: | | DATE: |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Colter Channel

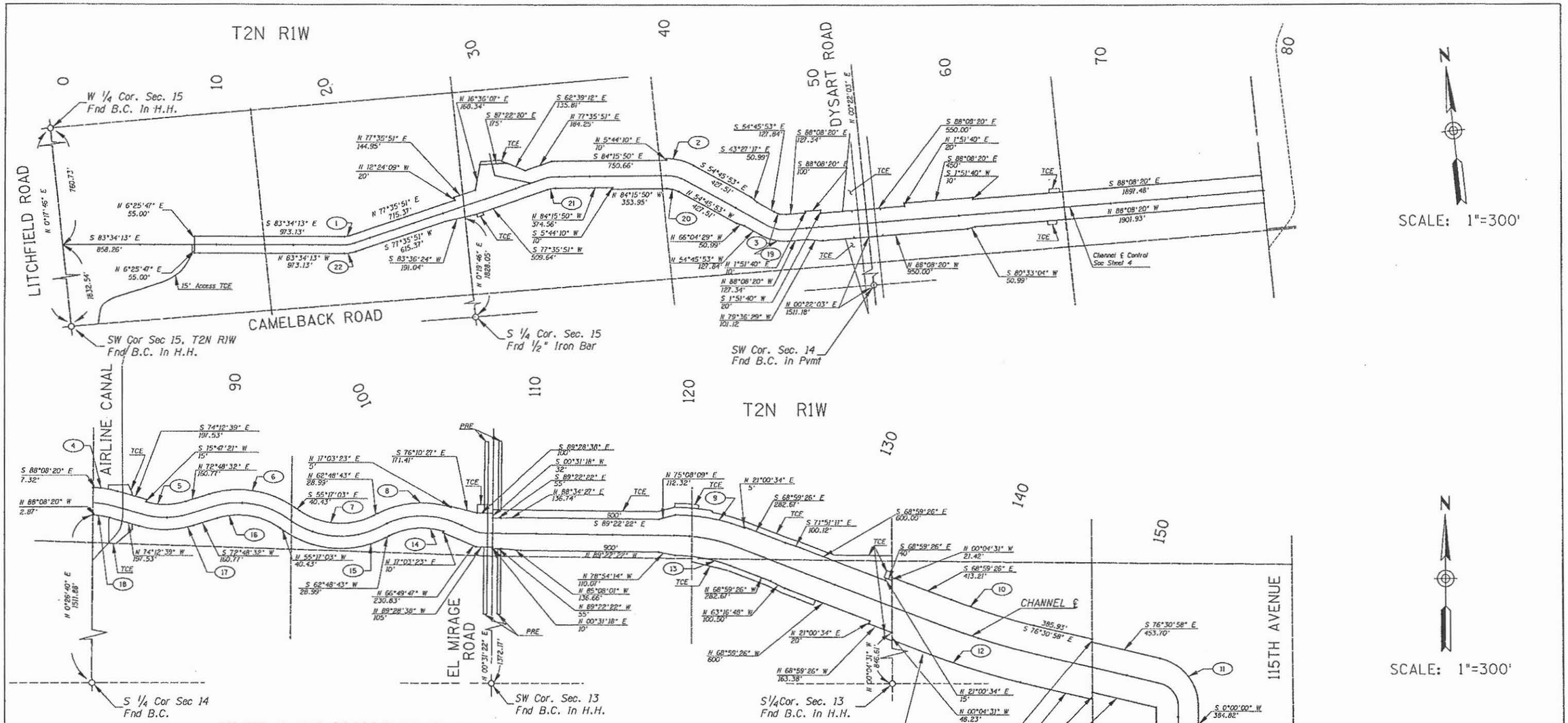
TYPICAL SECTIONS

RECOMMENDED BY: DATE:
APPROVED BY: DATE:
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 7 of 55

B10.11A - B11
B11.B12 - B12
B12.014 - B14

27 JULY 1993 CT01.10X







## STATE PLANE COORDINATE TABLE

| LOCATION | COORDINATE | |
|---|---|---|
| | NORTH | EAST |
| SW COR SEC 15 | 912,698.4789 | 365,661.8880 |
| W 1/4 COR SEC 15 | 915,291.4004 | 365,665.6601 |
| CTR SEC 15 | 915,214.2448 | 368,279.3164 |
| S 1/4 COR SEC 15 | 912,603.0918 | 368,273.9592 |
| E 1/4 COR SEC 15 | 915,191.0575 | 370,893.1060 |
| SE COR SEC 15 | 912,508.0151 | 370,885.8607 |
| | | |
| CTR SEC 14 | 915,105.8453 | 373,492.2950 |
| S 1/4 COR SEC 14 | 912,442.5759 | 373,481.5396 |
| E 1/4 COR SEC 14 | 915,021.2214 | 376,090.7703 |
| SE COR SEC 14 | 912,377.4327 | 376,076.4659 |
| | | |
| CTR SEC 13 | 914,997.8260 | 378,689.3360 |
| S 1/4 COR SEC 13 | 912,362.6780 | 378,702.5950 |
| E 1/4 COR SEC 13 | 914,982.6580 | 381,297.1330 |
| SE COR SEC 13 | 912,348.5750 | 381,317.4470 |

NOTE: Coordinates shown are Ground Coordinates

## CURVE DATA TABLE

| Curve No | Radius | Length | Curve No | Radius | Length |
|---|---|---|---|---|---|
| 1 | 107.00 | 35.17 | 12 | 4740.62 | 622.64 |
| 2 | 350.00 | 180.20 | 13 | 1020.00 | 362.85 |
| 3 | 140.00 | 81.55 | 14 | 470.00 | 362.94 |
| 4 | 650.00 | 158.01 | 15 | 630.00 | 680.67 |
| 5 | 465.00 | 267.66 | 16 | 470.00 | 425.79 |
| 6 | 635.00 | 575.28 | 17 | 630.00 | 362.64 |
| 7 | 465.00 | 502.40 | 18 | 470.00 | 114.25 |
| 8 | 635.00 | 490.35 | 19 | 315.00 | 183.48 |
| 9 | 1285.00 | 457.12 | 20 | 155.00 | 79.80 |
| 10 | 4355.62 | 572.08 | 21 | 165.00 | 52.24 |
| 11 | 319.12 | 426.17 | 22 | 217.00 | 71.32 |

NOTE: TCE AND PRE LIMITS TO BE PROVIDED BY FCDMC AT PRE-CON MTG.

CRSS Civil Engineers Inc. Phoenix, Arizona

| | BY | DATE |
|---|---|---|
| DRAWN | MEM | 6-93 |
| DESIGN | GW | 6-93 |
| CHECKED | JFM | 6-93 |
| APPROVED | GKC | 6-93 |
| SUBMITTED BY: | | DATE: |

20207 GEORGE K. COTTON ARIZONA U.S.A.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Colter Channel

CONSTRUCTION LIMITS

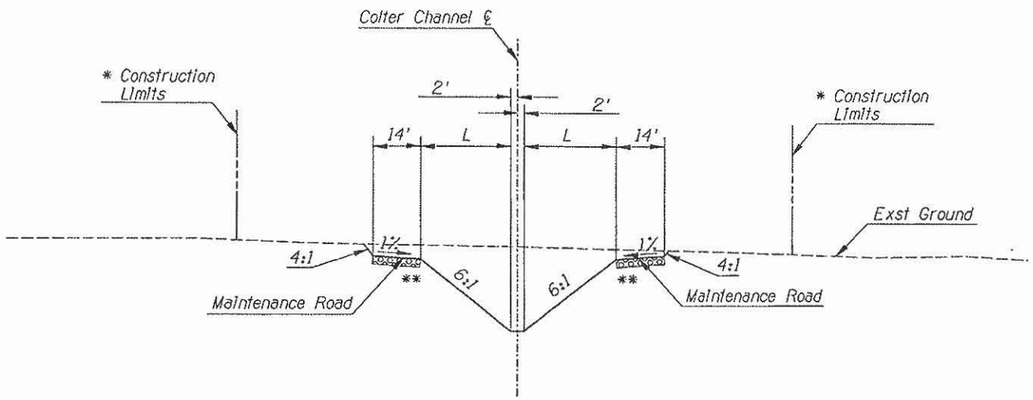
RECOMMENDED BY: DATE:

APPROVED BY: DATE:

CHIEF ENGINEER AND GENERAL MANAGER

SHEET 3 OF 55

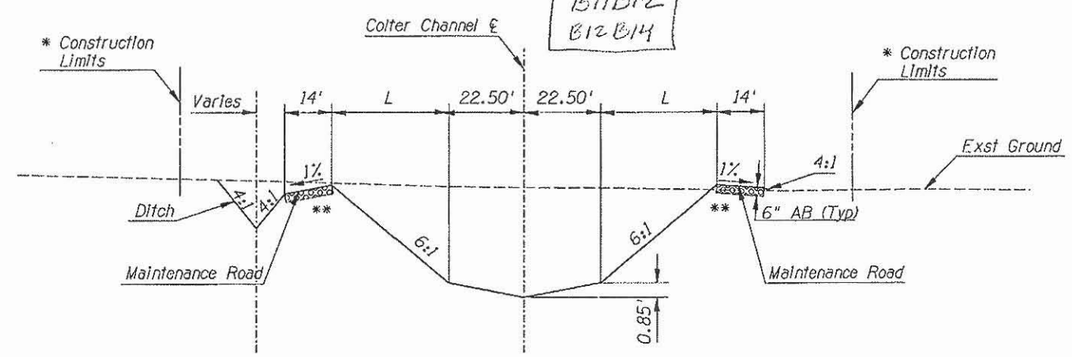
22 JULY 1993 COLTER.00/010/ROW01.10A




TYPICAL SECTION
STA 9+20 TO STA 12+50

| STA | L |
|---|---|
| 9+20 TO 12+50 | 26.40' |

B10B11
B11B12
B12B14



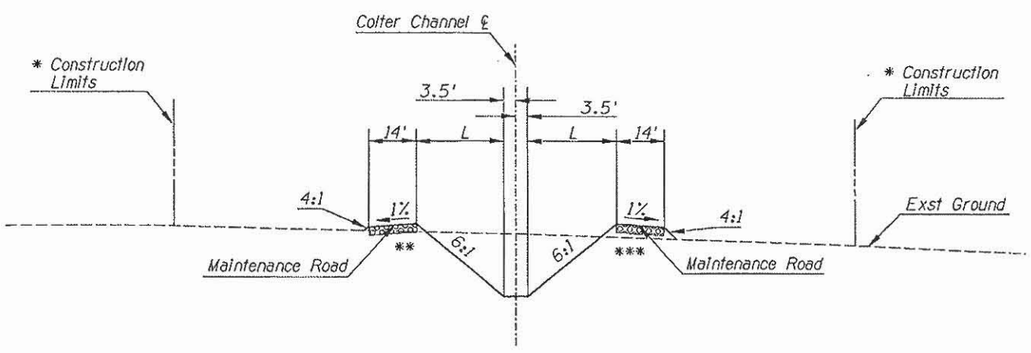

TYPICAL SECTION
STA 26+90 TO STA 107+62

* Construction Limits Vary, See Plan Sheets For Limits of Right-of-Way

** Scarify 6" And Compact To 90% In Cut Areas

*** Compact All Fill Areas To 90%

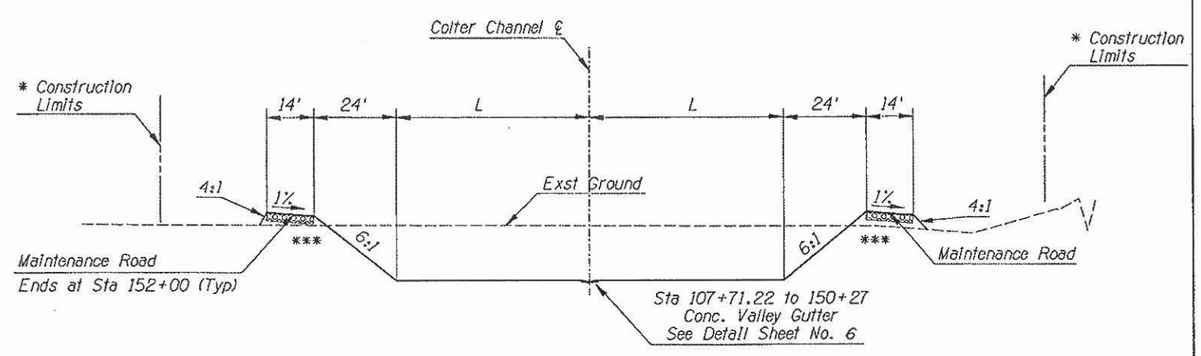
| STA | L | DITCHING |
|---|---|---|
| 26+90 TO 31+00 | 27.90' | No Ditch |
| 31+00 TO 36+50 | 27.90' | Ditch |
| 37+00 TO 43+00 | 35.70' | Ditch |
| 43+50 TO 50+00 | 27.90' | Ditch Ends 51+00 |
| 51+50 TO 60+50 | 39.90' | Ditch Begins 57+00 |
| 61+00 TO 107+62 | 33.90' | Ditch Ends 81+20 |




TYPICAL SECTION
STA 13+00 TO STA 26+40

| STA | L |
|---|---|
| 13+00 TO 23+20 | 25.50' |
| 24+70 TO 26+40 | 28.50' |

B14B15




TYPICAL SECTION
STA 108+87 TO STA 157+70

SCALE:
1" = 20' Horiz
1" = 4' Vert

| STA | L |
|---|---|
| 108+87 TO 119+00 | 57.00' |
| 120+00 TO 126+00 | 84.00' |
| 127+00 TO 157+70 | 89.00' |

Sta 152+00 To 157+70
Left Bank Terminates At Intersection
Of 6:1 With Existing Ground

REGISTERED PROFESSIONAL ENGINEER 20207 GEORGE K. COTTON ARIZONA U.S.A.

CRSS Civil Engineers Inc. Phoenix, Arizona

| | BY | DATE |
|---|---|---|
| DRAWN | MEM | 6-93 |
| DESIGN | GW | 6-93 |
| CHECKED | JFM | 6-93 |
| APPROVED | GKC | 6-93 |
| SUBMITTED BY: | | DATE: |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Colter Channel

TYPICAL SECTIONS

RECOMMENDED BY: DATE:
APPROVED BY: DATE:
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 7 of 55

27 JULY 1993 CT01.10X

B11

MASTER DRAINAGE REPORT
FOR

# DREAMING SUMMIT

PREPARED FOR

STARDUST DEVELOPMENT, INC.
6730 NORTH SCOTTSDALE ROAD, SUITE 230
SCOTTSDALE, AZ 85253
(602) 607-5800

PREPARED BY

TERI S. MINTZ, P.E.
DAVID EVANS AND ASSOCIATES, INC.
7878 NORTH 16TH STREET, SUITE 250
PHOENIX, AZ 85020
(602) 678-5151

Registered Professional Engineer (Civil)
CERTIFICATE NO. 30013
TERI S. MINTZ
Date Signed 2/10/00
ARIZONA, U.S.A.

NOVEMBER, 1999
DEA PROJECT NO. STAR0068

This master drainage report has been prepared under a contract from Stardust Development, Inc., Owner/Developer of the Dreaming Summit project. The purpose of this report is to provide the hydrologic and hydraulic analyses, required by Maricopa County, to support the preliminary plat submittals. Preparation of this report has been done according to the procedures detailed in the *Drainage Design Manual for Maricopa County, Arizona, Volumes I & II* (Reference Nos. 1 & 2). Final drainage reports will be prepared under separate covers as part of the improvement plan submittal for the infrastructure and Units 1, 2A and 2B and ultimately Unit 3.

The Dreaming Summit project site is located within Maricopa County, Arizona. The site is located within Sections 10 and 15, Township 2 North, Range 1 West of the Gila and Salt River Base and Meridian. To be more specific, the site is bound by the Colter Channel to the south, Litchfield Road to the west, Dysart Road to the east and Maryland Avenue and Clairemont Street to the north. Figure 1, located in Appendix A, illustrates the location of the project site in relation to Maricopa County street system. Dysart and Litchfield Roads will provide access to the site.

The Dreaming Summit project is a proposed single family subdivision of approximately 630 acres. Improvements to be made on-site will include full roadway sections with asphalt pavement, roll and vertical curbing, gutter and sidewalks, retention basins, and graded building pads. Off-site improvements will include roadway widening and curb and gutter adjacent to the project boundaries. Exhibit B, located in the back pocket, illustrates in concept, the proposed improvements for the project.

## 2.0 EXISTING DRAINAGE CONDITIONS

The proposed site is located on an undeveloped parcel that has historically been used for runoff detention. Approximately one fifth of the site has been previously graded to provide for a large detention basin, the Litchfield Park Detention Facility, changing the historic flow patterns slightly. Before the construction of the detention basin, two major washes cut across the site from the northwest to the south. After the construction of the detention basin, the two washes were intercepted and detained and released the runoff at the southeast corner of the detention facility. Currently the released flow is conveyed south in a meandering wash, Dale Creek Wash, ultimately spilling into the Colter Channel that runs along the project's southern boundary.

The site is hilly and drains in varying patterns, with the northeast corner draining northeast and the remainder of the site generally draining to the south/southeast at an average slope of 1.0 percent. Areas to the north, east, and west drain to the project site, where the flow is conveyed south to the Colter Channel. The Colter Channel is a Maricopa County Flood Control Structure that intercepts flow from the north and conveys it east to the Agua Fria River. The surrounding area to the north and portions to the east are developed and to the west it is undeveloped. Luke Air Force, to the north and northwest, affects the drainage patterns considerably.

The Litchfield Park Detention Facility is located roughly in the center of the project. Its purpose is to collect runoff from a portion of Luke Air Force Base, the residential area due north of the project site, and the undeveloped areas northwest, northeast and immediately north of the basin. The flow is released via a 42" bleedoff pipe located at the southeast corner of the basin where the flow is conveyed to the Colter Channel. The Colter Channel was constructed in 1992-1993 to permit the upgrading of Camelback Road between Litchfield Road and El Mirage Road.

The current FEMA Flood Insurance Rate Map (FIRM) for this area, map number 04013C1615H (effective date September 30, 1995) shows most of the project site is in a flood hazard Zone X. Zone X is defined as "*Areas of 500-year flood; areas of 100-year flood with average depths of less than one foot or with drainage areas less than one square mile; and areas protected by levees from 100-year flood.*" A portion of the project, the large detention basin and its major feeding watercourse, is within Zone AE. Zone AE is defined as "*Base flood elevations determined.*" The AE Zone was delineated as part of the White Tanks/Agua Fria ADMS. A copy of the current FIRM panel is provided on Appendix B.

## 3.0 PROPOSED DRAINAGE CONCEPT

The proposed drainage concept is presented in three parts: on-site drainage conveyance, off-site drainage, and on-site storm water retention. The hydrologic analysis is summarized in section 4.0 and the hydraulic analysis is summarized in section 5.0. On-site storm water retention calculations are in section 3.3. See Exhibit B in the back pocket for a graphical illustration of the proposed drainage concept.

### 3.1 On-site Drainage Conveyance

On-site storm water runoff will be conveyed through the site by the paved roadway sections that will have normal crown sections and either 4-inch roll or 6-inch vertical curb. Lots will be graded to drain into the roadway on which they front. Runoff within the northeastern section of the site will be directed towards their own comparatively smaller retention basins, while runoff from the northwest quarter will be directed towards the Litchfield Park Detention Facility.

The design of the Colter Channel (Reference #3) incorporated the design guideline that there would be a *"relaxing of the retention policy for those subbasins immediately adjacent to the Colter Channel alignment, thus allowing stormwater runoff from these adjacent areas to discharge directly to the channel without on-site retention."* After extensive discussions with Maricopa County Flood Control District (FCDMC) staff, it was determined that the boundary that is described in the Colter Channel design report refers to the Litchfield Ridge project that was proposed and in for FCDMC review at the time of the Colter Channel design process. The Litchfield Ridge project was not constructed, instead the property was incorporated into the Dreaming Summit project. That boundary correlates with the area within the Dreaming Summit project but outside of Units 1, 2A and 2B i.e. the southeastern portion of the site. This area has not been platted as of this time but will be waived of any retention requirement.

The roadway sections will be designed to convey the 10-year peak flows between the curbs and the 100-year peak flows will be contained between the property lines. Catch basins, scuppers, or depressed curbs will be used to direct the flows from the street into the retention basins or Upper Dale Creek Wash.

The Litchfield Park Detention Basin will be regraded to a smooth, landscaped community park. The park will continue to function as a regional detention facility, providing the required retention volume for the project as well as continue to provide the 88.7 acre-feet of volume reserved for off-site flows, as directed by FCDMC staff.

Off-site runoff from north of Maryland Avenue is conveyed south on 135th Avenue, with a portion splitting at the local streets that truncate at 135th Avenue, with the remaining portion collected in a storm drain system at the south end of 135th Avenue. The intercepted flow is then conveyed through Unit 2A within the storm drain system, west along Peck Drive and outlet into Upper Dale Creek Wash.

### *3.3 On-site Storm Water Retention*

The County requires that all runoff from the 100-year, 2-hour event generated from the project site and half streets adjacent to the site be retained within the project site. However, as explained in Section 3.1, the design of the Colter Channel was based on a relaxing of this retention requirement for the area that encompassed the former Litchfield Ridge project. Generally, the volume produced from the 100-year, 2-hour storm event for sub-basins north (upstream) of the Litchfield Park Detention Facility is retained within the drainage facility or retention basins included as part of the overall drainage design of Dreaming Summit. There are three exceptions, the runoff generated from the southwestern portion of Unit 2B, Litchfield Road adjacent to this portion of Unit 2B, and the southeastern portion of Unit 1. The runoff will flow directly to Colter channel through the former Litchfield Ridge site, without being retained. The required volume of 8.26 ac-ft is provided in the Litchfield Park Detention basin.

The required retention volume for the project site will be estimated as follows:

$$V_R = C \cdot (P/12) \cdot A$$

Where:

$V_R$ = Estimated volume in cubic feet
$C_{wt}$ = Weighted runoff coefficient
P = 100-year, 2-hour depth of rainfall in inches (2.65 in)
A = Drainage area in acres

The volume required for the entire Dreaming Summit project is 121.06 ac-ft. The volume provided in the detention basin under the proposed conditions is 126.40 ac-ft. The volume calculations are included in Appendix D.

The Litchfield Park Detention Facility will be tiered at increments of 3 feet and the existing 42" bleedoff pipe will not be modified in size or invert elevations. All basins will be designed with a maximum 4:1 side slopes. In accordance with standards set by the County, the retention facilities will be drained within 36 hours. Drywells may be provided to accomplish this.

```
KK  C225P3
KM   COMBINE 225P2 AND 225P3
HC       2

KK   C225P
KM   COMBINE 225A, 225B, 225P4, AND 225P3 AT LITCHFIELD DETENTION FACILITY
HC       4

KK   RS225
KM   STORAGE ROUTE C225 THROUGH LITCHFIELD DETENTION FACILITY
KM   WITH 42" PIPE OUTLET, INV=1058.0
RS       1    STOR       0
SA    .004     6.6    12.2    16.9    17.8    18.3    18.7    19.6    21.1    21.7
SE    1058    1059    1060    1061    1062    1063    1064    1065    1066    1067
SQ       0       5      18      37      58      79      92     104     115     125
* DDM   ***** Preserved *****
```

SRB11

```
KK    R225
KM   ROUTE RS225 TO COLTER CHANNEL
RS       2              -1
RC     .04     .04     .04    2300    .002
RX       0      25      35      40      45      70      75      85
RY      58      57      56      55    54.5      55      56      57
* DDM   ***** Preserved *****

KK  SN242B
KM   OFFSITE PORTION OF COLTER CHANNEL MODEL SUB-BASIN D242B
KM   UA RECORD  BASED OFF NATURAL WATERSHED
KM     L =  .24  Kb = .062  Adj. Slope =   65.0
BA    .033
LG    .350    .350   4.300    .380    .000
UC    .290    .210
UA       0       3       5       8      12      20      43      75      90      96
UA     100

KK  RN242B
KM  PONDING THAT OCCURS ALONG THE WEST SIDE OF LITCHFIELD RD
RS       1    STOR       0
SA    .370   1.295   2.249   3.459   4.711   5.764
SE    1083    1084    1085    1086    1087    1088
SQ       0       0       0       0       0      20
* DDM   ***** Preserved *****

KK  RN242B
KM   ROUTE SN242B THROUGH   242B
RS       2              -1
RC     .04     .04     .04    2400    .007
RX       0       1       2      49      50      98      99     100
RY       5       5       4       0       0       4       5       5
* DDM   ***** Preserved *****
```

| | | |
|---|---|---|
| 3.40 | ac-ft Required for Infrastructure Design | |
| 4.15 | ac-ft Required for Unit 1 Design | (1.83 directed to Detention Facility)<br>(2.32 directed to Colter Channel) |
| 10.60 | ac-ft Required for Unit 2A Design | |
| 15.17 | ac-ft Required for Unit 2B Design | (9.23 directed to Detention Facility)<br>(5.94 directed to Colter Channel) |
| 88.70 | ac-ft Required for off-site | |
| 122.02 | ac-ft Total Required for Detention Facility | |

| Elevation | Area ($ft^2$) | Avg. Area ($ft^2$) | Depth (ft) | Volume ($ft^3$) | Σ Volume ($ft^2$) | Σ Volume (ac-ft) |
|---|---|---|---|---|---|---|
| 58 | 175 | | | | | |
| | | 390 | 0.5 | 195 | 195 | 0.00 |
| 58.5 | 604 | | | | | |
| | | 143,034 | 0.5 | 71,517 | 71,712 | 1.65 |
| 59 | 285,463 | | | | | |
| | | 324,064 | 0.5 | 162,032 | 162,032 | 3.72 |
| 59.5 | 362,664 | | | | | |
| | | 446,331 | 0.5 | 223,165 | 223,165 | 5.12 |
| 60 | 529,997 | | | | | |
| | | 560,230 | 0.5 | 280,115 | 503,280 | 11.55 |
| 60.5 | 590,462 | | | | | |
| | | 662,462 | 0.5 | 331,231 | 554,396 | 12.73 |
| 61 | 734,461 | | | | | |
| | | 755,350 | 1.0 | 755,350 | 1,258,630 | 28.89 |
| 62 | 776,238 | | | | | |
| | | 786,105 | 1.0 | 786,105 | 2,044,734 | 46.94 |
| 63 | 795,972 | | | | | |
| | | 806,059 | 1.0 | 806,059 | 2,850,793 | 65.45 |
| 64 | 816,146 | | | | | |
| | | 835,206 | 1.0 | 835,206 | 3,685,999 | 84.62 |
| 65 | 854,266 | | | | | |
| | | 887,776 | 1.0 | 887,776 | 4,573,775 | 105.00 |
| 66 | 921,286 | | | | | |
| | | 932,194 | 1.0 | 932,194 | 5,505,969 | 126.40 |
| 67 | 943,101 | | | | | |

| | |
|---|---|
| | 5,505,969 $ft^3$ |
| Provided | 126.40 Acre-ft |
| Required | 122.02 Acre-ft |
| Excess Provided | 4.38 Acre-ft |

UPDATED 1-12-00

112.80 ac-ft actually gets to basin, producing WSEL of 66.36

DREAMING SUMMIT
LITCHFIELD PARK DETENTION FACILITY
STAR0071
TSM - 11/99

B12

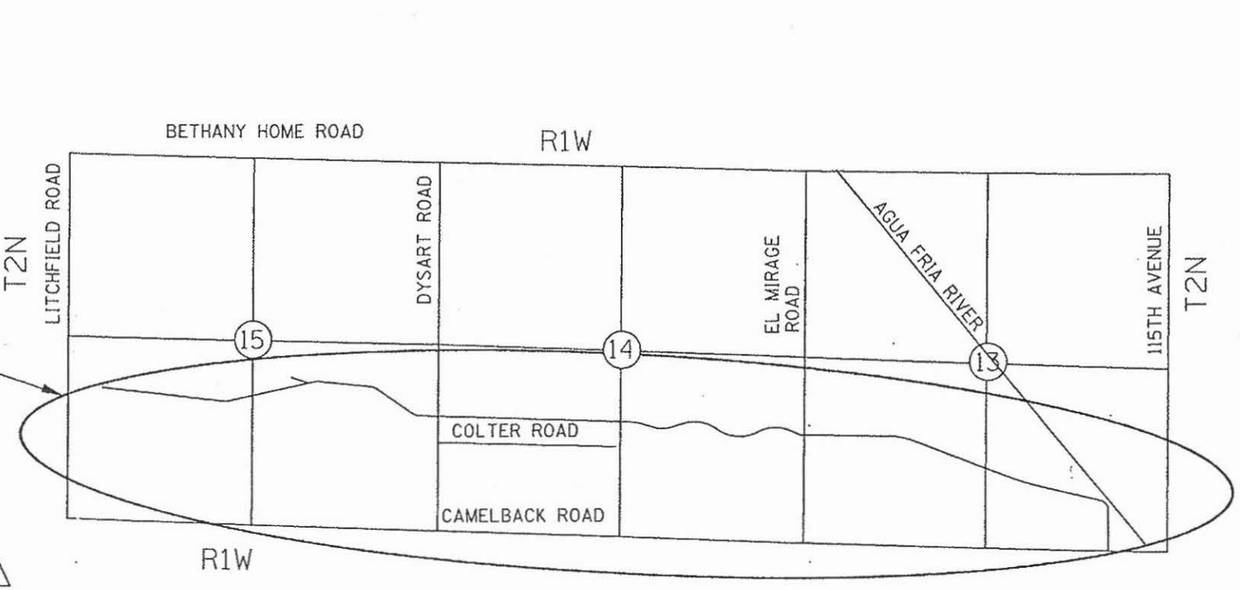
# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PLANS FOR THE CONSTRUCTION OF:

## COLTER CHANNEL

PROJECT NO. 93-08

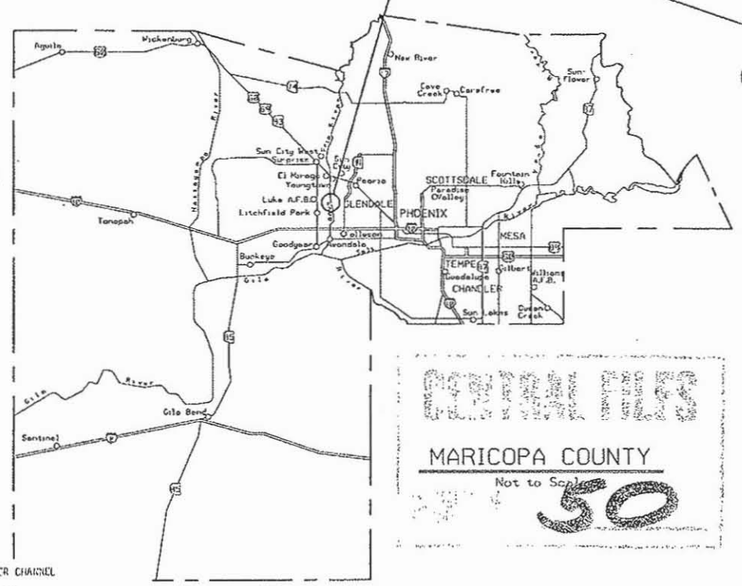
B11, B12, B14, B15




VICINITY MAP

Not to Scale

PROJECT LOCATION




MARICOPA COUNTY

Not to Scale

CENTRAL FILES

50

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION

D.L. Sagramoto — 8-31-93

Director — DATE

UTILITY INFORMATION:

Joseph E. Jason, P.E. — 8-24-93

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT — DATE

Bob Prince — 8-26-93

BOB PRINCE — DATE

VALLEY UTILITIES - TIERRA BUENA WATER

AS-BUILT

George K. Cotton

20207 GEORGE K. COTTON — 8-31-93 — ARIZONA, U.S.A.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

Neil Bruce — 9-10-93

CHIEF ENGINEER AND GENERAL MANAGER — DATE

BOARD OF DIRECTORS OF THE FLOOD CONTROL DISTRICT

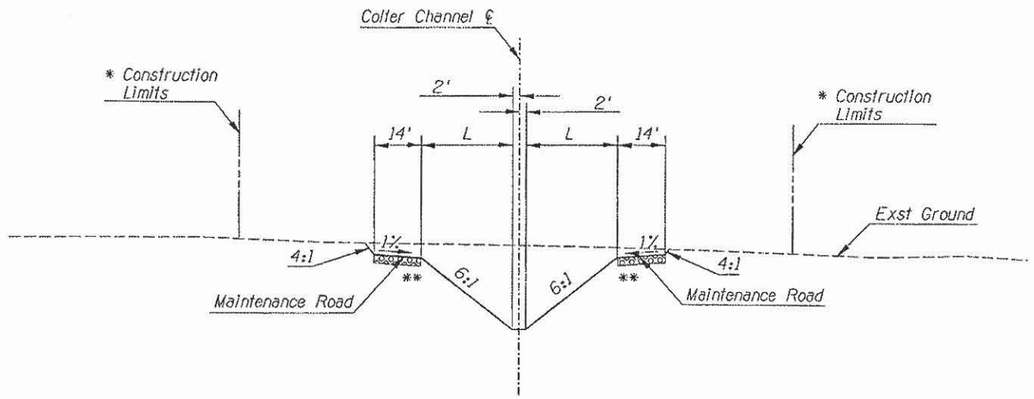
JIM BRUNER - CHAIRMAN

| | |
|---|---|
| DISTRICT 1 | TOM RAWLES |
| DISTRICT 2 | JIM BRUNER |
| DISTRICT 3 | BETSEY BAYLESS |
| DISTRICT 4 | EDWARD KING |
| DISTRICT 5 | MARY ROSE GARRIDO WILCOX |

COLTER CHANNEL

AS BUILT

FCD 93-08 470



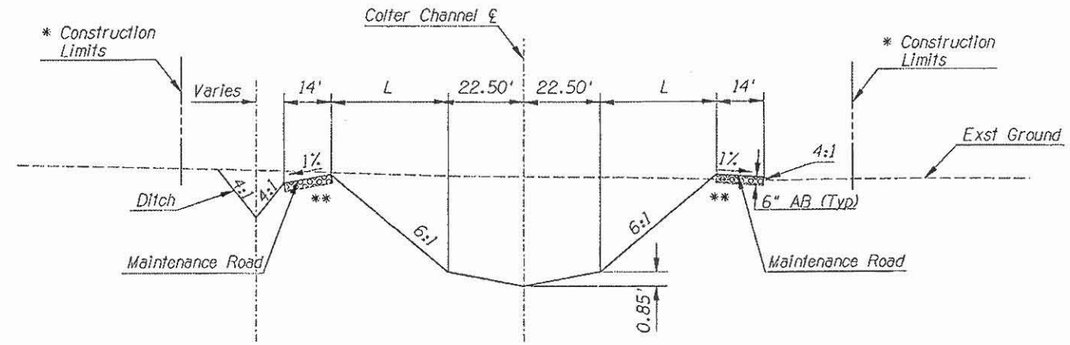

TYPICAL SECTION
STA 9+20 TO STA 12+50

| STA | L |
|---|---|
| 9+20 TO 12+50 | 26.40' |

* Construction Limits Vary, See Plan Sheets For Limits of Right-of-Way

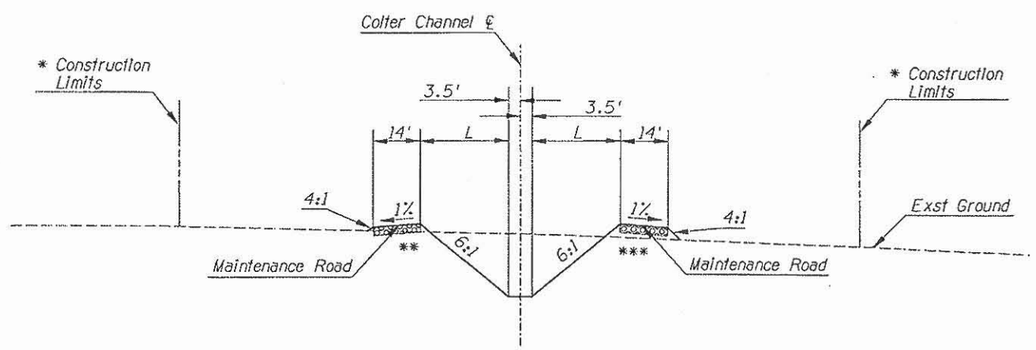
** Scarify 6" And Compact To 90% In Cut Areas

*** Compact All Fill Areas To 90%



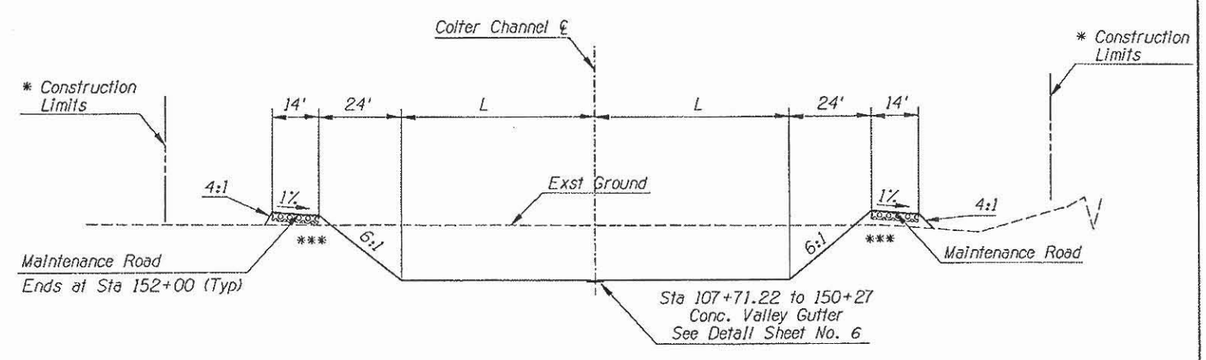

TYPICAL SECTION
STA 26+90 TO STA 107+62

| STA | L | DITCHING |
|---|---|---|
| 26+90 TO 31+00 | 27.90' | No Ditch |
| 31+00 TO 36+50 | 27.90' | Ditch |
| 37+00 TO 43+00 | 35.70' | Ditch |
| 43+50 TO 50+00 | 27.90' | Ditch Ends 51+00 |
| 51+50 TO 60+50 | 39.90' | Ditch Begins 57+00 |
| 61+00 TO 107+62 | 33.90' | Ditch Ends 81+20 |




TYPICAL SECTION
STA 13+00 TO STA 26+40

| STA | L |
|---|---|
| 13+00 TO 23+20 | 25.50' |
| 24+70 TO 26+40 | 28.50' |




TYPICAL SECTION
STA 108+87 TO STA 157+70

SCALE:
1" = 20' Horiz
1" = 4' Vert

| STA | L |
|---|---|
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Sta 152+00 To 157+70
Left Bank Terminates At Intersection
Of 6:1 With Existing Ground

20207 GEORGE K. COTTON

CRSS Civil Engineers Inc. Phoenix, Arizona

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|---|---|---|
| DRAWN | MEM | 6-93 |
| DESIGN | GW | 6-93 |
| CHECKED | JFM | 6-93 |
| APPROVED | GKC | 6-93 |
| SUBMITTED BY: | | DATE: |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Colter Channel

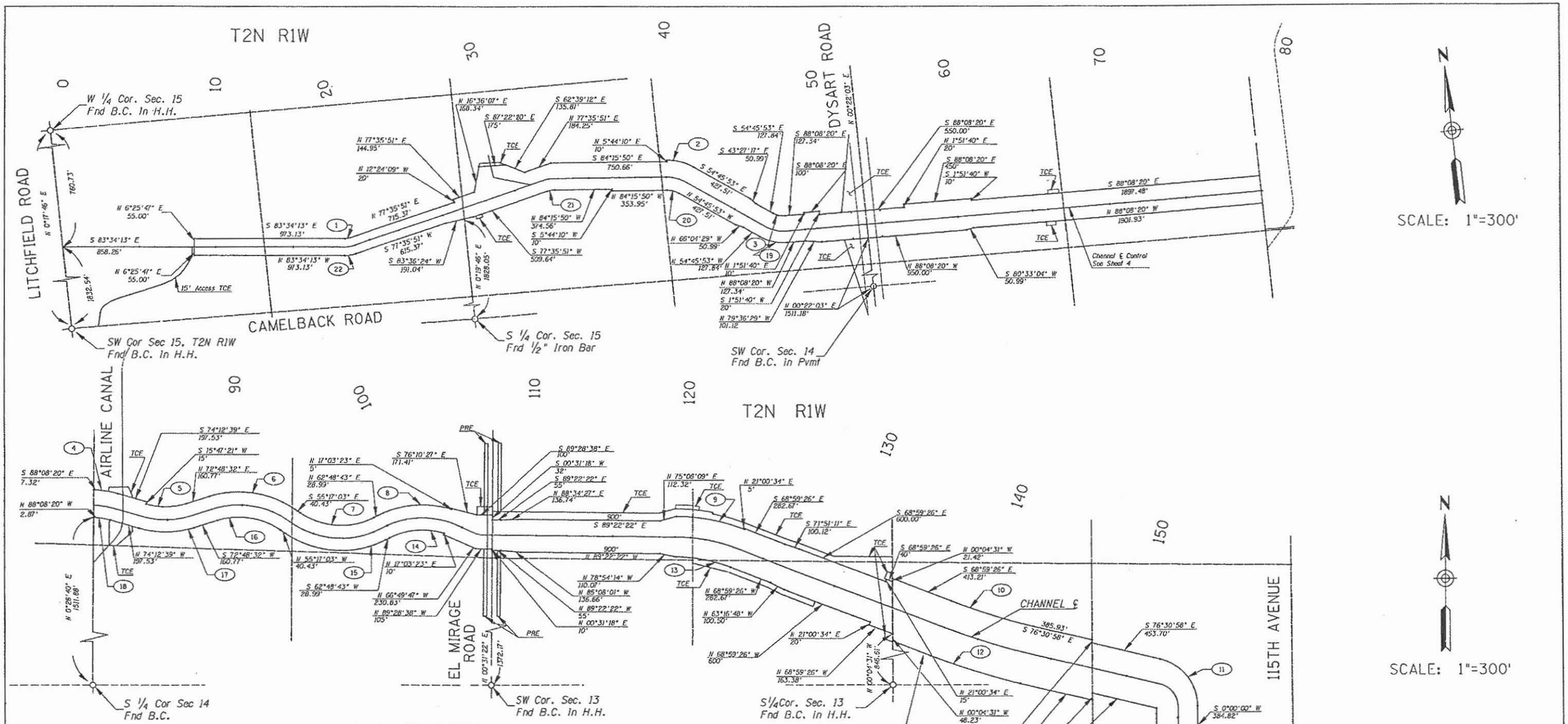
TYPICAL SECTIONS

RECOMMENDED BY: DATE:
APPROVED BY: DATE:
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 7 OF 55

B10 11A - B11
B11 B12 - B12
B12 B14 - B14

27 JULY 1993 CT01.10X




## STATE PLANE COORDINATE TABLE

| LOCATION | COORDINATE | |
|---|---|---|
| | NORTH | EAST |
| SW COR SEC 15 | 912,698.4789 | 365,661.8880 |
| W 1/4 COR SEC 15 | 915,291.4004 | 365,665.6601 |
| CTR SEC 15 | 915,214.2448 | 368,279.3164 |
| S 1/4 COR SEC 15 | 912,603.0918 | 368,273.9592 |
| E 1/4 COR SEC 15 | 915,191.0575 | 370,893.1060 |
| SE COR SEC 15 | 912,508.0151 | 370,865.8607 |
| | | |
| CTR SEC 14 | 915,105.8453 | 373,492.2950 |
| S 1/4 COR SEC 14 | 912,442.5759 | 373,481.5396 |
| E 1/4 COR SEC 14 | 915,021.2214 | 376,090.7703 |
| SE COR SEC 14 | 912,377.4327 | 376,076.4659 |
| | | |
| CTR SEC 13 | 914,997.8260 | 378,689.3360 |
| S 1/4 COR SEC 13 | 912,362.6780 | 378,702.5950 |
| E 1/4 COR SEC 13 | 914,982.6580 | 381,297.1330 |
| SE COR SEC 13 | 912,348.5750 | 381,317.4470 |

NOTE: Coordinates shown are Ground Coordinates

## CURVE DATA TABLE

| Curve No | Radius | Length | Curve No | Radius | Length |
|---|---|---|---|---|---|
| 1 | 107.00 | 35.17 | 12 | 4740.62 | 622.64 |
| 2 | 350.00 | 180.20 | 13 | 1020.00 | 362.85 |
| 3 | 140.00 | 81.55 | 14 | 470.00 | 362.94 |
| 4 | 650.00 | 158.01 | 15 | 630.00 | 680.67 |
| 5 | 465.00 | 267.66 | 16 | 470.00 | 425.79 |
| 6 | 635.00 | 575.28 | 17 | 630.00 | 362.64 |
| 7 | 465.00 | 502.40 | 18 | 470.00 | 114.25 |
| 8 | 635.00 | 490.35 | 19 | 315.00 | 183.48 |
| 9 | 1285.00 | 457.12 | 20 | 155.00 | 79.80 |
| 10 | 4355.62 | 572.08 | 21 | 165.00 | 52.24 |
| 11 | 319.12 | 426.17 | 22 | 217.00 | 71.32 |

NOTE: TCE AND PRE LIMITS TO BE PROVIDED BY FCDMC AT PRE-COM MTG.

20207 GEORGE K. COTTON ARIZONA, U.S.A.

CRSS Civil Engineers Inc. Phoenix, Arizona

| | BY | DATE |
|---|---|---|
| DRAWN | MEM | 6-93 |
| DESIGN | GW | 6-93 |
| CHECKED | JFM | 6-93 |
| APPROVED | GKC | 6-93 |
| SUBMITTED BY: | | DATE: |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

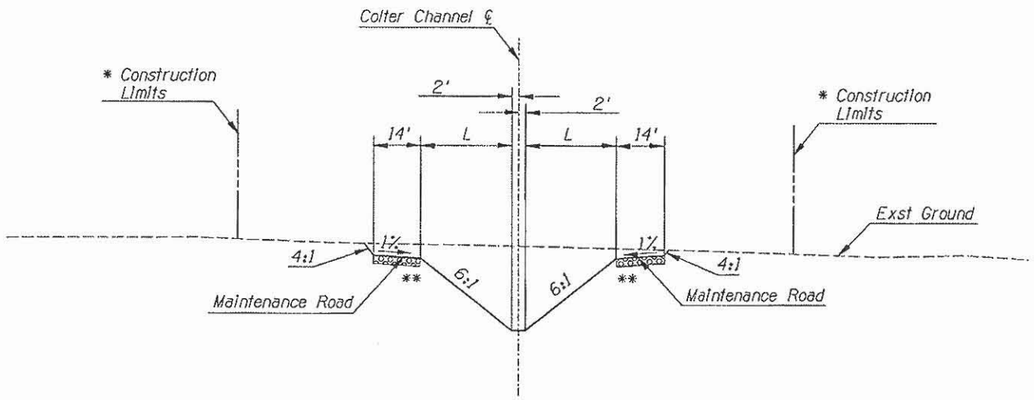
Colter Channel

CONSTRUCTION LIMITS

RECOMMENDED BY: DATE:
APPROVED BY: DATE:
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 3 OF 55

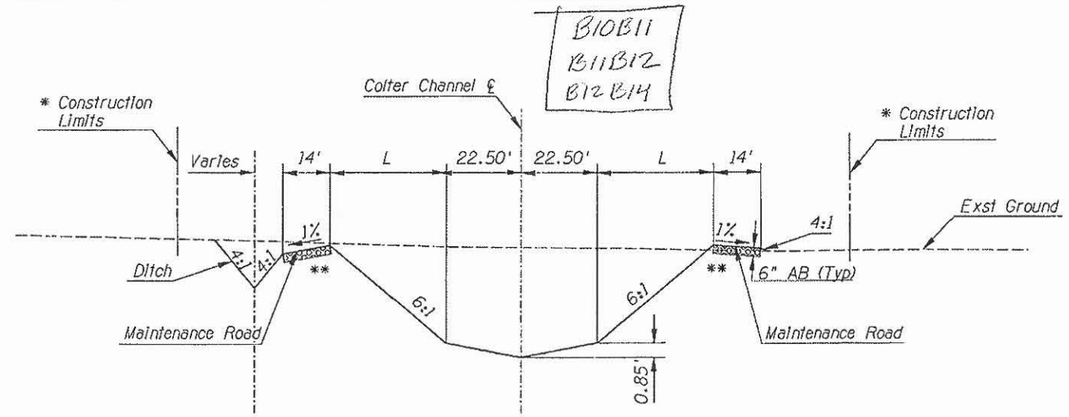
22 JULY 1993 COLTER.00/010/ROW01.10A




TYPICAL SECTION
STA 9+20 TO STA 12+50

| STA | L |
|---|---|
| 9+20 TO 12+50 | 26.40' |

B10B11
B11B12
B12B14




TYPICAL SECTION
STA 26+90 TO STA 107+62

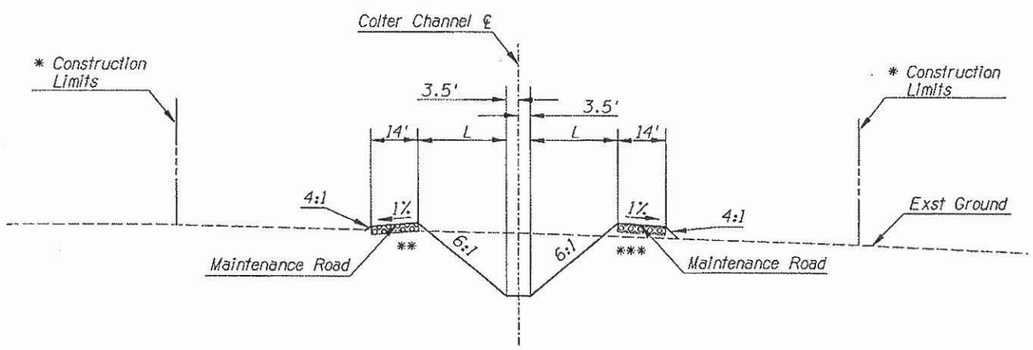
* Construction Limits Vary, See Plan Sheets For Limits of Right-of-Way

** Scarify 6" And Compact To 90% In Cut Areas

*** Compact All Fill Areas To 90%

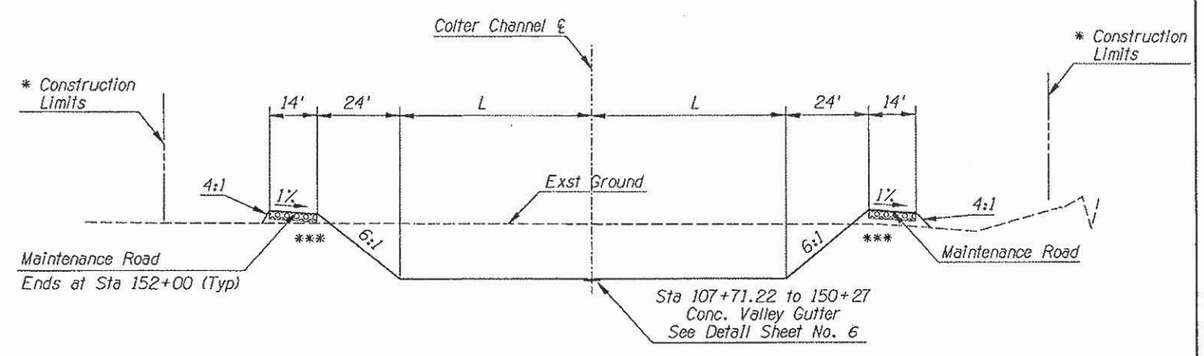
| STA | L | DITCHING |
|---|---|---|
| 26+90 TO 31+00 | 27.90' | No Ditch |
| 31+00 TO 36+50 | 27.90' | Ditch |
| 37+00 TO 43+00 | 35.70' | Ditch |
| 43+50 TO 50+00 | 27.90' | Ditch Ends 51+00 |
| 51+50 TO 60+50 | 39.90' | Ditch Begins 57+00 |
| 61+00 TO 107+62 | 33.90' | Ditch Ends 81+20 |

B14B15




TYPICAL SECTION
STA 13+00 TO STA 26+40

| STA | L |
|---|---|
| 13+00 TO 23+20 | 25.50' |
| 24+70 TO 26+40 | 28.50' |




TYPICAL SECTION
STA 108+87 TO STA 157+70

SCALE:
1" = 20' Horiz
1" = 4' Vert

| STA | L |
|---|---|
| 108+87 TO 119+00 | 57.00' |
| 120+00 TO 126+00 | 84.00' |
| 127+00 TO 157+70 | 89.00' |

Sta 152+00 To 157+70
Left Bank Terminates At Intersection
Of 6:1 With Existing Ground

20207 GEORGE K COTTON

CRSS Civil Engineers Inc. Phoenix, Arizona

| | BY | DATE |
|---|---|---|
| DRAWN | MEM | 6-93 |
| DESIGN | GW | 6-93 |
| CHECKED | JFM | 6-93 |
| APPROVED | GKC | 6-93 |
| SUBMITTED BY: | | DATE: |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Colter Channel

TYPICAL SECTIONS

RECOMMENDED BY: DATE:
APPROVED BY: DATE:
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 7 OF 55

27 JULY 1993 CT01.10X

B13

## This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B14

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

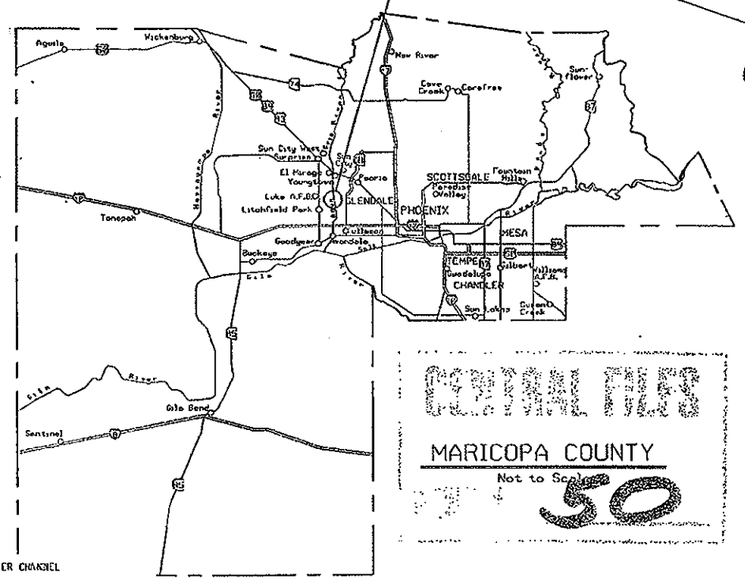
PLANS FOR THE CONSTRUCTION OF:

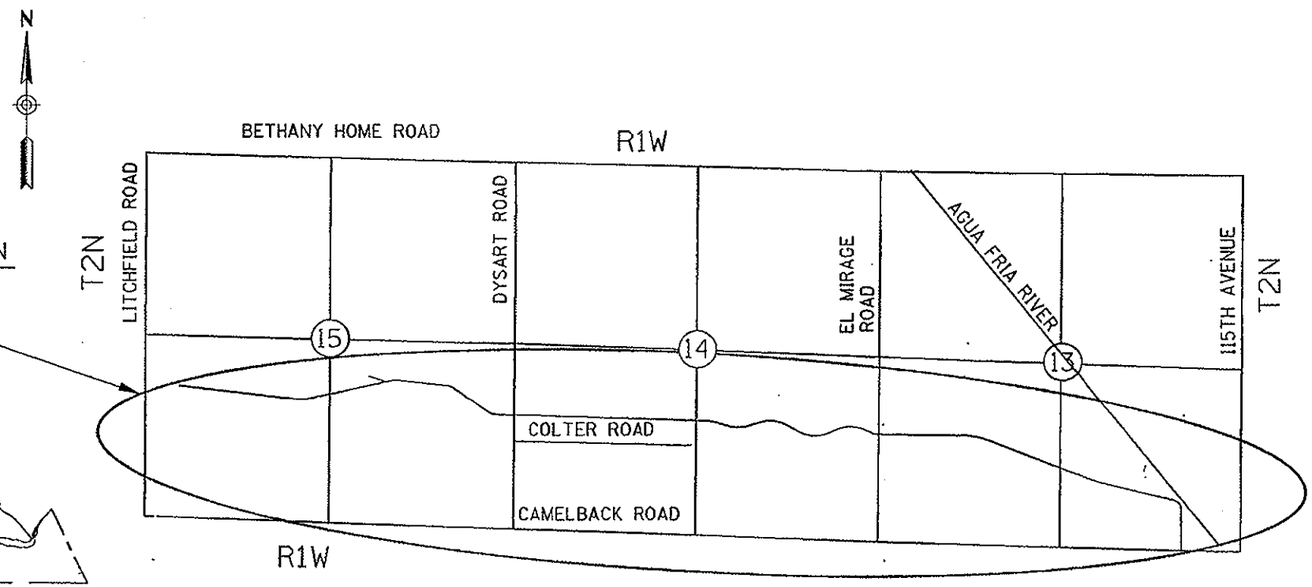
## COLTER CHANNEL

PROJECT NO. 93-08

B11, B12, B14, B15

PROJECT LOCATION




VICINITY MAP

Not to Scale

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION

Director — 8-31-93 DATE

UTILITY INFORMATION:

Joseph E. Jason, P.E. — 8-24-93 DATE
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Bob Prince — 8-26-93 DATE
BOB PRINCE
VALLEY UTILITIES - TIERRA BUENA WATER

AS-BUILT

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

CHIEF ENGINEER AND GENERAL MANAGER — 9-10-93 DATE

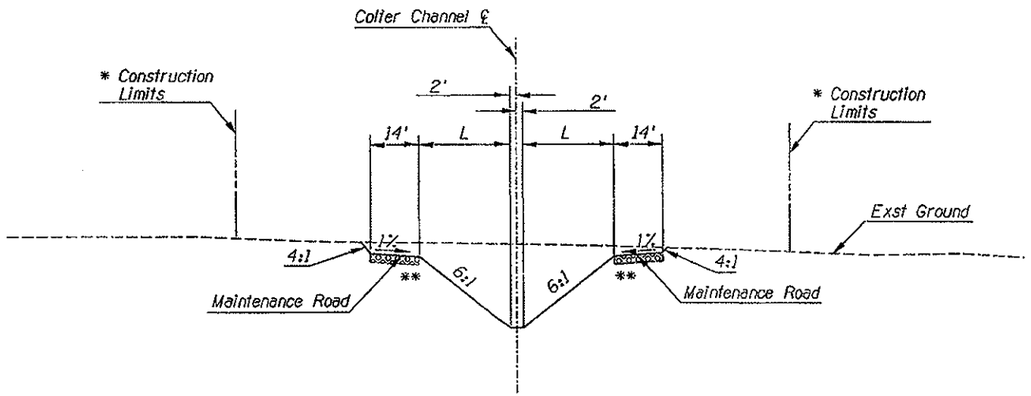
BOARD OF DIRECTORS OF THE FLOOD CONTROL DISTRICT

JIM BRUNER - CHAIRMAN

| | |
|---|---|
| DISTRICT 1 | TOM RAWLES |
| DISTRICT 2 | JIM BRUNER |
| DISTRICT 3 | BETSEY BAYLESS |
| DISTRICT 4 | EDWARD KING |
| DISTRICT 5 | MARY ROSE GARRIDO WILCOX |

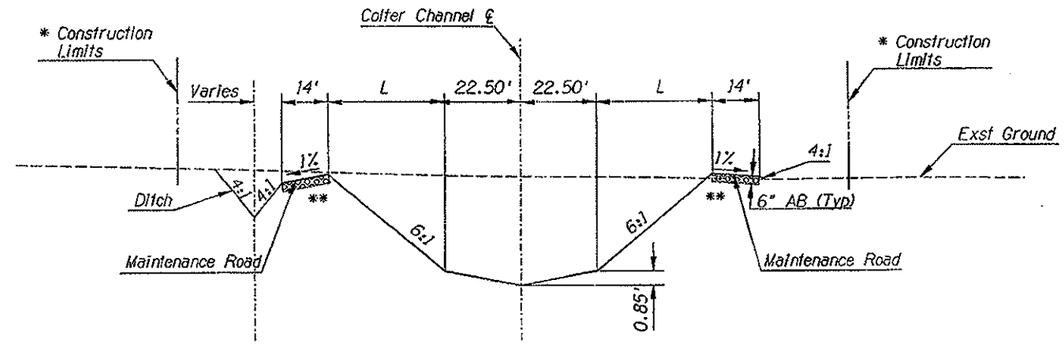
CENTRAL FILES
MARICOPA COUNTY
Not to Scale
50

COLTER CHANNEL
AS BUILT
FCD 93-09 470




TYPICAL SECTION
STA 9+20 TO STA 12+50

| STA | L |
|---|---|
| 9+20 TO 12+50 | 26.40' |



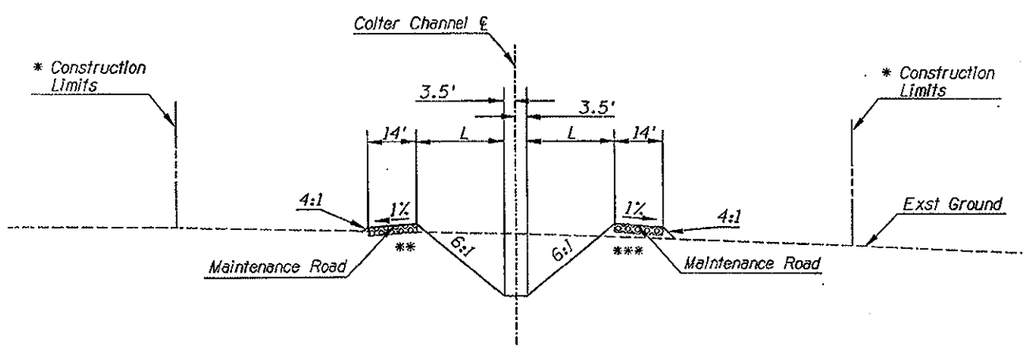

TYPICAL SECTION
STA 26+90 TO STA 107+62

* Construction Limits Vary, See Plan Sheets For Limits of Right-of-Way

** Scarify 6" And Compact To 90% In Cut Areas

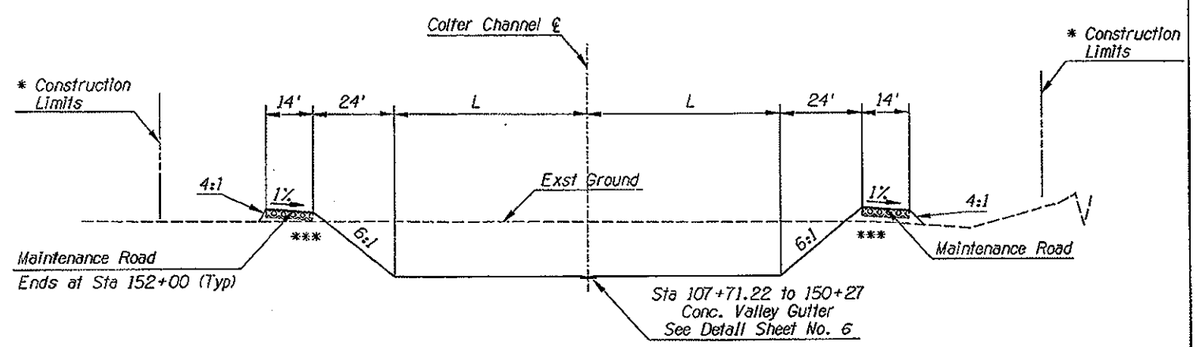
*** Compact All Fill Areas To 90%

| STA | L | DITCHING |
|---|---|---|
| 26+90 TO 31+00 | 27.90' | No Ditch |
| 31+00 TO 36+50 | 27.90' | Ditch |
| 37+00 TO 43+00 | 35.70' | Ditch |
| 43+50 TO 50+00 | 27.90' | Ditch Ends 51+00 |
| 51+50 TO 60+50 | 39.90' | Ditch Begins 57+00 |
| 61+00 TO 107+62 | 33.90' | Ditch Ends 81+20 |




TYPICAL SECTION
STA 13+00 TO STA 26+40

| STA | L |
|---|---|
| 13+00 TO 23+20 | 25.50' |
| 24+70 TO 26+40 | 28.50' |




TYPICAL SECTION
STA 108+87 TO STA 157+70

SCALE:
1" = 20' Horiz
1" = 4' Vert

| STA | L |
|---|---|
| 108+87 TO 119+00 | 57.00' |
| 120+00 TO 126+00 | 84.00' |
| 127+00 TO 157+70 | 89.00' |

Sta 152+00 To 157+70
Left Bank Terminates At Intersection
Of 6:1 With Existing Ground

20267 GEORGE K. COTTON

CRSS Civil Engineers Inc. Phoenix, Arizona

| | BY | DATE |
|---|---|---|
| DRAWN | MEM | 6-93 |
| DESIGN | GW | 6-93 |
| CHECKED | JFM | 6-93 |
| APPROVED | GKC | 6-93 |
| SUBMITTED BY: | | DATE: |

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

Colter Channel

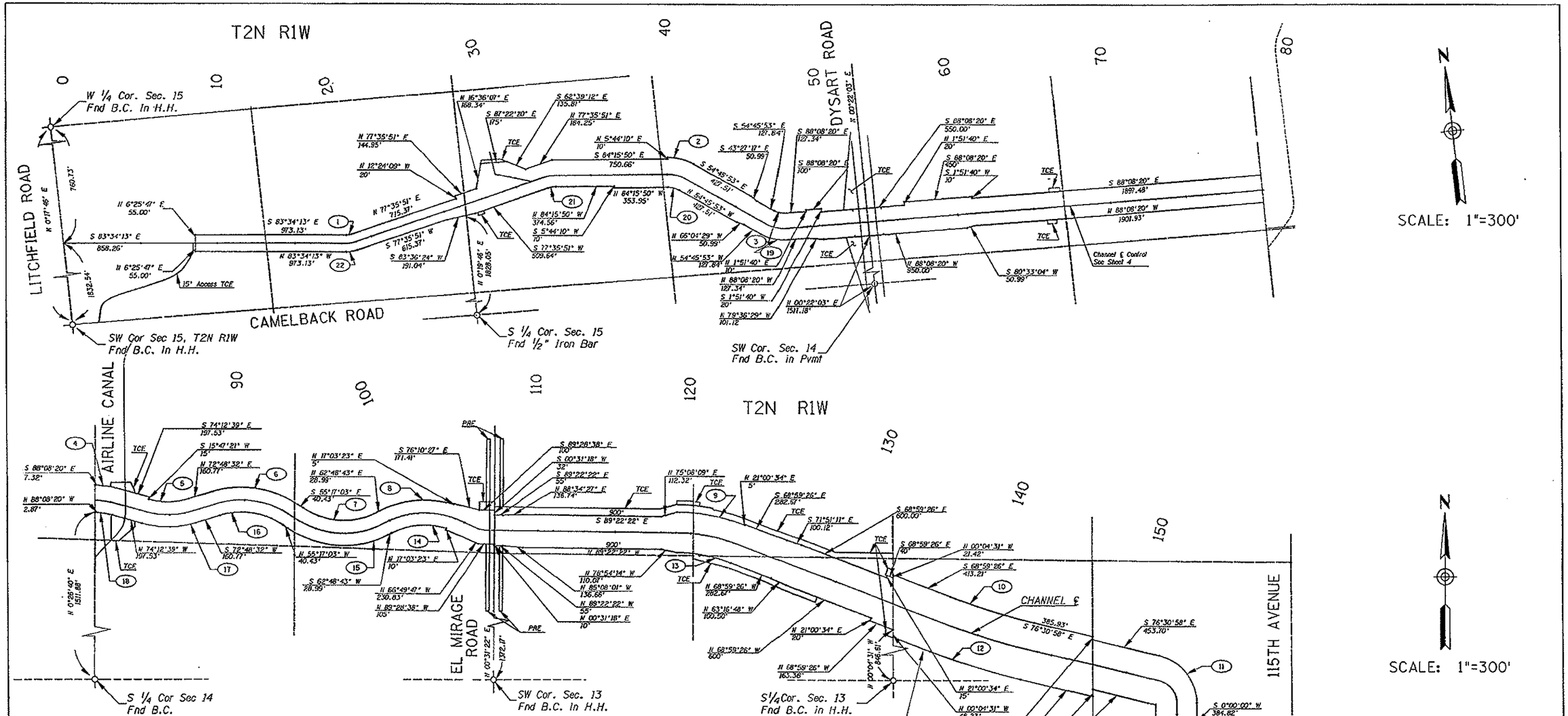
TYPICAL SECTIONS

RECOMMENDED BY: DATE:
APPROVED BY: DATE:
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 7 OF 55

B101A-B11
B11-B12-B12
B12-B19-B19

27 JULY 1993 CTOL.10X







## STATE PLANE COORDINATE TABLE

| LOCATION | COORDINATE | |
|---|---|---|
| | NORTH | EAST |
| SW COR SEC 15 | 912,698.4789 | 365,661.8880 |
| W 1/4 COR SEC 15 | 915,291.4004 | 365,665.6601 |
| CTR SEC 15 | 915,214.2448 | 368,279.3164 |
| S 1/4 COR SEC 15 | 912,603.0918 | 368,273.9592 |
| E 1/4 COR SEC 15 | 915,191.0575 | 370,893.1060 |
| SE COR SEC 15 | 912,508.0151 | 370,885.8607 |
| | | |
| CTR SEC 14 | 915,105.8453 | 373,492.2950 |
| S 1/4 COR SEC 14 | 912,442.5759 | 373,481.5396 |
| E 1/4 COR SEC 14 | 915,021.2214 | 376,090.7703 |
| SE COR SEC 14 | 912,377.4327 | 376,076.4659 |
| | | |
| CTR SEC 13 | 914,997.8260 | 378,689.3360 |
| S 1/4 COR SEC 13 | 912,362.6780 | 378,702.5950 |
| E 1/4 COR SEC 13 | 914,982.6580 | 381,297.1330 |
| SE COR SEC 13 | 912,348.5750 | 381,317.4470 |

NOTE: Coordinates shown are Ground Coordinates

## CURVE DATA TABLE

| Curve No | Radius | Length | Curve No | Radius | Length |
|---|---|---|---|---|---|
| 1 | 107.00 | 35.17 | 12 | 4740.62 | 622.64 |
| 2 | 350.00 | 180.20 | 13 | 1020.00 | 362.85 |
| 3 | 140.00 | 81.55 | 14 | 470.00 | 362.94 |
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| 5 | 465.00 | 267.66 | 16 | 470.00 | 425.79 |
| 6 | 635.00 | 575.28 | 17 | 630.00 | 362.64 |
| 7 | 465.00 | 502.40 | 18 | 470.00 | 114.25 |
| 8 | 635.00 | 490.35 | 19 | 315.00 | 183.48 |
| 9 | 1285.00 | 457.12 | 20 | 155.00 | 79.80 |
| 10 | 4355.62 | 572.08 | 21 | 165.00 | 52.24 |
| 11 | 319.12 | 426.17 | 22 | 217.00 | 71.32 |

NOTE: TCE AND PRE LIMITS TO BE PROVIDED BY FCDMC AT PRE-COM MTG.

CRSS Civil Engineers Inc. Phoenix, Arizona

| | BY | DATE |
|---|---|---|
| DRAWN | MEM | 6-93 |
| DESIGN | CW | 6-93 |
| CHECKED | JFM | 6-93 |
| APPROVED | GKC | 6-93 |
| SUBMITTED BY: | | DATE: |

RECOMMENDED BY: DATE:
APPROVED BY: DATE:
CHIEF ENGINEER AND GENERAL MANAGER

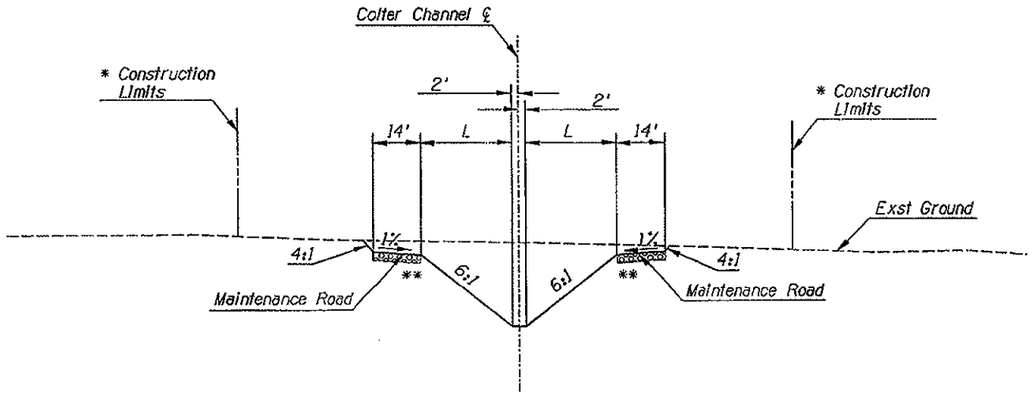
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Colter Channel

CONSTRUCTION LIMITS

SHEET 3 OF 55

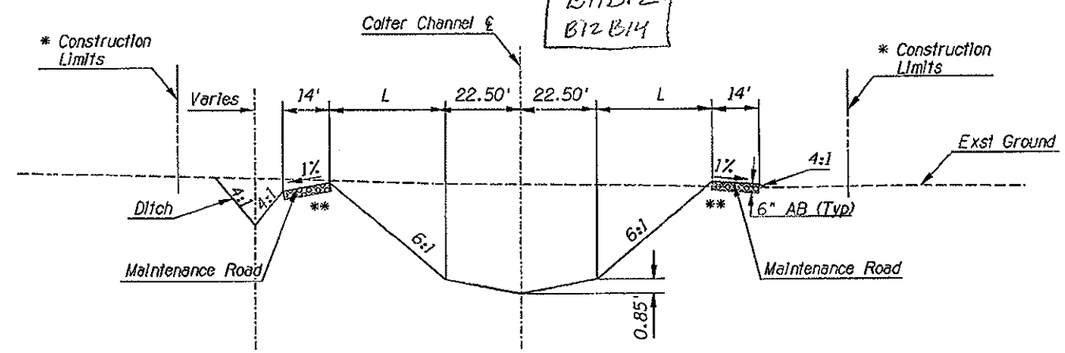
22 JULY 1993 COLTER.00/010/ROW01.10A




TYPICAL SECTION
STA 9+20 TO STA 12+50

| STA | L |
|---|---|
| 9+20 TO 12+50 | 26.40' |

B10B11
B11B12
B12B14




TYPICAL SECTION
STA 26+90 TO STA 107+62

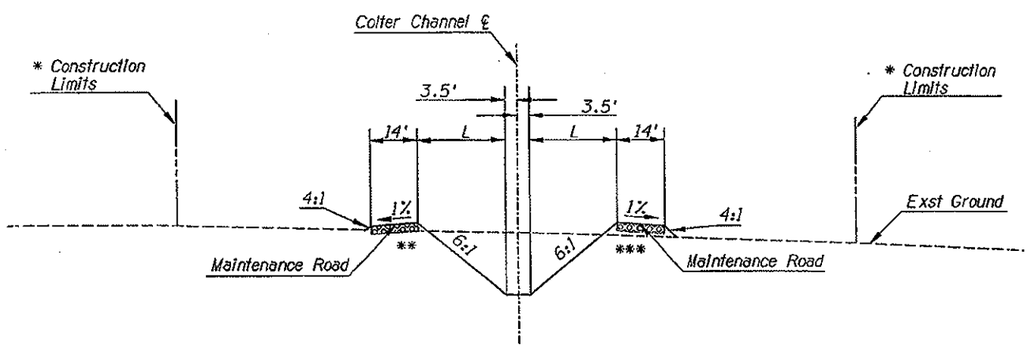
* Construction Limits Vary, See Plan Sheets For Limits of Right-of-Way

** Scarify 6" And Compact To 90% In Cut Areas

*** Compact All Fill Areas To 90%

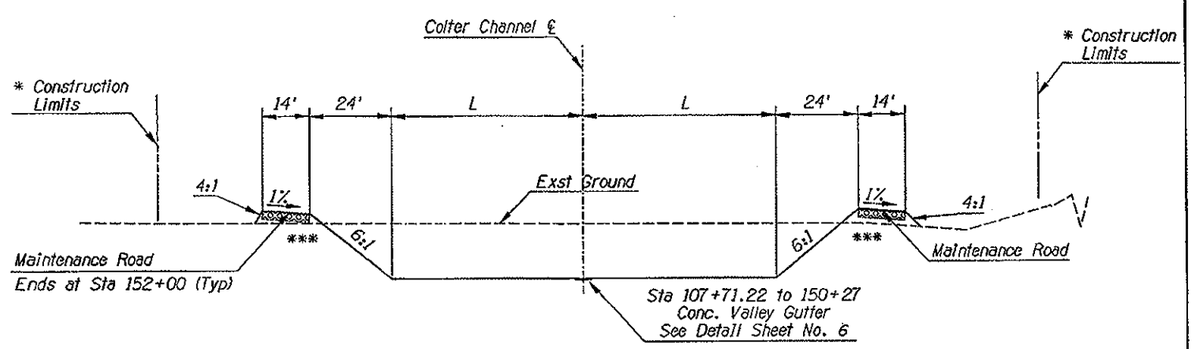
| STA | L | DITCHING |
|---|---|---|
| 26+90 TO 31+00 | 27.90' | No Ditch |
| 31+00 TO 36+50 | 27.90' | Ditch |
| 37+00 TO 43+00 | 35.70' | Ditch |
| 43+50 TO 50+00 | 27.90' | Ditch Ends 51+00 |
| 51+50 TO 60+50 | 39.90' | Ditch Begins 57+00 |
| 61+00 TO 107+62 | 33.90' | Ditch Ends 81+20 |

B14B15




TYPICAL SECTION
STA 13+00 TO STA 26+40

| STA | L |
|---|---|
| 13+00 TO 23+20 | 25.50' |
| 24+70 TO 26+40 | 28.50' |




TYPICAL SECTION
STA 108+87 TO STA 157+70

SCALE:
1" = 20' Horiz
1" = 4' Vert

| STA | L |
|---|---|
| 108+87 TO 119+00 | 57.00' |
| 120+00 TO 126+00 | 84.00' |
| 127+00 TO 157+70 | 89.00' |

Sta 152+00 To 157+70
Left Bank Terminates At Intersection
Of 6:1 With Existing Ground

20207 GEORGE K COTTON

CRSS Civil Engineers Inc. Phoenix, Arizona

| | BY | DATE |
|---|---|---|
| DRAWN | MEM | 6-93 |
| DESIGN | GW | 6-93 |
| CHECKED | JFM | 6-93 |
| APPROVED | GKC | 6-93 |
| SUBMITTED BY: | | DATE: |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Colter Channel

TYPICAL SECTIONS

RECOMMENDED BY: DATE:
APPROVED BY: DATE:
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 7 of 55

27 JULY 1993 CT01.10X

B15

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

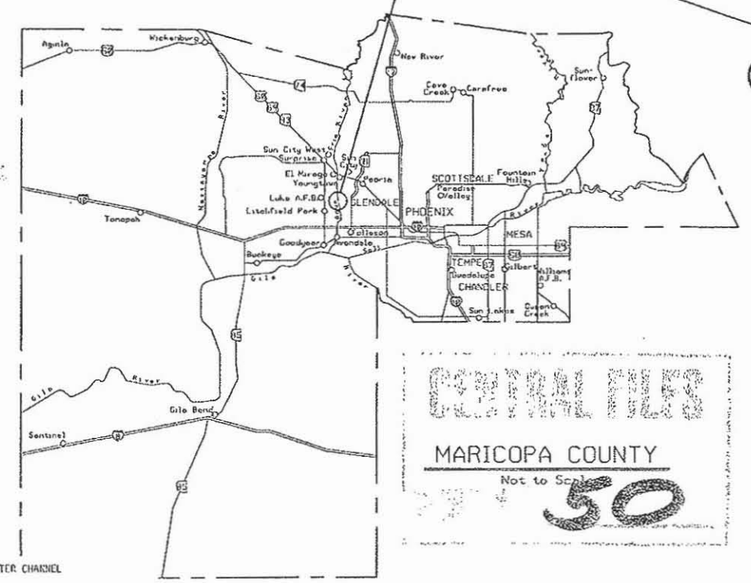
PLANS FOR THE CONSTRUCTION OF:

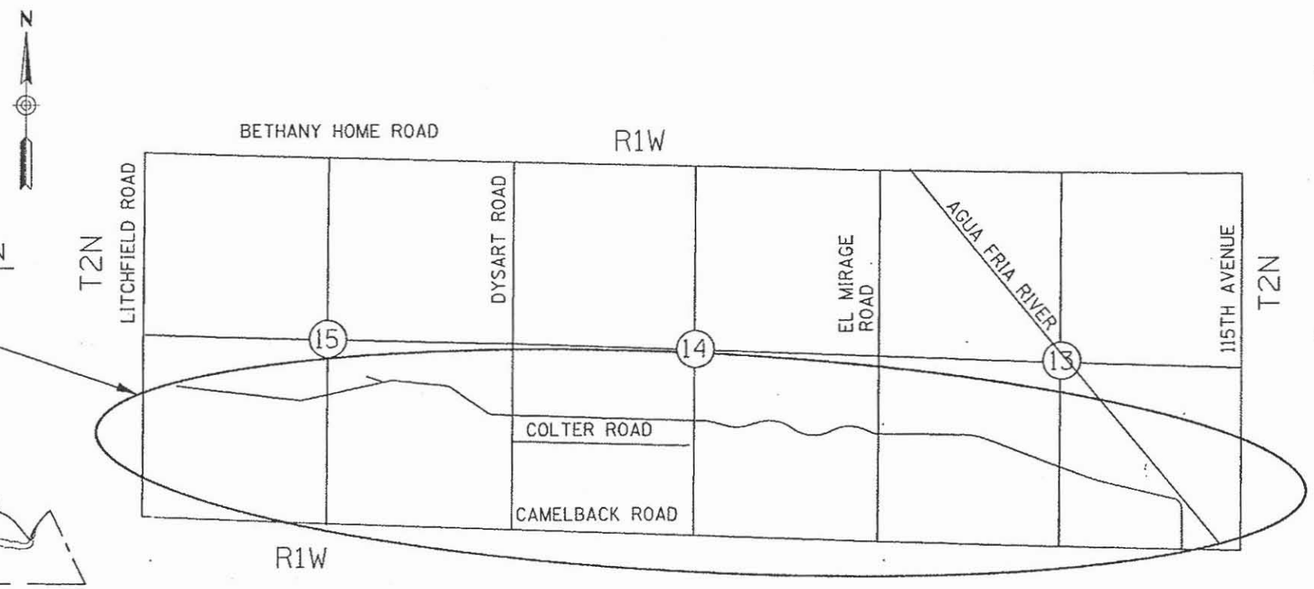
## COLTER CHANNEL

PROJECT NO. 93-08

B11, B12, B14, B15

PROJECT LOCATION




VICINITY MAP

Not to Scale

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION

Director — 8-31-93 DATE

UTILITY INFORMATION:

Joseph E. Jason, P.E. — 8-24-93 DATE
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Bob Prince — 8-26-93 DATE
BOB PRINCE
VALLEY UTILITIES - TIERRA BUENA WATER

AS-BUILT

CENTRAL FILES
MARICOPA COUNTY
Not to Scale
50

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

CHIEF ENGINEER AND GENERAL MANAGER — 9-10-93 DATE

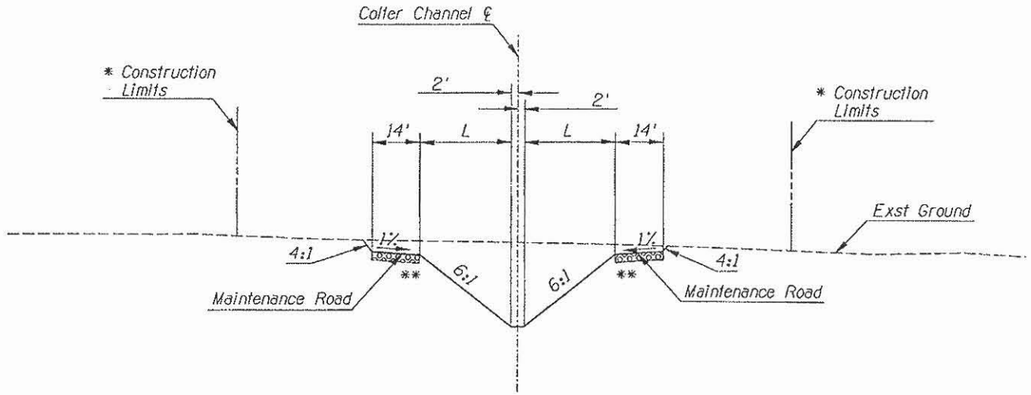
BOARD OF DIRECTORS OF THE FLOOD CONTROL DISTRICT

JIM BRUNER - CHAIRMAN

| | |
|---|---|
| DISTRICT 1 | TOM RAWLES |
| DISTRICT 2 | JIM BRUNER |
| DISTRICT 3 | BETSEY BAYLESS |
| DISTRICT 4 | EDWARD KING |
| DISTRICT 5 | MARY ROSE GARRIDO WILCOX |

20207 GEORGE R. COTTON

COLTER CHANNEL
AS BUILT
FCD 93-08 470



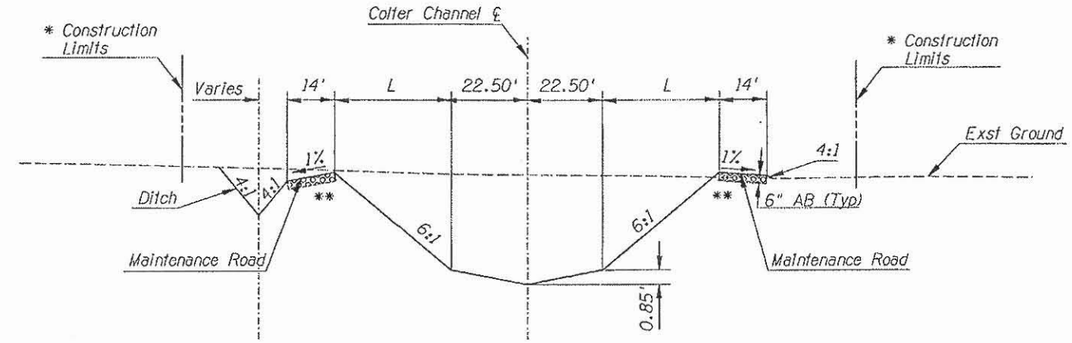

TYPICAL SECTION
STA 9+20 TO STA 12+50

| STA | L |
|---|---|
| 9+20 TO 12+50 | 26.40' |

* Construction Limits Vary, See Plan Sheets For Limits of Right-of-Way

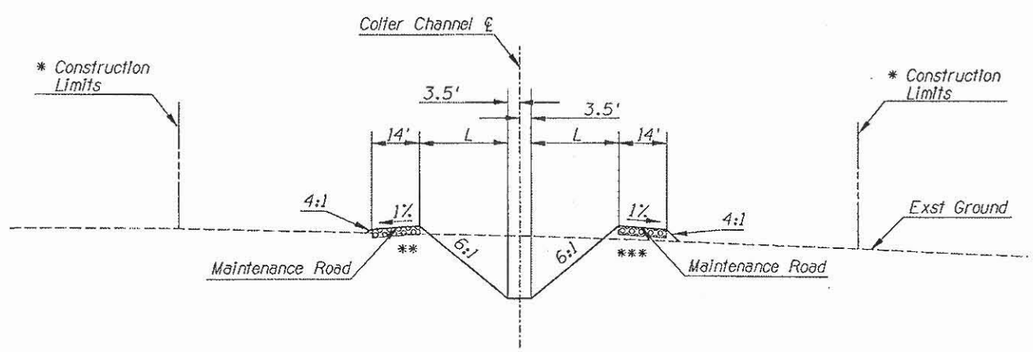
** Scarify 6" And Compact To 90% In Cut Areas

*** Compact All Fill Areas To 90%



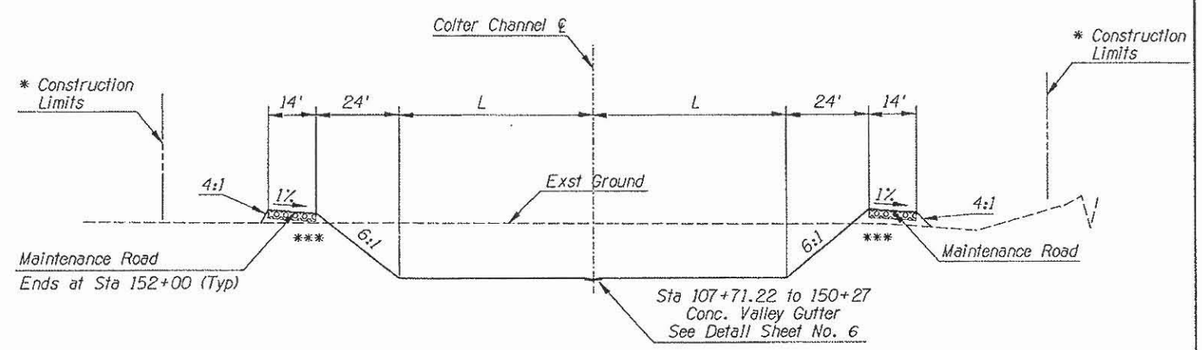

TYPICAL SECTION
STA 26+90 TO STA 107+62

| STA | L | DITCHING |
|---|---|---|
| 26+90 TO 31+00 | 27.90' | No Ditch |
| 31+00 TO 36+50 | 27.90' | Ditch |
| 37+00 TO 43+00 | 35.70' | Ditch |
| 43+50 TO 50+00 | 27.90' | Ditch Ends 51+00 |
| 51+50 TO 60+50 | 39.90' | Ditch Begins 57+00 |
| 61+00 TO 107+62 | 33.90' | Ditch Ends 81+20 |




TYPICAL SECTION
STA 13+00 TO STA 26+40

| STA | L |
|---|---|
| 13+00 TO 23+20 | 25.50' |
| 24+70 TO 26+40 | 28.50' |




TYPICAL SECTION
STA 108+87 TO STA 157+70

SCALE:
1" = 20' Horiz
1" = 4' Vert

| STA | L |
|---|---|
| 108+87 TO 119+00 | 57.00' |
| 120+00 TO 126+00 | 84.00' |
| 127+00 TO 157+70 | 89.00' |

Sta 152+00 To 157+70
Left Bank Terminates At Intersection
Of 6:1 With Existing Ground

20207 GEORGE K. COTTON

| CRSS Civil Engineers Inc. Phoenix, Arizona | | |
|---|---|---|
| DRAWN | MEM | 6-93 |
| DESIGN | GW | 6-93 |
| CHECKED | JFM | 6-93 |
| APPROVED | GKC | 6-93 |
| SUBMITTED BY: | | DATE: |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Colter Channel

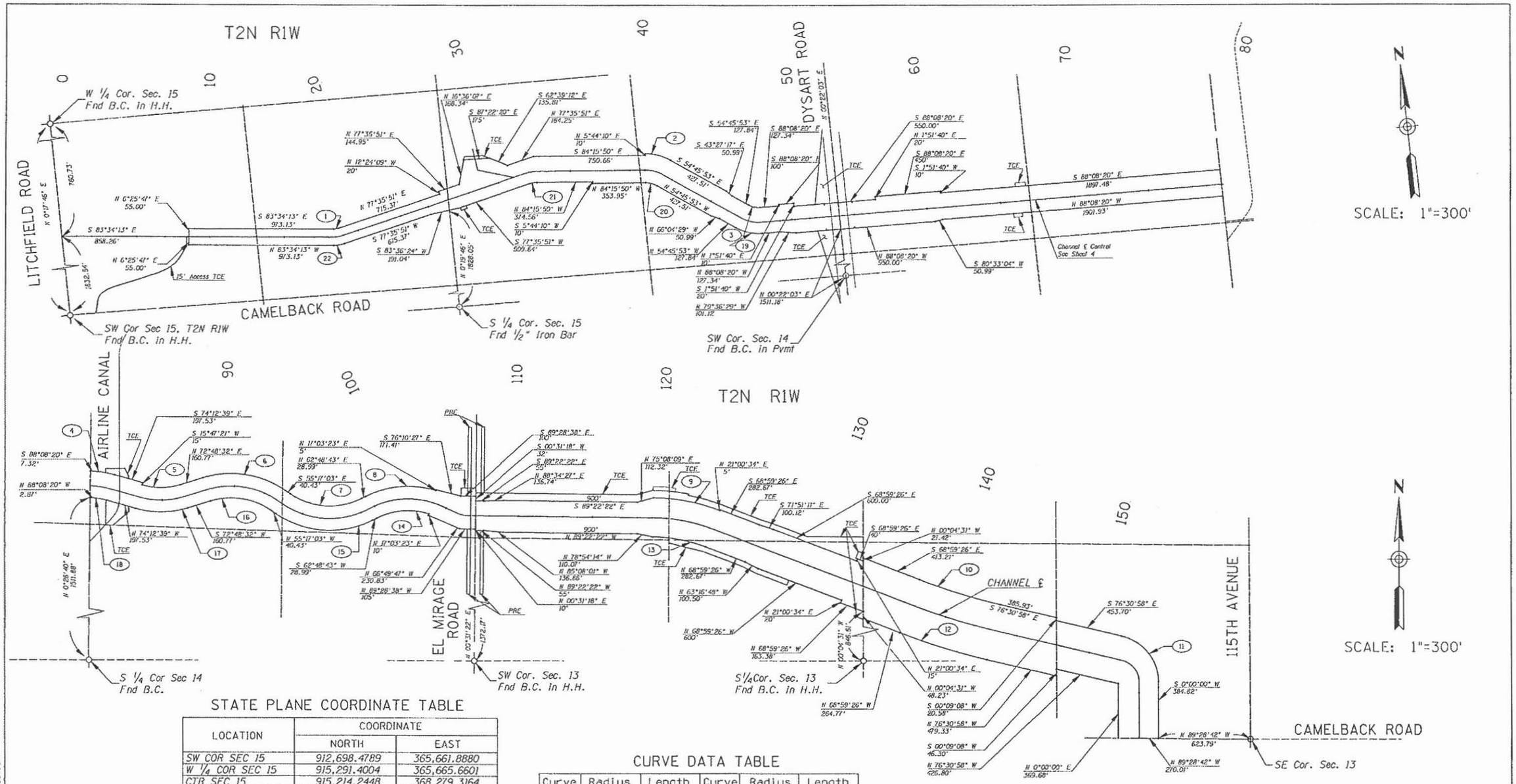
TYPICAL SECTIONS

RECOMMENDED BY: DATE:
APPROVED BY: DATE:
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 7 OF 55

B10-11A-B11
B11-B12-B12
B12-B13-B14

27 JULY 1993 CT01.10X




## STATE PLANE COORDINATE TABLE

| LOCATION | COORDINATE | |
|---|---|---|
| | NORTH | EAST |
| SW COR SEC 15 | 912,698.4789 | 365,661.8880 |
| W 1/4 COR SEC 15 | 915,291.4004 | 365,665.6601 |
| CTR SEC 15 | 915,214.2448 | 368,279.3164 |
| S 1/4 COR SEC 15 | 912,603.0918 | 368,273.9592 |
| E 1/4 COR SEC 15 | 915,191.0575 | 370,893.1060 |
| SE COR SEC 15 | 912,508.0151 | 370,885.8607 |
| | | |
| CTR SEC 14 | 915,105.8453 | 373,492.2950 |
| S 1/4 COR SEC 14 | 912,442.5759 | 373,481.5396 |
| E 1/4 COR SEC 14 | 915,021.2214 | 376,090.7703 |
| SE COR SEC 14 | 912,377.4327 | 376,076.4659 |
| | | |
| CTR SEC 13 | 914,997.8260 | 378,689.3360 |
| S 1/4 COR SEC 13 | 912,362.6780 | 378,702.5950 |
| E 1/4 COR SEC 13 | 914,982.6580 | 381,297.1330 |
| SE COR SEC 13 | 912,348.5750 | 381,317.4470 |

NOTE: Coordinates shown are Ground Coordinates

## CURVE DATA TABLE

| Curve No | Radius | Length | Curve No | Radius | Length |
|---|---|---|---|---|---|
| 1 | 107.00 | 35.17 | 12 | 4740.62 | 622.64 |
| 2 | 350.00 | 180.20 | 13 | 1020.00 | 362.85 |
| 3 | 140.00 | 81.55 | 14 | 470.00 | 362.94 |
| 4 | 650.00 | 158.01 | 15 | 630.00 | 680.67 |
| 5 | 465.00 | 267.66 | 16 | 470.00 | 425.79 |
| 6 | 635.00 | 575.28 | 17 | 630.00 | 362.64 |
| 7 | 465.00 | 502.40 | 18 | 470.00 | 114.25 |
| 8 | 635.00 | 490.35 | 19 | 315.00 | 183.48 |
| 9 | 1285.00 | 457.12 | 20 | 155.00 | 79.80 |
| 10 | 4355.62 | 572.08 | 21 | 165.00 | 52.24 |
| 11 | 319.12 | 426.17 | 22 | 217.00 | 71.32 |

NOTE: TCE AND PRE LIMITS TO BE PROVIDED BY FCDMC AT PRE-COM MTG.

GRSS Civil Engineers Inc. Phoenix, Arizona

| | BY | DATE |
|---|---|---|
| DRAWN | MEM | 6-93 |
| DESIGN | GW | 6-93 |
| CHECKED | JFM | 6-93 |
| APPROVED | GKC | 6-93 |
| SUBMITTED BY: | | DATE: |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

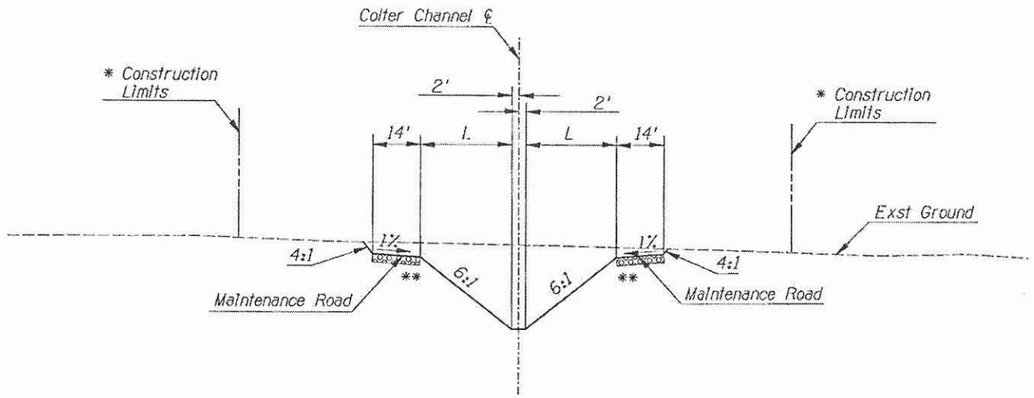
Colter Channel

CONSTRUCTION LIMITS

RECOMMENDED BY: DATE:
APPROVED BY: DATE:
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 3 OF 56

22 JULY 1993 COLTER.00/010/ROW01.10A




TYPICAL SECTION
STA 9+20 TO STA 12+50

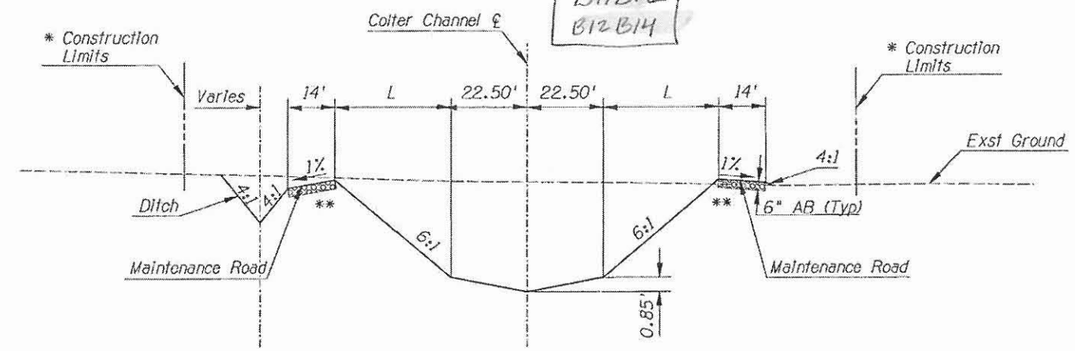
| STA | L |
|---|---|
| 9+20 TO 12+50 | 26.40' |

* Construction Limits Vary, See Plan Sheets For Limits of Right-of-Way

** Scarify 6" And Compact To 90% In Cut Areas

*** Compact All Fill Areas To 90%

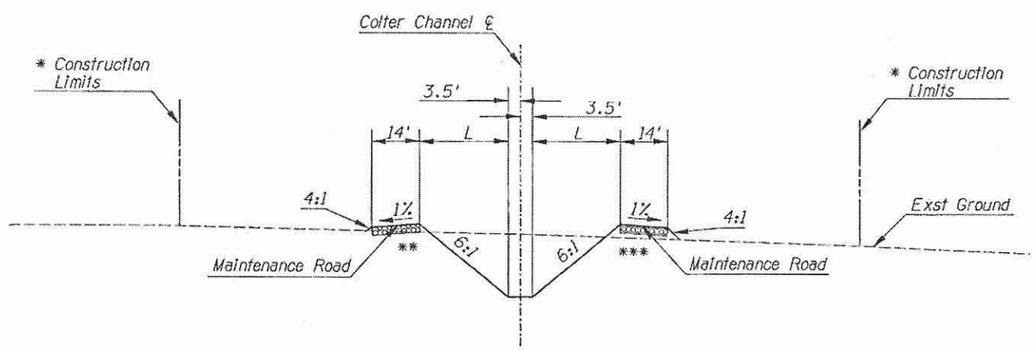
B10B11
B11B12
B12B14




TYPICAL SECTION
STA 26+90 TO STA 107+62

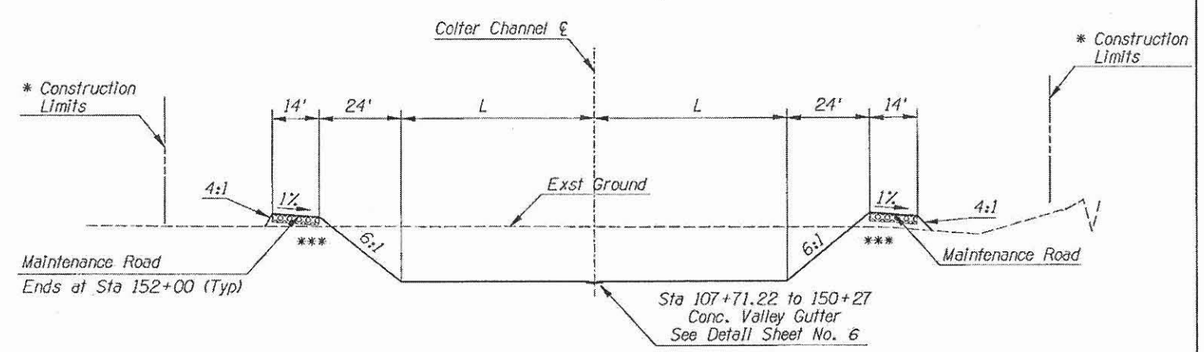
| STA | L | DITCHING |
|---|---|---|
| 26+90 TO 31+00 | 27.90' | No Ditch |
| 31+00 TO 36+50 | 27.90' | Ditch |
| 37+00 TO 43+00 | 35.70' | Ditch |
| 43+50 TO 50+00 | 27.90' | Ditch Ends 51+00 |
| 51+50 TO 60+50 | 39.90' | Ditch Begins 57+00 |
| 61+00 TO 107+62 | 33.90' | Ditch Ends 81+20 |

B14B15




TYPICAL SECTION
STA 13+00 TO STA 26+40

| STA | L |
|---|---|
| 13+00 TO 23+20 | 25.50' |
| 24+70 TO 26+40 | 28.50' |




TYPICAL SECTION
STA 108+87 TO STA 157+70

SCALE:
1" = 20' Horiz
1" = 4' Vert

| STA | L |
|---|---|
| 108+87 TO 119+00 | 57.00' |
| 120+00 TO 126+00 | 84.00' |
| 127+00 TO 157+70 | 89.00' |

Sta 152+00 To 157+70
Left Bank Terminates At Intersection
Of 6:1 With Existing Ground

20207 GEORGE K. COTTON

CRSS Civil Engineers Inc. Phoenix, Arizona

| | BY | DATE |
|---|---|---|
| DRAWN | MEM | 6-93 |
| DESIGN | GW | 6-93 |
| CHECKED | JFM | 6-93 |
| APPROVED | GKC | 6-93 |
| SUBMITTED BY: | | DATE: |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Colter Channel

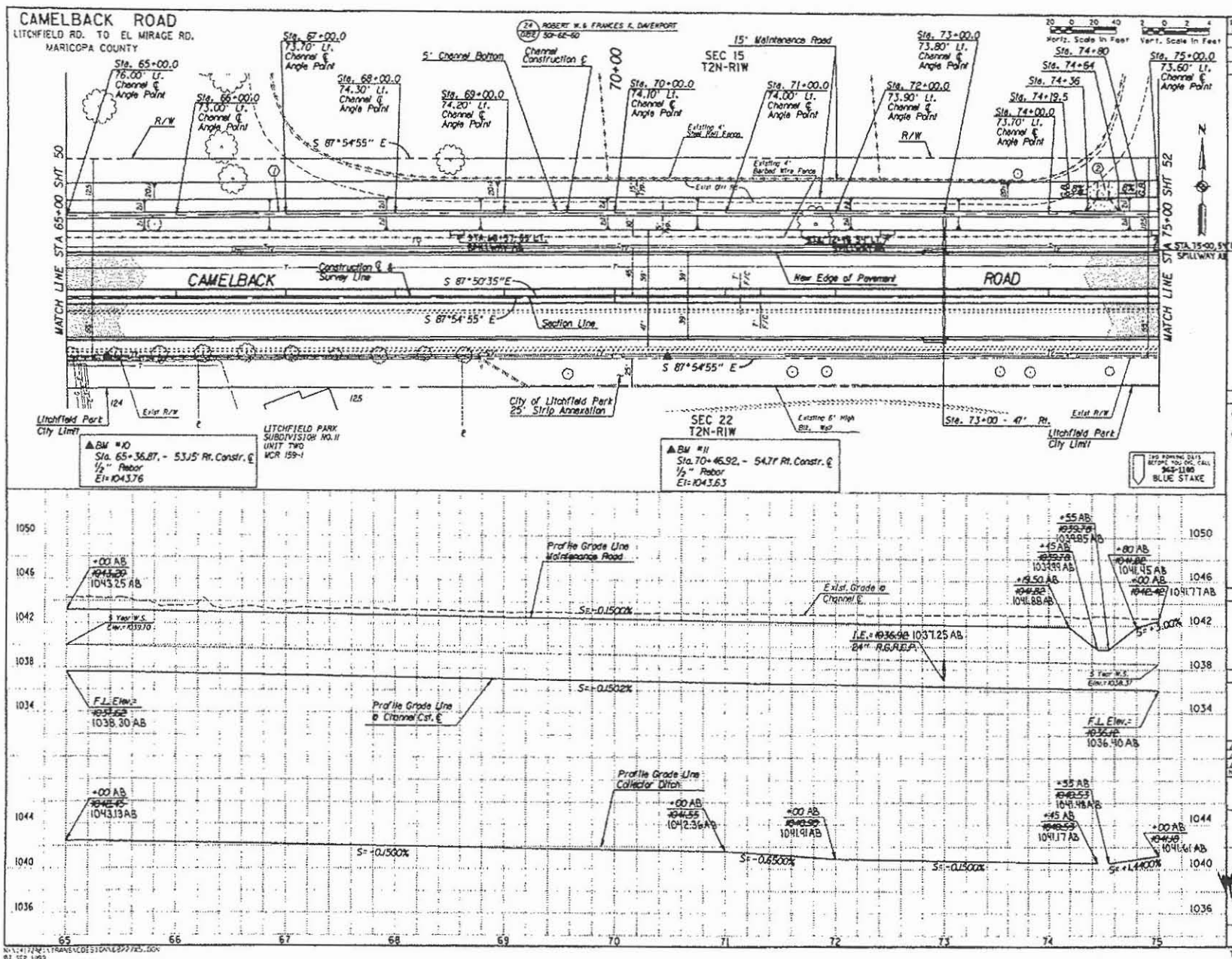
TYPICAL SECTIONS

RECOMMENDED BY: DATE:
APPROVED BY: DATE:
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 7 OF 55

27 JULY 1993 CT01.10X

B16




| F.H.W.A. REGION | STATE | PROJECT NO. | SHEET NO. | TOTAL SHEETS | RECORD DRAWING |
|---|---|---|---|---|---|
| 9 | AZ. | 68227 | 51 | 94 | JANUARY 2001 |

## CONSTRUCTION NOTES

### REMOVALS

### NEW CONSTRUCTION

(1) Sta. 65+00 to Sta. 75+00 - Construct Concrete Lined Drainage Channel - 3311 S.Y.

