Clark County Regional Flood Control District

FLOOD INSURANCE STUDY
RESTUDY
TROPICANA WASH AND TRIBUTARIES

Technical Support Data Notebook

Volume 1 of 3
Sections 1 through 5

CH2M HILL

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Technical Support Data Notebook

For

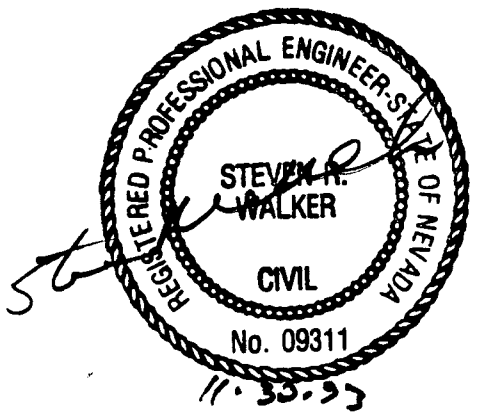
FLOOD INSURANCE STUDY

RESTUDY

TROPICANA WASH AND TRIBUTARIES

Clark County, Nevada
(Unincorporated Areas)

VOLUME I OF III



Submitted by:	Clark County Regional Flood Control District
Study Contractor:	CH2M HILL
Date Submitted:	January 20, 1993

SECTION 1

SPECIAL PROBLEM REPORTS

FLOOD INSURANCE STUDY SPR INDEX

CLARK COUNTY, NEVADA
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

SPR DATE	SPR TITLE	EXHIBIT NO.
7/19/92	#1	
7/19/92	#2	
9/9/93	rev. to #1	

MEMORANDUM CH2MHILL

TO: Kevin Eubanks/Clark County Regional Flood Control District
Bill Brandt/Clark County Public Works
Robert Thompson/Clark Co. Public Works Community Development
Rick Holmes/Clark Co. Public Works Comprehensive Planning
Tom Smith/Michael Baker Jr.
Karl Mohr/FEMA
Johnny Taylor/FEMA Region IX
Martin Nicholson/CH2M HILL
TSDN

FROM: Steve Walker/CH2M HILL

DATE: July 22, 1992
Revised: June 24, 1993

SUBJECT: Tropicana Wash Flood Insurance Study
Special Problem Report #1

PROJECT: RDD33832.A2.50

Detailed Explanation

Discharges on the Tropicana Wash are blocked and impeded by a raised railroad bed owned by the Union Pacific Railroad Company. Flow is conveyed beneath the railroad bed through a 9.5-foot corrugated metal pipe (CMP) culvert with a total available headwater of approximately 13 feet.

An hydraulic analysis prepared by the study contractor indicates that the maximum capacity of this culvert at the available headwater depth is about 700 cfs. Discharges exceeding this capacity are diverted northerly over land to Tropicana Boulevard. A hydrology report prepared for the Las Vegas Valley area, and reviewed and approved by FEMA for use in preparing flood insurance studies assumed a capacity of 1600 cfs at this culvert. The total discharge upstream of the culvert is 3300 cfs. Much of the discharge which exceeds the capacity of the culvert and is diverted into Tropicana Boulevard re-enters this watershed between the railroad and I-15. The actual locations where this discharge re-enters this reach of Tropicana Wash are very poorly defined.

In addition, flow from the unnamed tributary in the Blue Diamond/Duck Creek system also enter this reach of the Tropicana Wash between the railroad and I-15. Therefore, the use of the higher discharge for the reach between the railroad and I-15 is appropriate. This assumption, however, may result in underestimating the discharges diverted northerly, and therefore underestimating the flood hazards in the area impacted by breakout of stormwaters at this location.

Proposed Solution

After discussions with the communities and the study contractor, it was recommended that the adopted flood insurance study discharges be used between the railroad and I-15. However, the results of the study contractor's hydraulic analysis of the culvert be used to determine the maximum potential breakout flow to the north. If the railroad bed is considered to act as a dike, this recommendation is consistent with standard FEMA policy concerning dikes and levis.

In this instance, the obstruction of the railroad bed would be used to determine upstream ponding limits and flow diversions. However, the lower level of obstruction would be used to determine downstream flood hazards.

Upon further review and consideration by the community and the FEMA review contractor, the study contractor was directed to base the flood hazard delineations between the UPRR and I-15 on the actual estimated capacity of the culvert unless overtopping of the railroad bed is anticipated.