(2) Sta 74+36 to Sta. 74+64 - Construct Spillway. 145 S.Y. Concrete Paving. See Detail B, Sheet 16

### PAVEMENT QUANTITIES

1. Aggregate Base (Maintenance Rd.) 352 TONS

### NOTES

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 3 | | | |
| 2 | | | |
| 1 | AS BUILTS | KMS | 03-24-01 |

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION

CAMELBACK ROAD
LITCHFIELD ROAD TO EL MIRAGE ROAD
PROJECT NO. 68227

| | BY | DATE |
|---|---|---|
| DESIGNED | MG | 09/99 |
| DRAWN | GJC | 09/99 |
| CHECKED | MEM | 09/99 |

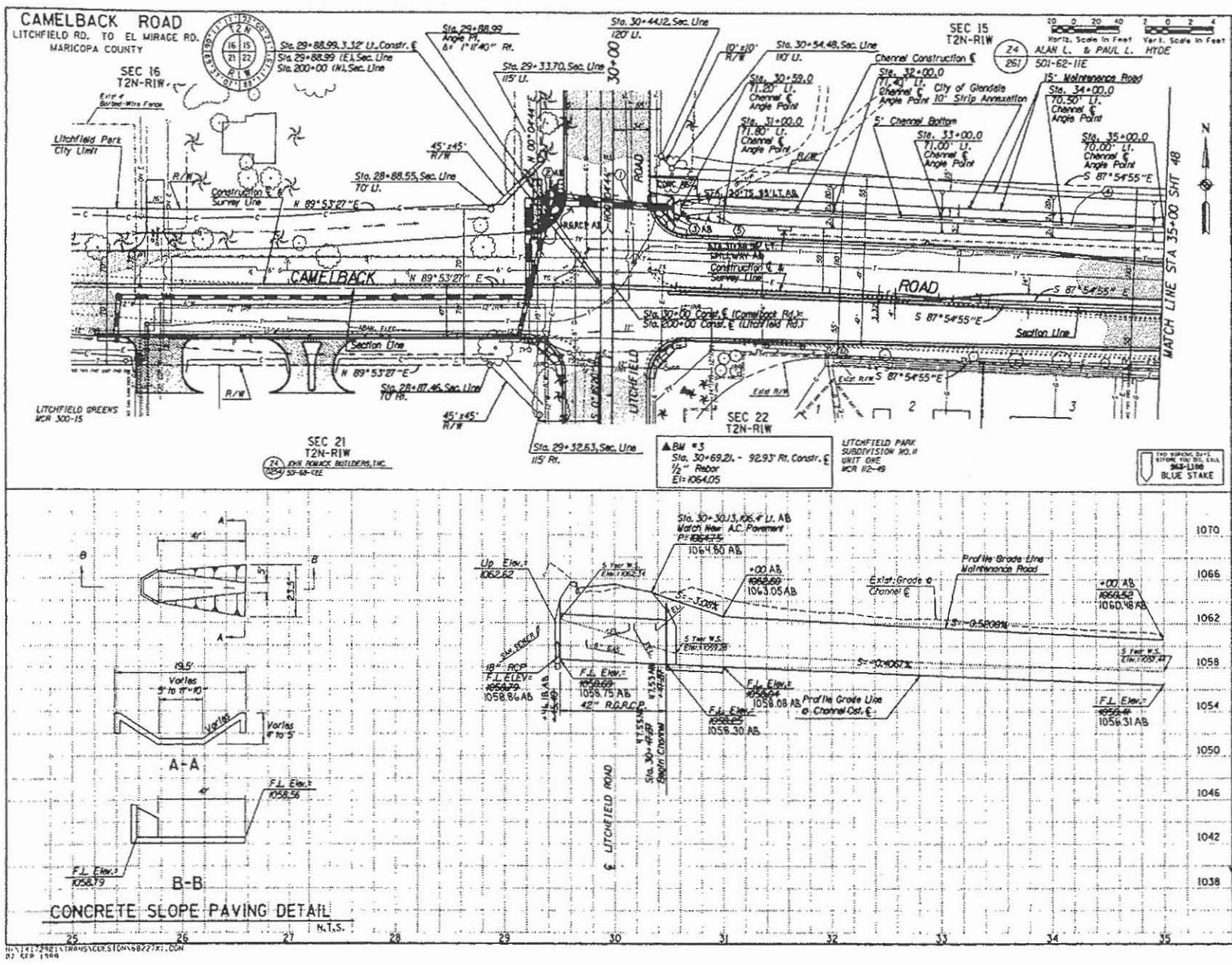
CELLA BARR ASSOCIATES

DRAINAGE CHANNEL PLAN
STA. 65+00.00 TO 75+00.00

SHEET OF 51 94

TRACS NO.

B16 B17 - B17







| F.H.W.A. REGION | STATE | PROJECT NO. | SHEET NO. | TOTAL SHEETS | RECORD DRAWING |
|---|---|---|---|---|---|
| 9 | AZ. | 68227 | 47 | 94 | JANUARY 2001 |

CONSTRUCTION NOTES

REMOVALS

RELOCATIONS

NEW CONSTRUCTION

1. Sta. 29+45.40, 80' Lt. to Sta. 30+47.87, 83' Lt. - Install 108 L.F. of 42" R.G.R.C.P. 29+46.18, 79' AB
2. Sta. ~~29+45.40, 80'~~ Lt. - Construct Drop Inlet Headwall per MAG Std. Det. 501-5, Lip Depression=0" with 12 L.F. Handrail, See Detail 9, Sheet 16 HEIGHT/ALL EXTENDED VERTICALLY TO MATCH FIELD GRADE AB
3. Sta. ~~30+47.87, 11' Lt.~~ - Construct Outlet Headwall w/ 2:1 embankment slope per MAG Std. Det. 501-3 30+47.33 AB
4. Sta. 30+59 to Sta. 35+00 - Construct Concrete Lined Drainage Channel 1341 S.Y.
5. Sta. 30+59 to Sta. 30+84 - Construct 147 S.Y. Concrete Slope Paving, See Detail this Sheet

PAVEMENT QUANTITIES

| | |
|---|---|
| 1. Aggregate Base (Maintenance Rd.) | 170 TONS |

NOTES

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 1 | AS BUILT'S | KMS | 03-24-01 |

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION

CAMELBACK ROAD
LITCHFIELD ROAD TO EL MIRAGE ROAD
PROJECT NO. 68227

| | BY | DATE |
|---|---|---|
| DESIGNED | MEM | 09/99 |
| DRAWN | GJG | 09/99 |
| CHECKED | MEM | 09/99 |

CELLA BARR ASSOCIATES

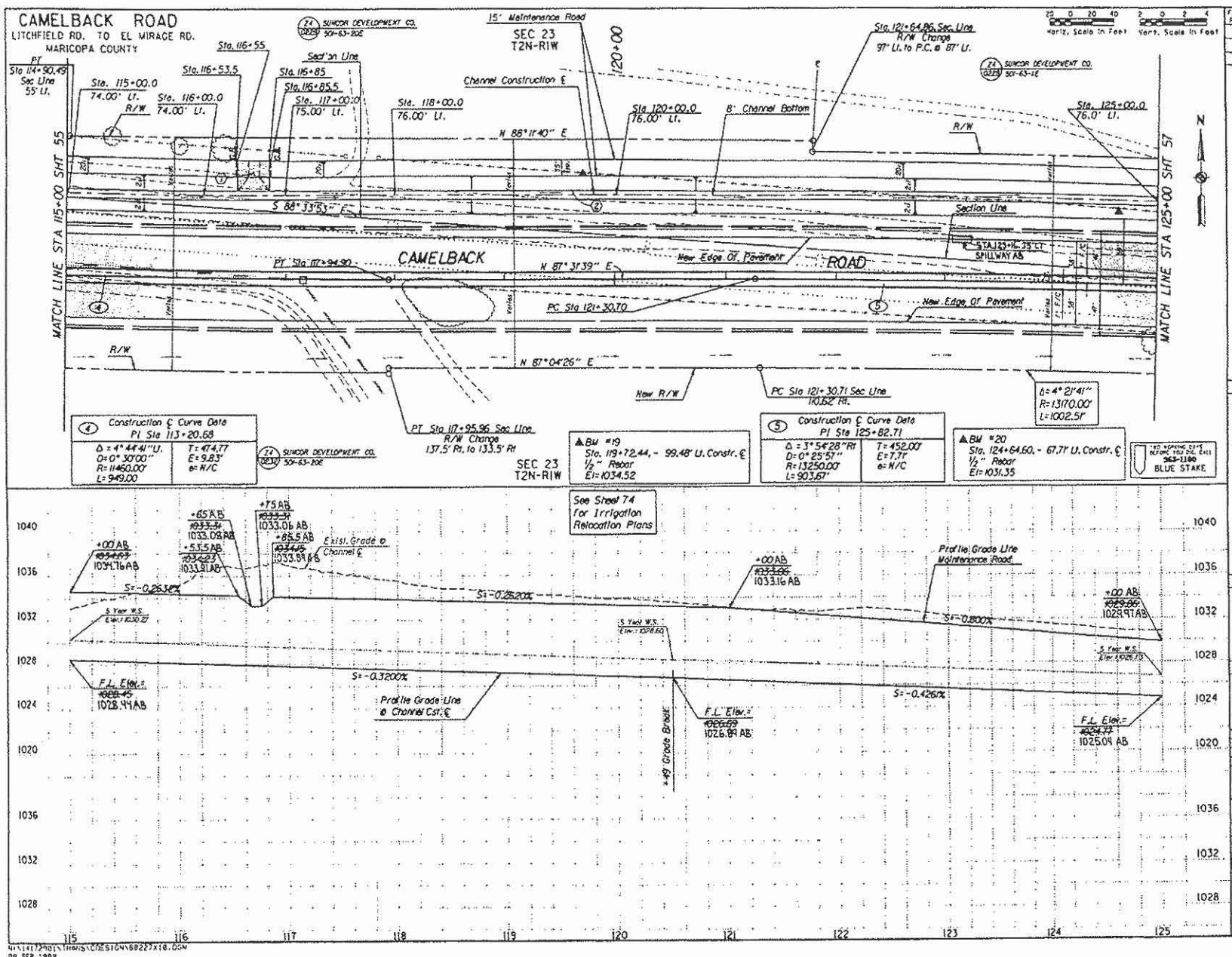
DRAINAGE CHANNEL PLAN
STA. 25+00.00 TO 35+00.00

SHEET 47 OF 94

TRACS NO.

Litchfield to AFR
B16B11
B17B17
B18B19

B17




| F.H.W.A. REGION | STATE | PROJECT NO. | SHEET NO. | TOTAL SHEETS | RECORD DRAWING |
|---|---|---|---|---|---|
| 9 | AZ. | 68227 | 56 | 94 | JANUARY 2001 |

## CONSTRUCTION NOTES

### REMOVALS

### NEW CONSTRUCTION

1. Sta. 116+55 to Sta. 116+85 - Construct Spillway, 158 S.Y. Concrete Paving See Detail B, Sheet 16
2. Sta. 115+00 to Sta. 125+00 Construct Concrete Lined Drainage Channel-3941 SY

### PAVEMENT QUANTITIES

1. Aggregate Base (Maintenance Rd.) 351 TONS

### NOTES

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 3 | | | |
| 2 | | | |
| 1 | AS BUILTS | KMS | 05-24-01 |

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION

CAMELBACK ROAD
LITCHFIELD ROAD TO EL MIRAGE ROAD
PROJECT NO. 68227

| | BY | DATE |
|---|---|---|
| DESIGNED | JEO | 09/99 |
| DRAWN | GJG | 09/99 |
| CHECKED | MEM | 09/99 |

CELLA BARR ASSOCIATES

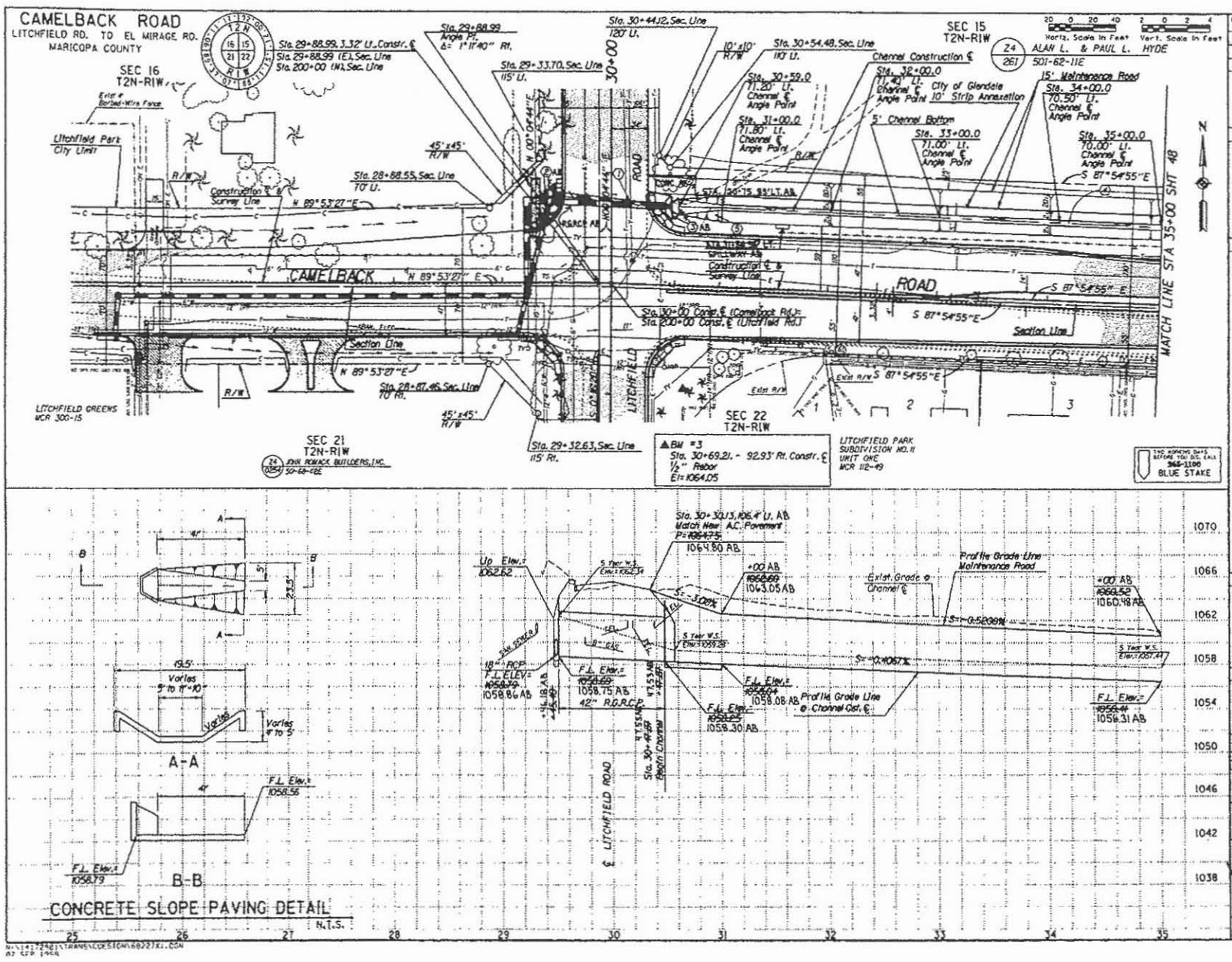
DRAINAGE CHANNEL PLAN
STA. 115+00.00 TO 125+00.00

SHEET 56 OF 94

TRACS NO.

N:\14172001\THANS\DESIGN\68227X10.DGN
09 SEP 1999

B17B18-B18







| F.H.W.A. REGION | STATE | PROJECT NO. | SHEET NO. | TOTAL SHEETS | RECORD DRAWING |
|---|---|---|---|---|---|
| 9 | AZ. | 68227 | 47 | 94 | JANUARY 2001 |

Horiz. Scale in Feet 20 0 20 40 — Vert. Scale in Feet 2 0 2 4

## CONSTRUCTION NOTES

### REMOVALS

### RELOCATIONS

### NEW CONSTRUCTION

1. Sta. 29+45.40, 80' Lt. to Sta. 30+47.87, 83' Lt. - Install 108 L.F. of 42" R.C.R.C.P.
2. Sta. ~~29+45.40, 80'~~ 29+46.18, 79' AB Lt. - Construct Drop Inlet Headwall per MAG Std. Det. 501-5, Lip Depression=0" with 12 L.F. Handrail, See Detail 9, Sheet 16 HEADWALL ESTIMATED VERTICALLY TO MATCH FIELD GRADE AB
3. Sta. ~~30+48.83, 77'~~ 30+47.55 AB Lt. - Construct Outlet Headwall w/ 2:1 embankment slope per MAG Std. Det. 501-3
4. Sta. 30+59 to Sta. 35+00 - Construct Concrete Lined Drainage Channel 1341 S.Y.
5. Sta. 30+59 to Sta. 30+84 - Construct 147 S.Y. Concrete Slope Paving, See Detail this Sheet

### PAVEMENT QUANTITIES

1. Aggregate Base (Maintenance Rd.) 170 TONS

### NOTES

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 2 | | | |
| 1 | | | |
| 0 | AS BUILTS | KMS | 05-24-01 |

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION

CAMELBACK ROAD
LITCHFIELD ROAD TO EL MIRAGE ROAD
PROJECT NO. 68227

| | BY | DATE |
|---|---|---|
| DESIGNED | MEM | 09/99 |
| DRAWN | GJG | 09/99 |
| CHECKED | MEM | 09/99 |

CELLA BARR ASSOCIATES

DRAINAGE CHANNEL PLAN
STA. 25+00.00 TO 35+00.00

SHEET 47 OF 94

TRACS NO.

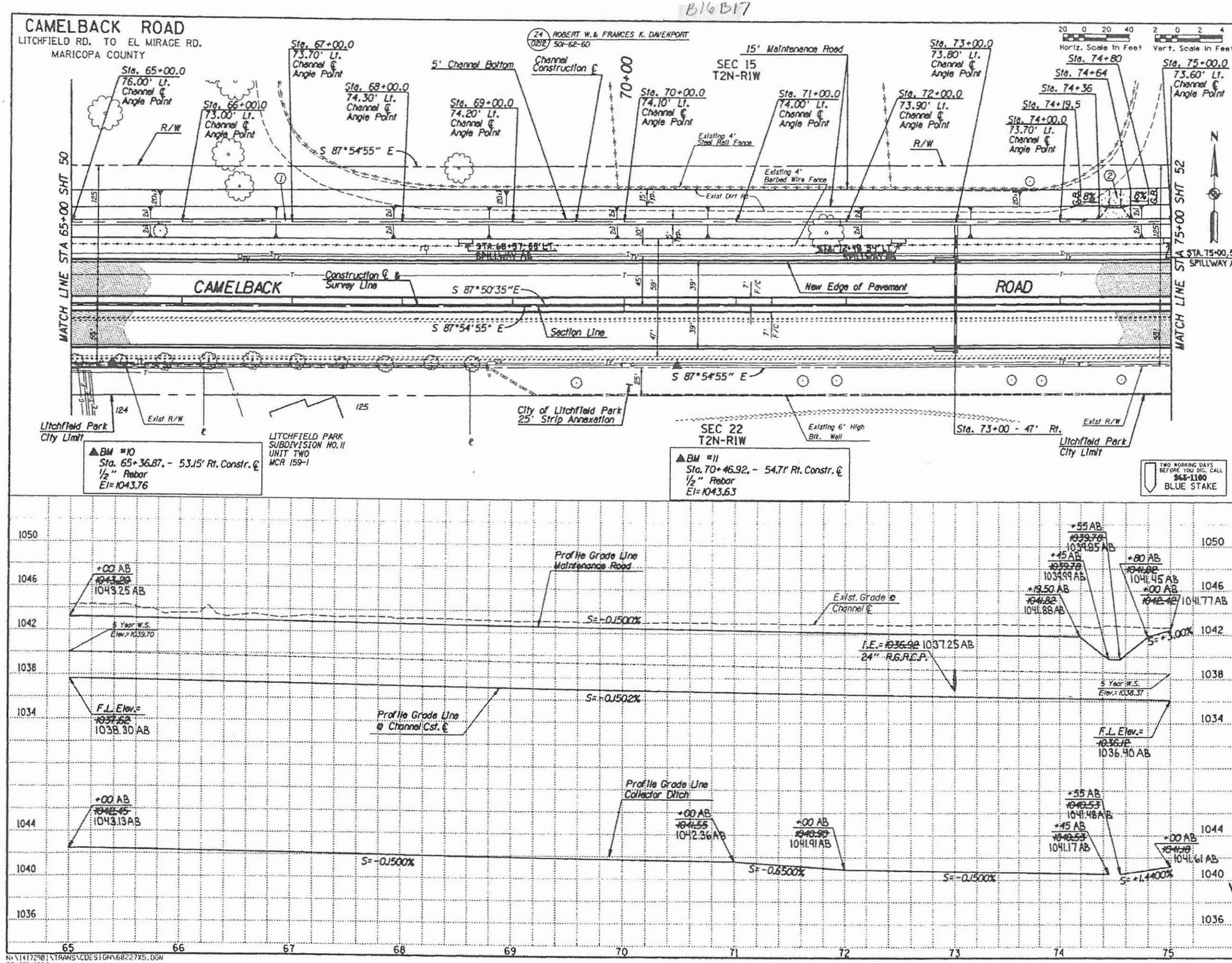
N:\14\72481\TRANS\CONSTRUCTION\68227X1.DGN
07 SEP 1999

Litchfield to AFR
B16B11
B17B19
B18B19

B16 B17

# CAMELBACK ROAD

LITCHFIELD RD. TO EL MIRAGE RD.
MARICOPA COUNTY




| F.H.W.A. REGION | STATE | PROJECT NO. | SHEET NO. | TOTAL SHEETS | RECORD DRAWING |
|---|---|---|---|---|---|
| 9 | AZ. | 68227 | 51 | 94 | JANUARY 2001 |

## CONSTRUCTION NOTES

### REMOVALS

### NEW CONSTRUCTION

1. Sta. 65+00 to Sta. 75+00 - Construct Concrete Lined Drainage Channel - 3311 S.Y.
2. Sta 74+36 to Sta. 74+64 - Construct Spillway, 145 S.Y. Concrete Paving. See Detail B, Sheet 16

### PAVEMENT QUANTITIES

1. Aggregate Base (Maintenance Rd.) 352 TONS

### NOTES

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | AS BUILTS | KMS | 05-24-01 |

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION

CAMELBACK ROAD
LITCHFIELD ROAD TO EL MIRAGE ROAD
PROJECT NO. 68227

| | BY | DATE |
|---|---|---|
| DESIGNED | MG | 09/99 |
| DRAWN | GJG | 09/99 |
| CHECKED | MEM | 09/99 |

20930 MICHAEL E. MATHEU ARIZONA U.S.A.

CELLA BARR ASSOCIATES
4911 E. BROADWAY BLVD. TUCSON ARIZONA 85711 PHONE (520) 750-7474 FAX (520) 750-7474

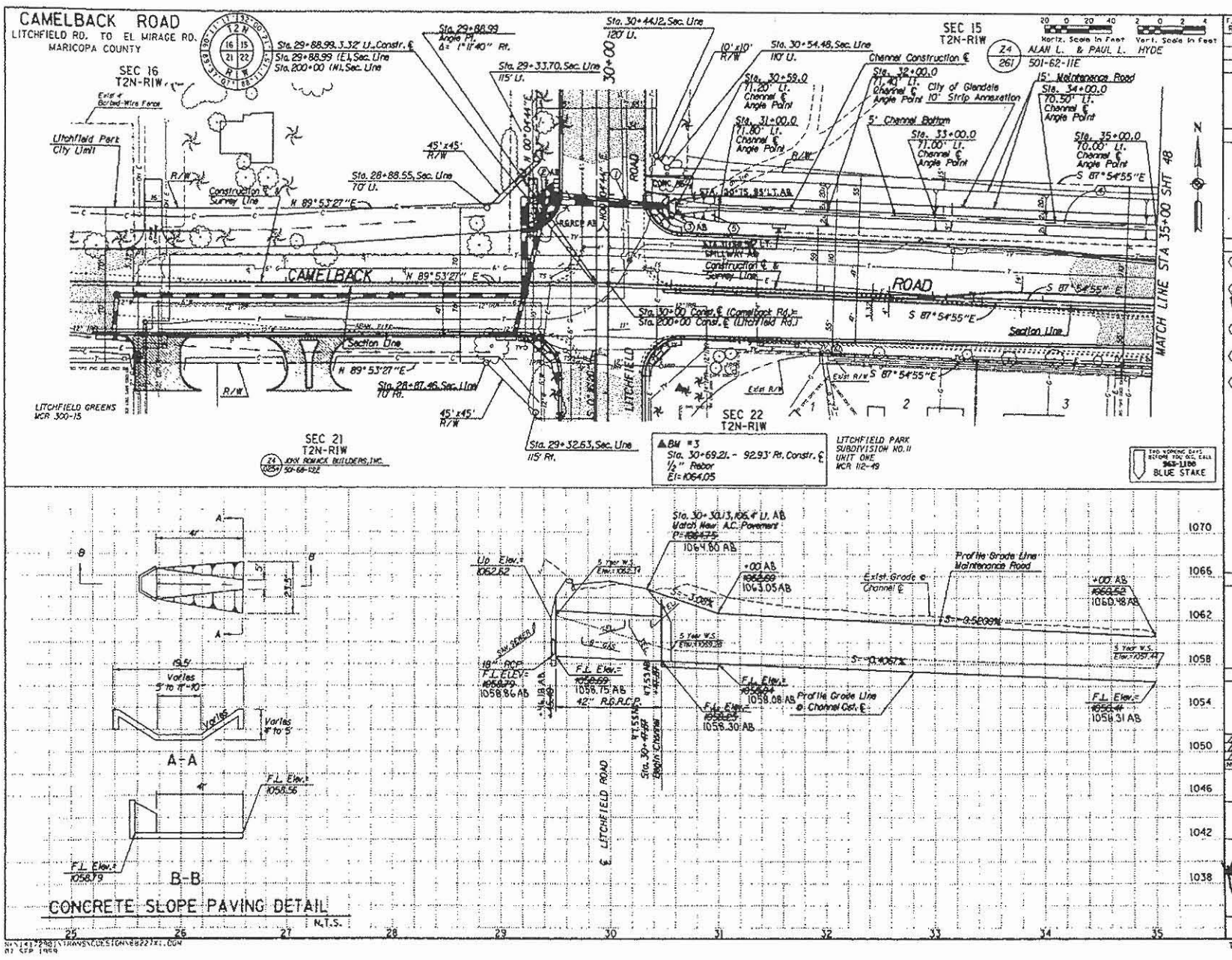
DRAINAGE CHANNEL PLAN
STA. 65+00.00 TO 75+00.00

SHEET 51 OF 94

N:\1412981\TRANS\CDESIGN\68227X5.DGN
07 SEP 1999

TRACS NO.

B18







| F.H.W.A. REGION | STATE | PROJECT NO. | SHEET NO. | TOTAL SHEETS | RECORD DRAWING |
|---|---|---|---|---|---|
| 9 | AZ. | 68227 | 47 | 94 | JANUARY 2001 |

## CONSTRUCTION NOTES

### REMOVALS

### RELOCATIONS

### NEW CONSTRUCTION

1. Sta. 29+45.40, 80' Lt. to Sta. 30+47.87, 83' Lt. - Install 108 L.F. of 42" R.C.R.C.P. 29+46.18, 75' AB
2. Sta. ~~29+45.40, 80'~~ Lt. - Construct Drop Inlet Headwall per MAG Std. Det. 501-5, Lip Depression=0' with 12 L.F. Handrail, See Detail 9, Sheet 16 HEADWALL EXTENDED VERTICALLY TO MATCH FIELD GRADE AB
3. Sta. ~~30+47.87, 71'~~ Lt. - Construct Outlet Headwall w/ 2:1 embankment slope per MAG Std. Det. 501-3 30+47.55 AB
4. Sta. 30+59 to Sta. 35+00 - Construct Concrete Lined Drainage Channel 1341 S.Y.
5. Sta. 30+59 to Sta. 30+84 - Construct 147 S.Y. Concrete Slope Paving, See Detail this Sheet

### PAVEMENT QUANTITIES

1. Aggregate Base (Maintenance Rd.) 170 TONS

### NOTES

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 1 | AS BUILTS | KMS | 05-14-01 |

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION

CAMELBACK ROAD
LITCHFIELD ROAD TO EL MIRAGE ROAD
PROJECT NO. 68227

| | BY | DATE |
|---|---|---|
| DESIGNED | MEM | 09/99 |
| DRAWN | GJG | 09/99 |
| CHECKED | MEM | 09/99 |

CELLA BARR ASSOCIATES

DRAINAGE CHANNEL PLAN
STA. 25+00.00 TO 35+00.00

SHEET OF 47 94

TRACS NO.

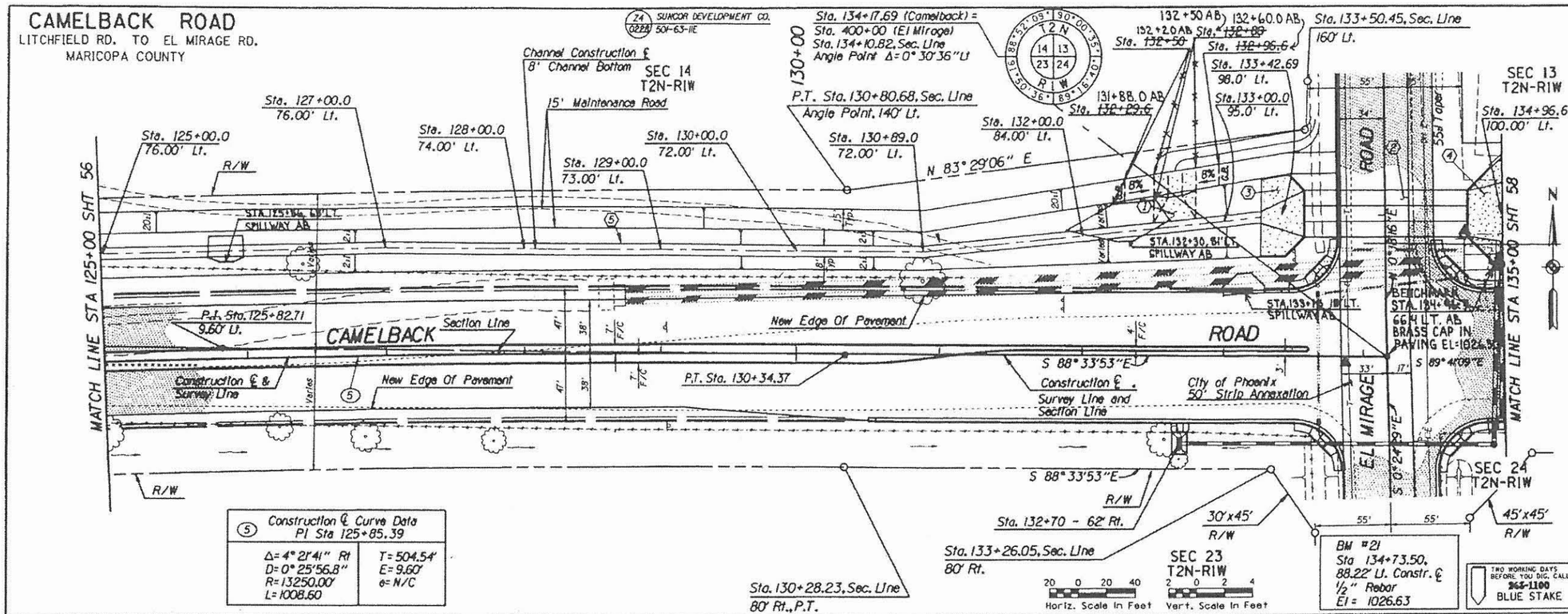
Litchfield to AFK
B16B11
B17B19
B18B19

B17B18

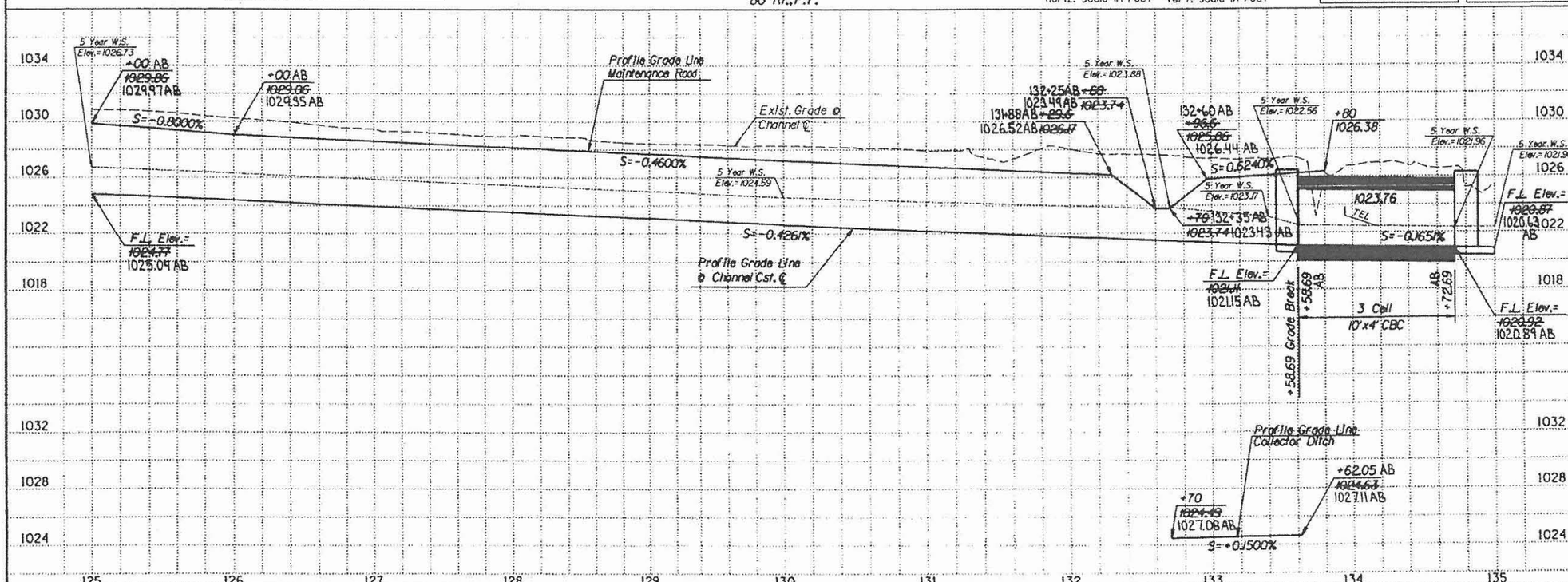
# CAMELBACK ROAD

LITCHFIELD RD. TO EL MIRAGE RD.
MARICOPA COUNTY

| F.H.W.A. REGION | STATE | PROJECT NO. | SHEET NO. | TOTAL SHEETS | RECORD DRAWING |
|---|---|---|---|---|---|
| 9 | AZ. | 68227 | 57 | 94 | JANUARY 2001 |




| Construction ℄ Curve Data (5) PI Sta 125+85.39 | |
|---|---|
| Δ= 4° 21' 41" Rt | T= 504.54' |
| D= 0° 25' 56.8" | E= 9.60' |
| R= 13250.00' | e= N/C |
| L= 1008.60 | |




## CONSTRUCTION NOTES

### REMOVALS

### RELOCATIONS

### NEW CONSTRUCTION

(1) Sta. 132+50 to Sta. 132+80 - Construct Spillway, 165 S.Y. Concrete Paving See Detail 8, Sheet 16

(2) Sta. 133+58.69 to Sta. 134+72.69, 100. 00' Lt. Construct 3-10'x4'x114' CBC w/ Level Wings & 154 L.F. Handrail per ADOT Std. B-02.20 & B-08.10, See Detail 9, Sheet 16

(3) Sta. 133+28.69 to Sta. 133+58.69 - Construct 258.7 S.Y. Concrete Slope Paving. See Detail 7, Sheet 15

(4) Sta. 134+72.69 to Sta. 135+06.69 - Construct 260 S.Y. Concrete Slope Paving. See Detail 7, Sheet 15

(5) Sta. 125+00 to Sta. 135+00 Construct Concrete Lined Drainage Channel 2553 S.Y.

### PAVEMENT QUANTITIES

1. Aggregate Base (Maintenance Rd.) 309 TONS

### NOTES

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 1 | AS BUILTS, BRASS CAP | KMS | 05-24-01 |
| 2 | | | |
| 3 | | | |

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION

CAMELBACK ROAD
LITCHFIELD ROAD TO EL MIRAGE ROAD
PROJECT NO. 68227

| | BY | DATE |
|---|---|---|
| DESIGNED | JEO | 09/99 |
| DRAWN | GJG | 09/99 |
| CHECKED | MEM | 09/99 |

CELLA BARR ASSOCIATES
4911 E. BROADWAY BLVD. TUCSON, ARIZONA 85711
PHONE: (520) 750-7474
FAX: (520) 750-7014

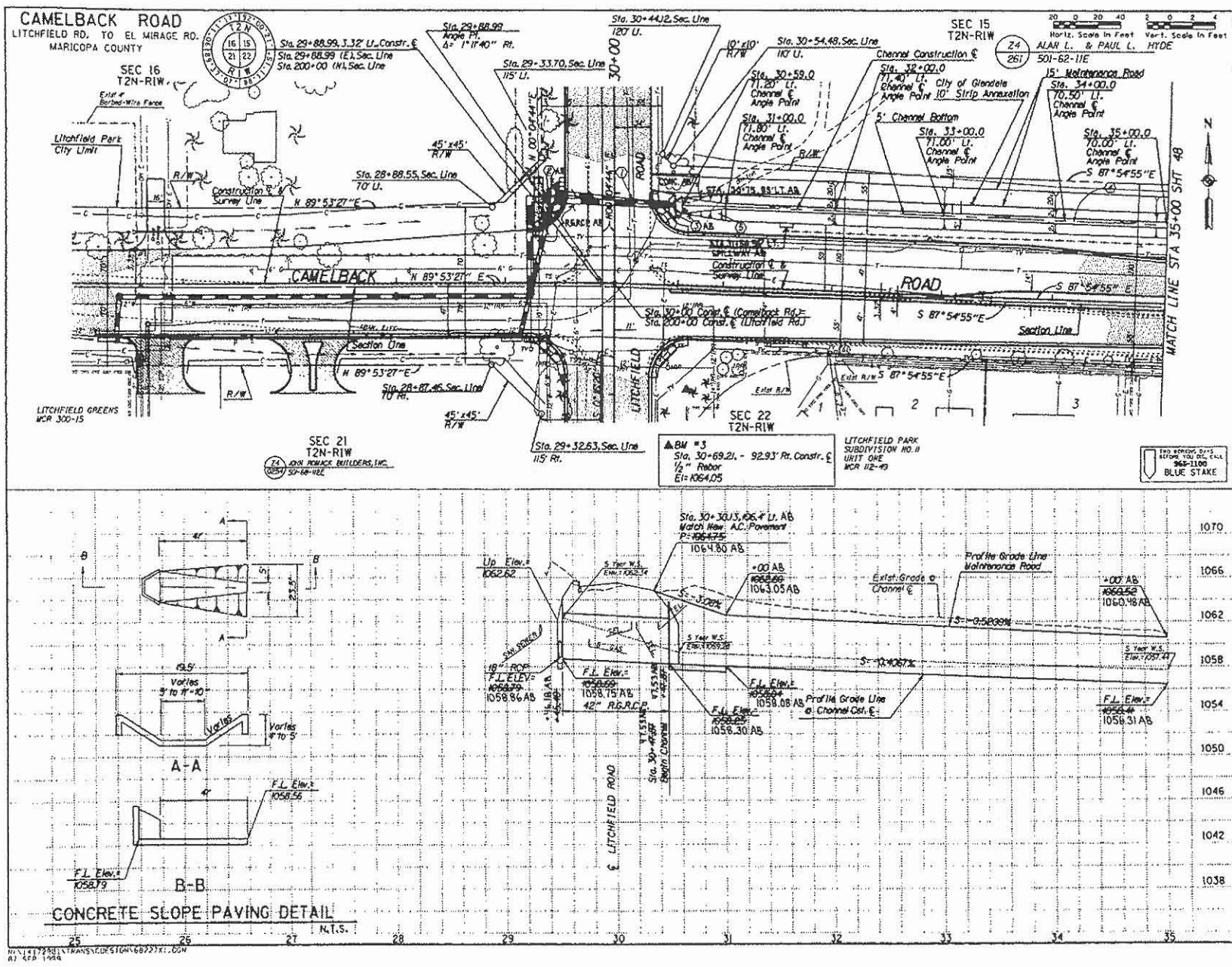
DRAINAGE CHANNEL PLAN
STA. 125+00.00 TO 135+00.00

SHEET 57 OF 94

N:\1417290\TRANS\CDESIGN\68227X11.DGN
08 SEP 1999
17:26:20

TRACS NO.

B19







| F.H.W.A. REGION | STATE | PROJECT NO. | SHEET NO. | TOTAL SHEETS | RECORD DRAWING |
|---|---|---|---|---|---|
| 9 | AZ. | 68227 | 47 | 94 | JANUARY 2001 |

CONSTRUCTION NOTES

REMOVALS

RELOCATIONS

NEW CONSTRUCTION

1. Sta. 29+45.40, 30' Lt. to Sta. 30+47.87, 83' Lt. - Install 108 L.F. of 42" R.G.R.C.P.
2. Sta. 29+46.18, 19' AB - Construct Drop Inlet Headwall per MAG Std. Det. 501-5, Lip Depression=0' with 12 L.F. Handrail, See Detail 9, Sheet 16. HEADWALL EXTENDED VERTICALLY TO MATCH FIELD GRADE AB
3. Sta. 30+47.87, 11' Lt. - Construct Outlet Headwall w/ 2:1 embankment slope per MAG Std. Det. 501-3 30+47.33 AB
4. Sta. 30+59 to Sta. 35+00 - Construct Concrete Lined Drainage Channel 1341 S.Y.
5. Sta. 30+59 to Sta. 30+84 - Construct 147 S.Y. Concrete Slope Paving, See Detail this Sheet

PAVEMENT QUANTITIES

1. Aggregate Base (Maintenance Rd.) 170 TONS

NOTES

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 1 | AS BUILTS | KMS | 05-24-01 |

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION

CAMELBACK ROAD
LITCHFIELD ROAD TO EL MIRAGE ROAD
PROJECT NO. 68227

| | BY | DATE |
|---|---|---|
| DESIGNED | MEM | 09/99 |
| DRAWN | GJG | 09/99 |
| CHECKED | MEM | 09/99 |

CELLA BARR ASSOCIATES

DRAINAGE CHANNEL PLAN
STA. 25+00.00 TO 35+00.00

SHEET 47 OF 94

TRACS NO.

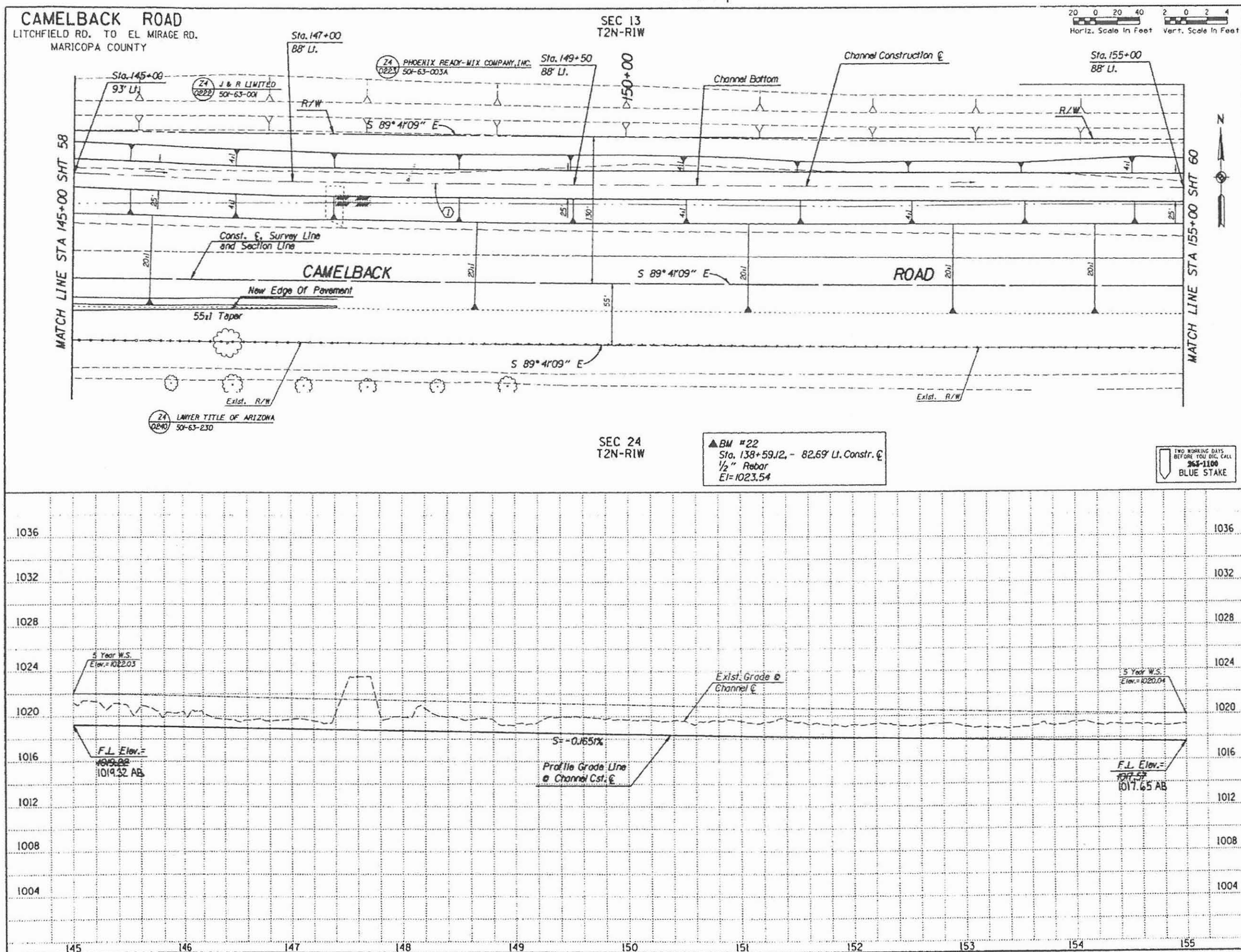
Litchfield to AFK
B16B11
B17B17
B18B19

DIB319

# CAMELBACK ROAD

LITCHFIELD RD. TO EL MIRAGE RD.
MARICOPA COUNTY

| F.H.W.A. REGION | STATE | PROJECT NO. | SHEET NO. | TOTAL SHEETS | RECORD DRAWING |
|---|---|---|---|---|---|
| 9 | AZ. | 68227 | 59 | 94 | JANUARY 2001 |




## CONSTRUCTION NOTES

### REMOVALS

### RELOCATIONS

### NEW CONSTRUCTION

(1) Sta. 145+00 to Sta. 155+00
Construct Dirt Drainage Channel

### NOTES

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | AS BUILTS | KMS | 05-24-01 |

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION

CAMELBACK ROAD
LITCHFIELD ROAD TO EL MIRAGE ROAD
PROJECT NO. 68227

| | BY | DATE |
|---|---|---|
| DESIGNED | JEO | 09/99 |
| DRAWN | GJG | 09/99 |
| CHECKED | MEM | 09/99 |

20830 MICHAEL E. MATHEU ARIZONA U.S.A.

CELLA BARR ASSOCIATES
4911 E. BROADWAY BLVD. TUCSON, ARIZONA 85711 PHONE: (520) 750-7474 FAX: (520) 750-7074

DRAINAGE CHANNEL PLAN
STA. 145+00.00 TO 155+00.00

SHEET 59 OF 94

TRACS NO.

N:\14172901\TRANS\CDESIGN\68227X13.DGN
08 SEP 1999

B20

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For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B21

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For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B22

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Loop 303/White Tanks ADMPU Area Hydrologic Analysis

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For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

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For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B30

SRB30

The WLB Group Inc. WLB

**COMPUTATION DATA SHEET**

Subject WHITE TANKS/AGUA FRIA ADMS Prepared by JSE Date 1-23-91

STAGE - STORAGE - DISCHARGE TABLE

SUBBASIN 302 - 50' 41 into Agua Fria

| ELEV (FT) | | AREA (AC) | | VOLUME (AC-FT) | | DISCHARGE (CFS) |
|---|---|---|---|---|---|---|
| 972.0 | *Invert | 0 | | 0 | | 0 |
| | | | 1.16 | | | |
| 974 | | 1.10 | | 1.16 | | 16 |
| | | | 6.28 | | | |
| 976 | | 5.18 | | 7.44 | | 39 |
| | | | 10.38 | | | |
| *977.6 | Weir Flow South | 7.79 | | 17.82 | | 49 |
| | | | 4.33 | | | |
| 978 | | 13.88 | | 22.15 | 51+66 | 117 |
| | | | 38.71 | | | |
| 980 | | 24.83 | | 60.86 | 67+3625 = | 3687 |

Weir Flow C=2.6
Q = CLH^3/2 L = 200/2
H = .4

at 978 Q = 66 cfs =
C = 2.6
at 980 Q = 3625 L = 750/2
H = 2.4

Form 209

PIPE CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE
February 11, 1991

PROGRAM INPUT DATA:

| DESCRIPTION | VALUE |
|---|---|
| Culvert Diameter (feet)..... | 2.50 |
| FHWA Chart Number (1,2 or 3)..... | 1 |
| Scale Number on Chart (Type of Culvert Entrance)..... | 1 |
| Manning's Roughness Coefficient (n-value)..... | 0.0120 |
| Entrance Loss Coefficient of Culvert Opening..... | 0.50 |
| Culvert Length (feet)..... | 100.0 |
| Culvert Slope (feet per foot)..... | 0.0050 |

PROGRAM RESULTS:

| Flow Rate (cfs) | Tailwater Depth (ft) | Headwater (ft) Inlet Control | Headwater (ft) Outlet Control | Normal Depth (ft) | Critical Depth (ft) | Depth at Outlet (ft) | Outlet Velocity (fps) |
|---|---|---|---|---|---|---|---|
| 16.0 | 1.35 | 2.00 | 1.80 | 1.26 | 1.35 | 1.26 | 6.43 |
| 38.0 | 2.08 | 4.06 | 3.91 | 2.50 | 2.08 | 2.50 | 7.74 |
| 49.0 | 2.29 | 5.64 | 5.42 | 2.50 | 2.29 | 2.50 | 9.98 |
| 51.0 | 2.31 | 5.97 | 5.73 | 2.50 | 2.31 | 2.50 | 10.39 |
| 62.0 | 2.41 | 8.02 | 7.60 | 2.50 | 2.41 | 2.50 | 12.63 |

PIPE CULVERT ANALYSIS COMPUTER PROGRAM Version 1.5 Copyright (c)1986
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B31

SRB31

The WLB Group Inc. WLB

**COMPUTATION DATA SHEET**

Subject WHITE TANK/AGUA FRIA ADMS Prepared by JSE Date 2-8-91

## STAGE - STORAGE - DISCHARGE TABLE

SUBBASIN (E20) 1-36" CP into Agua Fria Invert 956.0 Top PR = 968.3
L=60 S=.005 ft

| ELEV. (FT) | AREA (AC) | | VOLUME (AC-FT) | DISCHARGE (CFS) | |
|---|---|---|---|---|---|
| 956.0 * Invert | 0 | | 0 | 0 | |
| | | 4.15 | | | |
| 958 | 4.15 | | 4.15 | 16 | |
| | | 30.07 | | | |
| 962 | 12.96 | | 34.22 | 50 | |
| | | 36.87 | | | |
| 967 | 23.91 | | 71.09 | 71 | |
| | | 70.34 | | | |
| 964 | 46.43 | | 141.43 | 87 | |
| | | 135.53 | | | |
| 966 | 89.10 | | 276.96 | 100 | |
| | | 204.1 | | | |
| 968 | 115.00 | | 481.06 | 112 | |
| | | 35.25 | | | |
| 968.3 * Weir Flow | 120.01 | | 516.31 | 114 | |
| | | 88.10 | | | |
| 969 | 131.7 | | 604.41 | 117+1218 = 1335 | |
| | | 140.05 | | | |
| 970 | 148.4 | | 744.46 | 123+10373 = 10496 | |

Weir Flow
$Q = CLH^{3/2}$
Q at 969 = 1218 cfs
Q at 970 = 10373

C = 3.6
L = 1600/2
H = .7

L = 3600/2
H = 1.7

Form 200

PIPE CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE
February 8, 1991

PROGRAM INPUT DATA:

| DESCRIPTION | VALUE |
|---|---|
| Culvert Diameter (feet)..... | 3.00 |
| FHWA Chart Number (1,2 or 3)..... | 1 |
| Scale Number on Chart (Type of Culvert Entrance)..... | 1 |
| Manning`s Roughness Coefficient (n-value)..... | 0.0120 |
| Entrance Loss Coefficient of Culvert Opening..... | 0.50 |
| Culvert Length (feet)..... | 60.0 |
| Culvert Slope (feet per foot)..... | 0.0050 |

PROGRAM RESULTS:

| Flow Rate (cfs) | Tailwater Depth (ft) | Headwater (ft) Inlet Control | Headwater (ft) Outlet Control | Normal Depth (ft) | Critical Depth (ft) | Depth at Outlet (ft) | Outlet Velocity (fps) |
|---|---|---|---|---|---|---|---|
| 16.0 | 1.28 | 1.81 | 1.99 | 1.15 | 1.28 | 1.28 | 5.56 |
| 50.0 | 2.41 | 4.00 | 3.80 | 2.41 | 2.30 | 2.41 | 8.22 |
| 71.0 | 2.67 | 6.03 | 5.46 | 3.00 | 2.67 | 3.00 | 10.04 |
| 87.0 | 2.83 | 8.04 | 7.01 | 3.00 | 2.83 | 3.00 | 12.31 |
| 100.0 | 2.90 | 9.98 | 8.45 | 3.00 | 2.90 | 3.00 | 14.15 |
| 112.0 | 2.90 | 12.00 | 9.95 | 3.00 | 2.93 | 3.00 | 15.84 |
| 114.0 | 2.90 | 12.36 | 10.21 | 3.00 | 2.94 | 3.00 | 16.13 |
| 117.0 | 2.94 | 12.91 | 10.62 | 3.00 | 2.94 | 3.00 | 16.55 |
| 123.0 | 2.95 | 14.06 | 11.46 | 3.00 | 2.95 | 3.00 | 17.40 |

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B32

SRB32

Storage Route SRB32

| Elevation | Depth (ft) | Bot. Area (sq.ft) | Top. Area (sq.ft.) | Volume (ac-ft) |
|---|---|---|---|---|
| 942 | 0 | 2,240 | 2,240 | 0.00 |
| 944 | 2 | 2,240 | 337,150 | 7.79 |
| 946 | 4 | 2,240 | 1,164,471 | 53.57 |
| 948 | 6 | 2,240 | 2,252,555 | 155.29 |
| 950 | 8 | 2,240 | 3,013,944 | 276.97 |

# Rating Table for SRB32

## Project Description

| | |
|---|---|
| Solve For | Discharge |

## Input Data

| | | |
|---|---|---|
| Headwater Elevation | 950.00 | ft |
| Crest Elevation | 946.00 | ft |
| Weir Coefficient | 2.60 | US |
| Crest Length | 300.00 | ft |

| Headwater Elevation (ft) | Discharge (ft³/s) | Velocity (ft/s) |
|---|---|---|
| 946.00 | | |
| 948.00 | 2206.17 | 3.68 |
| 950.00 | 6240.00 | 5.20 |

# Cross Section for SRB32

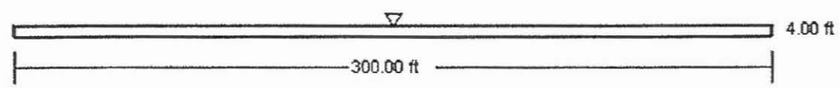
## Project Description

| | |
|---|---|
| Solve For | Discharge |

## Input Data

| | | |
|---|---|---|
| Discharge | 6240.00 | ft³/s |
| Headwater Elevation | 950.00 | ft |
| Crest Elevation | 946.00 | ft |
| Weir Coefficient | 2.60 | US |
| Crest Length | 300.00 | ft |

## Cross Section Image



B33

B34

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For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B35

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For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B36

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For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B37

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For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B38

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For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B39

SRB39

The WLB Group Inc. WLB

COMPUTATION DATA SHEET

Subject WHITE TANK/AGUA FRIA ADMS Prepared by JSE Date 1-30-91

STAGE - STORAGE - DISCHARGE TABLE

SUBBASIN 368

| ELEV. (FT) | AREA (AC) | VOLUME (AC-FT) | DISCHARGE (CFS) |
|---|---|---|---|
| 914 | 0 | 0 | 0 |
| | 1.84 | | |
| 916 | 1.84 | 1.84 | 0 |
| | 5.98 | | |
| 916.9 * Weir Flow South Over Canal | 11.44 | 7.82 | 0 |
| | 19.01 | | |
| 918 | 23.17 | 26.86 | 247 |
| | 146.77 | | |
| 920 | 123.6 | 173.63 | 6031 cfs |
| | | Weir Flow | C = 2.6 |
| | | Q = CLH^3/2 | L = 145/2 |
| | | | H = 1.1 |
| | | Q at 918 = 247 cfs | |
| | | | L = 850/2 |
| | | Q at 920 = 6031 cfs | H = 3.1 |

Form 209

B40

| Job No. | 79902 | No. | |
|---|---|---|---|

# Computation

| Project | Loop 303 / White Tanks ADMPU AHA | Computed | AHM | Date | 10/27/2008 |
|---|---|---|---|---|---|
| Subject | Weir Flow Analysis | Checked | [illegible] | Date | 3/10/09 |
| Task | Weir Calculations | Sheet | 1 | Of | x |

**Location: Glendale & Sarival (B40)**

| Segment | Start Elevation (ft amsl) | End Elevation (ft amsl) | Length L(ft) | Crest Ave Elevation (ft) | Start Calc Elev Iter 1 | Iter 1 H (ft) | Q1 (cfs) | Start Calc Elev Iter 2 | Iter 2 H (ft) | Q2 | Start Calc Elev Iter 3 | Iter 3 H (ft) | Q3 | Another iteration? | Start Calc Elev Iter 4 | Iter 4 H (ft) | Q4 | Another iteration? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| south | 1106 | 1105 | 140 | 1105.5 | 1104 | 0 | 0.00 | 1104.5 | 0 | 0.00 | 1105 | 0 | 0.00 | CHECK | 1105.5 | 0 | 0.00 | DONE |
| south | 1105 | 1104 | 530 | 1104.5 | 1104 | 0 | 0.00 | 1104.5 | 0 | 0.00 | 1105 | 0.5 | 562.15 | | 1105.5 | 1 | 1590.00 | |
| south | 1104 | 1103.6 | 140 | 1103.8 | 1104 | 0.2 | 37.57 | 1104.5 | 0.7 | 245.98 | 1105 | 1.2 | 552.10 | | 1105.5 | 1.7 | 930.94 | |
| southeast | 1103.6 | 1103.8 | 20 | 1103.7 | 1104 | 0.3 | 9.86 | 1104.5 | 0.8 | 42.93 | 1105 | 1.3 | 88.93 | | 1105.5 | 1.8 | 144.90 | |
| southeast | 1103.8 | 1103.6 | 10 | 1103.7 | 1104 | 0.3 | 4.93 | 1104.5 | 0.8 | 21.47 | 1105 | 1.3 | 44.47 | | 1105.5 | 1.8 | 72.45 | |
| east | 1103.6 | 1104 | 60 | 1103.8 | 1104 | 0.2 | 16.10 | 1104.5 | 0.7 | 105.42 | 1105 | 1.2 | 236.62 | | 1105.5 | 1.7 | 398.98 | |
| east | 1104 | 1105.3 | 300 | 1104.65 | 1104 | 0 | 0.00 | 1104.5 | 0 | 0.00 | 1105 | 0.35 | 186.36 | | 1105.5 | 0.85 | 705.30 | |
| east | 1105.3 | 1105 | 420 | 1105.15 | 1104 | 0 | 0.00 | 1104.5 | 0 | 0.00 | 1105 | 0 | 0.00 | | 1105.5 | 0.35 | 260.90 | |
| east | 1105 | 1106 | 220 | 1105.5 | 1104 | 0 | 0.00 | 1104.5 | 0 | 0.00 | 1105 | 0 | 0.00 | | 1105.5 | 0 | 0.00 | |
| | | | | | | TOTALS: | 68.45 | | | 415.80 | | | 1670.63 | | | | 4103.46 | |

Graph Computations:

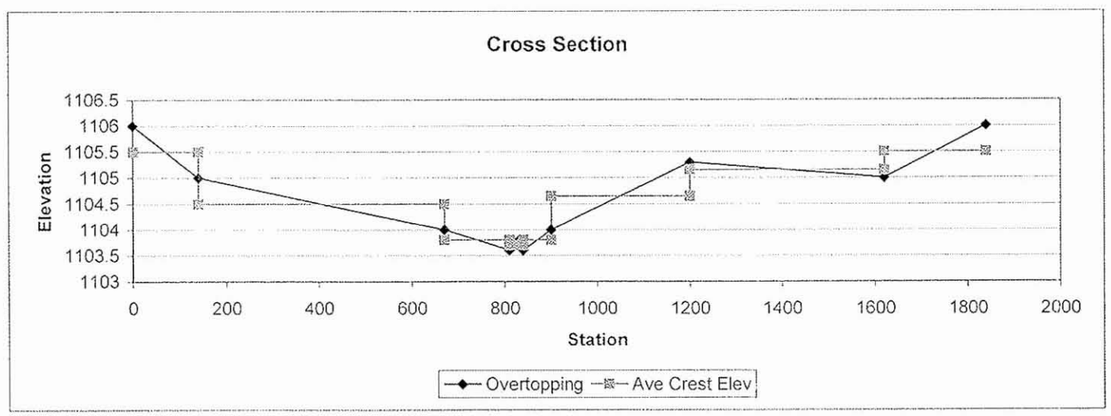
| Station | Elevation |
|---|---|
| 0 | 1106 |
| 140 | 1105 |
| 670 | 1104 |
| 810 | 1103.6 |
| 830 | 1103.8 |
| 840 | 1103.6 |
| 900 | 1104 |
| 1200 | 1105.3 |
| 1620 | 1105 |
| 1840 | 1106 |

Weir Approximation:

| Station | Elevation |
|---|---|
| 0 | 1105.5 |
| 140 | 1105.5 |
| 140 | 1104.5 |
| 670 | 1104.5 |
| 670 | 1103.8 |
| 810 | 1103.8 |
| 810 | 1103.7 |
| 830 | 1103.7 |
| 830 | 1103.7 |
| 840 | 1103.7 |
| 840 | 1103.8 |
| 900 | 1103.8 |
| 900 | 1104.65 |
| 1200 | 1104.65 |
| 1200 | 1105.15 |
| 1620 | 1105.15 |
| 1620 | 1105.5 |
| 1840 | 1105.5 |

Culvert Flows (cfs):

| | |
|---|---|
| south | 0 |
| southeast | 0 |
| east | 0 |



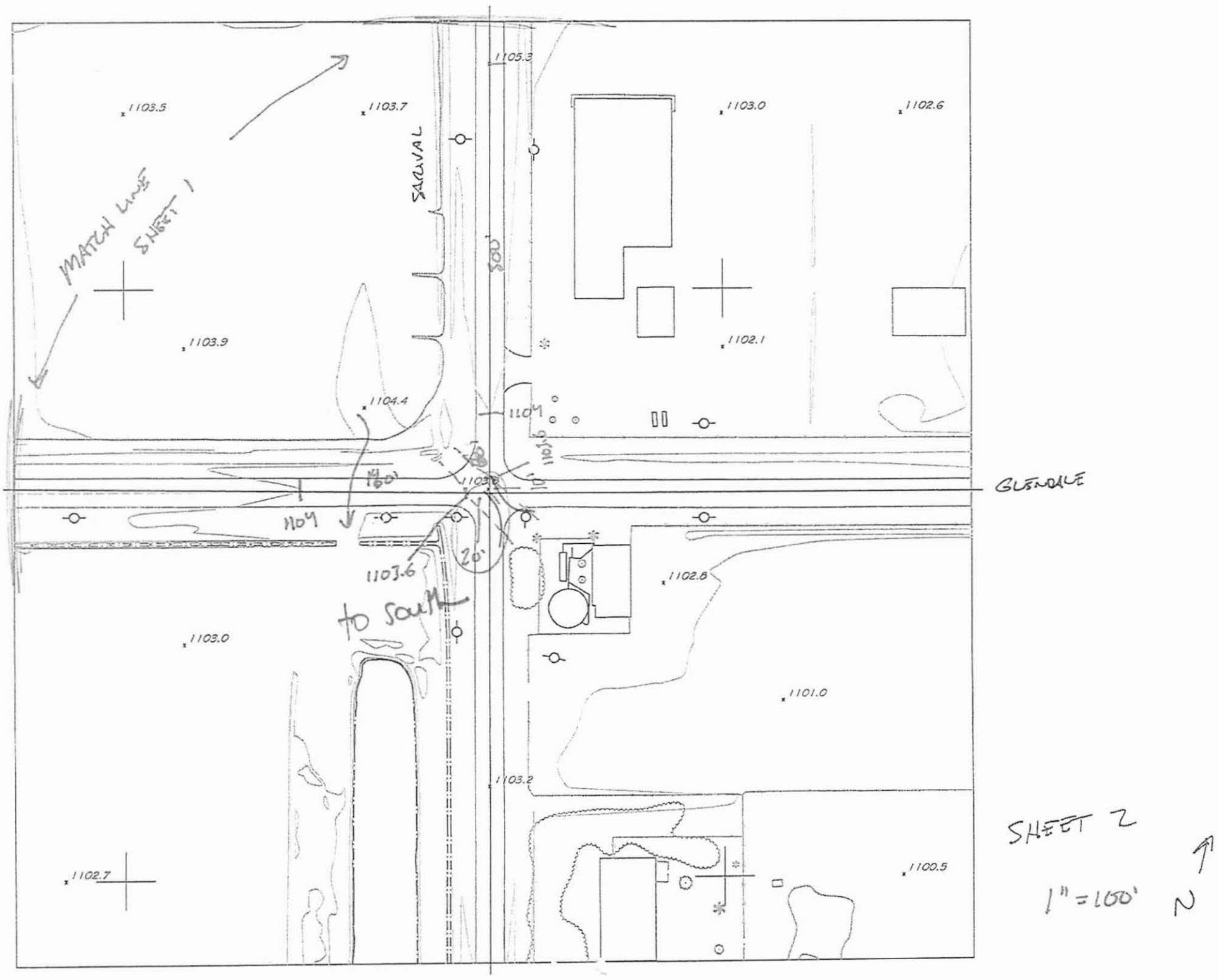

| Iteration Iter 1 | | | Iteration Iter 2 | | | Iteration Iter 3 | | | Iteration Iter 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q(south) | 37.57 | 55% | Q(south) | 245.98 | 59% | Q(south) | 1114.25 | 67% | Q(south) | 2520.94 | 61% |
| Q(southeast) | 14.79 | 22% | Q(southeast) | 64.40 | 15% | Q(southeast) | 133.40 | 8% | Q(southeast) | 217.35 | 5% |
| Q(east) | 16.10 | 24% | Q(east) | 105.42 | 25% | Q(east) | 422.97 | 25% | Q(east) | 1365.17 | 33% |
| | 68.45 | | | 415.80 | | | 1670.63 | | | 4103.46 | |

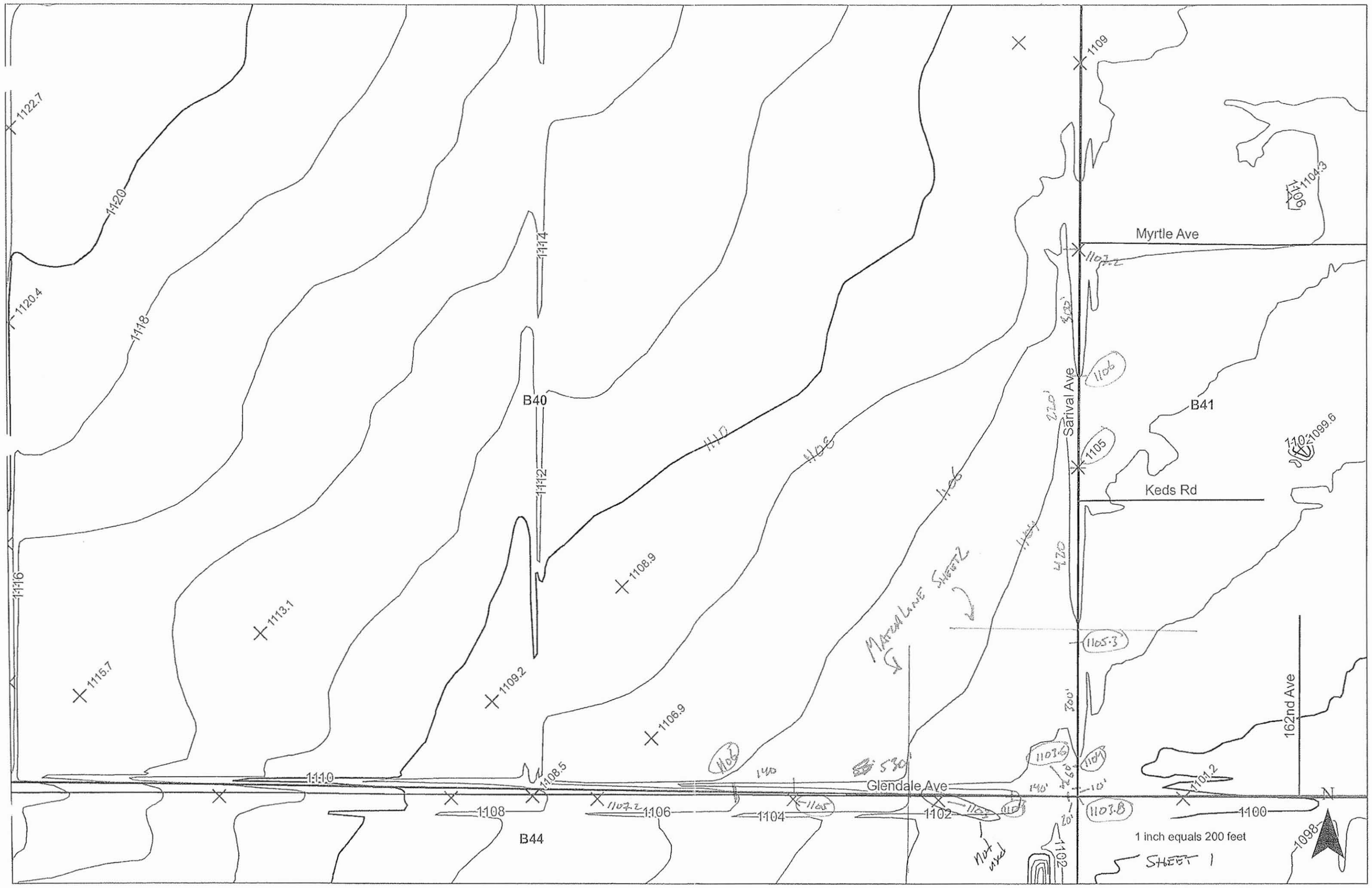
| First DI | East to South | | | |
|---|---|---|---|---|
| Inflow | 68.45 | 415.80 | 1670.63 | 4103.46 |
| Outflow | 37.57 | 245.98 | 1114.25 | 2520.94 |

Assumes diversion is to south

| Second DI | East to Southeast | | | |
|---|---|---|---|---|
| Inflow | 30.89 | 169.82 | 556.37 | 1582.52 |
| Outflow | 14.79 | 64.40 | 133.40 | 217.35 |

Assumes diversion is to southeast


1105.3
1103.5
1103.7
1103.0
1102.6
SARAVAL
MATCH LINE SHEET 1
1103.9
1102.1
1104.4
1104
1101.6
160'
1103.8
GLENDALE
1104
20'
1103.6
1102.8
to south
1103.0
1101.0
1103.2
1102.7
1100.5
SHEET 2
1" = 100'
N


1122.7
1120
1120.4
1118
1116
1114
1112
1110
1108
1106
1104
1102
1100
1098
1115.7
1113.1
1109.2
1108.9
1108.5
1107.2
1106.9
1109
1104.3
1101.2
1099.6
1103.8
1105.3
B40
B41
B44
Myrtle Ave
Sarival Ave
Keds Rd
Glendale Ave
162nd Ave
Not used
1 inch equals 200 feet
SHEET 1
N

Glendale Sarival

B41

# Computation

| | | | |
|---|---|---|---|
| Job No. | 79902 | No. | |
| Project | Loop 303 / White Tanks ADMPU AHA | Computed | AM |
| Date | 10/27/08 | | |
| Subject | Weir Flow Analysis | Checked | PP |
| Date | 3/10/09 | | |
| Task | Weir Calculations | Sheet | 1 |
| Of | x | | |

**Location: Reems at Glendale (DB41)**

| Segment | Start Elevation (ft amsl) | End Elevation (ft amsl) | Length L(ft) | Crest Ave Elevation (ft) | Start Calc Elev Iter 1 | Iter 1 H (ft) | Q1 (cfs) | Start Calc Elev Iter 2 | Iter 2 H (ft) | Q2 | Start Calc Elev Iter 3 | Iter 3 H (ft) | Q3 | Another iteration? | Start Calc Elev Iter 4 | Iter 4 H (ft) | Q4 | Another iteration? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| south | 14 | 13 | 250 | 13.5 | 12 | 0 | 0.00 | 12.5 | 0 | 0.00 | 13 | 0 | 0.00 | CHECK | 13.5 | 0 | 0.00 | DONE |
| south | 13 | 12 | 250 | 12.5 | 12 | 0 | 0.00 | 12.5 | 0 | 0.00 | 13 | 0.5 | 265.17 | | 13.5 | 1 | 750.00 | |
| south | 12 | 11.6 | 670 | 11.8 | 12 | 0.2 | 179.78 | 12.5 | 0.7 | 1177.18 | 13 | 1.2 | 2642.21 | | 13.5 | 1.7 | 4455.22 | |
| south | 11.6 | 11.7 | 35 | 11.65 | 12 | 0.35 | 21.74 | 12.5 | 0.85 | 82.28 | 13 | 1.35 | 164.70 | | 13.5 | 1.85 | 264.21 | |
| east | 11.7 | 11.8 | 15 | 11.75 | 12 | 0.25 | 5.63 | 12.5 | 0.75 | 29.23 | 13 | 1.25 | 62.89 | | 13.5 | 1.75 | 104.18 | |
| east | 11.8 | 12 | 30 | 11.9 | 12 | 0.1 | 2.85 | 12.5 | 0.6 | 41.83 | 13 | 1.1 | 103.83 | | 13.5 | 1.6 | 182.15 | |
| east | 12 | 13 | 195 | 12.5 | 12 | 0 | 0.00 | 12.5 | 0 | 0.00 | 13 | 0.5 | 206.83 | | 13.5 | 1 | 585.00 | |
| east | 13 | 14 | 195 | 13.5 | 12 | 0 | 0.00 | 12.5 | 0 | 0.00 | 13 | 0 | 0.00 | | 13.5 | 0 | 0.00 | |
| east | 14 | 14 | 1 | 14 | 12 | 0 | 0.00 | 12.5 | 0 | 0.00 | 13 | 0 | 0.00 | | 13.5 | 0 | 0.00 | |
| | | | | | | TOTALS: | 209.99 | | | 1330.52 | | | 3445.63 | | | | 6340.76 | |

Graph Computations:

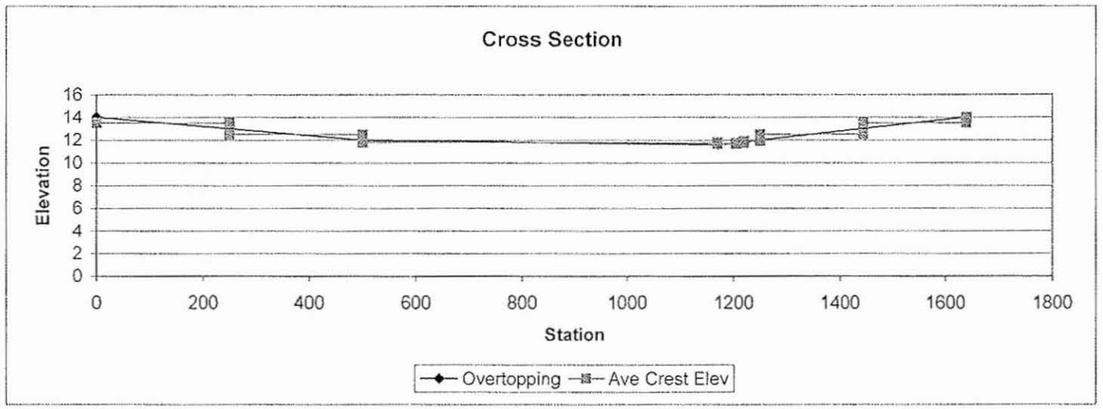
| Station | Elevation |
|---|---|
| 0 | 14 |
| 250 | 13 |
| 500 | 12 |
| 1170 | 11.6 |
| 1205 | 11.7 |
| 1220 | 11.8 |
| 1250 | 12 |
| 1445 | 13 |
| 1640 | 14 |
| 1641 | 14 |

Weir Approximation:

| Station | Elevation |
|---|---|
| 0 | 13.5 |
| 250 | 13.5 |
| 250 | 12.5 |
| 500 | 12.5 |
| 500 | 11.8 |
| 1170 | 11.8 |
| 1170 | 11.65 |
| 1205 | 11.65 |
| 1205 | 11.75 |
| 1220 | 11.75 |
| 1220 | 11.9 |
| 1250 | 11.9 |
| 1250 | 12.5 |
| 1445 | 12.5 |
| 1445 | 13.5 |
| 1640 | 13.5 |
| 1640 | 14 |
| 1641 | 14 |

Culvert Flows (cfs):

| | |
|---|---|
| south | 0 |
| southeast | 0 |
| east | 0 |



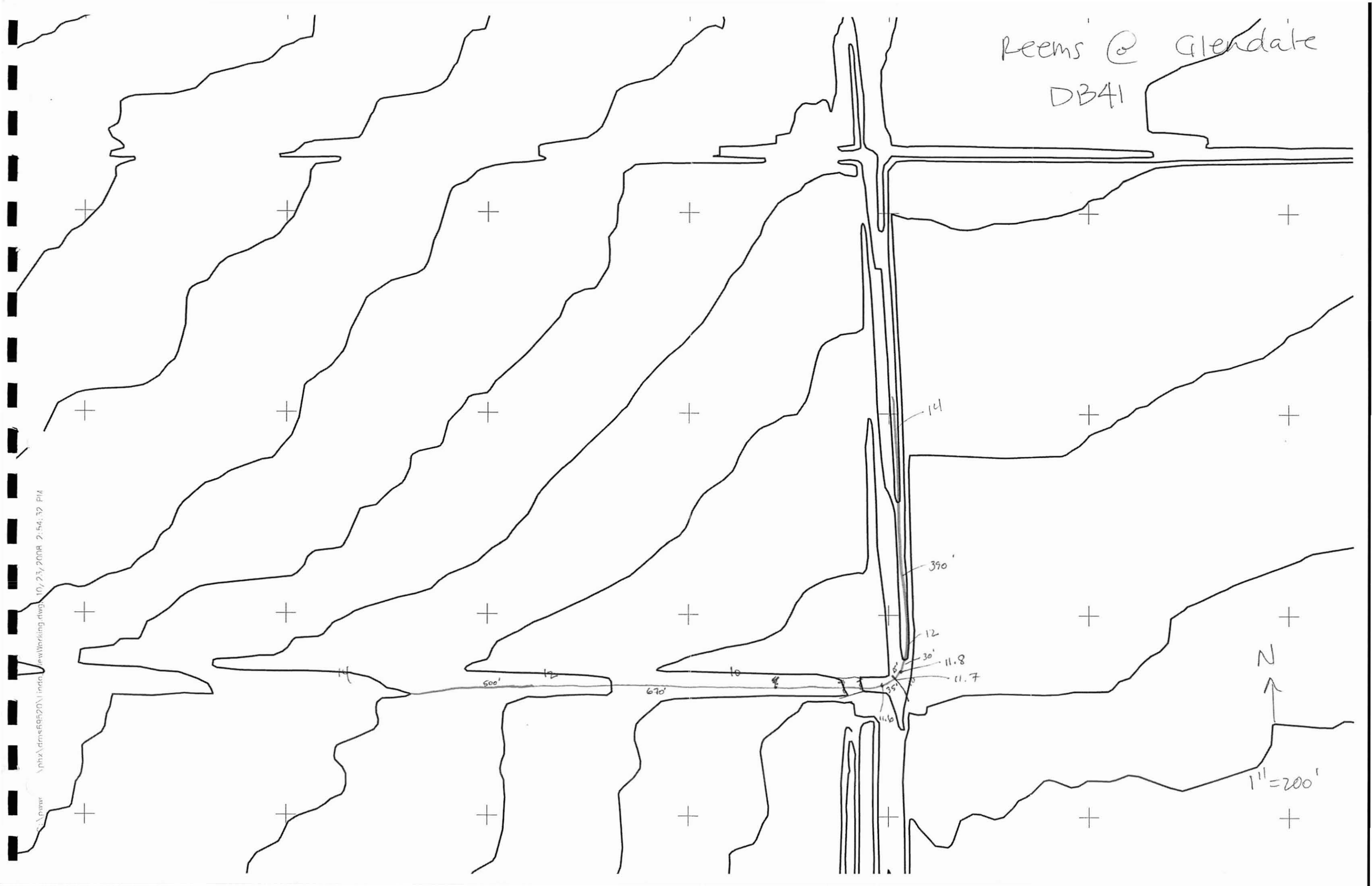

| Iteration Iter 1 | | | Iteration Iter 2 | | | Iteration Iter 3 | | | Iteration Iter 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q(south) | 201.52 | 96% | Q(south) | 1259.47 | 95% | Q(south) | 3072.08 | 89% | Q(south) | 5469.43 | 86% |
| Q(southeast) | 0.00 | 0% | Q(southeast) | 0.00 | 0% | Q(southeast) | 0.00 | 0% | Q(southeast) | 0.00 | 0% |
| Q(east) | 8.47 | 4% | Q(east) | 71.06 | 5% | Q(east) | 373.55 | 11% | Q(east) | 871.32 | 14% |
| | 209.99 | | | 1330.52 | | | 3445.63 | | | 6340.76 | |

| First DI | East to South | | | |
|---|---|---|---|---|
| Inflow | 209.99 | 1330.52 | 3445.63 | 6340.76 |
| Outflow | 201.52 | 1259.47 | 3072.08 | 5469.43 |

Assumes diversion is to south

| Second DI | East to Southeast | | | |
|---|---|---|---|---|
| Inflow | 8.47 | 71.06 | 373.55 | 871.32 |
| Outflow | 0.00 | 0.00 | 0.00 | 0.00 |

Assumes diversion is to southeast


Reems @ Glendale
DB41
14
390'
12
30'
11.8
11.7
11.6
35'
500'
670'
14
12
10
N
1" = 200'

N Reems Rd
7000
15500
W Glendale Ave
W Glendale Ave

B42

# This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B43

# This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B44

| Job No. | 79902 | No. | |
|---|---|---|---|

# Computation

| Project | Loop 303 / White Tanks ADMPU AHA | Location: Bethany Home & Sarival (B44) | Computed | AHM | Date | 10/28/2008 |
|---|---|---|---|---|---|---|
| Subject | Weir Flow Analysis | | Checked | LP | Date | 3/10/09 |
| Task | Weir Calculations | | Sheet | 1 | Of | x |

| Segment | Start Elevation (ft amsl) | End Elevation (ft amsl) | Length L(ft) | Crest Ave Elevation (ft) | Start Calc Elev Iter 1 | Iter 1 H (ft) | Q1 (cfs) | Start Calc Elev Iter 2 | Iter 2 H (ft) | Q2 | Start Calc Elev Iter 3 | Iter 3 H (ft) | Q3 | Another iteration? | Start Calc Elev Iter 4 | Iter 4 H (ft) | Q4 | Another iteration? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| south | 1085 | 1084 | 325 | 1084.5 | 1083 | 0 | 0.00 | 1083.5 | 0 | 0.00 | 1084 | 0 | 0.00 | CHECK | 1084.5 | 0 | 0.00 | DONE |
| south | 1084 | 1083.4 | 360 | 1083.7 | 1083 | 0 | 0.00 | 1083.5 | 0 | 0.00 | 1084 | 0.3 | 177.46 | | 1084.5 | 0.8 | 772.79 | |
| south | 1083.4 | 1082 | 270 | 1082.7 | 1083 | 0.3 | 133.10 | 1083.5 | 0.8 | 579.59 | 1084 | 1.3 | 1200.60 | | 1084.5 | 1.8 | 1956.11 | |
| southeast | 1082 | 1081.8 | 4 | 1081.9 | 1083 | 1.1 | 13.84 | 1083.5 | 1.6 | 24.29 | 1084 | 2.1 | 36.52 | | 1084.5 | 2.6 | 50.31 | |
| southeast | 1081.8 | 1082 | 20 | 1081.9 | 1083 | 1.1 | 69.22 | 1083.5 | 1.6 | 121.43 | 1084 | 2.1 | 182.59 | | 1084.5 | 2.6 | 251.54 | |
| east | 1082 | 1082 | 73 | 1082 | 1083 | 1 | 219.00 | 1083.5 | 1.5 | 402.33 | 1084 | 2 | 619.43 | | 1084.5 | 2.5 | 865.67 | |
| east | 1082 | 1082.9 | 530 | 1082.45 | 1083 | 0.55 | 648.55 | 1083.5 | 1.05 | 1710.73 | 1084 | 1.55 | 3068.28 | | 1084.5 | 2.05 | 4666.89 | |
| east | 1082.9 | 1084 | 230 | 1083.45 | 1083 | 0 | 0.00 | 1083.5 | 0.05 | 7.71 | 1084 | 0.55 | 281.44 | | 1084.5 | 1.05 | 742.39 | |
| east | 1084 | 1085.1 | 450 | 1084.55 | 1083 | 0 | 0.00 | 1083.5 | 0 | 0.00 | 1084 | 0 | 0.00 | | 1084.5 | 0 | 0.00 | |
| | | | | | | TOTALS: | 1083.71 | | | 2846.08 | | | 5566.32 | | | | 9305.71 | |

Graph Computations:

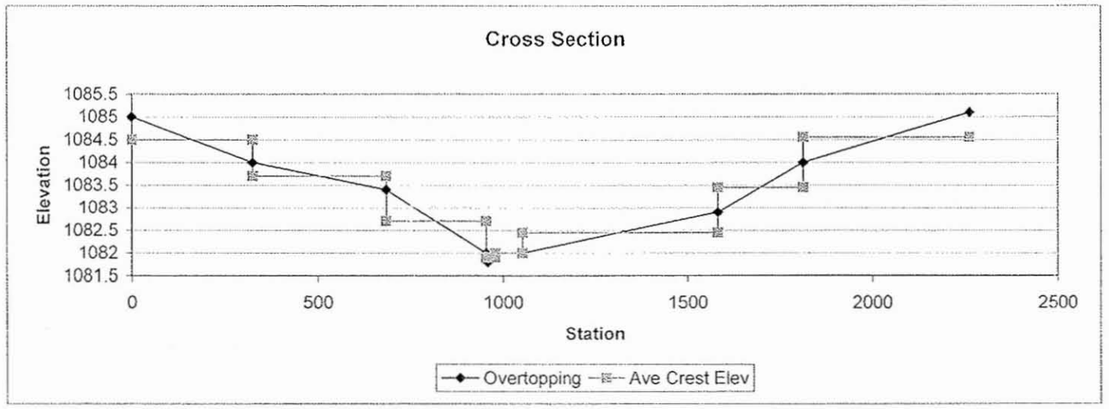
| Station | Elevation |
|---|---|
| 0 | 1085 |
| 325 | 1084 |
| 685 | 1083.4 |
| 955 | 1082 |
| 959 | 1081.8 |
| 979 | 1082 |
| 1052 | 1082 |
| 1582 | 1082.9 |
| 1812 | 1084 |
| 2262 | 1085.1 |

Weir Approximation:

| Station | Elevation |
|---|---|
| 0 | 1084.5 |
| 325 | 1084.5 |
| 325 | 1083.7 |
| 685 | 1083.7 |
| 685 | 1082.7 |
| 955 | 1082.7 |
| 955 | 1081.9 |
| 959 | 1081.9 |
| 959 | 1081.9 |
| 979 | 1081.9 |
| 979 | 1082 |
| 1052 | 1082 |
| 1052 | 1082.45 |
| 1582 | 1082.45 |
| 1582 | 1083.45 |
| 1812 | 1083.45 |
| 1812 | 1084.55 |
| 2262 | 1084.55 |

Culvert Flows (cfs):

| | |
|---|---|
| south | 0 |
| southeast | 0 |
| east | 0 |



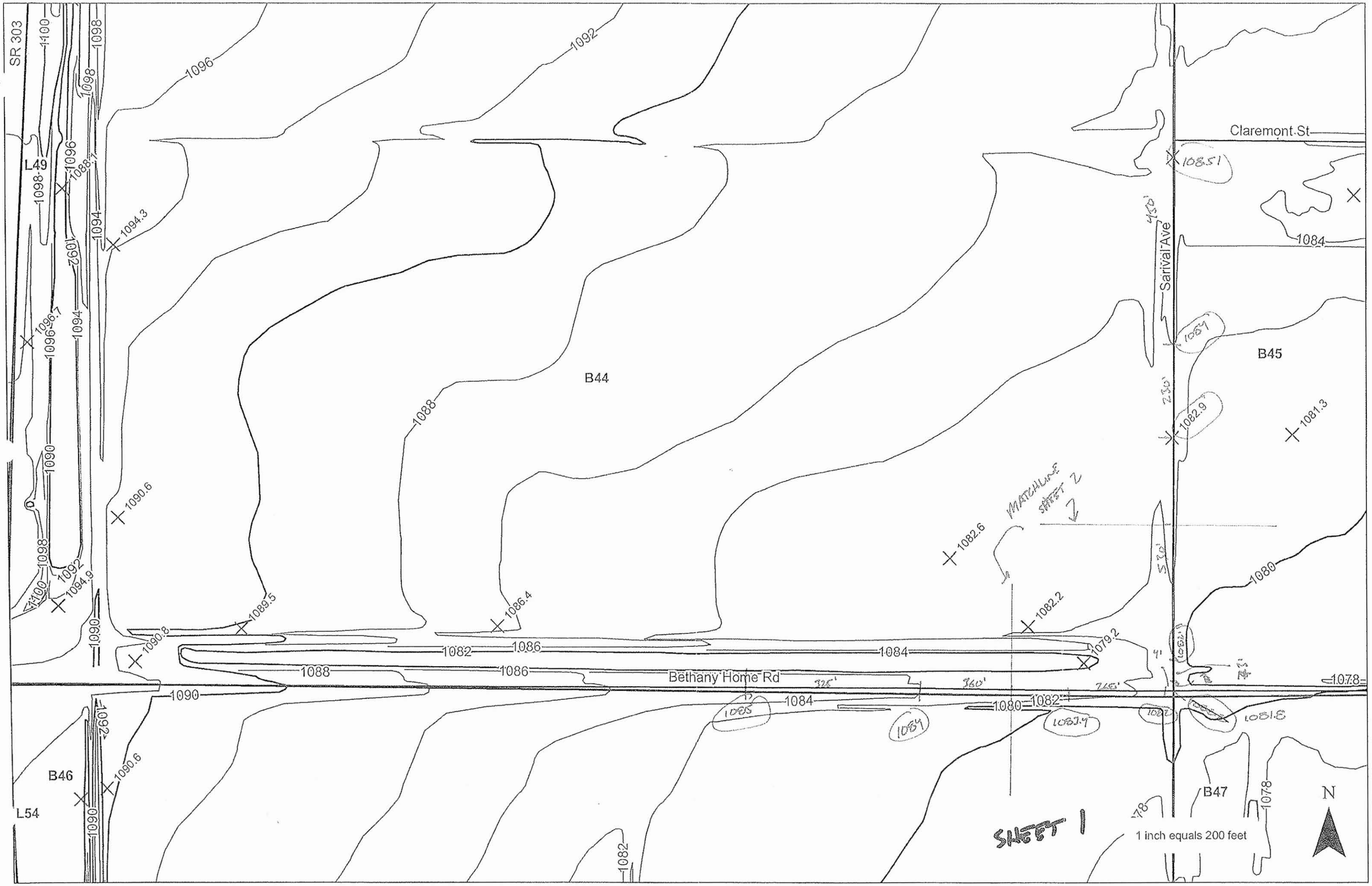

| Iteration Iter 1 | | | Iteration Iter 2 | | | Iteration Iter 3 | | | Iteration Iter 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q(south) | 133.10 | 12% | Q(south) | 579.59 | 20% | Q(south) | 1378.07 | 25% | Q(south) | 2728.90 | 29% |
| Q(southeast) | 83.07 | 8% | Q(southeast) | 145.72 | 5% | Q(southeast) | 219.11 | 4% | Q(southeast) | 301.85 | 3% |
| Q(east) | 867.55 | 80% | Q(east) | 2120.77 | 75% | Q(east) | 3969.15 | 71% | Q(east) | 6274.96 | 67% |
| | 1083.71 | | | 2846.08 | | | 5566.32 | | | 9305.71 | |

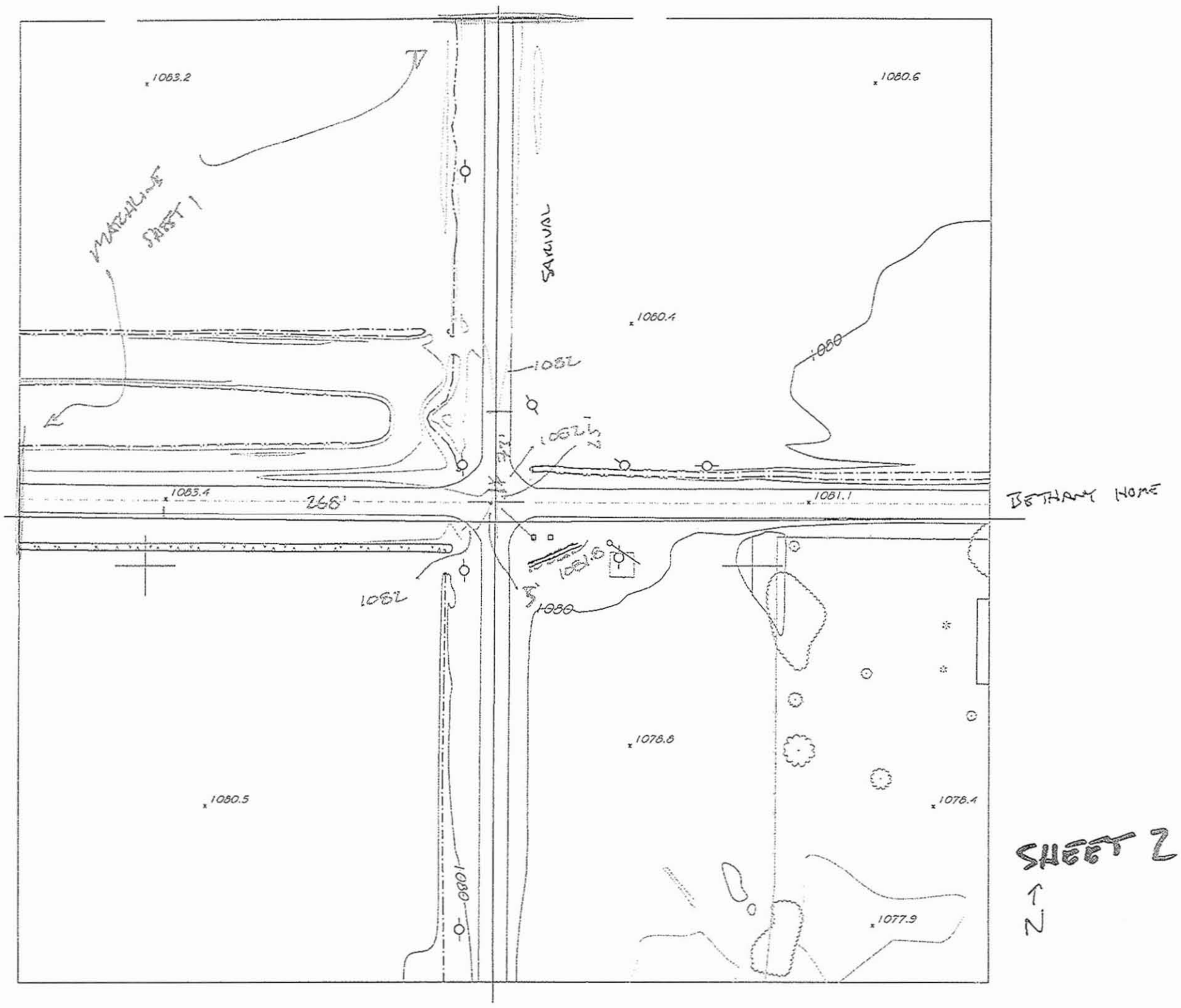
| First DI | East to South | | | |
|---|---|---|---|---|
| Inflow | 1083.71 | 2846.08 | 5566.32 | 9305.71 |
| Outflow | 133.10 | 579.59 | 1378.07 | 2728.90 |

Assumes diversion is to south

| Second DI | East to Southeast | | | |
|---|---|---|---|---|
| Inflow | 950.61 | 2266.49 | 4188.26 | 6576.81 |
| Outflow | 83.07 | 145.72 | 219.11 | 301.85 |

Assumes diversion is to southeast


SR 303
L49
B44
B45
B46
B47
L54
Claremont St
Sarival Ave
Bethany Home Rd
MATCHLINE SHEET 2
SHEET 1
1 inch equals 200 feet
N


1083.2
1080.6
MATCHLINE SHEET 1
SARGENT
1080.4
1082
1080
1082.5
1083.4
268'
1081.1
BETHANY HOME
1081.5
1082
1080
1078.8
1080.5
1078.4
1080
1077.9
SHEET 2
N

Bethany Home Sarival

B45

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For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B46

B46

```
1**************************************
*                                    *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
*            JUN   1998              *
*          VERSION 4.1               *
*                                    *
*     DATE   14JUL08  TIME  17:23:04 *
*                                    *
**************************************
```

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

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL  LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID      ASPEN CONSULTING ENGINEERS, JCS, 06-20-08, FILE: REC-EWP.DAT, 100-YR 24-HR
  2           ID      THIS IS THE EXISTING WITH RECOMMENDED PLAN MODEL.
  3           ID      NOTES:
  4           ID      THE PURPOSE OF THIS PROJECT IS TO UPDATE FOR LAND USE CHANGES FOR THE ENTIRE
  5           ID      MODEL AND TO REEVALUATE THE BASINS AT LOOP 303 AND CAMELBACK ROAD.
  6           ID
  7           ID      UPDATE LG CARD AND DEVELOPMENT RETENTION DIVERSIONS FOR EACH SUBBASIN.
  8           ID      CHANGE MODEL TO REFLECT THE NEW SUNCOR CHANNEL SOUTH OF CAMELBACK RD.
  9           ID      BETWEEN STATE ROUTE 303 AND BULLARD WASH.
 10           ID
 11           ID      THE RECOMMENDED PLAN IS A CHANNEL BEGINNING AT THE OUTLET FROM THE NORTHERN
 12           ID      AVENUE BASIN AT THE SW CORNER OF NORTHERN AND THE LOOP 303.  THE CHANNEL
 13           ID      GOES SOUTH ALONG THE WEST SIDE OF THE LOOP 303 TO CAMELBACK ROAD.  BEFORE
 14           ID      CAMELBACK ROAD THE CHANNEL TRANSITIONS INTO A LONG BOX CULVERT THAT
 15           ID      CROSSES DIAGONALLY UNDER THE LOOP 303 AND CAMELBACK ROAD WEHERE IT
 16           ID      DAYLIGHTS ON THE SOUTH SIDE OF CAMELBACK ROAD AT THE EXISTING SUNCOR
 17           ID      CHANNEL.  THE FLOW THEN CONTINUES ALONG THE SUNCOR CHANNEL ALIGNMENT TO A
 18           ID      BASIN NEAR REEMS ROAD WHICH THEN OUTLETS TO THE SUNCOR CHANNEL ALIGNMENT
 19           ID      AGAIN AND CONTINUES TO BULLARD WASH.  SEPARATELY, THERE IS A BASIN AT COTTON
 20           ID      LANE AND CAMELBACK ROAD.  A SHORT CHANNEL CONVEYS WATER COLLECTED AT THE
 21           ID      BASIN TO THE LOOP 303 AND THEN TRANSITIONS SOUTH IN A CULVERT UNDER
 22           ID      CAMELBACK ROAD.  THIS CHANNEL CONTINUES ALONG LOOP 303 TO A SMALL BASIN
 23           ID      SOUTH AT INDIAN SCHOOL ROAD AND THEN TO THE BASIN AT I-10 NEAR PERRYVILLE
 24           ID      PRISON.  THE I-10 AND PERRYVILLE PRISON BASIN IS AS PROPOSED IN THE ADMPU.
 25           ID
              * ***************************************************************************
              * *  THE FOLLOWING IS THE MODEL RECIEVED BY ASPEN FROM FCDMC ON 06/08/07
              * ***************************************************************************
 26           ID         DRAFT PREFERRED ALTERNATIVE LEVEL III
 27           ID
 28           ID         INCORPORATE ALTERNATIVE #3 FROM CHANGE ORDER #14 INTO
 29           ID         SR 303L OFFSITE FLOOD CONTROL FACILITY - NORTHERN AND CACTUS
 30           ID         BASINS ARE NOW OFFLINE WITH MULTIPLE BASINS LOCATED WITHIN
 31           ID         LUKE AIR FORCE BASE CRASH ZONE AREA
 32           ID
 33           ID         **ADOT BASIN GEOMETRY REPRESENTS MOST RECENT 2' CONTOURS**
 34           ID         WHITE TANKS AREA DRAINAGE MASTER STUDY *UPDATE*
 35           ID         Original MODEL BY THE WLB Group for FCDMC AS PART OF THE WHITE
 36           ID         TANKS/AGUA FRIA ADMS, Date: October 1991
 37           ID
 38           ID         REVISED HYDROLOGY HEC-1 RUN FOR WHITE TANKS ADMS
 39           ID         100-YEAR, 24-HOUR STORM                  original file: WTADMS.24
 40           ID
 41           ID                                   REVISED BY URS     DATE: 01-14-04
 42           ID                                                      FILE: L33PE4H.DAT
 43           ID
 44           ID        NOTES:
 45           ID        1. THIS HEC-1 MODEL CONTAINS THE FOLLOWING SUPER BASINS: WHITE TANKS 3,
 46           ID           2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2 & 3, 4 THRU 26.
 47           ID        2. REVISED TO REFLECT UPDATED SOILS MAPS AND NEW DEVELOPMENT.
 48           ID        3. AVERAGE XKSAT VALUES FOR EACH SUBBASIN WAS RECEIVED FROM FCDMC
 49           ID           GIS DATA AND THEN ADJUSTED FOR VEGETATION, OR LEFT AS ORIGINALLY IN
 50           ID           THE WLB MODEL.
 51           ID        4. FOR NEW DEVELOPMENTS ONLY 80% OF REPORTED PROVIDED RETENTION
 52           ID           WAS INCLUDED IN THIS MODEL (AS A CONSERVATIVE ESTIMATE). RETENTION
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 53           ID           CAPACITIES WERE ESTIMATED BY EEC FOR DEVELOPMENTS WITH NO
 54           ID           DRAINAGE REPORTS.
 55           ID        5. REVISED DRAINAGE BOUNDARIES BASED UPON FIELD INSPECTION OF SUN CITY.
 56           ID           GRAND.  COMBINED SEVERAL BASINS TOGETHER TO MAKE NEW BASINS 114 &115.
 57           ID           ALSO REROUTED SUBBASINS 100A, 101, 102A AND 106 TO THE SOUTH TO 113A.
```

```
5318          KK    R201
5319          KM        ROUTE FLOW FROM CP201 TO CP223
5320          RS      19          -1          0
5321          RC     .05     .035     .050    7000    .0017
5322          RX    1000     1200     1300    1500     1600     1800     1900     2000
5323          RY    1078   1074.5     1074    1073     1073     1074   1074.5     1078
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5324          KK     223
5325          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 223
5326          BA    1.26
5327          LG     .12      .25     5.52      .19    72.00
5328          UI    119.     218.     491.     643.     786.    1003.    1453.    1254.     993.     797.
5329          UI    634.     465.     257.     200.     140.     112.      37.      37.      37.      37.
5330          UI     37.       0.       0.       0.       0.       0.       0.       0.       0.       0.
5331          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.