SPECIAL PROBLEM REPORT
FLOOD INSURANCE STUDIES

~~#2~~ Date: 7/19/91

Contract Number: RDD 33832.AO

Name of Community: Clark Co., NV

Study Contractor: CH2M Hill

PROBLEM AREA

TECHNICAL COORDINATION	☐
UNRESOLVED	☐
DISCREPANCIES	☒
UNREALISTIC SCHEDULE	☐
OTHER	☐

DETAILED EXPLANATION

SEE ATTACHED MEMO

PROPOSED SOLUTION

MEMORANDUM CH2MHILL

TO: Kevin Eubanks/Clark County Regional Flood Control District
Bill Brandt/Clark County Public Works
Robert Thompson/Clark Co. Public Works Community Development
Rick Holmes/Clark County Public Works Comprehensive Planning
Tom Smith/Michael Baker Jr.
Karl Mohr/FEMA
Johnny Taylor/FEMA Region IX
Martin Nicholson/CH2M HILL
TSDN

FROM: Steve Walker/CH2M HILL

DATE: July 22, 1992

SUBJECT: Tropicana Wash Flood Insurance Study
Special Problem Report #2

PROJECT: RDD33832.A2.50

Detailed Explanation

The Tropicana Wash at I-15 has an estimated peak discharge of approximately 5100 cfs. A reinforced concrete box culvert conveys flow under I-15 and connects to a series of culvert structures extending northeasterly for approximately 6,400 feet and outletting at Koval Lane. According to previously accepted hydraulic analyses provided by the communities, the capacity of the inlet culvert is 2900 cfs at the maximum available headwater depth.

Subsequent to the preparation of these analyses, however, the culvert entrance has been reconstructed. The reconstruction included installation of a jersey barrier, which increases the available headwater depth by approximately 2 1/2-feet.

Flow exceeding the capacity of the culvert inlet will overtop the I-15 roadway, enter the freeway median and be conveyed northerly. This discharge would then be conveyed through urban areas of Las Vegas, eventually re-entering the Tropicana and Flamingo conveyance systems.

A hydrology report prepared for the Las Vegas Valley area, and reviewed and approved by FEMA for use in preparing flood insurance studies, assumes a peak discharge of 5100 cfs from the outlet of this culvert, downstream to the next concentration point studied. The discharge in this reach is limited to the capacity of the culvert. Therefore, using a flow rate of 5100 cfs in this reach will over estimate the true potential flood hazard. The use of a discharge rate of 2900 cfs may under

estimate the flood hazard as it does not reflect the additional conveyance of the culvert structure resulting from the increased available headwater.

Proposed Solution

Based on discussions between the study contractor and the communities, it is recommended that a hydraulic analysis be prepared for the culvert assuming inlet control and calibrating the discharge rate to the previously determined 2900 cfs, based on the pre-existing available headwater elevation.

The assumption of inlet control seems to be supported by the reported hydraulic grade line for the structure. However, no detailed review or analysis of the structure was prepared by the study contractor.

The calibrated model would then be modified to increase the available headwater to the elevation of the jersey barriers, and the resulting discharge will then be used for the reach of Tropicana Wash from the outlet of the culvert at Koval Lane to the next concentration point, which is the confluence with Airport Wash. At this confluence, the discharge would be increased to the approved flow rate from the flood insurance study hydrology report.

SPECIAL PROBLEM REPORT
FLOOD INSURANCE STUDIES

#1

Date: 7/19/92

Contract Number: EDD 3383Z.AQ

Name of Community: Clark Co., NV

Study Contractor: CH2M Hill

PROBLEM AREA

TECHNICAL COORDINATION	☐
UNRESOLVED	☐
DISCREPANCIES	☒
UNREALISTIC SCHEDULE	☐
OTHER	☐

DETAILED EXPLANATION

SEE ATTACHED MEMO

PROPOSED SOLUTION

MEMORANDUM CH2MHILL

TO: Kevin Eubanks/Clark County Regional Flood Control District
Bill Brandt/Clark County Public Works
Robert Thompson/Clark Co. Public Works Community Development
Rick Holmes/Clark Co. Public Works Comprehensive Planning
Tom Smith/Michael Baker Jr.
Karl Mohr/FEMA
Johnny Taylor/FEMA Region IX
Martin Nicholson/CH2M HILL
TSDN

FROM: Steve Walker/CH2M HILL

DATE: July 22, 1992

SUBJECT: Tropicana Wash Flood Insurance Study
Special Problem Report #1

PROJECT: RDD33832.A2.50

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In addition, flow from the unnamed tributary in the Blue Diamond/Duck Creek system also enter this reach of the Tropicana Wash between the railroad and I-15. Therefore, the use of the higher discharge for the reach between the railroad and I-15 is appropriate. This assumption, however, may result in underestimating the discharges diverted northerly, and therefore underestimating the flood hazards in the area impacted by breakout of stormwaters at this location.