5332          KK   1I223
5333          KM        ADD HYDROGRAPHS AT CP223 (223 + 201)
5334          HC       2     1.6

5335          KK   CP223
5336          KM        ADD HYDROGRAPHS AT CP223 (223 + 226)
5337          HC       2   54.67

5338          KK    R223
5339          KM        ROUTE REMAINDER FROM CP223 TO CP224
5340          RS       4           -1
5341          RC     .03     .025      .03    2900    .0017
5342          RX    1000     1120     1350    1590     1780     1960     2129     2130
5343          RY    1067     1066     1064    1063     1063     1064   1065.5   1065.5
              *

5344          KK     224
5345          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 224
5346          BA     .80
5347          LG     .35      .32     5.64      .20        6
5348          UI     94.     258.     469.     606.     833.    1145.     854.     655.     492.     310.
5349          UI    163.     121.      79.      29.      29.      29.      29.       0.       0.       0.
5350          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              * KK CP224

5351          KK   !BD1N
5352          KM   ADD HYDROGRAPHS AT CP224 (224 + 223)
5353          HC       2     3.58
              * KK  R224
              * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5354          KK   RBD1N
5355          KM   ROUTE FLOW FROM CP224 TO CP241
5356          RS     3.5          -1.0       0.0
5357          RC   0.030    0.030    0.030       0   0.0020
5358          RX     0.0     41.9     50.9      59.9     68.9     77.9     86.9    128.7
5359          RY  1064.0   1057.0   1057.0    1057.0   1057.0   1057.0   1057.0   1064.0
              * RS      7           -1
              * RC    .03      .03      .03      3000   0.0020
              * RX   1000     1042   1048.6    1055.2   1061.8   1068.4     1075     1117
              * RY   1057     1050     1050      1050     1050     1050     1050     1050
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5360          KK     241
5361          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 241
5362          BA    1.51
5363          LG     .29      .28     4.74      .34        8
5364          UI    133.     206.     513.     682.     817.    1005.    1376.    1635.    1253.    1036.
5365          UI    834.     673.     488.     276.     223.     162.     133.      50.      41.      41.
5366          UI     41.      41.       0.       0.       0.       0.       0.       0.       0.       0.
5367          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *

5368          KK    241T
5369          KM    Divert Retention in Subbasin 241
5370          DT    241R    21.5
5371          DI       0   10000
5372          DQ       0   10000
              *

5373          KK   1I241
5374          KM        ADD HYDROGRAPHS AT CP241 (241 + 224)
5375          HC       2   56.98
              * KK CP241

5376          KK   !BD2N
5377          KM   ADD HYDROGRAPHS AT CP241 (241 + 240)
5378          HC       2   39.76
              *

5379          KK   2D237
5380          KM        RETURN DIVERT FROM CP237
5381          DR  1D250A
              *

5382          KK    DIAG
5383          KM        ROUTE FROM (LP8!) CP237 TO SOUTHEAST CORNER OF LOOP 303 AND CAMELBACK
```

L54W2E

```
KM      VIA DIAGONAL CULVERT UNDER INTERSECTION
RS       1          -1
RC     .02     .02     .02    1400   .0057
RX    1000    1010    1035    1036    1076    1077    1082    1092
RY    1069    1069    1069    1065    1065    1069    1069    1069
*

KK   ~R237
KM       ROUTE FROM CP237 TO CP238 IN SUNCOR CHANNEL ALIGNMENT
KM      THIS IS THE CAMELBACK BASINS CAR RECOMMENDED PLAN
RS       1          -1
RC    .032    .032    .032    2640   .0039
RX   100.0   124.0   125.0   126.0   145.0   146.0   147.0   171.0
RY   18.00   10.00   10.00   10.00   10.00   10.00   10.00   18.00
*
```

W2EB46



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

KK   1D238
KM       RETURN DIVERT AT CP238
DR  2D250A
*

KK   2D238
KM       RETURN DIVERT AT CP238
DR   1D251
*

KK   SC238
KM       ADD HYDROGRAPHS AT CP238 IN SUNCOR CHANNEL ALIGNMENT
HC       3   30.34
*

KK   ~R238
KM       ROUTE FROM CP238 TO CP239 IN SUNCOR CHANNEL ALIGNMENT
KM      THIS THIS THE CAMELBACK BASINS CAR RECOMMENDED PLAN
RS       4          -1
RC    0.32    .032    .032    2640   .0015
RX   100.0   124.0   125.0   126.0   167.0   168.0   169.0   193.0
RY   18.00   10.00   10.00   10.00   10.00   10.00   10.00   18.00
*

KK   1D239
KM       RETURN DIVERT AT CP239
DR   2D251
*

KK   2D239
KM       RETURN DIVERT AT CP239
DR   DI252
*

KK   SC239
KM       ADD HYDROGRAPHS AT CP239 IN SUNCOR CHANNEL ALIGNMENT
HC       3   31.76
*

KK   DB252
KM      RECOMMENDED PLAN DETENTION BASIN SOUTH OF CAMELBACK
KM      BASIN DESIGNED TO BRING HYDROGAPH TO BULLARD WASH AFTER
KM      THE BULLARD WASH HYDROGRAPH HAS PASSED.
RS       1    STOR       0       0
SV       0    23.9    68.5   109.8
SQ       0     409     817    1156
*

KK   ~R240
KM       ROUTE FROM CP240 TO CP241 IN SUNCOR CHANNEL ALIGNMENT
RS       5          -1
RC    .032    .032    .032    4070   .0004
RX   100.0   124.0   125.0   126.0   166.0   167.0   168.0   192.0
RY   18.00   10.00   10.00   10.00   10.00   10.00   10.00   18.00
*
```

1



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

KK   ~BD2N
KO            2
KM       ADD HYDROGRAPHS AT CP241 (CP241 + SUNCOR CHANNEL)
HC       2   78.75
*
* KK SR241
* KM      STORAGE ROUTE THROUGH CP241
* RS     1    STOR       0       0
* SV     0     .09     .65     .94    8.45   16.94
* SQ     0       4     280     324    1773    7505
* SE1042.2    1044    1046  1046.3    1048    1049
* KK  R241
* PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

KK   RBD2N
KM   ROUTE FLOW FROM CP241 TO CP253
RS     3.2          -1.0     0.0
RC   0.030   0.030   0.030    5547  0.0020
RX     0.0    48.9    61.9    74.9    87.9   100.9   113.9   162.7
RY  1047.6  1039.5  1039.5  1039.5  1039.5  1039.5  1039.5  1047.6
* RS     4          -1
* RC  0.03     .03    0.03    5800  0.0020
```

B47

B47

```
FLOOD HYDROGRAPH PACKAGE  (HEC-1)
          JUN  1998
        VERSION 4.1

  DATE   14JUL08  TIME  17:23:04
```


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


```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL  LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

HEC-1 INPUT  PAGE 1

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   1          ID      ASPEN CONSULTING ENGINEERS, JCS, 06-20-08, FILE: REC-EWP.DAT, 100-YR 24-HR
   2          ID      THIS IS THE EXISTING WITH RECOMMENDED PLAN MODEL.
   3          ID      NOTES:
   4          ID      THE PURPOSE OF THIS PROJECT IS TO UPDATE FOR LAND USE CHANGES FOR THE ENTIRE
   5          ID      MODEL AND TO REEVALUATE THE BASINS AT LOOP 303 AND CAMELBACK ROAD.
   6          ID
   7          ID      UPDATE LG CARD AND DEVELOPMENT RETENTION DIVERSIONS FOR EACH SUBBASIN.
   8          ID      CHANGE MODEL TO REFLECT THE NEW SUNCOR CHANNEL SOUTH OF CAMELBACK RD.
   9          ID      BETWEEN STATE ROUTE 303 AND BULLARD WASH.
  10          ID
  11          ID      THE RECOMMENDED PLAN IS A CHANNEL BEGINNING AT THE OUTLET FROM THE NORTHERN
  12          ID      AVENUE BASIN AT THE SW CORNER OF NORTHERN AND THE LOOP 303.  THE CHANNEL
  13          ID      GOES SOUTH ALONG THE WEST SIDE OF THE LOOP 303 TO CAMELBACK ROAD.  BEFORE
  14          ID      CAMELBACK ROAD THE CHANNEL TRANSITIONS INTO A LONG BOX CULVERT THAT
  15          ID      CROSSES DIAGONALLY UNDER THE LOOP 303 AND CAMELBACK ROAD WEHERE IT
  16          ID      DAYLIGHTS ON THE SOUTH SIDE OF CAMELBACK ROAD AT THE EXISTING SUNCOR
  17          ID      CHANNEL.  THE FLOW THEN CONTINUES ALONG THE SUNCOR CHANNEL ALIGNMENT TO A
  18          ID      BASIN NEAR REEMS ROAD WHICH THEN OUTLETS TO THE SUNCOR CHANNEL ALIGNMENT
  19          ID      AGAIN AND CONTINUES TO BULLARD WASH.  SEPARATELY, THERE IS A BASIN AT COTTON
  20          ID      LANE AND CAMELBACK ROAD.  A SHORT CHANNEL CONVEYS WATER COLLECTED AT THE
  21          ID      BASIN TO THE LOOP 303 AND THEN TRANSITIONS SOUTH IN A CULVERT UNDER
  22          ID      CAMELBACK ROAD.  THIS CHANNEL CONTINUES ALONG LOOP 303 TO A SMALL BASIN
  23          ID      SOUTH AT INDIAN SCHOOL ROAD AND THEN TO THE BASIN AT I-10 NEAR PERRYVILLE
  24          ID      PRISON.  THE I-10 AND PERRYVILLE PRISON BASIN IS AS PROPOSED IN THE ADMPU.
  25          ID
              * ***************************************************************************
              * *  THE FOLLOWING IS THE MODEL RECIEVED BY ASPEN FROM FCDMC ON 06/08/07
              * ***************************************************************************
  26          ID         DRAFT PREFERRED ALTERNATIVE LEVEL III
  27          ID
  28          ID         INCORPORATE ALTERNATIVE #3 FROM CHANGE ORDER #14 INTO
  29          ID         SR 303L OFFSITE FLOOD CONTROL FACILITY - NORTHERN AND CACTUS
  30          ID         BASINS ARE NOW OFFLINE WITH MULTIPLE BASINS LOCATED WITHIN
  31          ID         LUKE AIR FORCE BASE CRASH ZONE AREA
  32          ID
  33          ID         **ADOT BASIN GEOMETRY REPRESENTS MOST RECENT 2' CONTOURS**
  34          ID         WHITE TANKS AREA DRAINAGE MASTER STUDY *UPDATE*
  35          ID         Original MODEL BY THE WLB Group for FCDMC AS PART OF THE WHITE
  36          ID         TANKS/AGUA FRIA ADMS, Date: October 1991
  37          ID
  38          ID         REVISED HYDROLOGY HEC-1 RUN FOR WHITE TANKS ADMS
  39          ID         100-YEAR, 24-HOUR STORM                  original file: WTADMS.24
  40          ID
  41          ID                                   REVISED BY URS     DATE: 01-14-04
  42          ID                                                      FILE: L33PE4H.DAT
  43          ID
  44          ID       NOTES:
  45          ID       1. THIS HEC-1 MODEL CONTAINS THE FOLLOWING SUPER BASINS: WHITE TANKS 3,
  46          ID          2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2 & 3, 4 THRU 26.
  47          ID       2. REVISED TO REFLECT UPDATED SOILS MAPS AND NEW DEVELOPMENT.
  48          ID       3. AVERAGE XKSAT VALUES FOR EACH SUBBASIN WAS RECEIVED FROM FCDMC
  49          ID          GIS DATA AND THEN ADJUSTED FOR VEGETATION, OR LEFT AS ORIGINALLY IN
  50          ID          THE WLB MODEL.
  51          ID       4. FOR NEW DEVELOPMENTS ONLY 80% OF REPORTED PROVIDED RETENTION
  52          ID          WAS INCLUDED IN THIS MODEL (AS A CONSERVATIVE ESTIMATE). RETENTION
```

HEC-1 INPUT  PAGE 2

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  53          ID          CAPACITIES WERE ESTIMATED BY EEC FOR DEVELOPMENTS WITH NO
  54          ID          DRAINAGE REPORTS.
  55          ID       5. REVISED DRAINAGE BOUNDARIES BASED UPON FIELD INSPECTION OF SUN CITY.
  56          ID          GRAND.  COMBINED SEVERAL BASINS TOGETHER TO MAKE NEW BASINS 114 &115.
  57          ID          ALSO REROUTED SUBBASINS 100A, 101, 102A AND 106 TO THE SOUTH TO 113A.
```

```
5384        KM      VIA DIAGONAL CULVERT UNDER INTERSECTION
5385        RS       1          -1
5386        RC     .02     .02     .02    1400   .0057
5387        RX    1000    1010    1035    1036    1076    1077    1082    1092
5388        RY    1069    1069    1069    1065    1065    1069    1069    1069
            *

5389        KK   ~R237
5390        KM       ROUTE FROM CP237 TO CP238 IN SUNCOR CHANNEL ALIGNMENT
5391        KM      THIS IS THE CAMELBACK BASINS CAR RECOMMENDED PLAN
5392        RS       1          -1
5393        RC    .032    .032    .032    2640   .0039
5394        RX   100.0   124.0   125.0   126.0   145.0   146.0   147.0   171.0
5395        RY   18.00   10.00   10.00   10.00   10.00   10.00   10.00   18.00
            *
```



```
LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5396        KK   1D238
5397        KM        RETURN DIVERT AT CP238
5398        DR  2D250A
            *

5399        KK   2D238
5400        KM        RETURN DIVERT AT CP238
5401        DR   1D251
            *

5402        KK   SC238
5403        KM       ADD HYDROGRAPHS AT CP238 IN SUNCOR CHANNEL ALIGNMENT
5404        HC       3   30.34
            *

5405        KK   ~R238
5406        KM       ROUTE FROM CP238 TO CP239 IN SUNCOR CHANNEL ALIGNMENT
5407        KM      THIS THIS THE CAMELBACK BASINS CAR RECOMMENDED PLAN
5408        RS       4          -1
5409        RC    0.32    .032    .032    2640   .0015
5410        RX   100.0   124.0   125.0   126.0   167.0   168.0   169.0   193.0
5411        RY   18.00   10.00   10.00   10.00   10.00   10.00   10.00   18.00
            *
```

B46B47

```
5412        KK   1D239
5413        KM        RETURN DIVERT AT CP239
5414        DR   2D251
            *

5415        KK   2D239
5416        KM        RETURN DIVERT AT CP239
5417        DR   DI252
            *

5418        KK   SC239
5419        KM       ADD HYDROGRAPHS AT CP239 IN SUNCOR CHANNEL ALIGNMENT
5420        HC       3   31.76
            *

5421        KK   DB252
5422        KM      RECOMMENDED PLAN DETENTION BASIN SOUTH OF CAMELBACK
5423        KM      BASIN DESIGNED TO BRING HYDROGAPH TO BULLARD WASH AFTER
5424        KM      THE BULLARD WASH HYDROGRAPH HAS PASSED.
5425        RS       1    STOR       0       0
5426        SV       0    23.9    68.5   109.8
5427        SQ       0     409     817    1156
            *

5428        KK   ~R240
5429        KM       ROUTE FROM CP240 TO CP241 IN SUNCOR CHANNEL ALIGNMENT
5430        RS       5          -1
5431        RC    .032    .032    .032    4070   .0004
5432        RX   100.0   124.0   125.0   126.0   166.0   167.0   168.0   192.0
5433        RY   18.00   10.00   10.00   10.00   10.00   10.00   10.00   18.00
            *
```



```
LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5434        KK   ~BD2N
5435        KO            2
5436        KM       ADD HYDROGRAPHS AT CP241 (CP241 + SUNCOR CHANNEL)
5437        HC       2   78.75
            *
            * KK SR241
            * KM      STORAGE ROUTE THROUGH CP241
            * RS      1    STOR       0       0
            * SV      0     .09     .65     .94    8.45   16.94
            * SQ      0       4     280     324    1773    7505
            * SE1042.2    1044    1046  1046.3    1048    1049
            * KK  R241
            * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5438        KK   RBD2N
5439        KM   ROUTE FLOW FROM CP241 TO CP253
5440        RS     3.2          -1.0     0.0
5441        RC   0.030   0.030   0.030    5547  0.0020
5442        RX     0.0    48.9    61.9    74.9    87.9   100.9   113.9   162.7
5443        RY  1047.6  1039.5  1039.5  1039.5  1039.5  1039.5  1039.5  1047.6
            * RS     4          -1
            * RC  0.03     .03    0.03    5800  0.0020
```

B48

B48

```
1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            JUN  1998              *
*          VERSION 4.1              *
*                                   *
*     DATE   14JUL08  TIME  17:23:04  *
*                                   *
**.  .*********************************
```

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

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X    X         XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X    X         X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL  LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   1          ID      ASPEN CONSULTING ENGINEERS, JCS, 06-20-08, FILE: REC-EWP.DAT, 100-YR 24-HR
   2          ID      THIS IS THE EXISTING WITH RECOMMENDED PLAN MODEL.
   3          ID      NOTES:
   4          ID      THE PURPOSE OF THIS PROJECT IS TO UPDATE FOR LAND USE CHANGES FOR THE ENTIRE
   5          ID      MODEL AND TO REEVALUATE THE BASINS AT LOOP 303 AND CAMELBACK ROAD.
   6          ID
   7          ID      UPDATE LG CARD AND DEVELOPMENT RETENTION DIVERSIONS FOR EACH SUBBASIN.
   8          ID      CHANGE MODEL TO REFLECT THE NEW SUNCOR CHANNEL SOUTH OF CAMELBACK RD.
   9          ID      BETWEEN STATE ROUTE 303 AND BULLARD WASH.
  10          ID
  11          ID      THE RECOMMENDED PLAN IS A CHANNEL BEGINNING AT THE OUTLET FROM THE NORTHERN
  12          ID      AVENUE BASIN AT THE SW CORNER OF NORTHERN AND THE LOOP 303.  THE CHANNEL
  13          ID      GOES SOUTH ALONG THE WEST SIDE OF THE LOOP 303 TO CAMELBACK ROAD.  BEFORE
  14          ID      CAMELBACK ROAD THE CHANNEL TRANSITIONS INTO A LONG BOX CULVERT THAT
  15          ID      CROSSES DIAGONALLY UNDER THE LOOP 303 AND CAMELBACK ROAD WEHERE IT
  16          ID      DAYLIGHTS ON THE SOUTH SIDE OF CAMELBACK ROAD AT THE EXISTING SUNCOR
  17          ID      CHANNEL.  THE FLOW THEN CONTINUES ALONG THE SUNCOR CHANNEL ALIGNMENT TO A
  18          ID      BASIN NEAR REEMS ROAD WHICH THEN OUTLETS TO THE SUNCOR CHANNEL ALIGNMENT
  19          ID      AGAIN AND CONTINUES TO BULLARD WASH.  SEPARATELY, THERE IS A BASIN AT COTTON
  20          ID      LANE AND CAMELBACK ROAD.  A SHORT CHANNEL CONVEYS WATER COLLECTED AT THE
  21          ID      BASIN TO THE LOOP 303 AND THEN TRANSITIONS SOUTH IN A CULVERT UNDER
  22          ID      CAMELBACK ROAD.  THIS CHANNEL CONTINUES ALONG LOOP 303 TO A SMALL BASIN
  23          ID      SOUTH AT INDIAN SCHOOL ROAD AND THEN TO THE BASIN AT I-10 NEAR PERRYVILLE
  24          ID      PRISON.  THE I-10 AND PERRYVILLE PRISON BASIN IS AS PROPOSED IN THE ADMPU.
  25          ID
              * ***************************************************************************
              * *  THE FOLLOWING IS THE MODEL RECIEVED BY ASPEN FROM FCDMC ON 06/08/07
              * ***************************************************************************
  26          ID         DRAFT PREFERRED ALTERNATIVE LEVEL III
  27          ID
  28          ID         INCORPORATE ALTERNATIVE #3 FROM CHANGE ORDER #14 INTO
  29          ID         SR 303L OFFSITE FLOOD CONTROL FACILITY - NORTHERN AND CACTUS
  30          ID         BASINS ARE NOW OFFLINE WITH MULTIPLE BASINS LOCATED WITHIN
  31          ID         LUKE AIR FORCE BASE CRASH ZONE AREA
  32          ID
  33          ID         **ADOT BASIN GEOMETRY REPRESENTS MOST RECENT 2' CONTOURS**
  34          ID         WHITE TANKS AREA DRAINAGE MASTER STUDY *UPDATE*
  35          ID         Original MODEL BY THE WLB Group for FCDMC AS PART OF THE WHITE
  36          ID         TANKS/AGUA FRIA ADMS, Date: October 1991
  37          ID
  38          ID         REVISED HYDROLOGY HEC-1 RUN FOR WHITE TANKS ADMS
  39          ID         100-YEAR, 24-HOUR STORM                  original file: WTADMS.24
  40          ID
  41          ID                                   REVISED BY URS     DATE: 01-14-04
  42          ID                                                      FILE: L33PE4H.DAT
  43          ID
  44          ID        NOTES:
  45          ID        1. THIS HEC-1 MODEL CONTAINS THE FOLLOWING SUPER BASINS: WHITE TANKS 3,
  46          ID           2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2 & 3, 4 THRU 26.
  47          ID        2. REVISED TO REFLECT UPDATED SOILS MAPS AND NEW DEVELOPMENT.
  48          ID        3. AVERAGE XKSAT VALUES FOR EACH SUBBASIN WAS RECEIVED FROM FCDMC
  49          ID           GIS DATA AND THEN ADJUSTED FOR VEGETATION, OR LEFT AS ORIGINALLY IN
  50          ID           THE WLB MODEL.
  51          ID        4. FOR NEW DEVELOPMENTS ONLY 80% OF REPORTED PROVIDED RETENTION
  52          ID           WAS INCLUDED IN THIS MODEL (AS A CONSERVATIVE ESTIMATE). RETENTION
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  53          ID           CAPACITIES WERE ESTIMATED BY EEC FOR DEVELOPMENTS WITH NO
  54          ID           DRAINAGE REPORTS.
  55          ID        5. REVISED DRAINAGE BOUNDARIES BASED UPON FIELD INSPECTION OF SUN CITY.
  56          ID           GRAND.  COMBINED SEVERAL BASINS TOGETHER TO MAKE NEW BASINS 114 &115.
  57          ID           ALSO REROUTED SUBBASINS 100A, 101, 102A AND 106 TO THE SOUTH TO 113A.
```

```
5384          KM      VIA DIAGONAL CULVERT UNDER INTERSECTION
5385          RS       1            -1
5386          RC     .02     .02     .02    1400   .0057
5387          RX    1000    1010    1035    1036    1076    1077    1082    1092
5388          RY    1069    1069    1069    1065    1065    1069    1069    1069
              *

5389          KK   ~R237
5390          KM        ROUTE FROM CP237 TO CP238 IN SUNCOR CHANNEL ALIGNMENT
5391          KM      THIS IS THE CAMELBACK BASINS CAR RECOMMENDED PLAN
5392          RS       1            -1
5393          RC    .032    .032    .032    2640   .0039
5394          RX   100.0   124.0   125.0   126.0   145.0   146.0   147.0   171.0
5395          RY   18.00   10.00   10.00   10.00   10.00   10.00   10.00   18.00
              *
1                                   HEC-1 INPUT                                          PAGE142

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5396          KK   1D238
5397          KM        RETURN DIVERT AT CP238
5398          DR  2D250A
              *

5399          KK   2D238
5400          KM        RETURN DIVERT AT CP238
5401          DR   1D251
              *

5402          KK   SC238
5403          KM        ADD HYDROGRAPHS AT CP238 IN SUNCOR CHANNEL ALIGNMENT
5404          HC       3   30.34
              *

5405          KK   ~R238
5406          KM        ROUTE FROM CP238 TO CP239 IN SUNCOR CHANNEL ALIGNMENT
5407          KM      THIS THIS THE CAMELBACK BASINS CAR RECOMMENDED PLAN
5408          RS       4            -1
5409          RC    0.32    .032    .032    2640   .0015
5410          RX   100.0   124.0   125.0   126.0   167.0   168.0   169.0   193.0
5411          RY   18.00   10.00   10.00   10.00   10.00   10.00   10.00   18.00
              *

5412          KK   1D239
5413          KM        RETURN DIVERT AT CP239
5414          DR   2D251
              *

5415          KK   2D239
5416          KM        RETURN DIVERT AT CP239
5417          DR   DI252
              *

5418          KK   SC239
5419          KM        ADD HYDROGRAPHS AT CP239 IN SUNCOR CHANNEL ALIGNMENT
5420          HC       3   31.76
              *

5421          KK   DB252
5422          KM      RECOMMENDED PLAN DETENTION BASIN SOUTH OF CAMELBACK
5423          KM      BASIN DESIGNED TO BRING HYDROGAPH TO BULLARD WASH AFTER
5424          KM      THE BULLARD WASH HYDROGRAPH HAS PASSED.
5425          RS       1    STOR       0       0
5426          SV       0    23.9    68.5   109.8
5427          SQ       0     409     817    1156
              *
```

SRB48

```
5428          KK   ~R240
5429          KM        ROUTE FROM CP240 TO CP241 IN SUNCOR CHANNEL ALIGNMENT
5430          RS       5            -1
5431          RC    .032    .032    .032    4070   .0004
5432          RX   100.0   124.0   125.0   126.0   166.0   167.0   168.0   192.0
5433          RY   18.00   10.00   10.00   10.00   10.00   10.00   10.00   18.00
              *
1                                   HEC-1 INPUT                                          PAGE143

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5434          KK   ~BD2N
5435          KO                2
5436          KM        ADD HYDROGRAPHS AT CP241 (CP241 + SUNCOR CHANNEL)
5437          HC       2   78.75
              *
              * KK SR241
              * KM      STORAGE ROUTE THROUGH CP241
              * RS      1    STOR       0       0
              * SV      0     .09     .65     .94    8.45   16.94
              * SQ      0       4     280     324    1773    7505
              * SE1042.2    1044    1046  1046.3    1048    1049
              * KK  R241
              * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5438          KK   RBD2N
5439          KM   ROUTE FLOW FROM CP241 TO CP253
5440          RS     3.2            -1.0     0.0
5441          RC   0.030   0.030   0.030    5547  0.0020
5442          RX     0.0    48.9    61.9    74.9    87.9   100.9   113.9   162.7
5443          RY  1047.6  1039.5  1039.5  1039.5  1039.5  1039.5  1039.5  1047.6
              * RS     4            -1
              * RC  0.03     .03    0.03    5800  0.0020
```

B49

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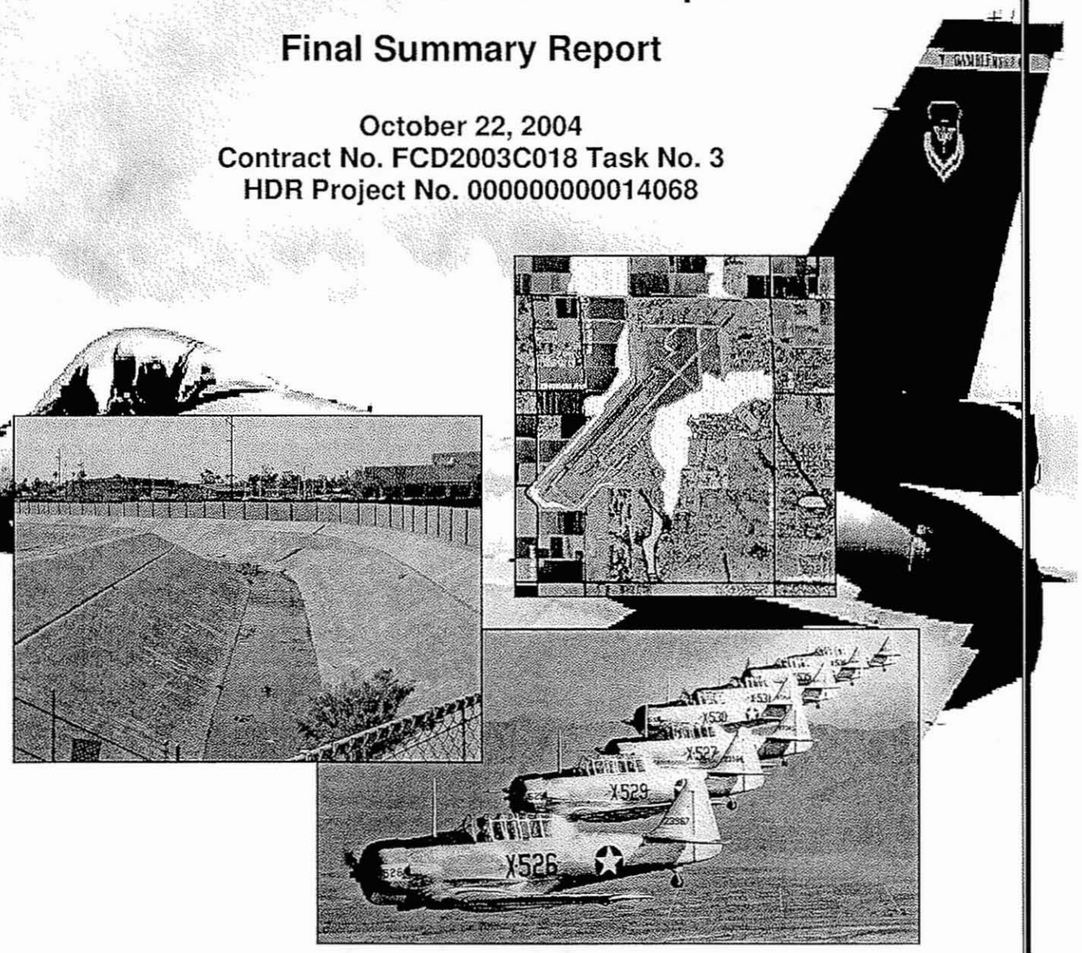
For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B50

# Luke Air Force Base Outfall Candidate Assessment Report

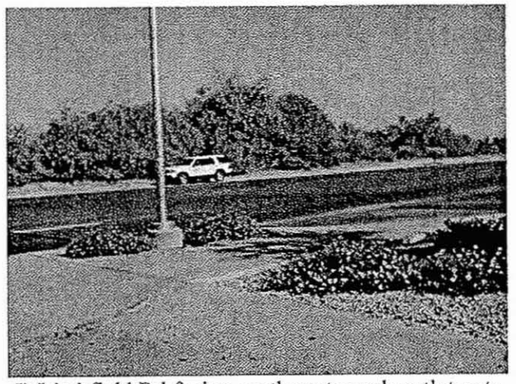
## Final Summary Report

October 22, 2004
Contract No. FCD2003C018 Task No. 3
HDR Project No. 000000000014068

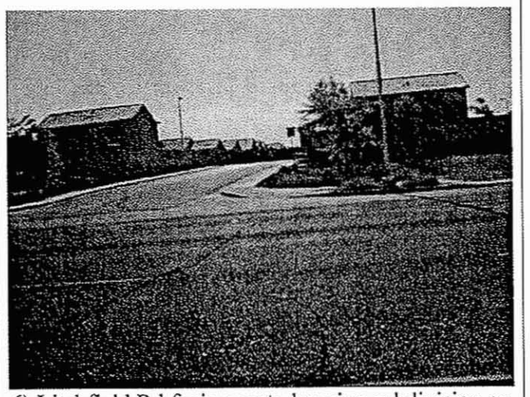



HDR

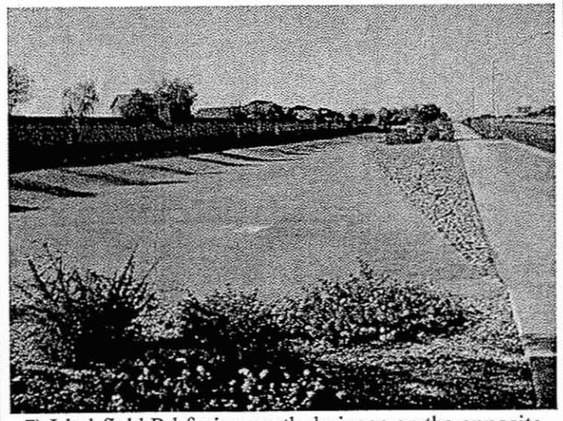
**Luke AFB Site Visit Photographs 6/25/04**



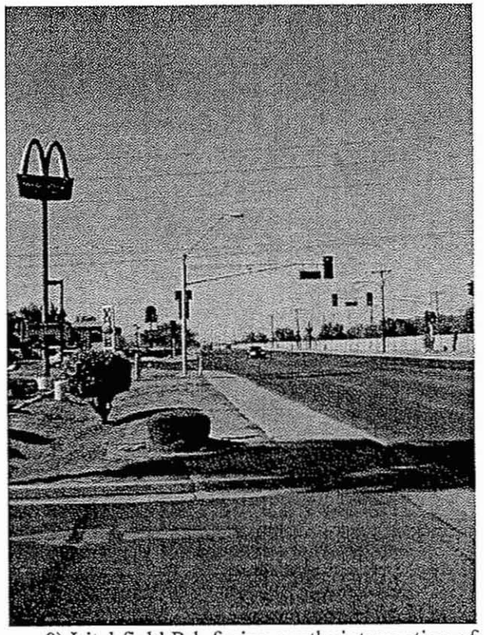
5) Litchfield Rd facing northwest; wash outlet onto Litchfield Rd south of Luke AFB



6) Litchfield Rd facing east; housing subdivision on the opposite side of the road from wash outlet (picture 5) where water overflows road

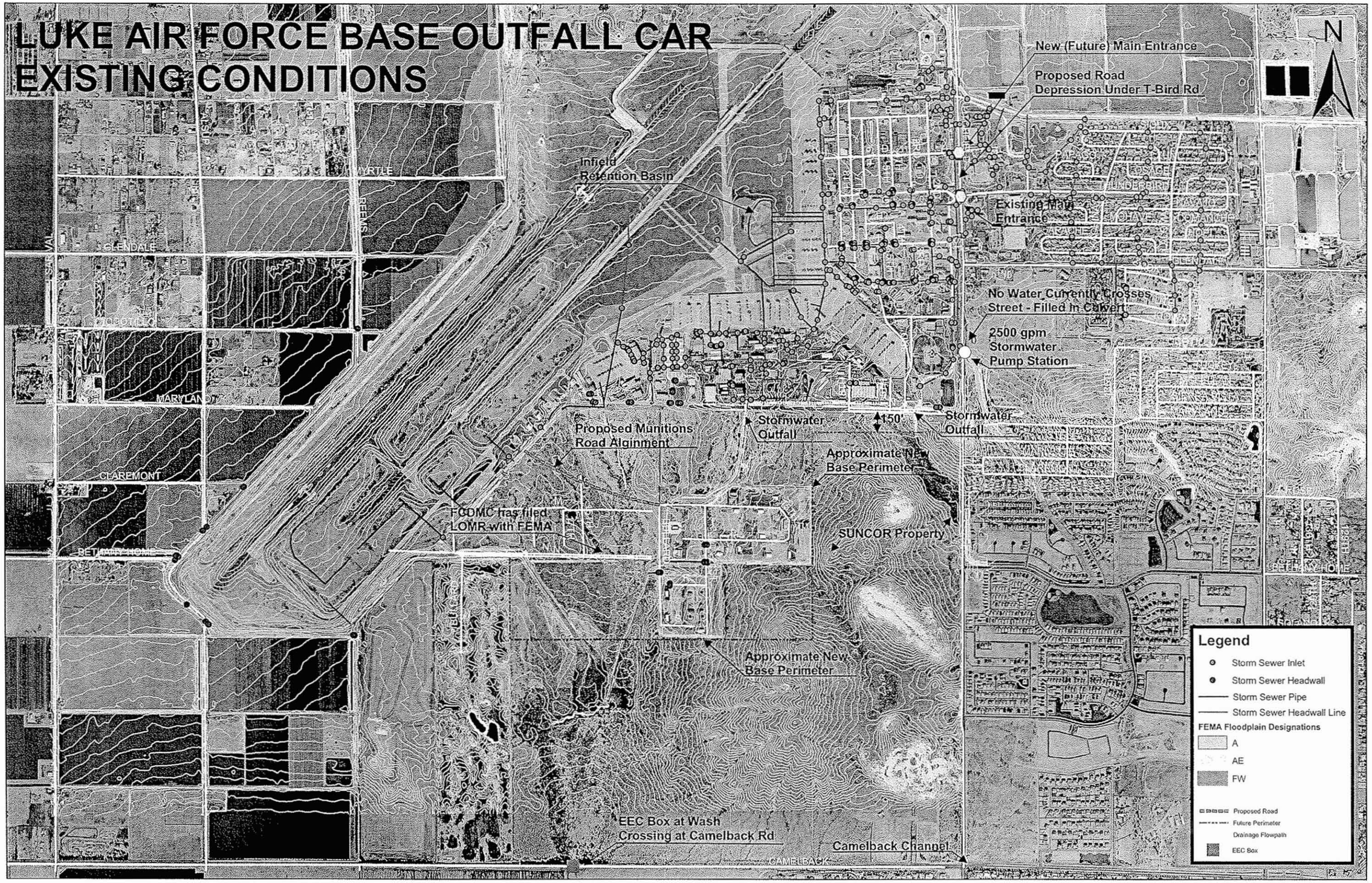


7) Litchfield Rd facing south drainage on the opposite side of the road from picture 5



8) Litchfield Rd. facing south; intersection of Glendale Rd.

# LUKE AIR FORCE BASE OUTFALL CAR
# EXISTING CONDITIONS

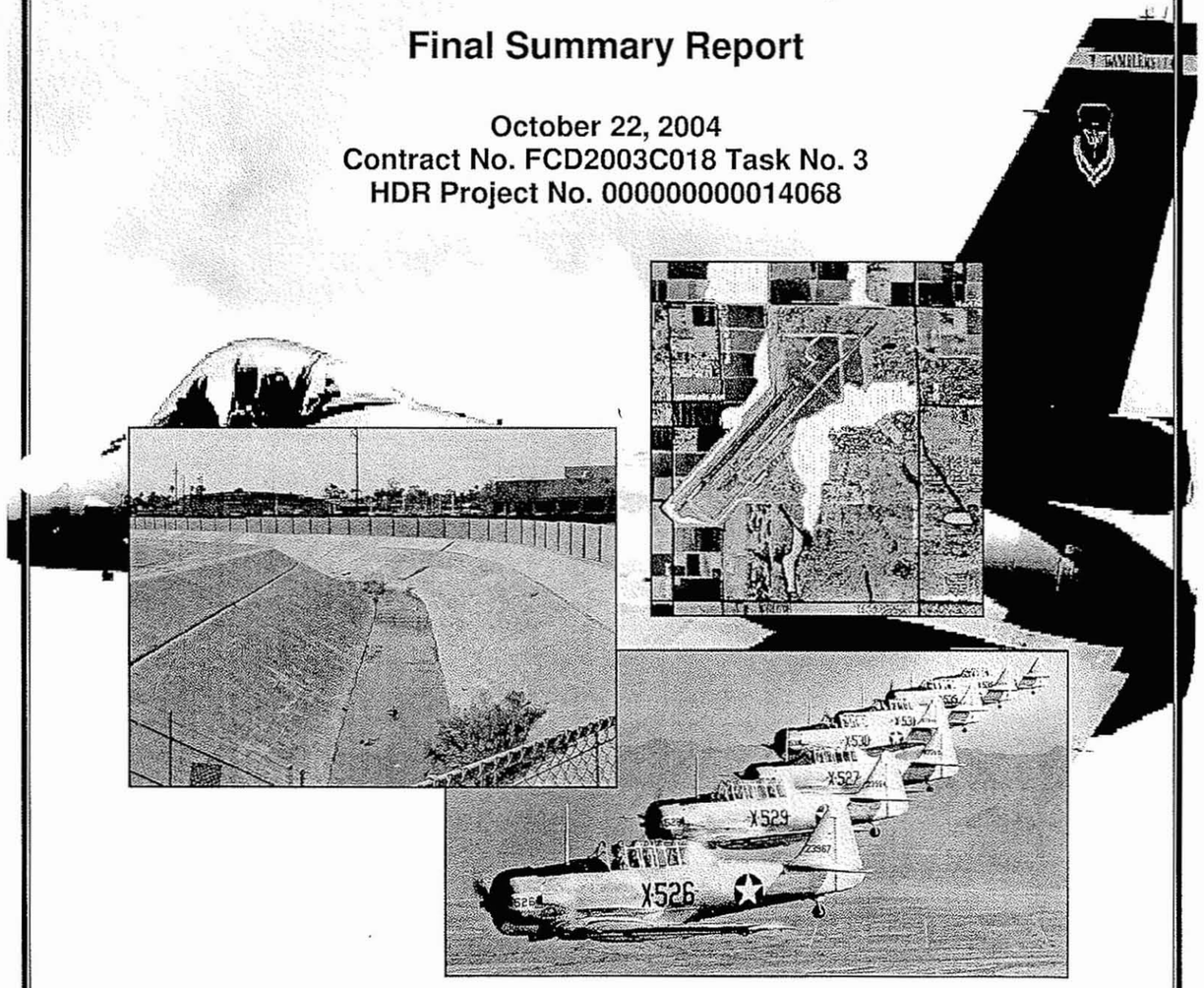


B51

# Luke Air Force Base Outfall Candidate Assessment Report

## Final Summary Report

October 22, 2004
Contract No. FCD2003C018 Task No. 3
HDR Project No. 000000000014068




HDR

- South of the 'Munitions Road" crossing, the unlined channel will become wider and intercept a major drainage way from the west.

- Before reaching the new box culvert at Camelback Road (by others), the widened unlined channel will become wider still and form an on-line detention basin just upstream of the Camelback Road box.

Hydrology for Alternative 2A: Exhibit 5

A 2650' channel conveyance system was analyzed for Alternative 2A to capture on-site flows from the east along Litchfield Road and convey the discharge north to the Dysart Drain. The U.S. Army Corps of Engineers HEC-RAS 3.1.1 was used in the design. This channel is concrete-lined and was analyzed to have a capacity of 1426 cfs, which was obtained from the existing HEC-1 model for the Loop 303/White Tanks ADMP. The water surface elevation for the Dysart Drain at the channel tie-in was taken from the HEC-2 output file per NBS/Lowry Consultants study, dated May 30, 1994. A concrete-lined channel with 2:1 side slopes, a design water depth of 5', and a 15' bottom width would have sufficient capacity to meet discharge requirements.

A second channel would be placed south of and parallel to Super Sabre Street. This 4600' channel would begin west of Litchfield Road at the pump station outfall channel and would converge with Bullard Wash west of Bullard Avenue. The discharge for this channel increases from upstream to downstream. The beginning discharge is 263 cfs and the final discharge is 460 cfs. In order to meet the discharge requirements, an earthen-lined channel with 4:1 side slopes, a design water depth of 4', and a 10' wide bottom would be required. A 2-12'x5' box culvert was analyzed for the crossing at Bullard Avenue.

Bullard Wash channel improvements would begin west of the Super Sabre Street and Bullard Avenue intersection and would follow the existing flow path south to Camelback Road. The channel improvements at Bullard Wash consists of a 8750' earthen channel with 4:1 side slopes, a design water depth of 5 feet, and a 40' bottom width. A 2-12'x6' box culvert would be required for the crossing at Bullard Wash and the proposed Munitions Road.

Hydrology Alternative 2B: Exhibit 6

A channel conveyance system was analyzed for Alternative 2B to capture on-site flows from the east along Litchfield Road and convey the flows south to Bullard Wash. This 8000' channel would begin southeast of the intersection at Litchfield Road and Thunderbird Road and would continue south past Super Sabre Street and would then turn west, crossing Litchfield Road and Bullard Avenue tying into the Bullard Wash improvements. This channel is concrete-lined along Litchfield Road and earthen along Super Sabre to the Bullard Wash Connection. The channel was analyzed with a beginning capacity of 1425 cfs. The capacity increases as it picks up the flow from the pump station and storm water collection system as it parallels Super Sabre. A concrete-lined channel with 2:1 side slopes, a design water depth of 5' and 20' bottom width meets capacity requirements along Litchfield Road. An earthen-lined channel with 4:1 side slopes, a design water depth of 6', and a 40' wide bottom would be required along Super Sabre. A 5-12'x5' box culvert is required at the Litchfield Road crossing and a 6 -12'x4' box culvert is required at the Bullard Avenue crossing.

Bullard Wash channel improvements would begin west of the Super Sabre Street and Bullard Avenue intersection and would follow the existing flow path south to Camelback Road. An earthen channel with 6:1 side slopes, a design water depth of 6 feet, and a 40' bottom would be sufficient for the discharge requirements. A 6-12'x6' box culvert would be required for the crossing with Bullard Wash and the proposed Munitions Road.

### 3.2.3 Alternative 3

Alternative 3 is the "Perimeter – Closed Conduit" alternative. This alternative is similar to alternative 2, except that the Litchfield Road and Super Sabre Street concrete open channels are replaced with a large storm drain (either pipe or box culvert). To maximize the efficiency of the storm drains they have been sized for pressure flow, with the hydraulic grade line below pavement sub-grade.

Hydrology for Alternative 3A: Exhibit 7

This alternative is identical to Alternative 2A, except that the Litchfield Road and Super Sabre Street open channels are replaced with box culvert. The Litchfield Road box culvert is 2650' in length and a 3-12'x6' box culvert was analyzed to meet the required discharge capacity of 1426 cfs. The Super Sabre Street box culvert is 4600' in length and a 2-12'x4' box culvert was analyzed to meet the required discharge capacity. The Bullard Wash improvements are identical to Alternative 2A.

Hydrology for Alternative 3B: Exhibit 8

This alternative is identical to Alternative 2B, except that the Litchfield Road channel and Super Sabre Street channel is replaced with a box culvert. This box culvert is 8000' in length and is a 5-12'x5' box. The Bullard Wash improvements are identical to Alternative 2B.

### 3.2.4 Alternative 4: Exhibit 9

Alternative 4 is the "On-Site" alternative. This alternative is a combined storm drain, open-channel system which collects and conveys storm water from Litchfield Road to Super Sabre Street, through the base and generally along the centerline of the floodplain. The alternative consists of:

- Flows from the depressed area of the future Litchfield Road underpass (as well as associated portions of watershed areas 201 and 226) will be collected at a new pump station, which will drain north to the Dysart Drain.
- The 72" outfall pipe from the existing pump station at the southeast corner of the AFB will be directed west, outfalling to the Bullard Wash.
- A in-field drainage structure comprised of box culvert and open channel sections will capture flows generated from the in-field outfalling to the Bullard Wash.

Hydrology for Alternative 4

This alternative is a combined storm drain, open-channel system which collects and conveys storm water generated from northern portions of subbasin 223 to Super Sabre Street. A 3200' 10'x4' box culvert located south of Thunderbird Road, aligned east-west, was analyzed to convey the storm water generated from northern portions of subbasin 223 west to the runway infield area. This box culvert was analyzed with a capacity of 150 cfs. A 1900' concrete-lined channel, aligned northwest-southeast, with 2:1 side slopes, a 10' wide bottom, and a 5' design water depth was analyzed to convey the runoff from through the infield area to another box culvert. A 2-10'x4' box culvert, aligned north-south, would then take the storm water 2000' south past Super Sabre Street and tie-in to Bullard Wash. This segment would have a design capacity of 460 cfs. The Bullard Wash improvements would be identical to Alternative 2A.

## 3.3 Constraints

Several constraints were identified that were taken into consideration during the development and ranking of the alternatives. They include;

Right-of-way

While Litchfield Road has few utility conflicts, there is essentially no right-of-way available for placement of an open channel between the west curb line and the Luke AFB fence at the west property line. Likewise, there is little or no available right of way for an open channel between the east back of curb and the property fence north of Glendale. South of Glendale however, there is vacant land that could serve to accommodate an open channel. Along Litchfield Road, a large storm drain could be placed under the pavement or on base property just east of the east property line, running through open areas and parking lots.

Along the southern boundary of the base, a storm drain could be placed in or near the Super Sabre alignment, however there is no available right-of-way for an open channel. The base is planning to acquire 150 feet of right-of-way along the southern boundary to buffer future development. This area if available could serve to accommodate an open channel.

alternatives run with the grade to the north and are shorter in distance that the 2B and 3B alternatives.

## 3.5 Recommended Alternative

The recommended alternative was selected at Progress Meeting #2, which was attended by all the major stakeholders. It consists of the Super Sabre channel portion of Alternative 2A and the closed conduit to the Dysart Drain portion of Alternative 3A. A modification to the Super Sabre portion is concrete lining the channel, rather than the recommended earth-lined channel. While the concrete lined channel will increase the initial project cost, it will be easily maintained, will not be a security concern, and will require a smaller footprint and therefore less right-of-way impact. Because the channel will be located within the fenced boundary of the base, there is no real multi-use opportunity for the public; however the base has indicated the desire to construct a running track parallel to the channel. In addition the flow from subbasin 201 would be conveyed to the Dysart Drain by increasing the existing capacity of the outfall. This would be accomplished by replacing the existing pipes (4-30"RCP) that drain the local low-elevation point, an on-base detention basin, with an 8'x5' RCBC.

Draft Final Alternative: Exhibit 10

The Draft Final Alternative is a variation of the Super Sabre channel portion of Alternative 2A and the closed conduit to the Dysart Drain portion of Alternative 3A. A modification to the Alternative 2A Super Sabre portion is that the channel will be concrete lined instead of earth lined. The Bullard Wash improvements will be identical to Alternative 2A.

### 3.5.1 Draft Final Alternative Hydrology and Hydraulics

Subbasin 226 was subdivided into smaller subbasins, and several new refined flow rates are a result of the subdivision, as previously discussed in the hydrology section. In order to decrease the total flow arriving at Litchfield Road, two stormwater pipes are proposed east of Litchfield Road, one at Lalomai Road and one at Kachina Road, each with a design flow of 416 cfs. These two pipes begin at Glendale Road and drain into the Dysart Drain. The pipe located parallel to

Lalomai Road consists of two sections: a 1223' long 78" concrete pipe from Glendale Avenue to approximately Thunderbird Road and a 1327' long 84" concrete pipe from approximately Thunderbird Road to the Dysart Drain. The proposed pipe located parallel to Kachina Road is a 2630' long 84" concrete pipe. The remainder of the flow from Subbasin 226 and the flow from portions of Subbasin 223 drain into a proposed stormwater system at Litchfield Road that empties into the Dysart Drain. This proposed system consists of three segments: 1) a 2-barrel 54" RCP 600' in length; 2) a 2-barrel 12'x 5' RCBC 1670' in length; and 3) a 2-barrel 12'x 6' RCBC 1100' in length.

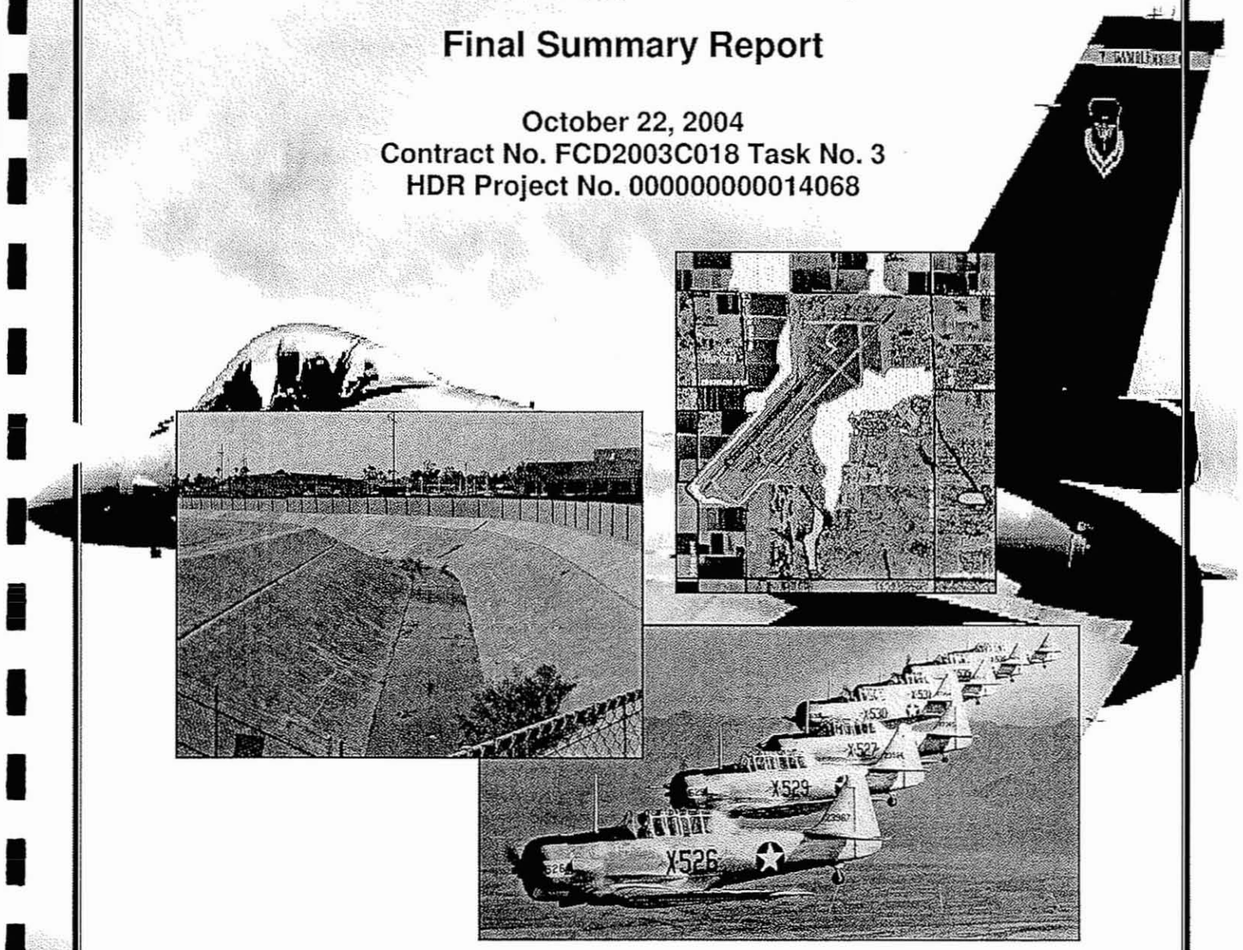
Several storm drain laterals and catch basins will be added perpendicular to Kachina and Lalomai Roads. These drainage laterals will tie-in with the large pipes to be located along Kachina and Lalomai Roads. A drainage ditch would be located on the north side of Glendale Road and would provide drainage to the proposed storm drain along Lalomai Road. There would also be several laterals that would tie into the drainage system located along Litchfield Road. Several small laterals would connect to the drainage system from the west side of Litchfield Road. There would also be a long lateral located along Glendale Road that would drain into the Litchfield drainage system. Another drainage lateral system would be located along Thunderbird Road that would drain to the Litchfield drainage system.

The open channel system along Super Sabre Road is similar to the system described in Alternative 3A. The channel begins west of Litchfield Road and south of Super Sabre Road at the new box culvert. This box culvert provides drainage from the pump station outfall located north of the box. The upstream channel invert will match the box culvert invert. The channel will run east past Bullard Avenue and will tie-in with the Bullard Wash improvements. Lateral connections from the north will tie-into the Super Sabre channel throughout its length.

# Luke Air Force Base Outfall Candidate Assessment Report

## Final Summary Report

October 22, 2004
Contract No. FCD2003C018 Task No. 3
HDR Project No. 000000000014068

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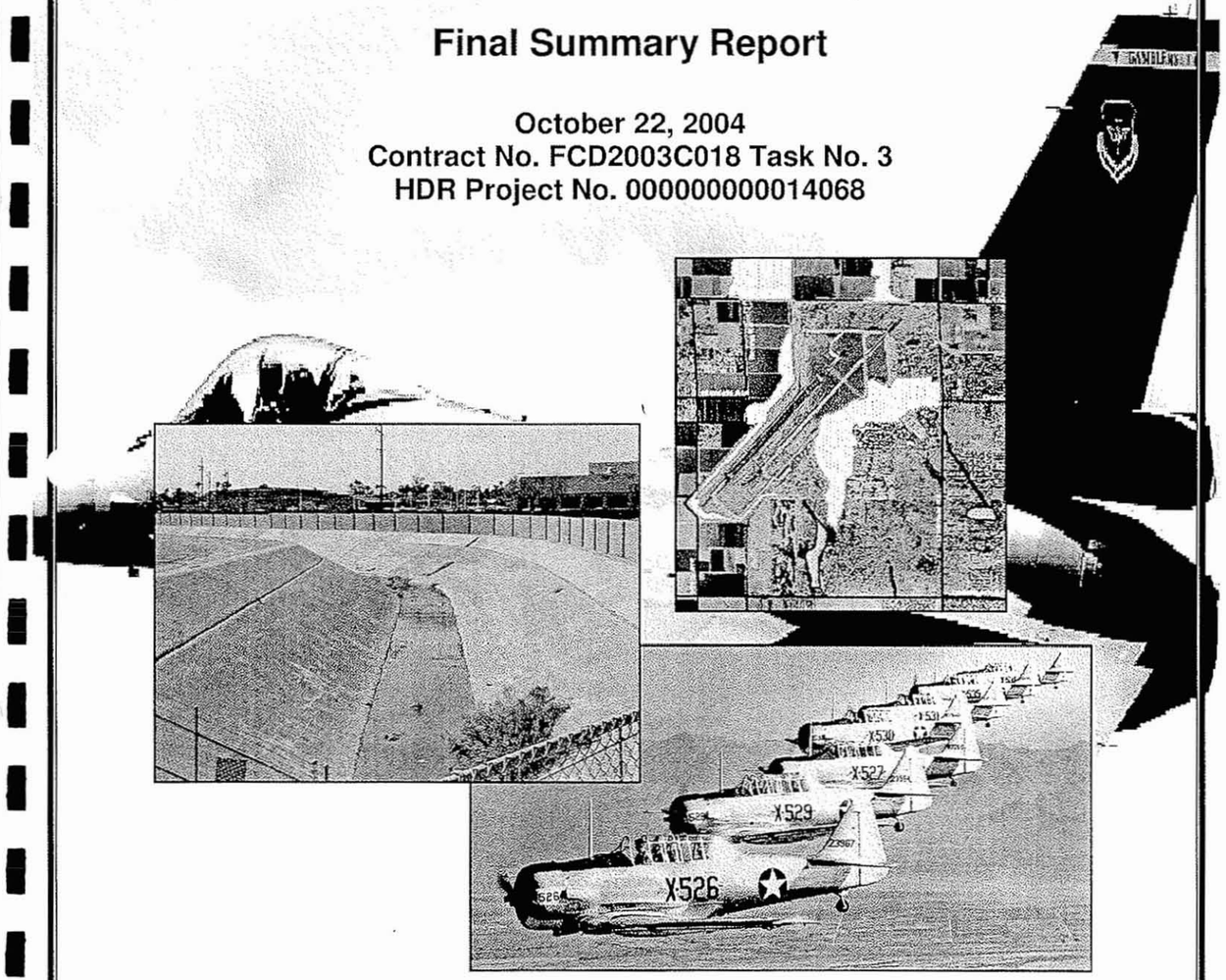
# Luke Air Force Base Outfall Candidate Assessment Report

## Final Summary Report

October 22, 2004
Contract No. FCD2003C018 Task No. 3
HDR Project No. 000000000014068




HDR

- South of the 'Munitions Road" crossing, the unlined channel will become wider and intercept a major drainage way from the west.

- Before reaching the new box culvert at Camelback Road (by others), the widened unlined channel will become wider still and form an on-line detention basin just upstream of the Camelback Road box.

Hydrology for Alternative 2A: Exhibit 5

A 2650' channel conveyance system was analyzed for Alternative 2A to capture on-site flows from the east along Litchfield Road and convey the discharge north to the Dysart Drain. The U.S. Army Corps of Engineers HEC-RAS 3.1.1 was used in the design. This channel is concrete-lined and was analyzed to have a capacity of 1426 cfs, which was obtained from the existing HEC-1 model for the Loop 303/White Tanks ADMP. The water surface elevation for the Dysart Drain at the channel tie-in was taken from the HEC-2 output file per NBS/Lowry Consultants study, dated May 30, 1994. A concrete-lined channel with 2:1 side slopes, a design water depth of 5', and a 15' bottom width would have sufficient capacity to meet discharge requirements.

A second channel would be placed south of and parallel to Super Sabre Street. This 4600' channel would begin west of Litchfield Road at the pump station outfall channel and would converge with Bullard Wash west of Bullard Avenue. The discharge for this channel increases from upstream to downstream. The beginning discharge is 263 cfs and the final discharge is 460 cfs. In order to meet the discharge requirements, an earthen-lined channel with 4:1 side slopes, a design water depth of 4', and a 10' wide bottom would be required. A 2-12'x5' box culvert was analyzed for the crossing at Bullard Avenue.

Bullard Wash channel improvements would begin west of the Super Sabre Street and Bullard Avenue intersection and would follow the existing flow path south to Camelback Road. The channel improvements at Bullard Wash consists of a 8750' earthen channel with 4:1 side slopes, a design water depth of 5 feet, and a 40' bottom width. A 2-12'x6' box culvert would be required for the crossing at Bullard Wash and the proposed Munitions Road.

Hydrology Alternative 2B: Exhibit 6

A channel conveyance system was analyzed for Alternative 2B to capture on-site flows from the east along Litchfield Road and convey the flows south to Bullard Wash. This 8000' channel would begin southeast of the intersection at Litchfield Road and Thunderbird Road and would continue south past Super Sabre Street and would then turn west, crossing Litchfield Road and Bullard Avenue tying into the Bullard Wash improvements. This channel is concrete-lined along Litchfield Road and earthen along Super Sabre to the Bullard Wash Connection. The channel was analyzed with a beginning capacity of 1425 cfs. The capacity increases as it picks up the flow from the pump station and storm water collection system as it parallels Super Sabre. A concrete-lined channel with 2:1 side slopes, a design water depth of 5' and 20' bottom width meets capacity requirements along Litchfield Road. An earthen-lined channel with 4:1 side slopes, a design water depth of 6', and a 40' wide bottom would be required along Super Sabre. A 5-12'x5' box culvert is required at the Litchfield Road crossing and a 6 -12'x4' box culvert is required at the Bullard Avenue crossing.

Bullard Wash channel improvements would begin west of the Super Sabre Street and Bullard Avenue intersection and would follow the existing flow path south to Camelback Road. An earthen channel with 6:1 side slopes, a design water depth of 6 feet, and a 40' bottom would be sufficient for the discharge requirements. A 6-12'x6' box culvert would be required for the crossing with Bullard Wash and the proposed Munitions Road.

### 3.2.3 Alternative 3

Alternative 3 is the "Perimeter – Closed Conduit" alternative. This alternative is similar to alternative 2, except that the Litchfield Road and Super Sabre Street concrete open channels are replaced with a large storm drain (either pipe or box culvert). To maximize the efficiency of the storm drains they have been sized for pressure flow, with the hydraulic grade line below pavement sub-grade.

Hydrology for Alternative 3A: Exhibit 7

This alternative is identical to Alternative 2A, except that the Litchfield Road and Super Sabre Street open channels are replaced with box culvert. The Litchfield Road box culvert is 2650' in length and a 3-12'x6' box culvert was analyzed to meet the required discharge capacity of 1426 cfs. The Super Sabre Street box culvert is 4600' in length and a 2-12'x4' box culvert was analyzed to meet the required discharge capacity. The Bullard Wash improvements are identical to Alternative 2A.

Hydrology for Alternative 3B: Exhibit 8

This alternative is identical to Alternative 2B, except that the Litchfield Road channel and Super Sabre Street channel is replaced with a box culvert. This box culvert is 8000' in length and is a 5-12'x5' box. The Bullard Wash improvements are identical to Alternative 2B.

### 3.2.4 Alternative 4: Exhibit 9

Alternative 4 is the "On-Site" alternative. This alternative is a combined storm drain, open-channel system which collects and conveys storm water from Litchfield Road to Super Sabre Street, through the base and generally along the centerline of the floodplain. The alternative consists of:

- Flows from the depressed area of the future Litchfield Road underpass (as well as associated portions of watershed areas 201 and 226) will be collected at a new pump station, which will drain north to the Dysart Drain.
- The 72" outfall pipe from the existing pump station at the southeast corner of the AFB will be directed west, outfalling to the Bullard Wash.
- A in-field drainage structure comprised of box culvert and open channel sections will capture flows generated from the in-field outfalling to the Bullard Wash.

Hydrology for Alternative 4

This alternative is a combined storm drain, open-channel system which collects and conveys storm water generated from northern portions of subbasin 223 to Super Sabre Street. A 3200' 10'x4' box culvert located south of Thunderbird Road, aligned east-west, was analyzed to convey the storm water generated from northern portions of subbasin 223 west to the runway infield area. This box culvert was analyzed with a capacity of 150 cfs. A 1900' concrete-lined channel, aligned northwest-southeast, with 2:1 side slopes, a 10' wide bottom, and a 5' design water depth was analyzed to convey the runoff from through the infield area to another box culvert. A 2-10'x4' box culvert, aligned north-south, would then take the storm water 2000' south past Super Sabre Street and tie-in to Bullard Wash. This segment would have a design capacity of 460 cfs. The Bullard Wash improvements would be identical to Alternative 2A.

## 3.3 Constraints

Several constraints were identified that were taken into consideration during the development and ranking of the alternatives. They include;

Right-of-way

While Litchfield Road has few utility conflicts, there is essentially no right-of-way available for placement of an open channel between the west curb line and the Luke AFB fence at the west property line. Likewise, there is little or no available right of way for an open channel between the east back of curb and the property fence north of Glendale. South of Glendale however, there is vacant land that could serve to accommodate an open channel. Along Litchfield Road, a large storm drain could be placed under the pavement or on base property just east of the east property line, running through open areas and parking lots.

Along the southern boundary of the base, a storm drain could be placed in or near the Super Sabre alignment, however there is no available right-of-way for an open channel. The base is planning to acquire 150 feet of right-of-way along the southern boundary to buffer future development. This area if available could serve to accommodate an open channel.

alternatives run with the grade to the north and are shorter in distance that the 2B and 3B alternatives.

## 3.5 Recommended Alternative

The recommended alternative was selected at Progress Meeting #2, which was attended by all the major stakeholders. It consists of the Super Sabre channel portion of Alternative 2A and the closed conduit to the Dysart Drain portion of Alternative 3A. A modification to the Super Sabre portion is concrete lining the channel, rather than the recommended earth-lined channel. While the concrete lined channel will increase the initial project cost, it will be easily maintained, will not be a security concern, and will require a smaller footprint and therefore less right-of-way impact. Because the channel will be located within the fenced boundary of the base, there is no real multi-use opportunity for the public; however the base has indicated the desire to construct a running track parallel to the channel. In addition the flow from subbasin 201 would be conveyed to the Dysart Drain by increasing the existing capacity of the outfall. This would be accomplished by replacing the existing pipes (4-30"RCP) that drain the local low-elevation point, an on-base detention basin, with an 8'x5' RCBC.

Draft Final Alternative: Exhibit 10

The Draft Final Alternative is a variation of the Super Sabre channel portion of Alternative 2A and the closed conduit to the Dysart Drain portion of Alternative 3A. A modification to the Alternative 2A Super Sabre portion is that the channel will be concrete lined instead of earth lined. The Bullard Wash improvements will be identical to Alternative 2A.

### 3.5.1 Draft Final Alternative Hydrology and Hydraulics

Subbasin 226 was subdivided into smaller subbasins, and several new refined flow rates are a result of the subdivision, as previously discussed in the hydrology section. In order to decrease the total flow arriving at Litchfield Road, two stormwater pipes are proposed east of Litchfield Road, one at Lalomai Road and one at Kachina Road, each with a design flow of 416 cfs. These two pipes begin at Glendale Road and drain into the Dysart Drain. The pipe located parallel to

Lalomai Road consists of two sections: a 1223' long 78" concrete pipe from Glendale Avenue to approximately Thunderbird Road and a 1327' long 84" concrete pipe from approximately Thunderbird Road to the Dysart Drain. The proposed pipe located parallel to Kachina Road is a 2630' long 84" concrete pipe. The remainder of the flow from Subbasin 226 and the flow from portions of Subbasin 223 drain into a proposed stormwater system at Litchfield Road that empties into the Dysart Drain. This proposed system consists of three segments: 1) a 2-barrel 54" RCP 600' in length; 2) a 2-barrel 12'x 5' RCBC 1670' in length; and 3) a 2-barrel 12'x 6' RCBC 1100' in length.

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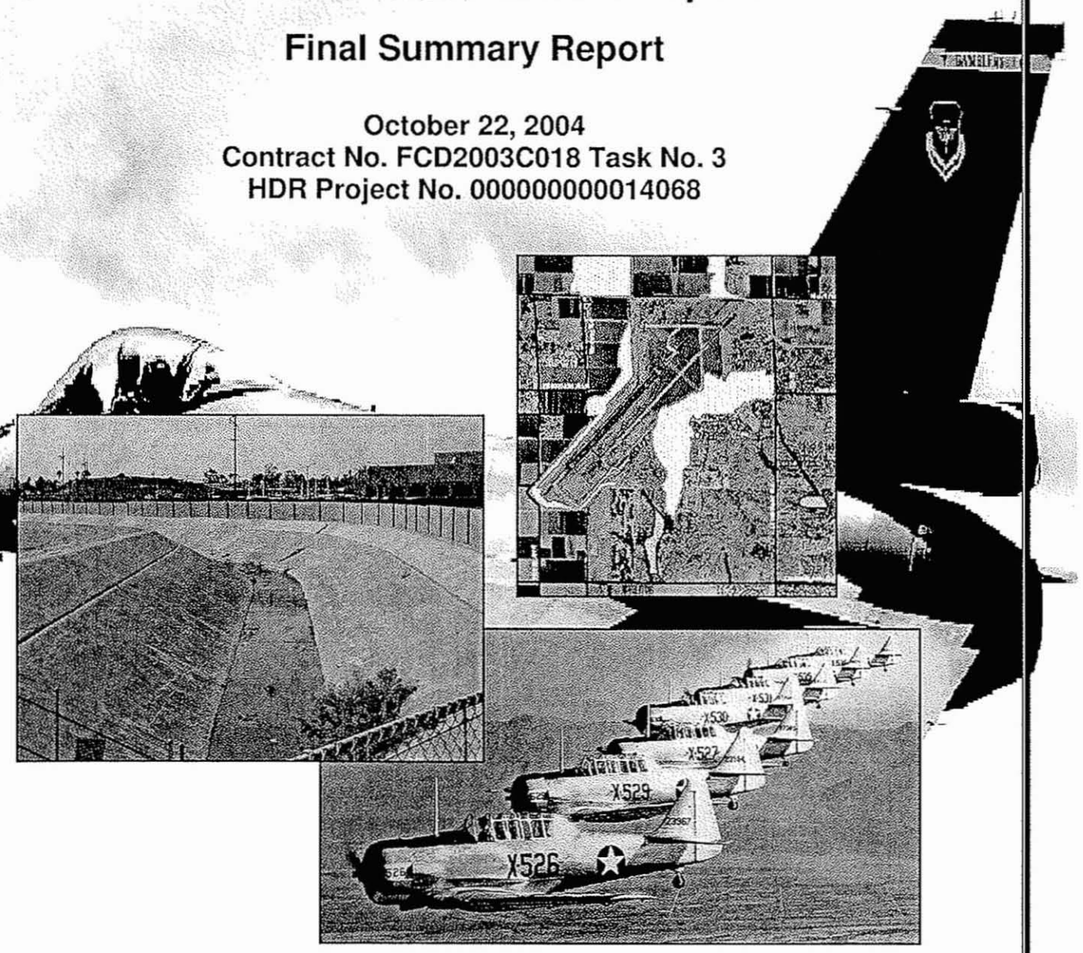
The open channel system along Super Sabre Road is similar to the system described in Alternative 3A. The channel begins west of Litchfield Road and south of Super Sabre Road at the new box culvert. This box culvert provides drainage from the pump station outfall located north of the box. The upstream channel invert will match the box culvert invert. The channel will run east past Bullard Avenue and will tie-in with the Bullard Wash improvements. Lateral connections from the north will tie-into the Super Sabre channel throughout its length.

# Luke Air Force Base Outfall Candidate Assessment Report

## Final Summary Report

October 22, 2004
Contract No. FCD2003C018 Task No. 3
HDR Project No. 000000000014068

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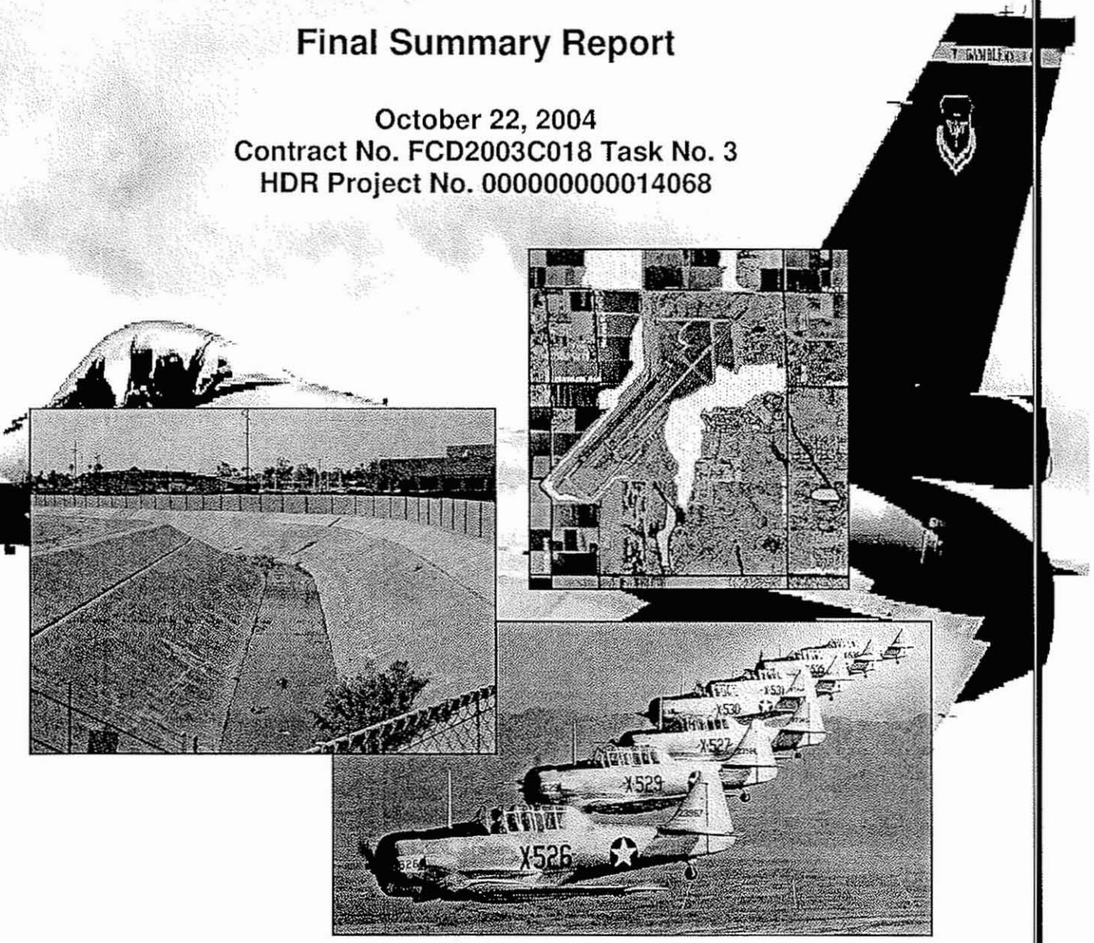
# Luke Air Force Base Outfall Candidate Assessment Report

## Final Summary Report

October 22, 2004
Contract No. FCD2003C018 Task No. 3
HDR Project No. 000000000014068

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*                                    *
*    U.S. ARMY CORPS OF ENGINEERS    *
*    HYDROLOGIC ENGINEERING CENTER   *
*          609 SECOND STREET         *
*       DAVIS, CALIFORNIA 95616      *
*           (916) 756-1104           *
*                                    *
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL  LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM



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   1          ID      ASPEN CONSULTING ENGINEERS, JCS, 06-20-08, FILE: REC-EWP.DAT, 100-YR 24-HR
   2          ID      THIS IS THE EXISTING WITH RECOMMENDED PLAN MODEL.
   3          ID      NOTES:
   4          ID      THE PURPOSE OF THIS PROJECT IS TO UPDATE FOR LAND USE CHANGES FOR THE ENTIRE
   5          ID      MODEL AND TO REEVALUATE THE BASINS AT LOOP 303 AND CAMELBACK ROAD.
   6          ID
   7          ID      UPDATE LG CARD AND DEVELOPMENT RETENTION DIVERSIONS FOR EACH SUBBASIN.
   8          ID      CHANGE MODEL TO REFLECT THE NEW SUNCOR CHANNEL SOUTH OF CAMELBACK RD.
   9          ID      BETWEEN STATE ROUTE 303 AND BULLARD WASH.
  10          ID
  11          ID      THE RECOMMENDED PLAN IS A CHANNEL BEGINNING AT THE OUTLET FROM THE NORTHERN
  12          ID      AVENUE BASIN AT THE SW CORNER OF NORTHERN AND THE LOOP 303.  THE CHANNEL
  13          ID      GOES SOUTH ALONG THE WEST SIDE OF THE LOOP 303 TO CAMELBACK ROAD.  BEFORE
  14          ID      CAMELBACK ROAD THE CHANNEL TRANSITIONS INTO A LONG BOX CULVERT THAT
  15          ID      CROSSES DIAGONALLY UNDER THE LOOP 303 AND CAMELBACK ROAD WEHERE IT
  16          ID      DAYLIGHTS ON THE SOUTH SIDE OF CAMELBACK ROAD AT THE EXISTING SUNCOR
  17          ID      CHANNEL.  THE FLOW THEN CONTINUES ALONG THE SUNCOR CHANNEL ALIGNMENT TO A
  18          ID      BASIN NEAR REEMS ROAD WHICH THEN OUTLETS TO THE SUNCOR CHANNEL ALIGNMENT
  19          ID      AGAIN AND CONTINUES TO BULLARD WASH.  SEPARATELY, THERE IS A BASIN AT COTTON
  20          ID      LANE AND CAMELBACK ROAD.  A SHORT CHANNEL CONVEYS WATER COLLECTED AT THE
  21          ID      BASIN TO THE LOOP 303 AND THEN TRANSITIONS SOUTH IN A CULVERT UNDER
  22          ID      CAMELBACK ROAD.  THIS CHANNEL CONTINUES ALONG LOOP 303 TO A SMALL BASIN
  23          ID      SOUTH AT INDIAN SCHOOL ROAD AND THEN TO THE BASIN AT I-10 NEAR PERRYVILLE
  24          ID      PRISON.  THE I-10 AND PERRYVILLE PRISON BASIN IS AS PROPOSED IN THE ADMPU.
  25          ID
              * ************************************************************************
              * *  THE FOLLOWING IS THE MODEL RECIEVED BY ASPEN FROM FCDMC ON 06/08/07
              * ************************************************************************
  26          ID         DRAFT PREFERRED ALTERNATIVE LEVEL III
  27          ID
  28          ID         INCORPORATE ALTERNATIVE #3 FROM CHANGE ORDER #14 INTO
  29          ID         SR 303L OFFSITE FLOOD CONTROL FACILITY - NORTHERN AND CACTUS
  30          ID         BASINS ARE NOW OFFLINE WITH MULTIPLE BASINS LOCATED WITHIN
  31          ID         LUKE AIR FORCE BASE CRASH ZONE AREA
  32          ID
  33          ID         **ADOT BASIN GEOMETRY REPRESENTS MOST RECENT 2' CONTOURS**
  34          ID         WHITE TANKS AREA DRAINAGE MASTER STUDY *UPDATE*
  35          ID         Original MODEL BY THE WLB Group for FCDMC AS PART OF THE WHITE
  36          ID         TANKS/AGUA FRIA ADMS, Date: October 1991
  37          ID
  38          ID         REVISED HYDROLOGY HEC-1 RUN FOR WHITE TANKS ADMS
  39          ID         100-YEAR, 24-HOUR STORM                  original file: WTADMS.24
  40          ID
  41          ID                                   REVISED BY URS     DATE: 01-14-04
  42          ID                                                      FILE: L33PE4H.DAT
  43          ID
  44          ID        NOTES:
  45          ID        1. THIS HEC-1 MODEL CONTAINS THE FOLLOWING SUPER BASINS: WHITE TANKS 3,
  46          ID           2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2 & 3, 4 THRU 26.
  47          ID        2. REVISED TO REFLECT UPDATED SOILS MAPS AND NEW DEVELOPMENT.
  48          ID        3. AVERAGE XKSAT VALUES FOR EACH SUBBASIN WAS RECEIVED FROM FCDMC
  49          ID           GIS DATA AND THEN ADJUSTED FOR VEGETATION, OR LEFT AS ORIGINALLY IN
  50          ID           THE WLB MODEL.
  51          ID        4. FOR NEW DEVELOPMENTS ONLY 80% OF REPORTED PROVIDED RETENTION
  52          ID           WAS INCLUDED IN THIS MODEL (AS A CONSERVATIVE ESTIMATE). RETENTION
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  53          ID           CAPACITIES WERE ESTIMATED BY EEC FOR DEVELOPMENTS WITH NO
  54          ID           DRAINAGE REPORTS.
  55          ID        5. REVISED DRAINAGE BOUNDARIES BASED UPON FIELD INSPECTION OF SUN CITY.
  56          ID           GRAND.  COMBINED SEVERAL BASINS TOGETHER TO MAKE NEW BASINS 114 &115.
  57          ID           ALSO REROUTED SUBBASINS 100A, 101, 102A AND 106 TO THE SOUTH TO 113A.
```

```
5384        KM      VIA DIAGONAL CULVERT UNDER INTERSECTION
5385        RS       1            -1
5386        RC     .02     .02     .02    1400   .0057
5387        RX    1000    1010    1035    1036    1076    1077    1082    1092
5388        RY    1069    1069    1069    1065    1065    1069    1069    1069
            *

5389        KK   ~R237
5390        KM       ROUTE FROM CP237 TO CP238 IN SUNCOR CHANNEL ALIGNMENT
5391        KM      THIS IS THE CAMELBACK BASINS CAR RECOMMENDED PLAN
5392        RS       1            -1
5393        RC    .032    .032    .032    2640   .0039
5394        RX   100.0   124.0   125.0   126.0   145.0   146.0   147.0   171.0
5395        RY   18.00   10.00   10.00   10.00   10.00   10.00   10.00   18.00
            *
1                                   HEC-1 INPUT                                                    PAGE142

LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5396        KK   1D238
5397        KM       RETURN DIVERT AT CP238
5398        DR  2D250A
            *

5399        KK   2D238
5400        KM       RETURN DIVERT AT CP238
5401        DR   1D251
            *

5402        KK   SC238
5403        KM       ADD HYDROGRAPHS AT CP238 IN SUNCOR CHANNEL ALIGNMENT
5404        HC       3   30.34
            *

5405        KK   ~R238
5406        KM       ROUTE FROM CP238 TO CP239 IN SUNCOR CHANNEL ALIGNMENT
5407        KM      THIS THIS THE CAMELBACK BASINS CAR RECOMMENDED PLAN
5408        RS       4            -1
5409        RC    0.32    .032    .032    2640   .0015
5410        RX   100.0   124.0   125.0   126.0   167.0   168.0   169.0   193.0
5411        RY   18.00   10.00   10.00   10.00   10.00   10.00   10.00   18.00
            *

5412        KK   1D239
5413        KM       RETURN DIVERT AT CP239
5414        DR   2D251
            *

5415        KK   2D239
5416        KM       RETURN DIVERT AT CP239
5417        DR   DI252
            *

5418        KK   SC239
5419        KM       ADD HYDROGRAPHS AT CP239 IN SUNCOR CHANNEL ALIGNMENT
5420        HC       3   31.76
            *

5421        KK   DB252
5422        KM      RECOMMENDED PLAN DETENTION BASIN SOUTH OF CAMELBACK
5423        KM      BASIN DESIGNED TO BRING HYDROGAPH TO BULLARD WASH AFTER
5424        KM      THE BULLARD WASH HYDROGRAPH HAS PASSED.
5425        RS       1    STOR       0       0
5426        SV       0    23.9    68.5   109.8
5427        SQ       0     409     817    1156
            *

5428        KK   ~R240
5429        KM       ROUTE FROM CP240 TO CP241 IN SUNCOR CHANNEL ALIGNMENT
5430        RS       5            -1
5431        RC    .032    .032    .032    4070   .0004
5432        RX   100.0   124.0   125.0   126.0   166.0   167.0   168.0   192.0
5433        RY   18.00   10.00   10.00   10.00   10.00   10.00   10.00   18.00
            *
1                                   HEC-1 INPUT                                                    PAGE143

LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5434        KK   ~BD2N
5435        KO               2
5436        KM       ADD HYDROGRAPHS AT CP241 (CP241 + SUNCOR CHANNEL)
5437        HC       2   78.75
            *
            * KK SR241
            * KM      STORAGE ROUTE THROUGH CP241
            * RS     1    STOR       0       0
            * SV     0     .09     .65     .94    8.45   16.94
            * SQ     0       4     280     324    1773    7505
            * SE1042.2    1044    1046  1046.3    1048    1049
            * KK  R241
            * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5438        KK   RBD2N
5439        KM   ROUTE FLOW FROM CP241 TO CP253
5440        RS     3.2            -1.0     0.0
5441        RC   0.030   0.030   0.030    5547  0.0020
5442        RX     0.0    48.9    61.9    74.9    87.9   100.9   113.9   162.7
5443        RY  1047.6  1039.5  1039.5  1039.5  1039.5  1039.5  1039.5  1047.6
            * RS     4            -1
            * RC  0.03     .03    0.03    5800  0.0020
```

B48B54

B55

# This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B56

# This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B57

B57

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN   1998                *
*           VERSION 4.1                 *
*                                       *
*      DATE   18APR07  TIME  11:52:52   *
*                                       *
*****************************************
```

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

```
X     X  XXXXXXX   XXXXX          X
X     X  X       X     X        XX
X     X  X       X               X
XXXXXXX  XXXX    X       XXXXX   X
X     X  X       X               X
X     X  X       X     X         X
X     X  XXXXXXX   XXXXX        XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL  LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   1          ID
   2          ID      ******************************************************************
   3          ID      The Basins North of I-10 on each side of Bullard Wash are Modified
   4          ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2007
   5          ID      ******************************************************************
   6          ID
   7          ID      ******************************************************************
   8          ID      The Basin at Northeast Corner of I-10 and Bullard Wash Is Modified
   9          ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2006
  10          ID      ******************************************************************
  11          ID
  12          ID         DRAFT PREFERRED ALTERNATIVE LEVEL III
  13          ID
  14          ID         INCORPORATE ALTERNATIVE #3 FROM CHANGE ORDER #14 INTO
  15          ID         SR 303L OFFSITE FLOOD CONTROL FACILITY - NORTHERN AND CACTUS
  16          ID         BASINS ARE NOW OFFLINE WITH MULTIPLE BASINS LOCATED WITHIN
  17          ID         LUKE AIR FORCE BASE CRASH ZONE AREA
  18          ID
  19          ID         **ADOT BASIN GEOMETRY REPRESENTS MOST RECENT 2' CONTOURS**
  20          ID         WHITE TANKS AREA DRAINAGE MASTER STUDY *UPDATE*
  21          ID         Original MODEL BY THE WLB Group for FCDMC AS PART OF THE WHITE
  22          ID         TANKS/AGUA FRIA ADMS, Date: October 1991
  23          ID
  24          ID         REVISED HYDROLOGY HEC-1 RUN FOR WHITE TANKS ADMS
  25          ID         100-YEAR, 24-HOUR STORM                  original file: WTADMS.24
  26          ID
  27          ID                                     REVISED BY URS     DATE: 01-14-04
  28          ID                                                        FILE: L33PE4H.DAT
  29          ID
  30          ID        NOTES:
  31          ID        1. THIS HEC-1 MODEL CONTAINS THE FOLLOWING SUPER BASINS: WHITE TANKS 3,
  32          ID           2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2 & 3, 4 THRU 26.
  33          ID        2. REVISED TO REFLECT UPDATED SOILS MAPS AND NEW DEVELOPMENT.
  34          ID        3. AVERAGE XKSAT VALUES FOR EACH SUBBASIN WAS RECEIVED FROM FCDMC
  35          ID           GIS DATA AND THEN ADJUSTED FOR VEGETATION, OR LEFT AS ORIGINALLY IN
  36          ID           THE WLB MODEL.
  37          ID        4. FOR NEW DEVELOPMENTS ONLY 80% OF REPORTED PROVIDED RETENTION
  38          ID           WAS INCLUDED IN THIS MODEL (AS A CONSERVATIVE ESTIMATE). RETENTION
  39          ID           CAPACITIES WERE ESTIMATED BY EEC FOR DEVELOPMENTS WITH NO
  40          ID           DRAINAGE REPORTS.
  41          ID        5. REVISED DRAINAGE BOUNDARIES BASED UPON FIELD INSPECTION OF SUN CITY.
  42          ID           GRAND.  COMBINED SEVERAL BASINS TOGETHER TO MAKE NEW BASINS 114 &115.
  43          ID           ALSO REROUTED SUBBASINS 100A, 101, 102A AND 106 TO THE SOUTH TO 113A.
  44          ID        6. CHANNEL ROUTE ALONG REEMS ROAD UPDATED TO REFLECT NEW CONSTRUCTION.
  45          ID        7. REVISED SCS TYPE II RAINFALL DISTRIBUTION FOR THE 24-HOUR GENERAL
  46          ID           STORM.
  47          ID        8. REVISED RAINFALL DEPTH-AREA REDUCTION FACTORS.
  48          ID        9. PSIF WERE ADJUSTED BASED ON THE VALUES OF XKSAT AND WERE EDITED INTO
  49          ID           THE DATA FILE BY THE FCDMC.
  50          ID       10. AVERAGE XKSAT VALUES FOR SUBBASINS WITH BORROW PITS (WHITE TANKS
  51          ID           AREAS #3 & #4) WERE ESTIMATED BY EEC.
  52          ID
              *DIAGRAM
  53          IT       5                  600
  54          IO       5
```

1 HEC-1 INPUT PAGE 2

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  55          IN      15
  56          JD    4.03    .001
  57          PC    .000    .002    .005    .008    .011    .014    .017    .020    .023    .026
  58          PC    .029    .032    .035    .038    .041    .044    .048    .052    .056    .060
  59          PC    .064    .068    .072    .076    .080    .085    .090    .095    .100    .105
```

```
5132    UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
        * KK241OUT
        * KM       DIVERSION-RETENTION
        * DT241RET   56.30
        * DI     0   10000
        * DQ     0   10000

5133    KK   1I241
5134    KM        ADD HYDROGRAPHS AT CP241 (241 + 224)
5135    HC       2   56.98
        * REMOVED PER ALTERNATIVE #3
        * KK 2I241
        * KM      ADD HYDROGRAPHS AT CP241 (241 + 222)
        * HC     2   59.77
        * KK CP241

5136    KK   !BD2N
        * KO     1                                21
5137    KM   ADD HYDROGRAPHS AT CP241 (241 + 240)
5138    HC       2   39.76
        * KK SR241
        * KM       STORAGE ROUTE THROUGH CP241
        * RS     1     STOR      0       0
        * SV     0      .09     .65     .94    8.45   16.94
        * SQ     0       4     280     324    1773    7505
        * SE1042.2    1044    1046  1046.3    1048    1049
        * KK  R241
        * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5139    KK   RBD2N
5140    KM   ROUTE FLOW FROM CP241 TO CP253
5141    RS     3.2            -1.0     0.0
5142    RC   0.030   0.030   0.030    5547  0.0020
5143    RX     0.0    48.9    61.9    74.9    87.9   100.9   113.9   162.7
5144    RY  1047.6  1039.5  1039.5  1039.5  1039.5  1039.5  1039.5  1047.6
        * RS     4              -1
        * RC  0.03     .03    0.03    5800  0.0020
        * RX  1000    1042  1051.4  1060.8  1070.2  1079.6    1089    1131
        * RY  1030    1023    1023    1023    1023    1023    1023    1030
        *

5145    KK     253
5146    KM   BASIN 253
5147    KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
5148    KM    L=      1.2  Lca=       .6   S=   23.4  Kn= .120  LAG=  84.8
5149    KM    AGRICULTURAL S-GRAPH WAS USED FOR THIS BASIN
5150    BA    1.01
```

B54B57



```
LINE    ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5151    LG     .50     .00    5.40     .38     .00
5152    UI     44.     44.     44.     65.     93.    138.    210.    260.    242.    270.
5153    UI    354.    323.    370.    370.    370.    370.    368.    308.    308.    335.
5154    UI    324.    231.    234.    264.    191.    168.    161.    132.    123.    137.
5155    UI    105.     84.     74.     71.     62.     54.     54.     45.     40.     40.
5156    UI     40.     28.     25.     25.     25.     25.     25.     15.      6.      6.
5157    UI      6.      6.      6.      6.      6.      6.      6.      6.      6.      6.
5158    UI      6.      6.      6.      6.      6.      6.      6.      6.      6.      6.
5159    UI      6.      6.      6.      6.      6.      0.      0.      0.      0.      0.
5160    UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
        * KK253OUT
        * KM       DIVERSION-RETENTION
        * DT253RET   87.04
        * DI     0   10000
        * DQ     0   10000

5161    KK   1I253
5162    KM        ADD HYDROGRAPHS AT CP253
5163    HC       2   79.75
        *

5164    KK    253A
5165    KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 253A
5166    BA     .25
5167    LG     .32     .33    4.05     .49       1
5168    UI     29.     75.    139.    179.    239.    349.    274.    211.    160.    111.
5169    UI     57.     43.     29.     12.      9.      9.      9.      0.      0.      0.
5170    UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
        * KK253AOT
        * KM       DIVERSION-RETENTION
        * DT253ART     4.0
        * DI     0   10000
        * DQ     0   10000

5171    KK   R253A
5172    KM        ROUTE FLOW FROM CP253A TO CP253
5173    RS      10             -1
5174    RC    .075    .075    .075    2800   .0030
5175    RX    1000    1001    1010    1110    1320    1480    1709    1710
5176    RY    1027    1027    1026    1025    1025    1026    1027    1027

5177    KK  !!I253
        * KK 2I253
5178    KM        ADD HYDROGRAPHS AT CP253
5179    HC       2   80.0
        *
        * ****************************************************************************
        * ***THE FOLLOWING SECTION TAKEN FROM NEW SUPER BASIN 4  WITH NEW SOILS*****
        * ****************************************************************************
        *
```

B57

```
1**************************************
 *                                    *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
 *             JUN  1998              *
 *           VERSION 4.1              *
 *                                    *
 *  RUN DATE   18APR07  TIME  11:52:52*
 *                                    *
  **********************************
```

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

```
X     X  XXXXXXX   XXXXX          X
X     X  X       X     X        XX
X     X  X       X              X
XXXXXXX  XXXX    X       XXXXX  X
X     X  X       X              X
X     X  X       X     X        X
X     X  XXXXXXX  XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL  LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID
  2           ID      ******************************************************************
  3           ID      The Basins North of I-10 on each side of Bullard Wash are Modified
  4           ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2007
  5           ID      ******************************************************************
  6           ID
  7           ID      ******************************************************************
  8           ID      The Basin at Northeast Corner of I-10 and Bullard Wash Is Modified
  9           ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2006
 10           ID      ******************************************************************
 11           ID
 12           ID         DRAFT PREFERRED ALTERNATIVE LEVEL III
 13           ID
 14           ID         INCORPORATE ALTERNATIVE #3 FROM CHANGE ORDER #14 INTO
 15           ID         SR 303L OFFSITE FLOOD CONTROL FACILITY - NORTHERN AND CACTUS
 16           ID         BASINS ARE NOW OFFLINE WITH MULTIPLE BASINS LOCATED WITHIN
 17           ID         LUKE AIR FORCE BASE CRASH ZONE AREA
 18           ID
 19           ID         **ADOT BASIN GEOMETRY REPRESENTS MOST RECENT 2' CONTOURS**
 20           ID         WHITE TANKS AREA DRAINAGE MASTER STUDY *UPDATE*
 21           ID         Original MODEL BY THE WLB Group for FCDMC AS PART OF THE WHITE
 22           ID         TANKS/AGUA FRIA ADMS, Date: October 1991
 23           ID
 24           ID         REVISED HYDROLOGY HEC-1 RUN FOR WHITE TANKS ADMS
 25           ID         100-YEAR, 24-HOUR STORM                  original file: WTADMS.24
 26           ID
 27           ID                                     REVISED BY URS     DATE: 01-14-04
 28           ID                                                        FILE: L33PE4H.DAT
 29           ID
 30           ID        NOTES:
 31           ID        1. THIS HEC-1 MODEL CONTAINS THE FOLLOWING SUPER BASINS: WHITE TANKS 3,
 32           ID           2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2 & 3, 4 THRU 26.
 33           ID        2. REVISED TO REFLECT UPDATED SOILS MAPS AND NEW DEVELOPMENT.
 34           ID        3. AVERAGE XKSAT VALUES FOR EACH SUBBASIN WAS RECEIVED FROM FCDMC
 35           ID           GIS DATA AND THEN ADJUSTED FOR VEGETATION, OR LEFT AS ORIGINALLY IN
 36           ID           THE WLB MODEL.
 37           ID        4. FOR NEW DEVELOPMENTS ONLY 80% OF REPORTED PROVIDED RETENTION
 38           ID           WAS INCLUDED IN THIS MODEL (AS A CONSERVATIVE ESTIMATE). RETENTION
 39           ID           CAPACITIES WERE ESTIMATED BY EEC FOR DEVELOPMENTS WITH NO
 40           ID           DRAINAGE REPORTS.
 41           ID        5. REVISED DRAINAGE BOUNDARIES BASED UPON FIELD INSPECTION OF SUN CITY.
 42           ID           GRAND.  COMBINED SEVERAL BASINS TOGETHER TO MAKE NEW BASINS 114 &115.
 43           ID           ALSO REROUTED SUBBASINS 100A, 101, 102A AND 106 TO THE SOUTH TO 113A.
 44           ID        6. CHANNEL ROUTE ALONG REEMS ROAD UPDATED TO REFLECT NEW CONSTRUCTION.
 45           ID        7. REVISED SCS TYPE II RAINFALL DISTRIBUTION FOR THE 24-HOUR GENERAL
 46           ID           STORM.
 47           ID        8. REVISED RAINFALL DEPTH-AREA REDUCTION FACTORS.
 48           ID        9. PSIF WERE ADJUSTED BASED ON THE VALUES OF XKSAT AND WERE EDITED INTO
 49           ID           THE DATA FILE BY THE FCDMC.
 50           ID       10. AVERAGE XKSAT VALUES FOR SUBBASINS WITH BORROW PITS (WHITE TANKS
 51           ID           AREAS #3 & #4) WERE ESTIMATED BY EEC.
 52           ID
              *DIAGRAM
 53           IT       5                    600
 54           IO       5
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 55           IN      15
 56           JD    4.03     .001
 57           PC    .000     .002     .005     .008     .011     .014     .017     .020     .023     .026
 58           PC    .029     .032     .035     .038     .041     .044     .048     .052     .056     .060
 59           PC    .064     .068     .072     .076     .080     .085     .090     .095     .100     .105
```

```
5132        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
            * KK241OUT
            * KM       DIVERSION-RETENTION
            * DT241RET   56.30
            * DI     0   10000
            * DQ     0   10000

5133        KK   1I241
5134        KM        ADD HYDROGRAPHS AT CP241 (241 + 224)
5135        HC        2   56.98
            * REMOVED PER ALTERNATIVE #3
            * KK 2I241
            * KM        ADD HYDROGRAPHS AT CP241 (241 + 222)
            * HC      2   59.77
            * KK CP241

5136        KK   !BD2N
            * KO     1                                21
5137        KM   ADD HYDROGRAPHS AT CP241 (241 + 240)
5138        HC       2   39.76
            * KK SR241
            * KM       STORAGE ROUTE THROUGH CP241
            * RS     1    STOR       0       0
            * SV     0     .09     .65     .94    8.45   16.94
            * SQ     0       4     280     324    1773    7505
            * SE1042.2    1044    1046  1046.3    1048    1049
            * KK  R241
            * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5139        KK   RBD2N
5140        KM   ROUTE FLOW FROM CP241 TO CP253
5141        RS     3.2              -1.0     0.0
5142        RC   0.030   0.030   0.030    5547  0.0020
5143        RX     0.0    48.9    61.9    74.9    87.9   100.9   113.9   162.7
5144        RY  1047.6  1039.5  1039.5  1039.5  1039.5  1039.5  1039.5  1047.6
            * RS     4              -1
            * RC  0.03     .03    0.03    5800  0.0020
            * RX  1000    1042  1051.4  1060.8  1070.2  1079.6    1089    1131
            * RY  1030    1023    1023    1023    1023    1023    1023    1030
            *

5145        KK     253
5146        KM   BASIN 253
5147        KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
5148        KM    L=      1.2  Lca=       .6   S=   23.4  Kn= .120  LAG=  84.8
5149        KM    AGRICULTURAL S-GRAPH WAS USED FOR THIS BASIN
5150        BA    1.01
```

B54B57



```
LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5151        LG     .50     .00    5.40     .38     .00
5152        UI     44.     44.     44.     65.     93.    138.    210.    260.    242.    270.
5153        UI    354.    323.    370.    370.    370.    370.    368.    308.    308.    335.
5154        UI    324.    231.    234.    264.    191.    168.    161.    132.    123.    137.
5155        UI    105.     84.     74.     71.     62.     54.     54.     45.     40.     40.
5156        UI     40.     28.     25.     25.     25.     25.     25.     15.      6.      6.
5157        UI      6.      6.      6.      6.      6.      6.      6.      6.      6.      6.
5158        UI      6.      6.      6.      6.      6.      6.      6.      6.      6.      6.
5159        UI      6.      6.      6.      6.      6.      0.      0.      0.      0.      0.
5160        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
            * KK253OUT
            * KM       DIVERSION-RETENTION
            * DT253RET   87.04
            * DI     0   10000
            * DQ     0   10000

5161        KK   1I253
5162        KM        ADD HYDROGRAPHS AT CP253
5163        HC       2   79.75
            *

5164        KK    253A
5165        KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 253A
5166        BA     .25
5167        LG     .32     .33    4.05     .49       1
5168        UI     29.     75.    139.    179.    239.    349.    274.    211.    160.    111.
5169        UI     57.     43.     29.     12.      9.      9.      9.      0.      0.      0.
5170        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
            * KK253AOT
            * KM       DIVERSION-RETENTION
            * DT253ART     4.0
            * DI     0   10000
            * DQ     0   10000

5171        KK   R253A
5172        KM        ROUTE FLOW FROM CP253A TO CP253
5173        RS      10              -1
5174        RC    .075    .075    .075    2800   .0030
5175        RX    1000    1001    1010    1110    1320    1480    1709    1710
5176        RY    1027    1027    1026    1025    1025    1026    1027    1027

5177        KK  !!I253
            * KK 2I253
5178        KM        ADD HYDROGRAPHS AT CP253
5179        HC       2    80.0
            *
            * ***********************************************************************
            * ***THE FOLLOWING SECTION TAKEN FROM NEW SUPER BASIN 4  WITH NEW SOILS*****
            * ***********************************************************************
            *
```

B58

B.58

```
1**************************************
*                                    *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
*            JUN  1998               *
*          VERSION 4.1               *
*                                    *
*     DATE   18APR07  TIME  11:52:52 *
*                                    *
**************************************
```

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

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL  LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
1                                   HEC-1 INPUT                                          PAGE  1

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

    1           ID
    2           ID      ******************************************************************
    3           ID      The Basins North of I-10 on each side of Bullard Wash are Modified
    4           ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2007
    5           ID      ******************************************************************
    6           ID
    7           ID      ******************************************************************
    8           ID      The Basin at Northeast Corner of I-10 and Bullard Wash Is Modified
    9           ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2006
   10           ID      ******************************************************************
   11           ID
   12           ID         DRAFT PREFERRED ALTERNATIVE LEVEL III
   13           ID
   14           ID         INCORPORATE ALTERNATIVE #3 FROM CHANGE ORDER #14 INTO
   15           ID         SR 303L OFFSITE FLOOD CONTROL FACILITY - NORTHERN AND CACTUS
   16           ID         BASINS ARE NOW OFFLINE WITH MULTIPLE BASINS LOCATED WITHIN
   17           ID         LUKE AIR FORCE BASE CRASH ZONE AREA
   18           ID
   19           ID         **ADOT BASIN GEOMETRY REPRESENTS MOST RECENT 2' CONTOURS**
   20           ID         WHITE TANKS AREA DRAINAGE MASTER STUDY *UPDATE*
   21           ID         Original MODEL BY THE WLB Group for FCDMC AS PART OF THE WHITE
   22           ID         TANKS/AGUA FRIA ADMS, Date: October 1991
   23           ID
   24           ID         REVISED HYDROLOGY HEC-1 RUN FOR WHITE TANKS ADMS
   25           ID         100-YEAR, 24-HOUR STORM                  original file: WTADMS.24
   26           ID
   27           ID                                       REVISED BY URS     DATE: 01-14-04
   28           ID                                                          FILE: L33PE4H.DAT
   29           ID
   30           ID        NOTES:
   31           ID        1. THIS HEC-1 MODEL CONTAINS THE FOLLOWING SUPER BASINS: WHITE TANKS 3,
   32           ID           2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2 & 3, 4 THRU 26.
   33           ID        2. REVISED TO REFLECT UPDATED SOILS MAPS AND NEW DEVELOPMENT.
   34           ID        3. AVERAGE XKSAT VALUES FOR EACH SUBBASIN WAS RECEIVED FROM FCDMC
   35           ID           GIS DATA AND THEN ADJUSTED FOR VEGETATION, OR LEFT AS ORIGINALLY IN
   36           ID           THE WLB MODEL.
   37           ID        4. FOR NEW DEVELOPMENTS ONLY 80% OF REPORTED PROVIDED RETENTION
   38           ID           WAS INCLUDED IN THIS MODEL (AS A CONSERVATIVE ESTIMATE). RETENTION
   39           ID           CAPACITIES WERE ESTIMATED BY EEC FOR DEVELOPMENTS WITH NO
   40           ID           DRAINAGE REPORTS.
   41           ID        5. REVISED DRAINAGE BOUNDARIES BASED UPON FIELD INSPECTION OF SUN CITY.
   42           ID           GRAND.  COMBINED SEVERAL BASINS TOGETHER TO MAKE NEW BASINS 114 &115.
   43           ID           ALSO REROUTED SUBBASINS 100A, 101, 102A AND 106 TO THE SOUTH TO 113A.
   44           ID        6. CHANNEL ROUTE ALONG REEMS ROAD UPDATED TO REFLECT NEW CONSTRUCTION.
   45           ID        7. REVISED SCS TYPE II RAINFALL DISTRIBUTION FOR THE 24-HOUR GENERAL
   46           ID           STORM.
   47           ID        8. REVISED RAINFALL DEPTH-AREA REDUCTION FACTORS.
   48           ID        9. PSIF WERE ADJUSTED BASED ON THE VALUES OF XKSAT AND WERE EDITED INTO
   49           ID           THE DATA FILE BY THE FCDMC.
   50           ID       10. AVERAGE XKSAT VALUES FOR SUBBASINS WITH BORROW PITS (WHITE TANKS
   51           ID           AREAS #3 & #4) WERE ESTIMATED BY EEC.
   52           ID
                *DIAGRAM
   53           IT       5                    600
   54           IO       5
                                            HEC-1 INPUT                                          PAGE  2
1
  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   55           IN      15
   56           JD    4.03    .001
   57           PC    .000    .002    .005    .008    .011    .014    .017    .020    .023    .026
   58           PC    .029    .032    .035    .038    .041    .044    .048    .052    .056    .060
   59           PC    .064    .068    .072    .076    .080    .085    .090    .095    .100    .105
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```
                 * KK CP253

5451             KK   !BD3N
5452             KM   ADD HYDROGRAPHS AT CP253
5453             HC       2   42.53
                 * KK  R253
                 * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5454             KK   RBD3N
5455             KM   ROUTE FLOW FROM CP253 TO CP268
5456             RS     3.4            -1.0     0.0
5457             RC   0.030   0.030   0.030    5971  0.0027
5458             RX     0.0    70.0    83.0    96.0   109.0   122.0   135.0   205.0
5459             RY  1022.8  1015.8  1015.8  1015.8  1015.8  1015.8  1015.8  1022.8
                 * RS     6             -1
                 * RC   .03     .03     .03    5500   .0021
                 * RX1000.0  1041.7  1047.1  1052.5  1057.9  1063.3  1068.7  1110.4
                 * RY1031.0  1024.1  1024.1  1024.1  1024.1  1024.1  1024.1  1031.0
                 *

5460             KK     267
5461             KM   BASIN 267
5462             KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
5463             KM    L=       1.9  Lca=       .9   S=   12.4  Kn= .030  LAG=  32.4
5464             KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
5465             BA    1.19
5466             LG     .23     .25    5.60     .26   14.00
5467             UI    124.    272.    554.    716.    901.   1285.   1465.   1089.    864.    671.
5468             UI    477.    254.    205.    124.     80.     38.     38.     38.     38.      0.
5469             UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
5470             UI      0.      0.

5471             KK  267OUT
5472             KM        DIVERT ONSITE RETENTION VOLUME  (Pebble Creek Phase 1)
5473             DT  267RET   105.12
5474             DI       0   10000
5475             DQ       0   10000
                 * KK CP267
1                                          HEC-1 INPUT                                                PAGE147

LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5476             KK   !BD4N
5477             KM   ADD HYDROGRAPHS AT CP267
5478             HC       2   43.72
                 * KK  R267
                 * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5479             KK   RBD4N
5480             KM   ROUTE FLOW FROM CP267 TO CP286
5481             RS     1.6            -1.0     0.0
5482             RC   0.020   0.020   0.020    5299  0.0048
5483             RX     0.0     0.0    18.4    36.7    55.1    73.4    91.8    91.8
5484             RY  1013.1  1005.7  1005.7  1005.7  1005.7  1005.7  1005.7  1013.1
                 * RS    11             -1
                 * RC   .03     .03     .03    5280  0.0020
                 * RX  1000    1042  1055.2  1068.4  1081.6  1094.8    1108    1156
                 * RY  1003     996     996     996     996     996     996    1004
                 *

5485             KK     286
5486             KM   BASIN 286
5487             KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
5488             KM    L=       1.2  Lca=       .4   S=   18.6  Kn= .113  LAG=  70.2
5489             KM    AGRICULTURAL S-GRAPH WAS USED FOR THIS BASIN
5490             BA     .70
5491             LG     .47     .03    5.80     .30    7.00
5492             UI     37.     37.     39.     77.    111.    181.    220.    202.    293.    267.
5493             UI    309.    309.    309.    309.    259.    257.    280.    224.    194.    217.
5494             UI    149.    140.    116.    104.    115.     77.     67.     59.     52.     45.
5495             UI     44.     34.     34.     34.     22.     21.     21.     21.     21.     10.
5496             UI      5.      5.      5.      5.      5.      5.      5.      5.      5.      5.
5497             UI      5.      5.      5.      5.      5.      5.      5.      5.      5.      5.
5498             UI      5.      5.      0.      0.      0.      0.      0.      0.      0.      0.
5499             UI      0.      0.      0.      0.      0.      0.      0.      0.
                 * KK286OUT
                 * KM       DIVERSION-RETENTION
                 * DT286RET   63.92
                 * DI     0   10000
                 * DQ     0   10000

5500             KK   1I286
5501             KM        ADD HYDROGRAPHS AT CP286
5502             HC       2   86.98
                 *

5503             KK     288
5504             KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 288
5505             BA     .22
5506             LG     .50     .00    4.90    0.47     .00
5507             UI      8.      8.      8.      8.     27.     31.     37.     41.     46.     49.
5508             UI     53.     58.     64.     69.     82.     98.    112.    100.     88.     79.
5509             UI     72.     67.     62.     56.     51.     46.     42.     39.     32.     24.
5510             UI     18.     15.     15.     14.     14.      9.      8.      8.      8.      3.
5511             UI      3.      3.      3.      3.      3.      3.      3.      3.      3.      3.
5512             UI      3.      3.      0.      0.      0.      0.      0.      0.      0.      0.
1                                          HEC-1 INPUT                                                PAGE148

LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5513             UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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B57 B58

B58

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1**************************************
 *                                    *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
 *             JUN  1998              *
 *           VERSION 4.1              *
 *                                    *
 *    RUN DATE   18APR07  TIME  11:52:52 *
 *                                    *
 **************************************
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```
**************************************
*                                    *
*    U.S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER    *
*         609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616      *
*          (916) 756-1104            *
*                                    *
**************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X    X         XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X    X         X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL  LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID
  2           ID      ******************************************************************
  3           ID      The Basins North of I-10 on each side of Bullard Wash are Modified
  4           ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2007
  5           ID      ******************************************************************
  6           ID
  7           ID      ******************************************************************
  8           ID      The Basin at Northeast Corner of I-10 and Bullard Wash Is Modified
  9           ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2006
 10           ID      ******************************************************************
 11           ID
 12           ID         DRAFT PREFERRED ALTERNATIVE LEVEL III
 13           ID
 14           ID         INCORPORATE ALTERNATIVE #3 FROM CHANGE ORDER #14 INTO
 15           ID         SR 303L OFFSITE FLOOD CONTROL FACILITY - NORTHERN AND CACTUS
 16           ID         BASINS ARE NOW OFFLINE WITH MULTIPLE BASINS LOCATED WITHIN
 17           ID         LUKE AIR FORCE BASE CRASH ZONE AREA
 18           ID
 19           ID         **ADOT BASIN GEOMETRY REPRESENTS MOST RECENT 2' CONTOURS**
 20           ID         WHITE TANKS AREA DRAINAGE MASTER STUDY *UPDATE*
 21           ID         Original MODEL BY THE WLB Group for FCDMC AS PART OF THE WHITE
 22           ID         TANKS/AGUA FRIA ADMS, Date: October 1991
 23           ID
 24           ID         REVISED HYDROLOGY HEC-1 RUN FOR WHITE TANKS ADMS
 25           ID         100-YEAR, 24-HOUR STORM                  original file: WTADMS.24
 26           ID
 27           ID                                     REVISED BY URS     DATE: 01-14-04
 28           ID                                                        FILE: L33PE4H.DAT
 29           ID
 30           ID       NOTES:
 31           ID       1. THIS HEC-1 MODEL CONTAINS THE FOLLOWING SUPER BASINS: WHITE TANKS 3,
 32           ID          2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2 & 3, 4 THRU 26.
 33           ID       2. REVISED TO REFLECT UPDATED SOILS MAPS AND NEW DEVELOPMENT.
 34           ID       3. AVERAGE XKSAT VALUES FOR EACH SUBBASIN WAS RECEIVED FROM FCDMC
 35           ID          GIS DATA AND THEN ADJUSTED FOR VEGETATION, OR LEFT AS ORIGINALLY IN
 36           ID          THE WLB MODEL.
 37           ID       4. FOR NEW DEVELOPMENTS ONLY 80% OF REPORTED PROVIDED RETENTION
 38           ID          WAS INCLUDED IN THIS MODEL (AS A CONSERVATIVE ESTIMATE). RETENTION
 39           ID          CAPACITIES WERE ESTIMATED BY EEC FOR DEVELOPMENTS WITH NO
 40           ID          DRAINAGE REPORTS.
 41           ID       5. REVISED DRAINAGE BOUNDARIES BASED UPON FIELD INSPECTION OF SUN CITY.
 42           ID          GRAND.  COMBINED SEVERAL BASINS TOGETHER TO MAKE NEW BASINS 114 &115.
 43           ID          ALSO REROUTED SUBBASINS 100A, 101, 102A AND 106 TO THE SOUTH TO 113A.
 44           ID       6. CHANNEL ROUTE ALONG REEMS ROAD UPDATED TO REFLECT NEW CONSTRUCTION.
 45           ID       7. REVISED SCS TYPE II RAINFALL DISTRIBUTION FOR THE 24-HOUR GENERAL
 46           ID          STORM.
 47           ID       8. REVISED RAINFALL DEPTH-AREA REDUCTION FACTORS.
 48           ID       9. PSIF WERE ADJUSTED BASED ON THE VALUES OF XKSAT AND WERE EDITED INTO
 49           ID          THE DATA FILE BY THE FCDMC.
 50           ID      10. AVERAGE XKSAT VALUES FOR SUBBASINS WITH BORROW PITS (WHITE TANKS
 51           ID          AREAS #3 & #4) WERE ESTIMATED BY EEC.
 52           ID
              *DIAGRAM
 53           IT       5                    600
 54           IO       5
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 55           IN      15
 56           JD    4.03     .001
 57           PC    .000     .002     .005     .008     .011     .014     .017     .020     .023     .026
 58           PC    .029     .032     .035     .038     .041     .044     .048     .052     .056     .060
 59           PC    .064     .068     .072     .076     .080     .085     .090     .095     .100     .105
```

```
                * KK CP253

5451            KK   !BD3N
5452            KM   ADD HYDROGRAPHS AT CP253
5453            HC       2   42.53
                * KK  R253
                * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5454            KK   RBD3N
5455            KM   ROUTE FLOW FROM CP253 TO CP268
5456            RS     3.4            -1.0     0.0
5457            RC   0.030   0.030   0.030    5971  0.0027
5458            RX     0.0    70.0    83.0    96.0   109.0   122.0   135.0   205.0
5459            RY  1022.8  1015.8  1015.8  1015.8  1015.8  1015.8  1015.8  1022.8
                * RS     6              -1
                * RC   .03     .03     .03    5500   .0021
                * RX1000.0  1041.7  1047.1  1052.5  1057.9  1063.3  1068.7  1110.4
                * RY1031.0  1024.1  1024.1  1024.1  1024.1  1024.1  1024.1  1031.0
                *

5460            KK     267
5461            KM   BASIN 267
5462            KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
5463            KM    L=      1.9  Lca=       .9   S=   12.4  Kn= .030  LAG=  32.4
5464            KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
5465            BA    1.19
5466            LG     .23     .25    5.60     .26   14.00
5467            UI    124.    272.    554.    716.    901.   1285.   1465.   1089.    864.    671.
5468            UI    477.    254.    205.    124.     80.     38.     38.     38.     38.      0.
5469            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
5470            UI      0.      0.

5471            KK  267OUT
5472            KM        DIVERT ONSITE RETENTION VOLUME  (Pebble Creek Phase 1)
5473            DT  267RET   105.12
5474            DI       0   10000
5475            DQ       0   10000
                * KK CP267
```



```
LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5476            KK   !BD4N
5477            KM   ADD HYDROGRAPHS AT CP267
5478            HC       2   43.72
                * KK  R267
                * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5479            KK   RBD4N
5480            KM   ROUTE FLOW FROM CP267 TO CP286
5481            RS     1.6            -1.0     0.0
5482            RC   0.020   0.020   0.020    5299  0.0048
5483            RX     0.0     0.0    18.4    36.7    55.1    73.4    91.8    91.8
5484            RY  1013.1  1005.7  1005.7  1005.7  1005.7  1005.7  1005.7  1013.1
                * RS    11              -1
                * RC   .03     .03     .03    5280  0.0020
                * RX  1000    1042  1055.2  1068.4  1081.6  1094.8    1108    1156
                * RY  1003     996     996     996     996     996     996    1004
                *

5485            KK     286
5486            KM   BASIN 286
5487            KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
5488            KM    L=      1.2  Lca=       .4   S=   18.6  Kn= .113  LAG=  70.2
5489            KM    AGRICULTURAL S-GRAPH WAS USED FOR THIS BASIN
5490            BA     .70
5491            LG     .47     .03    5.80     .30    7.00
5492            UI     37.     37.     39.     77.    111.    181.    220.    202.    293.    267.
5493            UI    309.    309.    309.    309.    259.    257.    280.    224.    194.    217.
5494            UI    149.    140.    116.    104.    115.     77.     67.     59.     52.     45.
5495            UI     44.     34.     34.     34.     22.     21.     21.     21.     21.     10.
5496            UI      5.      5.      5.      5.      5.      5.      5.      5.      5.      5.
5497            UI      5.      5.      5.      5.      5.      5.      5.      5.      5.      5.
5498            UI      5.      5.      0.      0.      0.      0.      0.      0.      0.      0.
5499            UI      0.      0.      0.      0.      0.      0.      0.      0.
                * KK286OUT
                * KM       DIVERSION-RETENTION
                * DT286RET   63.92
                * DI     0   10000
                * DQ     0   10000

5500            KK   1I286
5501            KM        ADD HYDROGRAPHS AT CP286
5502            HC       2   86.98
                *

5503            KK     288
5504            KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 288
5505            BA     .22
5506            LG     .50     .00    4.90    0.47     .00
5507            UI      8.      8.      8.      8.     27.     31.     37.     41.     46.     49.
5508            UI     53.     58.     64.     69.     82.     98.    112.    100.     88.     79.
5509            UI     72.     67.     62.     56.     51.     46.     42.     39.     32.     24.
5510            UI     18.     15.     15.     14.     14.      9.      8.      8.      8.      3.
5511            UI      3.      3.      3.      3.      3.      3.      3.      3.      3.      3.
5512            UI      3.      3.      0.      0.      0.      0.      0.      0.      0.      0.
```



```
LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5513            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

B59

B59

```
1**************************************                 **************************************
*                                    *                 *                                    *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*                 *    U.S. ARMY CORPS OF ENGINEERS    *
*             JUN   1998             *                 *   HYDROLOGIC ENGINEERING CENTER    *
*           VERSION 4.1              *                 *         609 SECOND STREET          *
*                                    *                 *      DAVIS, CALIFORNIA 95616       *
*  RUN DATE   18APR07  TIME  11:52:52*                 *         (916) 756-1104             *
*                                    *                 *                                    *
**************************************                 **************************************

X     X  XXXXXXX   XXXXX          X
X     X  X       X     X        XX
X     X  X       X              X
XXXXXXX  XXXX    X       XXXXX  X
X     X  X       X              X
X     X  X       X     X        X
X     X  XXXXXXX   XXXXX        XXX

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1                                   HEC-1 INPUT                                          PAGE  1

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

    1           ID
    2           ID      ******************************************************************
    3           ID      The Basins North of I-10 on each side of Bullard Wash are Modified
    4           ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2007
    5           ID      ******************************************************************
    6           ID
    7           ID      ******************************************************************
    8           ID      The Basin at Northeast Corner of I-10 and Bullard Wash Is Modified
    9           ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2006
   10           ID      ******************************************************************
   11           ID
   12           ID         DRAFT PREFERRED ALTERNATIVE LEVEL III
   13           ID
   14           ID         INCORPORATE ALTERNATIVE #3 FROM CHANGE ORDER #14 INTO
   15           ID         SR 303L OFFSITE FLOOD CONTROL FACILITY - NORTHERN AND CACTUS
   16           ID         BASINS ARE NOW OFFLINE WITH MULTIPLE BASINS LOCATED WITHIN
   17           ID         LUKE AIR FORCE BASE CRASH ZONE AREA
   18           ID
   19           ID         **ADOT BASIN GEOMETRY REPRESENTS MOST RECENT 2' CONTOURS**
   20           ID         WHITE TANKS AREA DRAINAGE MASTER STUDY *UPDATE*
   21           ID         Original MODEL BY THE WLB Group for FCDMC AS PART OF THE WHITE
   22           ID         TANKS/AGUA FRIA ADMS, Date: October 1991
   23           ID
   24           ID         REVISED HYDROLOGY HEC-1 RUN FOR WHITE TANKS ADMS
   25           ID         100-YEAR, 24-HOUR STORM                  original file: WTADMS.24
   26           ID
   27           ID                                     REVISED BY URS     DATE: 01-14-04
   28           ID                                                        FILE: L33PE4H.DAT
   29           ID
   30           ID        NOTES:
   31           ID        1. THIS HEC-1 MODEL CONTAINS THE FOLLOWING SUPER BASINS: WHITE TANKS 3,
   32           ID           2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2 & 3, 4 THRU 26.
   33           ID        2. REVISED TO REFLECT UPDATED SOILS MAPS AND NEW DEVELOPMENT.
   34           ID        3. AVERAGE XKSAT VALUES FOR EACH SUBBASIN WAS RECEIVED FROM FCDMC
   35           ID           GIS DATA AND THEN ADJUSTED FOR VEGETATION, OR LEFT AS ORIGINALLY IN
   36           ID           THE WLB MODEL.
   37           ID        4. FOR NEW DEVELOPMENTS ONLY 80% OF REPORTED PROVIDED RETENTION
   38           ID           WAS INCLUDED IN THIS MODEL (AS A CONSERVATIVE ESTIMATE). RETENTION
   39           ID           CAPACITIES WERE ESTIMATED BY EEC FOR DEVELOPMENTS WITH NO
   40           ID           DRAINAGE REPORTS.
   41           ID        5. REVISED DRAINAGE BOUNDARIES BASED UPON FIELD INSPECTION OF SUN CITY.
   42           ID           GRAND.  COMBINED SEVERAL BASINS TOGETHER TO MAKE NEW BASINS 114 &115.
   43           ID           ALSO REROUTED SUBBASINS 100A, 101, 102A AND 106 TO THE SOUTH TO 113A.
   44           ID        6. CHANNEL ROUTE ALONG REEMS ROAD UPDATED TO REFLECT NEW CONSTRUCTION.
   45           ID        7. REVISED SCS TYPE II RAINFALL DISTRIBUTION FOR THE 24-HOUR GENERAL
   46           ID           STORM.
   47           ID        8. REVISED RAINFALL DEPTH-AREA REDUCTION FACTORS.
   48           ID        9. PSIF WERE ADJUSTED BASED ON THE VALUES OF XKSAT AND WERE EDITED INTO
   49           ID           THE DATA FILE BY THE FCDMC.
   50           ID       10. AVERAGE XKSAT VALUES FOR SUBBASINS WITH BORROW PITS (WHITE TANKS
   51           ID           AREAS #3 & #4) WERE ESTIMATED BY EEC.
   52           ID
                *DIAGRAM
   53           IT       5                    600
   54           IO       5
1                                   HEC-1 INPUT                                          PAGE  2

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   55           IN      15
   56           JD    4.03    .001
   57           PC    .000    .002    .005    .008    .011    .014    .017    .020    .023    .026
   58           PC    .029    .032    .035    .038    .041    .044    .048    .052    .056    .060
   59           PC    .064    .068    .072    .076    .080    .085    .090    .095    .100    .105
```

```
                 * KK CP253

5451             KK   !BD3N
5452             KM   ADD HYDROGRAPHS AT CP253
5453             HC       2   42.53
                 * KK  R253
                 * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5454             KK   RBD3N
5455             KM   ROUTE FLOW FROM CP253 TO CP268
5456             RS     3.4          -1.0     0.0
5457             RC   0.030   0.030   0.030    5971  0.0027
5458             RX     0.0    70.0    83.0    96.0   109.0   122.0   135.0   205.0
5459             RY  1022.8  1015.8  1015.8  1015.8  1015.8  1015.8  1015.8  1022.8
                 * RS     6          -1
                 * RC   .03     .03     .03    5500   .0021
                 * RX1000.0  1041.7  1047.1  1052.5  1057.9  1063.3  1068.7  1110.4
                 * RY1031.0  1024.1  1024.1  1024.1  1024.1  1024.1  1024.1  1031.0
                 *

5460             KK     267
5461             KM   BASIN 267
5462             KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
5463             KM    L=      1.9  Lca=       .9   S=   12.4  Kn= .030  LAG=  32.4
5464             KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
5465             BA    1.19
5466             LG     .23     .25    5.60     .26   14.00
5467             UI    124.    272.    554.    716.    901.   1285.   1465.   1089.    864.    671.
5468             UI    477.    254.    205.    124.     80.     38.     38.     38.     38.      0.
5469             UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
5470             UI      0.      0.

5471             KK  267OUT
5472             KM        DIVERT ONSITE RETENTION VOLUME  (Pebble Creek Phase 1)
5473             DT  267RET   105.12
5474             DI       0   10000
5475             DQ       0   10000
                 * KK CP267
1                                        HEC-1 INPUT                                                    PAGE147

LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5476             KK   !BD4N
5477             KM   ADD HYDROGRAPHS AT CP267
5478             HC       2   43.72
                 * KK  R267
                 * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5479             KK   RBD4N
5480             KM   ROUTE FLOW FROM CP267 TO CP286
5481             RS     1.6          -1.0     0.0
5482             RC   0.020   0.020   0.020    5299  0.0048
5483             RX     0.0     0.0    18.4    36.7    55.1    73.4    91.8    91.8
5484             RY  1013.1  1005.7  1005.7  1005.7  1005.7  1005.7  1005.7  1013.1
                 * RS    11          -1
                 * RC   .03     .03     .03    5280  0.0020
                 * RX  1000    1042  1055.2  1068.4  1081.6  1094.8    1108    1156
                 * RY  1003     996     996     996     996     996     996    1004
                 *

5485             KK     286
5486             KM   BASIN 286
5487             KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
5488             KM    L=      1.2  Lca=       .4   S=   18.6  Kn= .113  LAG=  70.2
5489             KM    AGRICULTURAL S-GRAPH WAS USED FOR THIS BASIN
5490             BA     .70
5491             LG     .47     .03    5.80     .30    7.00
5492             UI     37.     37.     39.     77.    111.    181.    220.    202.    293.    267.
5493             UI    309.    309.    309.    309.    259.    257.    280.    224.    194.    217.
5494             UI    149.    140.    116.    104.    115.     77.     67.     59.     52.     45.
5495             UI     44.     34.     34.     34.     22.     21.     21.     21.     21.     10.
5496             UI      5.      5.      5.      5.      5.      5.      5.      5.      5.      5.
5497             UI      5.      5.      5.      5.      5.      5.      5.      5.      5.      5.
5498             UI      5.      5.      0.      0.      0.      0.      0.      0.      0.      0.
5499             UI      0.      0.      0.      0.      0.      0.      0.      0.
                 * KK286OUT
                 * KM      DIVERSION-RETENTION
                 * DT286RET   63.92
                 * DI     0   10000
                 * DQ     0   10000

5500             KK   1I286
5501             KM        ADD HYDROGRAPHS AT CP286
5502             HC       2   86.98
                 *

5503             KK     288
5504             KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 288
5505             BA     .22
5506             LG     .50     .00    4.90    0.47     .00
5507             UI      8.      8.      8.      8.     27.     31.     37.     41.     46.     49.
5508             UI     53.     58.     64.     69.     82.     98.    112.    100.     88.     79.
5509             UI     72.     67.     62.     56.     51.     46.     42.     39.     32.     24.
5510             UI     18.     15.     15.     14.     14.      9.      8.      8.      8.      3.
5511             UI      3.      3.      3.      3.      3.      3.      3.      3.      3.      3.
5512             UI      3.      3.      0.      0.      0.      0.      0.      0.      0.      0.
1                                        HEC-1 INPUT                                                    PAGE148

LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5513             UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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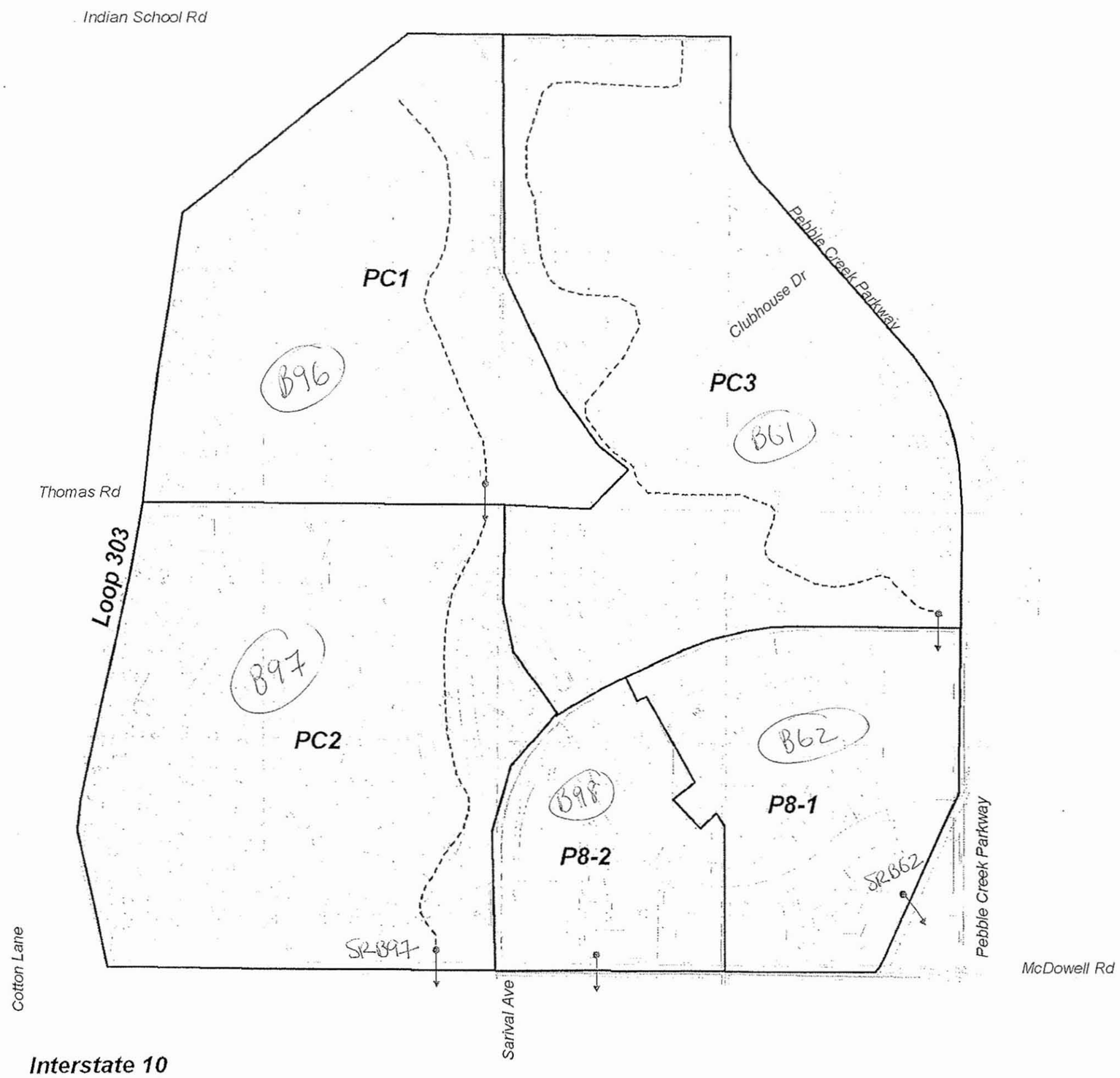
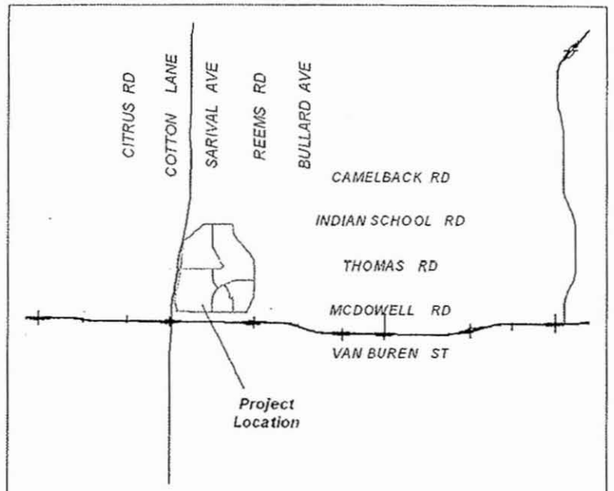
B58B59

B61




## Palm Valley Phase 8

**Exhibit 1**
**Onsite Drainage Area Map**

PC1 Basin ID
Basin Boundary
Flow Path
Concentration Point

Del Rio Eng

N

1" = 600'

600 0 600 1200 Feet

```
UI   105     86     62     62     58     58     46     35     35     35
UI    27     11     11     11     10     11     11     11     10     11
UI    11      0      0      0      0      0      0      0      0      0
UI     0      0      0      0      0      0      0      0      0      0
*
KK DOpc3 → RB61   (B61 Retention
KM  DIVERT OUT ALL 100 -6 Volume (68.2ac-ft)RETENTION EXCEPT LAST 17.0 AC-FT

KM  THIS IS REMAINING VOLUME TO BE RETAINED IN RID CANAL BASIN.  BASINS

DTOUT   68.2
DI     0    2000
DQ     0    2000
*
KK   P81   BASIN
BA 0.380
LG  0.21    0.27    4.80    0.33      26
UI    43     108     202     260     345     513     421     330     250     183
UI    96      71      44      26      13      13      13       0       0       0
UI     0       0       0       0       0       0       0       0       0       0
*
KKCP8-1
KM COMBINE ALL FLOWS At RID canal Retentin basin
HC     2
*
KKRS_1
KM       DETENTION BASIN ROUTING OPPERATION RID CANAL Basin

KO     2
RS     1   STOR
SV     0    20.9    67.1     70
SE  1003    1006    1011    1012
SQ   0.0     0.0     0.0    1000
*
KK   P82   BASIN
BA 0.240
LG  0.23    0.25    4.70    0.37      37
UI    31     100     164     216     344     324     238     175     116      54
UI    40      23       9      10      10       0       0       0       0       0
UI     0       0       0       0       0       0       0       0       0       0

*
KK DOp82
KM  DIVERT OUT ALL 100 -6 Volume (26.1ac-ft)RETENTION
KM  THIS IS REMAINING DRAINS INTO MCDOWELL rOAD
DTOUT   26.1
DI     0    2000
DQ     0    2000
ZZ
```

SRB62

B98 retention





```
ID Palm Valley Phase 8 LOMR HEC-1 model
IDPrepared by: Del Rio Engineering
ID              10-3-06
ID       File Name: pv_p8_LOMR.dat
ID
*DIAGRAM
IT     5                    2000
KK   PC1   BASIN
BA 0.679
IN    15
PB 4.010
PC 0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
PC 0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
PC 0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
PC 0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
PC 0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
PC 0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
PC 0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
PC 0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
PC 0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
PC 0.983   0.986   0.989   0.992   0.995   0.998   1.000
LG  0.21    0.28    4.80    0.32      25
UI    65     125     272     355     439     564     809     666     526     421
UI   334     232     127     109      67      49      20      20      20      20
UI     0       0       0       0       0       0       0       0       0       0
UI     0       0       0       0       0       0       0       0       0       0
*
KK   PC2   BASIN
BA   .85
LG   .23     .25    3.85     .58   25.00
UI   73.    108.    279.    372.    445.    542.    732.    911.    719.    593.
UI  482.    391.    302.    174.    126.    104.     73.     45.     23.     23.
UI   23.     23.     23.      0.      0.      0.      0.      0.      0.      0.
UI    0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
*
KKCP_pc2
KM COMBINE ALL FLOWS At McDowell Road Retentin basin
HC     2
*
KK DOpc
KM  DIVERT OUT ALL 100 -6 Volume (154.0ac-ft)RETENTION EXCEPT LAST 60.0 AC-FT

KM  THIS IS REMAINING VOLUME TO BE RETAINED IN McDowell Rd.  BASINS

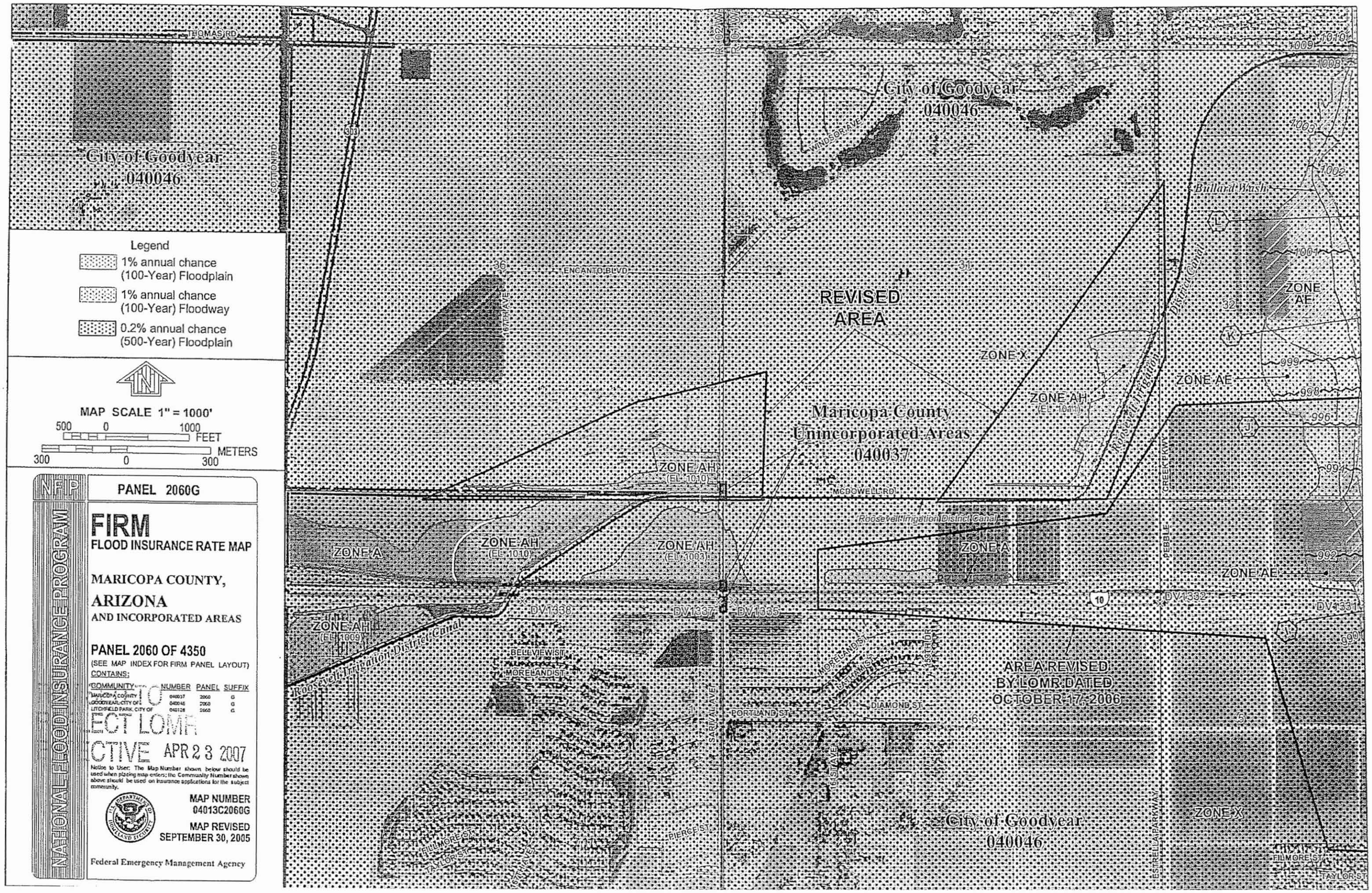
DTOUT   94.0
DI     0    2000
DQ     0    2000
*
KKRSPC2
KM       DETENTION BASIN ROUTING OPPERATION
KM      A LOW FLOW PIPE DRAINS BASIN TO THE SOUTH.

RS     1   STOR
SV     0    15.4    58.5    67.0
SE  1001    1003    1009    1010
SQ    10    10.0    55.0    1000
*
KK   PC3   BASIN
BA 0.948
LG  0.23    0.25    4.60    0.43      22
UI    35      35      35      35     101     125     146     168     183     195
UI   213     229     253     276     305     363     431     457     397     355
UI   321     296     278     252     228     212     192     173     163     136
```

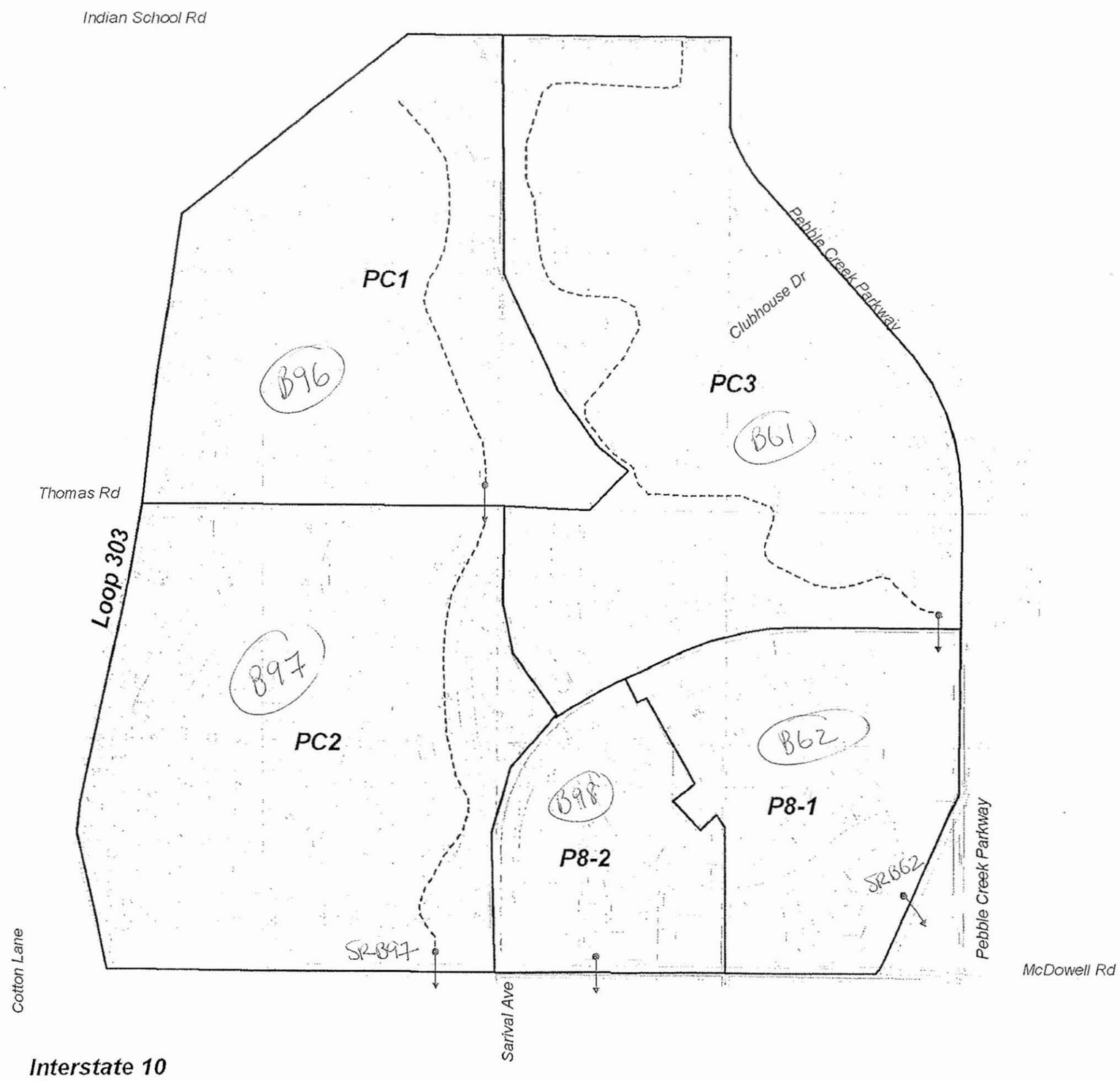
→ B97 Retention

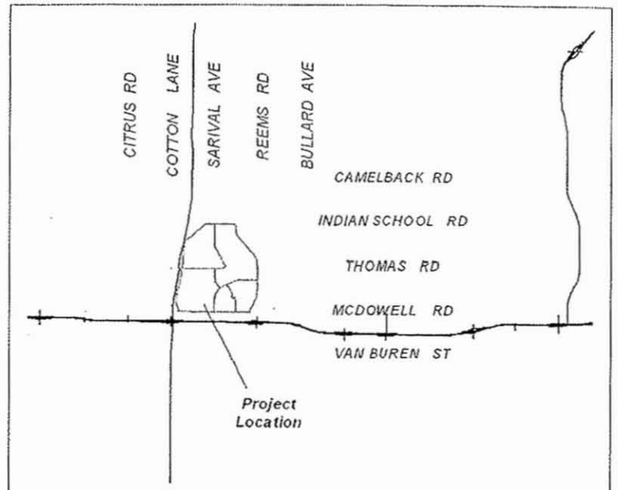
SR B97

B62


City of Goodyear
040046
Legend
1% annual chance (100-Year) Floodplain
1% annual chance (100-Year) Floodway
0.2% annual chance (500-Year) Floodplain
MAP SCALE 1" = 1000'
500 0 1000 FEET
300 0 300 METERS
NFIP
PANEL 2060G
FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY,
ARIZONA
AND INCORPORATED AREAS
PANEL 2060 OF 4350
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
MARICOPA COUNTY 040037 2060 G
GOODYEAR, CITY OF 040046 2060 G
LITCHFIELD PARK, CITY OF 040128 2060 G
EFFECT LOMR
EFFECTIVE APR 23 2007
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
04013C2060G
MAP REVISED
SEPTEMBER 30, 2005
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
THOMAS RD
COTTONWOOD
303
ENCANTO BLVD
67TH AVE
36
31
32
R 02 W
R 01 W
WINDSOR AVE
REVISED AREA
ZONE X
ZONE AH
(EL 1011)
Maricopa County
Unincorporated Areas
040037
ZONE AH
(EL 1010)
MCDOWELL RD
Roosevelt Irrigation District Canal
ZONE A
ZONE AH
(EL 1010)
ZONE AH
(EL 1003)
ZONE A
ZONE AE
DV1338
DV1337
DV1335
DV1332
DV1331
ZONE AH
(EL 1009)
BELLEVIEW ST
MORELAND ST
DIAMOND ST
PORTLAND ST
PIERCE ST
FILLMORE ST
TAYLOR ST
AREA REVISED
BY LOMR DATED
OCTOBER 17, 2006
City of Goodyear
040046
ZONE X
Bullard Wash
ZONE AE
ZONE AE
Roosevelt Irrigation District Canal
PEBBLE CREEK PKWY
ESTRELLA PARKWAY
1010
1009
1008
1003
1002
1001
999
998
996
994
992
990
L
K
J
10

Palm Valley
Phase 8




## Palm Valley Phase 8

**Exhibit 1**
**Onsite Drainage Area Map**

PC1 Basin ID
Basin Boundary
Flow Path
Concentration Point

Del Rio Eng

N

1" = 600'

600 0 600 1200 Feet

```
UI   105     86     62     62     58     58     46     35     35     35
UI    27     11     11     11     10     11     11     11     10     11
UI    11      0      0      0      0      0      0      0      0      0
UI     0      0      0      0      0      0      0      0      0      0
*
KK DOpc3 → RB61   (B61 Retention
KM  DIVERT OUT ALL 100 -6 Volume (68.2ac-ft)RETENTION EXCEPT LAST 17.0 AC-FT

KM  THIS IS REMAINING VOLUME TO BE RETAINED IN RID CANAL BASIN.  BASINS

DTOUT   68.2
DI     0    2000
DQ     0    2000
*
KK   P81   BASIN
BA 0.380
LG  0.21    0.27    4.80    0.33      26
UI    43     108     202     260     345     513     421     330     250     183
UI    96      71      44      26      13      13      13       0       0       0
UI     0       0       0       0       0       0       0       0       0       0
*
KKCP8-1
KM COMBINE ALL FLOWS At RID canal Retentin basin
HC     2
*
KKRS_1
KM       DETENTION BASIN ROUTING OPPERATION RID CANAL Basin

KO     2
RS     1   STOR
SV     0    20.9    67.1     70
SE  1003    1006    1011    1012
SQ   0.0     0.0     0.0    1000
*
KK   P82   BASIN
BA 0.240
LG  0.23    0.25    4.70    0.37      37
UI    31     100     164     216     344     324     238     175     116      54
UI    40      23       9      10      10       0       0       0       0       0
UI     0       0       0       0       0       0       0       0       0       0

*
KK DOp82
KM  DIVERT OUT ALL 100 -6 Volume (26.1ac-ft)RETENTION
KM  THIS IS REMAINING DRAINS INTO MCDOWELL ROAD
DTOUT   26.1
DI     0    2000
DQ     0    2000
ZZ
```

SRB62

B98 retention





```
ID Palm Valley Phase 8 LOMR HEC-1 model
IDPrepared by: Del Rio Engineering
ID              10-3-06
ID       File Name: pv_p8_LOMR.dat
ID
*DIAGRAM
IT     5                    2000
KK   PC1   BASIN
BA 0.679
IN    15
PB 4.010
PC 0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
PC 0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
PC 0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
PC 0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
PC 0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
PC 0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
PC 0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
PC 0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
PC 0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
PC 0.983   0.986   0.989   0.992   0.995   0.998   1.000
LG  0.21    0.28    4.80    0.32      25
UI    65     125     272     355     439     564     809     666     526     421
UI   334     232     127     109      67      49      20      20      20      20
UI     0       0       0       0       0       0       0       0       0       0
UI     0       0       0       0       0       0       0       0       0       0
*
KK   PC2   BASIN
BA   .85
LG   .23     .25    3.85     .58   25.00
UI   73.    108.    279.    372.    445.    542.    732.    911.    719.    593.
UI  482.    391.    302.    174.    126.    104.     73.     45.     23.     23.
UI   23.     23.     23.      0.      0.      0.      0.      0.      0.      0.
UI    0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
*
KKCP_pc2
KM COMBINE ALL FLOWS At McDowell Road Retentin basin
HC     2
*                                                    → B97 Retention
KK DOpc
KM  DIVERT OUT ALL 100 -6 Volume (154.0ac-ft)RETENTION EXCEPT LAST 60.0 AC-FT

KM  THIS IS REMAINING VOLUME TO BE RETAINED IN McDowell Rd.  BASINS

DTOUT   94.0
DI     0    2000
DQ     0    2000
*
KKRSPC2
KM       DETENTION BASIN ROUTING OPPERATION
KM      A LOW FLOW PIPE DRAINS BASIN TO THE SOUTH.

RS     1   STOR
SV     0    15.4    58.5    67.0
SE  1001    1003    1009    1010
SQ    10    10.0    55.0    1000
*
KK   PC3   BASIN
BA 0.948
LG  0.23    0.25    4.60    0.43      22
UI    35      35      35      35     101     125     146     168     183     195
UI   213     229     253     276     305     363     431     457     397     355
UI   321     296     278     252     228     212     192     173     163     136
```

SR B97

B63

Palm V - Hwy
McDowell / Pebble Creek

B64

# This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B65

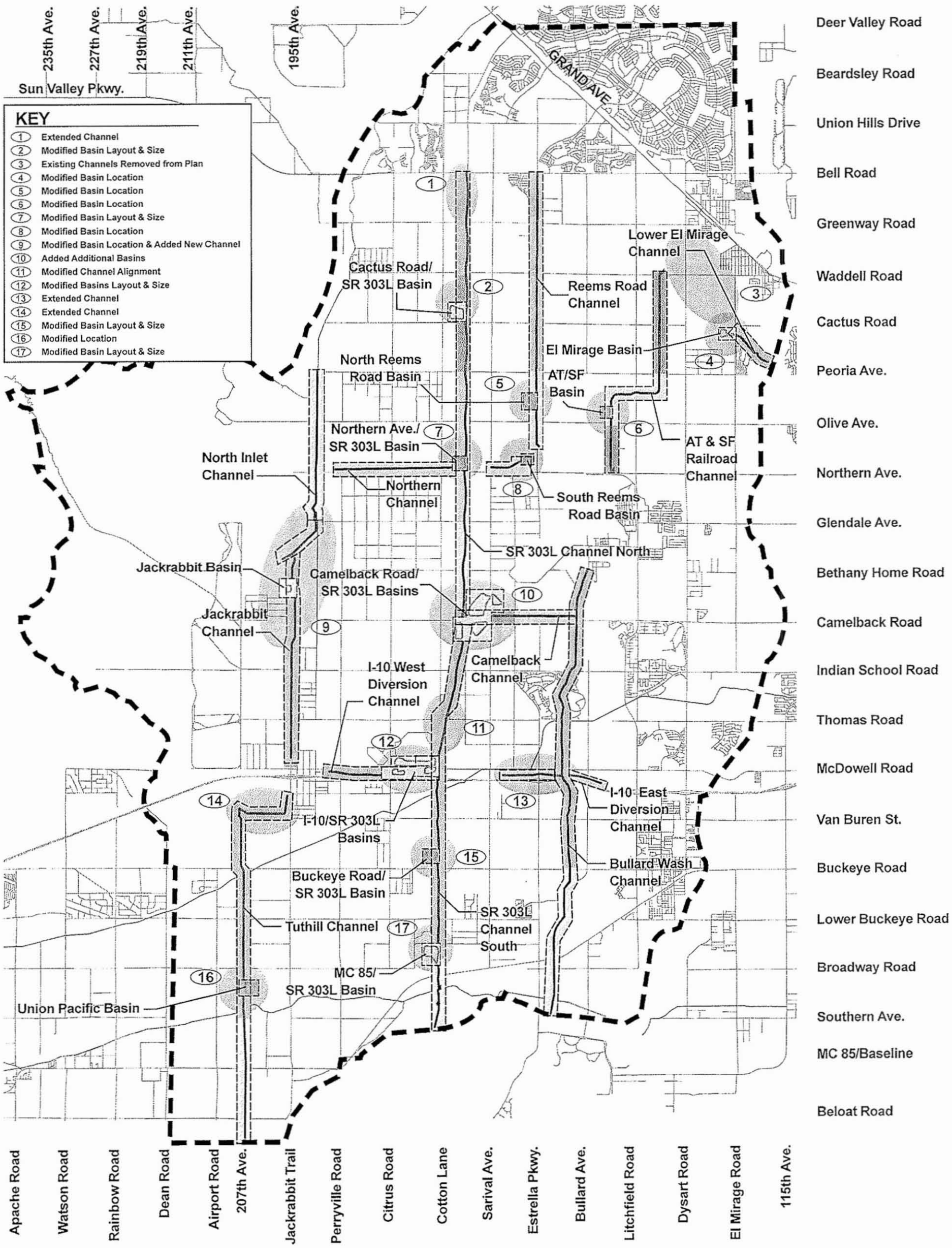
**DB65RE**
**(From Bullard Wash Channel and Detention Basins hydrology for Future Conditions L303/WT ADMPU by Wood Patel dated February 2007)**

```
KK  DBD1S
KM  DIVERT TO EAST AND WEST OFF-LINE BASIN
KM  Diversion Rating Curve
KO     1
DT  DIBD1O
DI     0   1000   1370   1900   2500   3000   3611   4000
DQ     0      0      0    268    717   1114   1608   1899
```

W28, S70, L72, B65, D69
L09, L13, L19, L27, L34

**Table 2.4B**
**Proposed Basin Summary**
**Existing Condition Hydrology**

| Channel/ Location ID | Qin (cfs) | Qout (cfs) | Vin (ac-ft) | Peak Storage (ac-ft) | Max. Vol. Provided (ac-ft) | Peak Stage (ft) | on/off line | Combined Total Outflow (cfs) | Length Low-Flow Basin Drain (ft) | Prop. Bot. Elev. (ft) | Prop. Top Elev. (ft) | Design FB (ft) | Actual FB (ft) | Backwater |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Jackrabbit Channel* | | | | | | | | | | | | | | |
| SRJR1 (N. of Camelback) | 850 | 65 | 42 | 41.5 | 43.9 | 1185.5 | off-line | 151 | 8,323 | 1,173.5 | 1,186.0 | 0.0 | 0.5 | ----- |
| *Tuthill Channel* | | | | | | | | | | | | | | |
| SRTC5 (@ RxR) | 1,646 | 550 | 109 | 108.5 | 108.5 | 898.0 | off-line | 618 | 4,390 | 890.0 | 898.0 | 0.0 | -0.6 | ----- |
| *I-10 Channel West* | | | | | | | | | | | | | | |
| SR10W7 | 1593 | 741 | 282 | 85.2 | 85.2 | 1022.0 | on-line | N/A | 2,487 | 1,010.5 | 1,022.0 | 0.0 | 0.0 | ----- |
| *L303 Channel* | | | | | | | | | | | | | | |
| SRLP2 (Cactus Road) | 2311 | 311 | 543 | 440 | 440.0 | 1212.0 | off-line | 587 | 5,630 | 1,197.0 | 1,212.0 | 0.0 | 0.0 | ----- |
| SRLP5 (Northern) | 4241 | 442 | 354 | 334 | 333.0 | 1141.0 | off-line | 1380 | 6,934 | 1,126.0 | 1,141.0 | 0.0 | 0.0 | ----- |
| SRLP8 (Camelback) | 2102 | 340 | 1081 | 705.9 | 700.0 | 1065.0 | on-line | N/A | 14,062 | 1,059.0 | 1,065.0 | 0.0 | 0.0 | ----- |
| SRLP12 (I-10) | 1781 | 701 | 1166 | 591.5 | 590.0 | 1016.0 | on-line | N/A | 4,961 | 1,001.0 | 1,016.0 | 0.0 | 0.0 | ----- |
| SRLP14 (Yuma/Buckeye) | 695 | 523 | 823 | 189.0 | 190.0 | 968.0 | on-line | N/A | 4,092 | 959.0 | 968.0 | 0.0 | 0.0 | ----- |
| SRLP16 (MC85) | 751 | 448 | 938 | 325.0 | 325.0 | 913.0 | on-line | N/A | 2,872 | 903.0 | 913.0 | 0.0 | 0.0 | ----- |
| *Reems/Northern Channel* | | | | | | | | | | | | | | |
| SRRM5 (Olive) | 1,752 | 198 | 189 | 165.0 | 165.0 | 1134.0 | off-line | 818 | 1,449 | 1,127.0 | 1,134.0 | 0.0 | 0.0 | ----- |
| BSNR6(Northern) | 477 | 0 | 55 | 55.0 | 61.1 | 1107.5 | in-line | 0 | 1,413 | 1,095.0 | 1,108.5 | 0.0 | 1.2 | ----- |
| *AT&SF Railroad Channel* | | | | | | | | | | | | | | |
| SRRR7 (@Olive) | 1,770 | 1285 | 331 | 81.3 | 142.7 | 1105.6 | off-line | 1439 | 1,832 | 1,097.5 | 1,111.5 | 0.0 | 6.1 | ----- |
| *Lower El Mirage Channel* | | | | | | | | | | | | | | |
| (SRLE4 SW corner of Cactus and El Mirage) | 1,312 | 813 | 191 | 56.9 | 80.0 | 1111.4 | off-line | 852 | 2,069 | 1,104.5 | 1,114.0 | 0.0 | 2.1 | ----- |
| *Bullard Wash* | | | | | | | | | | | | | | |
| SRBD1S (I-10 and Bullard Wash) | 2682 | 2011 | 813 | 134.9 | 138.0 | 990.2 | off-line | 575 - ADOT | 4,390 | 978.5 | 990.2 | 0.0 | -0.2 | ----- |
| | | | | | | | | 2239 - BLRD | | | | | | |




# Basin & Channel Locations

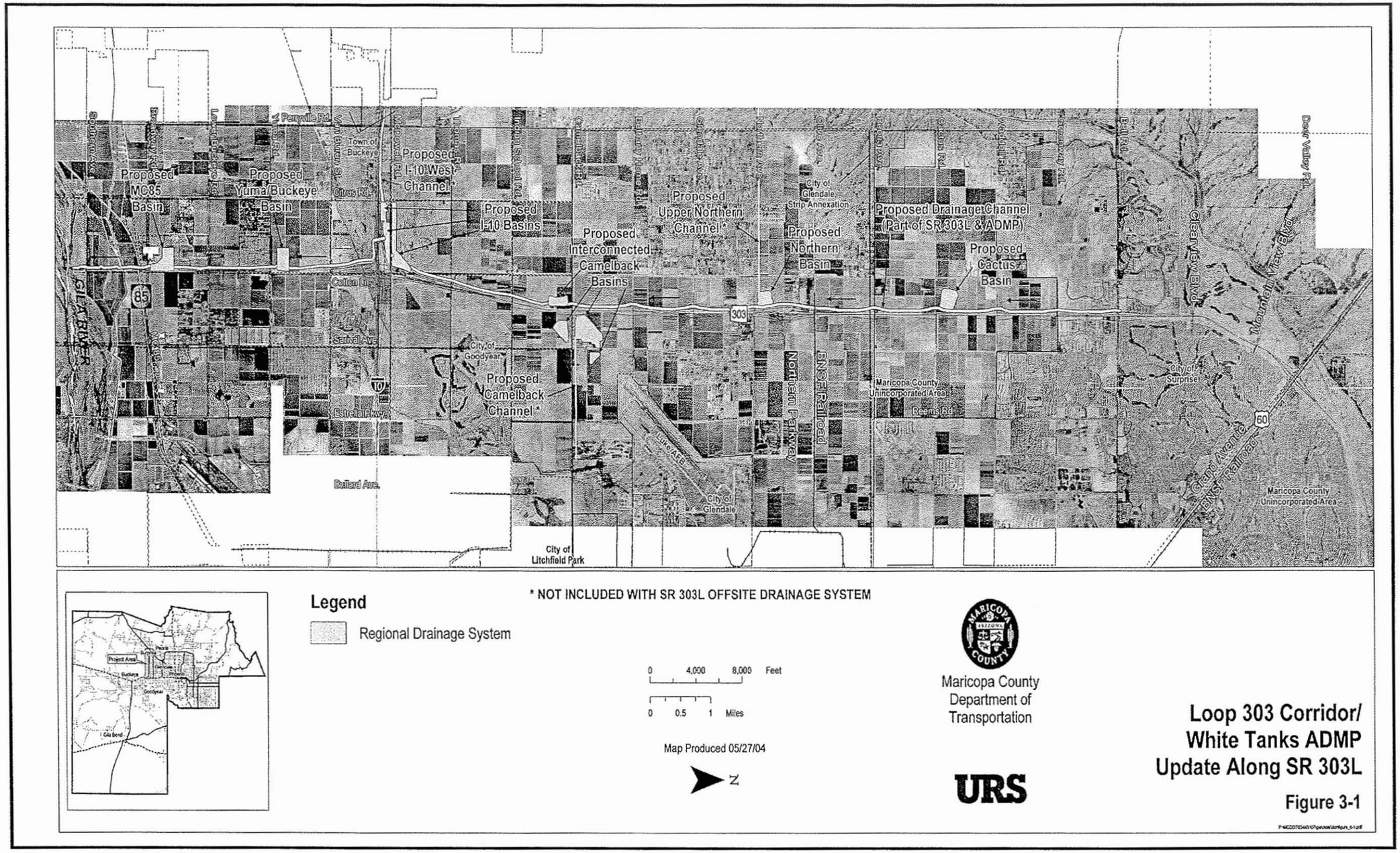



Figure 3 - Loop 303 Corridor/White Tanks ADMP Update Along SR303L

## Table 2.2A
## Proposed Channel Summary
## Existing Condition Hydrology

| Channel Name | Concentration Point | Qexist | [1]Approximate Qcap (cfs) | DS Invert (ft) | WSEL (ft) | Flow Depth (ft) | Channel Depth (ft) | Bottom Width (ft) | Side Slope (H:V) | Design s (ft/ft) | (Q/A) V ft/s | Froude Number $F_N$ | Channel [3]Tw (ft) | (WSEL) [3]Tw (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Camelback Channel* | | | | | | | | | | | | | | |
| | !CM2 | 372 | 372 | 1052.7 | 1056.5 | 3.8 | 4.7 | 5 | (6:1) | *0.0020* | 3.6 | 0.44 | 132 | 51 |
| | !CM3 | 485 | 485 | 1047.5 | 1051.8 | 4.2 | 5.4 | 5 | (6:1) | *0.0020* | 3.8 | 0.45 | 143 | 57 |
| | !CM4 | 783 | 783 | 1040.7 | 1044.8 | 4.1 | 6.3 | 26 | (4:1) | *0.0020* | 4.5 | 0.46 | 152 | 59 |
| *Jackrabbit Channel* | | | | | | | | | | | | | | |
| | !JR1 | 953 | 953 | 1177.1 | 1182.6 | 5.5 | 6.9 | 5 | (6:1) | *0.0021* | 4.6 | 0.47 | 167 | 71 |
| | !JR2 | 813 | 813 | 1165.0 | 1169.3 | 4.3 | 5.3 | 15 | (6:1) | *0.0025* | 4.7 | 0.51 | 154 | 67 |
| | !JR3 | 933 | 933 | 1147.4 | 1150.4 | 4.0 | 4.4 | 15 | (6:1) | *0.0046* | 6.1 | 0.61 | 140 | 51 |
| | !JR4 | 1,324 | 1,324 | 1109.9 | 1114.3 | 4.4 | 4.4 | 25 | (6:1) | *0.0035* | 5.9 | 0.61 | 153 | 78 |
| | !JR5 | 1,683 | 1,683 | 1080.3 | 1084.6 | 4.3 | 4.3 | 40 | (6:1) | *0.0033* | 6.0 | 0.60 | 171 | 92 |
| *SR303L URS DCR - Channel* | | | | | | | | | | | | | | |
| | !LP0 | 772 | 772 | 1275.6 | 1279.0 | 3.4 | 5.5 | 10 | (2:1) | *0.0049* | 13.7 | 1.57 | 62 | 24 |
| | !LP | 854 | 854 | 1247.9 | 1251.5 | 3.5 | 5.4 | 10 | (2:1) | *0.0050* | 14.3 | 1.61 | 62 | 24 |
| | !LP1 | 1,612 | 1,612 | 1227.3 | 1232.5 | 5.1 | 5.9 | 12 | (2:1) | *0.0031* | 14.1 | 1.33 | 66 | 33 |
| *Cactus Road Basin* | !LP2 | 2,898 | 2,898 | 1209.8 | 1215.9 | 6.0 | 6.1 | 20 | (2:1) | *0.0026* | 15.0 | 1.26 | 74 | 44 |
| *offline low flow/bypass channel* | 2LP2 | 587 | 587 | 1200.0 | 1202.6 | 2.5 | 4.8 | 20 | (2:1) | *0.0026* | 9.3 | 1.14 | 69 | 30 |
| | !LP3 | 2,140 | 2,140 | 1180.8 | 1185.9 | 5.0 | 5.1 | 21 | (2:1) | *0.0027* | 13.8 | 1.26 | 71 | 41 |
| | !LP4 | 2,636 | 2,636 | 1160.7 | 1165.9 | 5.2 | 5.2 | 26 | (2:1) | *0.0025* | 14.1 | 1.24 | 77 | 47 |
| | !LP5 | 2,624 | 2,636 | 1136.3 | 1141.5 | 5.2 | 5.2 | 26 | (2:1) | *0.0025* | 14.0 | 1.23 | 77 | 47 |
| *offline low flow/bypass channel* | 2LP5 | 1,380 | 1,380 | 1130.4 | 1133.8 | 3.4 | 3.7 | 26 | (2:1) | *0.0032* | 12.5 | 1.32 | 71 | 40 |
| | !LP6 | 1,539 | 1,539 | 1110.0 | 1115.1 | 5.1 | 6.4 | 16 | (2:1) | *0.0020* | 11.6 | 1.07 | 72 | 36 |
| | !LP7 | 1,770 | 1,770 | 1087.1 | 1092.2 | 5.0 | 6.2 | 19 | (2:1) | *0.0021* | 12.1 | 1.10 | 74 | 39 |
| | !LP8 | 2,097 | 2,097 | 1065.8 | 1070.7 | 4.9 | 6.1 | 26 | (2:1) | *0.0020* | 12.1 | 1.09 | 80 | 46 |
| | !LP9 | 557 | 557 | 1047.9 | 1052.2 | 4.2 | 4.3 | 5 | (2:1) | *0.0023* | 9.8 | 1.08 | 52 | 22 |
| | !LP10 | 624 | 624 | 1032.4 | 1036.1 | 3.7 | 3.7 | 5 | (2:1) | *0.0052* | 13.7 | 1.58 | 50 | 20 |
| | !LP11 | 988 | 988 | 1014.5 | 1019.2 | 4.7 | 5.7 | 5 | (2:1) | *0.0047* | 14.8 | 1.56 | 58 | 24 |
| | !LP13 | 697 | 701 | 984.8 | 988.5 | 3.6 | 3.8 | 8 | (2:1) | *0.0041* | 12.7 | 1.45 | 53 | 23 |
| | !LP14 | 695 | 701 | 966.2 | 969.7 | 3.5 | 3.7 | 8 | (2:1) | *0.0048* | 13.5 | 1.54 | 53 | 22 |
| | !LP15 | 676 | 676 | 934.2 | 937.7 | 3.4 | 4.2 | 8 | (2:1) | *0.0048* | 13.3 | 1.54 | 55 | 22 |
| | !LP16 | 751 | 751 | 914.8 | 918.3 | 3.5 | 4.2 | 8 | (2:1) | *0.0056* | 14.5 | 1.67 | 55 | 22 |
| | !LP17 | 447 | 448 | 884.3 | 888.7 | 4.3 | 5.5 | 5 | (2:1) | *0.0013* | 7.6 | 0.82 | 57 | 23 |
| *Upper Northern Channel* | | | | | | | | | | | | | | |
| | !NR1 | 256 | 256 | 1219.0 | 0.0 | 2.7 | 3.6 | 5 | (6:1) | *0.0050* | 4.6 | 0.66 | 115 | 37 |
| | !NR2 | 1,309 | 1,309 | 1182.2 | 1186.3 | 4.0 | 4.1 | 30 | (6:1) | *0.0039* | 6.1 | 0.65 | 155 | 79 |
| | !NR3 | 2,246 | 2,246 | 1143.5 | 1148.5 | 5.0 | 5.0 | 45 | (6:1) | *0.0028* | 6.0 | 0.56 | 189 | 105 |
| | !NR4 | 2,308 | 2,308 | 1136.0 | 1141.0 | 5.0 | 5.0 | 50 | (6:1) | *0.0025* | 5.8 | 0.54 | 195 | 110 |
| *Lower Northern Channel* | !NR5 | 262 | 262 | 1122.6 | 1125.9 | 3.3 | 4.3 | 5 | (6:1) | *0.0020* | 3.3 | 0.43 | 126 | 45 |
| | !NR6 | 477 | 477 | 1096.7 | 1100.2 | 3.4 | 4.5 | 5 | (6:1) | *0.0053* | 5.5 | 0.71 | 129 | 47 |
| *Reems Road Channel* | | | | | | | | | | | | | | |
| | [2]RM1 | 709 | 516 | 1222.1 | 1226.6 | 4.5 | 5.7 | 6.5 | (3:1) | *0.0040* | 5.8 | 0.63 | 105 | 34 |
| | [2]RM2 | 957 | 1,382 | 1208.2 | 1214.3 | 6.0 | 7.7 | 11.5 | (4:1) | *0.0032* | 6.5 | 0.60 | 147 | 60 |
| | !RM3 | 1,366 | 1,366 | 1167.8 | 1172.0 | 4.1 | 4.2 | 30 | (6:1) | *0.0037* | 6.0 | 0.63 | 157 | 80 |
| | !RM4 | 1,640 | 1,640 | 1142.7 | 1147.7 | 5.0 | 5.0 | 30 | (6:1) | *0.0025* | 5.5 | 0.53 | 169 | 90 |
| | !RM5 | 2,179 | 2,179 | 1119.4 | 1124.6 | 5.1 | 5.2 | 40 | (6:1) | *0.0027* | 6.0 | 0.57 | 185 | 102 |
| | !RM6 | 826 | 826 | 1100.6 | 1105.0 | 4.3 | 5.3 | 10 | (6:1) | *0.0034* | 5.3 | 0.59 | 148 | 63 |

## Table 2.2A (continued)
## Proposed Channel Summary
## Existing Condition Hydrology

| Channel Name | Concentration Point | Qexist | [1]Approximate Qcap (cfs) | DS Invert (ft) | WSEL (ft) | Flow Depth (ft) | Channel Depth (ft) | Bottom Width (ft) | Side Slope (H:V) | Design s (ft/ft) | (Q/A) V ft/s | Froude Number $F_N$ | Channel [3]Tw (ft) | (WSEL) [3]Tw (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *AT&SF Railroad Channel* | | | | | | | | | | | | | | |
| | !RR1 | 425 | 425 | 1150.8 | 1154.5 | 3.6 | 3.9 | 10 | (6:1) | *0.0020* | 3.7 | 0.44 | 126 | 54 |
| | !RR2 | 492 | 492 | 1146.2 | 1149.7 | 3.4 | 3.5 | 10 | (6:1) | *0.0035* | 4.7 | 0.58 | 120 | 52 |
| | !RR3 | 785 | 785 | 1127.9 | 1131.9 | 4.0 | 4.0 | 10 | (6:1) | *0.0046* | 5.9 | 0.68 | 127 | 58 |
| | !RR4 | 936 | 936 | 1110.1 | 1114.4 | 4.3 | 4.3 | 15 | (6:1) | *0.0034* | 5.4 | 0.59 | 139 | 67 |
| | !RR5 | 970 | 970 | 1103.3 | 1108.5 | 5.2 | 5.2 | 15 | (6:1) | *0.0015* | 4.0 | 0.41 | 153 | 77 |
| | !RR6 | 1,733 | 1,733 | 1098.8 | 1105.5 | 6.7 | 6.7 | 15 | (6:1) | *0.0015* | 4.7 | 0.42 | 176 | 95 |
| | !RR7 | 1,770 | 1,770 | 1095.1 | 1101.9 | 6.8 | 6.8 | 15 | (6:1) | *0.0015* | 4.7 | 0.42 | 178 | 97 |
| | !RR8 | 1,585 | 1,585 | 1081.1 | 1086.9 | 5.8 | 5.8 | 15 | (6:1) | *0.0025* | 5.5 | 0.53 | 162 | 85 |
| *Lower El Mirage Channel* | | | | | | | | | | | | | | |
| | !LE4 | 1,356 | 1,356 | 1107.2 | 1111.9 | 4.7 | 6.8 | 35 | (3:1) | *0.0026* | 5.9 | 0.54 | 151 | 63 |
| | !LE5 | 865 | 865 | 1086.6 | 1090.6 | 4.0 | 5.1 | 15 | (6:1) | *0.0038* | 5.6 | 0.63 | 152 | 63 |
| *Bullard Wash Channel* | | | | | | | | | | | | | | |
| | !BD1N | 2,103 | 2,103 | 1057.0 | 1047.3 | 5.2 | 7.0 | 45 | (6:1) | *0.0020* | 5.3 | 0.49 | 219 | 109 |
| | !BD2N | 3,244 | 3,244 | 1044.1 | 1049.8 | 5.7 | 7.8 | 65 | (6:1) | *0.0020* | 5.8 | 0.49 | 258 | 133 |
| | !BD3N | 3,410 | 3,410 | 1015.6 | 1020.7 | 5.0 | 6.7 | 65 | (10:1) | *0.0027* | 5.9 | 0.56 | 312 | 167 |
| | !BD4N | 3,248 | 3,410 | 1005.0 | 1010.8 | 4.7 | 6.4 | 102 | (9:1) | *0.0018* | 5.0 | 0.47 | 335 | 188 |
| | !BD1S | 3,556 | 3,556 | 985.5 | 990.4 | 4.9 | 6.4 | 90 | (6:1) | *0.0025* | 6.1 | 0.55 | 269 | 149 |
| | !BD2S | 2,321 | 2,321 | 980.9 | 984.4 | 3.5 | 3.8 | 95 | (6:1) | *0.0033* | 5.8 | 0.60 | 235 | 137 |
| *I-10 West Diversion Channel* | | | | | | | | | | | | | | |
| | !10W1 | 970 | 970 | 1045.8 | N/A | 3.8 | 4.5 | 25 | (6:1) | *0.0035* | 5.4 | 0.60 | 155 | 71 |
| | !10W2 | 1,010 | 1,010 | 1039.7 | 1043.4 | 3.7 | 4.2 | 25 | (6:1) | *0.0042* | 5.9 | 0.66 | 150 | 69 |
| | !10W3 | 1,046 | 1,046 | 1032.7 | 1036.5 | 3.7 | 4.1 | 25 | (6:1) | *0.0042* | 5.9 | 0.66 | 148 | 71 |
| | !10W4 | 1,175 | 1,175 | 1028.5 | 1032.4 | 3.8 | 4.3 | 30 | (6:1) | *0.0038* | 5.8 | 0.63 | 158 | 77 |
| | !10W5 | 1,588 | 1,588 | 1014.6 | 1018.9 | 4.3 | 5.0 | 35 | (6:1) | *0.0036* | 6.1 | 0.62 | 175 | 87 |
| | !10W7 | 1,593 | 1,593 | 1014.6 | 1019.6 | 5.0 | 5.7 | 35 | (6:1) | *0.0020* | 5.0 | 0.48 | 186 | 95 |
| | !10W8 | 743 | 743 | 1005.8 | 1010.5 | 4.6 | 5.5 | 10 | (6:1) | *0.0020* | 4.2 | 0.46 | 151 | 66 |
| *Tuthill Channel* | | | | | | | | | | | | | | |
| | !TC1 | 1,417 | 1,417 | 998.7 | 1003.5 | 4.7 | 5.8 | 20 | (6:1) | *0.0037* | 6.2 | 0.63 | 168 | 78 |
| | !TC2 | 1,553 | 1,553 | 991.8 | 997.1 | 5.2 | 6.1 | 25 | (6:1) | *0.0023* | 5.3 | 0.51 | 180 | 89 |
| | !TC3 | 1,491 | 1,491 | 957.0 | 961.9 | 4.8 | 5.1 | 25 | (6:1) | *0.0029* | 5.7 | 0.57 | 163 | 84 |
| | !TC4 | 1,546 | 1,546 | 914.7 | 919.3 | 4.6 | 4.6 | 30 | (6:1) | *0.0032* | 5.9 | 0.59 | 163 | 85 |
| | !TC5 | 1,926 | 1,926 | 886.8 | 891.4 | 4.6 | 4.6 | 40 | (6:1) | *0.0033* | 6.3 | 0.61 | 176 | 95 |
| | !TC6 | 646 | 646 | 882.3 | 885.9 | 3.6 | 3.6 | 15 | (6:1) | *0.0035* | 5.0 | 0.59 | 128 | 58 |
| | !TC7 | 1,323 | 1,323 | 863.6 | 867.8 | 4.1 | 4.2 | 45 | (6:1) | *0.0020* | 4.6 | 0.47 | 176 | 95 |
| | !TC8 | 1,506 | 1,506 | 859.4 | 864.6 | 5.2 | 5.2 | 45 | (6:1) | *0.0011* | 3.8 | 0.35 | 192 | 107 |
| | !TC9 | 1,503 | 1,506 | 854.8 | 860.1 | 5.3 | 5.3 | 45 | (6:1) | *0.0010* | 3.7 | 0.34 | 193 | 109 |
| *I-10 East Diversion Channel* | | | | | | | | | | | | | | |
| | 10CE-US | 575 | 575 | 984.5 | 988.6 | 4.1 | 4.5 | 12 | (6:1) | *0.0019* | 3.9 | 0.44 | 138 | 61 |
| | 10CE1 | 556 | 575 | 978.5 | 985.2 | 4.1 | 4.5 | 12 | (6:1) | *0.0018* | 3.8 | 0.43 | 138 | 62 |
| *I-10 Central Channel* | | | | | | | | | | | | | | |
| | !10C1 | 79 | 79 | 1005.4 | 1007.7 | 2.2 | 2.3 | 2 | (6:1) | *0.0020* | 2.4 | 0.40 | 90 | 29 |
| | !10C2 | 131 | 131 | 1002.6 | 1005.3 | 2.7 | 2.7 | 2 | (6:1) | *0.0020* | 2.8 | 0.41 | 96 | 34 |
| | !10C3 | 170 | 170 | 995.9 | 998.9 | 3.0 | 3.0 | 2 | (6:1) | *0.0020* | 2.9 | 0.42 | 101 | 38 |
| | !10C4 | 243 | 243 | 982.2 | 985.5 | 3.2 | 3.3 | 2 | (6:1) | *0.0026* | 3.6 | 0.49 | 105 | 41 |

1. By normal depth computation.
2. Channel reach exists.
3. Top width.

B65

```
1**************************************
*                                    *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
*          JUN   1998                *
*         VERSION 4.1                *
*                                    *
*  RUN DATE   18APR07  TIME  11:52:52 *
*                                    *
*     **********************************
```

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

```
X    X  XXXXXXX   XXXXX          X
X    X  X        X    X         XX
X    X  X        X              X
XXXXXXX  XXXX     X        XXXXX X
X    X  X        X              X
X    X  X        X    X         X
X    X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL  LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   1          ID
   2          ID      ******************************************************************
   3          ID      The Basins North of I-10 on each side of Bullard Wash are Modified
   4          ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2007
   5          ID      ******************************************************************
   6          ID
   7          ID      ******************************************************************
   8          ID      The Basin at Northeast Corner of I-10 and Bullard Wash Is Modified
   9          ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2006
  10          ID      ******************************************************************
  11          ID
  12          ID         DRAFT PREFERRED ALTERNATIVE LEVEL III
  13          ID
  14          ID         INCORPORATE ALTERNATIVE #3 FROM CHANGE ORDER #14 INTO
  15          ID         SR 303L OFFSITE FLOOD CONTROL FACILITY - NORTHERN AND CACTUS
  16          ID         BASINS ARE NOW OFFLINE WITH MULTIPLE BASINS LOCATED WITHIN
  17          ID         LUKE AIR FORCE BASE CRASH ZONE AREA
  18          ID
  19          ID         **ADOT BASIN GEOMETRY REPRESENTS MOST RECENT 2' CONTOURS**
  20          ID         WHITE TANKS AREA DRAINAGE MASTER STUDY *UPDATE*
  21          ID         Original MODEL BY THE WLB Group for FCDMC AS PART OF THE WHITE
  22          ID         TANKS/AGUA FRIA ADMS, Date: October 1991
  23          ID
  24          ID         REVISED HYDROLOGY HEC-1 RUN FOR WHITE TANKS ADMS
  25          ID         100-YEAR, 24-HOUR STORM                  original file: WTADMS.24
  26          ID
  27          ID                                     REVISED BY URS     DATE: 01-14-04
  28          ID                                                        FILE: L33PE4H.DAT
  29          ID
  30          ID       NOTES:
  31          ID       1. THIS HEC-1 MODEL CONTAINS THE FOLLOWING SUPER BASINS: WHITE TANKS 3,
  32          ID          2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2 & 3, 4 THRU 26.
  33          ID       2. REVISED TO REFLECT UPDATED SOILS MAPS AND NEW DEVELOPMENT.
  34          ID       3. AVERAGE XKSAT VALUES FOR EACH SUBBASIN WAS RECEIVED FROM FCDMC
  35          ID          GIS DATA AND THEN ADJUSTED FOR VEGETATION, OR LEFT AS ORIGINALLY IN
  36          ID          THE WLB MODEL.
  37          ID       4. FOR NEW DEVELOPMENTS ONLY 80% OF REPORTED PROVIDED RETENTION
  38          ID          WAS INCLUDED IN THIS MODEL (AS A CONSERVATIVE ESTIMATE). RETENTION
  39          ID          CAPACITIES WERE ESTIMATED BY EEC FOR DEVELOPMENTS WITH NO
  40          ID          DRAINAGE REPORTS.
  41          ID       5. REVISED DRAINAGE BOUNDARIES BASED UPON FIELD INSPECTION OF SUN CITY.
  42          ID          GRAND.  COMBINED SEVERAL BASINS TOGETHER TO MAKE NEW BASINS 114 &115.
  43          ID          ALSO REROUTED SUBBASINS 100A, 101, 102A AND 106 TO THE SOUTH TO 113A.
  44          ID       6. CHANNEL ROUTE ALONG REEMS ROAD UPDATED TO REFLECT NEW CONSTRUCTION.
  45          ID       7. REVISED SCS TYPE II RAINFALL DISTRIBUTION FOR THE 24-HOUR GENERAL
  46          ID          STORM.
  47          ID       8. REVISED RAINFALL DEPTH-AREA REDUCTION FACTORS.
  48          ID       9. PSIF WERE ADJUSTED BASED ON THE VALUES OF XKSAT AND WERE EDITED INTO
  49          ID          THE DATA FILE BY THE FCDMC.
  50          ID      10. AVERAGE XKSAT VALUES FOR SUBBASINS WITH BORROW PITS (WHITE TANKS
  51          ID          AREAS #3 & #4) WERE ESTIMATED BY EEC.
  52          ID
              *DIAGRAM
  53          IT       5                    600
  54          IO       5
```

1 HEC-1 INPUT PAGE 2

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  55          IN      15
  56          JD    4.03     .001
  57          PC    .000     .002     .005     .008     .011     .014     .017     .020     .023     .026
  58          PC    .029     .032     .035     .038     .041     .044     .048     .052     .056     .060
  59          PC    .064     .068     .072     .076     .080     .085     .090     .095     .100     .105
```

```
                 * KK288OUT
                 * KM      DIVERSION-RETENTION
                 * DT288RET   24.55
                 * DI     0   10000
                 * DQ     0   10000

5514             KK    R288
5515             KM        ROUTE FLOW FROM CP288 TO CP286
5516             RS       3              -1
5517             RC    .035    .035    .075    1500   .0033
5518             RX    1000    1001    1002    1040    1055    1280    1849    1850
5519             RY     997     997     997     996     996     998    1000    1000
                 *

5520             KK     287
5521             KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 287
5522             KM    The flow combined with Bullard Wash before divert into the offline basin
5523             BA     .23
5524             LG     .50     .00    5.20     .41     .00
5525             UI     15.     15.     39.     63.     77.     89.    103.    121.    158.    194.
5526             UI    165.    138.    120.    102.     87.     74.     56.     36.     27.     25.
5527             UI     18.     15.     11.      5.      5.      5.      5.      5.      5.      5.
5528             UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
5529             UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                 *

5530             KK  DT10C4
5531             KM   DIVERT WEST HALF OF SUB BASIN 287 TO !10C4
5532             DT  DI10C4
5533             DI       0     500    1000    5000   10000
5534             DQ       0     250     500    2500    5000
                 *

5535             KK   !BD1S
5536             KM    ADD HYDROGRAPHS AT CP286
5537             KO       1
5538             HC       3   44.87
                 *
                 *  STORAGE ROUTE I-10 BASIN
                 * DIVERT PER ALTERNATIVE 12-17-01 - OFFLINE BASIN - @BD1S
                 *
                 * ******************************************************************
                 * ***OFF-LINE BASINS ARE MODIFIED PER HECRAS LATERAL WEIR RATINGS ***
                 * ******************************************************************
                 *
                 * REVISED FOR OFF-LINE DETENTION BASINS ON EAST AND WEST SIDES
                 *

5539             KK   DBD1S
5540             KM   DIVERT TO EAST AND WEST OFF-LINE BASIN
5541             KM   Diversion Rating Curve
5542             KO       1
5543             DT  DIBD1O
5544             DI       0    1000    1370    1900    2500    3000    3611    4000
```

DB65BN



```
LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.....9......10

5545             DQ       0       0       0     268     717    1114    1608    1899
                 *
                 * KK DBD1S
                 * KM DIVERT TO OFF-LINE BASINS
                 * KM Diversion Rating Curve       Modified
                 * DTDIBD1S
                 *     DI     0     500     800    1400    1746    2192    2717    3307    3952
                 *     DQ     0       0       0       0     196     492     867    1307    1802
                 *

5546             KK   RBD1S
5547             KM   Routing BY-PASS Flow
5548             RS     2.8              -1.0     0.0
5549             RC   0.030   0.030   0.030    5229  0.0026
5550             RX     0.0    34.2    53.2    72.2    91.2   110.2   129.2   163.4
5551             RY   990.7   985.0   985.0   985.0   985.0   985.0   985.0   990.7
                 *
                 *
```

BG565B

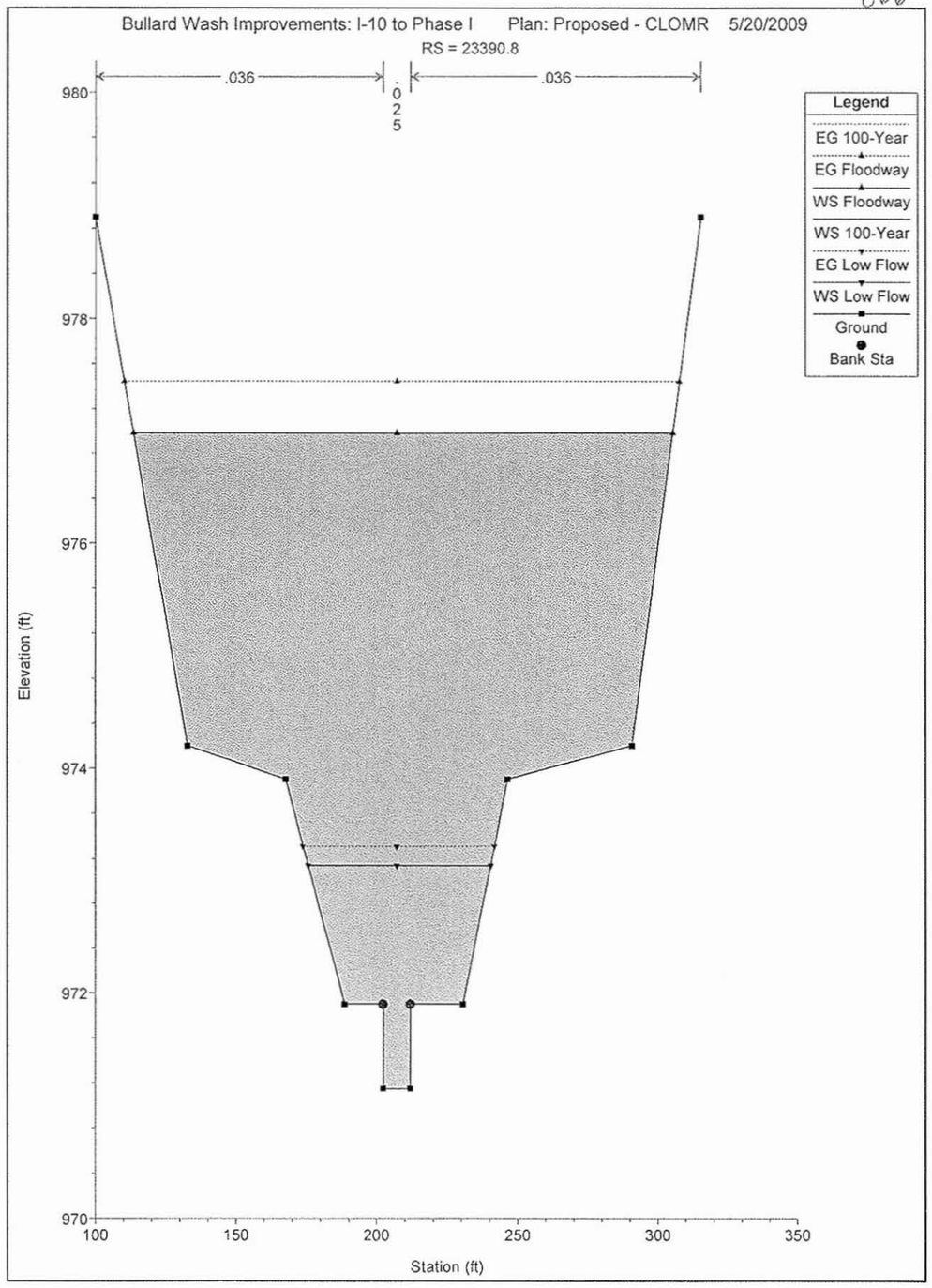
```
                 * ************************************************************************
                 * ***THE FOLLOWING SECTION TAKEN FROM NEW SUPER BASIN 5  WITH NEW SOILS*****
                 * ************************************************************************
                 *

5552             KK     283
5553             KM   BASIN 283
5554             KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
5555             KM    L=          .8  LCa=        .3    S=   11.2  Kn= .120  LAG=  63.5
5556             KM    AGRICULTURAL S-GRAPH WAS USED FOR THIS BASIN
5557             BA     .14
5558             LG     .50     .00    4.80     .47     .00
5559             UI      8.      8.     11.     17.     32.     46.     43.     58.     60.     67.
5560             UI     67.     67.     63.     56.     59.     54.     42.     47.     33.     30.
5561             UI     24.     23.     23.     15.     13.     12.     10.     10.      7.      7.
5562             UI      7.      5.      5.      5.      5.      3.      1.      1.      1.      1.
5563             UI      1.      1.      1.      1.      1.      1.      1.      1.      1.      1.
5564             UI      1.      1.      1.      1.      1.      1.      0.      0.      0.      0.
5565             UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                 * KK283OUT
                 * KM      DIVERSION-RETENTION
                 * DT283RET   13.54
                 * DI     0   10000
                 * DQ     0   10000

5566             KK    R283
```

B66

B66


Bullard Wash Improvements: I-10 to Phase I Plan: Proposed - CLOMR 5/20/2009
RS = 23390.8
.036
.025
.036
Legend
EG 100-Year
EG Floodway
WS Floodway
WS 100-Year
EG Low Flow
WS Low Flow
Ground
Bank Sta
Elevation (ft)
980
978
976
974
972
970
100
150
200
250
300
350
Station (ft)

B66

```
1**********************************
*                                *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          JUN   1998            *
*        VERSION 4.1             *
*                                *
*  RUN DATE   18APR07  TIME  11:52:52   *
*                                *
*     ******************************
```

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

```
X     X  XXXXXXX   XXXXX          X
X     X  X       X     X        XX
X     X  X       X               X
XXXXXXX  XXXX    X       XXXXX   X
X     X  X       X               X
X     X  X       X     X         X
X     X  XXXXXXX   XXXXX        XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL  LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
1                                   HEC-1 INPUT                                   PAGE  1

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

    1           ID
    2           ID      ******************************************************************
    3           ID      The Basins North of I-10 on each side of Bullard Wash are Modified
    4           ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2007
    5           ID      ******************************************************************
    6           ID
    7           ID      ******************************************************************
    8           ID      The Basin at Northeast Corner of I-10 and Bullard Wash Is Modified
    9           ID      ADOT Basin Is Eliminated.  Wood/Patel, February 2006
   10           ID      ******************************************************************
   11           ID
   12           ID         DRAFT PREFERRED ALTERNATIVE LEVEL III
   13           ID
   14           ID         INCORPORATE ALTERNATIVE #3 FROM CHANGE ORDER #14 INTO
   15           ID         SR 303L OFFSITE FLOOD CONTROL FACILITY - NORTHERN AND CACTUS
   16           ID         BASINS ARE NOW OFFLINE WITH MULTIPLE BASINS LOCATED WITHIN
   17           ID         LUKE AIR FORCE BASE CRASH ZONE AREA
   18           ID
   19           ID         **ADOT BASIN GEOMETRY REPRESENTS MOST RECENT 2' CONTOURS**
   20           ID         WHITE TANKS AREA DRAINAGE MASTER STUDY *UPDATE*
   21           ID         Original MODEL BY THE WLB Group for FCDMC AS PART OF THE WHITE
   22           ID         TANKS/AGUA FRIA ADMS, Date: October 1991
   23           ID
   24           ID         REVISED HYDROLOGY HEC-1 RUN FOR WHITE TANKS ADMS
   25           ID         100-YEAR, 24-HOUR STORM                  original file: WTADMS.24
   26           ID
   27           ID                                     REVISED BY URS     DATE: 01-14-04
   28           ID                                                        FILE: L33PE4H.DAT
   29           ID
   30           ID        NOTES:
   31           ID        1. THIS HEC-1 MODEL CONTAINS THE FOLLOWING SUPER BASINS: WHITE TANKS 3,
   32           ID           2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2 & 3, 4 THRU 26.
   33           ID        2. REVISED TO REFLECT UPDATED SOILS MAPS AND NEW DEVELOPMENT.
   34           ID        3. AVERAGE XKSAT VALUES FOR EACH SUBBASIN WAS RECEIVED FROM FCDMC
   35           ID           GIS DATA AND THEN ADJUSTED FOR VEGETATION, OR LEFT AS ORIGINALLY IN
   36           ID           THE WLB MODEL.
   37           ID        4. FOR NEW DEVELOPMENTS ONLY 80% OF REPORTED PROVIDED RETENTION
   38           ID           WAS INCLUDED IN THIS MODEL (AS A CONSERVATIVE ESTIMATE). RETENTION
   39           ID           CAPACITIES WERE ESTIMATED BY EEC FOR DEVELOPMENTS WITH NO
   40           ID           DRAINAGE REPORTS.
   41           ID        5. REVISED DRAINAGE BOUNDARIES BASED UPON FIELD INSPECTION OF SUN CITY.
   42           ID           GRAND.  COMBINED SEVERAL BASINS TOGETHER TO MAKE NEW BASINS 114 &115.
   43           ID           ALSO REROUTED SUBBASINS 100A, 101, 102A AND 106 TO THE SOUTH TO 113A.
   44           ID        6. CHANNEL ROUTE ALONG REEMS ROAD UPDATED TO REFLECT NEW CONSTRUCTION.
   45           ID        7. REVISED SCS TYPE II RAINFALL DISTRIBUTION FOR THE 24-HOUR GENERAL
   46           ID           STORM.
   47           ID        8. REVISED RAINFALL DEPTH-AREA REDUCTION FACTORS.
   48           ID        9. PSIF WERE ADJUSTED BASED ON THE VALUES OF XKSAT AND WERE EDITED INTO
   49           ID           THE DATA FILE BY THE FCDMC.
   50           ID       10. AVERAGE XKSAT VALUES FOR SUBBASINS WITH BORROW PITS (WHITE TANKS
   51           ID           AREAS #3 & #4) WERE ESTIMATED BY EEC.
   52           ID
                *DIAGRAM
   53           IT       5                    600
   54           IO       5
1                                   HEC-1 INPUT                                   PAGE  2

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   55           IN      15
   56           JD    4.03    .001
   57           PC    .000    .002    .005    .008    .011    .014    .017    .020    .023    .026
   58           PC    .029    .032    .035    .038    .041    .044    .048    .052    .056    .060
   59           PC    .064    .068    .072    .076    .080    .085    .090    .095    .100    .105
```

```
5684          KK   R10C3
5685          KM        ROUTE REMAINDER  FROM CP285 TO CP287
5686          RS      2.4          -1.0      0.0
5687          RC    0.030    0.030    0.030    2590  0.0026
5688          RX        0     25.8     26.1     26.4     26.7       27     27.3     53.1
5689          RY   1000.2    995.9    995.9    995.9    995.9    995.9    995.9   1000.2
              *

5690          KK  DR10C4
              * KO     1                                21
5691          KM   ONE HALF SUB BASIN 287 DIRECTED TO !10C4
5692          DR  DI10C4

5693          KK   !10C4
              * KO     1                                21
5694          KM        ADD HYDROGRAPHS AT CP287
5695          HC        2   38.16
              * KK CP287

5696          KK   !BD2S
              * KO     1                                21
5697          KM   ADD HYDROGRAPHS AT CP287
5698          HC        2   46.36
              * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5699          KK   RBD2S
5700          KM   ROUTE BD2S TO BD3S
5701          RS      1.0          -1.0      0.0
5702          RC    0.030    0.030    0.030    1312  0.0028
5703          RX      0.0     28.2     47.2     66.2     85.2    104.2    123.2    151.4
5704          RY    985.8    981.1    981.1    981.1    981.1    981.1    981.1    985.8
              * RS      1                -1        0
              * RC   0.03      .03     0.03     3750  0.0032
              * RX   1000     1024     1040     1056     1072     1088     1104     1128
              * RY   1100     1096     1096     1096     1096     1096     1096     1100
              *
```

B65B66



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5705          KK     298
5706          KM   BASIN 298
5707          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
5708          KM    L=       1.1  Lca=      .5   S=    20.4  Kn= .088  LAG=  57.1
5709          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
5710          BA     .84
5711          LG     .36      .10     4.80      .44    16.00
5712          UI     50.      50.      92.     179.     229.     264.     296.     340.     389.     484.
5713          UI    626.     577.     480.     419.     371.     318.     278.     240.     194.     133.
5714          UI     88.      83.      79.      50.      50.      34.      15.      15.      15.      15.
5715          UI     15.      15.      15.      15.       0.       0.       0.       0.       0.       0.
5716          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.