Proposed Solution

After discussions with the communities and the study contractor, it was recommended that the adopted flood insurance study discharges be used between the railroad and I-15. However, the results of the study contractor's hydraulic analysis of the culvert be used to determine the maximum potential breakout flow to the north. If the railroad bed is considered to act as a dike, this recommendation is consistent with standard FEMA policy concerning dikes and levis.

In this instance, the obstruction of the railroad bed would be used to determine upstream ponding limits and flow diversions. However, the lower level of obstruction would be used to determine downstream flood hazards.

SECTION 2

CONTACT REPORTS

(TELEPHONE CONVERSATION)

CONTACT (TELEPHONE CONVERSATION) REPORTS INDEX

CLARK COUNTY, NEVADA
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

CONTACT REPORT DATE	FIRM/AGENCY CONTACTED
10/13/92	CCRFCD
9/17/92	MBJ
8/26/92	CCRFCD
6/12/92	JMM
6/2/92	CCRFCD
6/2/92	MBJ
5/12/92	CCRFCD
5/15/92	Tim Pool CH2M HILL
5/7/92	WESCO SURVEYS
4/24/92	MITCHELL CH2M HILL
4/23/92	KENNY AERIAL
4/23/92	MIKE MILLER CH2M HILL
4/23/92	MIKE COLLINS CH2M HILL
4/20/92	Tim Pool
4/20/92	KENNY AERIAL
4/17/92	MBJ
4/15	MIKE MILLER CH2M HILL
5/25/93	MBJ
6/15/93	MBJ
7/8/93	CCRFCD
7/20/93	CCRFCD

CH2M HILL *TELEPHONE CONVERSATION RECORD*

Call to: Kevin Eubanks/CCRFCD

Project No.: RDD 33832.A0 **Phone No.:**

Call from: Steve Walker **Date:** July 20, 1993

Message taken by: **Time:** 10:45 ■ AM ☐ PM

Subject: Tropicana Wash Revisions

Kevin spoke with Tom Smith/MBJ re: Q's between UPRR and I-15. We should calculate the flows through the culverts and add if appropriate. If we don't add them in, document why. Tom is conserned about the "bookeeping". Use 750cfs from UPRR to the section where culvert flows enter, then increase where Tropicana Blvd re-enters.

Tom had a concern about flows between AV and AU. Kevin said for us to call him directly. \

Kevin will document his call to Tom and copy us. I should send Kevin a letter addressing additional costs to finish.

CH2M HILL

TELEPHONE CONVERSATION RECORD

Call to: Kevin Eubanks/CCRFCD

Project No.: RDD 33832.a0 **Phone No.:**

Call from: Steve Walker **Date:** July 8, 1993

Message taken by: **Time:** 10:15 ■ AM □ PM

Subject: Tropicana Revisions

I asked Kevin for direction for completion of the project. This summarizes the conversation and direction he gave.

Re: the reach downstream of the UPRR: Use the Q we calculated (750). If appropriate, add in flow that crossed the RR to the south. Base the decision on the FIS hydrology, and Tc's.

Re: Breakout sections: His preference is to maintain the breakouts and use the note on the maps as discussed with Baker.

Re: unconfined sections within ineffective flow areas: Map them as we have with A zones as opposed to making them AE zones.

Kevin suggested I submit a change order request ASAP. He indicated that he wants to see us get paid for our efforts.

CH2M HILL *TELEPHONE CONVERSATION RECORD*

Call to: Steve Walker

Project No.: RDD33832.a0 **Phone No.:** 703/960-8800

Call from: Scott Freda/MBJ **Date:** June 15, 1993

Message taken by: **Time:** 2:00 ☐ AM ■ PM

Subject: Tropicana Wash FIS

Scott called to follow up on Roya's questions. We had answered most of her questions on the phone on 5/25, however three questions required further information.

- Why are there negative floodway surcharges at two bridges on the Flamingo to I-15 reach ?

The bridge routine at section 60.170 was revised by adding .01 to the ET records and the floodway was widenedby about 80 feet to fix the problem caused by high velocity culvert flow. The bridge at section 60.705 was modeled using HY8. A starting WSE for the natural profile of the floodway run was input into the HEC2 using a X5 record. The negative surcharge at this location was fixed by adding a starting WSE for the encroached profile instead of allowing HEC2 to calculate it.

- On Flam-enc and I15-enc there are Qs that don't match the floodplain runs.

These runs were corrected. The new discharges did not result in any changes greater than 0.2 ft.

- At sections V, AE, AZ, and N. Trib section A the flood widths don't match the HEC2 data.

Sections AZ and N.Trib A were drafted incorrectly. Section AE does match but is hard to read. Section V differs due to an inneffective flow area defined by buildings not defined by the topo.

I offered to submit the revised runs and map detail by Fed Express today. Scott said to wait until he called back because they are still discussing a couple other issues that may require clarification.

He called again at 3:30 and asked about A zones upstream of the UPRR and an encroachment at Arville. I described how the A zones were defined at sections F,G,and H on the N. Trib but was not sure about the extended section at Arville. He said he would call tommorrow to try to finish there comments and questions.

CH2M HILL *TELEPHONE CONVERSATION RECORD*

Call to: Steve Walker

Project No.: RDD33832.a3.10 **Phone No.:** 703/960-8800

Call from: Roya Rashidmarati **Date:** May 25,1993

Message taken by: Steve **Time:** 10:00 ■ AM □ PM

Subject: Tropicana Wash FIS review comments

Roya asked for clarification on 13 questions. The questions and our responses and agreements are listed below:

1. How did we delineate the A zone downstream of Cameron Street? She wanted hydraulic computations for the approximate delineation.

   - We delineated this area using field methods, engineering judgement and topographic relief from the project mapping. No hydraulic calcs were done. The q was estimated by rating the flow diversion at the proposed culvert. Calcs are in the documentation. She was familiar with these calcs. She said she would relay our answer to her boss.

2. How did we delineate the A zone at the RR and Tropicana Blvd? Can we provide details and calcs?

   - We used Manning's ratings but they are very approximate and we did not think it was necessary to submit them. We agreed to send cross section locations and the Manning's calcs if we still had them.

3. She also asked for backup for the approximate study reaches. We described the process we used in the field and office. She asked for the section locations and the single section HEC2 data. (hard copy)

   - We agreed to send the locations and calcs.

4. Where does the flow split at Flamingo go?

   - It stays in Flamingo Rd past the end of our study area.

5. Where does the breakout at the RR boxcar bridges go? Does it come back into the channel?

   - We assumed it came back into the channel at section AN because the channel has capacity at that location. She felt the flow spit analysis doesn't reflect that return. We will recheck the flow split model.

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO Steve / Jon — PHONE NO. ____

DATE 10/13

CALL FROM Kevin Cubanski — TIME ____ ☐ AM ☐ PM

MESSAGE TAKEN BY ____ — PROJECT NO. ____

SUBJECT ____

Break-out analysis

K Did Hydro present 80 flow at RR or Industrial or F-15?

J Did have RR @ I-15

K. I haven't seen calcs - want to see before submittal

J we will send to you - won't submit to FEMA unless they request it.

K. Will Backwater at I-15 impact split of Industrial?

J no

FORM 4

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO Tom Smith / MBJ — PHONE NO. _____

DATE 9/12/92

CALL FROM Steve Walker / PHX — TIME 11:30 ☐ AM ☐ PM

MESSAGE TAKEN BY _____ — PROJECT NO. _____

SUBJECT Blue Diamond / Duke

S. What format do you want topo in

T. Electronic w/ any type of plot, blueline, mylar, velum ok

S. Do you want the photos?

T yes

S. you will make your own base sheets etc?

T yes

S.

Re Trap. work

S. Do we need any kind of release to use PX Montgomery Topo

T. no, it's FEMA's just have their title block on and add a title block of your own.

I called T. Pool / NDD & left detailed message on his voice mail

REV 1/88 FORM 4

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO Kevin Cubanski PHONE NO. _____

DATE 8/26/92

CALL FROM Steve TIME 8:30 ☒ AM ☐ PM

MESSAGE TAKEN BY _____ PROJECT NO. _____

SUBJECT Drafting Sheets

I faxed him exhibit 2 from FCDMC std for FIS studies
He approved the sheet layout for CURVED cor

CH2M HILL *TELEPHONE CONVERSATION RECORD*

CALL TO Mike Bagstead / Jmm — PHONE NO. _____

DATE 6/12/92

CALL FROM Steve Walker — TIME 8:30 ☐ AM ☐ PM

MESSAGE TAKEN BY _____ — PROJECT NO. _____

SUBJECT Trop Wash for

I requested a watershed map for Trop Wash Pan Gole of Kenai	will check & c/s

FORM 4

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT



TELECOPIER COVER SHEET

TO: Jon Fuller

TELECOPIER #: 602-966-9450

FROM: Kevin Eubanks

PHONE #: (702) 455-3139 FAX #: (702) 455-3870

PAGES (Excluding Cover sheet): 3

DATE: June 8, 1992

Mini wet COE A-D.A Curve

COMMENTS: If this doesn't come through, I'll give it to you Wed AM or you can come in earlier & get it

Ken.

301 E. Clark Avenue, Suite 301 • Las Vegas, Nevada 89101
(702) 455-3139 • FAX: (702) 455-3870

6. She asked for clarification and computations for the approximate methods downstream of I-15.

   - We described the methods and agreed to send available computations.

7. Is the culvert capacity of the long box culvert = the inlet capacity we calculated, and was an evaluation of this culvert part of our contract?