5717          KK  298OUT
5718          KM    Divert Retention in Subbasin 298
5719          DT  298RET    27.5
5720          DI        0   10000
5721          DQ        0   10000
              * KK CP298

5722          KK   !BD3S
5723          KM        ADD HYDROGRAPHS AT CP298
5724          HC        2   47.20
              * REMOVED PER CHANNEL
              * KK SR298
              * KM      STORAGE ROUTE THROUGH CP298
              * RS      1    STOR        0        0
              * SV      0     .08     7.03     9.28    32.19    53.97
              * SQ      0       0        0        0     2881     8075
              * SE 975.5     976      978    978.3      980      981
              * KK  R298
              * PER LEVEL III PRELIMINARY-DRAFT PREFERRED ALTERNATIVE

5725          KK   RBD3S
5726          KM   ROUTE FLOW FROM CP298 TO CP316
5727          RS      3.8          -1.0      0.0
5728          RC    0.030    0.030    0.030    5362  0.0026
5729          RX        0     18.8     58.8     98.8    138.8    178.8    218.8    237.6
5730          RY    975.2    970.5    970.5    970.5    970.5    970.5    970.5    975.2
              * RS      6               -1        0
              * RC    .03      .03      .03     5280  0.0028
              * RX   1000     1030   1044.8   1059.6   1074.4   1089.2     1104     1134
              * RY    980      975      975      975      975      975      975      980
              *

5731          KK     316
5732          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 316
5733          BA     .82
5734          LG     .50      .00     5.40      .38      .00
5735          UI     33.      33.      33.      43.     108.     125.     151.     165.     181.     195.
5736          UI    212.     236.     255.     293.     363.     410.     409.     352.     314.     286.
5737          UI    264.     243.     217.     198.     180.     163.     147.     121.      94.      65.
5738          UI     58.      55.      54.      48.      33.      33.      33.      24.      10.      10.
5739          UI     10.      10.      10.      10.      10.      10.      10.      10.      10.      10.
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

5740          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
5741          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
```

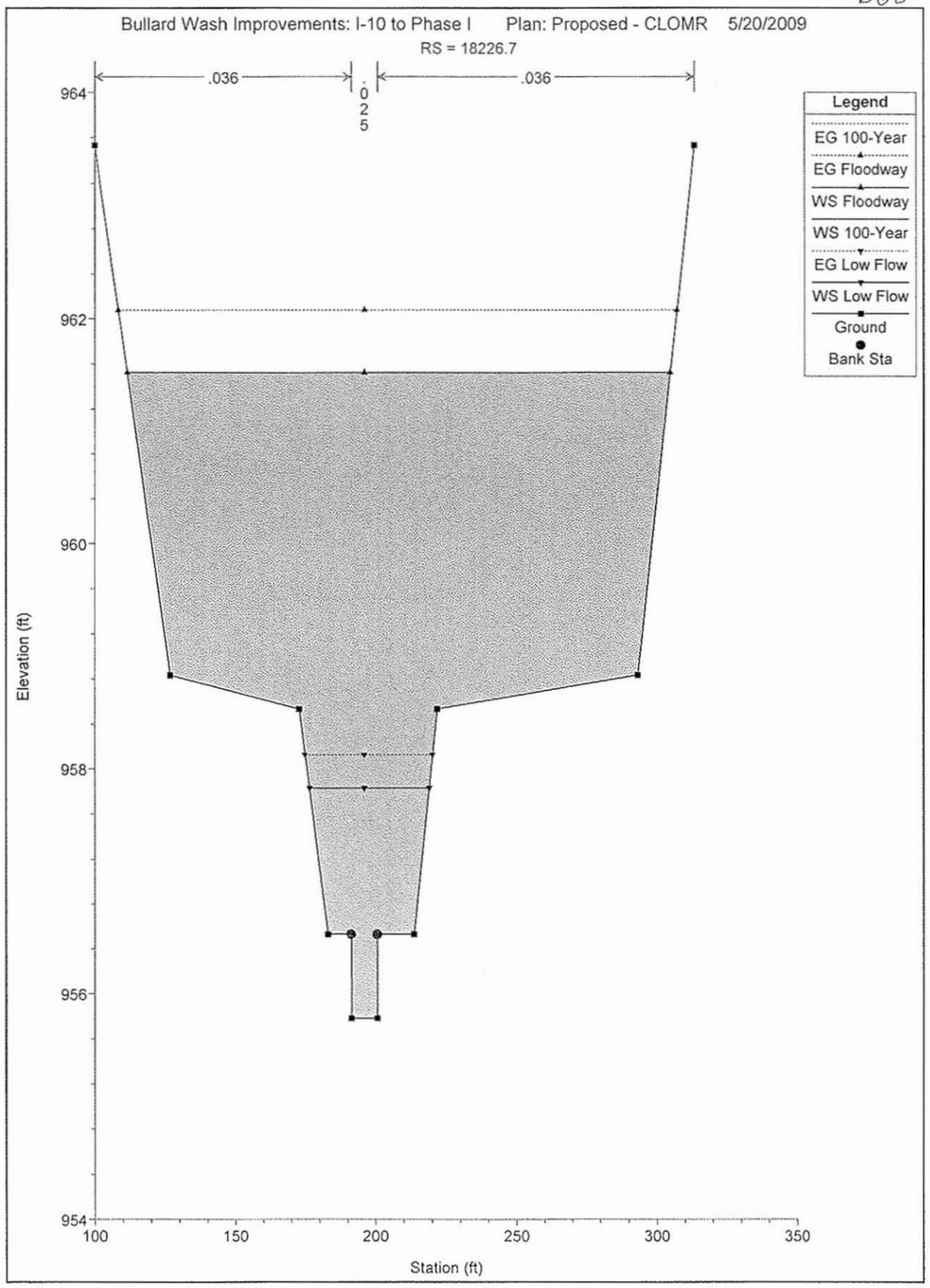
B67

# This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

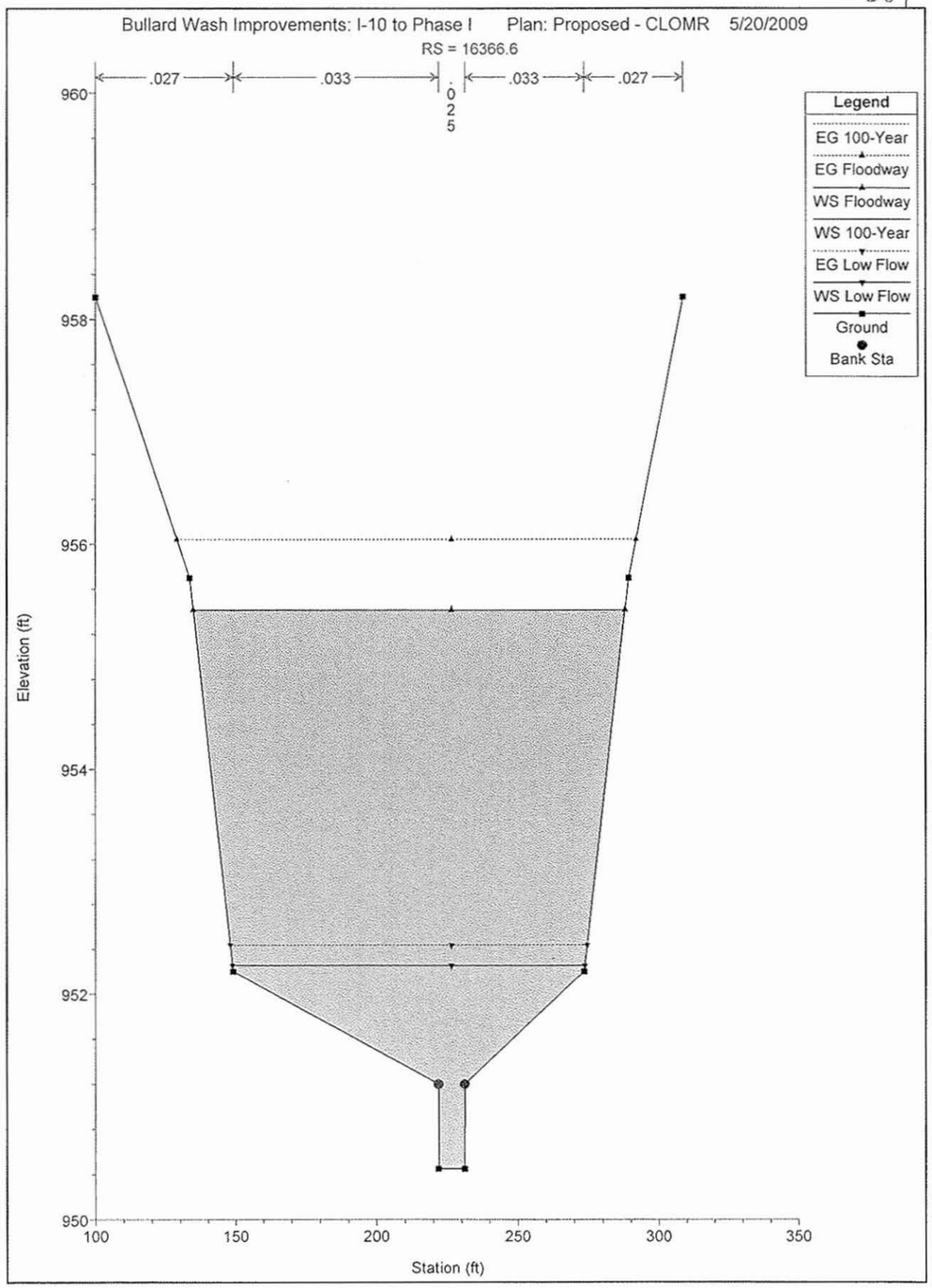
B68

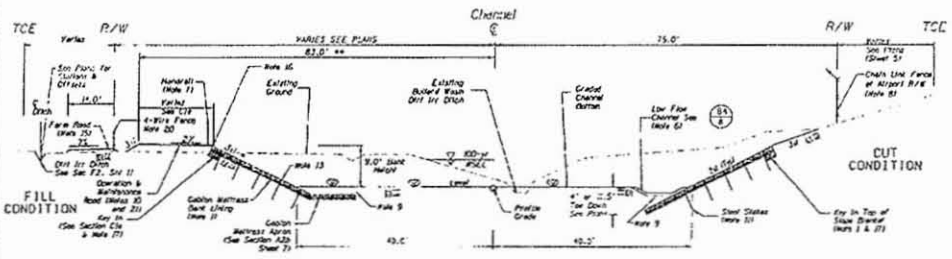
BG8

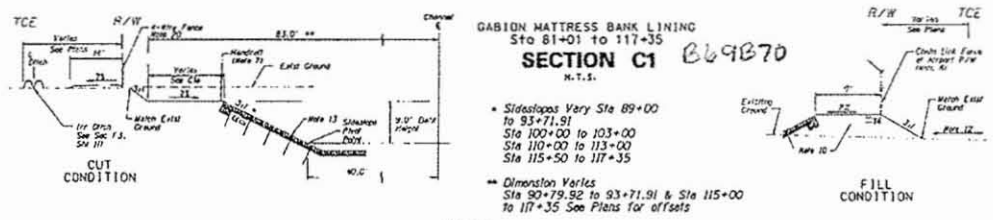

Bullard Wash Improvements: I-10 to Phase I Plan: Proposed - CLOMR 5/20/2009
RS = 18226.7
.036
.025
.036
Legend
EG 100-Year
EG Floodway
WS Floodway
WS 100-Year
EG Low Flow
WS Low Flow
Ground
Bank Sta
Elevation (ft)
964
962
960
958
956
954
100
150
200
250
300
350
Station (ft)

B69

B69


Bullard Wash Improvements: I-10 to Phase I Plan: Proposed - CLOMR 5/20/2009
RS = 16366.6
.027
.033
.025
.033
.027
Legend
EG 100-Year
EG Floodway
WS Floodway
WS 100-Year
EG Low Flow
WS Low Flow
Ground
Bank Sta
Elevation (ft)
960
958
956
954
952
950
100
150
200
250
300
350
Station (ft)




GABION MATTRESS BANK LINING
Sta 81+01 to 117+35

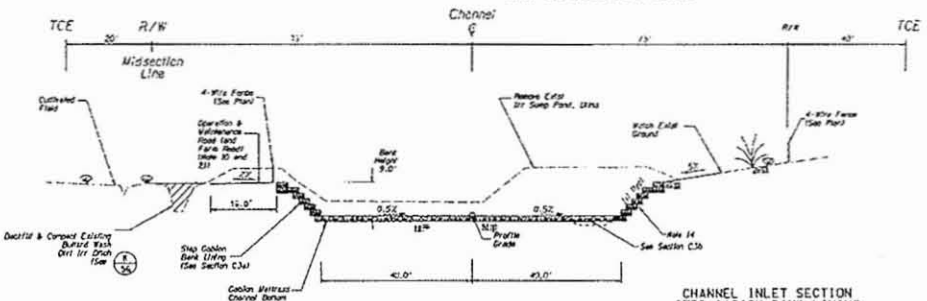
**SECTION C1**

H.T.S.

B69B70

* Sideslopes Vary Sta 89+00 to 93+71.91
Sta 100+00 to 103+00
Sta 110+00 to 113+00
Sta 115+50 to 117+35

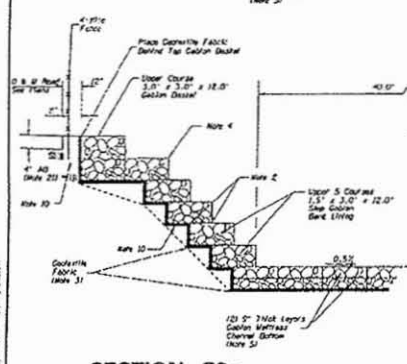
** Dimension Varies
Sta 90+79.92 to 93+71.91 & Sta 115+00 to 117+35 See Plans for offsets



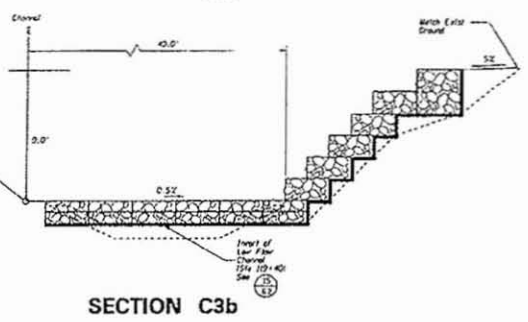

CHANNEL INLET SECTION
STEP GABION BANK LINING
Sta 119+43 to 121+95

**SECTION C3**

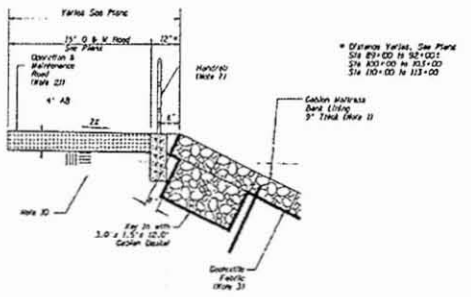
H.T.S.



**SECTION C3a**

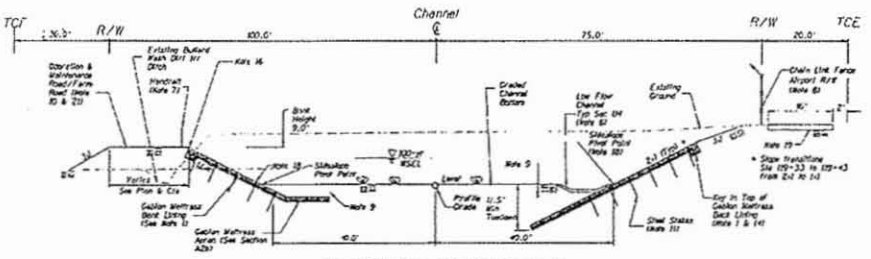


**SECTION C3b**



FOR SECTION C1 & C2

**SECTION C1a**




Sta 117+35 to 119+43 (Typical)

**SECTION C2**

H.T.S.

NOTES

1) Riprap filled, Gabion Mattress Bank Lining with, 9" x 6" x 12" basket size. Key in top of slope mattress gabions with 3.0' x 1.5' x 12" gabion baskets filled w/rounded river rock See Specifications.

2) All edges of gabions are connected to adjacent gabion baskets.

3) Geotextile fabric to be installed under all slope mattress gabions and aprons. Fabric shall be installed behind and under step gabion baskets See special provisions for burst strength, permeability and burst strength.

4) Banks lined with riprap filled gabion baskets, stacked with 50-percent overlap, 36" x 36" x 12" basket size except upper course, on geotextile fabric. (See Sec C3a)

5) Channel bottom lined with 2 layers of 9" x 6" x 12" gabion mattress, filled w/rounded river rock D 14.5 inches

6) Low flow channel lined with, 6-inch thick concrete. See Sec D4, SH 8.

7) Handrail will be installed 8' behind channel fencing left bank only. See Detail 5 and 5A and Detail 7c and 5S for baseline.

8) Chain link fence (AAC Std 360) is to be installed along Airport R/W only. Barbed wire top angled away from Airport. See Detail 7c and 5S for baseline.

9) Overexcavate in base of apron, gabion mattress, or gabion basket. Geotextile over apron to channel invert, compact to 85%. Compact base under low flow channel to 95%

10) Geotextile behind each course of gabion baskets, compact to 95%. Compact O & M road subgrade to 95%. Compact Embankment to 95%

11) Steel stakes are 1-inch outer diameter, 4-foot long, perforated steel pipe. See Detail 5G.

12) Sideslope transitions on Airport property to be arranged by Contractor. Contact Steven Arave, with Phoenix Goodyear Airport.

13) Section C1 includes transitions which vary from 2:1 to 3:1 sideslopes, see plan for locations.

14) Install counterfort Sta 119+43 (L) & R1 See Detail 5A, SH 53.

15) Construct Farm Road Sta 91+10 to 117+40 only.

16) Area between O & M Road and gabions varies in width (see section C1 & C2).

17) Install counterforts at Sta 81+01 U & R1, See Detail 5A, SH 53.

18) Section C2 includes sideslope transitions which vary from 2:1 to 1:1 Sta 119+33 to 119+43 (See Plans).

19) Construct new 4" AC, 16' wide airport perimeter road Sta 116+68 to 119+161 Compact AB and subgrade to 95%.

20) Install 4-wire fence, sta 90+95± to 119+33.

21) Install 4" thick AB over all operation & maintenance roads. Compact AB to 95%

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 4 | | | |
| 3 | | | |
| 2 | | | |
| 1 | | | |

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ENGINEERING DIVISION

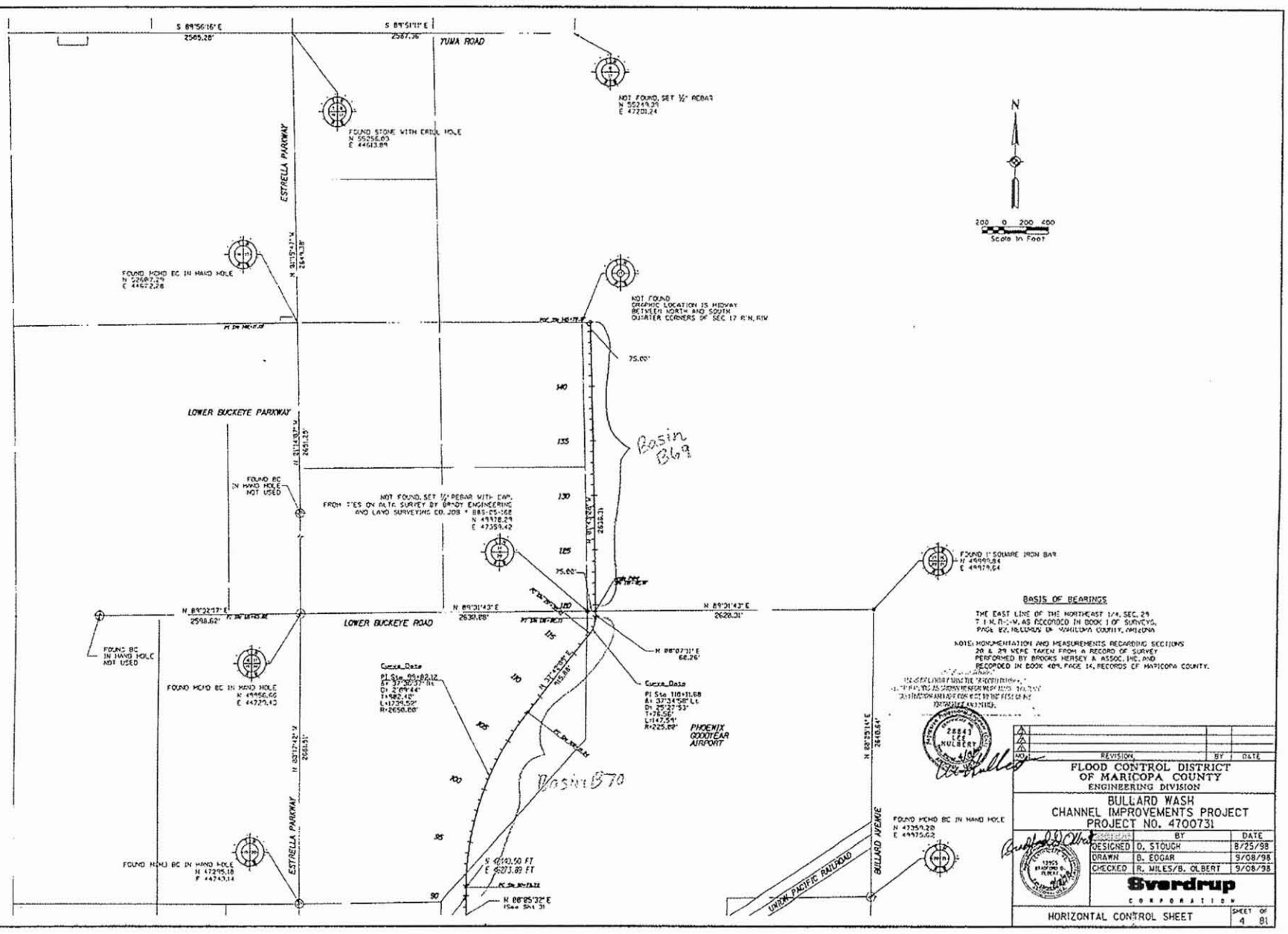
BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731

| | BY | DATE |
|---|---|---|
| DESIGNED | D. STOUGH | 6/25/98 |
| DRAWN | B. EDGAR | 9/08/98 |
| CHECKED | R. MILES/B. OLBERT | 9/08/98 |

Sverdrup
CORPORATION

CHANNEL TYPICAL SECTIONS
C1, C2 and C3

SHEET 9 OF 81



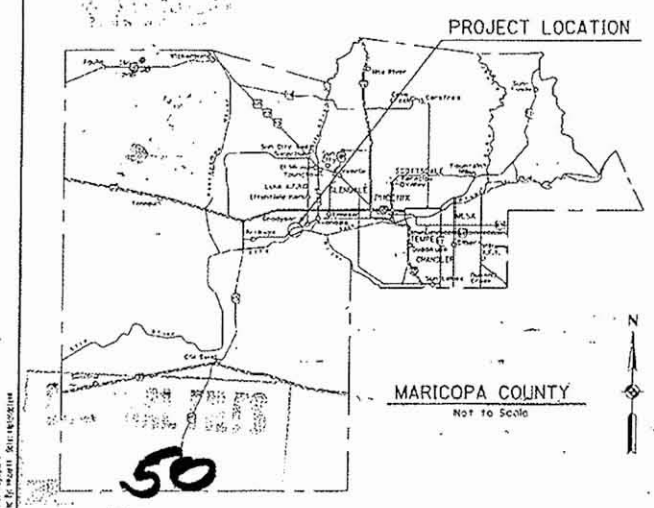

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

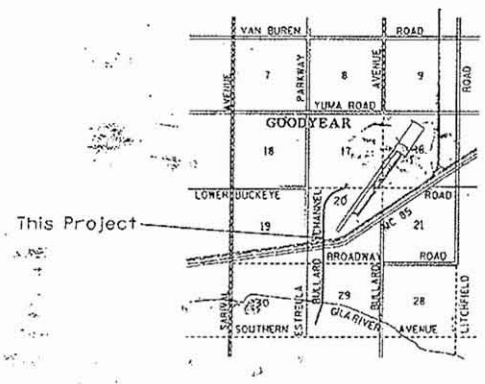
PLANS FOR THE CONSTRUCTION OF:

## BULLARD WASH CHANNEL IMPROVEMENTS PROJECT

CONTRACT NO. 98-15

PROJECT CONTROL NO. 4700731




IN COOPERATION WITH:
CITY OF GOODYEAR

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

CITY OF GOODYEAR — DATE

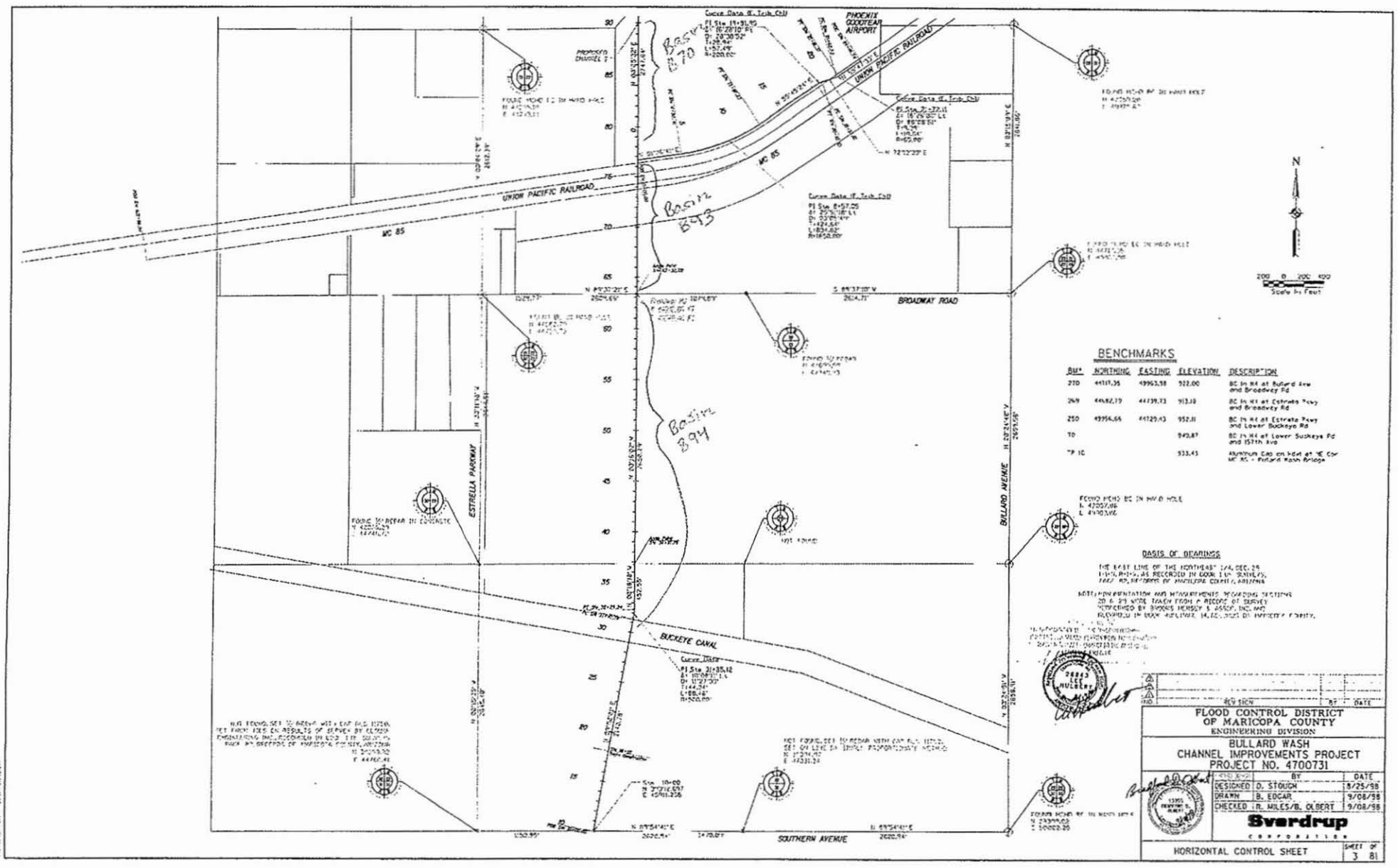
BUCKEYE IRRIGATION DISTRICT — DATE 7/10/98

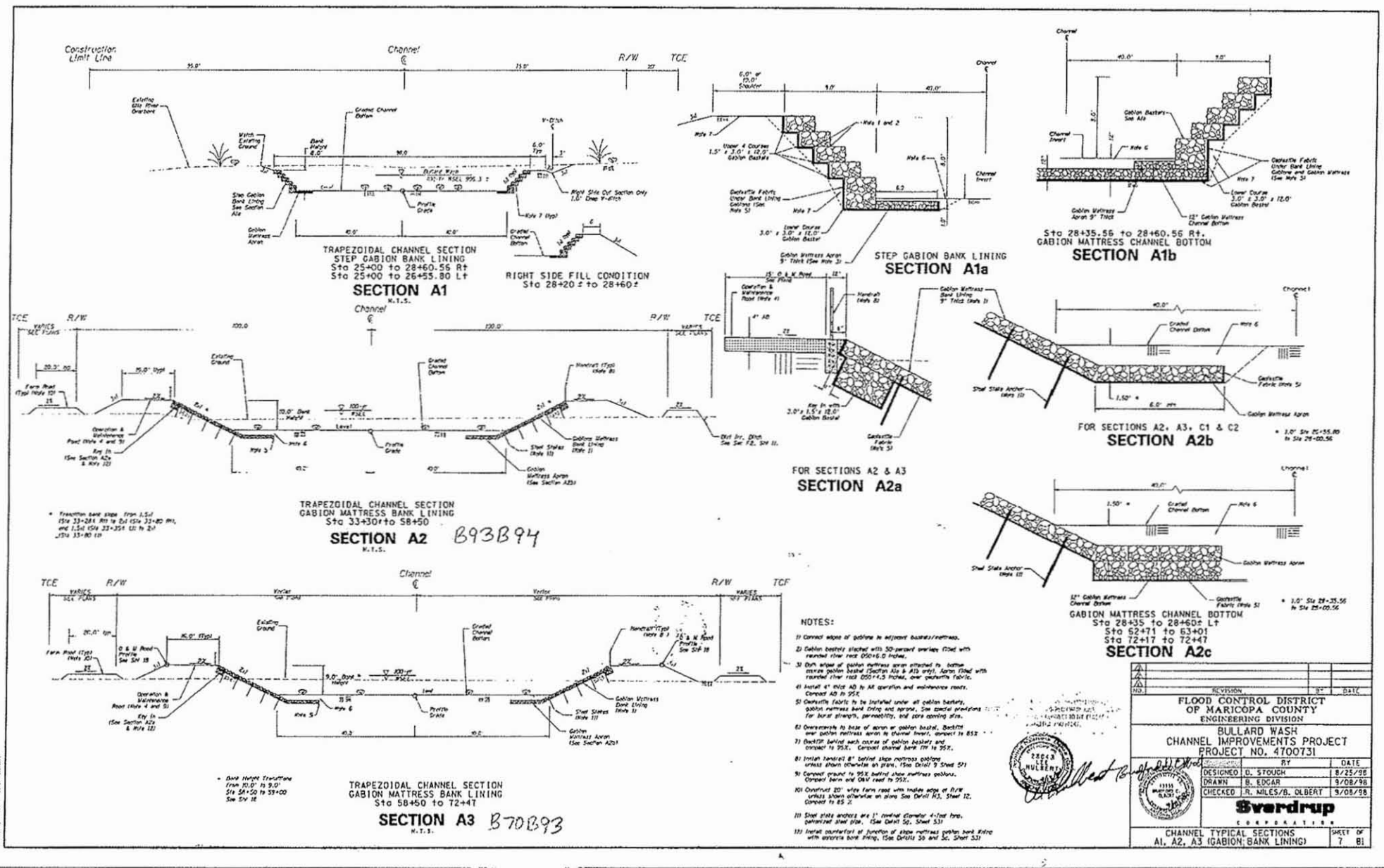
CHIEF ENGINEER & GENERAL MANAGER — DATE

COUNTY BOARD OF SUPERVISORS

JAN BREWER - CHAIRMAN

DISTRICT 1 FULTON BROCK
DISTRICT 2 DON STAPLEY
DISTRICT 3 ANDY KUNASEK
DISTRICT 4 JAN BREWER
DISTRICT 5 MARY ROSE WILCOX


PHOENIX GOODYEAR AIRPORT
UNION PACIFIC RAILROAD
MC 85
BROADWAY ROAD
ESTRELLA PARKWAY
BULLARD AVENUE
BUCKEYE CANAL
SOUTHERN AVENUE
Basin B70
Basin B73
Basin B94
N
Scale In Feet
BENCHMARKS
BM# NORTHING EASTING ELEVATION DESCRIPTION
270 44117.35 49963.58 922.00 BC in K4 at Bullard Ave and Broadway Rd
269 44682.79 44739.73 913.10 BC in K4 at Estrella Pkwy and Broadway Rd
250 49954.66 44129.43 952.11 BC in K4 at Estrella Pkwy and Lower Buckeye Rd
70 949.87 BC in K4 at Lower Buckeye Rd and 157th Ave
TP 10 933.43 Aluminum Cap on bolt at SE Cor MC 85 - Bullard Wash Bridge
BASIS OF BEARINGS
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION
BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731
DESIGNED D. STOUCH 8/25/98
DRAWN B. EDGAR 9/08/98
CHECKED R. MILES/B. OLBERT 9/08/98
Sverdrup
CORPORATION
HORIZONTAL CONTROL SHEET
SHEET 3 OF 81


Construction Limit Line
Channel ℄
R/W
TCE
TRAPEZOIDAL CHANNEL SECTION
STEP GABION BANK LINING
Sta 25+00 to 28+60.56 Rt
Sta 25+00 to 26+55.80 Lt
SECTION A1
RIGHT SIDE FILL CONDITION
Sta 28+20± to 28+60±
STEP GABION BANK LINING
SECTION A1a
Sta 28+35.56 to 28+60.56 Rt.
GABION MATTRESS CHANNEL BOTTOM
SECTION A1b
TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 33+30± to 58+50
SECTION A2
B93B94
FOR SECTIONS A2 & A3
SECTION A2a
FOR SECTIONS A2, A3, C1 & C2
SECTION A2b
GABION MATTRESS CHANNEL BOTTOM
Sta 28+35 to 28+60± Lt
Sta 62+71 to 63+01
Sta 72+17 to 72+47
SECTION A2c
TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 58+50 to 72+47
SECTION A3
B70B93
NOTES:
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION
BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731
DESIGNED D. STOUCH 8/25/98
DRAWN B. EDGAR 9/08/98
CHECKED R. MILES/B. OLBERT 9/08/98
Sverdrup
CORPORATION
CHANNEL TYPICAL SECTIONS
A1, A2, A3 (GABION BANK LINING)
SHEET 7 OF 81

B70

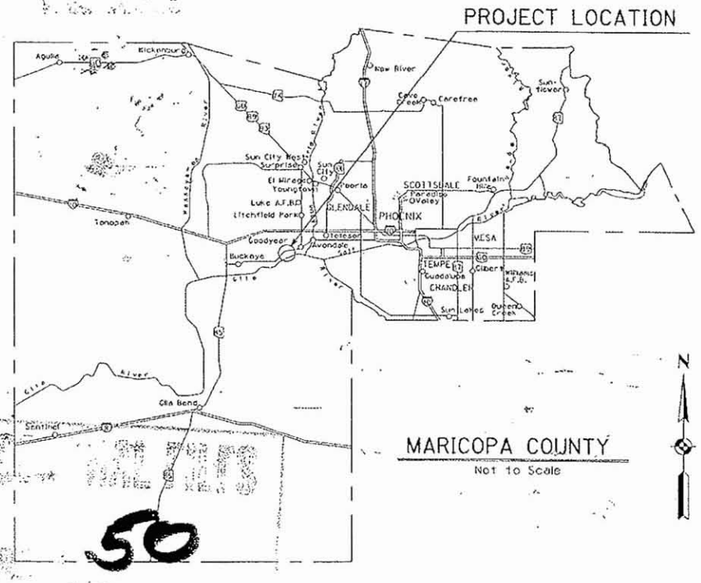
# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

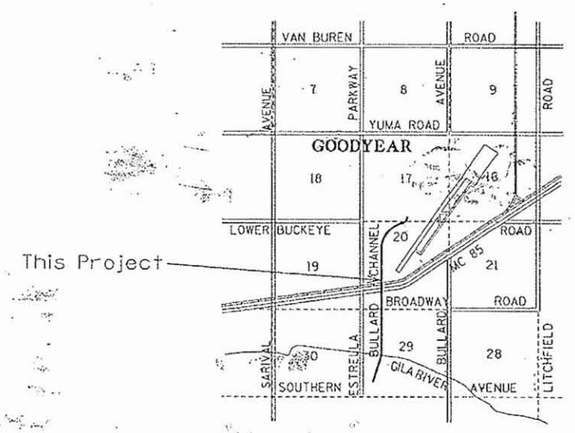
PLANS FOR THE CONSTRUCTION OF:

# BULLARD WASH CHANNEL IMPROVEMENTS PROJECT

CONTRACT NO. 98-15

PROJECT CONTROL NO. 4700731




IN COOPERATION WITH:
CITY OF GOODYEAR

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

CHIEF ENGINEER & GENERAL MANAGER — DATE

CITY OF GOODYEAR — DATE

for BUCKEYE IRRIGATION DISTRICT — 9/16/98 DATE

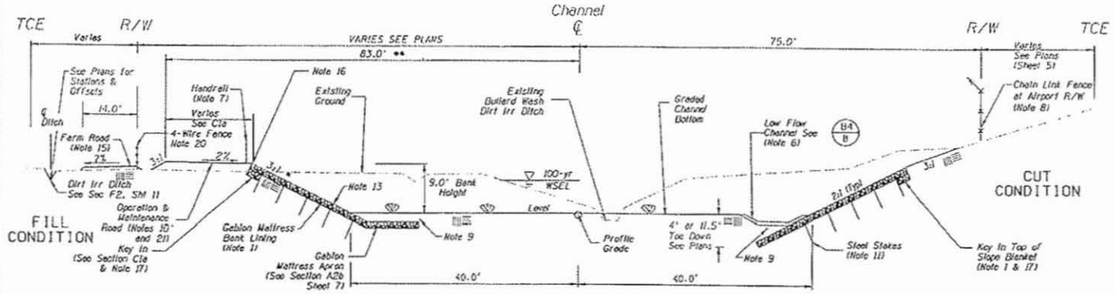
COUNTY BOARD OF SUPERVISORS

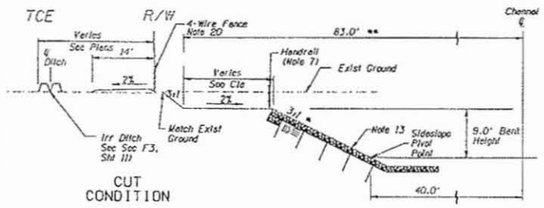
JAN BREWER - CHAIRMAN

DISTRICT 1 FULTON BROCK
DISTRICT 2 DON STAPLEY
DISTRICT 3 ANDY KUNASEK
DISTRICT 4 JAN BREWER
DISTRICT 5 MARY ROSE WILCOX

Bullard Wash Channel
Improvement Project
AS BUILTS FCD 98-15
50 470
DZB

670/693, 694



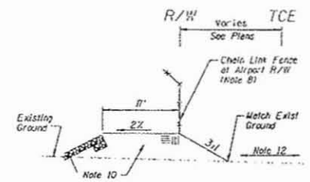

GABION MATTRESS BANK LINING
Sta 81+01 to 117+35

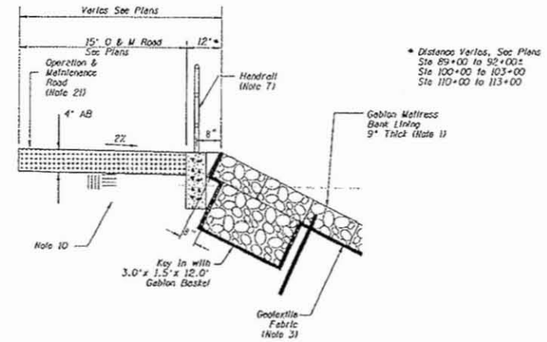
## SECTION C1

N.T.S.

- Sideslopes Vary Sta 89+00 to 93+71.91
  Sta 100+00 to 103+00
  Sta 110+00 to 113+00
  Sta 115+50 to 117+35

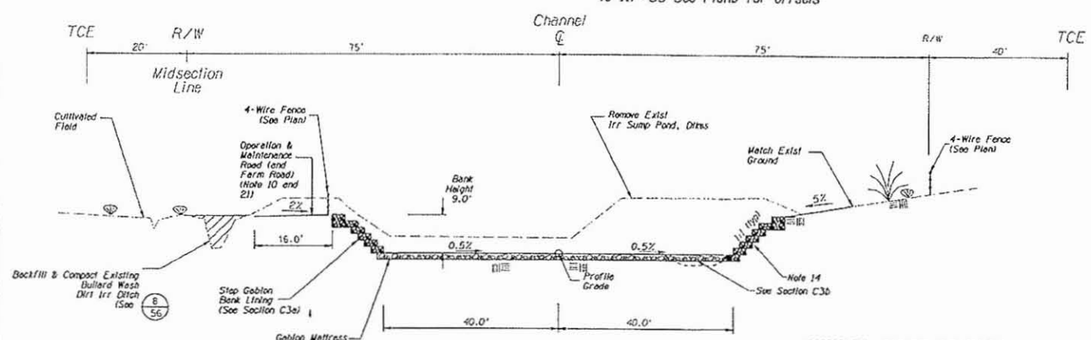
** Dimension Varies
Sta 90+79.92 to 93+71.91 & Sta 115+00 to 117+35 See Plans for offsets




FOR SECTION C1 & C2

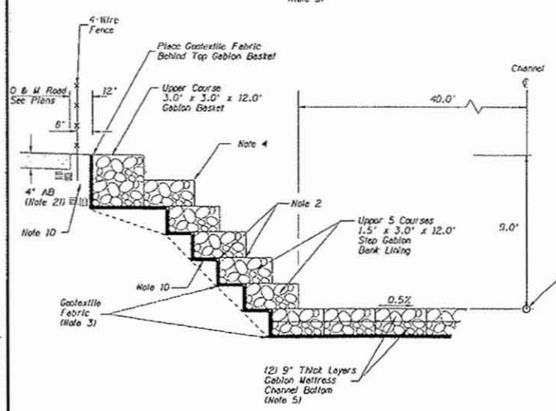
## SECTION C1a



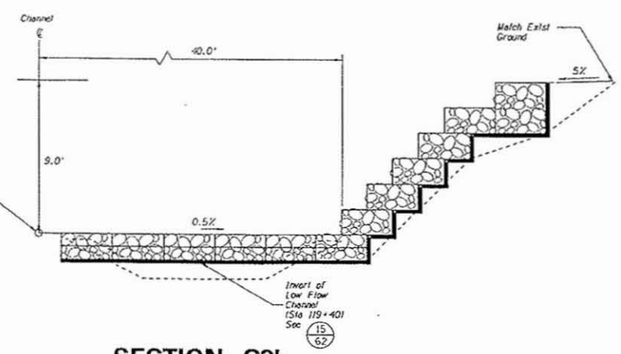

CHANNEL INLET SECTION
STEP GABION BANK LINING
Sta 119+43 to 121+95

## SECTION C3

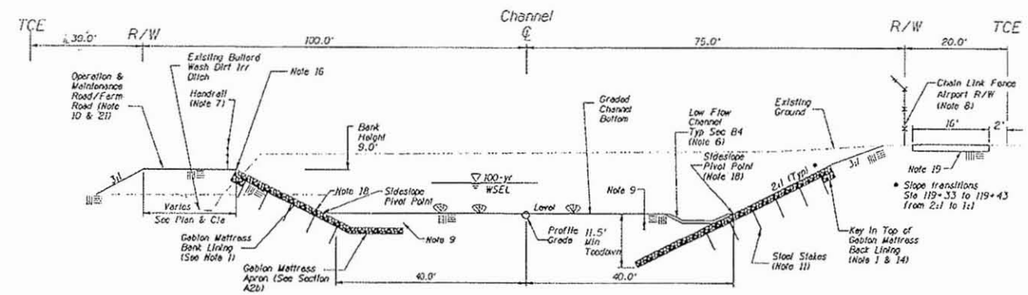
N.T.S.




## SECTION C3a




## SECTION C3b




Sta 117+35 to 119+43 (Typical)

## SECTION C2

N.T.S.

NOTES

1) Riprap Filled, Gabion Mattress Bank Lining with, 9" x 6" x 12" basket size. Key in top of slope mattress gabions with 3.0' x 1.5' x 12' gabion baskets; filled w/rounded river rock See Specifications.

2) All edges of gabions are connected to adjacent gabion baskets.

3) Geotextile fabric to be installed under all slope mattress gabions and aprons. Fabric shall be installed behind and under step gabion baskets See special provisions for burst strength, permeability and burst strength.

4) Banks lined with riprap filled gabion baskets, stacked with 50-percent overlap, 18" x 36" x 12' basket size (except upper course), on geotextile fabric. (See Sec C3a)

5) Channel bottom lined with 2 layers of 9" x 6" x 12" gabion mattress; filled w/rounded river rock D =4.5 inches

6) Low flow channel lined with, 6-inch " thick concrete. See Sec B4, Sht 8.

7) Handrail will be installed 8" behind channel lining left bank only. See Detail 9 sht 57 and Detail 7c sht 55 for locations.

8) Chain link fence (UIAC Std 1501) is to be installed along airport R/W only. Barbed wire top angled away from airport. See Detail 7c sht 55 for locations.

9) Overexcavate to base of apron, gabion mattress or gabion basket. Backfill over apron to channel invert, compact to 85%. Compact base under low flow channel to 95%

10) Backfill behind each course of gabion baskets, compact to 95%. Compact O & M road subgrade to 95%. Compact Embankments to 95%

11) Steel stakes are 1-inch outer diameter, 4-foot long, galvanized steel pipe. See Detail 5g.

12) Stockpile locations on Airport property to be arranged by Contractor. Contact Shawn Arena, with Phoenix Goodyear Airport.

13) Section C1 includes transitions which vary from 2:1 to 3:1 sideslopes, see plan for locations.

14) Install counterfort Sta 119+43 (L1 & R1) See Detail 5e, sht 53.

15) Construct Farm Road Sta 91+10 to 117+40 only.

16) Area between O & M Road and gabions varies in width (see section C1 & C2).

17) Install counterforts at Sta 81+01 L1 & R1, See Detail 5e, Sht 53.

18) Section C2 includes sideslope transitions which vary from 2:1 to 1:1 Sta 119+33 to 119+43 (See Plans).

19) Construct new 4" AB, 16' wide airport perimeter road Sta 116+68 to 119+16± Compact AB and subgrade to 95%.

20) Install 4-wire fence, sta 90+95± to 119+33.

21) Install 4" thick AB over all operation & maintenance roads. Compact AB to 95%

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731

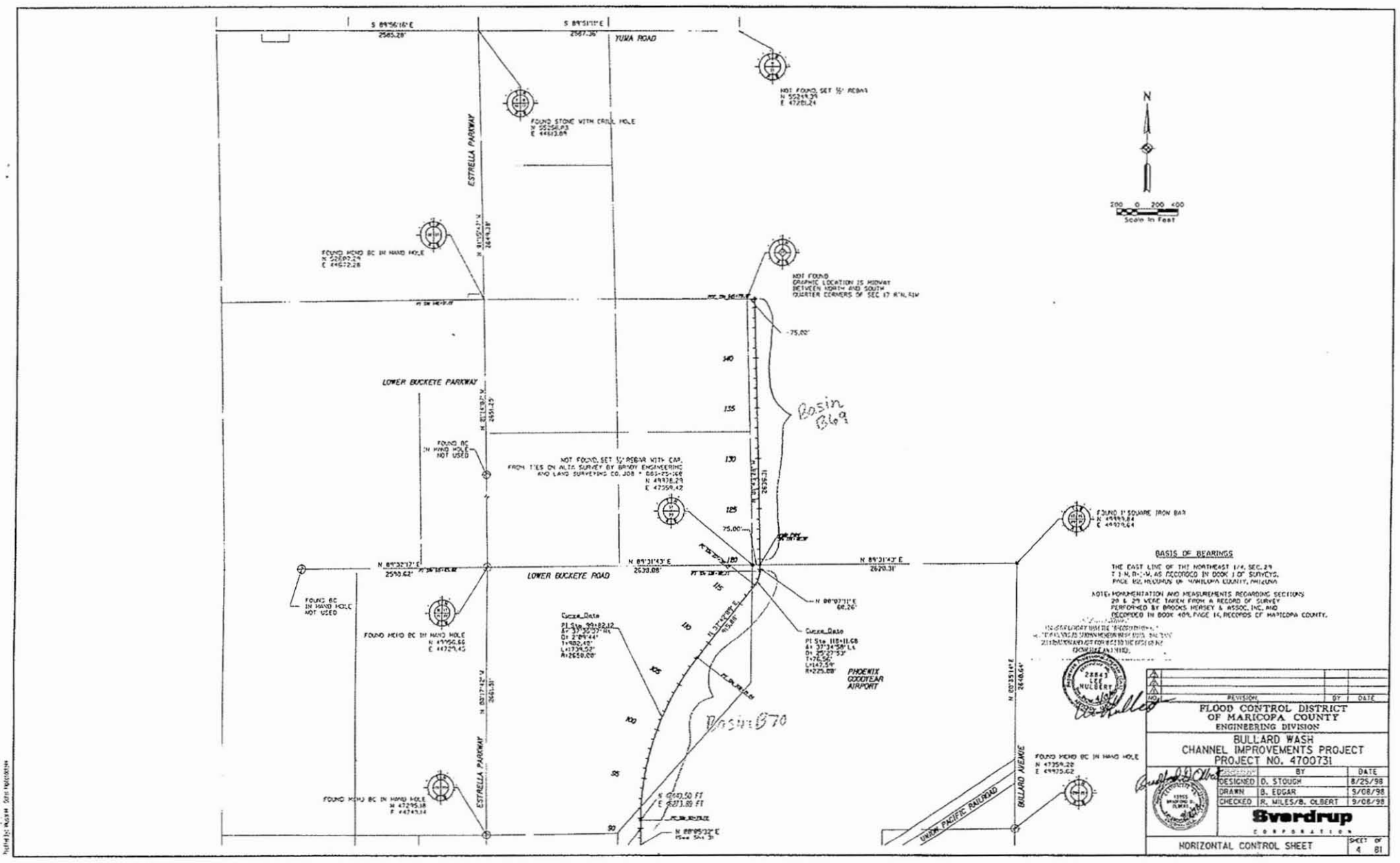
| | BY | DATE |
|---|---|---|
| DESIGNED | D. STOUGH | 8/25/98 |
| DRAWN | B. EDGAR | 9/08/98 |
| CHECKED | R. MILES/B. OLBERT | 9/08/98 |

Sverdrup CORPORATION

CHANNEL TYPICAL SECTIONS
C1, C2 and C3

SHEET 9 OF 81

B69B10 - B7D



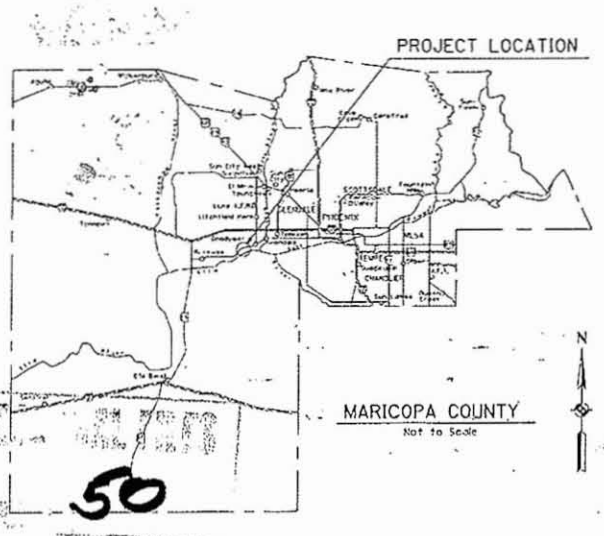

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

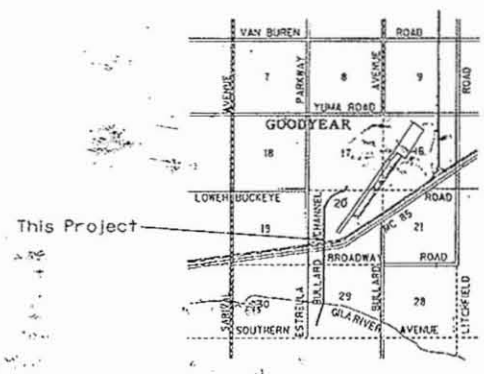
PLANS FOR THE CONSTRUCTION OF:

## BULLARD WASH CHANNEL IMPROVEMENTS PROJECT

CONTRACT NO. 98-15

PROJECT CONTROL NO. 4700731




IN COOPERATION WITH:
CITY OF GOODYEAR

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

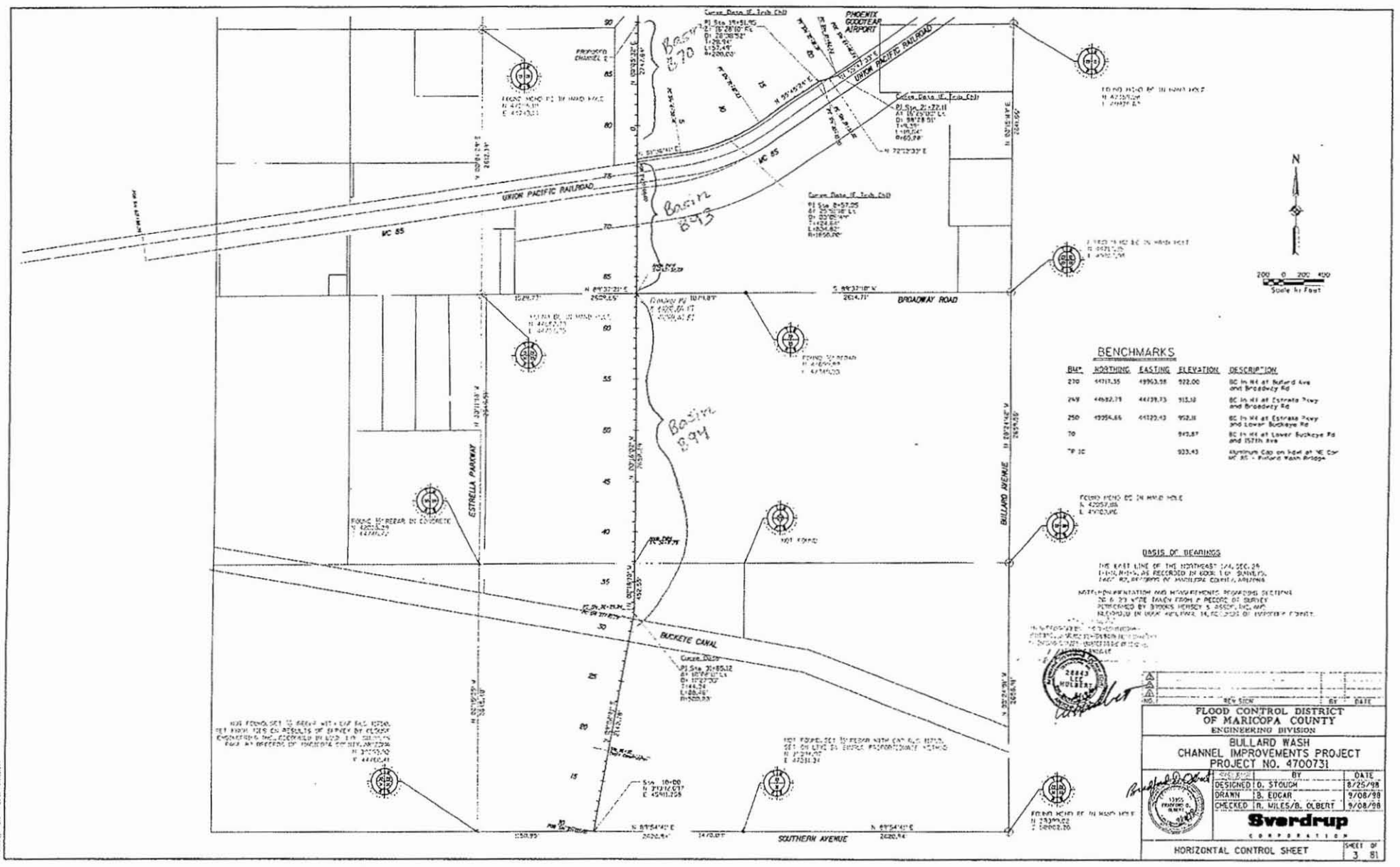
ISSUED FOR PUBLIC BIDDING BY:

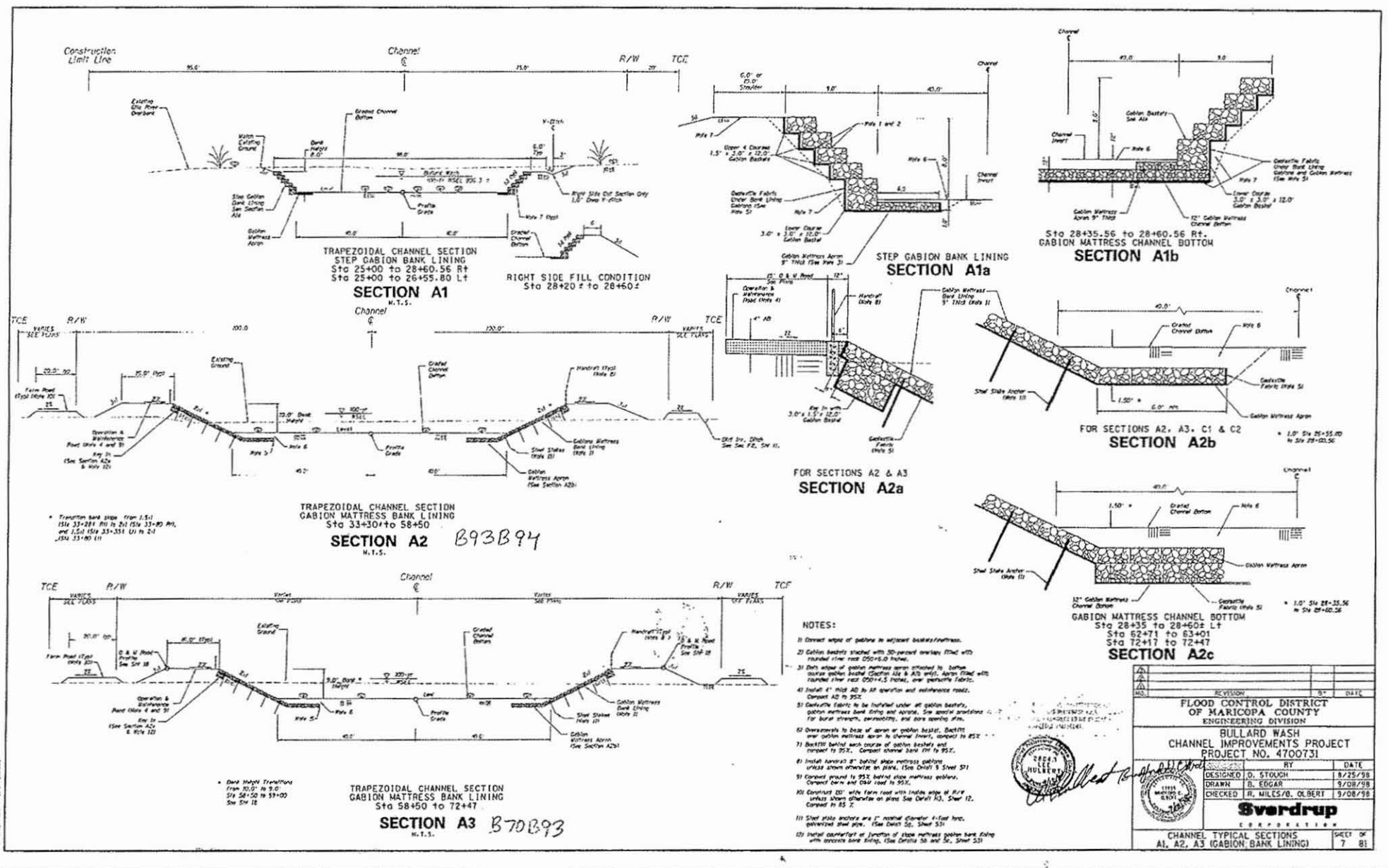
CHIEF ENGINEER & GENERAL MANAGER — DATE

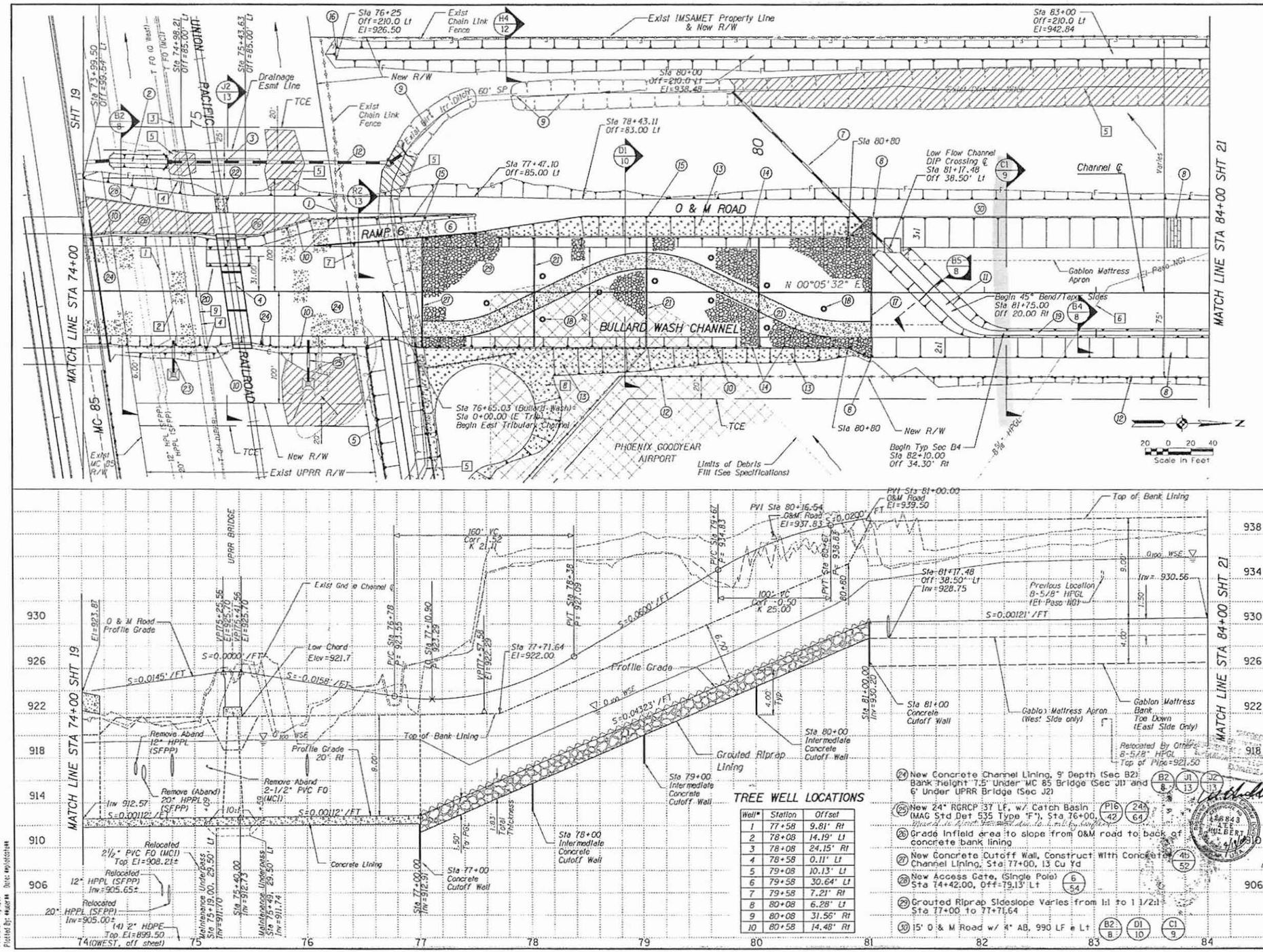
COUNTY BOARD OF SUPERVISORS

JAN BREWER - CHAIRMAN

DISTRICT 1 FULTON BROCK
DISTRICT 2 DON STAPLEY
DISTRICT 3 ANDY KUNASEK
DISTRICT 4 JAN BREWER
DISTRICT 5 MARY ROSE WILCOX


PHOENIX GOODYEAR AIRPORT
UNION PACIFIC RAILROAD
BROADWAY ROAD
ESTRELLA PARKWAY
BULLARD AVENUE
BUCKEYE CANAL
SOUTHERN AVENUE
Basin B70
Basin B73
Basin B94
BENCHMARKS
BASIS OF BEARINGS
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION
BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731
DESIGNED D. STOUGH 8/25/98
DRAWN B. EDGAR 9/08/98
CHECKED R. MILES/B. OLBERT 9/08/98
Sverdrup
HORIZONTAL CONTROL SHEET
SHEET 3 OF 81


TRAPEZOIDAL CHANNEL SECTION
STEP GABION BANK LINING
Sta 25+00 to 28+60.56 Rt
Sta 25+00 to 26+55.80 Lt
SECTION A1
RIGHT SIDE FILL CONDITION
Sta 28+20 ± to 28+60±
STEP GABION BANK LINING
SECTION A1a
Sta 28+35.56 to 28+60.56 Rt.
GABION MATTRESS CHANNEL BOTTOM
SECTION A1b
TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 33+30 to 58+50
SECTION A2
B93B94
FOR SECTIONS A2 & A3
SECTION A2a
FOR SECTIONS A2, A3, C1 & C2
SECTION A2b
GABION MATTRESS CHANNEL BOTTOM
Sta 28+35 to 28+60± Lt
Sta 62+71 to 63+01
Sta 72+17 to 72+47
SECTION A2c
TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 58+50 to 72+47
SECTION A3
B70B93
NOTES:
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION
BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731
DESIGNED D. STOUGH 8/25/98
DRAWN B. EDGAR 9/08/98
CHECKED R. MILES/B. OLBERT 9/08/98
Sverdrup
CHANNEL TYPICAL SECTIONS
A1, A2, A3 (GABION BANK LINING)
SHEET 7 OF 81







## TREE WELL LOCATIONS

| Well# | Station | Offset |
|---|---|---|
| 1 | 77+58 | 9.81' Rt |
| 2 | 78+08 | 14.19' Lt |
| 3 | 78+08 | 24.15' Rt |
| 4 | 78+58 | 0.11' Lt |
| 5 | 79+08 | 10.13' Lt |
| 6 | 79+58 | 30.64' Lt |
| 7 | 79+58 | 7.21' Rt |
| 8 | 80+08 | 6.28' Lt |
| 9 | 80+08 | 31.56' Rt |
| 10 | 80+58 | 14.48' Rt |

## REMOVAL/RELOCATE

1. Relocated 12" HP Petroleum Pipeline (by SFPP) Protect In Place
2. Relocated 20" HP Petroleum Pipeline (by SFPP) Protect In Place
3. Relocated Tel FO Cable (by MCI) Protect In Place
4. Relocated Railroad Switching OH Lines (UPRR) Protect In Place
5. Fill and Compact Dirt Irr Ditch.
6. Relocate 8⅝" HP Gas Pipeline (by El Paso NG)
7. Remove Existing Chain Link Fence 145 LF @ Lt & 50 LF @ Rt of Channel ℄
8. Remove Buried Construction Materials 1500 Tons
9. Remove Abandoned 2" Conduit (MCI)

## CONSTRUCTION

1. New 12' Access Gate, Chain Link Fence Sta 76+24.7, Off=71.00' Lt (MAG Std Det 160)
2. New Dirt Irr Ditch 55 LF @ Lt. See P6/40 F4/11
3. New 30" RGRCP (Pipe 6) 209 LF, w/ Sleeve Jacked Under RR 75 LF w/ 1 Hdwl (MAG Std Det 501-4) and 1 Hdwl (MAG Std Det 501-5) P6/40 23/64
4. New 3-Span Precast Concrete Railroad Bridge (By UPRR)
5. New Concrete Lined E Trib Chl, See Sht 26, & B3/8
6. New Concrete Maintenance Ramp, Sta 75+55.72 to 77+43.03 (Lt Bank); see RA6/34 R2/13
7. New 24" RGRCP (Pipe 7), 201 LF Headwall in Bank Lining (Inlet),Outlet Headwall (MAG Std Det 501-4); See P7/41 25/64
8. Begin Gabion Mattress Bank Lining (Sec C1), 3:1 SS, Sta 81+00, See C1/9
9. Clean Out 60" Steel Pipe & Reshape Ditch to Accomodate New Headwall (Pipe 7), see F4/11
10. New 4-Wire Fence 200 LF @ Lt, 608 LF @ Rt. See 7a/55 B5/8
11. New Low Flow Channel DIP Crossing, See B5/8
12. New Chain Link Fence, (MAG Std Det 160) 524 LF @ Rt, See Table 7c for Locations 7c/55
13. New Gravel Mulch, 1210 SY
14. New Grouted Riprap Channel Lining 2351 CY and O & M Path 425 LF Sta 77+00 to 81+00, 4/52 D1/10
15. New Handrail 617 LF @ Lt, See 7b/55
16. Begin New Landscaping Berm, Sta 76+25, Off=210' Lt, 1636 CY, See H4/12
17. New Concrete Cutoff Wall 20 CY, & Gabion Counterfort, Sta 81+00 3C/51 5c/53
18. New Tree Well 10 Ea, (For Locations See Table This Sheet) 21/63 B4/8
19. New 4' BW Concrete Low Flow Channel, Sta 82+10, 300 LF
20. New 12' Wide Maintenance Underpass Under UPRR Bridge, See K/13
21. New Intermediate Concrete Cutoff Wall; 28 CY Sta 78+00, 79+00, 80+00; See 4a/52
22. New Concrete RR At-Grade Crossing by UPRR
23. New 24" RGRCP 28 LF, w/ Catch Basin (MAG Std Det 535 Type "F"), Sta 74+80, P14/44 24/64
24. New Concrete Channel Lining, 9' Depth (Sec B2) Bank Height 7.5' Under MC 85 Bridge (Sec J1) and 6' Under UPRR Bridge (Sec J2) B2/8 J1/13 J2/13
25. New 24" RGRCP 37 LF, w/ Catch Basin (MAG Std Det 535 Type "F"), Sta 76+00, P16/42 24/64
26. Grade Infield area to slope from O&M road to back of concrete bank lining
27. New Concrete Cutoff Wall, Construct With Concrete Channel Lining, Sta 77+00, 13 Cu Yd 4b/52
28. New Access Gate, (Single Pole) Sta 74+42.00, Off=79.13' Lt 6/54
29. Grouted Riprap Sideslope Varies from 1:1 to 1 1/2:1 Sta 77+00 to 77+71.64
30. 15' O & M Road w/ 4" AB, 990 LF @ Lt B2/8 D1/10 C1/9

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 1 | | | |
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**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY**
ENGINEERING DIVISION

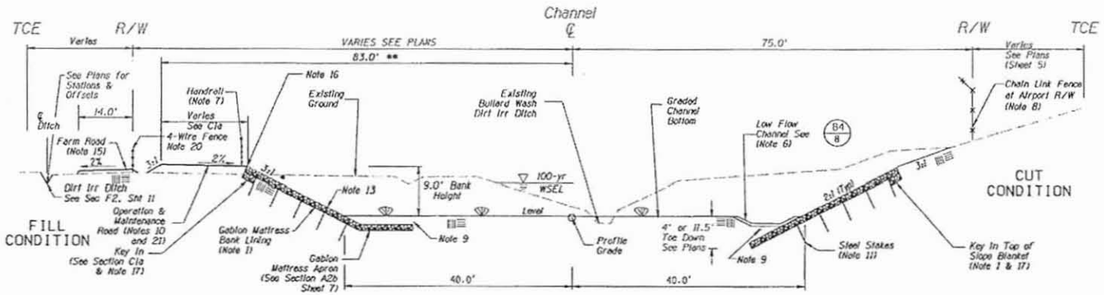
BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731

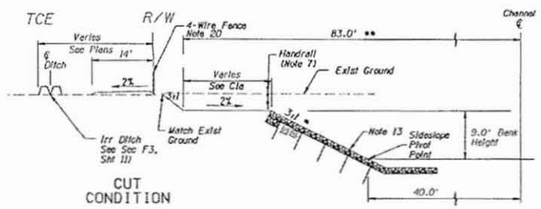
| | BY | DATE |
|---|---|---|
| DESIGNED | D. STOUGH | 8/25/98 |
| DRAWN | B. EDGAR | 9/08/98 |
| CHECKED | R. MILES/B. OLBERT | 9/08/98 |

**Sverdrup**
CORPORATION

PLAN AND PROFILE
STA 74+00.00 TO STA 84+00.00

SHEET 20 OF 81



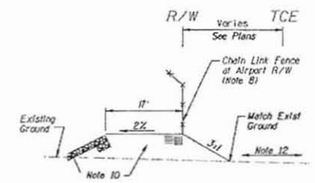

GABION MATTRESS BANK LINING
Sta 81+01 to 117+35

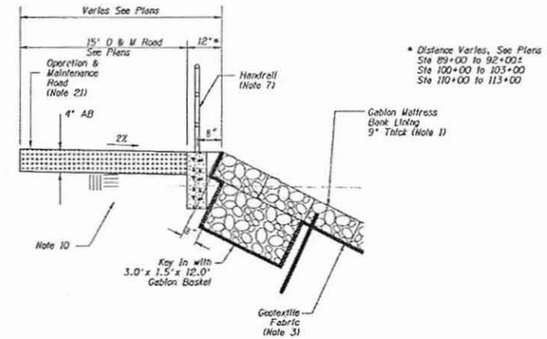
## SECTION C1

N.T.S.

- Sideslopes Vary Sta 89+00 to 93+71.91
  Sta 100+00 to 103+00
  Sta 110+00 to 113+00
  Sta 115+50 to 117+35

** Dimension Varies
Sta 90+79.92 to 93+71.91 & Sta 115+00 to 117+35 See Plans for offsets

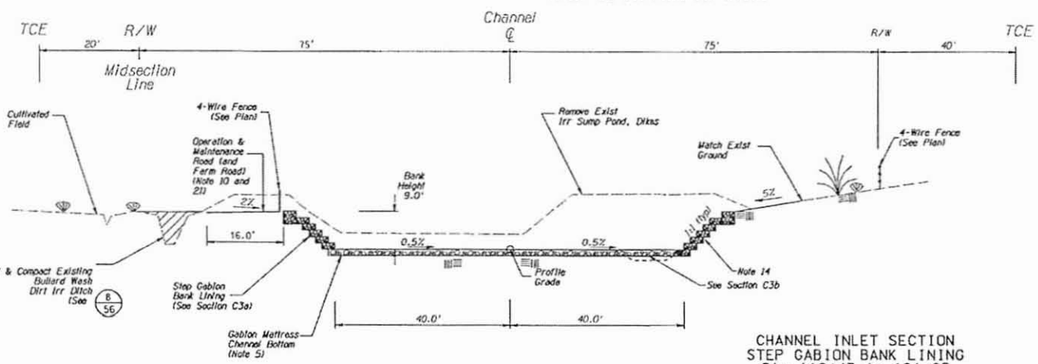



* Distance Varies, See Plans
Sta 89+00 to 92+00±
Sta 100+00 to 103+00
Sta 110+00 to 113+00

FOR SECTION C1 & C2

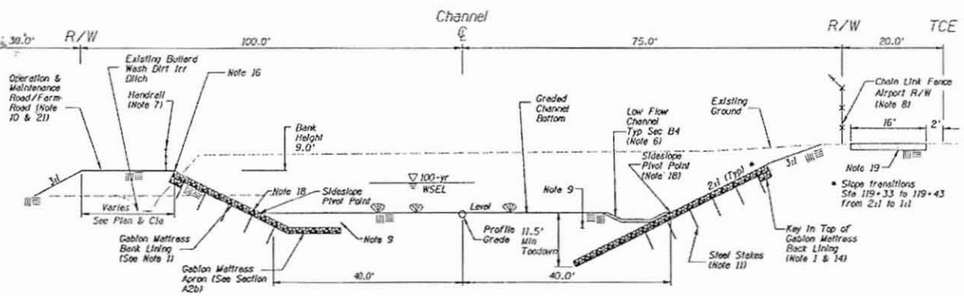
## SECTION C1a




CHANNEL INLET SECTION
STEP GABION BANK LINING
Sta 119+43 to 121+95

## SECTION C3

N.T.S.




Sta 117+35 to 119+43 (Typical)

## SECTION C2

N.T.S.

NOTES

1) Riprap Filled, Gabion Mattress Bank Lining with, 9" x 6" x 12" basket size. Key in top of slope mattress gabions with 3.0" x 1.5" x 12" gabion baskets; filled w/rounded river rock See Specifications.

2) All edges of gabions are connected to adjacent gabion baskets.

3) Geotextile fabric to be installed under all slope mattress gabions and aprons. Fabric shall be installed behind and under step gabion baskets See special provisions for burst strength, permeability and burst strength.

4) Banks lined with riprap filled gabion baskets, stacked with 50-percent overlap, 18" x 36" x 12" basket size (except upper course), on geotextile fabric. (See Sec C3a)

5) Channel bottom lined with 2 layers of 9" x 6" x 12" gabion mattress; filled w/rounded river rock D =4.5 inches

6) Low flow channel lined with, 6-inch * thick concrete. See Sec B4, Sht 8.

7) Handrail will be installed 8" behind channel lining left bank only. See Detail 9 sht 57 and Detail 7c sht 55 for locations.

8) Chain link fence (MAG Std 160) is to be installed along airport R/W only. Barbed wire top angled away from airport. See Detail 7c sht 55 for locations.

9) Overexcavate to base of apron, gabion mattress or gabion basket. Backfill over apron to channel invert, compact to 85%. Compact base under low flow channel to 95%

10) Backfill behind each course of gabion baskets, compact to 95%. Compact O & M road subgrade to 95%. Compact Embankments to 95%

11) Steel stakes are 1-inch outer diameter, 4-foot long, galvanized steel pipe. See Detail 5g.

12) Stockpile locations on Airport property to be arranged by Contractor. Contact Shawn Arene, with Phoenix Goodyear Airport.

13) Section C1 includes transitions which vary from 2:1 to 3:1 sideslopes, see plan for locations.

14) Install counterfort Sta 119+43 (Lt & Rt) See Detail 5a, sht 53.

15) Construct Farm Road Sta 91+10 to 117+40 only.

16) Area between O & M Road and gabions varies in width (see section C1 & C2).

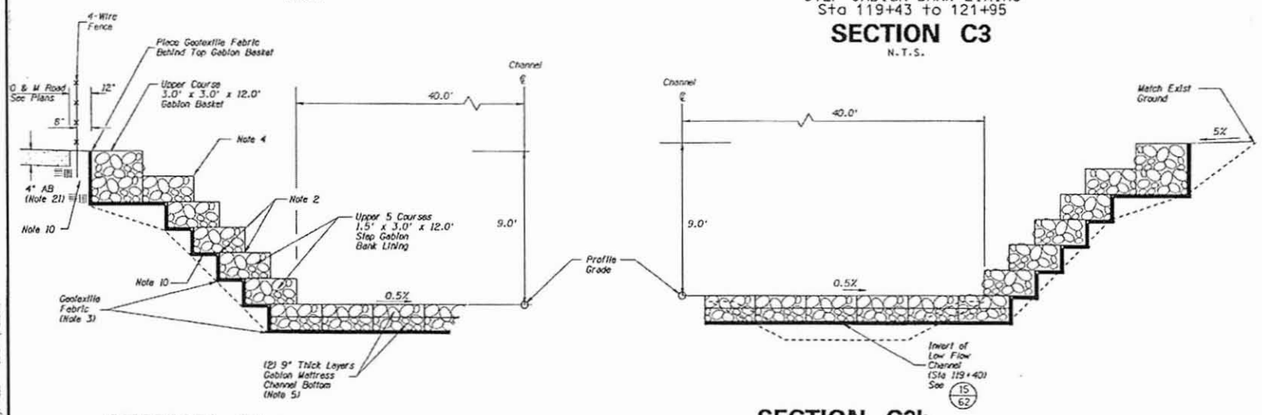
17) Install counterforts at Sta 81+01 Lt & Rt. See Detail 5c, Sht 53.

18) Section C2 includes sideslope transitions which vary from 2:1 to 1:1 Sta 119+33 to 119+43 (See Plans).

19) Construct new 4" AB, 16' wide airport perimeter road Sta 116+68 to 119+16± Compact AB and subgrade to 95%.

20) Install 4-wire fence, sta 90+95± to 119+33.

21) Install 4" thick AB over all operation & maintenance roads. Compact AB to 95%




## SECTION C3a

## SECTION C3b

| NO. | REVISION | BY | DATE |
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731

| | BY | DATE |
|---|---|---|
| DESIGNED | D. STOUGH | 8/25/98 |
| DRAWN | B. EDGAR | 9/08/98 |
| CHECKED | R. MILES/B. OLBERT | 9/08/98 |

Sverdrup CORPORATION

CHANNEL TYPICAL SECTIONS C1, C2 and C3

SHEET 9 OF 81

B71

# This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B72

# This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B73

Loop 303 ADMPU
Analysis of ADOT Basins A through D at Litchfield Road

Note: ADOT Basins A through D correspond to HDR Basins B73, B74, B84, and B83, respectively.

```
7799    KK  SR287A
        * KO     1                              21
7800    KM        STORAGE ROUTE CP287A IN I-10 DETENTION BASIN
7801    RS       1    STOR       0       0
7802    SV       0    9.46   52.88  120.61  265.17  348.06
7803    SE   975.7     978     980     982     986     988
7804    SQ       0       7      55      55      55     329
7805    SE   975.7     978     980     988   988.8     990
        * BELOW: WLB STUDY DATA
        * KKSR287A
        * KM      STORAGE ROUTE CP287A IN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   14.44   60.06   374.5  423.01  438.91
        * SQ     0       7      55      55      55     329
        * SE 975.7     978     980     988   988.8     990

3830    KK   SRB73 STORAGE
3831    KO
3832    RS       1    STOR      -1
3833    SV            9.46   52.88  120.61  265.17  348.06
3834    SQ            7.00   55.00   55.00   55.00  329.00
3835    SE  975.70  978.00  980.00  982.00  986.00  988.00
3836    ST
```

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-

See changes on pages 2-4.
Let me know if you have any questions.
- Ryan

```
7981    KK  SR287B
        * KO     1                              21
7982    KM        STORAGE ROUTE CP287B IN I-10 DETENTION BASIN
7983    RS       1    STOR       0       0
7984    SV       0   11.35   32.69      57  108.98  136.43
7985    SE   974.6     978     980     982     986     988
7986    SQ       0       2      60     800     953
7987    SE   974.6     978     980   987.3     988
        * BELOW: WLB STUDY DATA
        * KKSR287B
        * KM      STORAGE ROUTE CP287B IN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   17.05   38.57  132.52   143.0
        * SQ     0       2      60     800     953
        * SE 974.6     978     980   987.3     988

3856    KK   SRB74 STORAGE
3857    KO
3858    RS       1    STOR      -1
3859    SV           11.35   32.69   57.00  108.98  136.43
3860    SQ            2.00   60.00  800.00  953.00  953.00
3861    SE  974.60  978.00  980.00  982.00  986.00  988.00
3862    ST                          263     668
        *
```

```
8359    KK  SR287C
        * KO     1                              21
8360    KM        STORAGE ROUTE CP287C IN AN I-10 DETENTION BASIN
8361    RS       1    STOR       0       0
8362    SV       0   25.10   71.68  127.08  189.52  324.54  402.14
8363    SE   972.5     976     978     980     982     986     988
8364    SQ       0       6     460     460     460     657
8365    SE   972.5     976     980     988   988.6     990
        * BELOW: WLB STUDY DATA
        * KKSR287C
        * KM       STORAGE ROUTE CP287C IN AN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   37.15  141.31  425.75  453.25  562.86
        * SQ     0       6     460     460     460     657
        * SE 972.5     976     980     988   988.6     990

3882    KK   SRB84 STORAGE
3883    KO
3884    RS       1    STOR      -1
3885    SV           25.10   71.68  127.08  189.52  324.54  402.14
3886    SQ            6.00  460.00  460.00  460.00  657.00  657.00
3887    SE  972.50  976.00  978.00  980.00  982.00  986.00  988.00
                                                     460     460
```

```
KK  SR287D
* KO     1                                21
KM        STORAGE ROUTE CP287D IN AN I-10 DETENTION BASIN
RS       1    STOR       0       0
SV       0   19.83   60.59  109.71  161.17  215.52  334.65  399.54
SE   970.5     974     976     978     980     982     986     988
SQ       0      36      60      81      86      87
SE   970.5     974     980     988     990   990.5
* BELOW: WLB STUDY DATA
* KKSR287D
* KM       STORAGE ROUTE CP287D IN AN I-10 DETENTION BASIN
* RS     1    STOR       0       0
* SV     0   30.21  162.42   403.5  496.83  532.82
* SQ     0      36      60      81      86      87
* SE 970.5     974     980     988     990   990.5
```

```
KK   SRB83 STORAGE
KO
RS       1    STOR      -1
SV           19.83   60.59  109.71  161.17  215.52  334.65  399.54
SQ           36.00   44.00   52.00   60.00   67.00   73.00   81.00
SE  970.50  974.00  976.00  978.00  980.00  982.00  986.00  988.00
ST                                           65      76
*
```

## Loop 303/White Tanks ADMPU

Stage-Storage-Discharge Relationships for ADOT Basins A to D

**Basin A (HDR Basin B73)**

URS[1]

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 9.46 | 52.88 | 120.61 | 265.17 | 348.06 |
| SE | 975.7 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 7 | 55 | 55 | 55 | 329 |
| SE | 975.7 | 978 | 980 | 988 | 988.8 | 990 |

HDR

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 9.46 | 52.88 | 120.61 | 265.17 | 348.06 |
| SQ | 0 | 7 | 55 | 55 | 55 | 55 |
| SE | 975.7 | 978 | 980 | 982 | 986 | 988 |

*Interpolated for flows at elevations 982 and 986. Removed flow information at elevations higher than 988.

**Basin B (HDR Basin B74)**

URS[1]

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 11.35 | 32.69 | 57 | 108.98 | 136.43 |
| SE | 974.6 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 2 | 60 | 800 | 953 | |
| SE | 974.6 | 978 | 980 | 987.3 | 988 | |

HDR

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 11.35 | 32.69 | 57 | 108.98 | 136.43 |
| SQ | 0 | 2 | 60 | 263 | 668 | 953 |
| SE | 974.6 | 978 | 980 | 982 | 986 | 988 |

*Interpolated for flows at elevations 982 and 986.

**Basin C (HDR Basin B84)**

URS[1]

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SV | 0 | 25.1 | 71.68 | 127.08 | 189.52 | 324.54 | 402.14 |
| SE | 972.5 | 976 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 6 | 460 | 460 | 460 | 657 | |
| SE | 972.5 | 976 | 980 | 988 | 988.6 | 990 | |

HDR

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SV | 0 | 25.1 | 71.68 | 127.08 | 189.52 | 324.54 | 402.14 |
| SQ | 0 | 6 | 233 | 460 | 460 | 460 | 460 |
| SE | 972.5 | 976 | 978 | 980 | 982 | 986 | 988 |

*Interpolated for flows at elevations 978, 982, and 986. Removed flow information for elevations higher than 988.

**Basin D (HDR Basin B83)**

URS[1]

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SV | 0 | 19.83 | 60.59 | 109.71 | 161.17 | 215.52 | 334.65 | 399.54 |
| SE | 970.5 | 974 | 976 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 36 | 60 | 81 | 86 | 87 | | |
| SE | 970.5 | 974 | 980 | 988 | 990 | 990.5 | | |

HDR

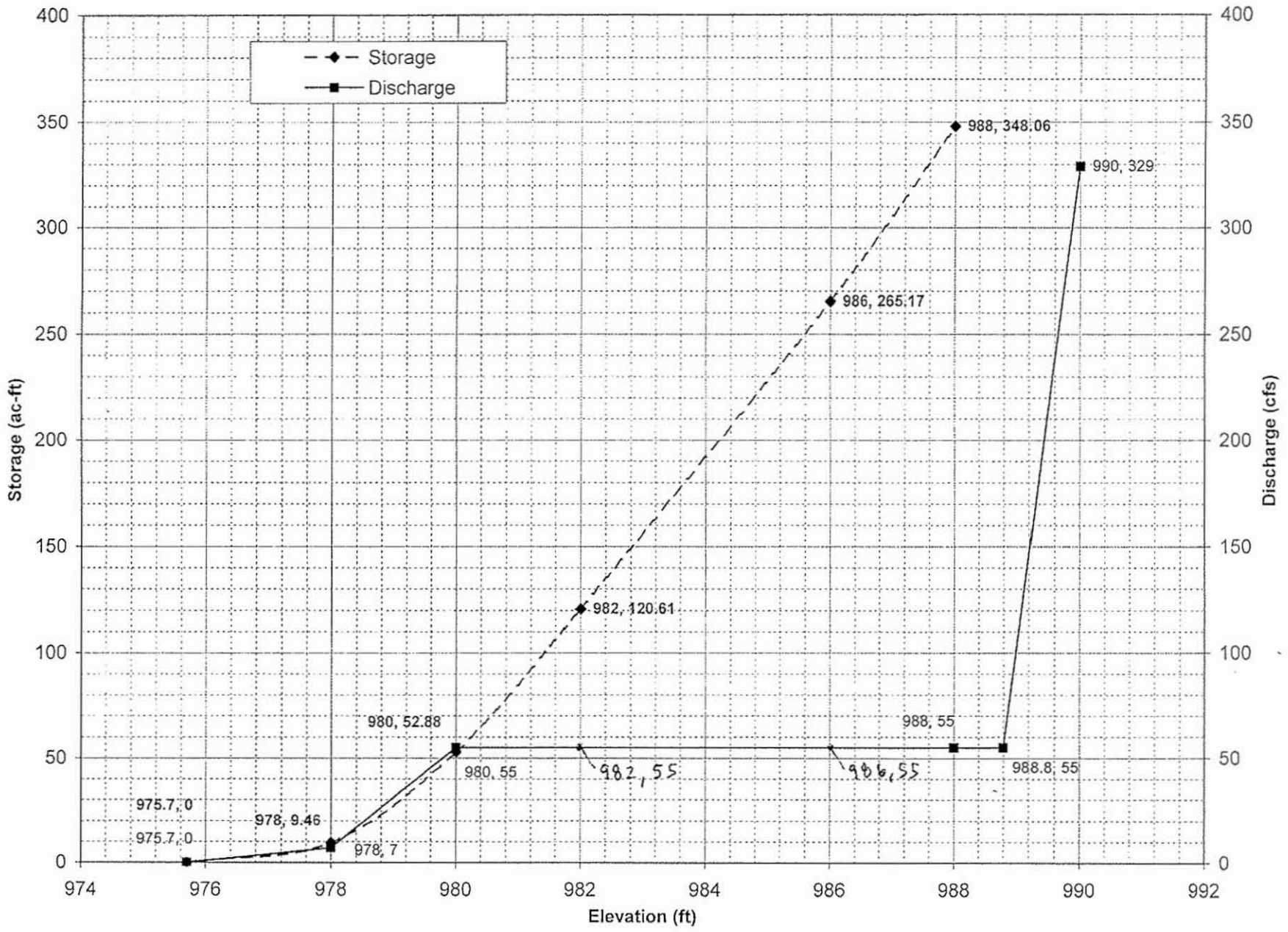
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SV | 0 | 19.83 | 60.59 | 109.71 | 161.17 | 215.52 | 334.65 | 399.54 |
| SQ | 0 | 36 | 44 | 52 | 60 | 65 | 76 | 81 |
| SE | 970.5 | 974 | 976 | 978 | 980 | 982 | 986 | 988 |

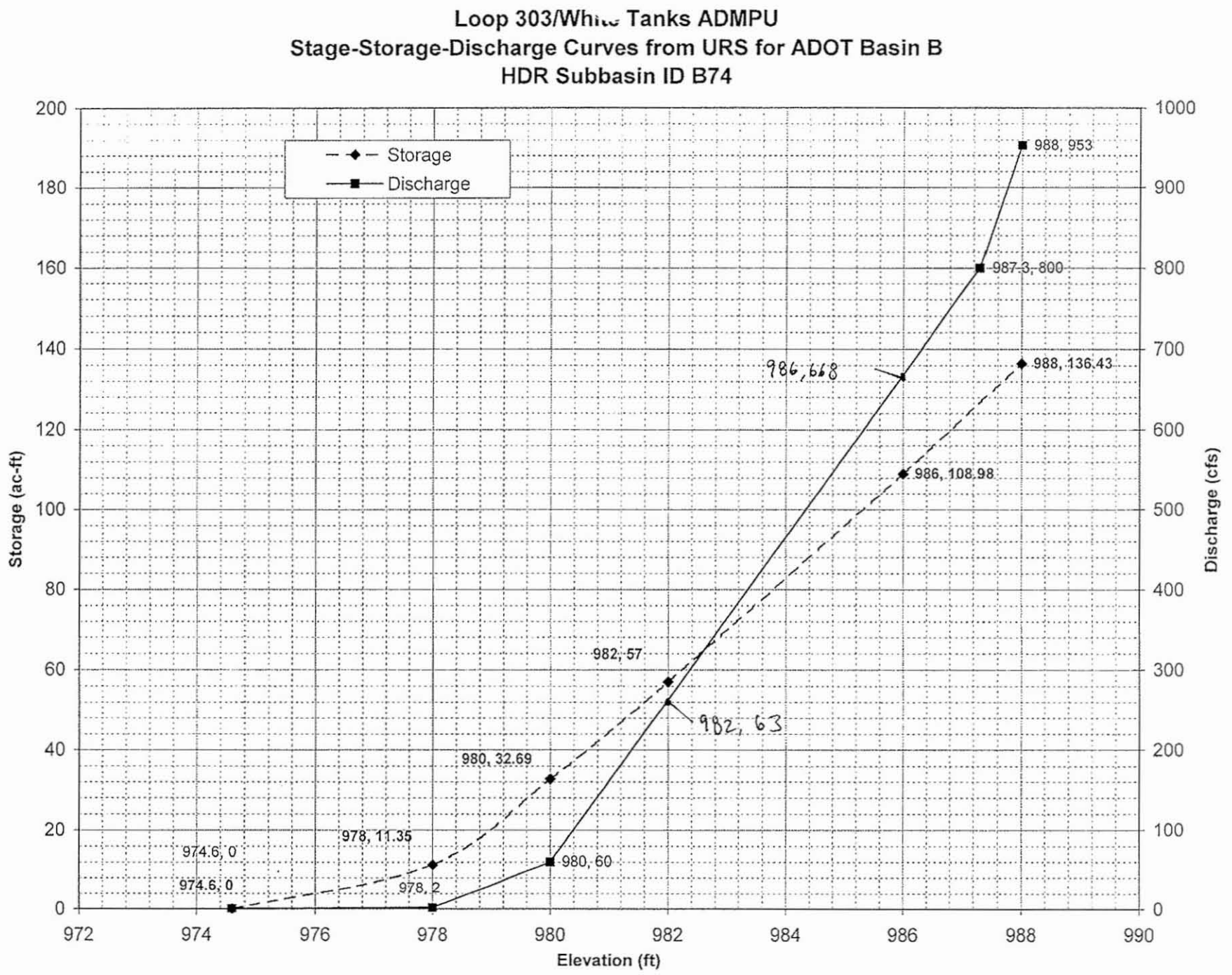
*Interpolated for flows at elevations 976, 978, 982, and 986. Removed flow information for elevations higher than 988.

Notes:

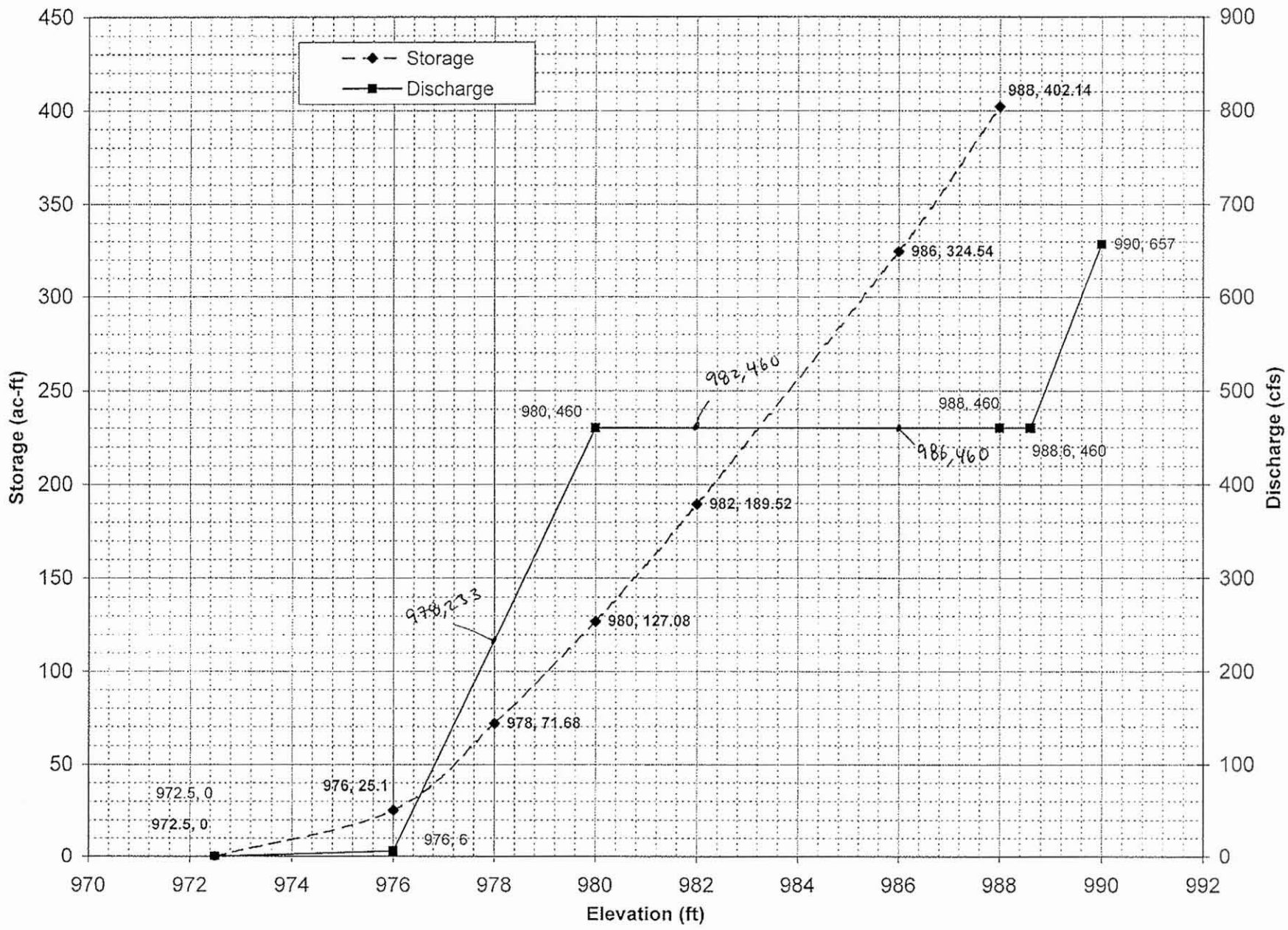
1. Stage-Storage-Discharge Relationships taken from Loop 303 Corridor/White Tanks ADMPU, 2005 by URS.

Loop 303/Wh. Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin A
HDR Subbasin ID B73

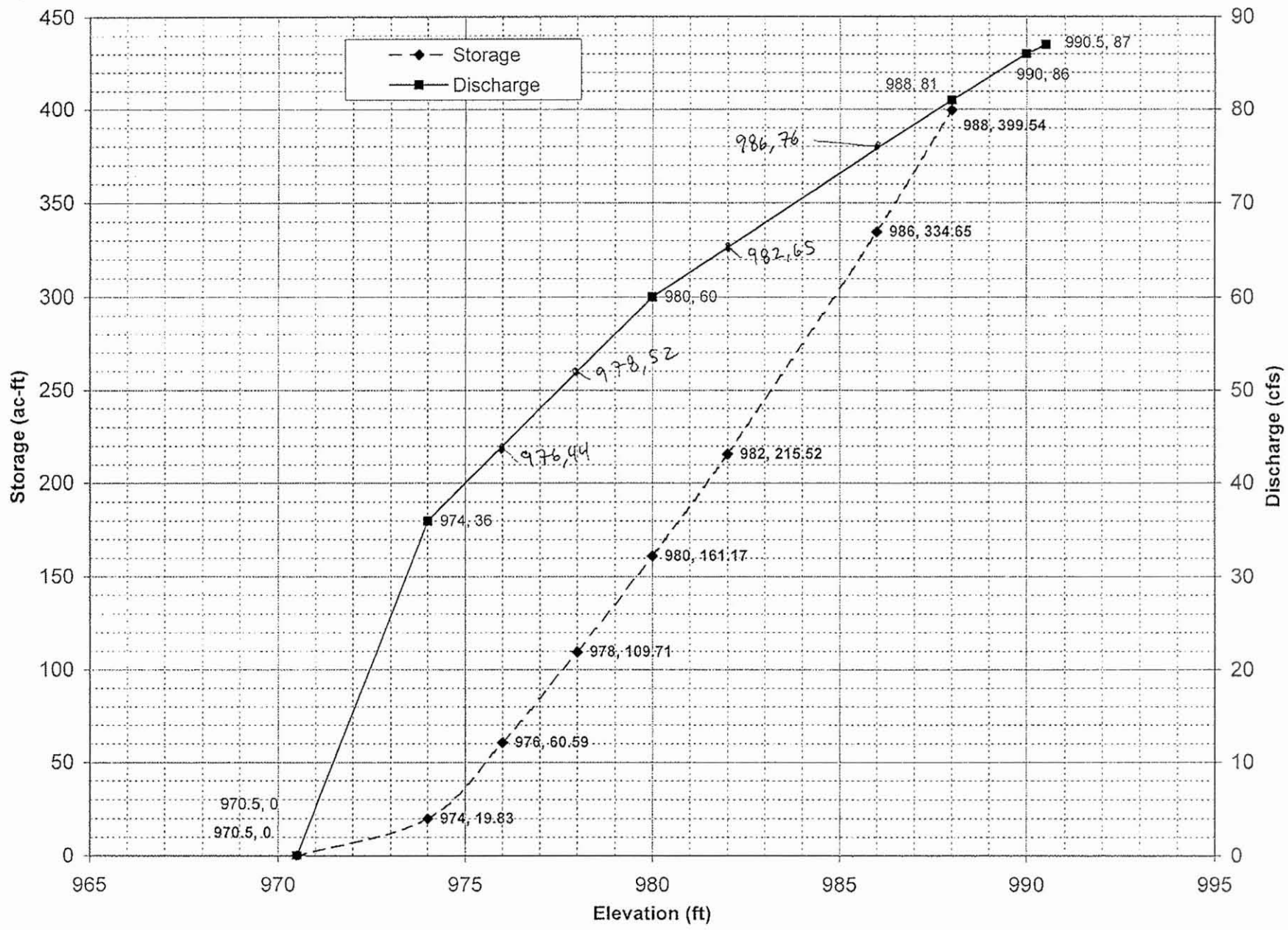



Loop 303/White Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin B
HDR Subbasin ID B74
Storage
Discharge
Storage (ac-ft)
Discharge (cfs)
Elevation (ft)
988, 953
987.3, 800
986, 668
988, 136.43
986, 108.98
982, 57
982, 63
980, 32.69
978, 11.35
974.6, 0
974.6, 0
978, 2
980, 60
200
180
160
140
120
100
80
60
40
20
0
1000
900
800
700
600
500
400
300
200
100
0
972
974
976
978
980
982
984
986
988
990

Loop 303/Wh... Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin C
HDR Subbasin ID B84



Loop 303/Wh. Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin D
HDR Subbasin ID B83



**APPENDIX C**

**ADOT BASIN ANALYSIS**

Final Volume IV Level III
ADMPV Report Feb. 2005

**URS**

# Memorandum

Date: March 27, 2002

To: Greg Jones, Flood Control District of Maricopa County (FCDMC)

From: Elliot Silverston
Rob Scrivo

Subject: **ADOT Basin Watershed Area**

URS has completed a review and analysis of the existing ADOT Basins and contributing watershed area located on the north side of I-10 between Bullard Avenue and Dysart Road. This Memorandum is an update to our earlier Memorandum submitted to FCDMC on October 29, 2001. This revised evaluation contains six additional scenarios related to runoff from the watershed to the existing ADOT Basins. These additional conditions were analyzed using the HEC-1 model as requested by the FCDMC at the October 31, 2001 meeting.

The six additional analyses and results are described under Tasks 3 and 4 below.

***Purpose***

The purpose of the analysis was to determine the volume of discharge resulting from the 100-year, 24-hour storm event intercepted by the existing ADOT Basins. In addition, the relative percentages of runoff contributing from area stakeholders upstream are summarized for comparison purposes. This information will be useful to the FCDMC in determining a quantifiable benefit in terms of flood control offered to the above entities through the use of the existing ADOT Basins as detention for the post-developed storm water volume generated within each jurisdictional boundary upstream. The stakeholders identified with the ADOT basin watershed area are listed below:

- The City of Goodyear
- The City of Litchfield Park
- The City of Avondale
- Maricopa County
- Estrella Community College
- Palm Valley Master Planned Development

***Analysis***

The analysis consisted of four major tasks. These tasks included a field trip, preparation of work maps, modification of the draft existing condition hydrology model prepared for the Loop 303 ADMP Update, modification of the Level III preliminary draft preferred alternative model and the preparation of various HEC-1 models for other conditions of interest.

***Task 1***

The first task consisted of a comprehensive field review to assess the extent to which development has occurred since the submittal of the Draft Existing Condition Hydrology model as well as to

verify modeled retention areas within the watershed. The watershed was video taped and several pictures were taken to document the findings of the field visit. The information was summarized in tables and put into the project file.

Information from the field visit was used to summarize the most recent changes in the watershed and incorporate those into a revised version of the Draft Existing Condition Hydrology model. This information is presented in Table 1.1a.

Only two modeled retention basins from the Draft Existing Condition Hydrology model were not field verified. The first is modeled in sub basin 288A and was not yet constructed. This basin is described in some detail in the "Drainage Report for Palm Valley Phase II Mass grading", dated December 23, 1998 by the WLB Group. This basin was removed from the draft existing condition model. The second basin is located within sub area 254. This area is gated and no access is permitted to the public. This development appeared fully built-out however, and the retention was assumed to be in place.

In some cases, on-lot retention in recently developed strip malls and other commercial properties was noted, however, this amount of volume was considered inconsequential compared with the total contributing watershed area and was not included in the model.

*Task 2*

The next task was to prepare a work-map from which the contributing areas and the percent contribution of each city/jurisdictions and the Palm Valley Master Planned Community boundary were estimated. The map is shown on Figure 1.1. The map shows stakeholder boundaries and sub basins. Using this map, the relative percentage of contributing watershed area associated with the stakeholders was determined and quantified.

*Task 3*

The next step in the analysis was to develop the following 10 hydrologic models:

- Undeveloped Model -This model was created by simply modifying the percent impervious (RTIMP) variable in the draft existing condition model to reflect an undeveloped condition. In addition, all existing retention/detention diverts were disabled.
- Existing Model – This model was a result of modifications made to the draft existing condition model based upon the data in Table 1.1a resulting from the field visit described in Task 1.
- Fully Developed No Retention – This model was created using the data provided URS from the FCDMC GIS Data base during the Level II portion of the Loop 303 ADMP Update project. This information consists of a tabulation of all sub basins within the ADMP Update project area and the associated full build-out or completely developed RTIMP variable. In this model, there were no diverts for retention of detention.
- Fully Developed with Retention – This model was created by adding retention diversions to the fully developed no retention model. The magnitude of these diverts was determined by running the 100-year, 6-hour storm for sub basins located within the City of Goodyear and the 100-year, 2-hour storm for all remaining sub basins. Sub Basins whose boundaries cross multiple jurisdictions were evaluated by computing a composite retention volume based upon the percentage of area found each jurisdiction. See Table 1.1b. All computed retention

volumes were multiplied by an 80% efficiency factor (as requested by FCDMC) to account for lost volume due to inadequate construction, siltation, etc…

- No ADMP, Future Retention Requirements met – This model was created by modifying the existing condition hydrology model for future conditions with onsite retention in currently undeveloped sub basins within the ADOT Basins contributing watershed.
- No ADMP, Future Retention Based on Pre-Post Analysis - This model was created by modifying the existing condition hydrology model for future conditions. Onsite retention in currently undeveloped sub basins within the ADOT Basins contributing watershed is provided. In lieu of normal on-site retention requirements, enough retention is provided so that post developed peak discharge is attenuated to be less than or equal to the existing peak discharge.
- The ADMP is in place and Future Retention Requirements are met – This model was created by modifying the Level III preliminary draft preferred condition hydrology model for future conditions within the ADOT Basins watershed. Onsite retention in currently undeveloped sub basins within the ADOT Basins contributing watershed is modeled for the ultimate build-out scenario.
- The ADMP is in place and Future Retention Based on Pre-Post Analysis is provided - This model was created by modifying the Level III preliminary draft preferred condition hydrology model for future conditions within the ADOT Basins watershed. Onsite retention in currently undeveloped sub basins within the ADOT Basins contributing watershed is provided. In lieu of normal on-site retention requirements however, only the amount of retention required for a pre-post peak attenuation is modeled.
- The ADMP is in place and there is no future retention modeled for the ultimate build out of the ADOT Basin watershed.
- There is no ADMP in place and there is no future retention modeled for the ultimate build out of the ADOT Basin watershed.

*Task 4*

This task involved the preparation of summary tables showing the results of the ten hydrologic models described above. Table 1.2a shows a break down of all four ADOT Basins labeled A – D from west to east and the amount of volume flowing to each. Both the total volume as well as the percentage of volume from the individual cities/jurisdictions and Palm Valley is shown. Table 1.2b shows a break down of all four ADOT Basins labeled A – D from west to east and the approximate stage corresponding with the condition modeled within the contributing watershed.

Table(s) 1.3 – 1.7 show the ADOT Basins as a composite and then individually for all ten hydrologic models analyzed as well as analysis results from other studies/reports. The information contained on these tables includes peak inflow/outflow data, peak stage/storage data and maximum ponding and storage information.

Figure 1.2 illustrates total expected inflow volume based on the results of the modeled conditions described above relative to the existing volume provided by the ADOT Basins. Important relationships between the inflow volumes have been highlighted. These relationships show comparisons of interest between various modeled watershed conditions. Table 1.8 contains a tabulated summary of the key comparisons shown on Figure 1.2.

*Results*

It is important to note that the volume of inflow indicated on Table 1.2a is lower than the peak storage information shown on Table(s) 1.3 – 1.7. This is a result of the way in which the HEC-1 model is routing flow from the western most basin ('A') to the eastern most basin ('D'). Since the basins are connected by pipes/culverts and the flow moves from one to the next in the model, peak storage volume data given by the HEC-1 output summary at Basin D for example would include both runoff directly flowing into basin D and also, runoff routed from Basin C to the west. For this reason, the total inflow volumes shown on Table 1.2a were obtained by simply summing the volume generated on individual sub basins contributing to the total inflow upstream.

In addition, it should be noted that the total inflow volume would typically be higher than the peak storage volume since it represents the entire volume under the inflow hydrograph for the entire storm duration rather than only that volume present in the basin corresponding to the hydrograph peak discharge. This is always true for a basin with only a single inflow point.

The results of the analysis showed that for any given storm event the majority of runoff contributing to the volume at the ADOT Basins comes from the City of Goodyear followed by Litchfield Park and then Avondale. The Palm Valley development contributes approximately 60% of the total volume conveyed downstream to the ADOT Basins (Note: Palm Valley is located in several jurisdictions – Figure 1.1). By comparison, the City of Goodyear contributes approximately 46% of the total inflow volume versus approximately 37% and 14% for the cities of Litchfield Park and Avondale respectively.

The results of the above analysis have been charted and are presented on figure 1.2. From a review of the analysis results and figure 1.2, it is clear that under existing conditions, the outer ADOT Basins 'A' (far west) and 'D' (far east) have far more volume than that which is directly flowing in from the adjacent watershed. However, the results also indicate that the existing inner ADOT Basins 'B' and 'C' accept the highest rates of inflow and may not have adequate volume under certain conditions modeled. This indicates that the excess inflow volume to the inner basins would require transfer to the outer basins whose geometry provide more volume than that which directly flows in from the adjacent land. This would be a direct function of the adequacy or in-adequacy of the existing connection pipes/culverts.

Taken as a composite facility, the existing ADOT Basins appear to have adequate capacity to store the runoff generated by the offsite drainage area as well as diverted discharges from the Bullard Wash, however, the FCDMC minimum freeboard requirement may not be met.

Table 1.8 summarizes key comparisons made between the 10 modeled inflow conditions illustrated on Figure 1.2. According to these comparisons, the difference between the existing condition inflow volume and the undeveloped inflow volume (165 ac-ft) represents the current benefit to upstream development. This apparent benefit is due to the lack of existing onsite retention provided by the majority of existing upstream development. Typically, development must reserve land for the construction of onsite retention basins to attenuate post-developed peak discharges resulting from the 100-year storm event. In this case, most of the upstream development has not constructed onsite retention basins but has instead directed storm water runoff downstream to the existing ADOT Basins.

If planned future development on currently undeveloped sub basins upstream of the existing ADOT Basins is allowed to directly discharge post developed storm water downstream without providing onsite retention, the total benefit would be equal to the land that would be required to store approximately 415 ac-ft. Based on Table 1.2a, the approximate relative benefits to each of the stakeholders in the watershed in terms of volume are as follows:

- The City of Goodyear – 192 ac-ft
- The City of Litchfield Park – 156 ac-ft
- The City of Avondale – 59 ac-ft
- Maricopa County – 5 ac-ft
- Estrella Community College – 3 ac-ft
- Palm Valley Master Planned Community – 264 ac-ft

In reviewing the results in Figure 1.2 and Table 1.2a, key comparisons can be made to the use of retention in the existing contributing watershed to the ADOT Basins. The impacts of the ADMP in diverting runoff to the ADOT Basins can also be evaluated. These scenarios are used for comparison purposes.

1. Assuming there is no ADMP in place, the impact of waiving retention criteria in the contributing watershed to date is approximately 165 ac-ft, which is approximately 25% of the present contributing runoff volume to the basins. Based on Table 1.2a, the approximate relative benefits to each of the stakeholders in the watershed in terms of volume are as follows:
    - The City of Goodyear – 76 ac-ft
    - The City of Litchfield Park – 62 ac-ft
    - The City of Avondale – 23 ac-ft
    - Maricopa County – 2 ac-ft
    - Estrella Community College – 2 ac-ft
    - Palm Valley Master Planned Community – 105 ac-ft
2. If the ADMP is not implemented and development occurred as planned in the ADOT Basins watershed, the increased volume of runoff to the ADOT Basins by waiving retention entirely is approximately 139 ac-ft. Based on Table 1.2a, the approximate relative benefits to each of the stakeholders in the watershed in terms of volume are as follows:
    - The City of Goodyear – 64 ac-ft
    - The City of Litchfield Park – 52 ac-ft
    - The City of Avondale – 20 ac-ft
    - Maricopa County – 2 ac-ft
    - Estrella Community College – 1 ac-ft
    - Palm Valley Master Planned Community – 89 ac-ft
3. If the ADMP is implemented and development occurs as planned in the entire watershed (existing hydrology), the increase in runoff volume to the ADOT Basins is again 139 ac-ft. However, the ADMP project diverts an additional runoff volume of approximately 156 ac-ft to the ADOT Basins. Again, based on Table 1.2a, the approximate relative benefits to each of the stakeholders in the watershed in terms of volume are as follows:
    - The City of Goodyear – 64 ac-ft

- The City of Litchfield Park – 50 ac-ft
- The City of Avondale – 20 ac-ft
- Maricopa County – 156 ac-ft
- Estrella Community College – 1 ac-ft
- Palm Valley Master Planned Community – 898 ac-ft

Note that when the ADMP is in place the FCDMC now contributes 55% of the total increase in inflow at the ADOT Basins while area stakeholders combined contribute 45% of the total increase in runoff volume. The 45% would then be split between the stakeholders according to the percentages shown on Table 1.2a.
The data provided herein can be used to determine the impacts of each stakeholder including FCDMC on the ADOT Basins. The proportional benefit to each stakeholder may be used to facilitate partnering in the future improvement(s) to the basins.

cc:

Attachment

*Table 1.1a*

*Hydrologic Modeling Parameters*

| Sub Area | Modeled Parameters: Retention Triangle (Y/N) | Modeled Parameters: Development: [16]RTIMP (WLB) | Modeled Parameters: Development: RTIMP (Draft Exist) (URS) | [5]Ultimate RTIMP (FCDMC-GIS) | [1]Modeled As Dev or (FD,UD,PD) | Color Aerial Visible Development (FD,UD,PD) | [6]Estimated Percentage of Development in Draft Exist. Condition Model | Field Check Development As a % of Full Build-out (approx. %) | Field Verified Existing Condition of Sub Basin (FD,UD,PD) | Revised Existing Cond. RTIMP | [7]Field Check Verified Retention (Y/N) | [8]Future Retention Proposed in Sub-Area (Y/N) | Palm Valley Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 288A | Y | 0% | 0% | 80.0% | UD | UD | 0% | 0% | *UD* | 0.0% | [15]N | Y | II |
| 287A | N | 0% | 15% | 61.0% | PD | PD | 26% | 26% | *PD* | 16% | N/A | N/A | N/A |
| 254 | Y | 0% | 8% | 9.9% | PD | PD | 81% | 92% | *PD* | 9.1% | [10]Y | N | NS |
| 254B | N | 0% | 0% | 20.7% | UD | UD | 0% | 0% | *UD* | 0.0% | N/A | [14]N | NS |
| 269 | Y | 0% | 30% | 37.9% | PD | PD | 79% | 100% | *FD* | 37.9% | [15]Y | [14]N | NS |
| 269B | Y | 0% | 15% | 46.0% | PD | PD | 33% | 74% | *PD* | 34.0% | [15]Y | [14]N | NS |
| 268 | Y | 0% | 30% | 37.4% | PD | PD | 80% | 100% | *FD* | 37.4% | [12]Y | [14]N | NS |
| [5]288B | Y | 0% | 14% | 32.4% | PD | PD | 43% | 43% | *PD* | 13.9% | Y | [14]N | II |
| 287B | N | 0% | 54% | 55.7% | PD | PD | 97% | 100% | *FD* | 55.7% | [9]N/A | N/A | N/A |
| 2711 | N | 0% | 20% | 20.0% | FD | FD | 100% | 100% | *FD* | 20.0% | N/A | [20]N | NS |
| 254A | N | 20% | 20% | 48.1% | FD | FD | Used URS RTIMP | 100% | *FD* | 20.0% | N/A | [20]N | N/A |
| 257 | N | 0% | 0% | 21.7% | UD | UD | 0% | 0% | *UD* | 0.0% | N/A | Unknown | N/A |
| 256 | Y | 0% | 3% | 22.1% | PD | PD | 14% | 27% | *PD* | 6.0% | Y | [21]Y | N/A |
| SUB6 | N | 12% | 20% | 11.0% | FD | FD | Used URS RTIMP | 100% | *FD* | 20.0% | N/A | [20]N | N/A |
| SUB7 | N | 12% | 3% | 5.8% | FD | FD | Used URS RTIMP | 100% | *FD* | 3.0% | N/A | [20]N | N/A |
| 271A | Y | 0% | 13% | 71.1% | PD | PD | 18% | 65% | *PD* | 46.2% | Y | [14]N | NS |
| 255A | N | 12% | 12% | 9.5% | FD | FD | Used URS RTIMP | 100% | *FD* | 12.0% | N/A | [20]N | N/A |
| 2712 | N | 0% | 2% | 59.8% | PD | PD | 3% | 3% | *PD* | 2% | N/A | [14]N | I |
| 270 | N | 18% | 30% | 35.4% | PD | PD | 85% | 100% | *FD* | 35.4% | N/A | [20]N | N/A |
| 289C | N | 0% | 1% | 13.6% | PD | PD | 7% | 7% | *PD* | 1.0% | N/A | [14]N | I |
| 289A | N | 0% | 27% | 27.0% | FD | [13]PD | 100% | 100% | *FD* | 27.0% | N/A | [14]N | I |
| [2]288B | N | 0% | 15% | 25.7% | FD | FD | Used URS RTIMP | 90% | *PD* | 15.0% | N/A | [14]N | I |
| D | N | 0% | 26% | 26.0% | FD | FD | 100% | 100% | *FD* | 26.0% | N/A | [14]N | I |
| 289 | N | 0% | 27% | 30.4% | PD | PD | 89% | 96% | *PD* | 29.2% | [9]N/A | [14]N | I |
| 287C | N | 0% | 48% | 53.0% | PD | PD | 91% | 91% | *PD* | 48% | N/A | N/A | N/A |
| 287D | N | 0% | 0% | 56.7% | UD | UD | 0% | 0% | *UD* | 0.0% | N/A | N/A | N/A |

FD = Fully Developed
PD = Partly Developed
UD = Un-Developed

1. If the percent impervious is 0%, then undeveloped.
2. Represents off-line retention as described in "Drainage Report for Palm Valley Phase 2 Mass Grading", dated 12/23/1998.
3. EEC/URS modeled as a lower RTIMP at full build-out than later calculated by the FCDMC GIS data base for preparation of Future Condition Hydrology model. Did not change to the higher value since the value used in the Existing Condition model had already been approved by the FCDMC.
4. RTIMP fully developed was less than the full build-out RTIMP used in the Existing Condition model, therefore, the RTIMP from the Existing Condition model was used for consistency.
5. Data source from the FCDMC GIS Data Base. Based on the percentage of the total sub basin area that will be developed in the ultimate built-out condition.
6. This is the percentage of the sub area that was built out at the time the Draft Existing Condition Hydrology model was prepared.
7. N = field trip could not verify the modled retention. Y = field trip verified modeled retention.
8. As described by applicable drainage report, this would be new or additional retention, beyond what currently exists.
9. Some on-lot retention observed, not included in model.
10. Could not access portion of sub area 254 due to gate, assume no change from draft and that retention exists.
11. "100%" indicates this area is completely built-out according to future land-use plan. Note that this does not necessarily mean the entire sub area is covered with development for the 100% or "full build-out" condition.
12. This retention was verified and documented on page 12 by the "Palm Valley Concept Drainage Plan for the Roosevelt Canal Watershed", dated 12/17/96.
13. Retention as described on pages 9 and 12 of the "Drainage Report for Palm Valley Phase 2 Mass Grading", dated 12/23/1998 - not yet constructed however, modeled in the Draft Existing Condtion Hydrology Model. This divert will be turned off for the existing condition in this analysis since it was not yet constructed.
14. Per the "Developed Conditions Watershed Boundary Map" (11"x17") map, in the "Master Drainage Study for Palm Valley", dated March 8 1998, excess runoff from this area will drain directly to the ADOT basins.
15. Retention provided per the "Palm Valley Master Drainage Study", by the WLB Group, dated 1/8/98 - see sub basins 'S34', 'S34A' and 'S12'.
16. ~r the "Developed Conditions Watershed Boundary Map" (11"x17") map, in the "Master Drainage Study for Palm Valley", dated March 8 1998, this area generally drains to the RID Overchute.
17. S" indicates that there was no phase specified for this sub basin in any documentation available to URS.
18. Some differences due to sub basin boundary changes in the ADMP Update.
19. Although area appears partly developed on aerial, it may be fully developed according to future land use.
20. Sub basin is fully developed without retention.
21. Retention construction noted during field trip.

Table 1.1b

Onsite Retention Requirements for
ADOT Basin Watershed Sub Basins

| Retention Requirement Sub Basin | ADOT Basin Study % Area Within Jurisdiction 100-yr, 2-hr Avondale | 100-yr, 6-hr Goodyear | 100-yr, 2-hr Litchfield Park | 100-yr, 2-hr Maricopa County | 100-yr, 2-hr Estrella CC | 100-yr, 2-hr Volume (ac-ft) | 100-yr, 6-hr Volume (ac-ft) | [1]Modeled Design Storm | Required Onsite Retention (ac-ft) | Volume of Diverted Flow Currently Used to Model Existing Onsite Retention (ac-ft) | Required to Provide Future Retention? | % Future Development to be Retained | (80% Eff.) (ac-ft) | Part 1A&2A RET. DIV. in HEC-1 as % of Future Developed Area (ac-ft) | Part 1B&2B RET. DIV. in HEC-2 as % of Future (ac-ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 254 | | | 100% | | | 11.8 | 21.8 | 100-yr, 2-hr | 11.8 | 29.6 | N | 0.0% | 9.4 | 29.6 | 4.80 |
| 256 | | | 95% | 5% | | 36.9 | 50.8 | 100-yr, 2-hr | 36.9 | 5.0 | Y | 73.0% | 29.5 | 26.5 | 20.50 |
| 257 | | | 100% | | | 31.9 | 42.5 | 100-yr, 2-hr | 31.9 | 0.0 | Y | 100.0% | 25.5 | 25.5 | 18.40 |
| 268 | | 100% | | | | 19.2 | 27.4 | 100-yr, 6-hr | 27.4 | N/A | N/A | N/A | 21.9 | N/A | N/A |
| 269 | | 100% | | | | 18.1 | 25.9 | 100-yr, 6-hr | 25.9 | N/A | N/A | N/A | 20.7 | N/A | N/A |
| 270 | | | 90% | 10% | | 23.5 | 33.4 | 100-yr, 2-hr | 23.5 | N/A | N/A | N/A | 18.8 | N/A | N/A |
| [6]289 | | 100% | | | | 20.7 | 29.6 | 100-yr, 6-hr | 29.6 | 0.0 | N | 0.0% | 23.7 | 0.0 | N/A |
| 2711 | | | 100% | | | 6.8 | 10.7 | 100-yr, 2-hr | 6.8 | N/A | N/A | N/A | 5.4 | N/A | N/A |
| [5]2712 | 90% | 6% | | 4% | | 45.2 | 59.4 | *Composite* | 46.1 | 0.0 | Y | 89.0% | 36.9 | 32.8 | 36.65 |
| 254A | | | 100% | | | 11.3 | 23.8 | 100-yr, 2-hr | 11.3 | N/A | N/A | N/A | 9.0 | N/A | N/A |
| [6]254B | | | 100% | | | 8.1 | 12.7 | 100-yr, 2-hr | 8.1 | 0.0 | N | 0.0% | 6.5 | 0.0 | N/A |
| 255A | | | 100% | | | 38.1 | 59.3 | 100-yr, 2-hr | 38.1 | N/A | N/A | N/A | 30.5 | N/A | N/A |
| [5]269B | | 55% | 37% | 7% | | 21.5 | 30.3 | *Composite* | 26.4 | 12.4 | Y | 24.0% | 21.1 | 17.5 | 16.60 |
| [5]271A | 100% | | | | | 27.2 | 34.5 | 100-yr, 2-hr | 27.2 | 11.1 | Y | 33.5% | 21.7 | 18.4 | 20.00 |
| [5]287A | | 100% | | | | 35.3 | 45.9 | ADOT Basin | 45.9 | 0.0 | Y | 74.0% | 36.7 | N/A | N/A |
| 287B | | 100% | | | | 9.4 | 12.6 | ADOT Basin | 12.6 | N/A | N/A | N/A | 10.1 | N/A | N/A |
| [6]287C | | 100% | | | | 24.6 | 31.7 | ADOT Basin | 31.7 | 0.0 | N | 0.0% | 25.3 | 0.0 | N/A |
| [5]287D | | 100% | | | | 26.1 | 33.0 | ADOT Basin | 33.0 | 0.0 | Y | 100.0% | 26.4 | N/A | N/A |
| [5]288A | | 100% | | | | 8.9 | 11.0 | 100-yr, 6-hr | 11.0 | 0.0 | Y | 100.0% | 8.8 | 8.8 | 6.50 |
| [5,7]288B | | 100% | | | | 68.3 | 99.8 | 100-yr, 6-hr | 99.8 | [7]N/A | Y | 26.0% | 79.8 | 20.8 | 47.10 |
| 289A | 57% | | | | 33% | 13.8 | 20.9 | 100-yr, 2-hr | 13.8 | N/A | N/A | N/A | 11.0 | N/A | N/A |
| [6]289B | | 100% | | | | 21.4 | 31.4 | 100-yr, 6-hr | 31.4 | 0.0 | N | 0.0% | 25.1 | 0.0 | N/A |
| [5]289C | 87% | 14% | | | | 16.6 | 27.1 | *Composite* | 18.1 | 0.0 | Y | 76.5% | 14.5 | 11.1 | 10.80 |
| 289D | | 100% | | | | 17.2 | 26.1 | 100-yr, 6-hr | 26.1 | N/A | N/A | N/A | 20.9 | N/A | N/A |
| SUB6 | | | 100% | | | 8.2 | 11.8 | 100-yr, 2-hr | 8.2 | N/A | N/A | N/A | 6.6 | N/A | N/A |
| SUB7 | | | 100% | | | 14.4 | 23.1 | 100-yr, 2-hr | 14.4 | N/A | N/A | N/A | 11.5 | N/A | N/A |

1. N/A indicates that the sub area exists as 100% developed with no retention, therefore, no future retention divert is waranted. However, for the purposes of this study retention will be used to evaluate the "benefit" to a development of not having to provide on-site retention.
2. Data taken frome the Loop 303 ADMP Update workbook, "sub basin data.xls". Since the scope for this study allows for more accurate determination of jurisdictional boudaries as well as percentages of sub basins within different jurisdictions, the data from this study supercedes that from the ADMP Update. The ADMP data was included for information only.
3. Differences in percentages of a sub basin found in multiple jurisdictions between the ADMP Update and this study are a result of more detailed scope and data used to produce this information.
4. The ADMP Update used the following criteria to model future onsite retention: If 75% or more of a sub basin was within the city of Goodyear, the 100-year, 6-hour storm event was used, otherwise the 100-year, 2-hour storm event was used (results in higher downstream runoff and hence is more conservative).
   Per the higher level of detail required by this study, the retention will be weighted by the percentages of the sub basin found within and outside of the City of Goodyear.
5. Sub basin is going to develop in the future and will be required to provide the required on-site retention.
6. Sub basin is going to develop in the future but is part of existing phases of the Palm Valley development and will not provide future retention.
7. Off-line retention exists in the golf course portion of this sub basin. It is modeled by HEC-1. The proposed future retention will be based on on the balance of area currently un-developed and will be shown in the HEC-1 model as a divert.
8. Total divert in existing condition is 29.6 ac-ft. This includes approximately 4.8 ac-ft for existing development and 24.8 ac-ft for ponding behind the airline canal.

*Table 1.2a*

*Contributing Jurisdictions/Development*
*to*
*ADOT Basin Inflow*

*Total ADOT Basin Contributing Watershed Area:* 7.39 sm

| Basin ID | Total Contributing Area (sm) | Modeled Condition | City/Jurisdictional Agency: Goodyear % Total | Goodyear Peak Discharge (cfs) | Goodyear Volume (ac-ft) | Litchfield Park % Total | Litchfield Park Peak Discharge (cfs) | Litchfield Park Volume (ac-ft) | Avondale % Total | Avondale Peak Discharge (cfs) | Avondale Volume (ac-ft) | Maricopa County % Total | Maricopa County Peak Discharge (cfs) | Maricopa County Volume (ac-ft) | Estrella Community College % Total | Estrella Community College Peak Discharge (cfs) | Estrella Community College Volume (ac-ft) | Palm Valley % Total | Palm Valley Peak Discharge (cfs) | Palm Valley Volume (ac-ft) | [2]Total Inflow Volume (ac-ft) | Actual Available Storage (ac-ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 0.41 | *Completely Undeveloped* | 100.0% | 277 | 25 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 66.6% | 184 | 17 | 26 | 265.2 |
| | | *Existing Conditions* | 100.0% | 295 | 34 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 66.6% | 196 | 23 | 34 | |
| | | *Fully Developed - No Onsite Retention* | 100.0% | 361 | 64 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 66.6% | 240 | 42 | 64 | |
| | | *Fully Developed - Onsite Retention All Sub Basins* | 100.0% | 297 | 55 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 66.6% | 198 | 37 | 55 | |
| | | *Part 1A:No diverts from ADMP, Future Onsite Retention Provided* | 100.0% | 297 | 55 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 66.6% | 198 | 37 | 55 | |
| | | *Part 1B:No diverts from ADMP, Post developed Q's <equal to existing* | 100.0% | 297 | 57 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 66.6% | 198 | 38 | 57 | |
| | | *Part 2A:Diverts from ADMP, Future Onsite Retention Provided* | 100.0% | 723 | 211 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 66.6% | 481 | 140 | 211 | |
| | | *Part 2B: Diverts from ADMP, Post developed Q's <equal to existing* | 100.0% | 733 | 213 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 66.6% | 488 | 142 | 213 | |
| | | *Part 3A: No ADMP, Dev. W/O Future Retention* | 100.0% | 361 | 64 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 66.6% | 240 | 42 | 64 | |
| | | *Part 3B: W/ADMP, Dev. W/O Future Retention* | 100.0% | 733 | 220 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 66.6% | 488 | 146 | 220 | |
| B | 2.18 | *Completely Undeveloped* | 75.7% | 890 | 93 | 23.5% | 276 | 29 | 0.0% | 0 | 0 | 0.8% | 9 | 1 | 0.0% | 0 | 0 | 96.0% | 1128 | 118 | 123 | 109.0 |
| | | *Existing Conditions* | 75.7% | 520 | 143 | 23.5% | 162 | 44 | 0.0% | 0 | 0 | 0.8% | 6 | 2 | 0.0% | 0 | 0 | 96.0% | 659 | 181 | 189 | |
| | | *Fully Developed - No Onsite Retention* | 75.7% | 1007 | 174 | 23.5% | 313 | 54 | 0.0% | 0 | 0 | 0.8% | 11 | 2 | 0.0% | 0 | 0 | 96.0% | 1276 | 220 | 229 | |
| | | *Fully Developed - Onsite Retention All Sub Basins* | 75.7% | 290 | 58 | 23.5% | 87 | 18 | 0.0% | 0 | 0 | 0.8% | 3 | 1 | 0.0% | 0 | 0 | 96.0% | 365 | 73 | 77 | |
| | | *Part 1A:No diverts from ADMP, Future Onsite Retention Provided* | 75.7% | 532 | 141 | 23.5% | 165 | 44 | 0.0% | 0 | 0 | 0.8% | 6 | 1 | 0.0% | 0 | 0 | 96.0% | 675 | 179 | 186 | |
| | | *Part 1B:No diverts from ADMP, Post developed Q's <equal to existing* | 75.7% | 436 | 122 | 23.5% | 135 | 38 | 0.0% | 0 | 0 | 0.8% | 5 | 1 | 0.0% | 0 | 0 | 96.0% | 553 | 154 | 161 | |
| | | *Part 2A:Diverts from ADMP, Future Onsite Retention Provided* | 75.7% | 532 | 141 | 23.5% | 165 | 44 | 0.0% | 0 | 0 | 0.8% | 6 | 1 | 0.0% | 0 | 0 | 96.0% | 675 | 179 | 186 | |
| | | *Part 2B: Diverts from ADMP, Post developed Q's <equal to existing* | 75.7% | 436 | 122 | 23.5% | 135 | 38 | 0.0% | 0 | 0 | 0.8% | 5 | 1 | 0.0% | 0 | 0 | 96.0% | 553 | 154 | 161 | |
| | | *Part 3A: No ADMP, Dev. W/O Future Retention* | 75.7% | 535 | 158 | 23.5% | 166 | 49 | 0.0% | 0 | 0 | 0.8% | 6 | 2 | 0.0% | 0 | 0 | 96.0% | 678 | 200 | 208 | |
| | | *Part 3B: W/ADMP, Dev. W/O Future Retention* | 75.7% | 535 | 158 | 23.5% | 166 | 49 | 0.0% | 0 | 0 | 0.8% | 6 | 2 | 0.0% | 0 | 0 | 96.0% | 678 | 200 | 208 | |
| C | 4.57 | *Completely Undeveloped* | 24.7% | 331 | 76 | 49.4% | 662 | 152 | 22.8% | 305 | 70 | 1.5% | 21 | 5 | 1.5% | 22 | 5 | 47.1% | 630 | 145 | 308 | 324.5 |
| | | *Existing Conditions* | 24.7% | 350 | 99 | 49.4% | 699 | 197 | 22.8% | 322 | 91 | 1.5% | 22 | 6 | 1.5% | 23 | 6 | 47.1% | 666 | 188 | 400 | |
| | | *Fully Developed - No Onsite Retention* | 24.7% | 436 | 121 | 49.4% | 872 | 242 | 22.8% | 402 | 111 | 1.5% | 28 | 8 | 1.5% | 28 | 8 | 47.1% | 831 | 230 | 489 | |
| | | *Fully Developed - Onsite Retention All Sub Basins* | 24.7% | 132 | 49 | 49.4% | 265 | 98 | 22.8% | 122 | 45 | 1.5% | 8 | 3 | 1.5% | 9 | 3 | 47.1% | 252 | 93 | 199 | |
| | | *Part 1A:No diverts from ADMP, Future Onsite Retention Provided* | 24.7% | 322 | 93 | 49.4% | 644 | 185 | 22.8% | 297 | 85 | 1.5% | 21 | 6 | 1.5% | 21 | 6 | 47.1% | 614 | 176 | 375 | |
| | | *Part 1B:No diverts from ADMP, Post developed Q's <equal to existing* | 24.7% | 314 | 95 | 49.4% | 627 | 189 | 22.8% | 289 | 87 | 1.5% | 20 | 6 | 1.5% | 20 | 6 | 47.1% | 597 | 180 | 383 | |
| | | *Part 2A:Diverts from ADMP, Future Onsite Retention Provided* | 24.7% | 322 | 93 | 49.4% | 644 | 185 | 22.8% | 297 | 85 | 1.5% | 21 | 6 | 1.5% | 21 | 6 | 47.1% | 614 | 176 | 375 | |
| | | *Part 2B: Diverts from ADMP, Post developed Q's <equal to existing* | 24.7% | 314 | 95 | 49.4% | 627 | 189 | 22.8% | 289 | 87 | 1.5% | 20 | 6 | 1.5% | 20 | 6 | 47.1% | 597 | 180 | 383 | |
| | | *Part 3A: No ADMP, Dev. W/O Future Retention* | 24.7% | 379 | 117 | 49.4% | 758 | 234 | 22.8% | 349 | 108 | 1.5% | 24 | 7 | 1.5% | 25 | 8 | 47.1% | 723 | 223 | 473 | |
| | | *Part 3B: W/ADMP, Dev. W/O Future Retention* | 24.7% | 379 | 117 | 49.4% | 758 | 234 | 22.8% | 349 | 108 | 1.5% | 24 | 7 | 1.5% | 25 | 8 | 47.1% | 723 | 223 | 473 | |
| D | 0.23 | *Completely Undeveloped* | 100.0% | 460 | 19 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 51.7% | 238 | 10 | 19 | 334.7 |
| | | *Existing Conditions* | 100.0% | 460 | 19 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 51.7% | 238 | 10 | 19 | |
| | | *Fully Developed - No Onsite Retention* | 100.0% | 482 | 35 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 51.7% | 249 | 18 | 35 | |
| | | *Fully Developed - Onsite Retention All Sub Basins* | 100.0% | 284 | 35 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 51.7% | 147 | 18 | 35 | |
| | | *Part 1A:No diverts from ADMP, Future Onsite Retention Provided* | 100.0% | 472 | 35 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 51.7% | 244 | 18 | 35 | |
| | | *Part 1B:No diverts from ADMP, Post developed Q's <equal to existing* | 100.0% | 472 | 35 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 51.7% | 244 | 18 | 35 | |
| | | *Part 2A:Diverts from ADMP, Future Onsite Retention Provided* | 100.0% | 472 | 35 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 51.7% | 244 | 18 | 35 | |
| | | *Part 2B: Diverts from ADMP, Post developed Q's <equal to existing* | 100.0% | 472 | 35 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 51.7% | 244 | 18 | 35 | |
| | | *Part 3A: No ADMP, Dev. W/O Future Retention* | 100.0% | 477 | 35 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 51.7% | 247 | 18 | 35 | |
| | | *Part 3B: W/ADMP, Dev. W/O Future Retention* | 100.0% | 477 | 35 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0 | 51.7% | 247 | 18 | 35 | |

| Modeled Condition | Composite [1]Total Inflow Volume (ac-ft) | Percentage of Contributing Area at ADOT Basins: 46.3% [3]Goodyear (ac-ft) | 37.5% [3]Litchfield Park (ac-ft) | 14.1% [3]Avondale (ac-ft) | 1.2% [3]Maricopa County (ac-ft) | 1.0% [3]Estrella College (ac-ft) | 63.7% [3]Palm Valley (ac-ft) |
|---|---|---|---|---|---|---|---|
| *Completely Undeveloped* | 475 | 220 | 178 | 67 | 6 | 5 | 303 |
| *Existing Conditions* | 641 | 297 | 240 | 90 | 8 | 6 | 408 |
| *Fully Developed - No Onsite Retention* | 818 | 378 | 307 | 115 | 10 | 8 | 521 |
| *Fully Developed - Onsite Retention All Sub Basins* | 365 | 169 | 137 | 51 | 4 | 4 | 233 |
| *Part 1A:No diverts from ADMP, Future Onsite Retention Provided* | 651 | 301 | 244 | 92 | 8 | 7 | 415 |
| *Part 1B:No diverts from ADMP, Post developed Q's <equal to existing* | 635 | 294 | 239 | 90 | 8 | 6 | 405 |
| *Part 2A:Diverts from ADMP, Future Onsite Retention Provided* | 807 | 374 | 303 | 114 | 10 | 8 | 514 |
| *Part 2B: Diverts from ADMP, Post developed Q's <equal to existing* | 792 | 367 | 297 | 112 | 10 | 8 | 505 |
| *Part 3A: No ADMP, Dev. W/O Future Retention* | 780 | 361 | 292 | 110 | 9 | 8 | 497 |
| *Part 3B: W/ADMP, Dev. W/O Future Retention* | 936 | 433 | 351 | 132 | 11 | 9 | 597 |

1. Note: The 'Total Volume' reported here is indicative of the sum of the volumes generated on the individual sub basins upstream that contribute directly to the ADOT Basins. Peak storage values on Table 1.3 were obtained by summing the peak storage value reported at each ADOT Basin (A-D) in the HEC-1 output file. Since the basins are interconnected and modeled routing the discharges from one to the next (A-D), these volumes in effect double-count storm water. For example, the peak storage in Basin D would have portions of the volume that originally discharged into the upstream basins A - C as well as volume from the adjacent/upstream sub basin areas.
2. Note: The sum of the volumes will be higher than the total if Palm Valley is included. This is because portions of Palm Valley lie within multiple cities. If it is excluded, the summation will equal the total volume.
3. Note: Portion of the total volume that drains to the ADOT Basins from respective city, jurisdiction or development. This value is based on the percentage of total contributing area shown above.

*Tabl 2b*

***Ponding Elevation Summary***

| Basin ID | Total Contributing Area (sm) | Modeled Condition | [2]Max. Ponding Elevation (ft) | [3]Ponding Elevation at Peak Inflow (ft) |
|---|---|---|---|---|
| A | 0.41 (Ex. Vol: 265.2 ac-ft) | *Completely Undeveloped* | 986 | 978.7 |
| | | *Existing Conditions* | 986 | 978.9 |
| | | *Fully Developed - No Onsite Retention* | 986 | 979.6 |
| | | *Fully Developed - Onsite Retention All Sub Basins* | 986 | 979.3 |
| | | *Part 1A:No diverts from ADMP, Future Onsite Retention Provided* | 986 | 979.3 |
| | | *Part 1B:No diverts from ADMP, Post developed Q's </equal to existing* | 986 | 979.4 |
| | | *Part 2A:Diverts from ADMP, Future Onsite Retention Provided* | 986 | 983.3 |
| | | *Part 2B: Diverts from ADMP, Post developed Q's </equal to existing* | 986 | 983.3 |
| | | *Part 3A: No ADMP, Dev. W/O Future Retention* | 986 | 979.6 |
| | | *Part 3B: W/ADMP, Dev. W/O Future Retention* | 986 | 983.5 |
| B | 2.18 (Ex. Vol: 109.0 ac-ft) | *Completely Undeveloped* | 986 | 982.9 |
| | | *Existing Conditions* | 986 | 982.0 |
| | | *Fully Developed - No Onsite Retention* | 986 | 985.1 |
| | | *Fully Developed - Onsite Retention All Sub Basins* | 986 | 980.5 |
| | | *Part 1A:No diverts from ADMP, Future Onsite Retention Provided* | 986 | 981.9 |
| | | *Part 1B:No diverts from ADMP, Post developed Q's </equal to existing* | 986 | 981.7 |
| | | *Part 2A:Diverts from ADMP, Future Onsite Retention Provided* | 986 | 981.9 |
| | | *Part 2B: Diverts from ADMP, Post developed Q's </equal to existing* | 986 | 981.7 |
| | | *Part 3A: No ADMP, Dev. W/O Future Retention* | 986 | 982.4 |
| | | *Part 3B: W/ADMP, Dev. W/O Future Retention* | 986 | 982.4 |
| C | 4.57 (Ex. Vol: 324.5 ac-ft) | *Completely Undeveloped* | 986 | 982.7 |
| | | *Existing Conditions* | 986 | 983.9 |
| | | *Fully Developed - No Onsite Retention* | 986 | 987.3 |
| | | *Fully Developed - Onsite Retention All Sub Basins* | 986 | 978.6 |
| | | *Part 1A:No diverts from ADMP, Future Onsite Retention Provided* | 986 | 982.9 |
| | | *Part 1B:No diverts from ADMP, Post developed Q's </equal to existing* | 986 | 982.8 |
| | | *Part 2A:Diverts from ADMP, Future Onsite Retention Provided* | 986 | 982.9 |
| | | *Part 2B: Diverts from ADMP, Post developed Q's </equal to existing* | 986 | 982.9 |
| | | *Part 3A: No ADMP, Dev. W/O Future Retention* | 986 | 986.0 |
| | | *Part 3B: W/ADMP, Dev. W/O Future Retention* | 986 | 985.7 |
| D | 0.23 (Ex. Vol: 334.7 ac-ft) | *Completely Undeveloped* | 986 | 984.9 |
| | | *Existing Conditions* | 986 | 987.6 |
| | | *Fully Developed - No Onsite Retention* | 986 | 992.9 |
| | | *Fully Developed - Onsite Retention All Sub Basins* | 986 | 981.0 |
| | | *Part 1A:No diverts from ADMP, Future Onsite Retention Provided* | 986 | 987.5 |
| | | *Part 1B:No diverts from ADMP, Post developed Q's </equal to existing* | 986 | 987.7 |
| | | *Part 2A:Diverts from ADMP, Future Onsite Retention Provided* | 986 | 988.1 |
| | | *Part 2B: Diverts from ADMP, Post developed Q's </equal to existing* | 986 | 988.2 |
| | | *Part 3A: No ADMP, Dev. W/O Future Retention* | 986 | 990.9 |
| | | *Part 3B: W/ADMP, Dev. W/O Future Retention* | 986 | 991.5 |

(Ex. Vol: 1033.3 ac-ft)

| *COMPOSITE BASIN* | | |
|---|---|---|
| **Modeled Condition** | **Max. Ponding Elevation (ft)** | **[1]Ponding Elevation at Peak Inflow (ft)** |
| *Completely Undeveloped* | 986 | 982.4 |
| *Existing Conditions* | 986 | 983.6 |
| *Fully Developed - No Onsite Retention* | 986 | 986.9 |
| *Fully Developed - Onsite Retention All Sub Basins* | 986 | 979.8 |
| *Part 1A:No diverts from ADMP, Future Onsite Retention Provided* | 986 | 983.4 |
| *Part 1B:No diverts from ADMP, Post developed Q's </equal to existing* | 986 | 983.4 |
| *Part 2A:Diverts from ADMP, Future Onsite Retention Provided* | 986 | 984.6 |
| *Part 2B: Diverts from ADMP, Post developed Q's </equal to existing* | 986 | 984.6 |
| *Part 3A: No ADMP, Dev. W/O Future Retention* | 986 | 985.6 |
| *Part 3B: W/ADMP, Dev. W/O Future Retention* | 986 | 986.6 |

1. Represents a weighted average using the peak elevations shown above within individual basins and weighting them according to total volume provided. This is only an approximation and is not the result of an actual model.
2. WSEL's exceding 986' may no longer be contained within the basins and may begin to pond on upstream adjacent land.
3. At the time of peak inflow discharge, this is the HEC-1 maximum ponding WSEL. This indicates breakout if it exceeds the maximum WSEL of 986'.

Table 1.3

Composite
ADOT Basin
Capacity

| Design Storm (Yr-Duration) | $Q_{in}$ Peak (cfs) | $Q_{out}$ Peak (cfs) | Peak[1,10] Stage (ft) | Max.[2] Ponding Elevation (ft) | Peak Storage (ac-ft) | Max. Storage (ac-ft) | Modeled Condition | Data Source (Design Report) |
|---|---|---|---|---|---|---|---|---|
| 100-24 | 3252 | 73 | 978.7 - 984.9 | 986 | 605.6 | 1033.3 | Completely Undeveloped | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 2857 | 80 | 978.9 - 987.7 | 986 | 726.2 | 1033.3 | [11]Existing Condition | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 3938 | 92 | 979.6 - 992.9 | 986 | 1074.1 | 1033.3 | Completely Developed with NO Onsite Retention on All Sub Basins | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 1487 | 63 | 978.6 - 981.0 | 986 | 353.8 | 1033.3 | Completely Developed with Onsite Retention on All Sub Basins | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 2776 | 79 | 979.3 - 987.5 | 986 | 696.9 | 1033.3 | Part 1A:No diverts from ADMP, Future Onsite Retention Provided | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 2614 | 79 | 979.4 - 987.7 | 986 | 699.9 | 1033.3 | Part 1B:No diverts from ADMP, Post developed Q's </equal to existing | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 3202 | 81 | 981.9 - 988.1 | 986 | 846.5 | 1033.3 | Part 2A:Diverts from ADMP, Future Onsite Retention Provided | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 3050 | 81 | 981.7 - 988.2 | 986 | 847.8 | 1033.3 | Part 2B:Diverts from ADMP, Post developed Q's </equal to existing | ADOT Basin Analysis, URS, 2/02 |
| 100-25 | 3080 | 87 | 979.6 - 990.9 | 986 | 913.2 | 1033.3 | Part 3A: No ADMP, Dev. W/O Future Retention | ADOT Basin Analysis, URS, 2/03 |
| 100-26 | 3452 | 88 | 982.4 - 991.5 | 986 | 1062.2 | 1033.3 | Part 3B: W/ADMP, Dev. W/O Future Retention | ADOT Basin Analysis, URS, 2/04 |
| 50-24 | 965[3] | 58[4] | 982.1 | 983.4 | 810[5] | 1020 | Existing Condition | Offsite Drainage Design Report, HG-10-2(37)C, Ehrenberg-Phoenix, Highway, Bullard-Dysart Road, Dibble and Associates, January, 1976. |
| 100-24 | 1,861 | 67 | 979.3 - 982.8 | Varies[8,9] | 514.2 | 1541.6 | Existing Condition | White Tanks/Agua Fria Area Drainage Master Study, Part A: Flood Study Technical Data Notebook, By: The WLB Group, Inc., October 1992 |
| 100-24 | 2,100[6]/3,600[7] | 62[6]/67[7] | 981[6]/982.5[7] | 988 | 510[6]/650[7] | 1350.0 | Existing/Developed | Palm Valley Phase I, Golf Course LOMR, RID Canal Overchute to ADOT Detention Basins, by The WLB Group, 2/298. |
| 100-24 | 4,303 | 99 | 979.7 | 984 | 416.0 | 725.0 | Existing Condition | I-10/Litchfield Road Basins, Final Hydrology Study, by Parsons Brinckerhoff, 7/23/99. |
| 100-24 | 2,797 | 77 | 978.8 - 986.8 | 986 | 700.6 | 1125.7 | Existing Condition | URS Draft Existing Condition Hydrology, 6/29/01. |

1. May not include freeboard.
2. Overflow elevation. Freeboard is equal to peak stage minus max. ponding elevation.
3. Sum of discharges 1-3 from Hydrologic Design Data Sheets, SCS Method, 50-year, 24-hour event.
4. From stage-storage-discharge curve for Alternate 3, 48" pipe.
5 From stage-storage-discharge curve for Alternate 3, 48" pipe.
6. Existing discharge.
7. Post development discharge.
8. See Flood Study Technical Data Notebook for the White Tanks/Agua Fria ADMS, Appendix I, Vol. 10 of 15 by WLB, dated 5/28/92.
9. Max. ponding elevations are: Basin A = 988.8'; Basin B = 987.3'; Basin C = 988.6'; Basin D = 990.5'.
10. WLB and URS values represent the range from lowest to highest WSEL computed within the 4 basins - these models look at each basin individually.
11. Note:The Peak Storage for the "ADOT Basin Analysis" Existing Condition is larger than that shown for the Draft Existing Hydrology. This is due to increased RTIMP variables verified by recent field trips.

Table 1.4

Capacity/Inflow
to
ADOT Basin 'A'

| Design Storm (Yr-Duration) | $Q_{in}$ Peak (cfs) | $Q_{out}$ Peak (cfs) | Peak[1] Stage (ft) | Max.[2] Ponding Elevation (ft) | Peak Storage (ac-ft) | Max. Storage (ac-ft) | Modeled Condition | Data Source (Design Report) |
|---|---|---|---|---|---|---|---|---|
| 100-24 | 277 | 23 | 978.7 | 986 | 23.9 | 265.17 | Completely Undeveloped | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 295 | 28 | 978.9 | 986 | 27.9 | 265.17 | [9]Existing Condition | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 361 | 46 | 979.6 | 986 | 44.9 | 265.17 | Completely Developed with NO Onsite Retention on All Sub Basins | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 297 | 38 | 979.3 | 986 | 37.9 | 265.17 | Completely Developed with Onsite Retention on All Sub Basins | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 297 | 36 | 979.3 | 986 | 37.9 | 265.17 | Part 1A:No diverts from ADMP, Future Onsite Retention Provided | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 297 | 38 | 979.4 | 986 | 39.9 | 265.17 | Part 1B:No diverts from ADMP, Post developed Q's </equal to existing | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 723 | 55 | 983.3 | 986 | 167.0 | 265.17 | Part 2A:Diverts from ADMP, Future Onsite Retention Provided | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 733 | 55 | 983.3 | 986 | 169.0 | 265.17 | Part 2B:Diverts from ADMP, Post developed Q's </equal to existing | ADOT Basin Analysis, URS, 2/02 |
| 100-25 | 0 | 44 | 979.6 | 986 | 44.9 | 265.17 | Part 3A: No ADMP, Dev. W/O Future Retention | ADOT Basin Analysis, URS, 2/03 |
| 100-26 | 0 | 55 | 983.5 | 986 | 174.1 | 265.17 | Part 3B: W/ADMP, Dev. W/O Future Retention | ADOT Basin Analysis, URS, 2/04 |
| 50-24 | n/a | n/a | n/a | n/a | n/a | n/a | Existing Condition | Offsite Drainage Design Report, I-IG-10-2(37)C, Ehrenberg-Phoenix, Highway, Bullard-Dysart Road, Dibble and Associates, January, 1976. |
| 100-24 | 618 | 55 | 981.18 | 988.8 | 106.5 | 423.01 | Existing Condition | WLB[8] |
| 100-24 | n/a | n/a | n/a | n/a | n/a | n/a | Existing/Developed | PV |
| 100-24 | n/a | n/a | n/a | n/a | n/a | n/a | Existing Condition | PB |
| 100-24 | 245 | 23 | 978.75 | 986 | 25.9 | 265.17 | Existing Condition | URS Draft Existing Condition Hydrology, 6/29/01. |

1. Does not include freeboard.
2. Overflow elevation. Freeboard is equal to peak stage minus max. ponding elevation.
3. Sum of discharges 1-3 from Hydrologic Design Data Sheets, SCS Method, 50-year, 24-hour event.
4. From stage-storage-discharge curve for Alternate 3, 48" pipe.
5 From stage-storage-discharge curve for Alternate 3, 48" pipe.
6. Existing discharge.
7. Post development discharge.
8. See Flood Study Technical Data Notebook for the White Tanks/Agua Fria ADMS, Appendix I, Vol. 10 of 15 by WLB, dated 5/28/92.
9. Note:The Peak Storage for the "ADOT Basin Analysis" Existing Condition is larger than that shown for the Draft Existing Hydrology. This is due to increased RTIMP variables verified by recent field trips.

From Appendix C
Final Volume IV Level III
AZ MPU Report Feb. 2005

Table 1.5

Capacity/Inflow
to
ADOT Basin 'B'

lower than what is in HEC-1 Model

| Design Storm (Yr-Duration) | $Q_{in}$ Peak (cfs) | $Q_{out}$ Peak (cfs) | Peak[1] Stage (ft) | Max.[2] Ponding Elevation (ft) | Peak Storage (ac-ft) | Max. Storage (ac-ft) | Modeled Condition | Data Source (Design Report) |
|---|---|---|---|---|---|---|---|---|
| 100-24 | 1176 | 357 | 982.9 | 986.0 | 68.86 | 108.98 | Completely Undeveloped | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 687 | 270 | 982.0 | 986.0 | 57 | 108.98 | [9]Existing Condition | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 1330 | 581 | 985.1 | 986.0 | 97.58 | 108.98 | Completely Developed with NO Onsite Retention on All Sub Basins | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 370 | 114 | 980.5 | 986.0 | 39.58 | 108.98 | Completely Developed with Onsite Retention on All Sub Basins | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 703 | 247 | 981.9 | 986.0 | 55.7 | 108.98 | Part 1A:No diverts from ADMP, Future Onsite Retention Provided | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 576 | 231 | 981.7 | 986.0 | 53.7 | 108.98 | Part 1B:No diverts from ADMP, Post developed Q's </equal to existing | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 703 | 247 | 981.9 | 986.0 | 55.7 | 108.98 | Part 2A:Diverts from ADMP, Future Onsite Retention Provided | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 576 | 231 | 981.7 | 986.0 | 53.7 | 108.98 | Part 2B:Diverts from ADMP, Post developed Q's </equal to existing | ADOT Basin Analysis, URS, 2/02 |
| 100-25 | 576 | 301 | 982.4 | 986.0 | 62 | 108.98 | Part 3A: No ADMP, Dev. W/O Future Retention | ADOT Basin Analysis, URS, 2/03 |
| 100-26 | 576 | 301 | 982.4 | 986.0 | 62 | 108.98 | Part 3B: W/ADMP, Dev. W/O Future Retention | ADOT Basin Analysis, URS, 2/04 |
| 50-24 | n/a | n/a | n/a | n/a | n/a | n/a | Existing Condition | Offsite Drainage Design Report, I-IG-10-2(37)C, Ehrenberg-Phoenix, Highway, Bullard-Dysart Road, Dibble and Associates, January, 1976. |
| 100-24 | 212 | 65 | 980.06 | 987.3 | 39 | 132.52 | Existing Condition | WLB[8] |
| 100-24 | n/a | n/a | n/a | n/a | n/a | n/a | Existing/Developed | PV |
| 100-24 | n/a | n/a | n/a | n/a | n/a | n/a | Existing Condition | PB |
| 100-24 | 692 | 252 | 981.9 | 986 | 56 | 108.98 | Existing Condition | URS Draft Existing Condition Hydrology, 6/29/01. |

1. Does not include freeboard.
2. Overflow elevation. Freeboard is equal to peak stage minus max. ponding elevation.
3. Sum of discharges 1-3 from Hydrologic Design Data Sheets, SCS Method, 50-year, 24-hour event.
4. From stage-storage-discharge curve for Alternate 3, 48" pipe.
5 From stage-storage-discharge curve for Alternate 3, 48" pipe.
6. Existing discharge.
7. Post development discharge.
8. See Flood Study Technical Data Notebook for the White Tanks/Agua Fria ADMS, Appendix I, Vol. 10 of 15 by WLB, dated 5/28/92.
9. Note:The Peak Storage for the "ADOT Basin Analysis" Existing Condition is larger than that shown for the Draft Existing Hydrology. This is due to increased RTIMP variables verified by recent field trips.

Table 6

Capacity/Inflow
to
ADOT Basin 'C'

| Design Storm (Yr-Duration) | $Q_{in}$ Peak (cfs) | $Q_{out}$ Peak (cfs) | Peak[1] Stage (ft) | Max.[2] Ponding Elevation (ft) | Peak Storage (ac-ft) | Max. Storage (ac-ft) | Modeled Condition | Data Source (Design Report) |
|---|---|---|---|---|---|---|---|---|
| 100-24 | 1339 | 460 | 982.7 | 986 | 211.7 | 324.54 | Completely Undeveloped | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 1415 | 460 | 983.9 | 986 | 254.9 | 324.54 | [6]Existing Condition | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 1765 | 460 | 987.3 | 986 | 373.6 | 324.54 | Completely Developed with NO Onsite Retention on All Sub Basins | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 536 | 297 | 978.6 | 986 | 87.5 | 324.54 | Completely Developed with Onsite Retention on All Sub Basins | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 1304 | 460 | 982.9 | 986 | 219.7 | 324.54 | Part 1A:No diverts from ADMP, Future Onsite Retention Provided | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 1269 | 460 | 982.8 | 986 | 218.2 | 324.54 | Part 1B:No diverts from ADMP, Post developed Q's </equal to existing | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 1304 | 460 | 982.9 | 986 | 220.4 | 324.54 | Part 2A:Diverts from ADMP, Future Onsite Retention Provided | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 1269 | 460 | 982.9 | 986 | 218.2 | 324.54 | Part 2B:Diverts from ADMP, Post developed Q's </equal to existing | ADOT Basin Analysis, URS, 2/02 |
| 100-25 | 1269 | 460 | 986.0 | 986 | 313.7 | 324.54 | Part 3A: No ADMP, Dev. W/O Future Retention | ADOT Basin Analysis, URS, 2/03 |
| 100-26 | 1269 | 460 | 985.7 | 986 | 314.7 | 324.54 | Part 3B: W/ADMP, Dev. W/O Future Retention | ADOT Basin Analysis, URS, 2/04 |
| 50-24 | n/a | n/a | n/a | n/a | n/a | n/a | Existing Condition | Offsite Drainage Design Report, I-IG-10-2(37)C, Ehrenberg-Phoenix, Highway, Bullard-Dysart Road, Dibble and Associates, January, 1976. |
| 100-24 | 649 | 376 | 979.28 | 988.6 | 122.6 | 453.25 | Existing Condition | WLB[8] |
| 100-24 | n/a | n/a | n/a | n/a | n/a | n/a | Existing/Developed | PV |
| 100-24 | n/a | n/a | n/a | n/a | n/a | n/a | Existing Condition | PB |
| 100-24 | 1400 | 460 | 983.43 | 986 | 237.7 | 324.54 | Existing Condition | URS Draft Existing Condition Hydrology, 6/29/01. |

1. Does not include freeboard.
2. Overflow elevation. Freeboard is equal to peak stage minus max. ponding elevation.
3. Sum of discharges 1-3 from Hydrologic Design Data Sheets, SCS Method, 50-year, 24-hour event.
4. From stage-storage-discharge curve for Alternate 3, 48" pipe.
5 From stage-storage-discharge curve for Alternate 3, 48" pipe.
6. Existing discharge.
7. Post development discharge.
8. See Flood Study Technical Data Notebook for the White Tanks/Agua Fria ADMS, Appendix I, Vol. 10 of 15 by WLB, dated 5/28/92.
9. Note:The Peak Storage for the "ADOT Basin Analysis" Existing Condition is larger than that shown for the Draft Existing Hydrology. This is due to increased RTIMP variables verified by recent field trips.

# Capacity/Inflow to ADOT Basin 'D'

lower ~~than what~~ is in ~~HEC-1 Model~~

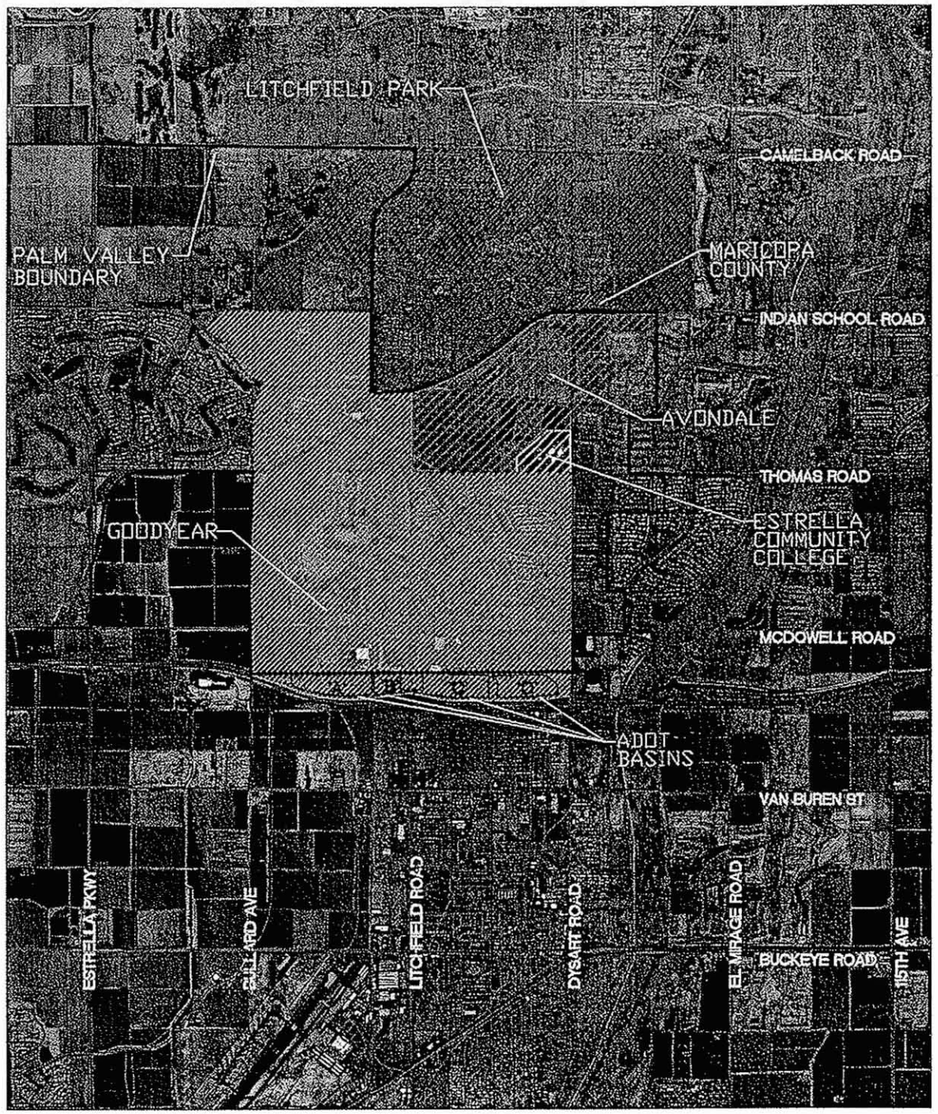
| Design Storm (Yr-Duration) | $Q_{in}$ Peak (cfs) | $Q_{out}$ Peak (cfs) | Peak[1] Stage (ft) | Max.[2] Ponding Elevation (ft) | Peak Storage (ac-ft) | Max. Storage (ac-ft) | Modeled Condition | Data Source (Design Report) |
|---|---|---|---|---|---|---|---|---|
| 100-24 | 460 | 73 | 984.9 | 986 | 301.2 | 334.65 | Completely Undeveloped | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 460 | 80 | 987.6 | 986 | 386.4 | 334.65 | [9]Existing Condition | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 482 | 92 | 992.9 | 986 | 558.1 | 334.65 | Completely Developed with NO Onsite Retention on All Sub Basins | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 284 | 63 | 981.0 | 986 | 188.8 | 334.65 | Completely Developed with Onsite Retention on All Sub Basins | ADOT Basin Analysis, URS, 10/01 |
| 100-24 | 472 | 79 | 987.5 | 986 | 383.6 | 334.65 | Part 1A:No diverts from ADMP, Future Onsite Retention Provided | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 472 | 79 | 987.7 | 986 | 388.1 | 334.65 | Part 1B:No diverts from ADMP, Post developed Q's </equal to existing | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 472 | 81 | 988.1 | 986 | 403.4 | 334.65 | Part 2A:Diverts from ADMP, Future Onsite Retention Provided | ADOT Basin Analysis, URS, 2/02 |
| 100-24 | 472 | 81 | 988.2 | 986 | 406.9 | 334.65 | Part 2B:Diverts from ADMP, Post developed Q's </equal to existing | ADOT Basin Analysis, URS, 2/02 |
| not include fre | 472 | 87 | 990.9 | 986 | 492.6 | 334.65 | Part 3A: No ADMP, Dev. W/O Future Retention | ADOT Basin Analysis, URS, 2/03 |
| equal to peak | 472 | 88 | 991.5 | 986 | 511.4 | 334.65 | Part 3B: W/ADMP, Dev. W/O Future Retention | ADOT Basin Analysis, URS, 2/04 |
| 50-24 | n/a | n/a | n/a | n/a | n/a | n/a | Existing Condition | Offsite Drainage Design Report, I-IG-10-2(37)C, Ehrenberg-Phoenix, Highway, Bullard-Dysart Road, Dibble and Associates, January, 1976. |
| 100-24 | 382 | 67 | 982.8 | 990.5 | 246.1 | 532.82 | Existing Condition | WLB[8] |
| 100-24 | n/a | n/a | n/a | n/a | n/a | n/a | Existing/Developed | PV |
| 100-24 | n/a | n/a | n/a | n/a | n/a | n/a | Existing Condition | PB |
| 100-24 | 460 | 77 | 986.8 | 986 | 381 | 334.65 | Existing Condition | URS Draft Existing Condition Hydrology, 6/29/01. |

1. Does not include freeboard.
2. Overflow elevation. Freeboard is equal to peak stage minus max. ponding elevation.
3. Sum of discharges 1-3 from Hydrologic Design Data Sheets, SCS Method, 50-year, 24-hour event.
4. From stage-storage-discharge curve for Alternate 3, 48" pipe.
5 From stage-storage-discharge curve for Alternate 3, 48" pipe.
6. Existing discharge.
7. Post development discharge.
8. See Flood Study Technical Data Notebook for the White Tanks/Agua Fria ADMS, Appendix I, Vol. 10 of 15 by WLB, dated 5/28/92.
9. Note:The Peak Storage for the "ADOT Basin Analysis" Existing Condition is larger than that shown for the Draft Existing Hydrology. This is due to increased RTIMP variables verified by recent field trips.

Table 1.8

| Modeled Condition Comparison | Total Inflow Volume (ac-ft) | Δ (delta) (ac-ft) | Comments |
|---|---|---|---|
| *Part 1A:No diverts from ADMP, Future Onsite Retention Provided* | 651 | *156* | Increased inflow volume at ADOT Basins due to the ADMP |
| *Part 2A:Diverts from ADMP, Future Onsite Retention Provided* | 807 | | |
| | | | |
| *Part 3A: No ADMP, Dev. W/O Future Retention* | 780 | *156* | Diversion to ADOT Basin with ADMP |
| *Part 3B: W/ADMP, Dev. W/O Future Retention* | 936 | | |
| | | | |
| *Fully Developed - Onsite Retention All Sub Basins* | 365 | *276* | Decreased volume due to enforcement of retention requirements to date |
| *Existing Conditions* | 641 | | |
| | | | |
| *Completely Undeveloped* | 476 | *165* | Benefit to date to development - volume increase from adjacent properties and sub basins to ADOT Basins |
| *Existing Conditions* | 641 | | |
| | | | |
| *Part 3A: No ADMP, Dev. W/O Future Retention* | 780 | *139* | Increase in volume associated with the future condition assuming no future retention and no ADMP |
| *Existing Conditions* | 641 | | |
| | | | |
| *Part 3A: No ADMP, Dev. W/O Future Retention* | 780 | *415* | Approximate total increase in volume due to non-enforcement of retention requirements at ultimate build-out |
| *Fully Developed - Onsite Retention All Sub Basins* | 365 | | |
| | | | |
| *Part 3B: W/ADMP, Dev. W/O Future Retention* | 936 | *295* | Total additional ADMP volume from today |
| *Existing Conditions* | 641 | | |
| | | | |
| *Part 3B: W/ADMP, Dev. W/O Future Retention* | 936 | *94* | Minimum excess volume of ADOT Basin - ADMP diversion to basins, no on-site retention in watershed for future development |
| *Existing Volume Provided* | 1030 | | |

1. Maximum ponding elevation before overtopping is 986'.




LEGEND:

- AVONDALE
- GOODYEAR
- LITCHFIELD PARK
- MARICOPA COUNTY
- ESTRELLA COMMUNITY COLLEGE
- PALM VALLEY

N

MARICOPA COUNTY N.T.S.

CONTRIBUTING WATERSHED TO ADOT BASINS

February 2002

*ADOT Basins/Contributing Watershed Analysis*

Flood Control District of Maricopa County

*FIGURE 1.1*

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## Composite ADOT Basin Total Inflow Volume

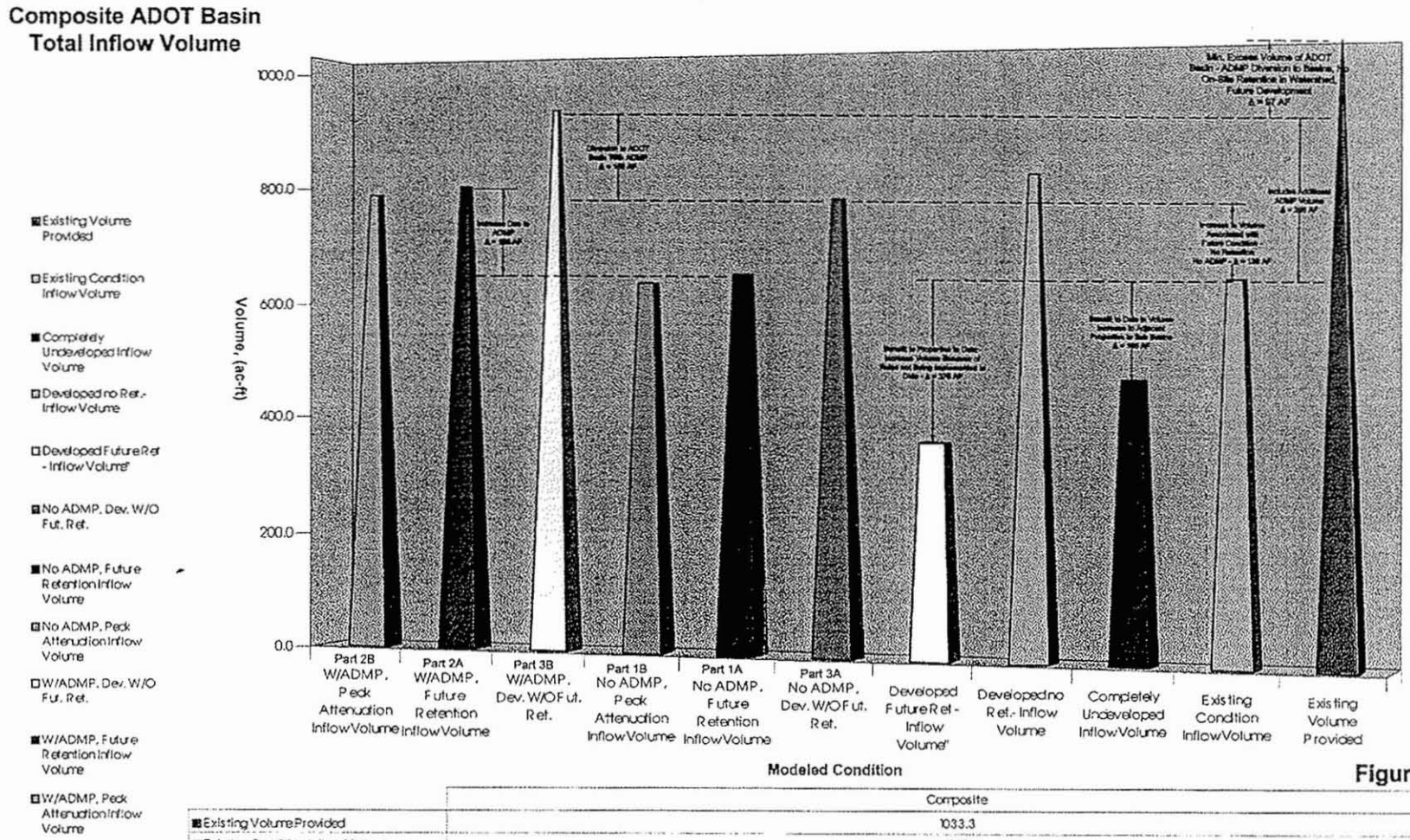



**Figure 1.2**

| | Composite |
|---|---|
| Existing Volume Provided | 1033.3 |
| Existing Condition Inflow Volume | 641 |
| Completely Undeveloped Inflow Volume | 476 |
| Developed no Ret.- Inflow Volume | 818 |
| Developed Future Ret - Inflow Volume* | 365 |
| No ADMP, Dev. W/O Fut. Ret. | 780 |
| No ADMP, Future Retention Inflow Volume | 651 |
| No ADMP, Peck Attenuation Inflow Volume | 636 |
| W/ADMP, Dev. W/O Fut. Ret. | 936 |
| W/ADMP, Future Retention Inflow Volume | 807 |
| W/ADMP, Peck Attenuation Inflow Volume | 792 |

APPENDIX C

ADOT BASIN ANALYSIS

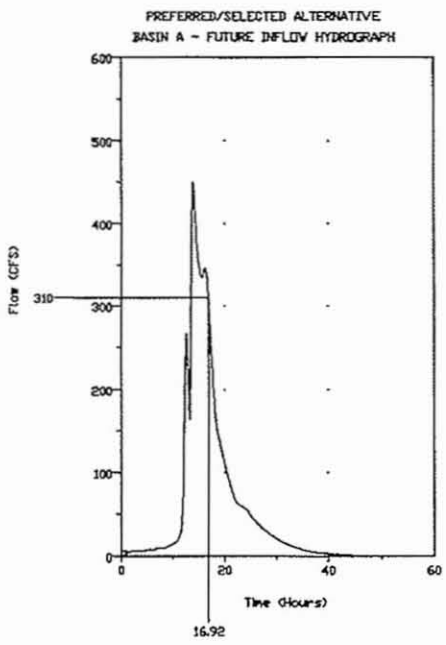
Addendum to Appendix C

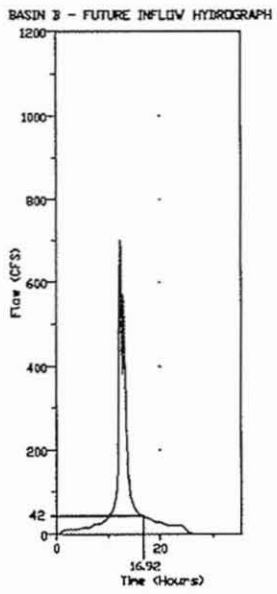
# LEVEL III ANALYSIS OF THE ADOT BASINS

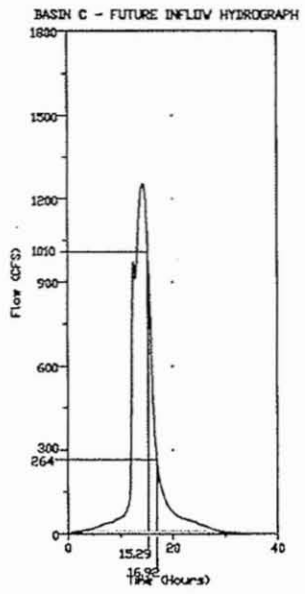
The following procedure was developed and followed for the analysis of the existing ADOT basins:

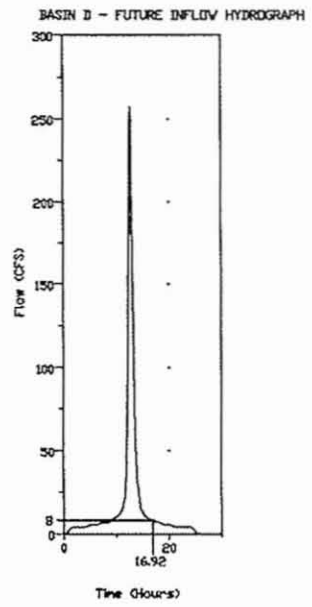
- The four existing ADOT basins were labeled "A" through "D" beginning with the far west basin located just east of Bullard Avenue.
- The approximate capacity of each of the four existing basins is as follows:
  - Basin A = 265.2 AF, Basin B = 109.0 AF, Basin C = 324.5 AF, and Basin D = 334.7 AF.
- It was assumed that the first 109 AF of the total estimated inflow of 127 AF to Basin B would stay in Basin B. There would be little to no transfer to either Basin A on the west or Basin C on the east until the peak stage in Basin B occurred.
  - The inflow hydrograph to Basin B was used to determine the time, $t_B$, at which the basin was completely filled (time $t_B$, at which the inflow volume was equal to 109 AF).
- Using the hydrographs for the inflow at Basin A, Basin C, and Basin D, the total volume of inflow to each basin was determined at time, $t_B$.
  - The WSELs within Basin A, Basin C, and Basin D at time, $t_B$, were determined by interpolating the total inflow volume obtained from the hydrograph on the stage storage rating curve for each basin.
  - From the above interpolation, the adjacent WSEL in Basin A was estimated at 982.5 feet, in Basin C at 988.0 feet, and in Basin D at 974.6 feet. The WSEL in Basin B at time, $t_B$, was 986.0 feet.
    - Since Basin C is over capacity at time, $t_B$, the time at which Basin C was at capacity (time, $t_C$) was determined and the corresponding peak flow rate was estimated from the hydrograph. At time, Tc, the WSEL within Basin C is approximately 986.0 feet.
  - The peak inflow to Basin A and Basin D was also determined from their respective inflow hydrographs at time, $t_B$.
- Using the relative WSELs at time, $t_B$, the direction of flow between the basins was estimated as the following:
  - There would be a transfer of volume from Basin B to Basin A in the amount of approximately 18 AF and at a maximum flow rate of approximately 42 cubic feet per second (cfs).
  - Beginning at approximately time, $t_C$ (occurring 1 hour prior to $t_B$), there would be a transfer of volume from Basin C to Basin D in the amount of approximately 135.5 AF and at a maximum flow rate of approximately 1,010 cfs.
    - Although there may be some transfer of flow from Basin C to Basin B as well, it is assumed that this amount of transfer is very small since the relative head elevation between Basin C and Basin D is on the order of 11.4 feet compared with 1 to 2 feet maximum between Basin C and Basin B. The main impact of the transfer of volume to Basin B from Basin C at time, $t_C$ would be to fill Basin B prior to time, $t_B$ but after time, $t_C$. Since there is only a 1-hour difference between these times, this is not significant.
  - Very little, if any, transfer of volume would take place between Basins B and C.
- Based on the above transfer data and assumptions, the approximate conveyance capacity of each of the interconnecting basin pipes was checked to ensure adequate performance during the equalization of the basins. A pipe was determined as adequate if it had the ability to convey the inflow rate in cfs estimated at time, $t_B$, (or $t_C$), given the tailwater conditions in the adjacent basin without exceeding the maximum elevation of 986. All of the connector pipes appeared adequate for equalization.
- The total volume provided by the ADOT basins is approximately 1,030.0 AF and the total inflow volume was approximately *862 AF*. Therefore, the maximum peak stage will not exceed 984.5 feet once the basins have equalized. This is determined by interpolation on the composite stage-storage curve for the basins. Due to the limitations of the HEC-1 model described above, the peak stage data reported by HEC-1 may not be accurate.

*Figure CI* shows the ADOT Basins and the associated inflow hydrographs for the future condition storm with projects in place. *Table CI* contains a summary of the inflow volume to each of the ADOT Basins for all of the HEC-1 models.



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MARICOPA COUNTY N.T.S.

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Flood Control District of Maricopa County

PROPOSED ADOT BASIN IMPROVEMENTS

AUGUST, 2004

Figure C.1

*Table C.1*
*ADOT Basin Inflow*
*Volume Summary*

| *ADOT Basins Inflow Volume Summary* | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basin A | | | | | Basin B | | | | | Basin C | | | Basin D | | | [2]TOTAL |
| HEC-1 Model | RADOT (ac-ft) | 287A (ac-ft) | R288A (ac-ft) | Total (ac-ft) | [1]Provided (ac-ft) | 1I287B (ac-ft) | R288B (ac-ft) | 287B (ac-ft) | Total (ac-ft) | [1]Provided (ac-ft) | 1I287C (ac-ft) | Total (ac-ft) | [1]Provided (ac-ft) | 287D (ac-ft) | Total (ac-ft) | [1]Provided (ac-ft) | A-D (ac-ft) |
| Existing, no projects | n/a | 29 | 2 | 31 | 265 | n/a | 88 | 14 | 102 | 109 | 388 | 388 | 325 | 19 | 19 | 335 | 540 |
| Future, no projects | n/a | 51 | 4 | 55 | 265 | n/a | 113 | 14 | 127 | 109 | 460 | 460 | 325 | 35 | 35 | 335 | 677 |
| Existing, with projects | 201 | 29 | 2 | 232 | 265 | n/a | 88 | 14 | 102 | 109 | 388 | 388 | 325 | 19 | 19 | 335 | 741 |
| Future, with projects | 185 | 51 | 4 | 240 | 265 | 126 | n/a | n/a | 126 | 109 | 460 | 460 | 325 | 35 | 35 | 335 | 861 |

**Composite** ***Volume Provided by the ADOT Basins:***

| Elevation (ft) | Volume (ac-ft) |
|---|---|
| 970.5 | 0 |
| 974.0 | 20 |
| 976.0 | 80 |
| 978.0 | 197 |
| 980.0 | 370 |
| 982.0 | 578 |
| 986.0 | 1,029 |
| 988.0 | 1,282 |
| 990.0 | 1,714 |

1. Indicates the total volume provided by the individual basin at the maximum WSEL of 986 ft. If ponding exceeds 986 ft, the topography indicates that basins A, B and C may overtop.
2. This is the total inflow volume to the 'composite' of all four basins (A through D) given the scenario described in the column 1.

B74

Loop 303 ADMPU
Analysis of ADOT Basins A through D at Litchfield Road

Note: ADOT Basins A through D correspond to HDR Basins B73, B74, B84, and B83, respectively.

```
7799    KK  SR287A
        * KO     1                              21
7800    KM        STORAGE ROUTE CP287A IN I-10 DETENTION BASIN
7801    RS       1    STOR       0       0
7802    SV       0    9.46   52.88  120.61  265.17  348.06
7803    SE   975.7     978     980     982     986     988
7804    SQ       0       7      55      55      55     329
7805    SE   975.7     978     980     988   988.8     990
        * BELOW: WLB STUDY DATA
        * KKSR287A
        * KM      STORAGE ROUTE CP287A IN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   14.44   60.06   374.5  423.01  438.91
        * SQ     0       7      55      55      55     329
        * SE 975.7     978     980     988   988.8     990

3830    KK   SRB73 STORAGE
3831    KO
3832    RS       1    STOR      -1
3833    SV            9.46   52.88  120.61  265.17  348.06
3834    SQ            7.00   55.00   55.00   55.00  329.00
3835    SE  975.70  978.00  980.00  982.00  986.00  988.00
3836    ST
```

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See changes on pages 2-4.
Let me know if you have any questions.
- Ryan

```
7981    KK  SR287B
        * KO     1                              21
7982    KM        STORAGE ROUTE CP287B IN I-10 DETENTION BASIN
7983    RS       1    STOR       0       0
7984    SV       0   11.35   32.69      57  108.98  136.43
7985    SE   974.6     978     980     982     986     988
7986    SQ       0       2      60     800     953
7987    SE   974.6     978     980   987.3     988
        * BELOW: WLB STUDY DATA
        * KKSR287B
        * KM      STORAGE ROUTE CP287B IN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   17.05   38.57  132.52   143.0
        * SQ     0       2      60     800     953
        * SE 974.6     978     980   987.3     988

3856    KK   SRB74 STORAGE
3857    KO
3858    RS       1    STOR      -1
3859    SV           11.35   32.69   57.00  108.98  136.43
3860    SQ            2.00   60.00  800.00  953.00  953.00
3861    SE  974.60  978.00  980.00  982.00  986.00  988.00
3862    ST                          263     668
        *
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-

```
8359    KK  SR287C
        * KO     1                                21
8360    KM        STORAGE ROUTE CP287C IN AN I-10 DETENTION BASIN
8361    RS       1    STOR       0       0
8362    SV       0   25.10   71.68  127.08  189.52  324.54  402.14
8363    SE   972.5     976     978     980     982     986     988
8364    SQ       0       6     460     460     460     657
8365    SE   972.5     976     980     988   988.6     990
        * BELOW: WLB STUDY DATA
        * KKSR287C
        * KM       STORAGE ROUTE CP287C IN AN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   37.15  141.31  425.75  453.25  562.86
        * SQ     0       6     460     460     460     657
        * SE 972.5     976     980     988   988.6     990

3882    KK   SRB84 STORAGE
3883    KO
3884    RS       1    STOR      -1
3885    SV           25.10   71.68  127.08  189.52  324.54  402.14
3886    SQ            6.00  460.00  460.00  460.00  657.00  657.00
3887    SE  972.50  976.00  978.00  980.00  982.00  986.00  988.00
                                                     460     460
```

---

```
8384    KK  SR287D
        * KO     1                              21
8385    KM        STORAGE ROUTE CP287D IN AN I-10 DETENTION BASIN
8386    RS       1    STOR       0       0
8387    SV       0   19.83   60.59  109.71  161.17  215.52  334.65  399.54
8388    SE   970.5     974     976     978     980     982     986     988
8389    SQ       0      36      60      81      86      87
8390    SE   970.5     974     980     988     990   990.5
        * BELOW: WLB STUDY DATA
        * KKSR287D
        * KM      STORAGE ROUTE CP287D IN AN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   30.21  162.42   403.5  496.83  532.82
        * SQ     0      36      60      81      86      87
        * SE 970.5     974     980     988     990   990.5
```

```
3763    KK   SRB83 STORAGE
3764    KO
3765    RS       1    STOR      -1
3766    SV           19.83   60.59  109.71  161.17  215.52  334.65  399.54
3767    SQ           36.00   44.00   52.00   60.00   67.00   73.00   81.00
3768    SE  970.50  974.00  976.00  978.00  980.00  982.00  986.00  988.00
3769    ST                                          65      76
        *
```

## Loop 303/White Tanks ADMPU

Stage-Storage-Discharge Relationships for ADOT Basins A to D

**Basin A (HDR Basin B73)**

**URS[1]**

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 9.46 | 52.88 | 120.61 | 265.17 | 348.06 |
| SE | 975.7 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 7 | 55 | 55 | 55 | 329 |
| SE | 975.7 | 978 | 980 | 988 | 988.8 | 990 |

**HDR**

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 9.46 | 52.88 | 120.61 | 265.17 | 348.06 |
| SQ | 0 | 7 | 55 | 55 | 55 | 55 |
| SE | 975.7 | 978 | 980 | 982 | 986 | 988 |

*Interpolated for flows at elevations 982 and 986. Removed flow information at elevations higher than 988.

**Basin B (HDR Basin B74)**

**URS[1]**

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 11.35 | 32.69 | 57 | 108.98 | 136.43 |
| SE | 974.6 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 2 | 60 | 800 | 953 | |
| SE | 974.6 | 978 | 980 | 987.3 | 988 | |

**HDR**

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 11.35 | 32.69 | 57 | 108.98 | 136.43 |
| SQ | 0 | 2 | 60 | 263 | 668 | 953 |
| SE | 974.6 | 978 | 980 | 982 | 986 | 988 |

*Interpolated for flows at elevations 982 and 986.

**Basin C (HDR Basin B84)**

**URS[1]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SV | 0 | 25.1 | 71.68 | 127.08 | 189.52 | 324.54 | 402.14 |
| SE | 972.5 | 976 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 6 | 460 | 460 | 460 | 657 | |
| SE | 972.5 | 976 | 980 | 988 | 988.6 | 990 | |

**HDR**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SV | 0 | 25.1 | 71.68 | 127.08 | 189.52 | 324.54 | 402.14 |
| SQ | 0 | 6 | 233 | 460 | 460 | 460 | 460 |
| SE | 972.5 | 976 | 978 | 980 | 982 | 986 | 988 |

*Interpolated for flows at elevations 978, 982, and 986. Removed flow information for elevations higher than 988.

**Basin D (HDR Basin B83)**

**URS[1]**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SV | 0 | 19.83 | 60.59 | 109.71 | 161.17 | 215.52 | 334.65 | 399.54 |
| SE | 970.5 | 974 | 976 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 36 | 60 | 81 | 86 | 87 | | |
| SE | 970.5 | 974 | 980 | 988 | 990 | 990.5 | | |

**HDR**

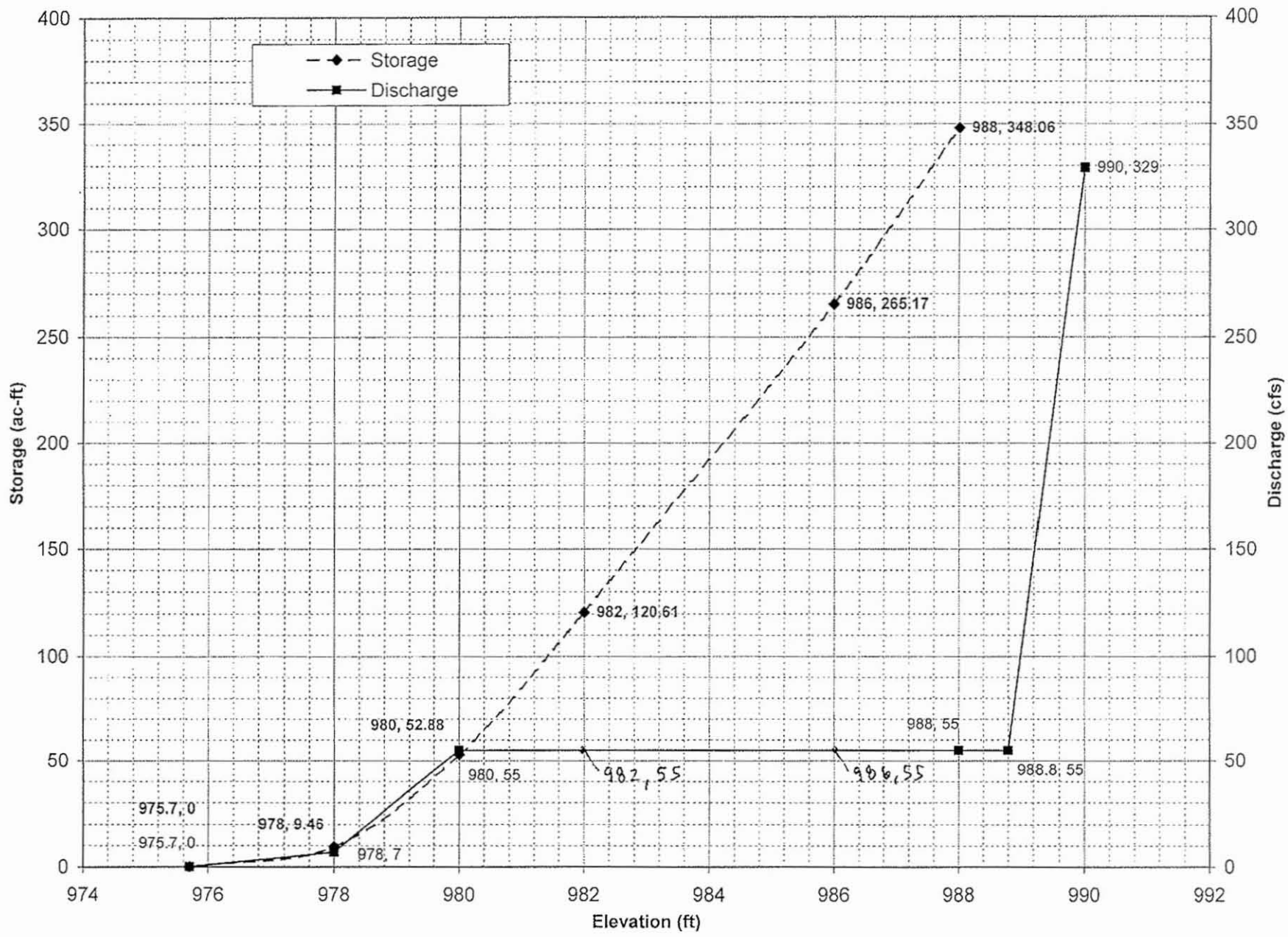
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SV | 0 | 19.83 | 60.59 | 109.71 | 161.17 | 215.52 | 334.65 | 399.54 |
| SQ | 0 | 36 | 44 | 52 | 60 | 65 | 76 | 81 |
| SE | 970.5 | 974 | 976 | 978 | 980 | 982 | 986 | 988 |

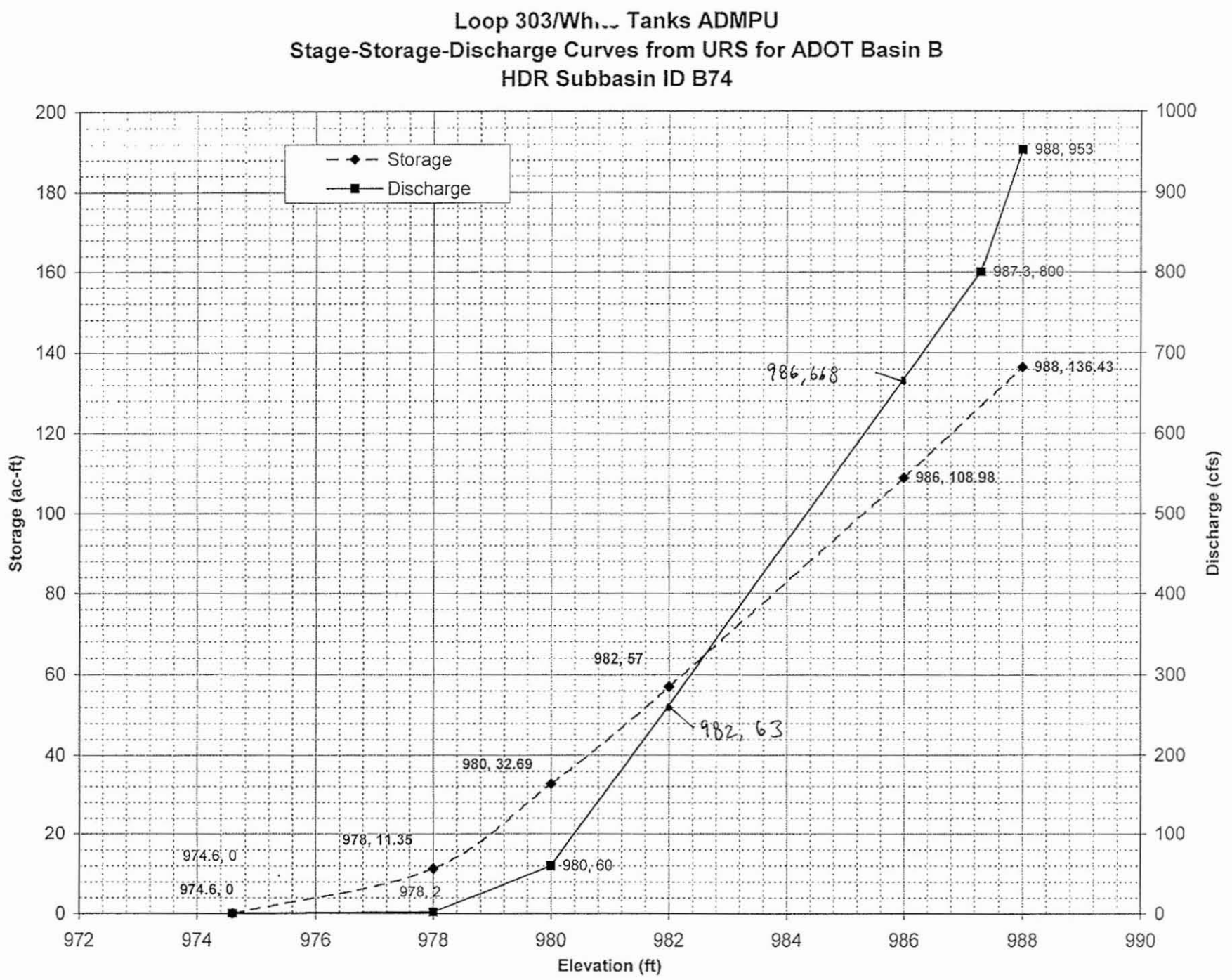
*Interpolated for flows at elevations 976, 978, 982, and 986. Removed flow information for elevations higher than 988.

Notes:

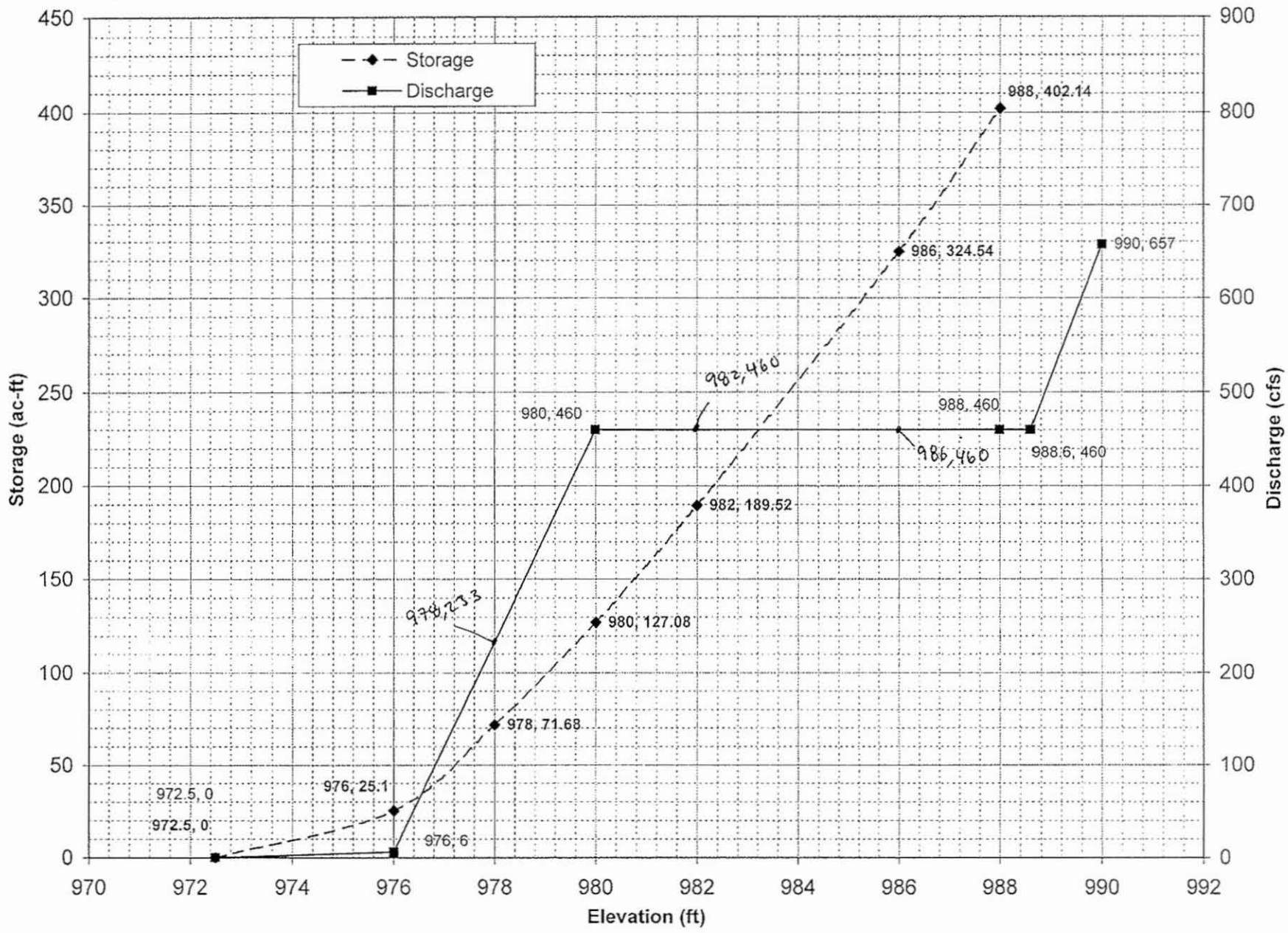
1. Stage-Storage-Discharge Relationships taken from Loop 303 Corridor/White Tanks ADMPU, 2005 by URS.

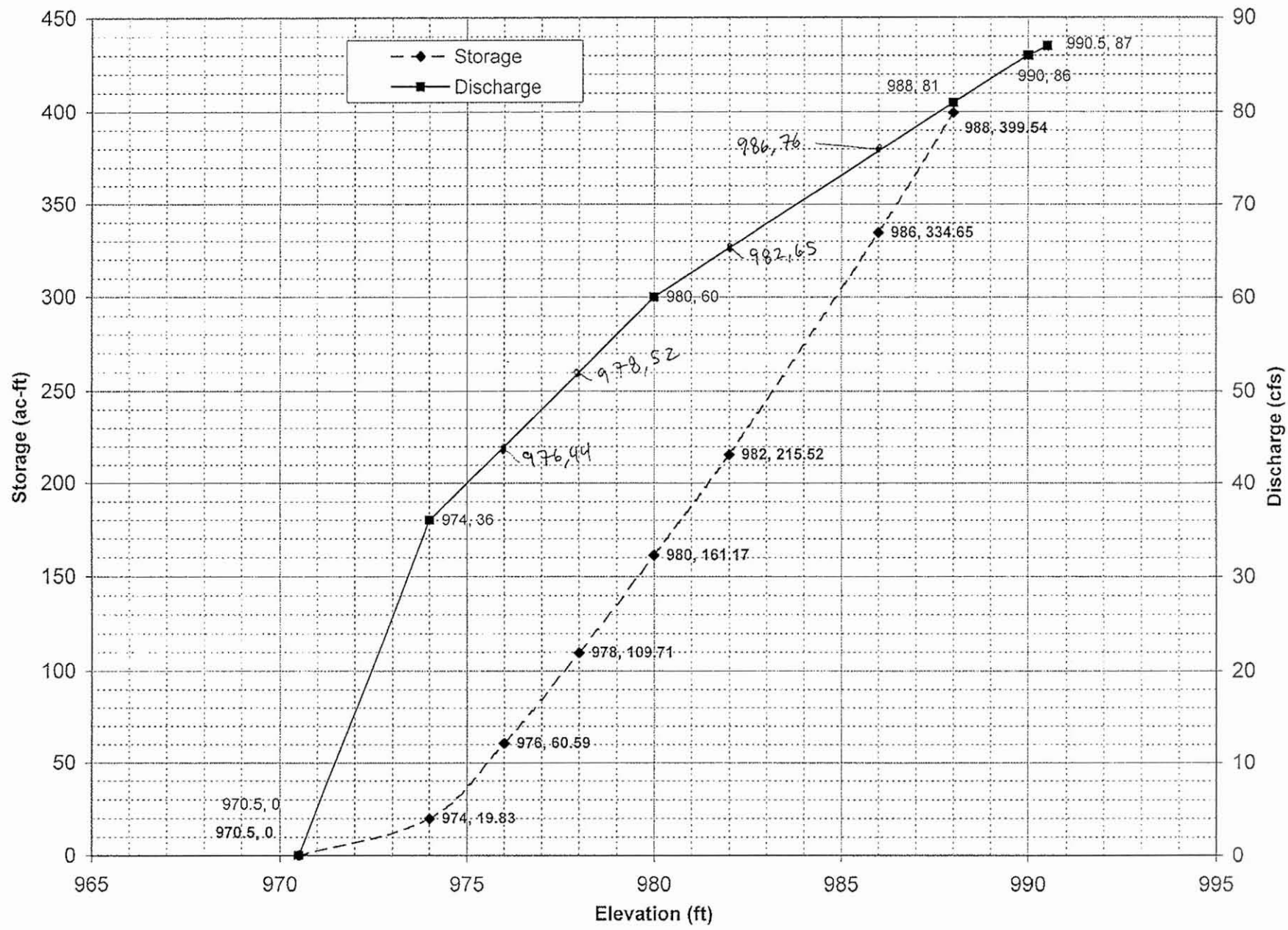
Loop 303/Wh. Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin A
HDR Subbasin ID B73



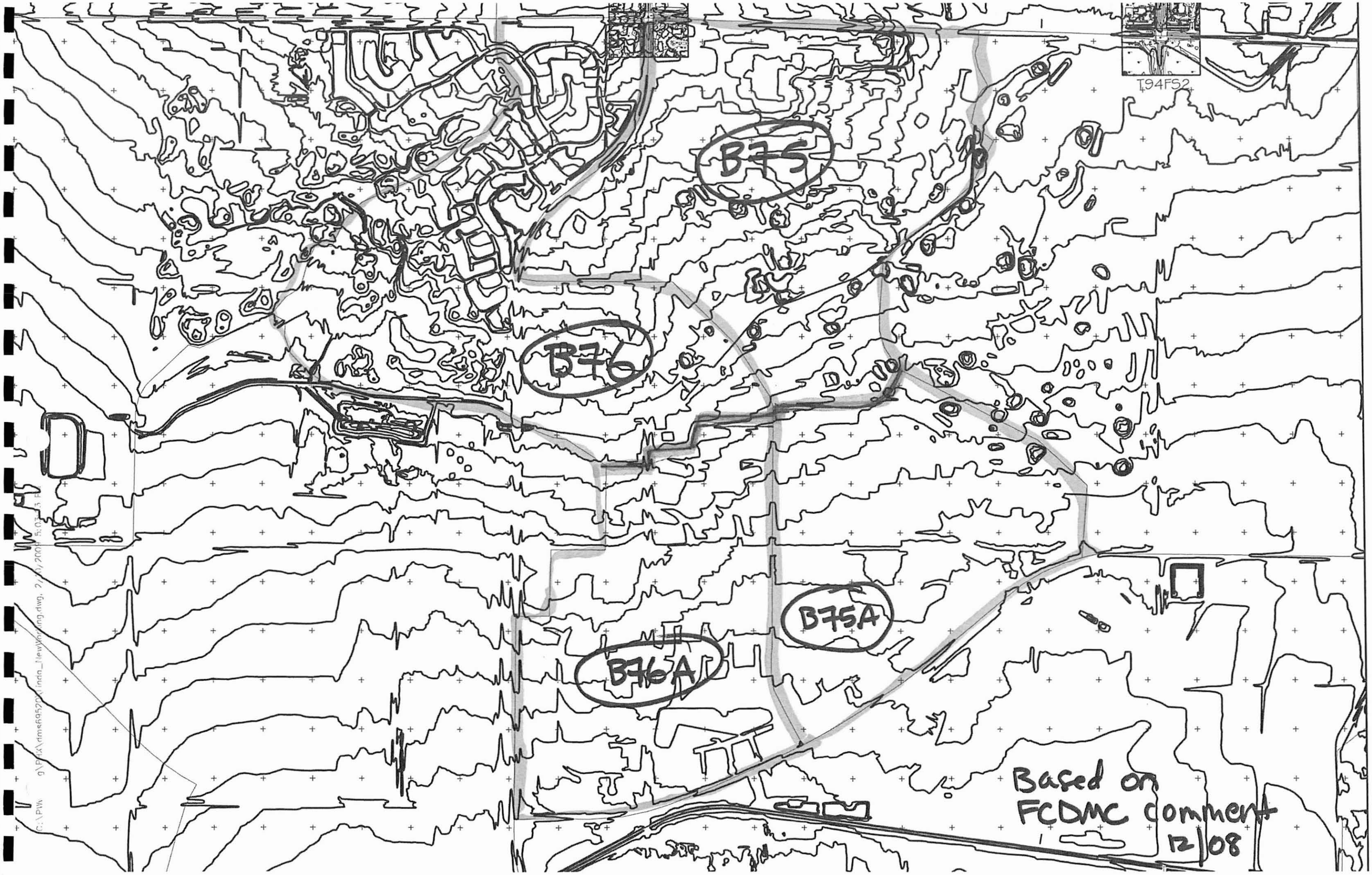

Loop 303/Wh... Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin B
HDR Subbasin ID B74
Storage
Discharge
Storage (ac-ft)
Discharge (cfs)
Elevation (ft)
988, 953
987.3, 800
986,668
988, 136.43
986, 108.98
982, 57
982, 63
980, 32.69
978, 11.35
974.6, 0
974.6, 0
980, 60
978, 2
200
180
160
140
120
100
80
60
40
20
0
1000
900
800
700
600
500
400
300
200
100
0
972
974
976
978
980
982
984
986
988
990

Loop 303/Wh. Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin C
HDR Subbasin ID B84

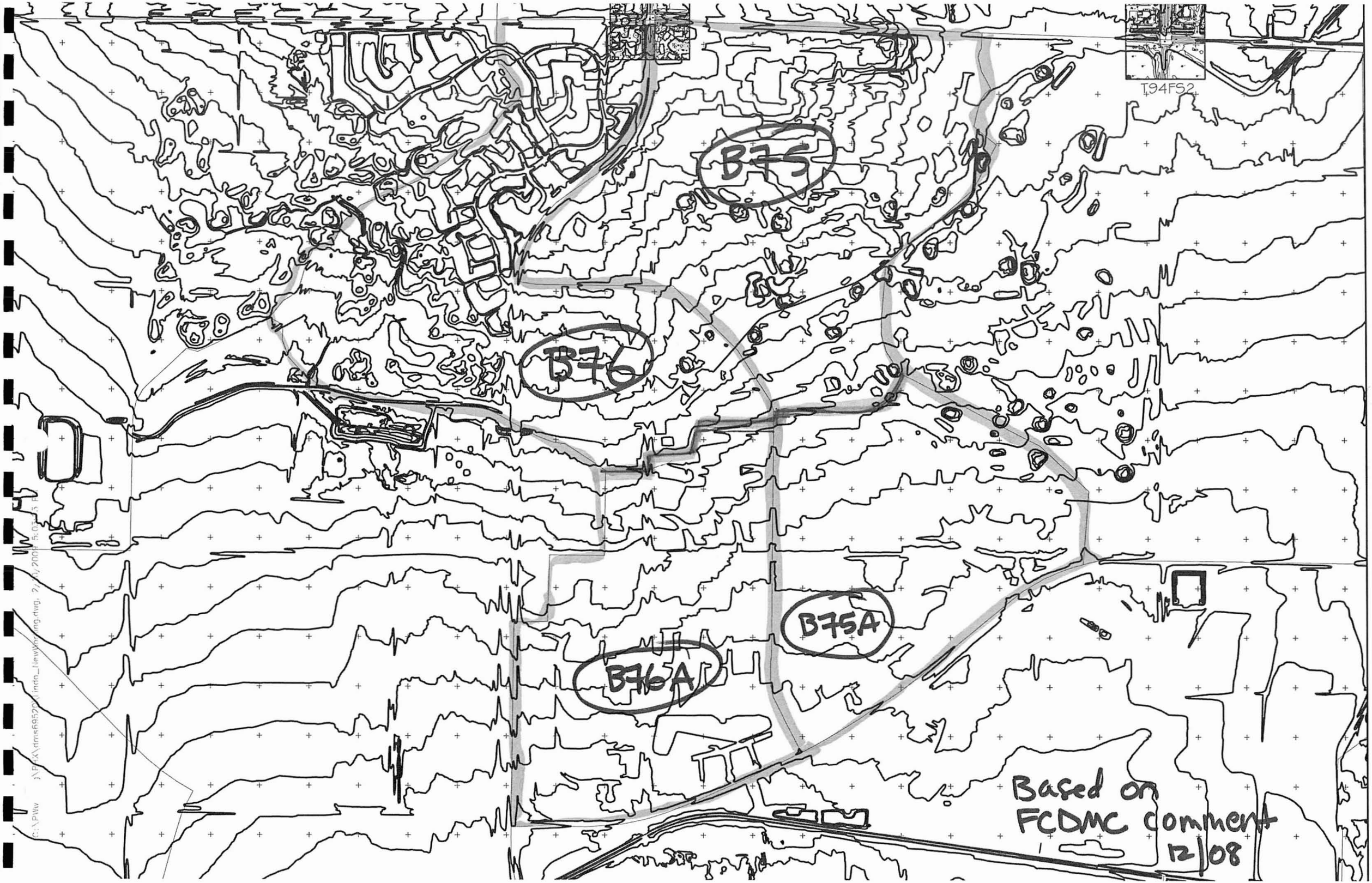



Loop 303/Wh... Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin D
HDR Subbasin ID B83
Storage
Discharge
Storage (ac-ft)
Discharge (cfs)
Elevation (ft)
990.5, 87
990, 86
988, 81
988, 399.54
986, 334.65
980, 60
982, 215.52
980, 161.17
978, 109.71
976, 60.59
974, 19.83
974, 36
970.5, 0
970.5, 0
986.76
982.65
978.52
976.44
450
400
350
300
250
200
150
100
50
0
90
80
70
60
50
40
30
20
10
0
965
970
975
980
985
990
995

B75


T94FS2
B75
B76
B75A
B76A
Based on
FCDMC comment
12/08

B76


T94FS2
B75
B76
B76A
B75A
Based on
FCDMC comment
12/08

B77

# This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B78

## Live Search Maps

Dysart Ranch Channel
Sage Creek Channel

**NEW! Try Live Search 411**
Dial **1-800-CALL-411** for latest info

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

# RID OVERCHUTE PROJECT

*DESIGN REPORT*

*FCD 94-07*

FLOOD CONTROL DISTRICT of MARICOPA COUNTY

FLOOD CONTROL DISTRICT
RECEIVED
JUN 27 1997

| | | | |
|---|---|---|---|
| | CHENG | | P & PM |
| | DEF | | REG |
| | ADMIN | | LMGT |
| | FINANCE | | FILE |
| | C & M | | |
| | ENGR | | |

REMARKS

JULY 1997

Prepared for:

*FLOOD CONTROL DISTRICT*
*OF MARICOPA COUNTY*
2801 West Durango Street
Phoenix, Arizona 85009

SFC PROJECT NO. 28900014

SFC

Flood Control District of Maricopa County (FCDMC)
RID Overchute Project
*Basin Stage-Storage Relationship Summary*
Stantech Project No. 28900014
July 1997

| ELEVATION | BASIN NO. 1 VOLUME | BASIN NO. 2 VOLUME | BASIN NO. 3 VOLUME | BASIN NO. 4 VOLUME | MCDOT CHANNEL VOLUME | TOTAL BASIN VOLUME | TOTAL CUMULATIVE VOLUME |
|---|---|---|---|---|---|---|---|
| | (ac-ft) | (ac-ft) | (ac-ft) | (ac-ft) | (ac-ft) | (ac-ft) | (ac-ft) |
| | | | | | | | |
| 1009.00 | 0.34 | 0.37 | 1.00 | 3.66 | 0.33 | 5.70 | 5.70 |
| 1010.00 | 0.57 | 1.21 | 1.19 | 5.48 | 0.44 | 8.89 | 14.59 |
| 1011.00 | 0.72 | 1.40 | 1.36 | 5.61 | 0.55 | 9.64 | 24.23 |
| 1012.00 | 0.88 | 1.59 | 1.55 | 5.73 | 0.66 | 10.41 | 34.64 |
| 1012.50 | 0.51 | 0.89 | 0.87 | 2.95 | 0.38 | 5.60 | 40.24 |
| **TOTAL BASIN VOLUME** | **3.02** | **5.46** | **5.97** | **23.43** | **2.36** | **40.24** | |

NOT ON PLANS

Source: Stantech Consultants, 1997

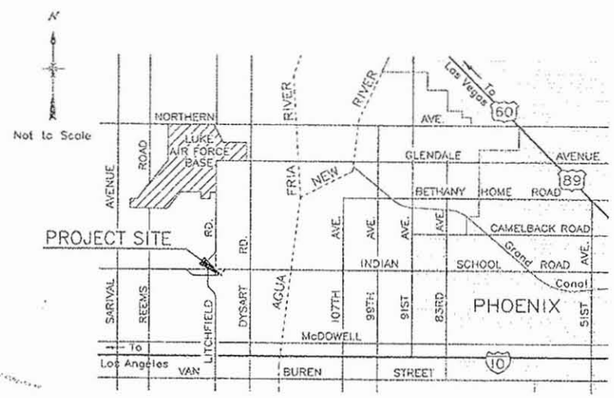
B78

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

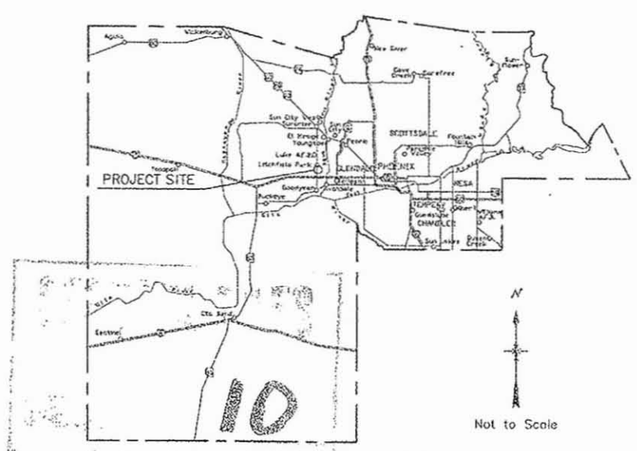
## PLANS FOR THE CONSTRUCTION OF:

# ROOSEVELT IRRIGATION DISTRICT
# OVERCHUTE PROJECT
# PHASE 2

## CONTRACT NO. FCD-97-01




VICINITY MAP
Not to Scale




MARICOPA COUNTY
LOCATION MAP

### BENCHMARKS

| BM # | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---|---|---|---|---|
| 9 | 905,015.7660 | 366,700.1810 | 1014.71 | BRASS CAP AT THE INTERSECTION OF PALADIN AND INDIAN SCHOOL ROAD BYPASS. |
| 170 | 907,231.900 | 370,870.520 | – | BRASS CAP IN HANDHOLE NEAR INTERSECTION OF DYSART ROAD AND INDIAN SCHOOL ROAD BYPASS. |
| 186 | 901,951.4380 | 370,851.0380 | 1011.83 | BRASS CAP AT THE INTERSECTION OF THOMAS ROAD AND DYSART ROAD. |
| – | 907,231.590 | 370,892.500 | – | MCDOT BRASS CAP AT THE INTERSECTION OF DYSART ROAD AND INDIAN SCHOOL ROAD BYPASS. |

BENCHMARKS NOS 170 AND 186 WERE PROVIDED BY FCDMC AS PART OF THE WLB GROUP WHITE TANKS ADMS CONTROL POINTS LISTING DATED 12/22/89. BENCHMARK NO 9 WAS PROVIDED BY SFC ENGINEERING COMPANY FROM THE WHITE TANKS ADMS DATUM AND SURVEY CONTROL ESTABLISHED FOR THIS PROJECT.

### SHEET INDEX LIST


| SHEET # | SHEET TITLE |
|---|---|
| 1 | COVER SHEET |
| 2 | GENERAL NOTES – GENERAL CONSTRUCTION AND PIPING NOTES, AND LEGEND |
| 3 | PLAN AND PROFILE – WEST INTERCEPTOR CHANNEL STA 101+00 TO STA 108+00 |
| 4 | PLAN AND PROFILE – WEST INTERCEPTOR CHANNEL STA 108+00 TO STA 112+85 |
| 5 | PLAN AND PROFILE – BASIN OUTLET CHANNEL STA 10+79.77 TO STA 20+00 |
| 6 | PLAN AND PROFILE – PLAZA CIRCLE CHANNEL STA 20+00 TO STA 30+00 |
| 7 | PLAN AND PROFILE – PLAZA CIRCLE CHANNEL STA 30+00 TO STA 40+00 |
| 8 | PLAN AND PROFILE – PLAZA CIRCLE CHANNEL STA 40+00 TO STA 50+00 |
| 9 | PLAN AND PROFILE – PLAZA CIRCLE CHANNEL STA 50+00 TO STA 57+85.78 |
| 10 | DETAIL SHEET – TYPICAL CHANNEL SECTIONS AND DETAILS |
| 11 | SITE PLAN – PALADIN ROAD BOX CULVERT |
| 12 | SITE PLAN – PALADIN ROAD AND PLAZA CIRCLE DRIVE REALIGNMENT |
| 13 | DETAIL SHEET – WEST INTERCEPTOR CHANNEL – SPILLWAYS |
| 14 | DETAIL SHEET – PLAZA CIRCLE CHANNEL – SPILLWAY |
| 15 | DETAIL SHEET – SANITARY SEWER MANHOLE HEIGHT ADJUSTMENT |
| 16 | PLAN AND PROFILE – 12" WATER LINE REALIGNMENT |


### APPROVAL

BY: Thomas M. Koenekamp 6/2/97
ROOSEVELT IRRIGATION DISTRICT — DATE

BY: 6/12/97
LITCHFIELD PARK SERVICE CO. — DATE

BY: 6/16/97
CITY OF AVONDALE — DATE

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 16606 GARY G. BRADY Date 6-24-97 ARIZONA U.S.A.