   - The culvert analysis was not part of our contract, but the capacity we used was less than the capacity estimated by the design engineers.

8. Is the area downstream of the RR between the wash and Tropicana Blvd high ground ie. zone x?

   - We did not map it as a Zone x, but it is above the 100-yr WSEL.

9. The work map Sheet 4 between sections U-AI is not readable. Can we draw better lines on a copy and fax of F-X?

   - Yes we will delineate the lines better and send it.

10. There is a negative surcharge on the floodway runs at H and R on the floodway run, why?

    - Critical depth at bridge inlets.

11. Were the ET cards on the first profiles of the floodway runs to delineate ineffective flow areas?

    - Yes, they replaced X3s on the natural runs.

12. At sections V, AE, AZ, and N.trib A, the topwidths don't seem to match well please check.

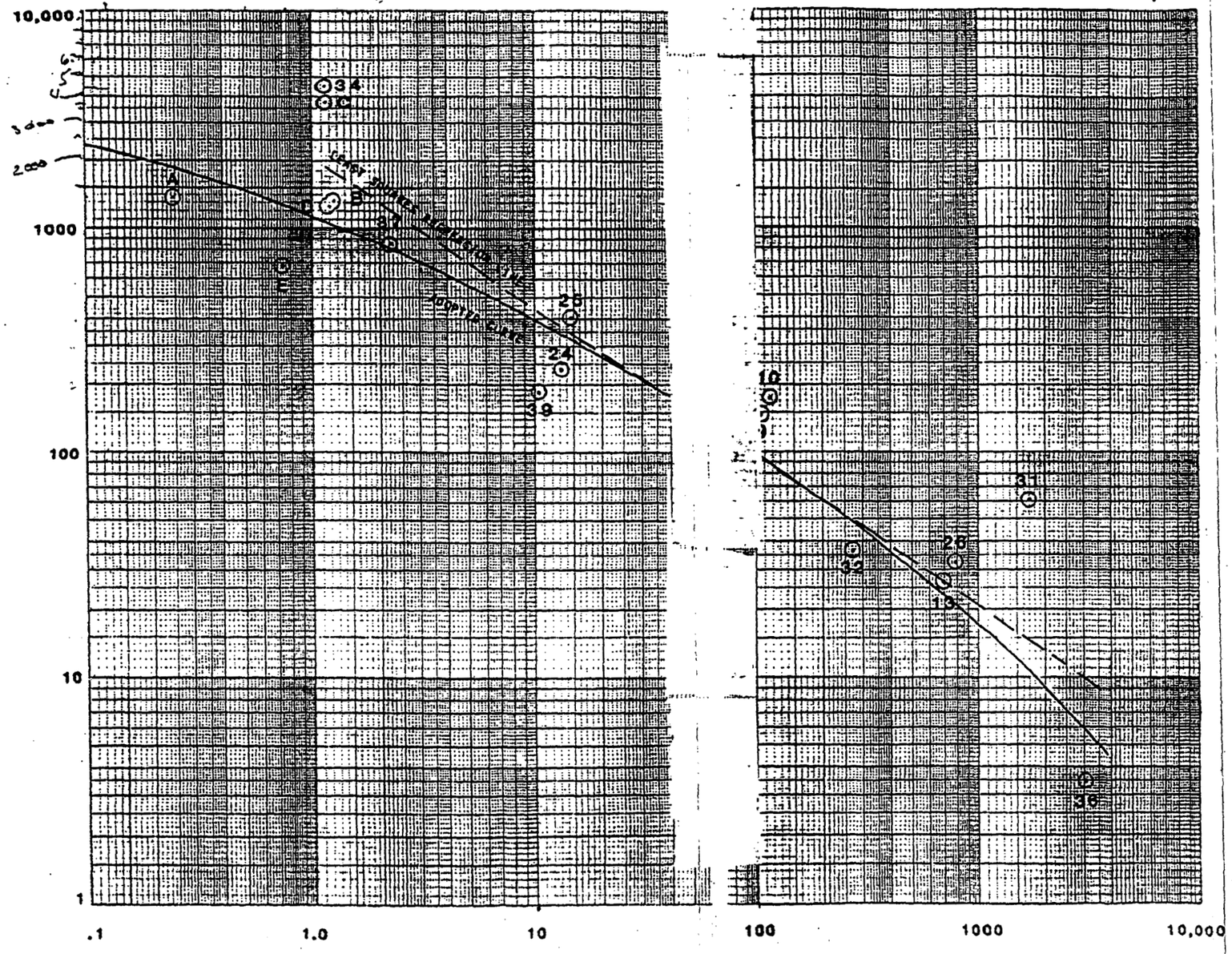
    - OK

13. At two split flow locations the Q determined by the split don't match Qs in the floodway runs exactly, Why?

    - We're not sure it may have been a run generation bust. We will check and get back to you.