Two working days before you dig CALL FOR THE BLUE STAKES 263-1100 Blue Stake Center


SFC Engineering Company
7776 Pointe Parkway W, Suite 290
Phoenix, Arizona 85044
Phone: (602) 438-2200
Fax: (602) 431-9562


FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

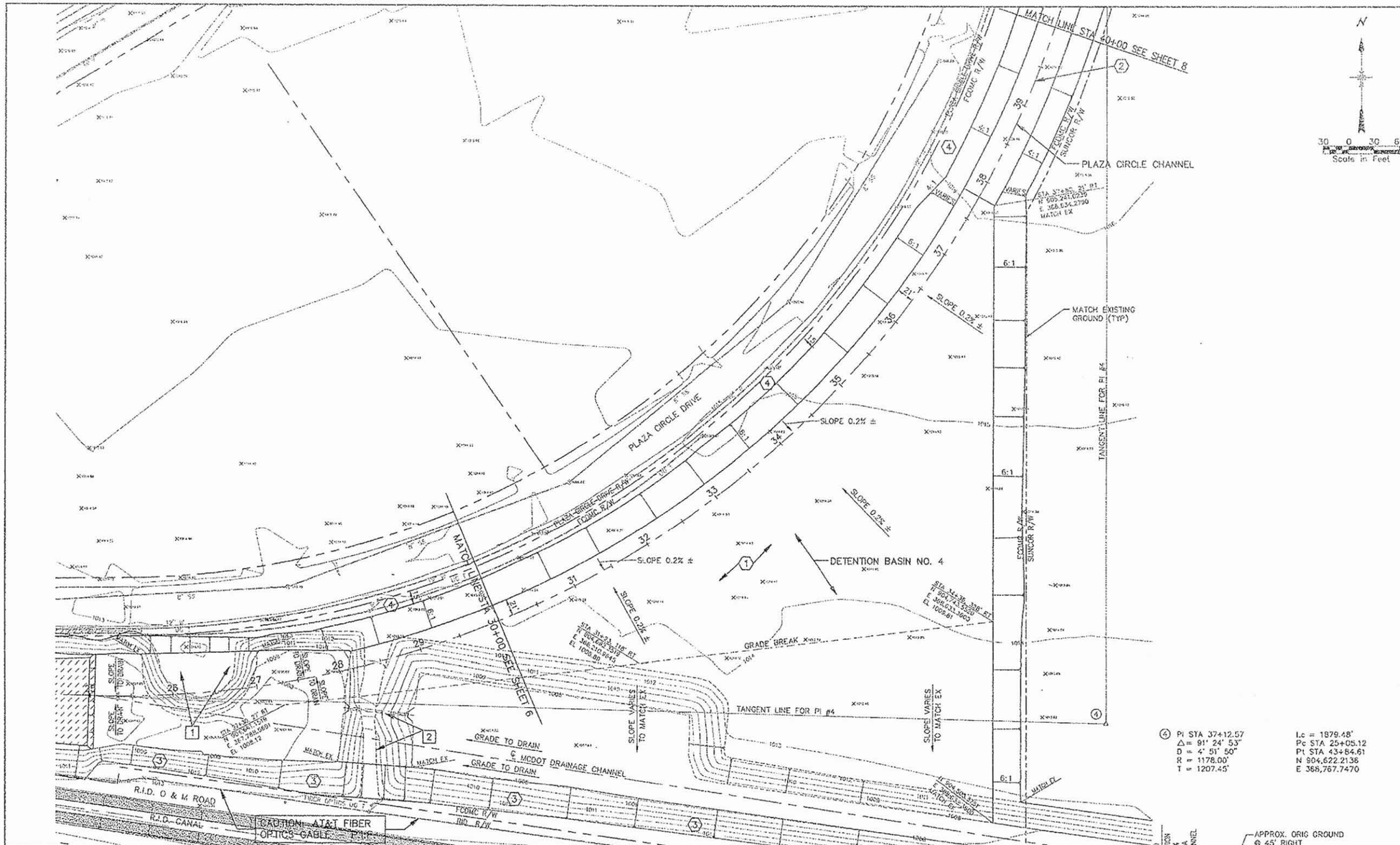
CHIEF ENGINEER AND GENERAL MANAGER — 6/25/97 DATE

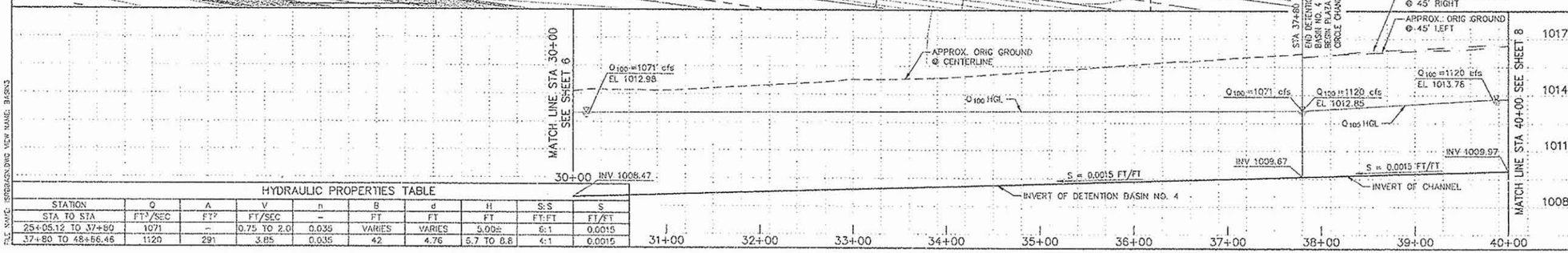
BOARD OF DIRECTORS OF THE FLOOD CONTROL DISTRICT

DON T. STAPLEY – CHAIRMAN

| | |
|---|---|
| DISTRICT 1 | FULTON BROCK |
| DISTRICT 2 | DON T. STAPLEY |
| DISTRICT 3 | BETSEY BAYLESS |
| DISTRICT 4 | JAN BREWER |
| DISTRICT 5 | MARY ROSE GARRIDO WILCOX |

ROOSEVELT IRRIGATION DISTRICT
OVERCHUTE PROJECT PHASE II
CONSTRUCTION PLANS
FCD 97-01 — 109




## HYDRAULIC PROPERTIES TABLE

| STATION STA TO STA | Q FT³/SEC | A FT² | V FT/SEC | n – | B FT | d FT | H FT | S:S FT:FT | S FT/FT |
|---|---|---|---|---|---|---|---|---|---|
| 25+05.12 TO 37+80 | 1071 | – | 0.75 TO 2.0 | 0.035 | VARIES | VARIES | 5.00± | 6:1 | 0.0015 |
| 37+80 TO 48+66.46 | 1120 | 291 | 3.85 | 0.035 | 42 | 4.76 | 5.7 TO 8.8 | 4:1 | 0.0015 |

## CONSTRUCT

1. STA 28+10 TO STA 37+80 – CONSTRUCT DETENTION BASIN 4.
2. STA 37+80 TO STA 40+00 – CONSTRUCT PLAZA CIRCLE CHANNEL. SEE SHEET 8.
3. EXISTING SIDESLOPES TO REMAIN AS IS.
4. CONSTRUCT 15' (MIN) GRATED STRIP. GRADE 15' WIDE STRIP AT 1% TOWARD DRAINAGE CHANNEL.

## REMOVE

1. REMOVE AND DISPOSE OF EXISTING EARTHEN "BULGE", EXCAVATE MATCHING EXISTING BASIN SIDESLOPES TO INVERT ELEVATION 1008.00 AND SLOPE TO CONTROL LINE INVERT AT 0.2% ± GRADE.
2. REMOVE AND DISPOSE OF EXISTING EARTHEN BERM DIVIDING BASINS, CULVERT INLET AND OUTLET STRUCTURES, AND CONCRETE PIPE. MATCH EXISTING BASIN SIDESLOPES ON THE NORTH AND SOUTH SIDES.

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 3 | | | |
| 2 | | | |
| 1 | | | |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

ROOSEVELT IRRIGATION DISTRICT
OVERCHUTE PROJECT – PHASE 2
CONTRACT NO. FCD-97-01

| | BY | DATE |
|---|---|---|
| DESIGNED | G. BRADY | 5/29/97 |
| DRAWN | D. SENUM | 5/29/97 |
| CHECKED | T. KOENEKAMP | 5/29/97 |

SFC Engineering Company
2775 Pointe Parkway E, Suite 690
Phoenix, Arizona 85044
Phone: (602) 430-0300
Fax: (602) 431-0065

PLAN AND PROFILE
PLAZA CIRCLE CHANNEL STA 30+00 TO STA 40+00

SHEET 7 OF 16

FILE NAME: 5R02A5N.DWG VIEW NAME: 3V5N3

B79

# This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B80

# Rating Table Report
## SRB80

Range Data:

| | Minimum | Maximum | Increment | |
|---|---|---|---|---|
| Allowable HW E | 996.00 | 1,000.00 | 2.00 | ft |

| HW Elev. (ft) | Discharge (cfs) |
|---|---|
| 996.00 | 607.40 |
| 998.00 | 3,236.62 |
| 1,000.00 | 7,036.41 |

HDR | ONE COMPANY *Many Solutions*℠

| | | | | | |
|---|---|---|---|---|---|
| Project: | Loop 303 ADMPU AHA | Computed: | AM | Date: | 10/27/09 |
| Subject: | Hydrology | Checked: | LP | Date: | 3/10/09 |
| Task: | Stage-Storage Table | | | | |
| Job #: | 79902 | | | | |

## SRB80

| Elevation | Area (sq. ft.) | Volume (ac-ft) |
|---|---|---|
| 996 | 129240 | 0.00 |
| 998 | 158605 | 6.61 |
| 1000 | 205093 | 16.70 |

1" = 200'

B81

# Rating Table Report
## SRB81

Range Data:

| | Minimum | Maximum | Increment | |
|---|---|---|---|---|
| Allowable HW E | 992.00 | 998.00 | 2.00 | ft |

| HW Elev. (ft) | Discharge (cfs) |
|---|---|
| 992.00 | 0.00 |
| 994.00 | 114.77 |
| 996.00 | 324.61 |
| 998.00 | 2,290.53 |

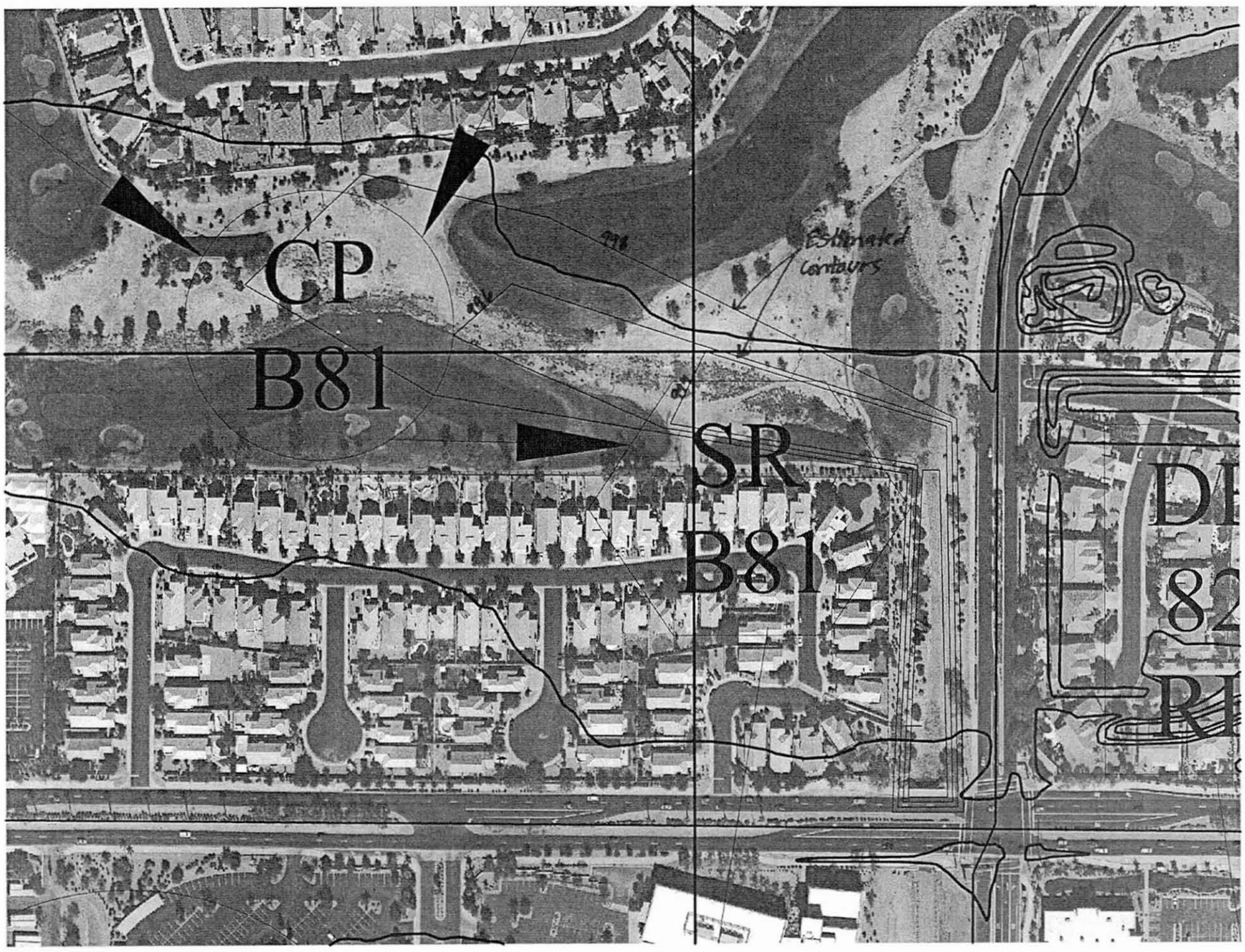
HDR | ONE COMPANY *Many Solutions*℠

| | | | | | |
|---|---|---|---|---|---|
| Project: | Loop 303 ADMPU AHA | Computed: | AM | Date: | 10/27/08 |
| Subject: | Hydrology | Checked: | CP | Date: | 3/10/09 |
| Task: | Stage-Storage Table | | | | |
| Job #: | 79902 | | | | |

## SRB81

| Elevation | Area (sq. ft.) | Volume (ac-ft) |
|---|---|---|
| 992 | 22977 | 0.00 |
| 994 | 72797 | 2.20 |
| 996 | 133260 | 9.46 |
| 998 | 301014 | 29.91 |

1"=20'



B82

# This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B83

Loop 303 ADMPU
Analysis of ADOT Basins A through D at Litchfield Road

Note: ADOT Basins A through D correspond to HDR Basins B73, B74, B84, and B83, respectively.

```
7799    KK  SR287A
        * KO     1                                21
7800    KM        STORAGE ROUTE CP287A IN I-10 DETENTION BASIN
7801    RS       1    STOR       0       0
7802    SV       0    9.46   52.88  120.61  265.17  348.06
7803    SE   975.7     978     980     982     986     988
7804    SQ       0       7      55      55      55     329
7805    SE   975.7     978     980     988   988.8     990
        * BELOW: WLB STUDY DATA
        * KKSR287A
        * KM       STORAGE ROUTE CP287A IN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   14.44   60.06   374.5  423.01  438.91
        * SQ     0       7      55      55      55     329
        * SE 975.7     978     980     988   988.8     990

3830    KK   SRB73 STORAGE
3831    KO
3832    RS       1    STOR      -1
3833    SV            9.46   52.88  120.61  265.17  348.06
3834    SQ            7.00   55.00   55.00   55.00  329.00
3835    SE  975.70  978.00  980.00  982.00  986.00  988.00
3836    ST
```

---

See changes on pages 2-4.
Let me know if you have any questions.
- Ryan

```
7981    KK  SR287B
        * KO     1                              21
7982    KM        STORAGE ROUTE CP287B IN I-10 DETENTION BASIN
7983    RS       1    STOR       0       0
7984    SV       0   11.35   32.69      57  108.98  136.43
7985    SE   974.6     978     980     982     986     988
7986    SQ       0       2      60     800     953
7987    SE   974.6     978     980   987.3     988
        * BELOW: WLB STUDY DATA
        * KKSR287B
        * KM      STORAGE ROUTE CP287B IN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   17.05   38.57  132.52   143.0
        * SQ     0       2      60     800     953
        * SE 974.6     978     980   987.3     988

3856    KK   SRB74 STORAGE
3857    KO
3858    RS       1    STOR      -1
3859    SV           11.35   32.69   57.00  108.98  136.43
3860    SQ            2.00   60.00  800.00  953.00  953.00
3861    SE  974.60  978.00  980.00  982.00  986.00  988.00
3862    ST                          263     668
        *
```

---

```
8359    KK  SR287C
        * KO     1                              21
8360    KM        STORAGE ROUTE CP287C IN AN I-10 DETENTION BASIN
8361    RS       1    STOR       0       0
8362    SV       0   25.10   71.68  127.08  189.52  324.54  402.14
8363    SE   972.5     976     978     980     982     986     988
8364    SQ       0       6     460     460     460     657
8365    SE   972.5     976     980     988   988.6     990
        * BELOW: WLB STUDY DATA
        * KKSR287C
        * KM      STORAGE ROUTE CP287C IN AN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   37.15  141.31  425.75  453.25  562.86
        * SQ     0       6     460     460     460     657
        * SE 972.5     976     980     988   988.6     990

3882    KK   SRB84 STORAGE
3883    KO
3884    RS       1    STOR      -1
3885    SV           25.10   71.68  127.08  189.52  324.54  402.14
3886    SQ            6.00  460.00  460.00  460.00  657.00  657.00
3887    SE  972.50  976.00  978.00  980.00  982.00  986.00  988.00
                                                     460     460
```

---

```
KK  SR287D
* KO     1                              21
KM        STORAGE ROUTE CP287D IN AN I-10 DETENTION BASIN
RS       1    STOR       0       0
SV       0   19.83   60.59  109.71  161.17  215.52  334.65  399.54
SE   970.5     974     976     978     980     982     986     988
SQ       0      36      60      81      86      87
SE   970.5     974     980     988     990   990.5
* BELOW: WLB STUDY DATA
* KKSR287D
* KM       STORAGE ROUTE CP287D IN AN I-10 DETENTION BASIN
* RS      1    STOR       0       0
* SV      0   30.21  162.42   403.5  496.83  532.82
* SQ      0      36      60      81      86      87
* SE 970.5     974     980     988     990   990.5
```

```
KK   SRB83 STORAGE
KO
RS       1    STOR      -1
SV           19.83   60.59  109.71  161.17  215.52  334.65  399.54
SQ           36.00   44.00   52.00   60.00   67.00   73.00   81.00
SE  970.50  974.00  976.00  978.00  980.00  982.00  986.00  988.00
ST                                           65      76
*
```

## Loop 303/White Tanks ADMPU

Stage-Storage-Discharge Relationships for ADOT Basins A to D

**Basin A (HDR Basin B73)**

URS[1]

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 9.46 | 52.88 | 120.61 | 265.17 | 348.06 |
| SE | 975.7 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 7 | 55 | 55 | 55 | 329 |
| SE | 975.7 | 978 | 980 | 988 | 988.8 | 990 |

HDR

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 9.46 | 52.88 | 120.61 | 265.17 | 348.06 |
| SQ | 0 | 7 | 55 | 55 | 55 | 55 |
| SE | 975.7 | 978 | 980 | 982 | 986 | 988 |

*Interpolated for flows at elevations 982 and 986. Removed flow information at elevations higher than 988.

**Basin B (HDR Basin B74)**

URS[1]

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 11.35 | 32.69 | 57 | 108.98 | 136.43 |
| SE | 974.6 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 2 | 60 | 800 | 953 | |
| SE | 974.6 | 978 | 980 | 987.3 | 988 | |

HDR

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 11.35 | 32.69 | 57 | 108.98 | 136.43 |
| SQ | 0 | 2 | 60 | 263 | 668 | 953 |
| SE | 974.6 | 978 | 980 | 982 | 986 | 988 |

*Interpolated for flows at elevations 982 and 986.

**Basin C (HDR Basin B84)**

URS[1]

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SV | 0 | 25.1 | 71.68 | 127.08 | 189.52 | 324.54 | 402.14 |
| SE | 972.5 | 976 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 6 | 460 | 460 | 460 | 657 | |
| SE | 972.5 | 976 | 980 | 988 | 988.6 | 990 | |

HDR

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SV | 0 | 25.1 | 71.68 | 127.08 | 189.52 | 324.54 | 402.14 |
| SQ | 0 | 6 | 233 | 460 | 460 | 460 | 460 |
| SE | 972.5 | 976 | 978 | 980 | 982 | 986 | 988 |

*Interpolated for flows at elevations 978, 982, and 986. Removed flow information for elevations higher than 988.

**Basin D (HDR Basin B83)**

URS[1]

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SV | 0 | 19.83 | 60.59 | 109.71 | 161.17 | 215.52 | 334.65 | 399.54 |
| SE | 970.5 | 974 | 976 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 36 | 60 | 81 | 86 | 87 | | |
| SE | 970.5 | 974 | 980 | 988 | 990 | 990.5 | | |

HDR

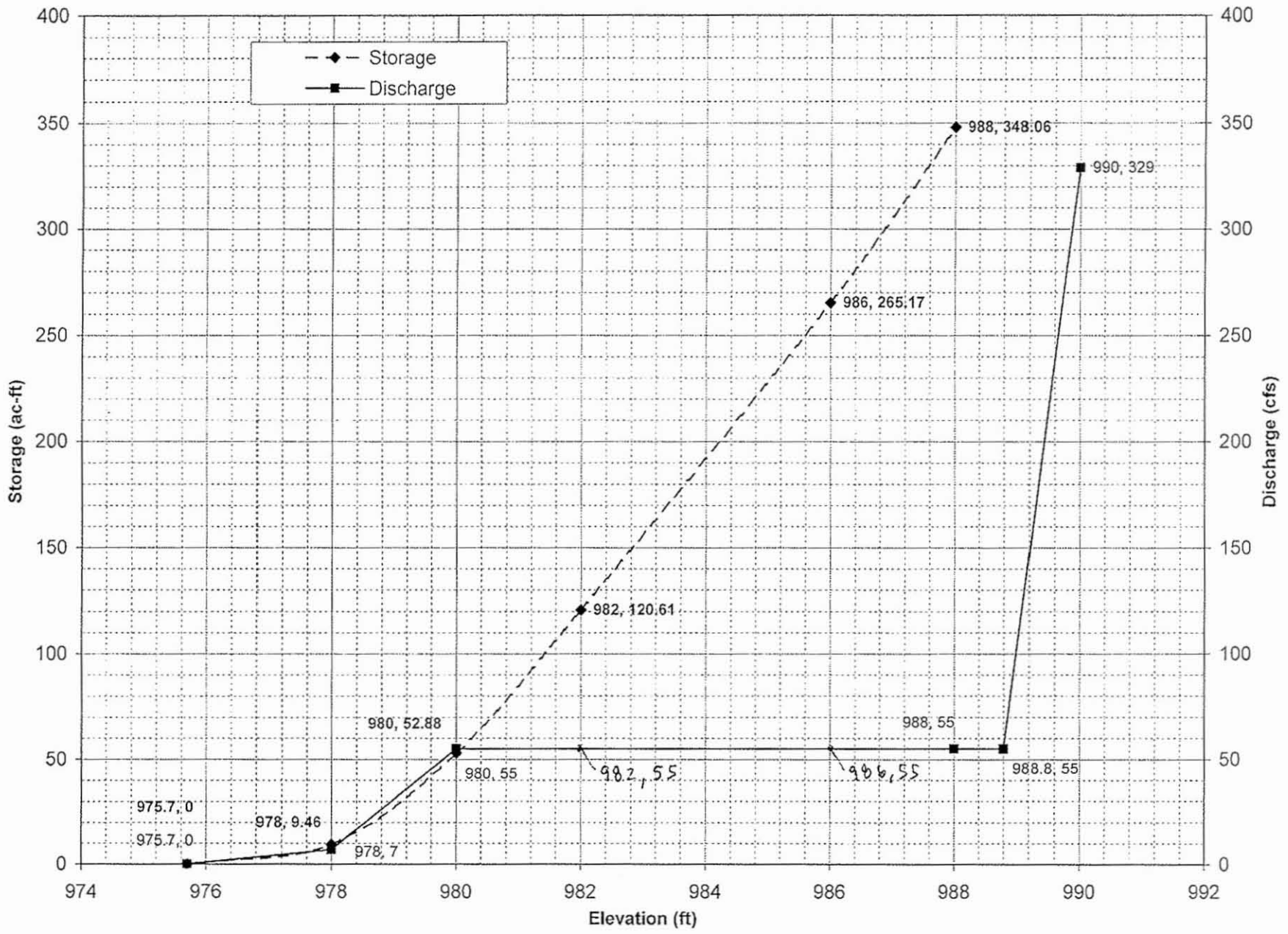
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SV | 0 | 19.83 | 60.59 | 109.71 | 161.17 | 215.52 | 334.65 | 399.54 |
| SQ | 0 | 36 | 44 | 52 | 60 | 65 | 76 | 81 |
| SE | 970.5 | 974 | 976 | 978 | 980 | 982 | 986 | 988 |

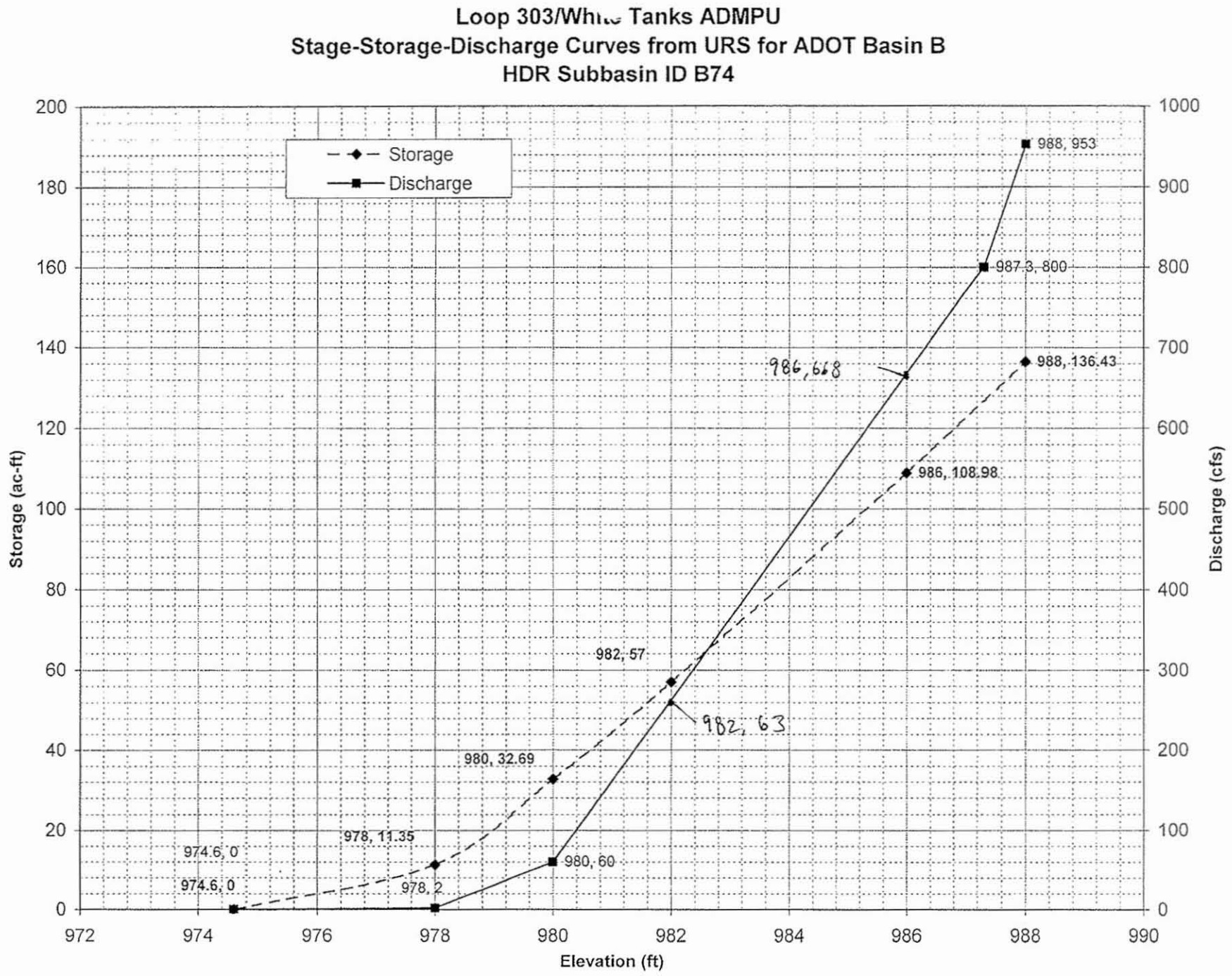
*Interpolated for flows at elevations 976, 978, 982, and 986. Removed flow information for elevations higher than 988.

Notes:

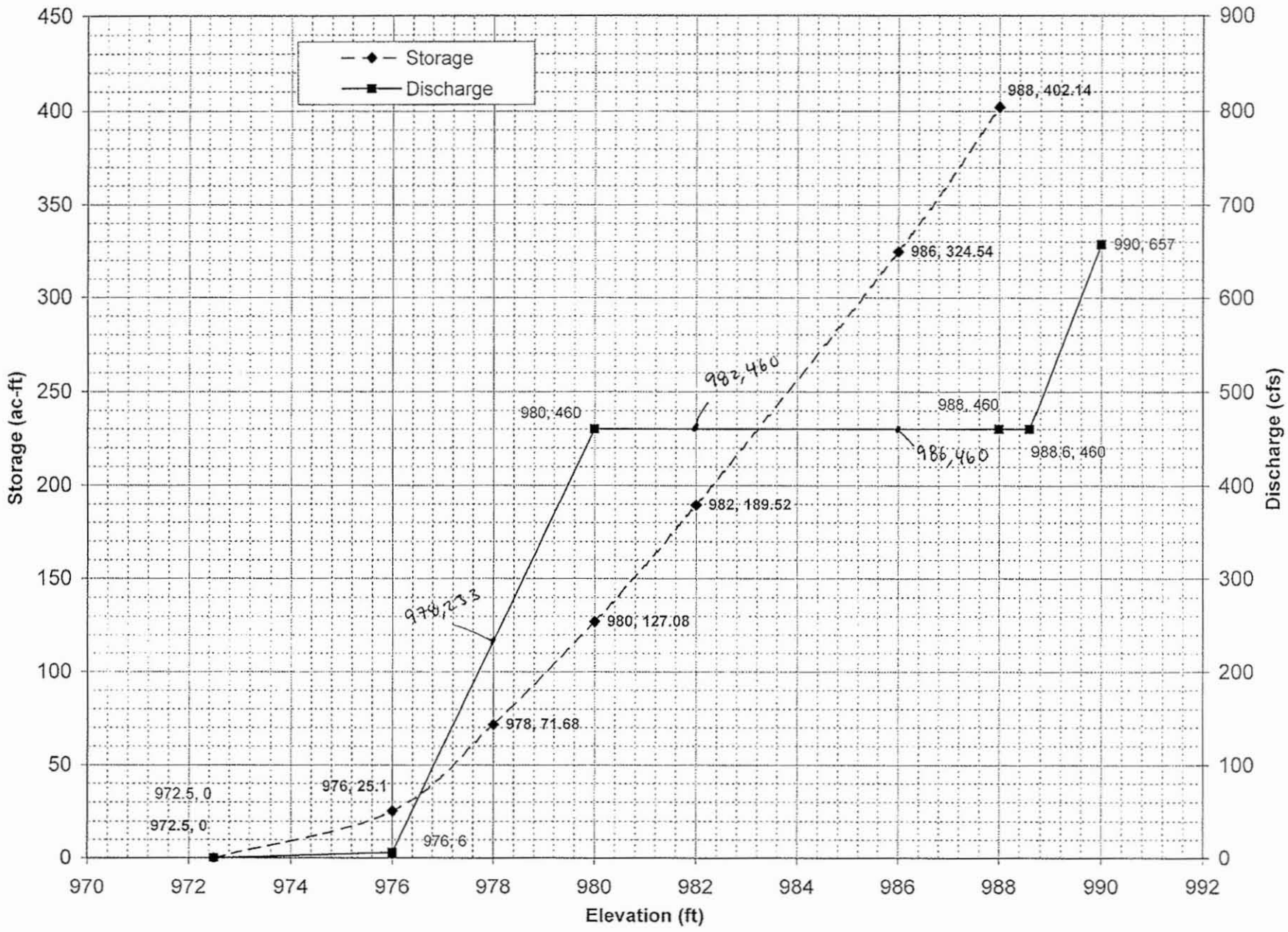
1. Stage-Storage-Discharge Relationships taken from Loop 303 Corridor/White Tanks ADMPU, 2005 by URS.

Loop 303/Wh. Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin A
HDR Subbasin ID B73

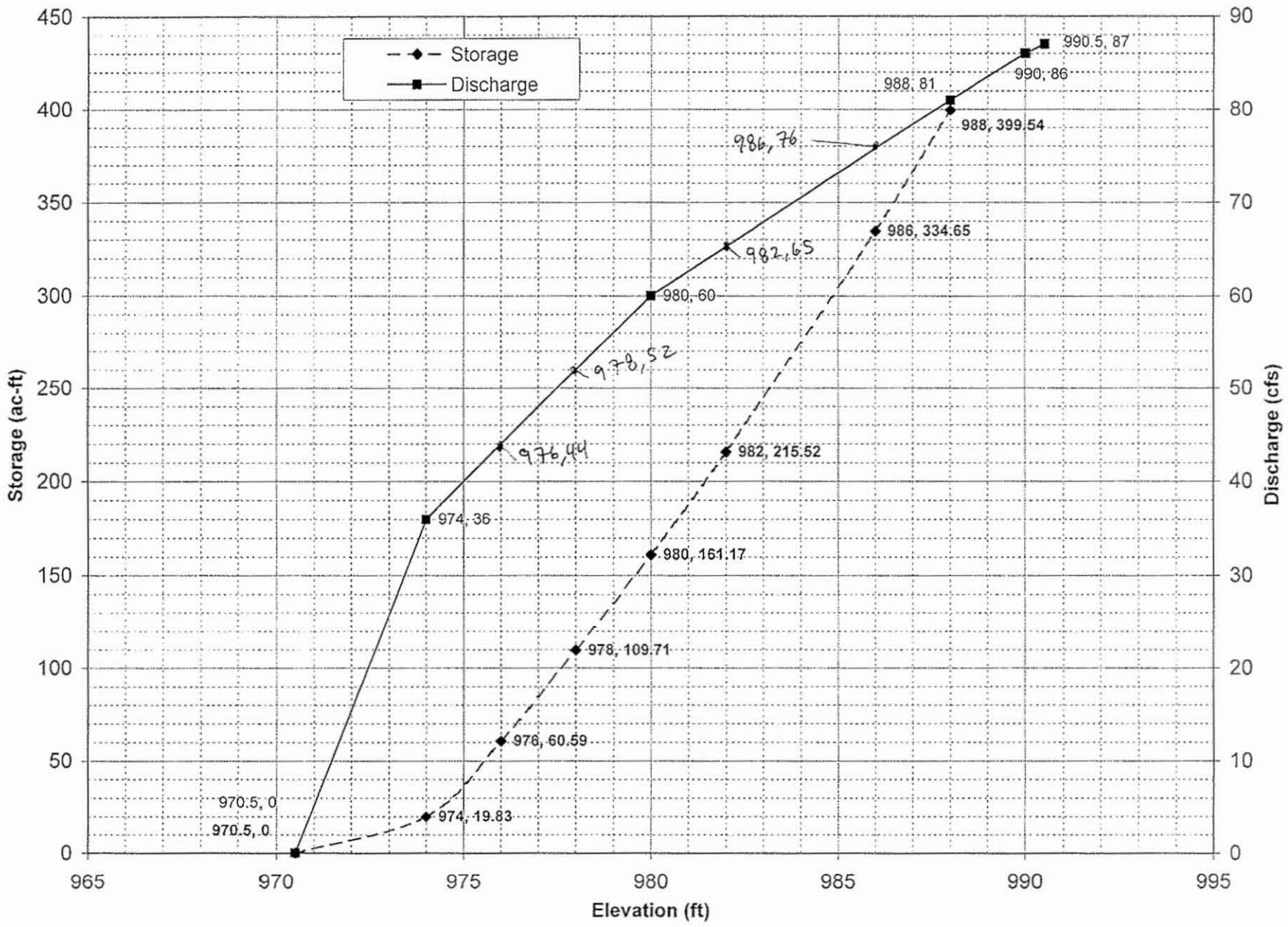



Loop 303/White Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin B
HDR Subbasin ID B74
Storage
Discharge
Storage (ac-ft)
Discharge (cfs)
Elevation (ft)
988, 953
987.3, 800
986, 618
988, 136.43
986, 108.98
982, 57
982, 63
980, 32.69
978, 11.35
974.6, 0
974.6, 0
980, 60
978, 2
200
180
160
140
120
100
80
60
40
20
0
1000
900
800
700
600
500
400
300
200
100
0
972
974
976
978
980
982
984
986
988
990

Loop 303/Wh... Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin C
HDR Subbasin ID B84



Loop 303/Wh.. Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin D
HDR Subbasin ID B83



B84

Loop 303 ADMPU
Analysis of ADOT Basins A through D at Litchfield Road

Note: ADOT Basins A through D correspond to HDR Basins B73, B74, B84, and B83, respectively.

```
7799    KK  SR287A
        * KO     1                                21
7800    KM        STORAGE ROUTE CP287A IN I-10 DETENTION BASIN
7801    RS       1    STOR       0       0
7802    SV       0    9.46   52.88  120.61  265.17  348.06
7803    SE   975.7     978     980     982     986     988
7804    SQ       0       7      55      55      55     329
7805    SE   975.7     978     980     988   988.8     990
        * BELOW: WLB STUDY DATA
        * KKSR287A
        * KM      STORAGE ROUTE CP287A IN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   14.44   60.06   374.5  423.01  438.91
        * SQ     0       7      55      55      55     329
        * SE 975.7     978     980     988   988.8     990

3830    KK   SRB73 STORAGE
3831    KO
3832    RS       1    STOR      -1
3833    SV            9.46   52.88  120.61  265.17  348.06
3834    SQ            7.00   55.00   55.00   55.00  329.00
3835    SE  975.70  978.00  980.00  982.00  986.00  988.00
3836    ST
```

---
-

See changes on pages 2-4.
Let me know if you have any questions.
- Ryan

```
7981    KK  SR287B
        * KO     1                              21
7982    KM        STORAGE ROUTE CP287B IN I-10 DETENTION BASIN
7983    RS       1    STOR       0       0
7984    SV       0   11.35   32.69      57  108.98  136.43
7985    SE   974.6     978     980     982     986     988
7986    SQ       0       2      60     800     953
7987    SE   974.6     978     980   987.3     988
        * BELOW: WLB STUDY DATA
        * KKSR287B
        * KM      STORAGE ROUTE CP287B IN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   17.05   38.57  132.52   143.0
        * SQ     0       2      60     800     953
        * SE 974.6     978     980   987.3     988


3856    KK   SRB74 STORAGE
3857    KO
3858    RS       1    STOR      -1
3859    SV           11.35   32.69   57.00  108.98  136.43
3860    SQ            2.00   60.00  ~~800.00~~  ~~953.00~~  953.00
3861    SE  974.60  978.00  980.00  982.00  986.00  988.00
3862    ST                          263     668
        *
```

---
-

```
8359    KK  SR287C
        * KO     1                                21
8360    KM        STORAGE ROUTE CP287C IN AN I-10 DETENTION BASIN
8361    RS       1    STOR       0       0
8362    SV       0   25.10   71.68  127.08  189.52  324.54  402.14
8363    SE   972.5     976     978     980     982     986     988
8364    SQ       0       6     460     460     460     657
8365    SE   972.5     976     980     988   988.6     990
        * BELOW: WLB STUDY DATA
        * KKSR287C
        * KM      STORAGE ROUTE CP287C IN AN I-10 DETENTION BASIN
        * RS     1    STOR       0       0
        * SV     0   37.15  141.31  425.75  453.25  562.86
        * SQ     0       6     460     460     460     657
        * SE 972.5     976     980     988   988.6     990

3882    KK   SRB84 STORAGE
3883    KO
3884    RS       1    STOR      -1
3885    SV           25.10   71.68  127.08  189.52  324.54  402.14
3886    SQ            6.00  460.00  460.00  460.00  657.00  657.00
3887    SE  972.50  976.00  978.00  980.00  982.00  986.00  988.00
                                                     460     460
```

---
-

```
KK  SR287D
* KO     1                              21
KM        STORAGE ROUTE CP287D IN AN I-10 DETENTION BASIN
RS       1    STOR       0       0
SV       0   19.83   60.59  109.71  161.17  215.52  334.65  399.54
SE   970.5     974     976     978     980     982     986     988
SQ       0      36      60      81      86      87
SE   970.5     974     980     988     990   990.5
* BELOW: WLB STUDY DATA
* KKSR287D
* KM       STORAGE ROUTE CP287D IN AN I-10 DETENTION BASIN
* RS      1    STOR       0       0
* SV      0   30.21  162.42   403.5  496.83  532.82
* SQ      0      36      60      81      86      87
* SE 970.5     974     980     988     990   990.5
```

```
KK   SRB83 STORAGE
KO
RS       1    STOR      -1
SV           19.83   60.59  109.71  161.17  215.52  334.65  399.54
SQ           36.00   44.00   52.00   60.00   67.00   73.00   81.00
SE  970.50  974.00  976.00  978.00  980.00  982.00  986.00  988.00
ST                                          65      76
*
```

## Loop 303/White Tanks ADMPU

Stage-Storage-Discharge Relationships for ADOT Basins A to D

**Basin A (HDR Basin B73)**

URS[1]

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 9.46 | 52.88 | 120.61 | 265.17 | 348.06 |
| SE | 975.7 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 7 | 55 | 55 | 55 | 329 |
| SE | 975.7 | 978 | 980 | 988 | 988.8 | 990 |

HDR

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 9.46 | 52.88 | 120.61 | 265.17 | 348.06 |
| SQ | 0 | 7 | 55 | 55 | 55 | 55 |
| SE | 975.7 | 978 | 980 | 982 | 986 | 988 |

*Interpolated for flows at elevations 982 and 986. Removed flow information at elevations higher than 988.

**Basin B (HDR Basin B74)**

URS[1]

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 11.35 | 32.69 | 57 | 108.98 | 136.43 |
| SE | 974.6 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 2 | 60 | 800 | 953 | |
| SE | 974.6 | 978 | 980 | 987.3 | 988 | |

HDR

| | | | | | | |
|---|---|---|---|---|---|---|
| SV | 0 | 11.35 | 32.69 | 57 | 108.98 | 136.43 |
| SQ | 0 | 2 | 60 | 263 | 668 | 953 |
| SE | 974.6 | 978 | 980 | 982 | 986 | 988 |

*Interpolated for flows at elevations 982 and 986.

**Basin C (HDR Basin B84)**

URS[1]

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SV | 0 | 25.1 | 71.68 | 127.08 | 189.52 | 324.54 | 402.14 |
| SE | 972.5 | 976 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 6 | 460 | 460 | 460 | 657 | |
| SE | 972.5 | 976 | 980 | 988 | 988.6 | 990 | |

HDR

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SV | 0 | 25.1 | 71.68 | 127.08 | 189.52 | 324.54 | 402.14 |
| SQ | 0 | 6 | 233 | 460 | 460 | 460 | 460 |
| SE | 972.5 | 976 | 978 | 980 | 982 | 986 | 988 |

*Interpolated for flows at elevations 978, 982, and 986. Removed flow information for elevations higher than 988.

**Basin D (HDR Basin B83)**

URS[1]

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SV | 0 | 19.83 | 60.59 | 109.71 | 161.17 | 215.52 | 334.65 | 399.54 |
| SE | 970.5 | 974 | 976 | 978 | 980 | 982 | 986 | 988 |
| SQ | 0 | 36 | 60 | 81 | 86 | 87 | | |
| SE | 970.5 | 974 | 980 | 988 | 990 | 990.5 | | |

HDR

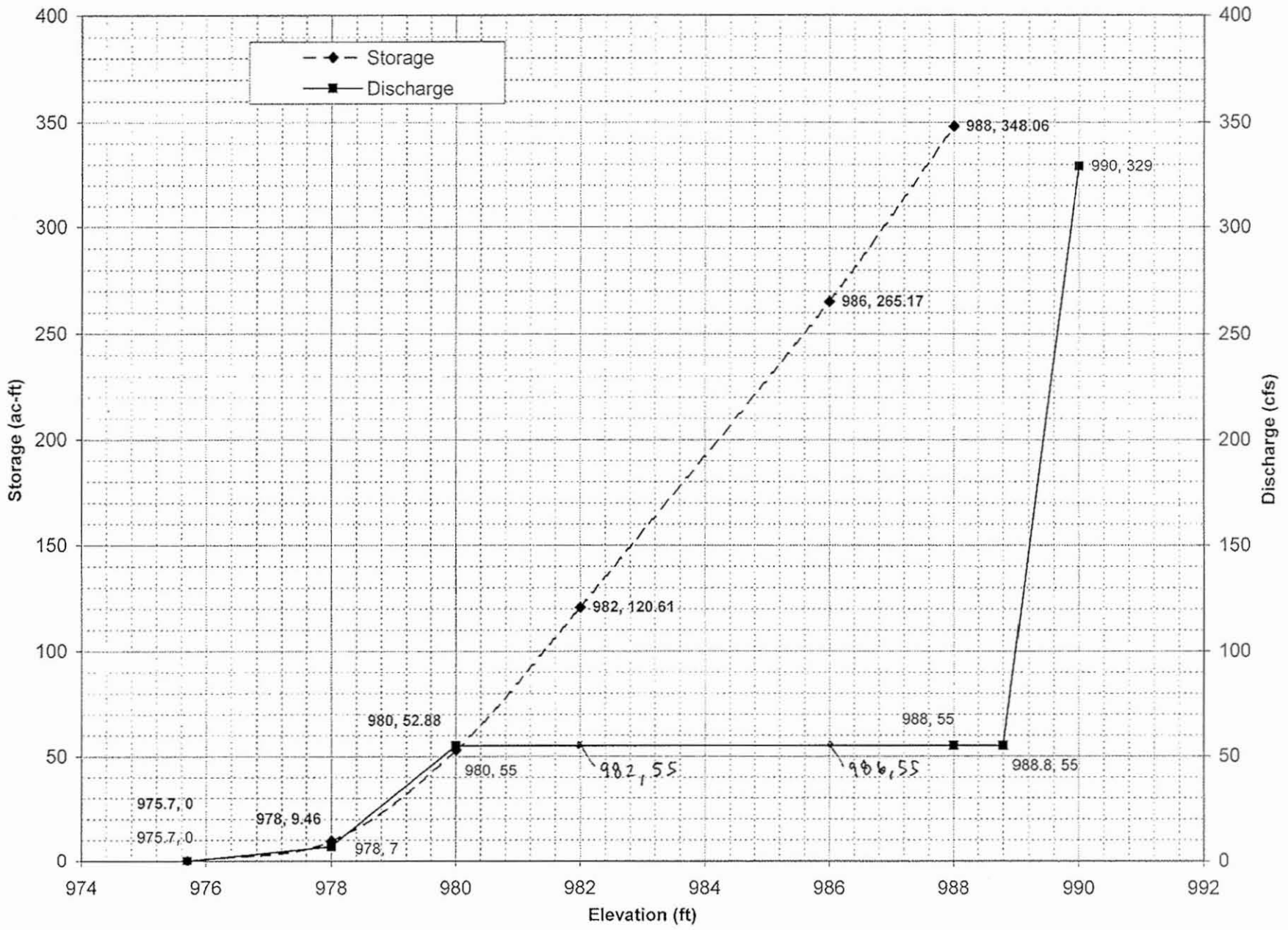
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SV | 0 | 19.83 | 60.59 | 109.71 | 161.17 | 215.52 | 334.65 | 399.54 |
| SQ | 0 | 36 | 44 | 52 | 60 | 65 | 76 | 81 |
| SE | 970.5 | 974 | 976 | 978 | 980 | 982 | 986 | 988 |

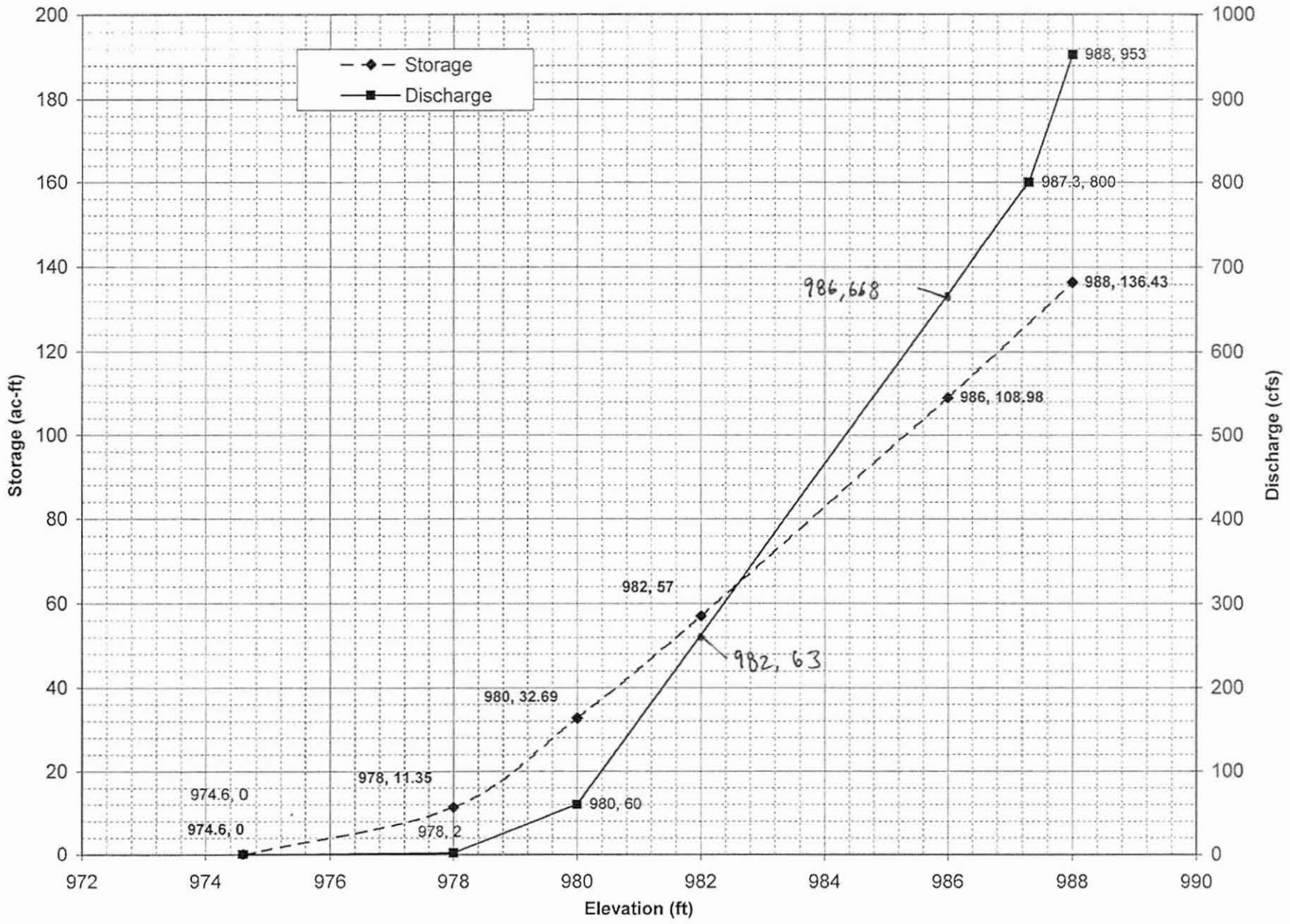
*Interpolated for flows at elevations 976, 978, 982, and 986. Removed flow information for elevations higher than 988.

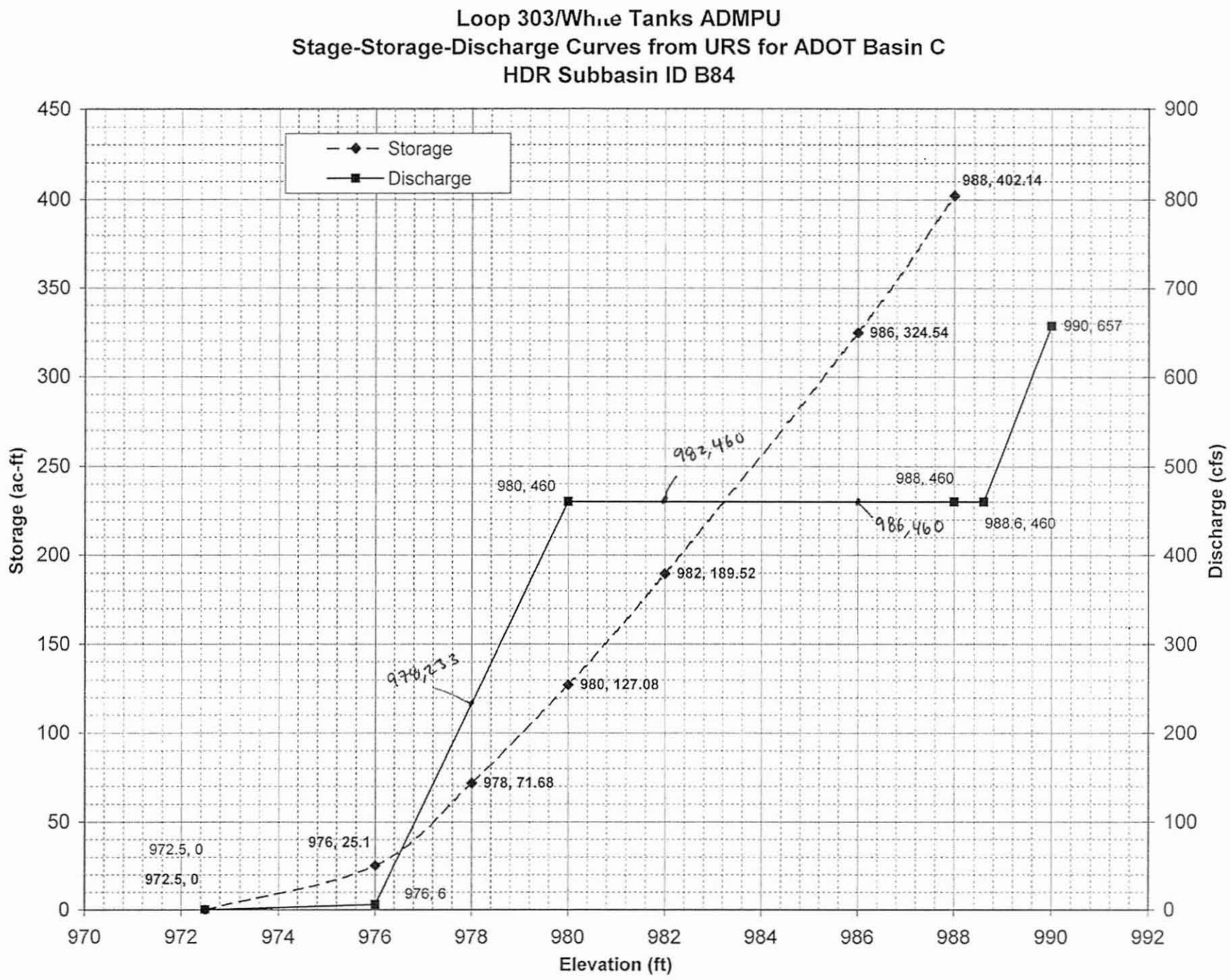
Notes:

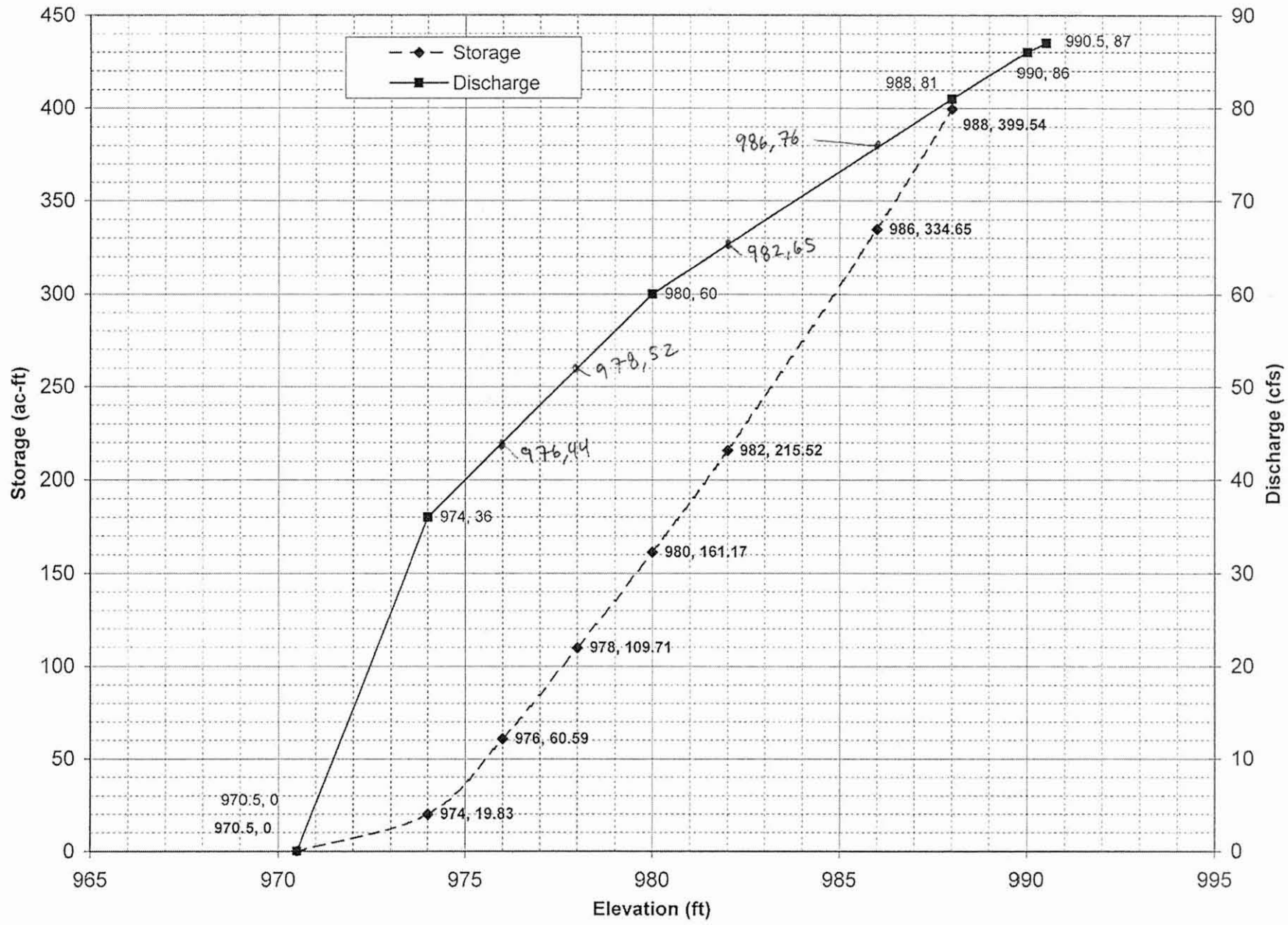
1. Stage-Storage-Discharge Relationships taken from Loop 303 Corridor/White Tanks ADMPU, 2005 by URS.

Loop 303/White Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin A
HDR Subbasin ID B73




Loop 303/White Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin B
HDR Subbasin ID B74
Storage
Discharge
Storage (ac-ft)
Discharge (cfs)
Elevation (ft)
988, 953
987.3, 800
986,618
988, 136.43
986, 108.98
982, 57
982, 63
980, 32.69
978, 11.35
974.6, 0
974.6, 0
978, 2
980, 60
200
180
160
140
120
100
80
60
40
20
0
1000
900
800
700
600
500
400
300
200
100
0
972
974
976
978
980
982
984
986
988
990


Loop 303/White Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin C
HDR Subbasin ID B84
Storage
Discharge
Storage (ac-ft)
Discharge (cfs)
Elevation (ft)
988, 402.14
986, 324.54
990, 657
982,460
980, 460
988, 460
986,460
988.6, 460
982, 189.52
970,233
980, 127.08
978, 71.68
976, 25.1
972.5, 0
972.5, 0
976, 6
450
400
350
300
250
200
150
100
50
0
900
800
700
600
500
400
300
200
100
0
970
972
974
976
978
980
982
984
986
988
990
992


Loop 303/White Tanks ADMPU
Stage-Storage-Discharge Curves from URS for ADOT Basin D
HDR Subbasin ID B83
Storage
Discharge
Storage (ac-ft)
Discharge (cfs)
Elevation (ft)
990.5, 87
990, 86
988, 81
988, 399.54
986, 76
986, 334.65
982, 65
980, 60
978, 52
976, 44
982, 215.52
974, 36
980, 161.17
978, 109.71
976, 60.59
970.5, 0
970.5, 0
974, 19.83
450
400
350
300
250
200
150
100
50
0
90
80
70
60
50
40
30
20
10
0
965
970
975
980
985
990
995

B85

## This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B86

## This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B87

## This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B88

## This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B89

SRB89

The WLB Group Inc. WLB

**COMPUTATION DATA SHEET**

Subject WHITE TANK/AGUA FRIA ADMS Prepared by JSE Date 2-12-91

STAGE - STORAGE - DISCHARGE TABLE

SUBBASIN 337

| ELEV. (FT) | AREA (ac) | VOLUME (AC-FT) | DISCHARGE (CFS) |
|---|---|---|---|
| 951.3 | 0 | 0 | 0 |
| | .06 | | |
| 952 | .18 | .06 | 10 |
| | 3.08 | | |
| 954 | 2.90 | 3.14 | 100 |
| | 11.94 | | |
| 956 | 9.04 | 15.08 | 250 |
| | 30.2 | | |
| 958 | 21.16 | 45.28 | 310 |
| | 65.31 | | |
| 960 | 44.15 | 110.59 | 380 |
| | 111.19 | | |
| 962 | 67.04 | 222.78 | 383 |
| | 68.66 | | |
| 962.8 * Weir Flow | 104.62 | 290.44 | 383 |
| | 159.37 | | |
| 964 | 161.0 | 449.81 | 383 + 8545 = 8928 |

Weir Flow
$Q = CLH^{3/2}$

C = 2.6
L = 2500
H = 1.2

Qd 964 = 8545 cfs

Form 209

CP
B89
SR
B89

B90

## This Section Intentionally Left Blank

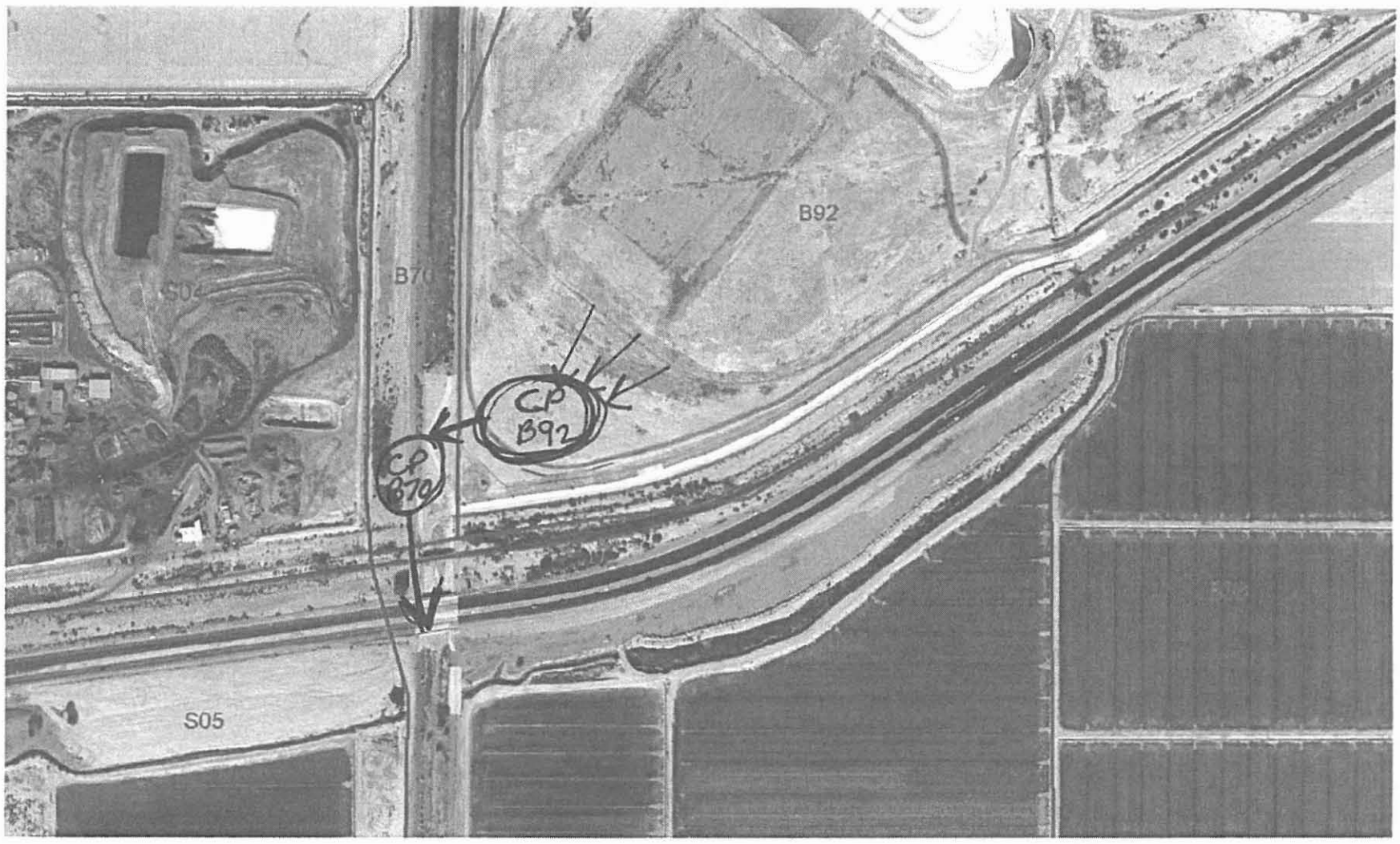
For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B91

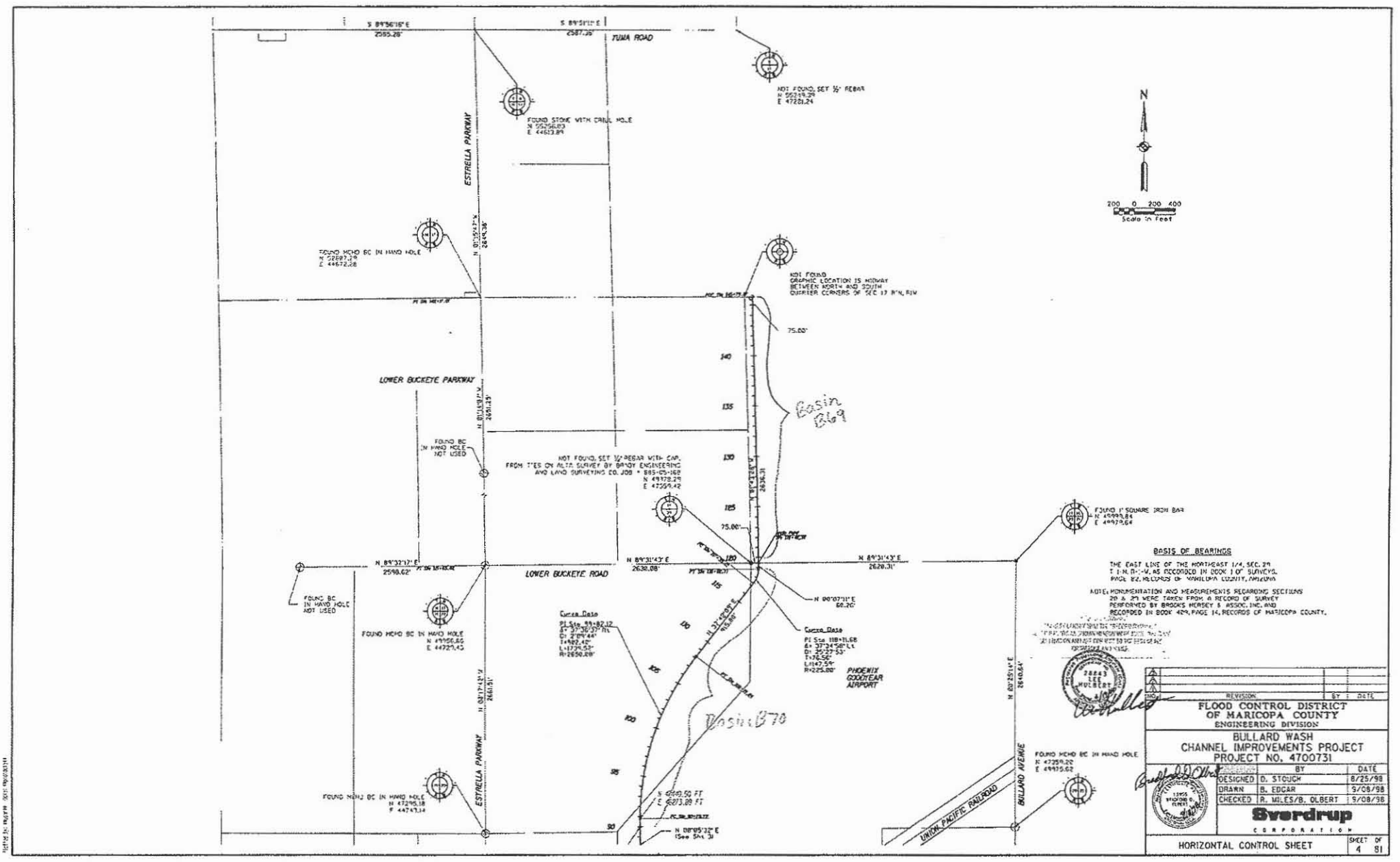
## This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B92




Remove
SR
B92



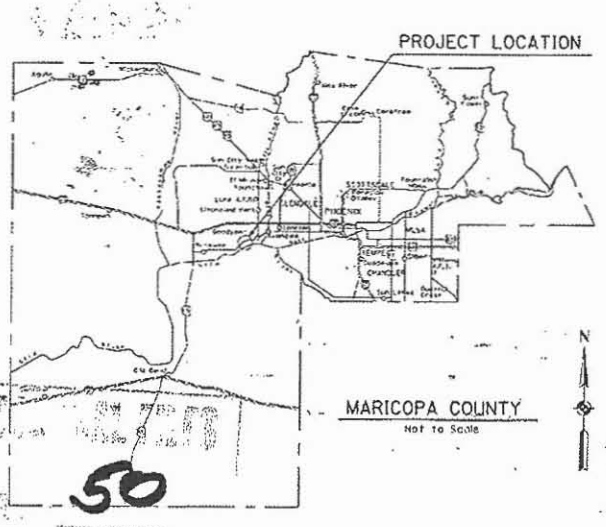

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

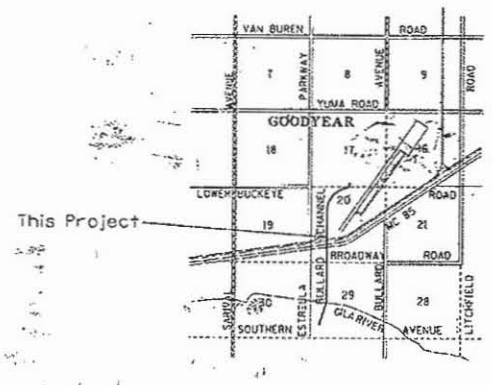
PLANS FOR THE CONSTRUCTION OF:

## BULLARD WASH CHANNEL IMPROVEMENTS PROJECT

CONTRACT NO. 98-15

PROJECT CONTROL NO. 4700731




IN COOPERATION WITH:
CITY OF GOODYEAR

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

CHIEF ENGINEER & GENERAL MANAGER — DATE

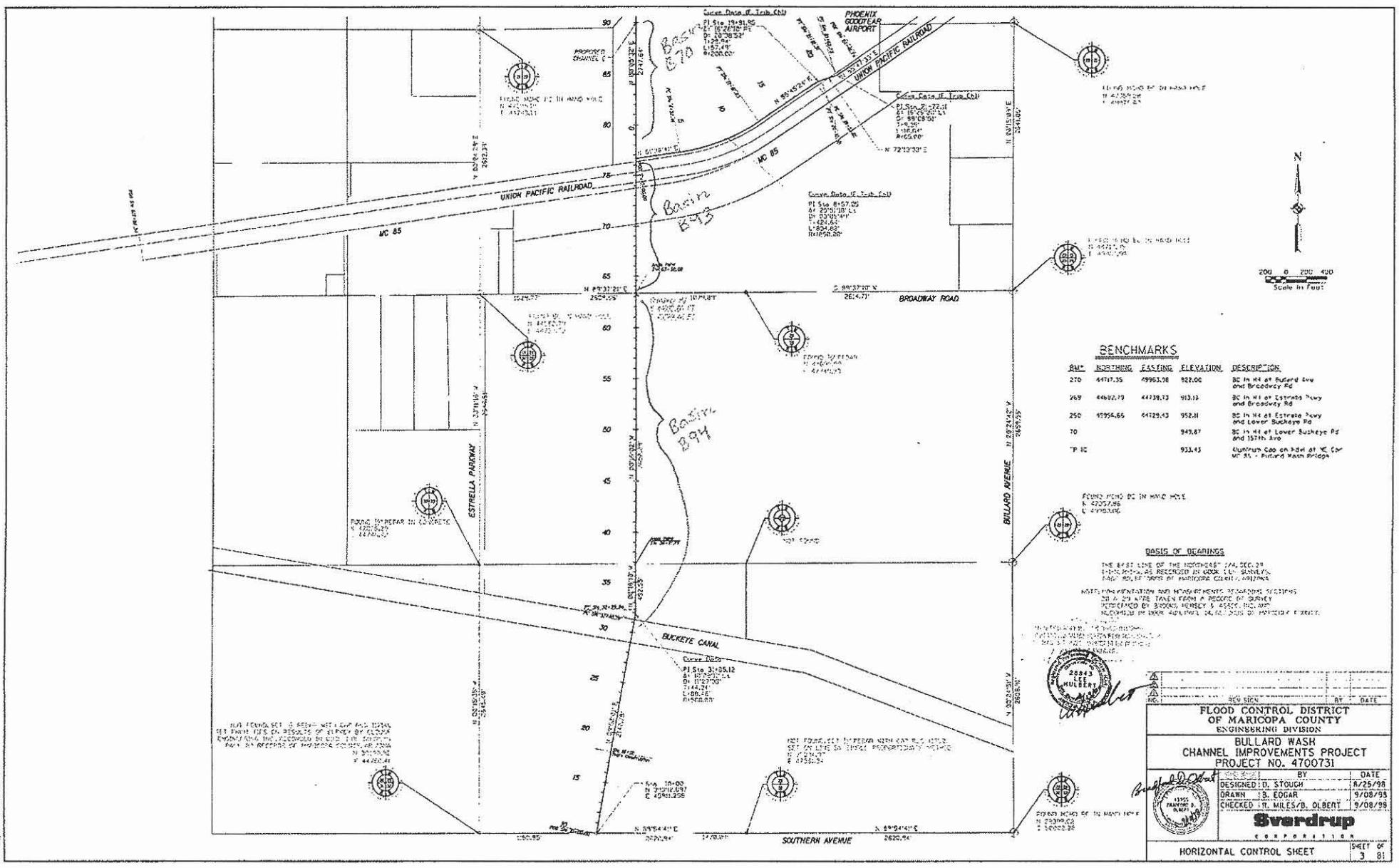
CITY OF GOODYEAR — DATE

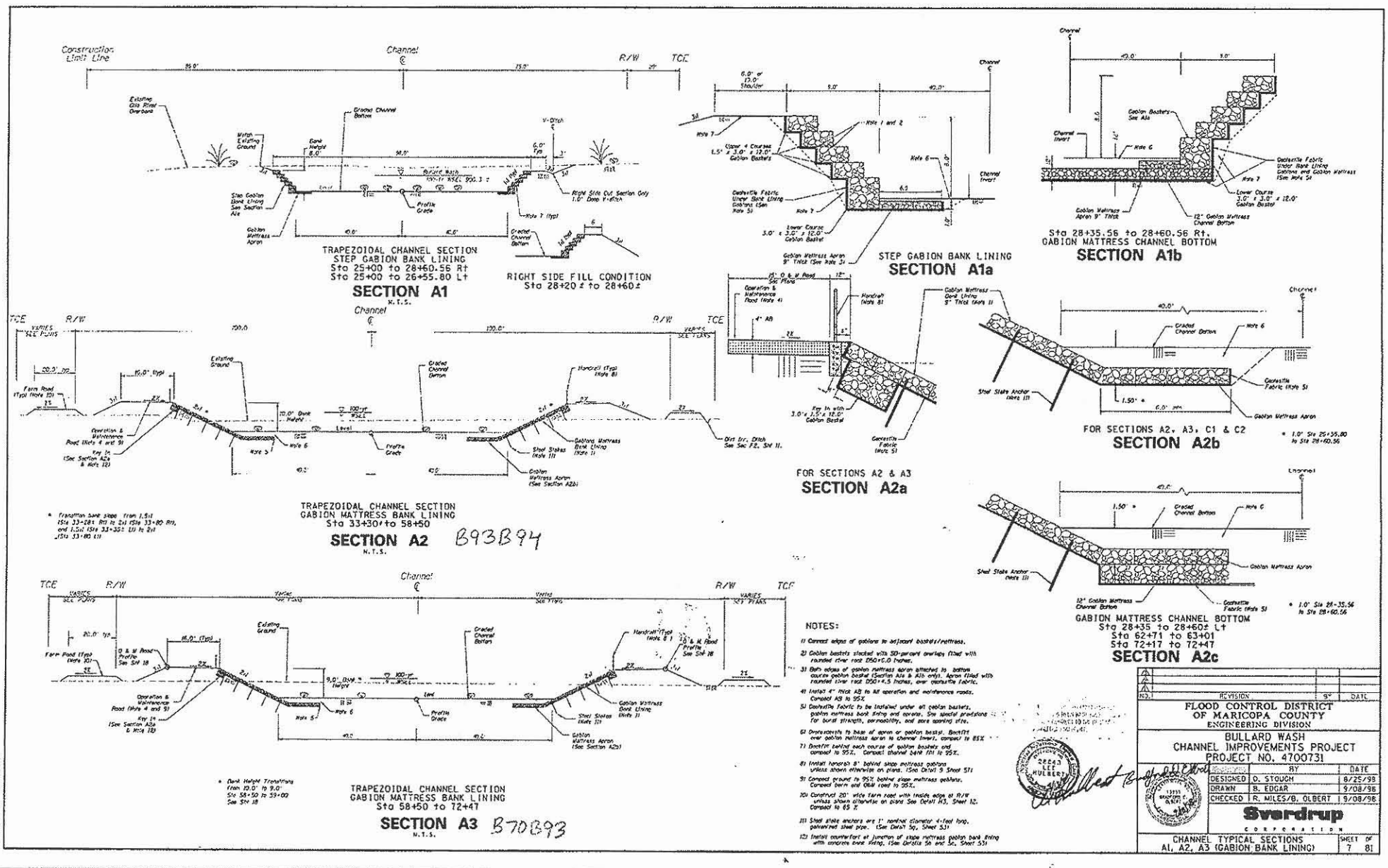
for BUCKEYE IRRIGATION DISTRICT — 7/8/98 DATE

COUNTY BOARD OF SUPERVISORS

JAN BREWER - CHAIRMAN

DISTRICT 1 PULTON BROCK
DISTRICT 2 DON STAPLEY
DISTRICT 3 ANDY KUNASEK
DISTRICT 4 JAN BREWER
DISTRICT 5 MARY ROSE WILCOX


PHOENIX GOODYEAR AIRPORT
UNION PACIFIC RAILROAD
MC 85
BROADWAY ROAD
ESTRELLA PARKWAY
BULLARD AVENUE
BUCKEYE CANAL
SOUTHERN AVENUE
Basin B70
Basin B93
Basin B94
N
Scale in Feet
BENCHMARKS
BM NORTHING EASTING ELEVATION DESCRIPTION
270 44717.35 49963.98 922.00 BC in H4 at Bullard Ave and Broadway Rd
269 44692.73 44739.13 913.10 BC in H1 at Estrella Pkwy and Broadway Rd
250 47956.66 44729.43 952.11 BC in H4 at Estrella Pkwy and Lower Buckeye Rd
70 949.87 Aluminum Cap on Rebar at NE Cor MC 85 - Bullard Wash Bridge
BASIS OF BEARINGS
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION
BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731
DESIGNED D. STOUCH 8/25/98
DRAWN B. EDGAR 9/08/98
CHECKED R. MILES/B. OLBERT 9/08/98
Sverdrup
CORPORATION
HORIZONTAL CONTROL SHEET
SHEET 3 OF 81


Construction Limit Line
Channel ℄
R/W
TCE
TRAPEZOIDAL CHANNEL SECTION
STEP GABION BANK LINING
Sta 25+00 to 28+60.56 Rt
Sta 25+00 to 26+55.80 Lt
SECTION A1
N.T.S.
RIGHT SIDE FILL CONDITION
Sta 28+20 ± to 28+60±
STEP GABION BANK LINING
SECTION A1a
Sta 28+35.56 to 28+60.56 Rt.
GABION MATTRESS CHANNEL BOTTOM
SECTION A1b
TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 33+30± to 58+50
SECTION A2
B93B94
FOR SECTIONS A2 & A3
SECTION A2a
FOR SECTIONS A2, A3, C1 & C2
SECTION A2b
GABION MATTRESS CHANNEL BOTTOM
Sta 28+35 to 28+60± Lt
Sta 62+71 to 63+01
Sta 72+17 to 72+47
SECTION A2c
TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 58+50 to 72+47
SECTION A3
B70B93
NOTES:
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION
BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731
DESIGNED D. STOUCH 8/25/98
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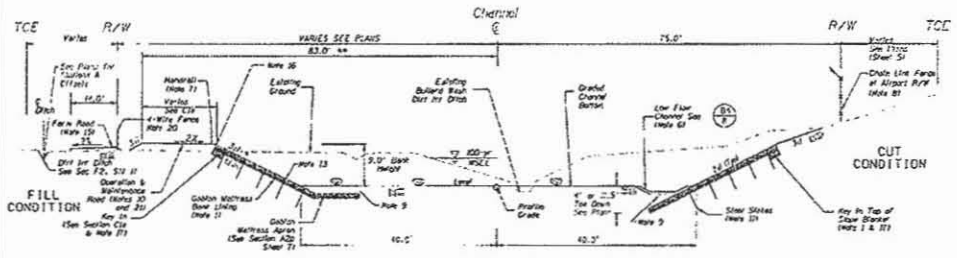
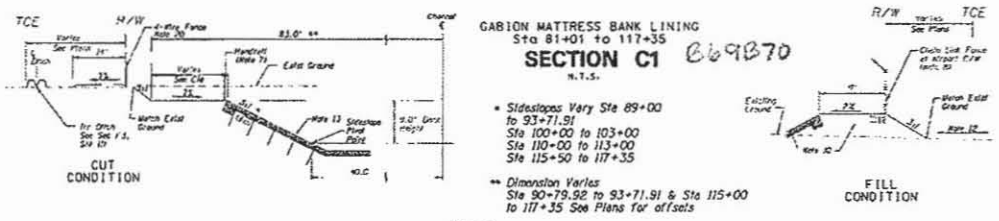
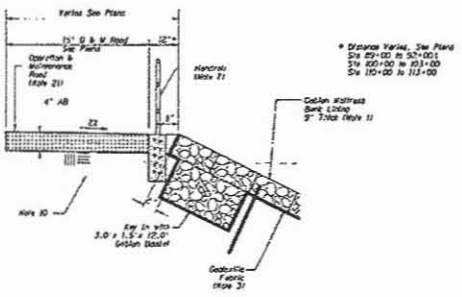
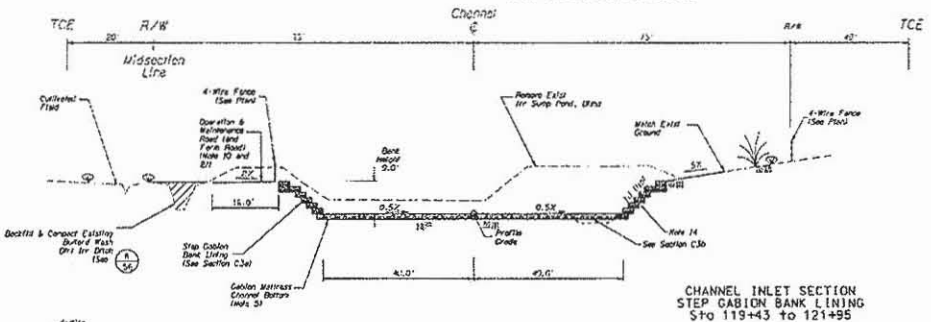
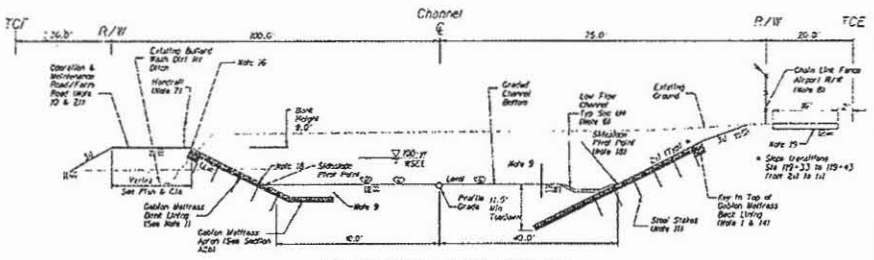
Sverdrup
CORPORATION
CHANNEL TYPICAL SECTIONS
A1, A2, A3 (GABION BANK LINING)
SHEET 7 OF 81




NOTES

1) Riprap filled, Gabion Mattress Bank Lining with, 9" x 6' x 12' basket size. Key in top of slope mattress gabions with 3.0' x 1.5' x 12' gabion baskets; filled w/rounded river rock See Specifications.

2) All edges of gabions are connected to adjacent gabion baskets.

3) Geotextile fabric to be installed under all slope mattress gabions and aprons. Fabric shall be installed behind and under step gabion baskets See special provisions for burst strength, permeability and burst strength.

4) Banks lined with riprap filled gabion baskets, stacked with 50-percent overlap, 18" x 36" x 12" basket size (except upper courses), on geotextile fabric. (See Sec C3b)

5) Channel bottom lined with 2 layers of 9" x 6" x 12" gabion mattress filled w/rounded river rock D ≥4.5 inches

6) Low flow channel lined with, 6-inch " thick concrete. See Sec U4, Std 2.

7) Handrail will be installed 8' behind channel lining left bank only. See Detail 9 and 9A and Detail 7c and 5S for locations.

8) Chain link fence (AAC Std 150) is to be installed along airport R/W only. Barbed wire top angled away from airport. See Detail 7c and 5S for locations.

9) Overexcavate to base of apron, gabion mattress or gabion basket, backfill over apron to channel invert, compact to 85%. Compact base under low flow channel to 95%

10) Geotex behind each course of gabion baskets, compact to 95%. Compact O & M road subgrade to 95%. Compact Embankments to 95%

11) Steel stakes are 1-inch outer diameter, 4-foot long, galvanized steel pipe. See Detail 5G.

12) Stockpile locations on Airport property to be arranged by Contractor. Contact Steven Abreu, with Phoenix Goodyear Airport.

13) Section C1 includes transitions which vary from 2:1 to 3:1 sideslopes, see plan for locations.

14) Install counterfort Sta 119+43 (LT & RT) See Detail 5c, Std 53.

15) Construct Farm Road Sta 91+73 to 117+40 only.

16) Area between O & M Road and gabions varies in width (see section C1 & C2).

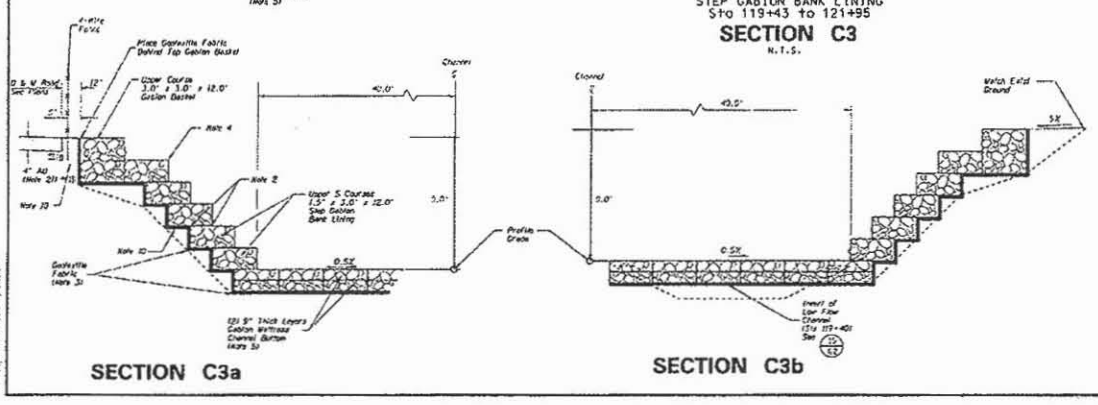
17) Install counterforts at Sta 81+01 LT & RT. See Detail 5c, Std 53.

18) Section C2 includes sideslope transitions which vary from 2:1 to 3:1 Sta 119+33 to 119+43 (See Plans).

19) Construct new 4" AB, 16' wide airport perimeter road Sta 116+82 to 119+36. Compact AB and subgrade to 95%.

20) Install 4-wire fence, sta 90+95± to 119+33.

21) Install 4" thick AB over all operation & maintenance roads. Compact AB to 95%




| REV. | REVISION | BY | DATE |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

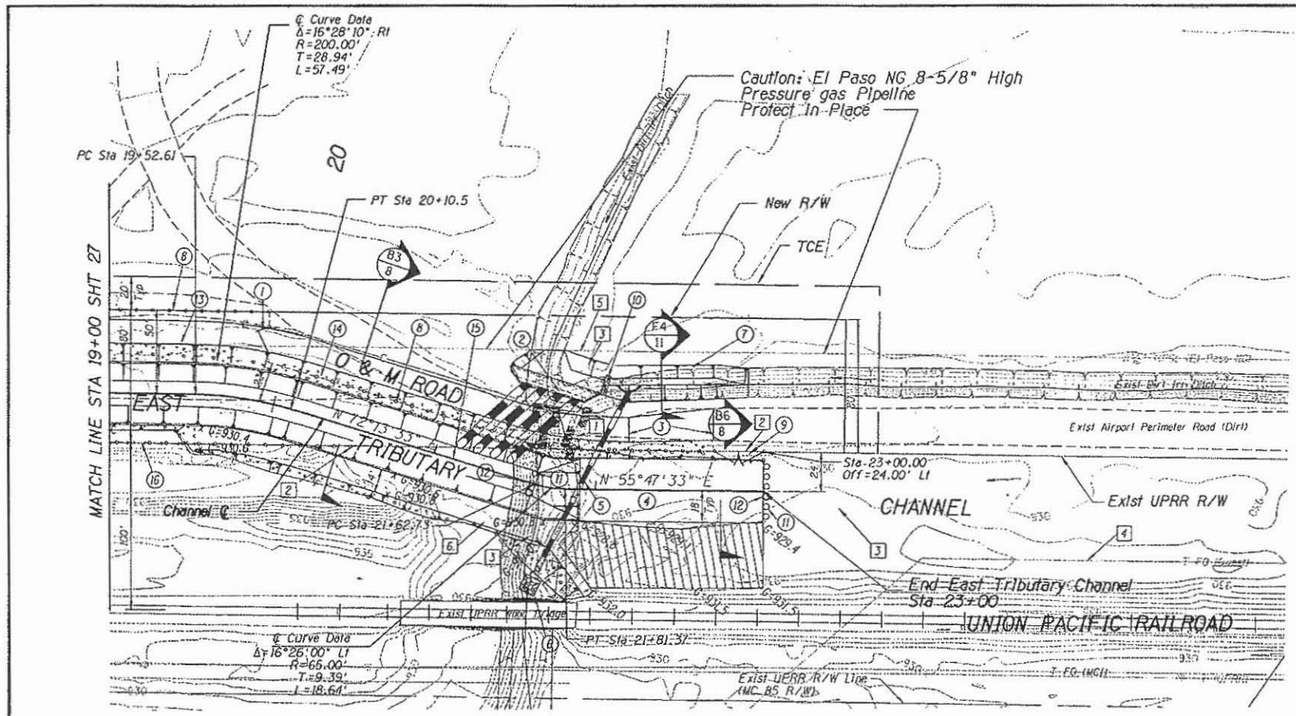
BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731

| | BY | DATE |
|---|---|---|
| DESIGNED | D. STOUGH | 8/25/98 |
| DRAWN | B. EDGAR | 9/08/98 |
| CHECKED | R. MILES/B. GILBERT | 9/08/98 |

Sverdrup CORPORATION

CHANNEL TYPICAL SECTIONS C1, C2 and C3

SHEET 9 OF 81



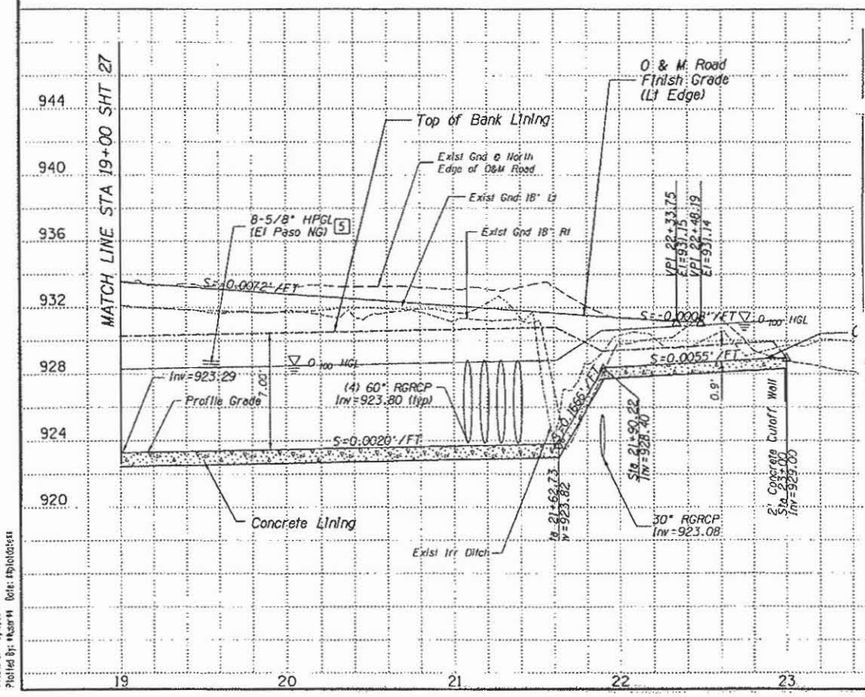

* UNLESS STATED OTHERWISE ALL STATIONS ON THIS SHEET REFER TO EAST TRIBUTARY CHANNEL ℄

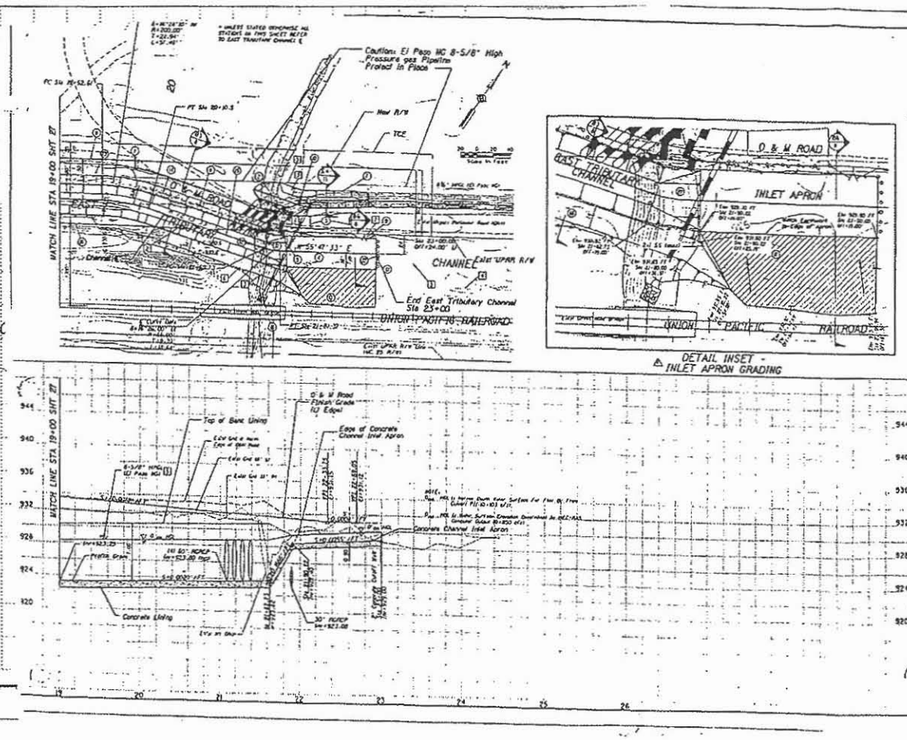
## REMOVAL/RELOCATE

1. Remove Exist 60" Steel Pipe 27 LF x 5 ea (Lump Sum)
2. Remove Exist Chain Link Fence Sta 19+00 ⌀ Rt to Sta 23+50 ⌀ Lt, 400 LF
3. Clear and Grub, 0.6 Ac
4. Exist Tel-FO Cable (Protect In Place)
5. Exist 8-5/8" High Pressure Gas Line Protect In Place (El Paso NG)
6. Rubble & Debris Removal, 10 Tons

## CONSTRUCTION

1. New 12' Wide (Single) Access Gate, Chain Link Fence (MAG Std Det 160) Sta 19+90, 30.7' Lt
2. New (4) 60" RGRCP x 58 LF (232 LF) ⌀ Lt and Inlet & Outlet Headwalls Detail 13 & 22 (P11/43)
3. 50' Roadway Transition, Match Exist Airport Perimeter Road, Sta 22+19.06, Off=44.66' Lt to Sta 22+69.05, Off=49.64'
4. New Concrete Channel Inlet Apron, See (B6/8)
5. New 30" RGRCP 122 LF with Outlet End Section w/ Drop Inlet Headwall (MAG Std Det 501-5) (P10/43)
6. New Dumped Riprap Outlet Protection, 4 CY (11/12) (P10/43)
7. New 4' BW Dirt Irr Ditch, 83 LF, see Sta 22+07.25, Off 66.00' Lt to Sta 22+90.00, Off 66.00' Lt; See (F4/11) (P10/43)
8. New Chain Link Fence 422 LF ⌀ Lt, (MAG Std Det 160), See Table 7c For Locations (7c/55)
9. New 24' Wide (Double 12') Access Gate, Chain Link Fence (MAG Std Det 160) East Pole at Sta 23+00, Off=24.00' Lt
10. New Gabion Basket Wire, 12 LF Sta 22+03.44, Off=56.97' Rt to Sta 22+06.84, Off=68.48' Rt (13c/61)
11. New Safety Posts (Fixed) (7 ea) at Sta 23+00 Off 3' Lt, 9' Lt, 15' Lt, 9' Rt, and 15' Rt
21+60, Off 0' Lt and 6' Lt.
ivveable Safety Post, 2 ea at Sta 23+00, and Sta 21+60, Off 6' Rt; see (17/63)
Road w/ 4" AB; 370 LF ⌀ Lt
el Mulch, 233 SY
rete Channel Lining 15' Bottom Width Tributary Channel) (B3/8)
e Fence, 50 LF ⌀ Rt to Sta 19+50, see (7e/55) (16/63) for Locations




| REVISION | BY | DATE |
|---|---|---|

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

BULLARD WASH
EL IMPROVEMENTS PROJECT
PROJECT NO. 4700731

| | BY | DATE |
|---|---|---|
| DESIGNED | D. STOUGH | 8/25/98 |
| DRAWN | B. EDGAR | 9/08/98 |
| CHECKED | R. MILES/B. OLBERT | 9/08/98 |

Sverdrup
CORPORATION

ROFILE (EAST TRIBUTARY)
0.00 TO STA 23+00.00

SHEET 28 OF 81

B93

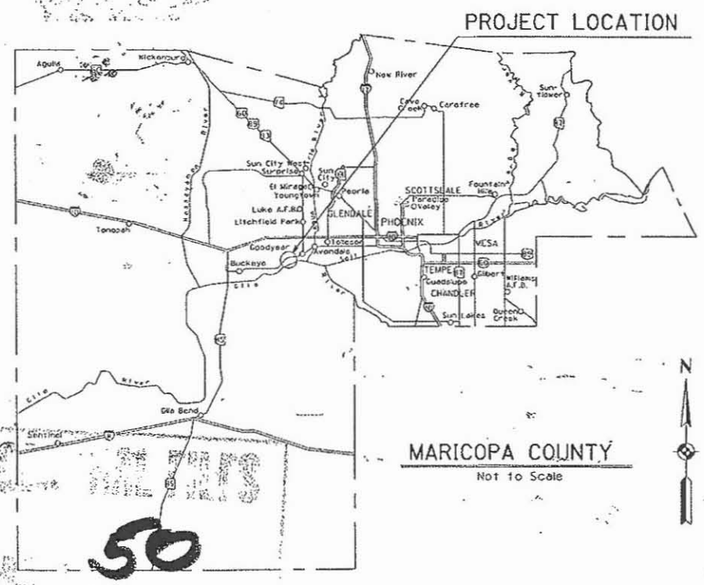
# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

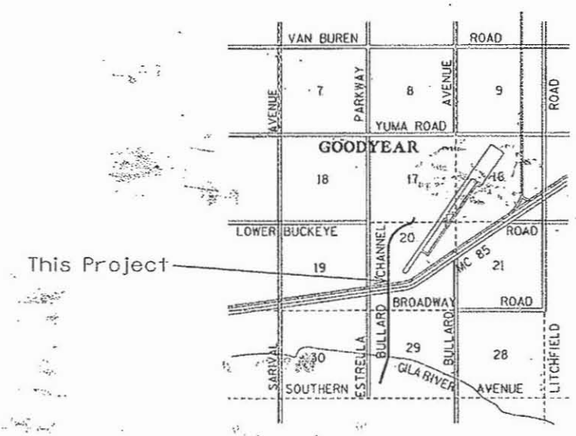
PLANS FOR THE CONSTRUCTION OF:

# BULLARD WASH CHANNEL IMPROVEMENTS PROJECT

CONTRACT NO. 98-15

PROJECT CONTROL NO. 4700731




CITY OF GOODYEAR — DATE

for BUCKEYE IRRIGATION DISTRICT — DATE

IN COOPERATION WITH:

CITY OF GOODYEAR

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

FOR CHIEF ENGINEER & GENERAL MANAGER — DATE

COUNTY BOARD OF SUPERVISORS

JAN BREWER - CHAIRMAN

DISTRICT 1 FULTON BROCK
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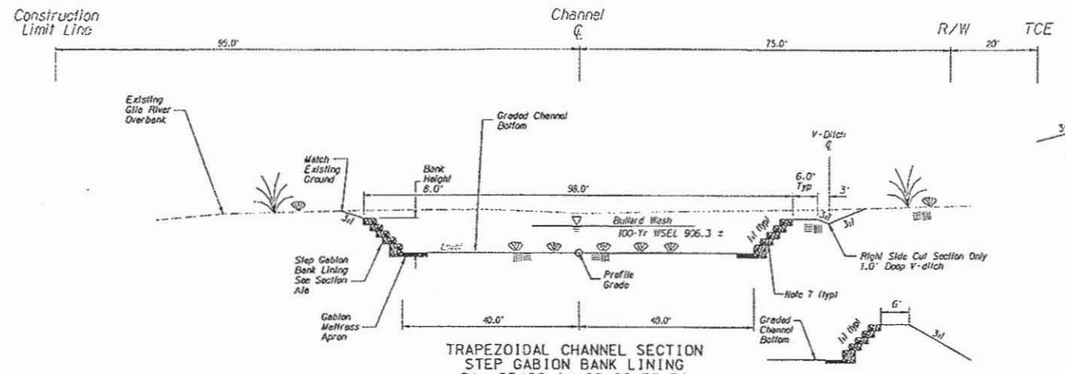
DISTRICT 3 ANDY KUNASEK
DISTRICT 4 JAN BREWER
DISTRICT 5 MARY ROSE WILCOX

Bullard Wash Channel
Improvement Project
AS BUILTS
50
DJB

FCD 98-15
470

670 / 693 / 694

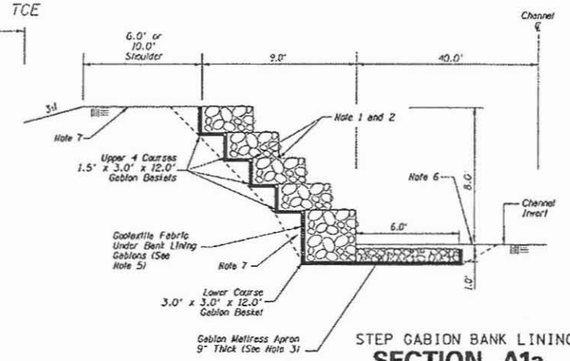



TRAPEZOIDAL CHANNEL SECTION
STEP GABION BANK LINING
Sta 25+00 to 28+60.56 Rt
Sta 25+00 to 26+55.80 Lt

RIGHT SIDE FILL CONDITION
Sta 28+20 ± to 28+60 ±

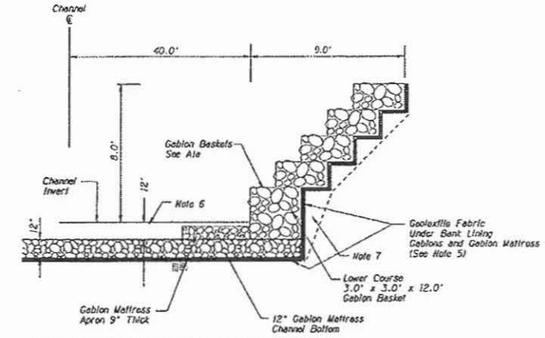
## SECTION A1

N.T.S.



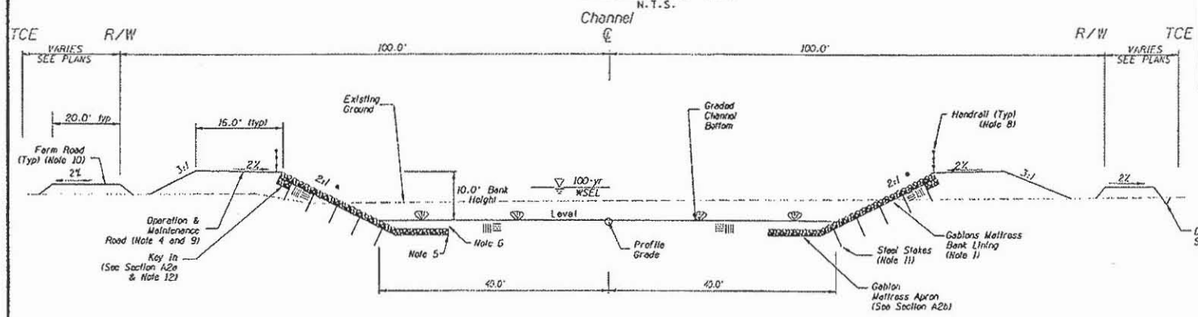

STEP GABION BANK LINING

## SECTION A1a




Sta 28+35.56 to 28+60.56 Rt.
GABION MATTRESS CHANNEL BOTTOM

## SECTION A1b

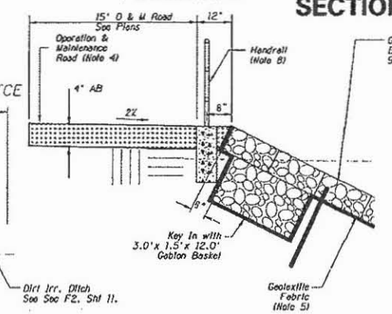



* Transition bank slope from 1.5:1 (Sta 33+28± Rt) to 2:1 (Sta 33+80 Rt), and 1.5:1 (Sta 33+35± Lt) to 2:1 (Sta 33+80 Lt)

TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 33+30± to 58+50

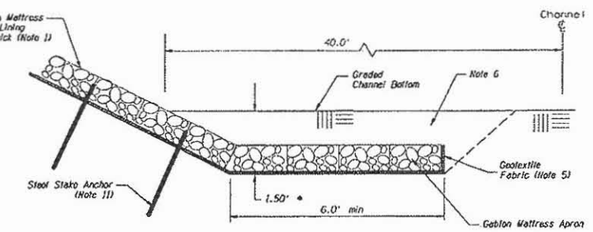
## SECTION A2

N.T.S.