cc:file
Ted Davis
Kevin Eubanks/CCRFCD

T4
T5
T1
T3
T6
T10



STREAMGAUGES USED IN REGIONAL ANALYSIS (ANALYTICAL ANALYSIS)

8. FLAMINGO WASH @ LAS VEGAS
9. FLAMINGO WASH @ MARYLAND PKWY
10. FLAMINGO WASH NEAR MOUTH
13. LAS VEGAS WASH @ N. LAS VEGAS
24. TYSON WASH TR. NEAR QUARZITE
25. SACTO WASH TR, NEAR TOPOC
26. SACTO WASH NR. YUCCA, ARIZONA
31. SAN FELIPE CRK NR. WSTMRELND
32. SALT CREEK NEAR MECCA, CALIF.
34. CARUTHERS CRK NR. IVANPAH, CA
36. AMARGOSA RIVER @ TECOPA
37. AMARGOSA R TR. #1 NR. JOHNNIE
38. SALT WELLS CRK NR. WESTEND, CA
39. NINEMILE CREEK NEAR BROWN, CA

STREAMGAUGES USED TO HELP SHAPE CURVE (GRAPHICAL ANALYSIS)

A. BOON CREEK NEAR BARSTOW, CA
B. DETRITAL WASH NR. CHLORIDE, AZ
C. LAS VEGAS WASH TR. NR. HENDERSON
D. LAS VEGAS WASH TR. S. OF NELLIS
E. BEACON CREEK AT HELENDALE, CA

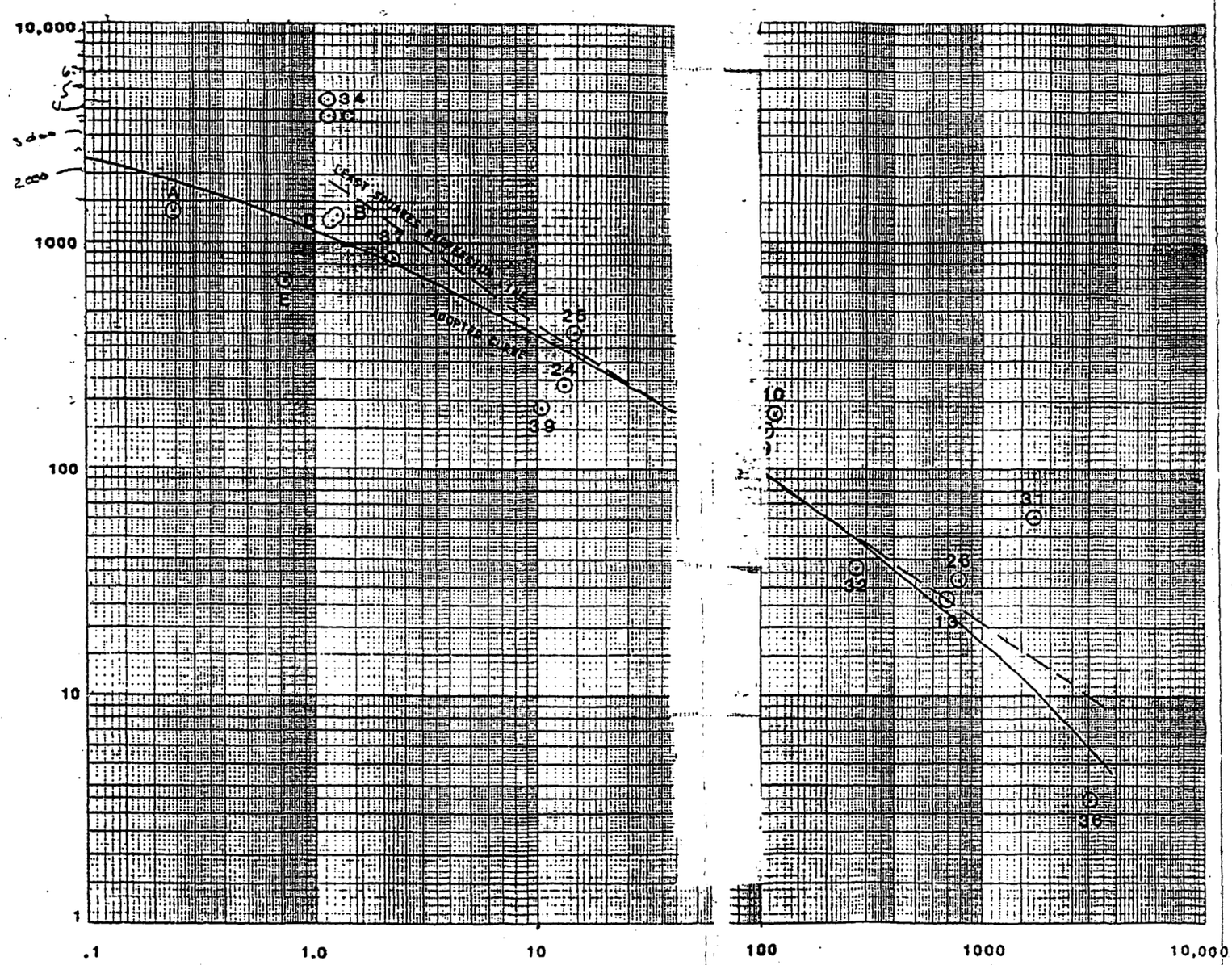
LAS VEGAS FEASIBILITY STUDY

Computed Probability

COMPUTED 100-YEAR PEAK DISCHARGE VERSUS DRAINAGE AREA

US ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 34



TH
TS
T1
T3
T6
T10

STREAMGAUGES USED IN REGIONAL ANALYSIS (ANALYTICAL ANALYSIS)

8. FLAMINGO WASH @ LAS VEGAS
9. FLAMINGO WASH @ MARYLAND PKWY
10. FLAMINGO WASH NEAR MOUTH
13. LAS VEGAS WASH @ N. LAS VEGAS
24. TYSON WASH TR. NEAR QUARZITE
25. SACTO WASH TR, NEAR TOPOC
26. SACTO WASH NR. YUCCA, ARIZONA
31. SAN FELIPE CRK NR. WSTNRELND
32. SALT CREEK NEAR MECCA, CALIF.
34. CARUTHERS CRK NR. IVANPAH, CA
36. AMARGOSA RIVER @ TECOPA
37. AMARGOSA R TR. #1 NR. JOHNNIE
38. SALT WELLS CRK NR. WESTEND, CA
39. NINEMILE CREEK NEAR BROWN, CA

STREAMGAUGES USED TO HELP SHAPE CURVE (GRAPHICAL ANALYSIS)

A. BOOM CREEK NEAR BARSTOW, CA
B. DETRITAL WASH NR. CHLORIDE, AZ
C. LAS VEGAS WASH TR. NR. HENDERSON
D. LAS VEGAS WASH TR. S. OF NELLIS
E. BEACON CREEK AT HELENDALE, CA

LAS VEGAS FEASIBILITY STUDY

Computed Probability

COMPUTED 100-YEAR PEAK DISCHARGE VERSUS DRAINAGE AREA

US ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 34

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO Tom Smith
Michael Baker Jr

PHONE NO. 703 838 0400

DATE 6/3/92

CALL FROM Fuller / PAX

TIME 11:00 ☒ AM ☐ PM

MESSAGE TAKEN BY

PROJECT NO. RDD?

SUBJECT Manual: Guide for Preparing Tech Support Data Notebook

Blue Diamond Fan
Tropicana Wash FIS

Sent to FCD

Coordination: are sending info to Fred Frazer for next monday (overnight) on Blue Diamond

Karl Mohr - reviewing MBJ work

will send guide book.

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO Kevin Eubanks / Carter

PHONE NO. _____

DATE 5/12/92

CALL FROM _____

TIME 9:15 ☒ AM ☐ PM

MESSAGE TAKEN BY _____

PROJECT NO. _____

SUBJECT _____

K Cole doesn't want to do supplemental mapping until next fiscal year - July 1. Need to do survey & mapping in 2 pieces

S If we fly it we save your $ - we will bill later if you're sure it will be approved

K w/ Cole need to talk to Cole

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO Tim Post / 200 PHONE NO. _____

DATE 5/15/92

CALL FROM Steve TIME 10:40 ☐ AM ☐ PM

MESSAGE TAKEN BY _____ PROJECT NO. RDD 37832.00

SUBJECT Tropcon Work

S Sched flight for Tue 5/26

T Can do. will confirm after sched

I called Ted on GS & left message to confirm w/ Bill Avery

CH2M HILL *TELEPHONE CONVERSATION RECORD*

CALL TO Bill Avery / Waste

PHONE NO. 702 367 0588

DATE 5/7/92

CALL FROM Steve

TIME 9 45 ☐ AM ☐ PM

MESSAGE TAKEN BY

PROJECT NO.