FOR SECTIONS A2 & A3

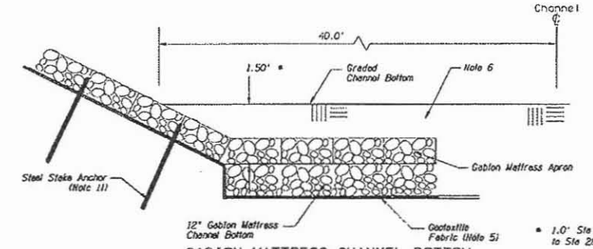
## SECTION A2a




FOR SECTIONS A2, A3, C1 & C2

## SECTION A2b

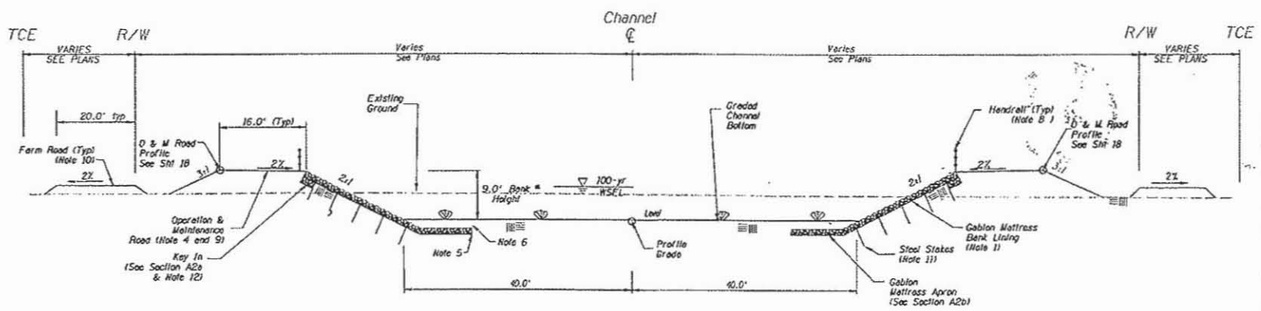
* 1.0' Sta 26+55.80 to Sta 28+60.56




* 1.0' Sta 28+35.56 to Sta 28+60.56

GABION MATTRESS CHANNEL BOTTOM
Sta 28+35 to 28+60± Lt
Sta 62+71 to 63+01
Sta 72+17 to 72+47

## SECTION A2c




* Bank Height Transitions from 10.0' to 9.0' Sta 58+50 to 59+00 See Sht 18

TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 58+50 to 72+47

## SECTION A3

N.T.S.

NOTES:

1) Connect edges of gabions to adjacent baskets/mattress.
2) Gabion baskets stacked with 50-percent overlaps filled with rounded river rock D50=6.0 inches.
3) Both edges of gabion mattress apron attached to bottom course gabion basket (Section A1e & A1b only). Apron filled with rounded river rock D50=4.5 inches, over geotextile fabric.
4) Install 4" thick AB to All operation and maintenance roads. Compact AB to 95%
5) Geotextile fabric to be installed under all gabion baskets, gabion mattress bank lining and aprons. See special provisions for burst strength, permeability, and pore opening size.
6) Overexcavate to base of apron or gabion basket. Backfill over gabion mattress apron to channel invert, compact to 85%
7) Backfill behind each course of gabion baskets and compact to 95%. Compact channel bank fill to 95%.
8) Install handrail 8" behind slope mattress gabions unless shown otherwise on plans. (See Detail 9 Sheet 51)
9) Compact ground to 95% behind slope mattress gabions. Compact berm and O&M road to 95%.
10) Construct 20' wide farm road with inside edge at R/W unless shown otherwise on plans See Detail H3, Sheet 12. Compact to 85 %
11) Steel stake anchors are 1" nominal diameter 4-foot long, galvanized steel pipe. (See Detail 5g, Sheet 53)
12) Install counterfort at junction of slope mattress gabion bank lining with concrete bank lining. (See Details 5b and 5c, Sheet 53)

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 3 | | | |
| 2 | | | |
| 1 | | | |

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ENGINEERING DIVISION

BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731

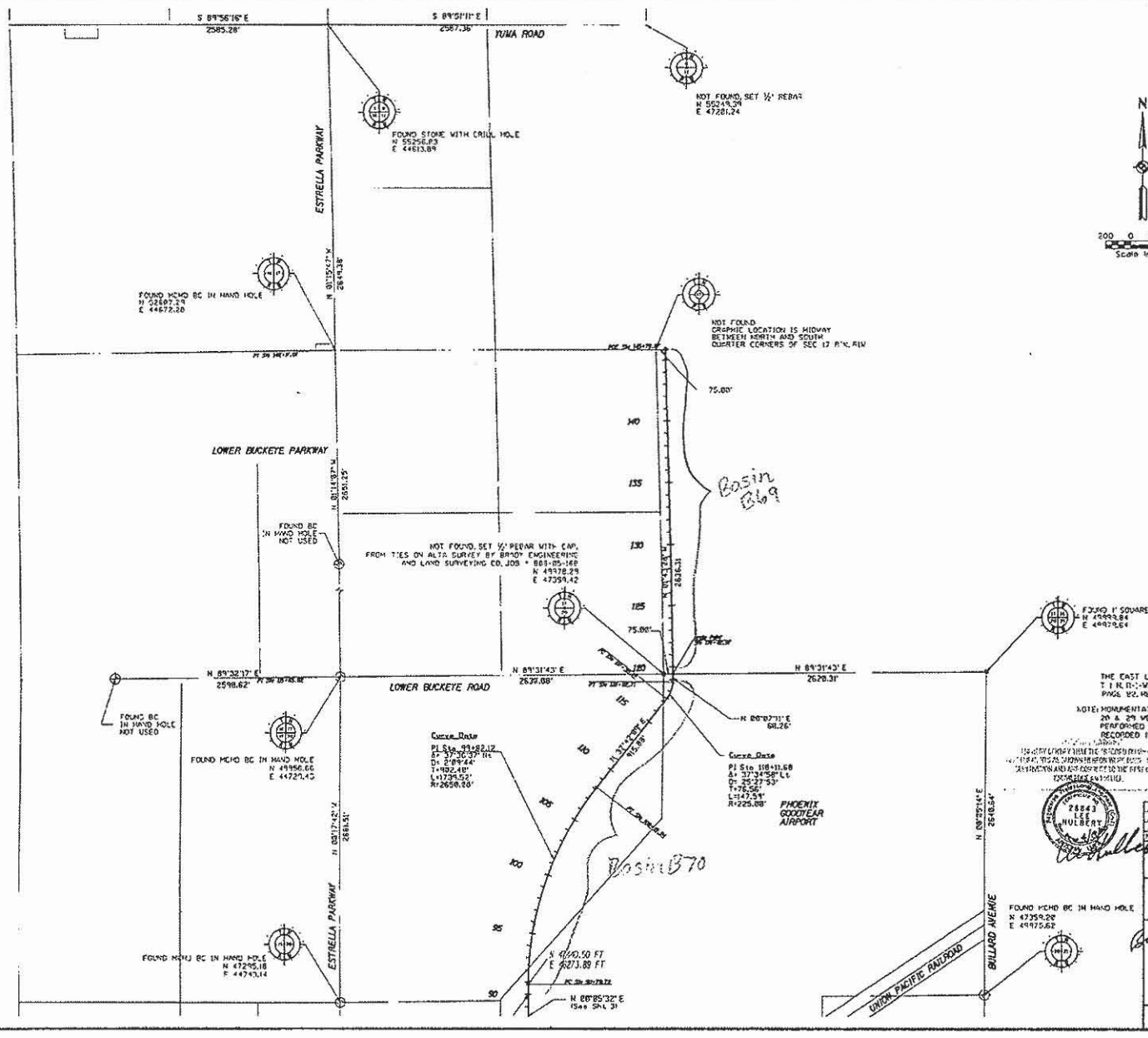
| | BY | DATE |
|---|---|---|
| DESIGNED | D. STOUGH | 8/25/98 |
| DRAWN | B. EDGAR | 9/08/98 |
| CHECKED | R. MILES/B. OLBERT | 9/08/98 |

Sverdrup
CORPORATION

CHANNEL TYPICAL SECTIONS
A1, A2, A3 (GABION BANK LINING)

SHEET 7 OF 81

B70B93 - B93
B93B94 - B94



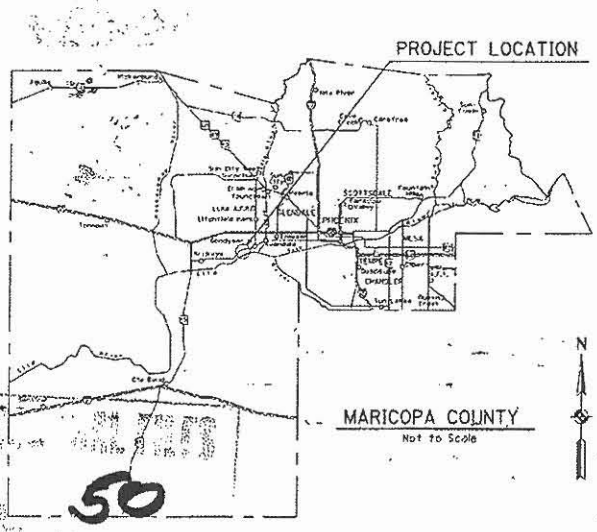

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

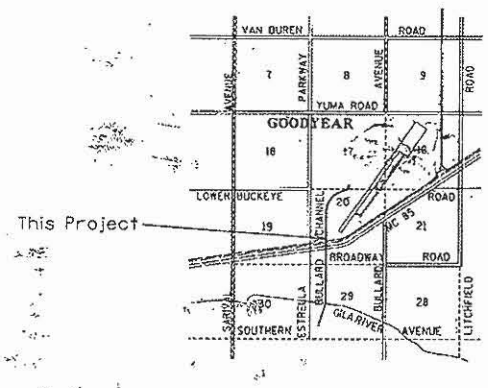
PLANS FOR THE CONSTRUCTION OF:

## BULLARD WASH CHANNEL IMPROVEMENTS PROJECT

CONTRACT NO. 98-15

PROJECT CONTROL NO. 4700731




IN COOPERATION WITH:
CITY OF GOODYEAR

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

CHIEF ENGINEER & GENERAL MANAGER — DATE

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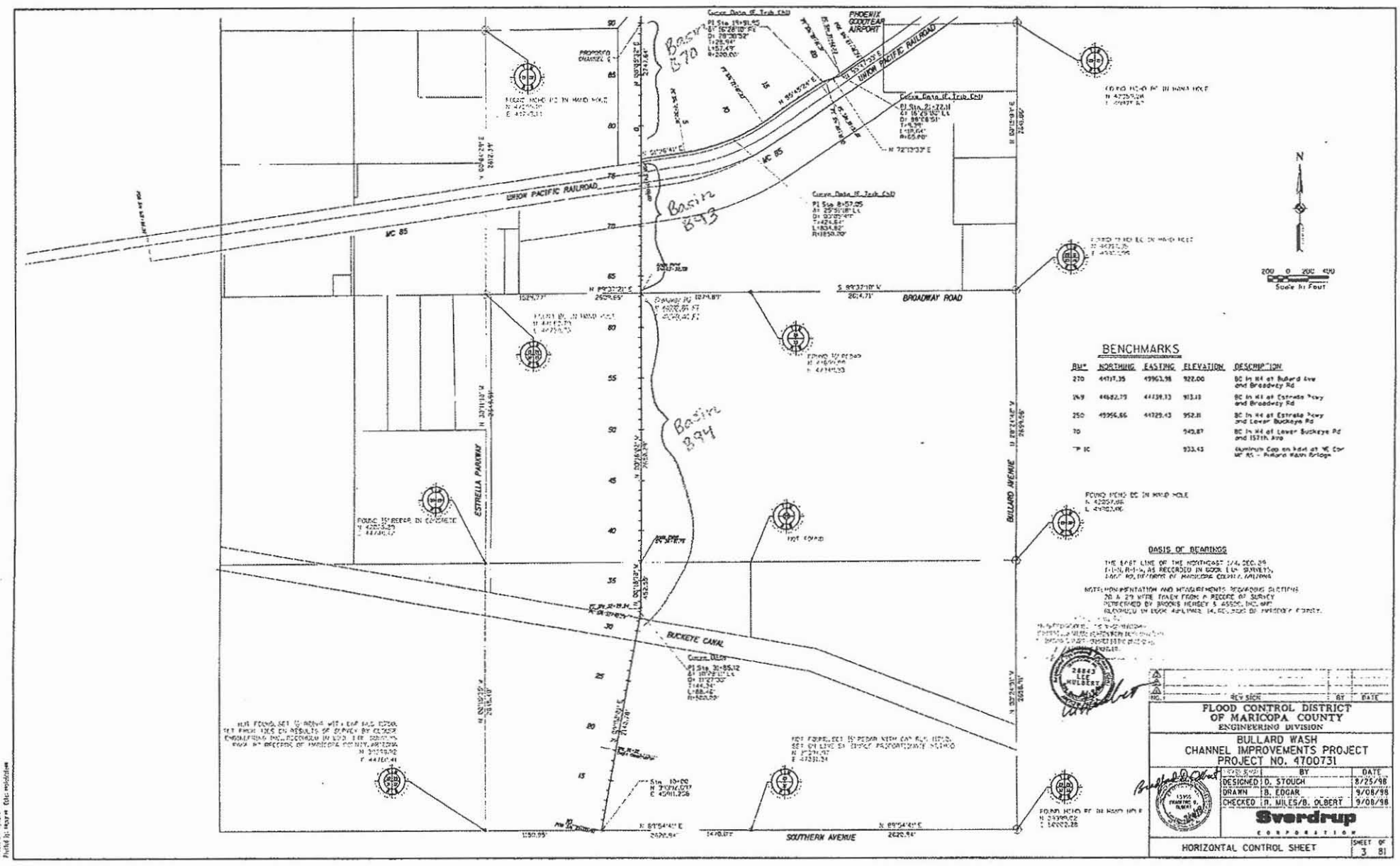
PHOENIX GOODYEAR AIRPORT
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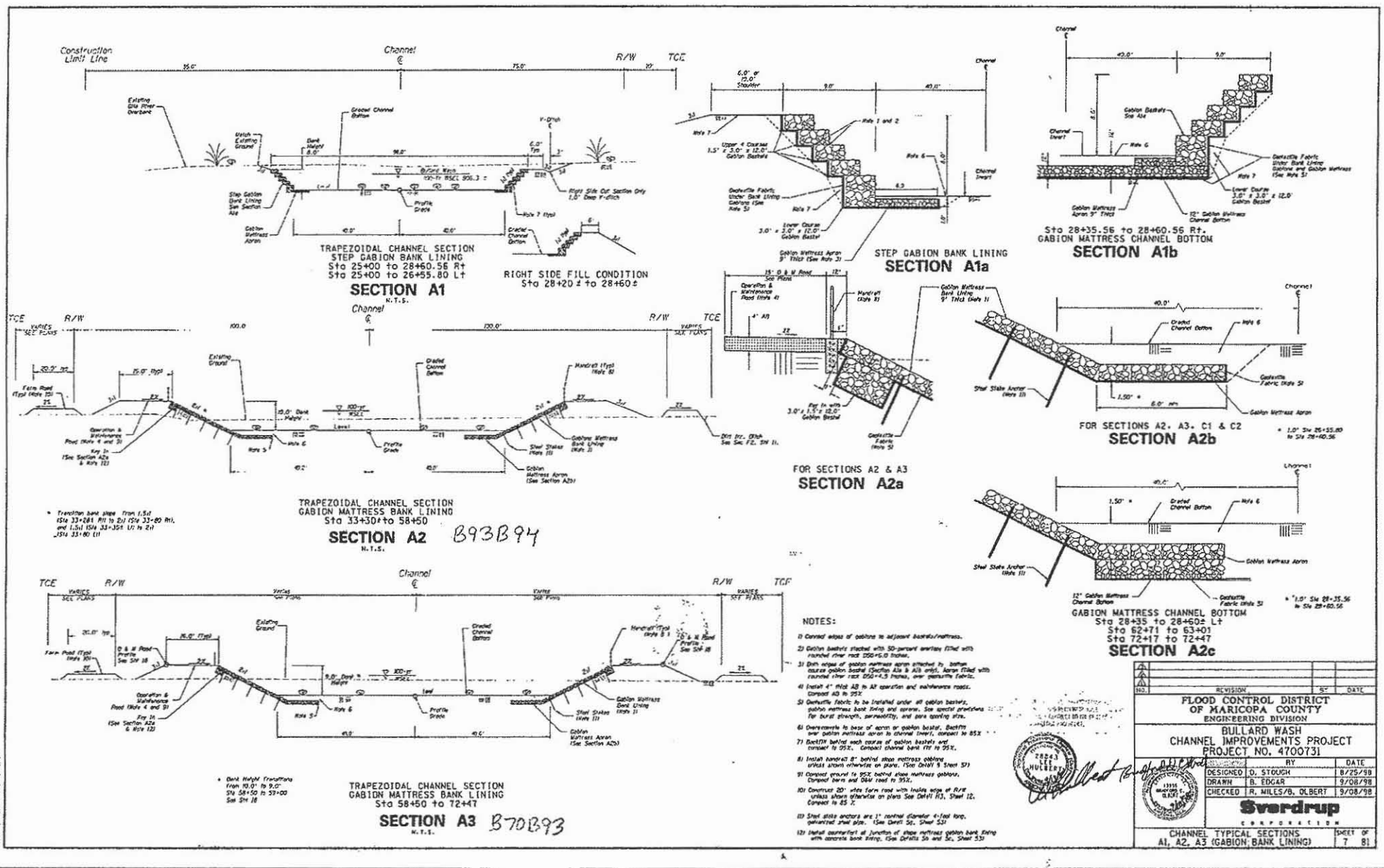
HORIZONTAL CONTROL SHEET
SHEET OF 3 81


Construction Limit Line
Channel ℄
R/W
TCE
TRAPEZOIDAL CHANNEL SECTION
STEP GABION BANK LINING
Sta 25+00 to 28+60.56 Rt
Sta 25+00 to 26+55.80 Lt
SECTION A1
N.T.S.
RIGHT SIDE FILL CONDITION
Sta 28+20± to 28+60±
STEP GABION BANK LINING
SECTION A1a
Sta 28+35.56 to 28+60.56 Rt.
GABION MATTRESS CHANNEL BOTTOM
SECTION A1b
TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 33+30± to 58+50
SECTION A2
B93B94
FOR SECTIONS A2 & A3
SECTION A2a
FOR SECTIONS A2, A3, C1 & C2
SECTION A2b
GABION MATTRESS CHANNEL BOTTOM
Sta 28+35 to 28+60± Lt
Sta 62+71 to 63+01
Sta 72+17 to 72+47
SECTION A2c
TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 58+50 to 72+47
SECTION A3
B70B93
NOTES:
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION
BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731
DESIGNED D. STOUCH 8/25/98
DRAWN B. EDGAR 9/08/98
CHECKED R. MILES/B. OLBERT 9/08/98
Sverdrup
CORPORATION
CHANNEL TYPICAL SECTIONS
A1, A2, A3 (GABION BANK LINING)
SHEET OF 7 81

B94

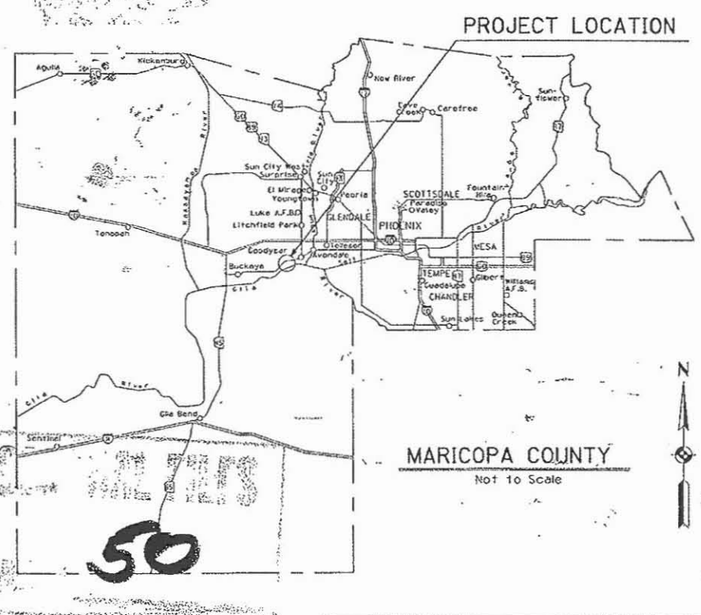
# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

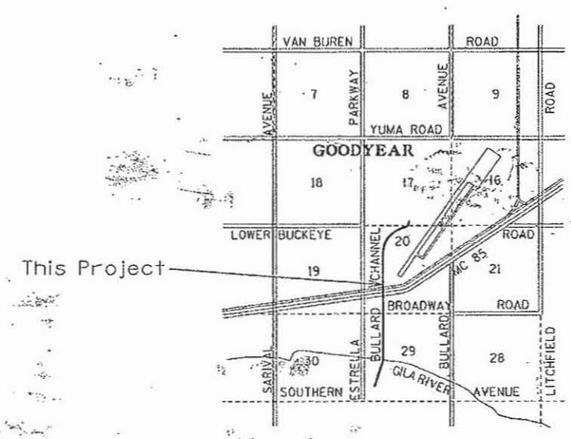
PLANS FOR THE CONSTRUCTION OF:

# BULLARD WASH CHANNEL IMPROVEMENTS PROJECT

CONTRACT NO. 98-15

PROJECT CONTROL NO. 4700731




VICINITY MAP

Not to Scale

CITY OF GOODYEAR — DATE

for BUCKEYE IRRIGATION DISTRICT — 9/10/98 DATE

IN COOPERATION WITH:

CITY OF GOODYEAR

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

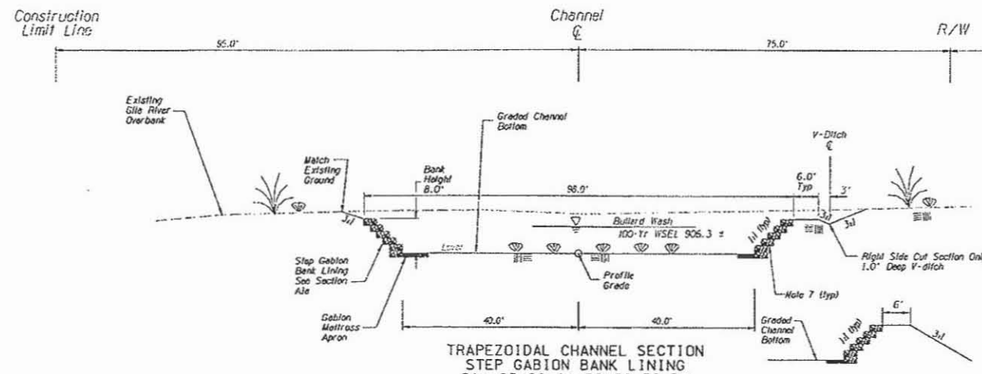
FOR CHIEF ENGINEER & GENERAL MANAGER — DATE

COUNTY BOARD OF SUPERVISORS

JAN BREWER - CHAIRMAN

DISTRICT 1 FULTON BROCK
DISTRICT 2 DON STAPLEY
DISTRICT 3 ANDY KUNASEK
DISTRICT 4 JAN BREWER
DISTRICT 5 MARY ROSE WILCOX

Bullard Wash Channel
Improvement Project
AS BUILTS FCD 98-15
50 470
DSR

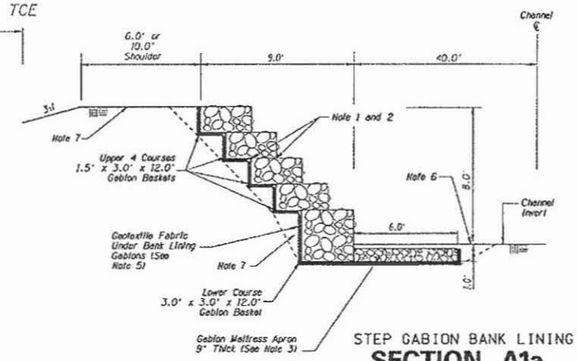



TRAPEZOIDAL CHANNEL SECTION
STEP GABION BANK LINING
Sta 25+00 to 28+60.56 Rt
Sta 25+00 to 26+55.80 Lt

**SECTION A1**

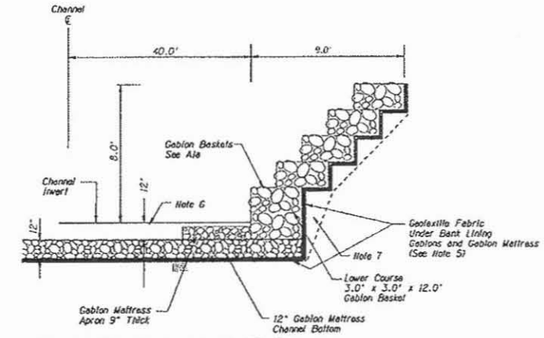
N.T.S.

RIGHT SIDE FILL CONDITION
Sta 28+20 ± to 28+60±



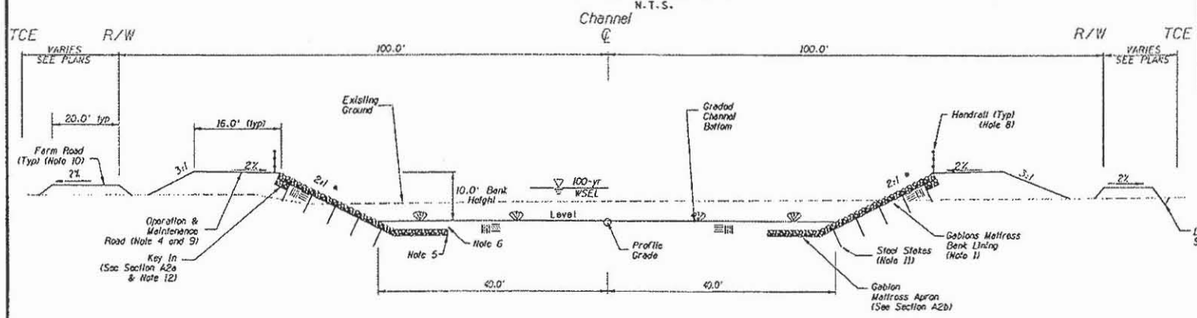

STEP GABION BANK LINING

**SECTION A1a**




Sta 28+35.56 to 28+60.56 Rt.
GABION MATTRESS CHANNEL BOTTOM

**SECTION A1b**

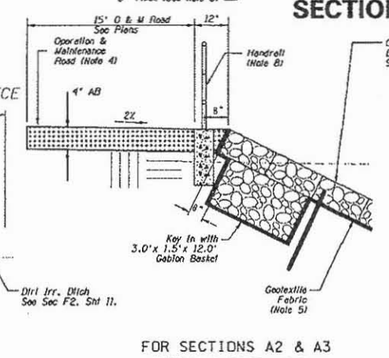



* Transition bank slope from 1.5:1 (Sta 33+28± Rt) to 2:1 (Sta 33+80 Rt), and 1.5:1 (Sta 33+35± Lt) to 2:1 (Sta 33+80 Lt)

TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 33+30±to 58+50

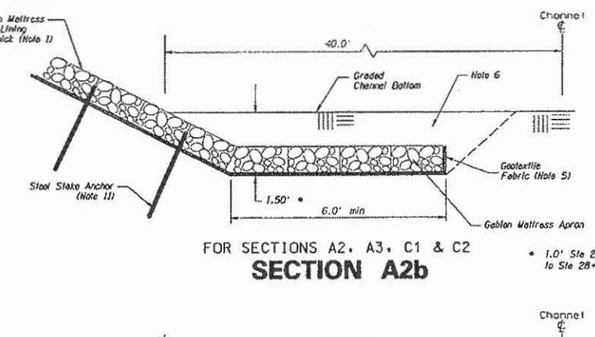
**SECTION A2**

N.T.S.




FOR SECTIONS A2 & A3

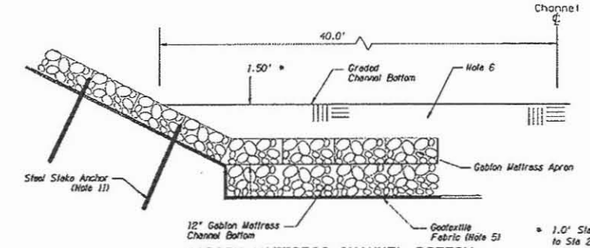
**SECTION A2a**




FOR SECTIONS A2, A3, C1 & C2

**SECTION A2b**

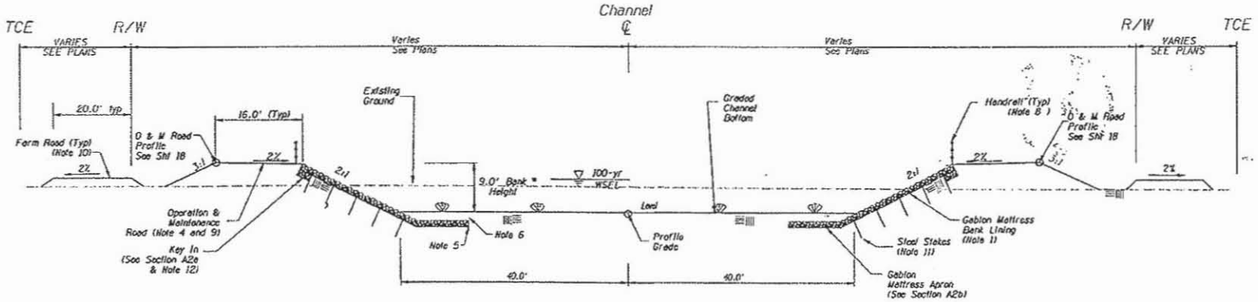
* 1.0' Sta 26+55.80 to Sta 28+60.56




* 1.0' Sta 28+35.56 to Sta 28+60.56

GABION MATTRESS CHANNEL BOTTOM
Sta 28+35 to 28+60± Lt
Sta 62+71 to 63+01
Sta 72+17 to 72+47

**SECTION A2c**




* Bank Height Transitions from 10.0' to 9.0' Sta 58+50 to 59+00 See Sht 18

TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 58+50 to 72+47

**SECTION A3**

N.T.S.

NOTES:

1) Connect edges of gabions to adjacent baskets/mattress.
2) Gabion baskets stacked with 50-percent overlap; filled with rounded river rock D50=6.0 inches.
3) Both edges of gabion mattress apron attached to bottom course gabion basket (Section A1a & A1b only). Apron filled with rounded river rock D50=4.5 inches, over geotextile fabric.
4) Install 4" thick AB to All operation and maintenance roads. Compact AB to 95%
5) Geotextile fabric to be installed under all gabion baskets, gabion mattress bank lining and aprons. See special provisions for burst strength, permeability, and pore opening size.
6) Overexcavate to base of apron or gabion basket. Backfill over gabion mattress apron to channel invert, compact to 85%
7) Backfill behind each course of gabion baskets and compact to 95%. Compact channel bank fill to 95%.
8) Install handrail 8" behind slope mattress gabions unless shown otherwise on plans. (See Detail 9 Sheet 57)
9) Compact ground to 95% behind slope mattress gabions. Compact berm and O&M road to 95%.
10) Construct 20' wide farm road with inside edge at R/W unless shown otherwise on plans See Detail H3, Sheet 12. Compact to 85 %
11) Steel stake anchors are 1" nominal diameter 4-foot long, galvanized steel pipe. (See Detail 5g, Sheet 53)
12) Install counterfort at junction of slope mattress gabion bank lining with concrete bank lining. (See Details 5b and 5c, Sheet 53)

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ENGINEERING DIVISION

BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731

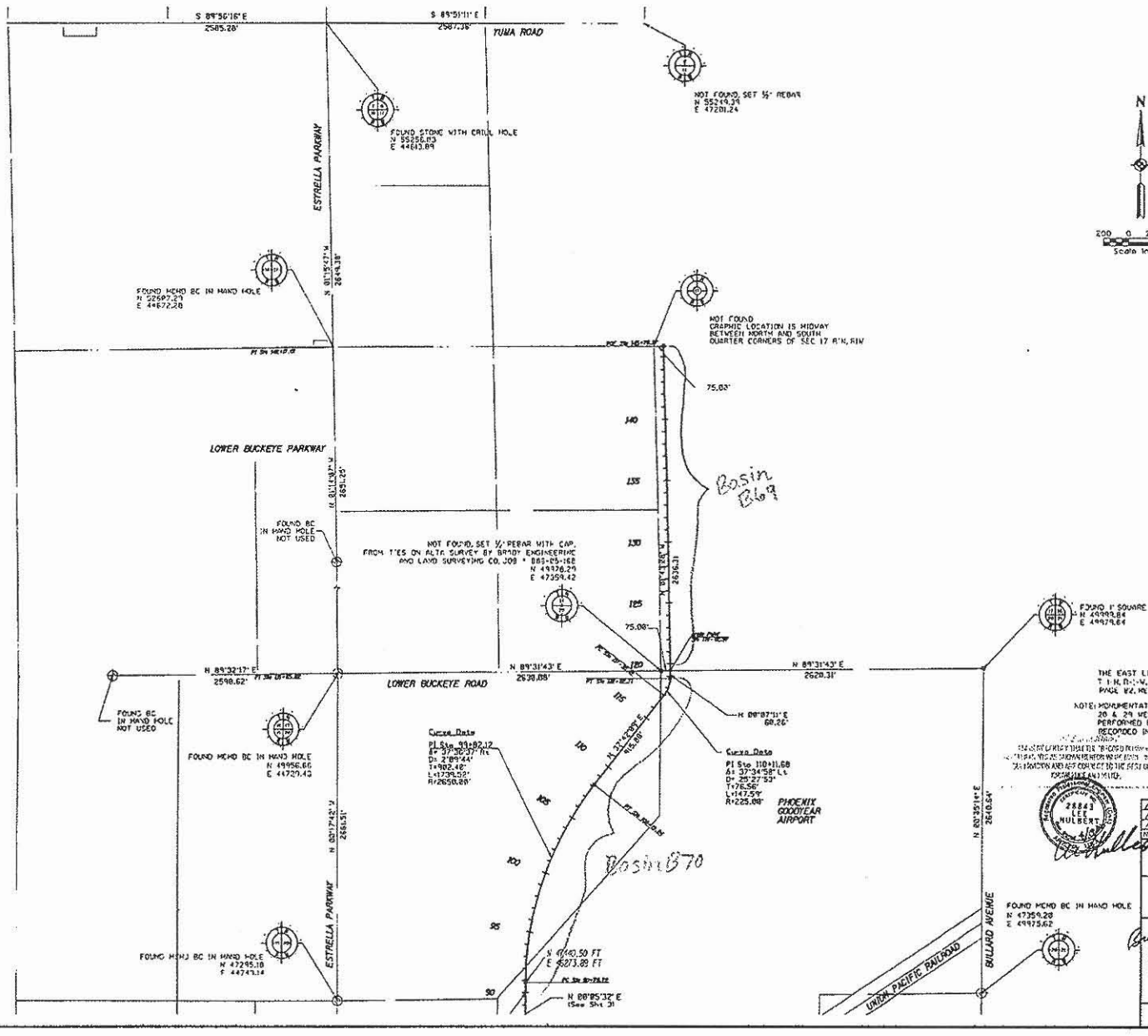
| | BY | DATE |
|---|---|---|
| DESIGNED | D. STOUCH | 8/25/98 |
| DRAWN | B. EDGAR | 9/08/98 |
| CHECKED | R. MILES/B. OLBERT | 9/08/98 |

Sverdrup
CORPORATION

CHANNEL TYPICAL SECTIONS
A1, A2, A3 (GABION BANK LINING)

SHEET 7 OF 81

B10B93 - B93
B93B91 - B94



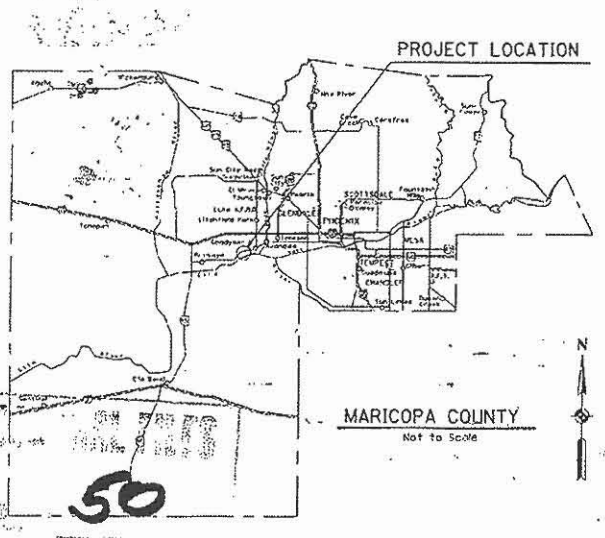

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

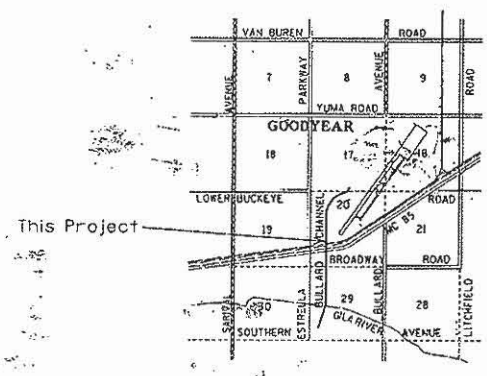
PLANS FOR THE CONSTRUCTION OF:

## BULLARD WASH CHANNEL IMPROVEMENTS PROJECT

CONTRACT NO. 98-15

PROJECT CONTROL NO. 4700731




IN COOPERATION WITH:
CITY OF GOODYEAR

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

CHIEF ENGINEER & GENERAL MANAGER — DATE

COUNTY BOARD OF SUPERVISORS

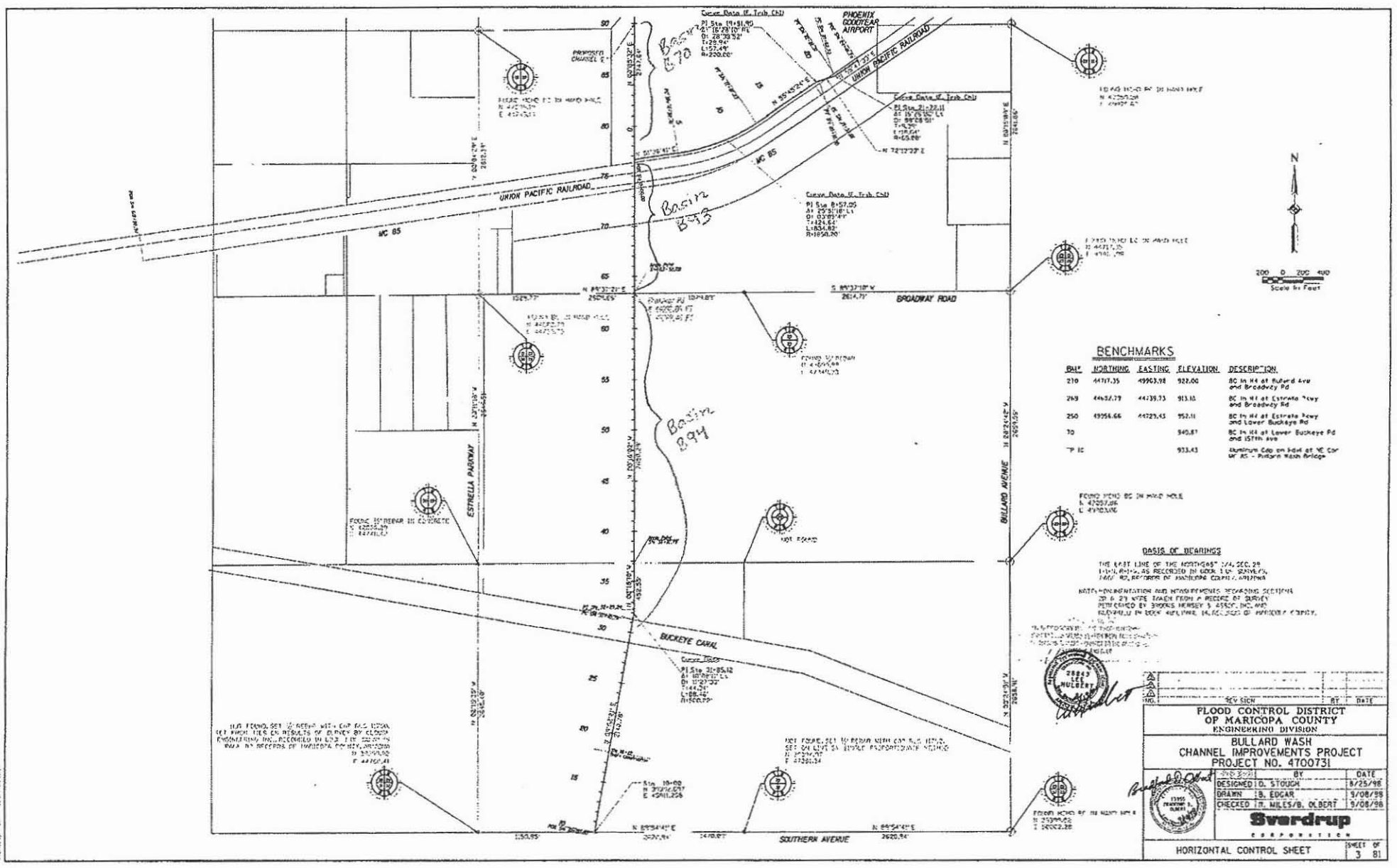
JAN BREWER - CHAIRMAN

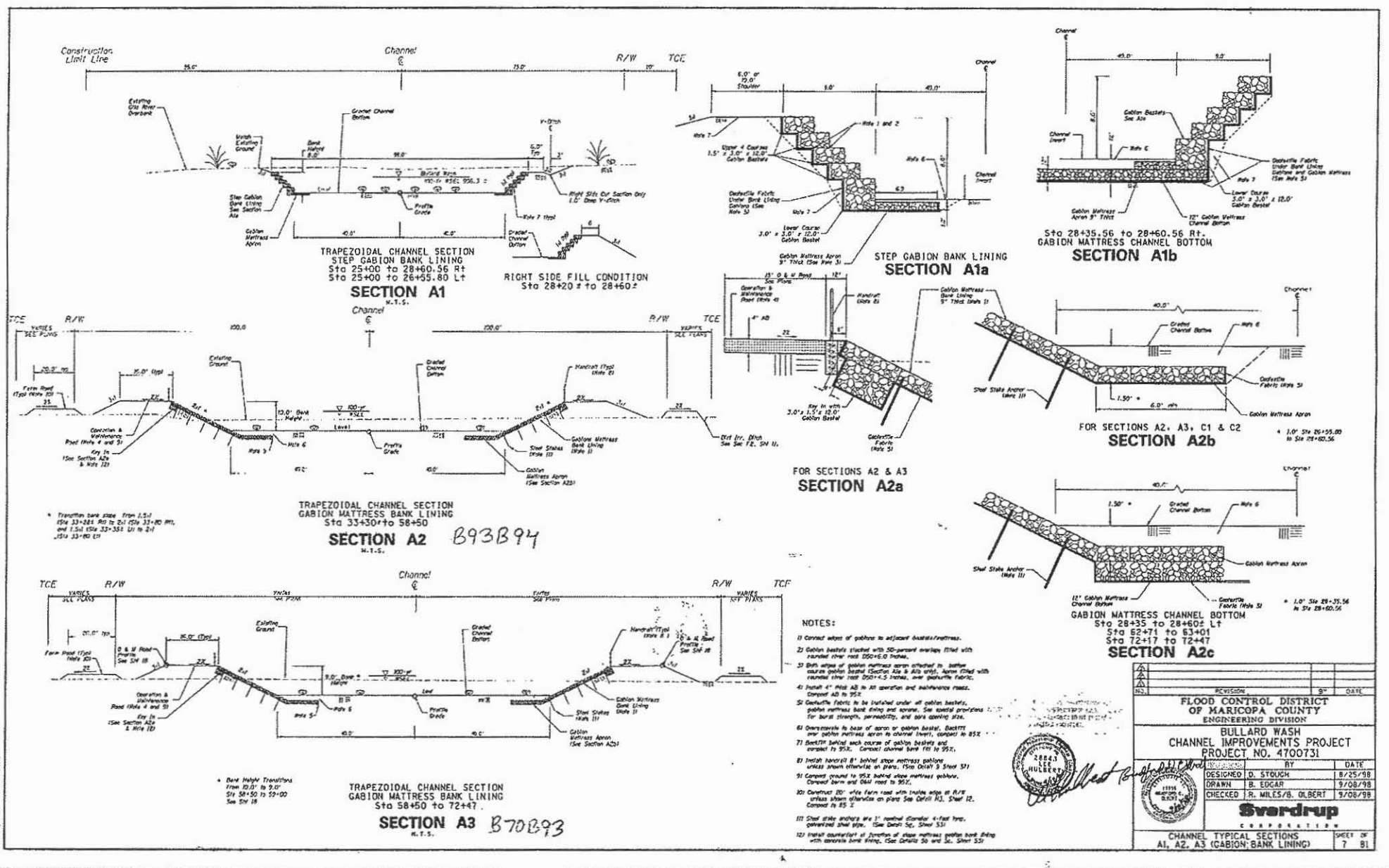
DISTRICT 1 FULTON BROCK
DISTRICT 2 DON STAPLEY
DISTRICT 3 ANDY KUNASEK
DISTRICT 4 JAN BREWER
DISTRICT 5 MARY ROSE WILCOX

CITY OF GOODYEAR — DATE

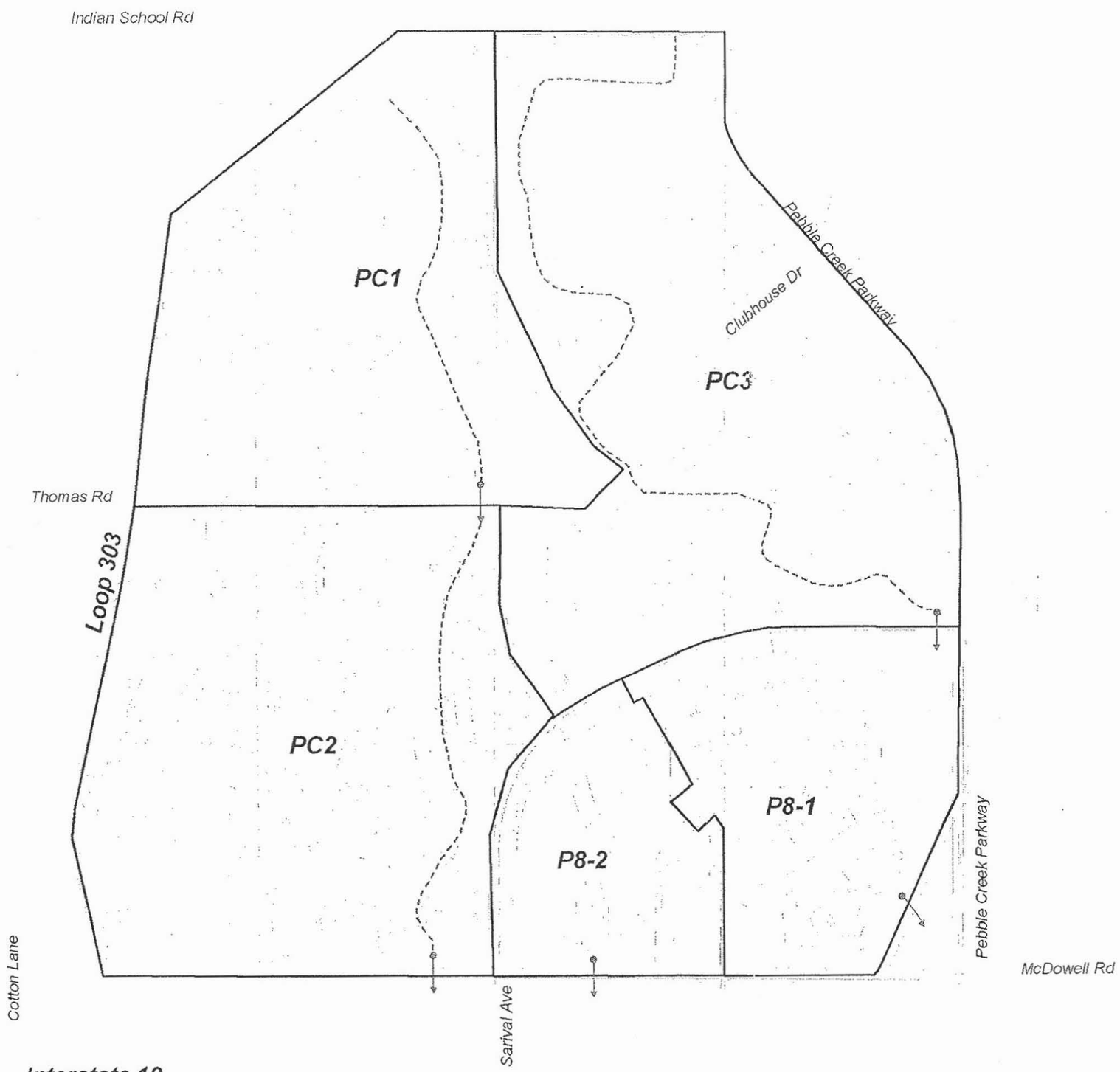
BUCKEYE IRRIGATION DISTRICT — DATE 7/6/98

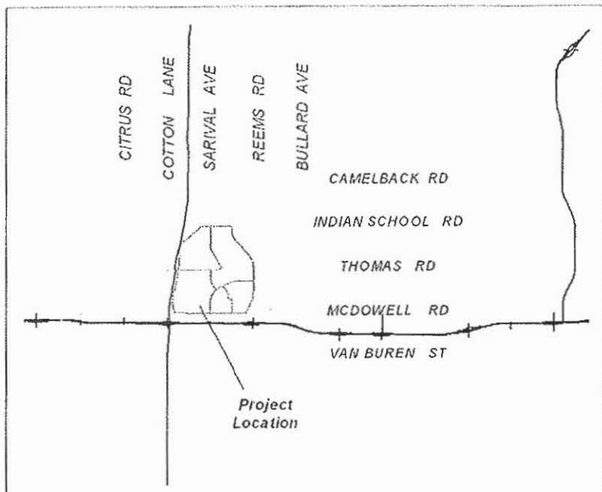
Bullard Wash Channel Improvement Project
AS BUILTS — FCD 98-15
50 — 470
DJR


PHOENIX GOODYEAR AIRPORT
UNION PACIFIC RAILROAD
MC 85
BROADWAY ROAD
ESTRELLA PARKWAY
BULLARD AVENUE
BUCKEYE CANAL
SOUTHERN AVENUE
Basin B70
Basin B93
Basin B94
N
Scale In Feet
BENCHMARKS
BASIS OF BEARINGS
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION
BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731
DESIGNED D. STOUGH 8/25/98
DRAWN B. EDGAR 9/08/98
CHECKED R. MILES/B. OLBERT 9/08/98
Sverdrup
CORPORATION
HORIZONTAL CONTROL SHEET
SHEET 3 OF 81


Construction Limit Line
Channel ℄
R/W
TCE
TRAPEZOIDAL CHANNEL SECTION
STEP GABION BANK LINING
Sta 25+00 to 28+60.56 Rt
Sta 25+00 to 26+55.80 Lt
SECTION A1
RIGHT SIDE FILL CONDITION
Sta 28+20 ± to 28+60±
STEP GABION BANK LINING
SECTION A1a
Sta 28+35.56 to 28+60.56 Rt.
GABION MATTRESS CHANNEL BOTTOM
SECTION A1b
TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 33+30±to 58+50
SECTION A2
B93B94
FOR SECTIONS A2 & A3
SECTION A2a
FOR SECTIONS A2, A3, C1 & C2
SECTION A2b
GABION MATTRESS CHANNEL BOTTOM
Sta 28+35 to 28+60± Lt
Sta 62+71 to 63+01
Sta 72+17 to 72+47
SECTION A2c
TRAPEZOIDAL CHANNEL SECTION
GABION MATTRESS BANK LINING
Sta 58+50 to 72+47
SECTION A3
B70B93
NOTES:
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION
BULLARD WASH
CHANNEL IMPROVEMENTS PROJECT
PROJECT NO. 4700731
DESIGNED D. STOUGH 8/25/98
DRAWN B. EDGAR 9/08/98
CHECKED R. MILES/B. OLBERT 9/08/98
Sverdrup
CORPORATION
CHANNEL TYPICAL SECTIONS
A1, A2, A3 (GABION BANK LINING)
SHEET 7 OF 81

B95




## Palm Valley Phase 8

**Exhibit 1**
**Onsite Drainage Area Map**

PC1 Basin ID
Basin Boundary
Flow Path
Concentration Point

Del Rio Eng

N

1" = 600'

600 0 600 1200 Feet

B96

```
ID Palm Valley Phase 8 LOMR HEC-1 model
IDPrepared by: Del Rio Engineering
ID              10-3-06
ID       File Name: pv_p8_LOMR.dat
ID
*DIAGRAM
IT     5                    2000
KK   PC1   BASIN
BA 0.679
IN    15
PB 4.010
PC 0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
PC 0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
PC 0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
PC 0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
PC 0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
PC 0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
PC 0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
PC 0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
PC 0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
PC 0.983   0.986   0.989   0.992   0.995   0.998   1.000
LG  0.21    0.28    4.80    0.32      25
UI    65     125     272     355     439     564     809     666     526     421
UI   334     232     127     109      67      49      20      20      20      20
UI     0       0       0       0       0       0       0       0       0       0
UI     0       0       0       0       0       0       0       0       0       0
*
KK   PC2   BASIN
BA   .85
LG   .23     .25    3.85     .58   25.00
UI   73.    108.    279.    372.    445.    542.    732.    911.    719.    593.
UI  482.    391.    302.    174.    126.    104.     73.     45.     23.     23.
UI   23.     23.     23.      0.      0.      0.      0.      0.      0.      0.
UI    0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
*
KKCP_pc2
KM COMBINE ALL FLOWS At McDowell Road Retentin basin
HC     2
*
KK DOpc
KM  DIVERT OUT ALL 100 -6 Volume (154.0ac-ft)RETENTION EXCEPT LAST 60.0 AC-FT

KM  THIS IS REMAINING VOLUME TO BE RETAINED IN McDowell Rd.  BASINS

DTOUT   94.0
DI     0    2000
DQ    0    2000
*
KKRSPC2
KM       DETENTION BASIN ROUTING OPPERATION
KM      A LOW FLOW PIPE DRAINS BASIN TO THE SOUTH.

RS     1   STOR
SV     0    15.4    58.5    67.0
SE  1001    1003    1009    1010
SQ    10   10.0    55.0    1000
*
KK   PC3   BASIN
BA 0.948
LG  0.23    0.25    4.60    0.43      22
UI    35      35      35      35     101     125     146     168     183     195
UI   213     229     253     276     305     363     431     457     397     355
UI   321     296     278     252     228     212     192     173     163     136
```

→ B97 Retention

SR B97

```
UI   105      86      62      62      58      58      46      35      35      35
UI    27      11      11      11      10      11      11      11      10      11
UI    11       0       0       0       0       0       0       0       0       0
UI     0       0       0       0       0       0       0       0       0       0
*
KK DOpc3 → RB61   (B61 Retention)
KM  DIVERT OUT ALL 100 -6 Volume (68.2ac-ft)RETENTION EXCEPT LAST 17.0 AC-FT

KM  THIS IS REMAINING VOLUME TO BE RETAINED IN RID CANAL BASIN.  BASINS

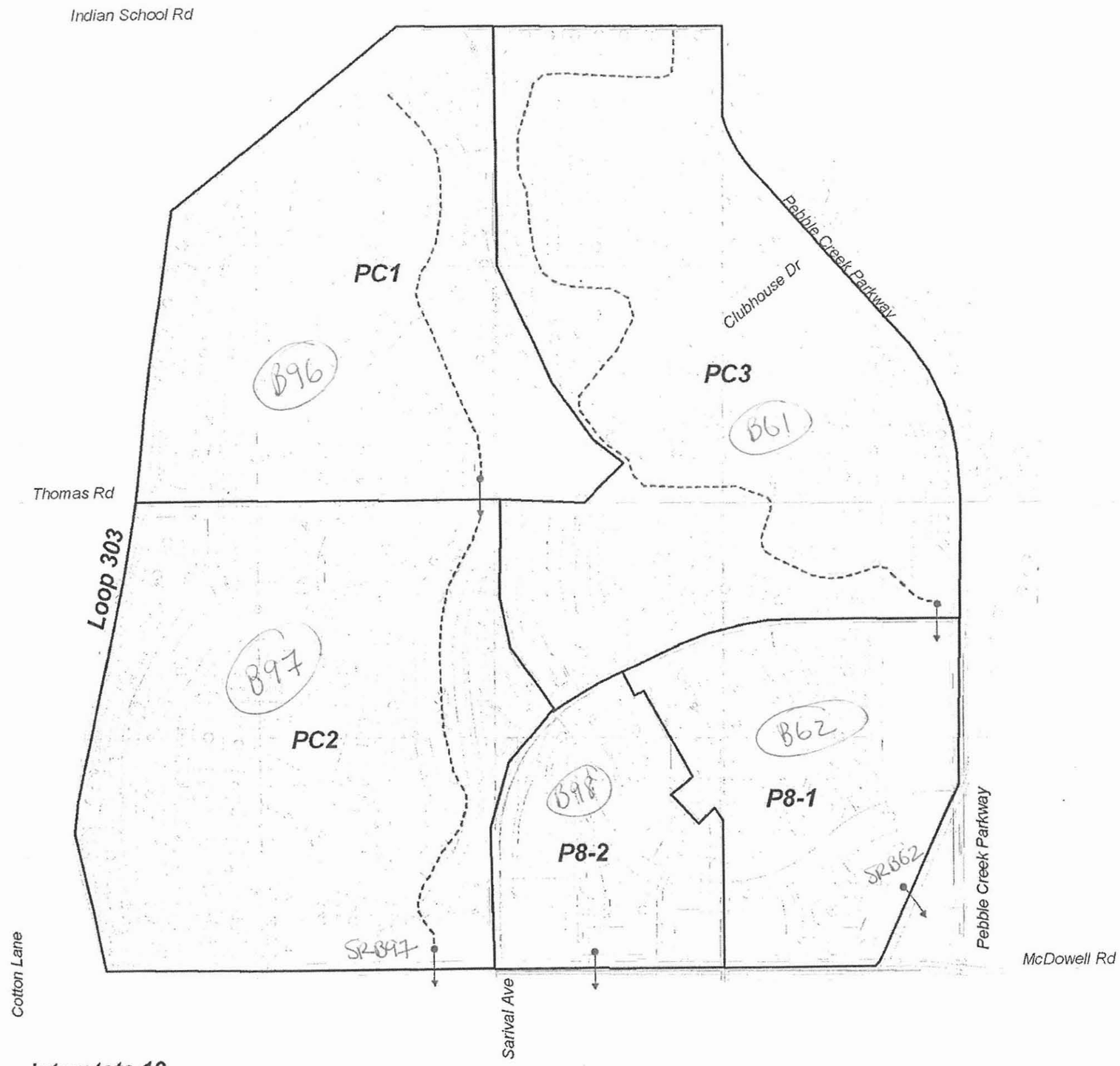
DTOUT   68.2
DI     0    2000
DQ    0    2000
*
KK   P81   BASIN
BA 0.380
LG  0.21    0.27    4.80    0.33      26
UI    43     108     202     260     345     513     421     330     250     183
UI    96      71      44      26      13      13      13       0       0       0
UI     0       0       0       0       0       0       0       0       0       0
*
KKCP8-1
KM COMBINE ALL FLOWS At RID canal Retentin basin
HC     2
*
KKRS_1
KM      DETENTION BASIN ROUTING OPPERATION RID CANAL Basin

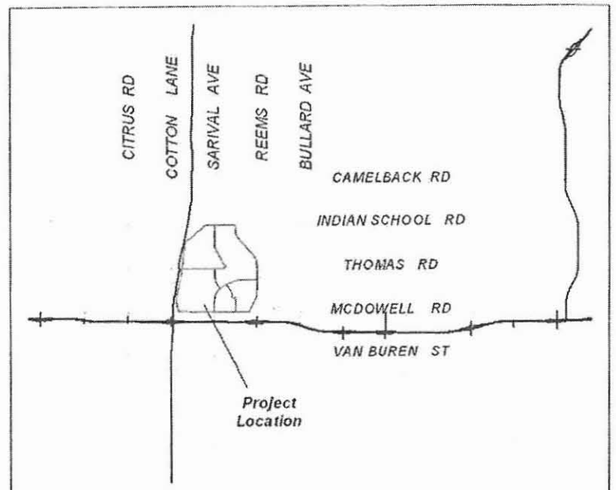
KO     2
RS     1   STOR
SV     0    20.9    67.1    70
SE  1003    1006    1011    1012
SQ    0.0   0.0     0.0    1000
*
KK   P82   BASIN
BA 0.240
LG  0.23    0.25    4.70    0.37      37
UI    31     100     164     216     344     324     238     175     116      54
UI    40      23       9      10      10       0       0       0       0       0
UI     0       0       0       0       0       0       0       0       0       0

*
KK DOp82
KM  DIVERT OUT ALL 100 -6 Volume (26.1ac-ft)RETENTION
KM  THIS IS REMAINING DRAINS INTO MCDOWELL rOAD
DTOUT   26.1
DI     0    2000
DQ    0    2000
ZZ
```

SRB62

B98 retention




## Palm Valley Phase 8

**Exhibit 1**
**Onsite Drainage Area Map**

PC1 Basin ID
Basin Boundary
Flow Path
Concentration Point

Del Rio Eng

N

1" = 600'

600 0 600 1200 Feet

B97

```
1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              JUN   1998           *
 *            VERSION 4.1            *
 *                                   *
 *  RUN DATE   07MAY09  TIME  08:05:50  *
 *                                   *
 *     *********************************
```

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

```
X     X  XXXXXXX   XXXXX          X
X     X  X       X     X         XX
X     X  X       X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X       X               X
X     X  X       X     X         X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL  LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
1                                          HEC-1 INPUT                                          PAGE  1

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

    1           ID         LOOP 303 OFF-SITE HYDROLOGY
    2           ID         MODIFIED BASED ON FCDMC'S WHITE TANKS/LOOP 303 CORRIDOR ADMP
    3           ID         THE MODIFICATIONS ARE DESCRIBED AS FOLLOWS:
    4           ID         1. THE CACTUS RD BASIN WAS REMOVED AND TWO RELATIVELY SMALL BASINS
    5           ID            LOCATED AT NORTH OF WADDELL ROAD AND NORTH OF OLIVE AVENUE WERE
    6           ID            ADDED TO THE MODEL BASED ON CMX'S HEC-1 MODEL PROVIDED IN DEC,2006.
    7           ID         2. FLOW DIVERSION TO THE OFF-LINE BASINS, SUCH AS WADDELL ROAD
    8           ID            BASIN, OLIVE AVENUE BASIN, NORTHERN AVENUE BASIN WERE ESTIMATED
    9           ID            USING HEC-RAS LATERAL WEIR ROUTINE.
   10           ID         3. DETENTION BASIN ELEVATION AND VOLUME RELATIONSHIPS WERE ESTIMATED
   11           ID            BASED ON 30% DESIGN OF THE BASIN.
   12           ID         4. ELEVATION AND OUTFLOW RELATIONSHIP WERE ESTIMATED BASED ON 30% DESIG
   13           ID            USING CULVERTMASTER. THE OUTFLOW INCLUDES FLOW FROM BLEED-OFF PIPE
   14           ID            AND FLOW FROM OUTFLOW PIPE.
   15           ID         5. CHANNEL ROUTING WERE MODIFIED BASED ON 30% DESIGN.
   16           ID         6. FLOW FROM THE PROPOSED FCDMC CHANNEL ALONG NORTHEN AVENUE  WILL
   17           ID            NOT BE COMBINED WITH FLOW FROM LOOP 303 OFF-SITE CHANNEL.
   18           ID            INSTEAD THE FLOW FROM THE CHANNEL ALONG NORTHERN AVENUE WILL GO
   19           ID            TO THE NORTHERN AVENUE BASIN DIRECTLY.  SO THE FLOW FROM THE
   20           ID            NORTHERN AVENUE CHANNEL WILL BE COMBINED WITH THE DIVERTED FLOW
   21           ID            FROM LOOP 303 CHANNEL AT NORTHERN AVENUE BASIN.
   22           ID         7. IN THE ADMP MODEL, SOME OF THE OUTFLOW FROM CAMELBACK ROAD BASINS
   23           ID            WERE DIVERTED TO EAST ALONG CAMELBACK ROAD (THE PEAK FLOW IS
   24           ID            180 CFS).  NO STRUCTURE WAS RECOMMENDED IN THE ADMP UPDATE. PB
   25           ID            DESIGNED 3-30" PIPES TO DIVERT SOME FLOW TO THE EXISTING CAMELBACK
   26           ID            ROAD CHANNEL LOCATED AT SOUTH SIDE OF CAMELBACK ROAD.
   27           ID         9. PEBBLE CREEK AND PALM VALLEY 8 DEVELOPMENTS WERE INCLUDED IN THE
   28           ID            MODEL BASED ON HEC-1 MODEL PROVIDED BY DEL RIO ENGINEERING.
   29           ID        10. MCDOWELL ROAD DETENTION BASIN WERE DIVIDED INTO TWO DETENTION BASINS
   30           ID            ONE IS CALLED MCDOWELL ROAD UPPER BASIN AND THE OTHER ONE IS CALLED
   31           ID            MCDOWELL ROAD LOWER BASIN
   32           ID        11  PROPOSED I-10/303L TI (ULTIMATED CONDITION) ON-SITE DRAINAGE SYSTEM
   33           ID            WAS REFLECTED IN THE MODEL.  THERE ARE TOTAL 11 ON-SITE BASINS.
   34           ID
   35           ID         EXISTING CONDITION WITH PROJECTS IN PLACE SCENARIO
   36           ID         REVISED BY PARSONS BRINCKERHOFF    DATE: Aug 2008
   37           ID                                            FILE NAME: EX_SPLT.DAT
   38           ID         ******************************************************************
   39           ID         DRAFT PREFERRED ALTERNATIVE LEVEL III
   40           ID
   41           ID         INCORPORATE ALTERNATIVE #3 FROM CHANGE ORDER #14 INTO
   42           ID         SR 303L OFFSITE FLOOD CONTROL FACILITY - NORTHERN AND CACTUS
   43           ID         BASINS ARE NOW OFFLINE WITH MULTIPLE BASINS LOCATED WITHIN
   44           ID         LUKE AIR FORCE BASE CRASH ZONE AREA
   45           ID
   46           ID         **ADOT BASIN GEOMETRY REPRESENTS MOST RECENT 2' CONTOURS**
   47           ID         WHITE TANKS AREA DRAINAGE MASTER STUDY "UPDATE"
   48           ID         Original MODEL BY THE WLB Group for FCDMC AS PART OF THE WHITE
   49           ID         TANKS/AGUA FRIA ADMS, Date: October 1991
   50           ID
   51           ID         REVISED HYDROLOGY HEC-1 RUN FOR WHITE TANKS ADMS
   52           ID         100-YEAR, 24-HOUR STORM                  original file: WTADMS.24
   53           ID
   54           ID                                   REVISED BY URS     DATE: 01-14-04
   55           ID                                                      FILE: L33PE4H.DAT
1                                          HEC-1 INPUT                                          PAGE  2

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   56           ID
   57           ID        NOTES:
   58           ID        1. THIS HEC-1 MODEL CONTAINS THE FOLLOWING SUPER BASINS: WHITE TANKS 3,
   59           ID           2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2 & 3, 4 THRU 26.
   60           ID        2. REVISED TO REFLECT UPDATED SOILS MAPS AND NEW DEVELOPMENT.
```

```
                 * DT DI280
                 * DI     0    8539
                 * DQ     0     646
                 * KK  R281
                 * KM       ROUTE FLOW FROM CP281 TO CP282
                 * RS     5       -1
                 * RC  .075    .075    .075    1450   .0041
                 * RX  1000    1001    1002    1040    1720    1868    1869    1870
                 * RY  1050    1003    1003    1002    1002    1003    1003    1050
                 * ******************************************************************************
                 *  PB Modification:
                 *  Add new basin 265B which is portion of original sub-basin 265A and not modele
                 *  in Palm Valley 8 LOMR  HEC-1 model.
                 * ******************************************************************************
1                                          HEC-1 INPUT                                          PAGE178

      LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

      6449       KK    265B
      6450       KM   BASIN 265B
      6451       KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
      6452       KM    L=      .3  Lca=      .1   S=   27.1  Kn= .035  LAG=   6.4
      6453       KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
      6454       BA     .08
      6455       LG     .47     .03    4.70     .48     .00
      6456       UI    166.    338.     67.      0.      0.      0.      0.      0.      0.      0.
      6457       UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

      6458       KK  DO265B
      6459       KM    DIVERT OUT ALL storm Volume to the ponding area behind the community wall.
      6460       DT     OUT
      6461       DI       0    2000
      6462       DQ       0    2000
                 *  ******************************************************************************
                 *  PB Modification:  The followings are taken from Palm Valley 8 LOMR HEC-1.
                 *  The ADMP sub-basins 280 and 281 were subdivided and renamed as PC1, PC2, PC3
                 *  P8-1, and P8-2 in the LOMR HEC-1.
                 *  ******************************************************************************

      6463       KK     PC1   BASIN
      6464       KM     This is portion of ADMPUpdated sub-basin 265A
      6465       KO       1                                21
      6466       BA   0.679
      6467       LG    0.21    0.28    4.80    0.32      25
      6468       UI      65     125     272     355     439     564     809     666     526     421
      6469       UI     334     232     127     109      67      49      20      20      20      20
      6470       UI       0       0       0       0       0       0       0       0       0       0
      6471       UI       0       0       0       0       0       0       0       0       0       0

      6472       KK     PC2   BASIN
      6473       KM     Basin PC2 consists of portions of ADMP Update sub-basins 280 and 281
      6474       KO       1                                21
      6475       BA     .85
      6476       LG     .23     .25    3.85     .58   25.00
      6477       UI     73.    108.    279.    372.    445.    542.    732.    911.    719.    593.
      6478       UI    482.    391.    302.    174.    126.    104.     73.     45.     23.     23.
      6479       UI     23.     23.     23.      0.      0.      0.      0.      0.      0.      0.
      6480       UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                 *

      6481       KK  CP_pc2
      6482       KM   COMBINE ALL FLOWS At McDowell Road Retentin basin
      6483       KO       1                                21
                 * HC     2
      6484       HC       4   1.529
                 *
1                                          HEC-1 INPUT                                          PAGE179

      LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

      6485       KK    DOpc
      6486       KM    DIVERT OUT ALL 100 -6 Volume (154.0ac-ft)RETENTION EXCEPT LAST 60.0 AC-FT
      6487       KM    THIS IS REMAINING VOLUME TO BE RETAINED IN McDowell Rd.  BASINS
      6488       DT     OUT    94.0
      6489       DI       0    2000
      6490       DQ       0    2000
                 *

      6491       KK   RSPC2
      6492       KM        DETENTION BASIN ROUTING OPPERATION
      6493       KM       A LOW FLOW PIPE DRAINS BASIN TO THE SOUTH.
      6494       KO       1                                21
      6495       RS       1    STOR       0       0
      6496       SV       0    15.4    58.5    67.0
      6497       SE    1001    1003    1009    1010
      6498       SQ       0    10.0    55.0    1000
                 *  SV     0    5.36   11.17   17.34   23.89   30.89   38.46   46.71   55.69
                 *  SE  1003    1004    1005    1006    1007    1008    1009    1010    1011
                 *  SQ     0       0       0    3.64    9.79   11.49   13.26   14.83 1066.24
                 *  ******************************************************************************
                 *  PB Modifications: Divert the bleed off flow from Pebble Creek detention basin
                 *                    located at northwest corner of McDowell Rd and Sarival Ave
                 *                    to the new Saaaaasarival Ave detention basin. Add new
                 *                    Sub-basin TI-3 and one storage routing through the proposed
                 *                    on-site detention basin 4. TI-3 is the off-site drainage ar
                 *                    east of 303L NB frontage road and west of Pebble Creek
                 *                    primeter wall.
                 *  ******************************************************************************

      6499       KK   DIPC2
```

DB77SE

```
6500   KM    DIVERT BLEED OFF PIPE FLOW TO A TEMPARY DDETENSION BASIN LOCATED AT NORTHWES
6501   KM    CORNER OF I-10 AND SARAVIAL AVENUE
6502   DT   BLEED
6503   DI       0    3.64    9.79   11.49   13.26   14.83 1066.24
6504   DQ       0    3.64    9.79   11.49   13.26   14.83   16.24

6505   KK    TI-3
6506   KM   BASIN TI-3
6507   KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
6508   KM    L=       1.4  Lca=        .5   S=   24.6  Kn= .035  LAG=  23.3
6509   KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
6510   BA     .04
6511   LG     .50     .00    4.66     .53   18.68
6512   UI      6.     23.     35.     50.     72.     52.     37.     24.     11.      7.
6513   UI      4.      2.      2.      0.      0.      0.      0.      0.      0.      0.
6514   UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

6515   KK  SRTI-3
6516   KM        STORAGE ROUTE THROUGH ON-SITE DETENTION BASIN 4
6517   RS       1    STOR       0       0
6518   SV       0    0.35    1.19    2.10    3.08
6519   SE    1017    1018    1019    1020    1021
6520   SQ       0    3.42   11.63   20.41   25.78
```



```
LINE   ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

6521   KK   RTI-3
6522   KM        ROUTE FLOW FROM SRTI-3 TO CP281A
6523   RS       3       -1
6524   RC    .035    .015    .035    3300   .0027
6525   RX    1000    1001    1002    1008  1008.1  1014.1  1015.1  1016.1
6526   RY    1013    1013    1013    1010    1010    1013    1013    1013
       * ******************************************************************************
       * PB Modifications: Add three new Sub-basins, 280A, 281A, and TI-1, and one
       *                   storage routing through the proposed RID Canal north Detent
       *                   basin. 280A is a portion of original sub-basin 280 south of
       *                   Road and north of I-10 WB frontage road.  281A is a portion
       *                   of original sub-basin 281 south of McDowell Road and northw
       *                   of RID canal.  TI-1 is portion of original sub-basin 280 wh
       *                   drains portion of I-10 and WB frontage road.
       * ******************************************************************************

6527   KK    280A
6528   KM   BASIN 280A
6529   KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
6530   KM    L=        .4  Lca=        .2   S=   16.3  Kn= .025  LAG=   7.9
6531   KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
       * BA  .033
6532   BA    .035
6533   LG     .50     .00    4.66     .53    9.83
6534   UI     44.    122.     53.     10.      0.      0.      0.      0.      0.      0.
6535   UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

6536   KK    281A
6537   KM   BASIN 281A
6538   KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
6539   KM    L=        .3  Lca=        .1   S=   19.6  Kn= .035  LAG=   6.9
6540   KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
6541   BA    .029
6542   LG     .49     .02    4.80     .46   17.57
6543   UI     45.    106.     30.      4.      0.      0.      0.      0.      0.      0.
6544   UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

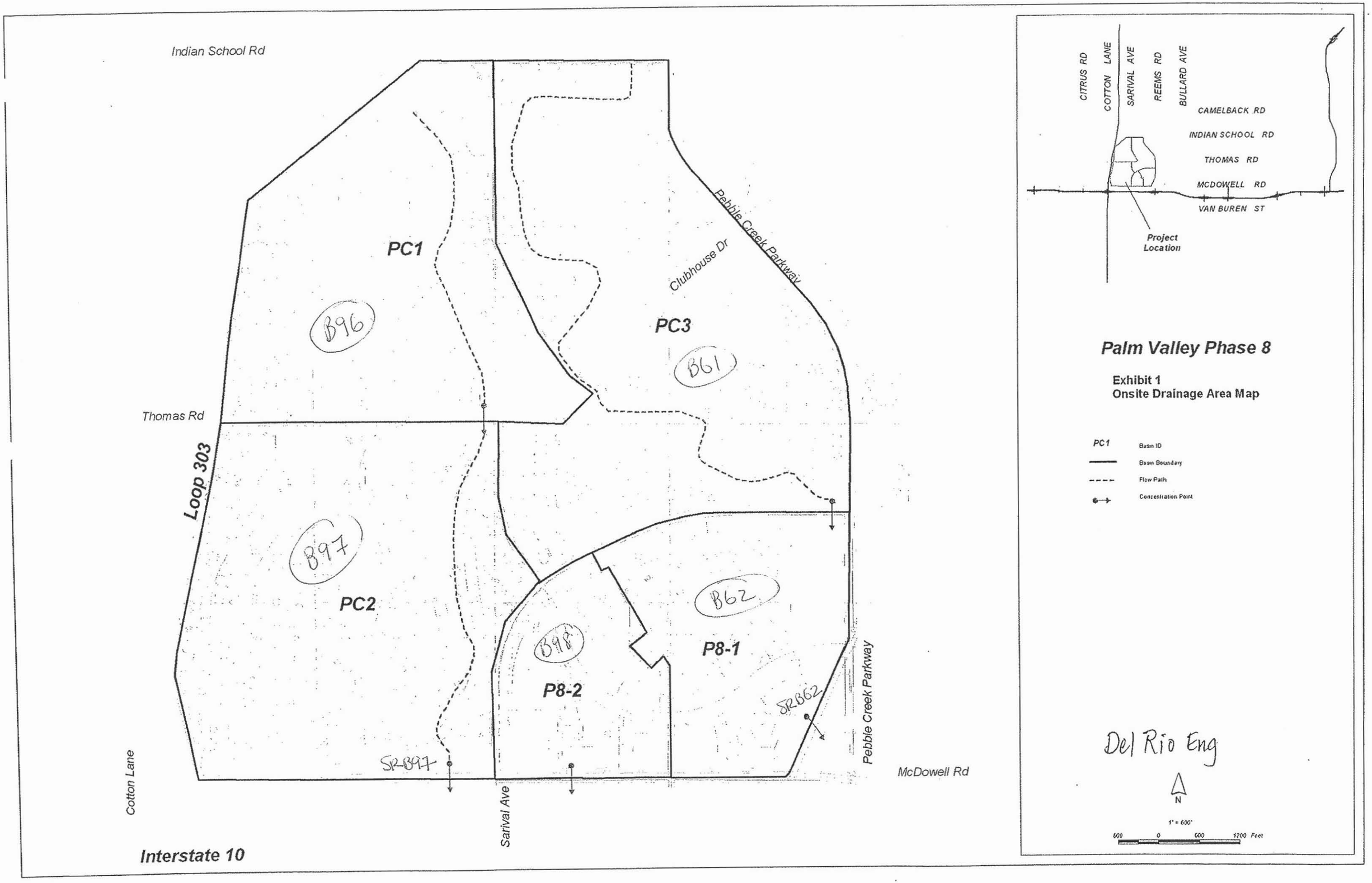
6545   KK    TI-1
6546   KM   BASIN TI-1
6547   KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
6548   KM    L=        .3  Lca=        .2   S=   30.7  Kn= .025  LAG=   5.9
6549   KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
6550   BA     .02
6551   LG     .50     .00    4.66     .53   31.01
6552   UI     47.     80.     11.      0.      0.      0.      0.      0.      0.      0.
6553   UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

6554   KK  CP281A
6555   KO       1                                21
6556   KM        ADD HYDROGRAPHS AT CP281A
6557   HC       5   0.124
```



```
LINE   ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

6558   KK  SR281A
6559   KO       1                                21
6560   KM        STORAGE ROUTE THROUGH THE RETENTION BASIN AT NORTHWEST CORNER OF I-10 AN
6561   KM        RID CANAL
6562   RS       1    STOR       0       0
       * SV     0    0.78    2.33    3.97    5.73
       * SE  1005    1006    1007    1008    1009
       * SQ  0.00    0.00   27.54   47.56   55.91
6563   SV       0    1.23    3.71    6.32
6564   SE    1006    1007    1008    1009
6565   SQ    0.00    4.17   13.78   20.55
       * ******************************************************************************
       * PB Modifications: Outflow from the proposed detention basin will be diverted
       *                   sub-basin CT-5C through the proposed  1-30 inch pipe. This i
       *                   different from ADMP. In ADMP this flow will go to the pondin
       *                   area north of RID canal and south of I-10 and than overtop R
       *                   canal to sub-basin 296.
       * ******************************************************************************
```


Indian School Rd
Thomas Rd
Loop 303
Cotton Lane
Sarival Ave
Interstate 10
McDowell Rd
Pebble Creek Parkway
Clubhouse Dr
PC1
PC2
PC3
P8-1
P8-2
B96
B97
B61
B62
B98
SR B97
SR B62
CITRUS RD
COTTON LANE
SARIVAL AVE
REEMS RD
BULLARD AVE
CAMELBACK RD
INDIAN SCHOOL RD
THOMAS RD
MCDOWELL RD
VAN BUREN ST
Project Location
Palm Valley Phase 8
Exhibit 1
Onsite Drainage Area Map
PC1 Basin ID
Basin Boundary
Flow Path
Concentration Point
Del Rio Eng
N
1" = 600'
600 0 600 1200 Feet

```
UI   105    86    62    62    58    58    46    35    35    35
UI    27    11    11    11    10    11    11    11    10    11
UI    11     0     0     0     0     0     0     0     0     0
UI     0     0     0     0     0     0     0     0     0     0
*
KK DOpc3 → RB61   (B61 Retention)
KM  DIVERT OUT ALL 100 -6 Volume (68.2ac-ft)RETENTION EXCEPT LAST 17.0 AC-FT

KM  THIS IS REMAINING VOLUME TO BE RETAINED IN RID CANAL BASIN.  BASINS

DTOUT   68.2
DI     0    2000
DQ    0    2000
*
KK   P81   BASIN
BA 0.380
LG  0.21    0.27    4.80    0.33      26
UI    43     108     202     260     345     513     421     330     250     183
UI    96      71      44      26      13      13      13       0       0       0
UI     0       0       0       0       0       0       0       0       0       0
*
KKCP8-1
KM COMBINE ALL FLOWS At RID canal Retentin basin
HC     2
*
KKRS_1
KM       DETENTION BASIN ROUTING OPPERATION RID CANAL Basin

KO     2
RS     1   STOR
SV     0    20.9    67.1    70
SE  1003    1006    1011    1012
SQ   0.0     0.0     0.0    1000
*
KK   P82   BASIN
BA 0.240
LG  0.23    0.25    4.70    0.37      37
UI    31     100     164     216     344     324     238     175     116      54
UI    40      23       9      10      10       0       0       0       0       0
UI     0       0       0       0       0       0       0       0       0       0

*
KK DOp82
KM  DIVERT OUT ALL 100 -6 Volume (26.1ac-ft)RETENTION
KM  THIS IS REMAINING DRAINS INTO MCDOWELL rOAD
DTOUT   26.1
DI     0    2000
DQ    0    2000
ZZ
```

SRB62

B98 retention





```
ID Palm Valley Phase 8 LOMR HEC-1 model
IDPrepared by: Del Rio Engineering
ID              10-3-06
ID       File Name: pv_p8_LOMR.dat
ID
*DIAGRAM
IT     5                    2000
KK   PC1   BASIN
BA 0.679
IN    15
PB 4.010
PC 0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
PC 0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
PC 0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
PC 0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
PC 0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
PC 0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
PC 0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
PC 0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
PC 0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
PC 0.983   0.986   0.989   0.992   0.995   0.998   1.000
LG  0.21    0.28    4.80    0.32      25
UI    65     125     272     355     439     564     809     666     526     421
UI   334     232     127     109      67      49      20      20      20      20
UI     0       0       0       0       0       0       0       0       0       0
UI     0       0       0       0       0       0       0       0       0       0
*
KK   PC2   BASIN
BA   .85
LG   .23     .25    3.85     .58   25.00
UI   73.    108.    279.    372.    445.    542.    732.    911.    719.    593.
UI  482.    391.    302.    174.    126.    104.     73.     45.     23.     23.
UI   23.     23.     23.      0.      0.      0.      0.      0.      0.      0.
UI    0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
*
KKCP_pc2
KM COMBINE ALL FLOWS At McDowell Road Retentin basin
HC     2
*
KK DOpc
KM  DIVERT OUT ALL 100 -6 Volume (154.0ac-ft)RETENTION EXCEPT LAST 60.0 AC-FT

KM  THIS IS REMAINING VOLUME TO BE RETAINED IN McDowell Rd.  BASINS

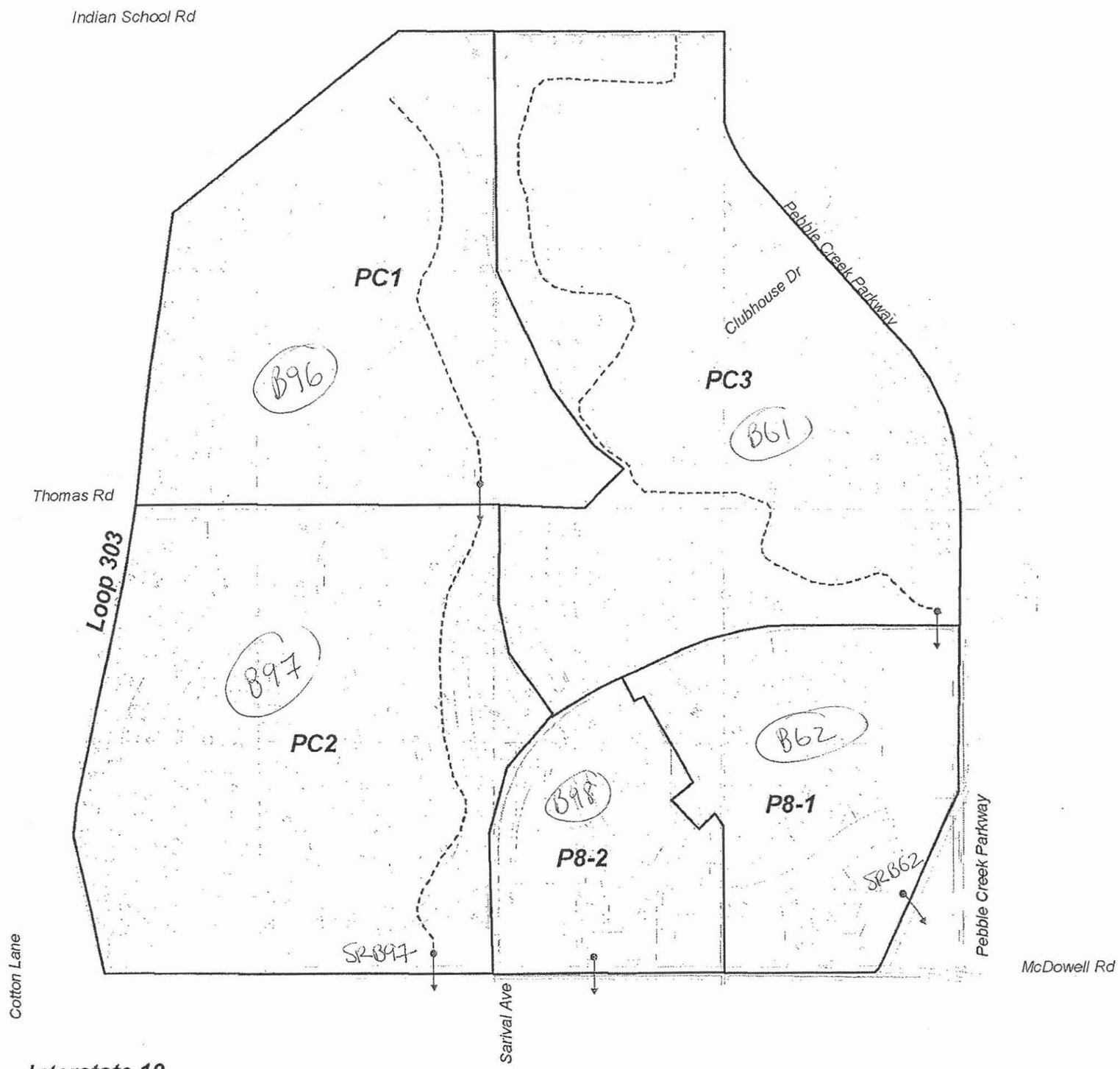
DTOUT   94.0
DI     0    2000
DQ    0    2000
*
KKRSPC2
KM       DETENTION BASIN ROUTING OPPERATION
KM      A LOW FLOW PIPE DRAINS BASIN TO THE SOUTH.

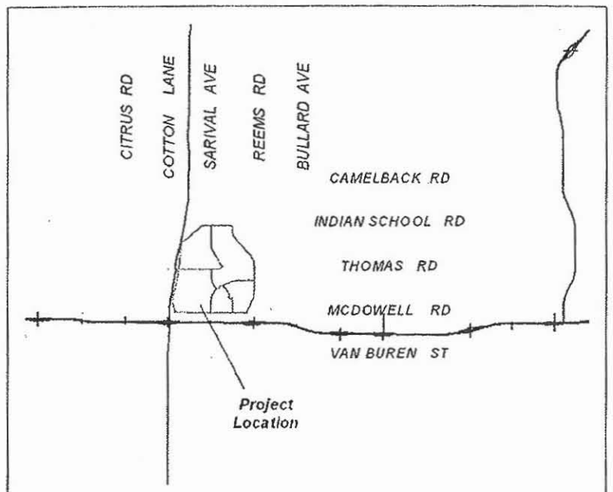
RS     1   STOR
SV     0    15.4    58.5    67.0
SE  1001    1003    1009    1010
SQ    10    10.0    55.0    1000
*
KK   PC3   BASIN
BA 0.948
LG  0.23    0.25    4.60    0.43      22
UI    35      35      35      35     101     125     146     168     183     195
UI   213     229     253     276     305     363     431     457     397     355
UI   321     296     278     252     228     212     192     173     163     136
```

→ B97 Retention

SR B97

B98




## Palm Valley Phase 8

**Exhibit 1**
**Onsite Drainage Area Map**

PC1 Basin ID

Basin Boundary

Flow Path

Concentration Point

Del Rio Eng

N

1" = 600'

600 0 600 1200 Feet

```
UI   105     86     62     62     58     58     46     35     35     35
UI    27     11     11     11     10     11     11     11     10     11
UI    11      0      0      0      0      0      0      0      0      0
UI     0      0      0      0      0      0      0      0      0      0
*
KK DOpc3 → RB61    (B61 Retention)
KM  DIVERT OUT ALL 100 -6 Volume (68.2ac-ft)RETENTION EXCEPT LAST 17.0 AC-FT

KM  THIS IS REMAINING VOLUME TO BE RETAINED IN RID CANAL BASIN.  BASINS

DTOUT   68.2
DI     0    2000
DQ     0    2000
*
KK   P81   BASIN
BA 0.380
LG  0.21    0.27    4.80    0.33      26
UI    43     108     202     260     345     513     421     330     250     183
UI    96      71      44      26      13      13      13       0       0       0
UI     0       0       0       0       0       0       0       0       0       0
*
KKCP8-1
KM COMBINE ALL FLOWS At RID canal Retentin basin
HC     2
*
KKRS_1
KM       DETENTION BASIN ROUTING OPPERATION RID CANAL Basin

KO     2
RS     1   STOR
SV     0    20.9    67.1    70
SE  1003    1006    1011    1012
SQ   0.0    0.0     0.0    1000
*
KK   P82   BASIN
BA 0.240
LG  0.23    0.25    4.70    0.37      37
UI    31     100     164     216     344     324     238     175     116      54
UI    40      23       9      10      10       0       0       0       0       0
UI     0       0       0       0       0       0       0       0       0       0

*
KK DOp82
KM  DIVERT OUT ALL 100 -6 Volume (26.1ac-ft)RETENTION
KM  THIS IS REMAINING DRAINS INTO MCDOWELL rOAD
DTOUT   26.1
DI     0    2000
DQ     0    2000
ZZ
```

SRB62

B98 retention





```
ID Palm Valley Phase 8 LOMR HEC-1 model
IDPrepared by: Del Rio Engineering
ID              10-3-06
ID       File Name: pv_p8_LOMR.dat
ID
*DIAGRAM
IT     5                    2000
KK   PC1   BASIN
BA 0.679
IN    15
PB 4.010
PC 0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
PC 0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
PC 0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
PC 0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
PC 0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
PC 0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
PC 0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
PC 0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
PC 0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
PC 0.983   0.986   0.989   0.992   0.995   0.998   1.000
LG  0.21    0.28    4.80    0.32      25
UI    65     125     272     355     439     564     809     666     526     421
UI   334     232     127     109      67      49      20      20      20      20
UI     0       0       0       0       0       0       0       0       0       0
UI     0       0       0       0       0       0       0       0       0       0
*
KK   PC2   BASIN
BA   .85
LG   .23     .25    3.85     .58   25.00
UI   73.    108.    279.    372.    445.    542.    732.    911.    719.    593.
UI  482.    391.    302.    174.    126.    104.     73.     45.     23.     23.
UI   23.     23.     23.      0.      0.      0.      0.      0.      0.      0.
UI    0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
*
KKCP_pc2
KM COMBINE ALL FLOWS At McDowell Road Retentin basin
HC     2
*
KK DOpc
KM  DIVERT OUT ALL 100 -6 Volume (154.0ac-ft)RETENTION EXCEPT LAST 60.0 AC-FT

KM  THIS IS REMAINING VOLUME TO BE RETAINED IN McDowell Rd.  BASINS

DTOUT   94.0
DI     0    2000
DQ     0    2000
*
KKRSPC2
KM       DETENTION BASIN ROUTING OPPERATION
KM      A LOW FLOW PIPE DRAINS BASIN TO THE SOUTH.

RS     1   STOR
SV     0    15.4    58.5    67.0
SE  1001    1003    1009    1010
SQ    10    10.0    55.0    1000
*
KK   PC3   BASIN
BA 0.948
LG  0.23    0.25    4.60    0.43      22
UI    35      35      35      35     101     125     146     168     183     195
UI   213     229     253     276     305     363     431     457     397     355
UI   321     296     278     252     228     212     192     173     163     136
```

→ B97 Retentio

SR B97

B99

## This Section Intentionally Left Blank

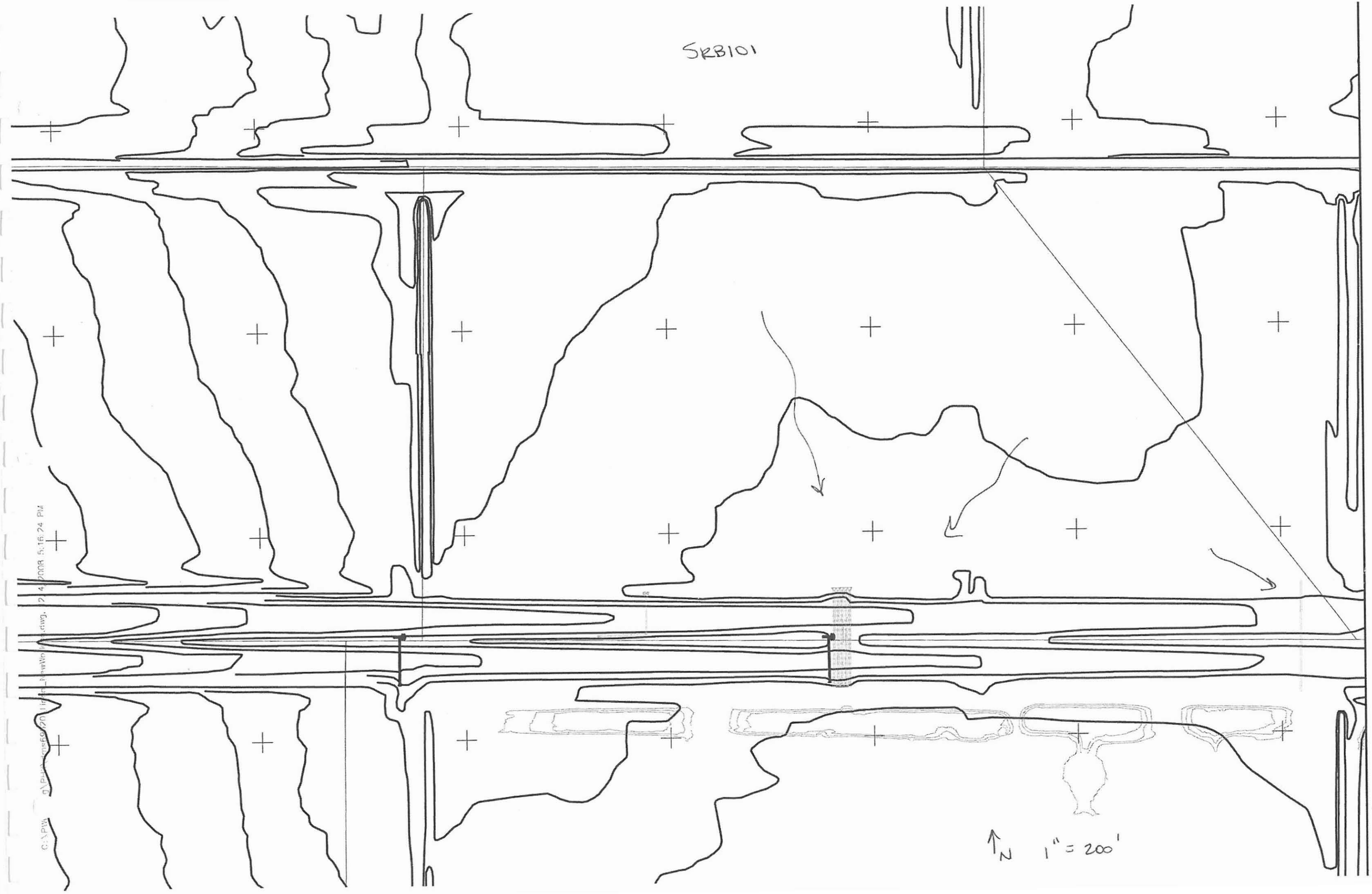
For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B100

## This Section Intentionally Left Blank

For information on this sub-basin, reference the hydrology model
Loop 303/White Tanks ADMPU Area Hydrologic Analysis

B101


SRB101
N
1" = 200'

# B101

SR

B101

The WLB Group Inc. WLB

**COMPUTATION DATA SHEET**

Subject WHITE TANKS/AGUA FRIA ADMS Prepared by JSE Date 1-24-91

STAGE- STORAGE- DISCHARGE TABLE

SUBBASIN (285B)
5-29" x 45" HERCP 2-24" RCP

| ELEV (FT) | | AREA (AC.) | | VOLUME (AC-FT) | | DISCHARGE (CFS) |
|---|---|---|---|---|---|---|
| 1005.5 | x Pipe Invert | 0 | | 0 | | 0 |
| 1.4 | 2-24" RCP | | .7 | | | |
| 1006.9 | x Pipe Invert | 1.0 | | .7 | | 16 |
| 2.6 | 5-29"x45" HERCP | | 4.98 | | | |
| 1009.5 | x Weir Flow | 2.83 | | 5.68 | 44+183 = | 227 |
| .5 | East | | 2.16 | | | |
| 1010.0 | | 5.80 | | 7.84 | 40+226+161 = | 435 |
| 1011.0 | | | | 10.0 | 48+286+1194 = | 1468 |

Weir Flow
$Q = CLH^{3/2}$

C = 2.6
L = 350 ft
H = .5

Q = 161 cfs

Q at 1011 =

L = 500 ft
H = 1.5

Form 209

PIPE CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE
January 23, 1991

PROGRAM INPUT DATA:

| DESCRIPTION | VALUE |
|---|---|
| Culvert Diameter (feet)..... | 2.00 |
| FHWA Chart Number (1,2 or 3)..... | 1 |
| Scale Number on Chart (Type of Culvert Entrance)..... | 1 |
| Manning's Roughness Coefficient (n-value)..... | 0.0120 |
| Entrance Loss Coefficient of Culvert Opening..... | 0.50 |
| Culvert Length (feet)..... | 308.0 |
| Culvert Slope (feet per foot)..... | 0.0054 |

PROGRAM RESULTS:

| Flow Rate (cfs) | Tailwater Depth (ft) | Headwater (ft) Inlet Control | Headwater (ft) Outlet Control | Normal Depth (ft) | Critical Depth (ft) | Depth at Outlet (ft) | Outlet Velocity (fps) |
|---|---|---|---|---|---|---|---|
| 8.0 | 1.01 | 1.47 | 0.32 | 0.94 | 1.01 | 0.94 | 5.55 |
| 22.0 | 1.67 | 3.29 | 3.78 | 2.00 | 1.67 | 1.67 | 7.83 |
| 24.0 | 1.73 | 3.66 | 4.50 | 2.00 | 1.73 | 1.73 | 8.29 |

PIPE CULVERT ANALYSIS COMPUTER PROGRAM Version 1.5 Copyright (c)1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. All Rights Reserved.

CURRENT DATE: 01-23-1991
CURRENT TIME: 02:54:07

FILE DATE: 01-23-1991
FILE NAME: WT2

FHWA CULVERT ANALYSIS
HY-8, VERSION 3.2

| CULV | SITE DATA INLET ELEV. (FT) | OUTLET ELEV. (FT) | CULVERT LENGTH (FT) | BARRELS SHAPE MATERIAL | CULVERT SHAPE, MATERIAL, INLET SPAN (FT) | RISE (FT) | MANNING n | INLET TYPE |
|---|---|---|---|---|---|---|---|---|
| 1 | 1006.90 | 1005.67 | 228.00 | 5 RCPE | 3.75 | 2.42 | .012 | CONVENTIONAL |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |

SUMMARY OF CULVERT FLOWS (CFS) FILE: WT2 DATE: 01-23-1991

| ELEV (FT) | TOTAL | 1 | 2 | 3 | 4 | 5 | 6 | ROADWAY | ITR |
|---|---|---|---|---|---|---|---|---|---|
| 1006.90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1008.02 | 50 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1008.61 | 100 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1009.14 | 150 | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1009.57 | 200 | 189 | 0 | 0 | 0 | 0 | 0 | 9 | 8 |
| 1009.72 | 250 | 202 | 0 | 0 | 0 | 0 | 0 | 47 | 5 |
| 1009.83 | 300 | 211 | 0 | 0 | 0 | 0 | 0 | 88 | 4 |
| 1009.93 | 350 | 219 | 0 | 0 | 0 | 0 | 0 | 130 | 4 |
| 1010.02 | 400 | 226 | 0 | 0 | 0 | 0 | 0 | 171 | 3 |
| 1010.11 | 450 | 233 | 0 | 0 | 0 | 0 | 0 | 214 | 3 |
| 1010.19 | 500 | 239 | 0 | 0 | 0 | 0 | 0 | 259 | 3 |
| 1009.50 | 183 | 183 | 0 | 0 | 0 | 0 | 0 | OVERTOPPING | |

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: WT2 DATE: 01-23-1991

| HEAD ELEV(FT) | HEAD ERROR(FT) | TOTAL FLOW(CFS) | FLOW ERROR(CFS) | % FLOW ERROR |
|---|---|---|---|---|
| 1006.90 | 0.00 | 0 | 0 | 0.00 |
| 1008.02 | 0.00 | 50 | 0 | 0.00 |
| 1008.61 | 0.00 | 100 | 0 | 0.00 |
| 1009.14 | 0.00 | 150 | 0 | 0.00 |
| 1009.57 | -0.01 | 200 | 2 | 0.86 |
| 1009.72 | -0.01 | 250 | 1 | 0.45 |
| 1009.83 | -0.01 | 300 | 2 | 0.53 |
| 1009.93 | -0.01 | 350 | 1 | 0.27 |
| 1010.02 | -0.00 | 400 | 3 | 0.75 |
| 1010.11 | -0.00 | 450 | 3 | 0.64 |
| 1010.19 | -0.00 | 500 | 2 | 0.50 |

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 01-23-1991 FILE DATE: 01-23-1991
CURRENT TIME: 02:54:07 FILE NAME: WT2

CULVERT # 1

PERFORMANCE CURVE FOR 5 BARREL(S)

| Q (cfs) | HWE (ft) | TWE (ft) | ICH (ft) | OCH (ft) | FLOW TYPE | CCE (ft) | FCE (ft) | TCE (ft) | VO (fps) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1006.90 | 1005.67 | 0.00 | -1.23 | 0-NF | 0.00 | 1006.90 | 0.00 | 0.00 |
| 50 | 1008.02 | 1005.97 | 1.12 | 0.47 | 6-FF | 0.00 | 0.00 | 0.00 | 5.50 |
| 100 | 1008.61 | 1006.12 | 1.71 | 0.91 | 6-FF | 0.00 | 0.00 | 0.00 | 6.82 |
| 150 | 1009.14 | 1006.24 | 2.24 | 1.47 | 6-FF | 0.00 | 0.00 | 0.00 | 7.66 |
| 189 | 1009.57 | 1006.34 | 2.67 | 2.02 | 6-FF | 0.00 | 0.00 | 0.00 | 8.16 |
| 202 | 1009.72 | 1006.44 | 2.82 | 2.21 | 6-FF | 0.00 | 0.00 | 0.00 | 8.31 |
| 211 | 1009.82 | 1006.53 | 2.92 | 2.35 | 6-FF | 0.00 | 0.00 | 0.00 | 8.39 |
| 219 | 1009.93 | 1006.61 | 3.03 | 2.49 | 6-FF | 0.00 | 0.00 | 0.00 | 8.47 |
| 226 | 1010.02 | 1006.68 | 3.12 | 2.61 | 6-FF | 0.00 | 0.00 | 0.00 | 8.53 |
| 233 | 1010.11 | 1006.76 | 3.21 | 2.72 | 6-FF | 0.00 | 0.00 | 0.00 | 8.59 |
| 239 | 1010.19 | 1006.82 | 3.29 | 2.83 | 6-FF | 0.00 | 0.00 | 0.00 | 8.63 |

El. inlet face invert 1006.90 ft El. outlet invert 1005.67 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

| | |
|---|---|
| INLET STATION (FT) | 0.00 |
| INLET ELEVATION (FT) | 1006.90 |
| OUTLET STATION (FT) | 228.00 |
| OUTLET ELEVATION (FT) | 1005.67 |
| NUMBER OF BARRELS | 5.00 |
| SLOPE (V-FT/H-FT) | 0.0054 |
| CULVERT LENGTH ALONG SLOPE (FT) | 228.00 |

***** CULVERT DATA SUMMARY **********

| | |
|---|---|
| BARREL SHAPE | ELLIPTICAL |
| BARREL SPAN | 45.00 FT |
| BARREL RISE | 29.00 FT |
| BARREL MATERIAL | CONCRETE |
| BARREL MANNING'S N | 0.012 |
| INLET TYPE | CONVENTIONAL |
| INLET EDGE AND WALL | SQ. EDGE WITH HEADWALL |
| INLET DEPRESSION | NONE |

ENT DATE: 01-23-1991 FILE DATE: 01-23-1991
CURRENT TIME: 02:54:07 FILE NAME: WT2

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

| | |
|---|---|
| BOTTOM WIDTH (FT) | 100.00 |
| SIDE SLOPE H/V (X:1) | %10.0 |
| CHANNEL SLOPE V/H (FT/FT) | 0.006 |
| MANNING'S N (.01-0.1) | 0.030 |
| CHANNEL INVERT ELEVATION (FT) | 1005.67 |
| CULVERT NO.1 OUTLET INVERT ELEVATION | 1005.67 FT |

******** UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

| FLOW (CFS) | W.S.E. (FT) | FROUDE NUMBER | VEL. (FPS) | SHEAR (PSF) |
|---|---|---|---|---|
| 0.00 | 1005.67 | 0.000 | 0.00 | 0.00 |
| 50.00 | 1005.97 | 0.532 | 1.64 | 0.11 |
| 100.00 | 1006.12 | 0.565 | 2.14 | 0.16 |
| 150.00 | 1006.24 | 0.584 | 2.50 | 0.21 |
| 200.00 | 1006.34 | 0.597 | 2.78 | 0.24 |
| 250.00 | 1006.44 | 0.607 | 3.02 | 0.28 |
| 300.00 | 1006.53 | 0.615 | 3.23 | 0.31 |
| 350.00 | 1006.61 | 0.622 | 3.42 | 0.34 |
| 400.00 | 1006.68 | 0.628 | 3.59 | 0.37 |
| 450.00 | 1006.76 | 0.633 | 3.74 | 0.39 |
| 500.00 | 1006.82 | 0.637 | 3.88 | 0.42 |

ROADWAY OVERTOPPING DATA

| | |
|---|---|
| WEIR COEFFICIENT | 2.60 |
| EMBANKMENT TOP WIDTH (FT) | 40.00 |
| CREST LENGTH (FT) | 175.00 |
| OVERTOPPING CREST ELEVATION (FT) | 1009.50 |