SUBJECT Trap Work

S: When can you have panels set

S: Needs Control Layouts

Are we going V only on H & V

S: Don't know w/o's

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO Steve Mitchell PHONE NO. _____

DATE 4/24/92

CALL FROM Steve Walker TIME _____ ☐ AM ☐ PM

MESSAGE TAKEN BY _____ PROJECT NO. R00302.76

SUBJECT Trip Work

406 - 449 3669

Overall tight

1.0 ok added a little Tech time

need more work by techs

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO Steve — PHONE NO. _____

DATE 4/23/92

CALL FROM Frank / Kenny — TIME _____ ☐ AM ☐ PM

MESSAGE TAKEN BY _____ — PROJECT NO. _____

SUBJECT _____

DTM AutoCad 11 topo on whole strata	18,186
Supp 2'	500
Cross sects	3330
ARC INF conversion	1230
2X enlargmts 2 sets	1900
Ortho	5000
	$30,046

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO Mike Miller/CVO — PHONE NO. _____

DATE _____

CALL FROM Steve Walker — TIME _____ ☐ AM ☐ PM

MESSAGE TAKEN BY _____ — PROJECT NO. _____

SUBJECT _____

1. Can you make maps in either DXF/INFO or do you

2. How can we make the translation work
   - Communicate between Miller, FOX, Pool
   - Topo will be a pain - Translate to DXF

Mike worked on the ESRI & helped put together the data base of centerlines.

5" actual work won't be done for 21-28 months
Will give price today -
will include 1 trip (2 nights) to CVO

REV 1/88 FORM 4

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO Steve

PHONE NO. _____

DATE 4/23/93

CALL FROM Mike Collins

TIME 9:20 ☐ AM ☐ PM

MESSAGE TAKEN BY _____

PROJECT NO. _____

SUBJECT Trip Work

Hydrology is light

Would take job overall looks real good

REV 1/88 FORM 4

CH2M HILL *TELEPHONE CONVERSATION RECORD*

CALL TO Tim Poole / Ron — PHONE NO. _____

DATE 4/24/92

CALL FROM Stern — TIME 2:15 ☐ AM ☐ PM

MESSAGE TAKEN BY _____ — PROJECT NO. _____

SUBJECT _____

Control layout is for 400 w/ 4' C.I.
fly from 1200 ft
400' rectified photo overlay
both electronic & hard copy
can use 2' supplementals
6 sheets
per spec can use quadsheet for horizontal
3 month job 1st topo in 2 months (flexible)

if done in 200 sc. may need layout
3 no jobs

CH2M HILL *TELEPHONE CONVERSATION RECORD*

CALL TO Steve — PHONE NO. _____

DATE 4/20/92

CALL FROM Mark / Kennedy — TIME 5 PM ☒ AM ☐ PM

MESSAGE TAKEN BY _____ — PROJECT NO. _____

SUBJECT Trop Work

2' CI 200 auto-scaled cons + intergraph
Cross sections $42,949
photobase w/ overlay 17 sheets
w/ cross sections

working
50/1 days for topo
1st topo in about 14 days

what alt:

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO Tom Smith / Baker — PHONE NO. _____

DATE 4/17/93

CALL FROM Steve Walker — TIME 12:30 ☐ AM ☐ PM

MESSAGE TAKEN BY Steve — PROJECT NO. _____

SUBJECT _____

1. Hydrology. If we modify existing FLS HEC-1 - What are criteria and review requirement. -

T.S: ok to break model into pieces without rerouting downstream FP

if A_3 < .20 A_{main} use unit discharge

A_3 > .20 A_{main} break out of model

Will need their results for Q's from - should be done by end of May

2. TOPO - We have 1984 topo

T.S. Recommend new topo for changed areas - not try to match new and old.

He will request JMM release topo originals to CEXFD

CH2M HILL *TELEPHONE CONVERSATION RECORD*

CALL TO Mike Miller/CVO — PHONE NO. _____

DATE 4/15

CALL FROM STEVE — TIME 11:15 ☐ AM ☐ PM

MESSAGE TAKEN BY _____ — PROJECT NO. RD233932.A6

SUBJECT Topo GIS

Translation is easy if original mapping is done right
i.e. the cuts on topo lines (——— 550 ———)
don't translate - GIS needs continuous lines.
Can use either MicroStn or AutoCadd files → DXF → ARC/INFO
must coord w/ FDX in RDO

FORM 1

SECTION 3

MEETING MINUTES/REPORTS

MEETING MINUTES/REPORTS INDEX

CLARK COUNTY, NEVADA
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

MINUTES/REPORT DATE	MEETING DATE	MEETING TYPE
Oct 5	SEPT 9	PROGRESS MTN #4
July 22	July 14	PROGRESS MTN #2
JUNE 29	JUNE 24	PROGRESS MTN #1
JUNE 24 (1992)	JUNE 10	KICKOFF MTN
June 24, 1993	June 24	Review

MEMORANDUM CH2MHILL

TO: Kevin Eubanks/Clark County Regional Flood Control District
Bill Brandt/Clark County Public Works
Robert Thompson/Clark Co. Public Works Community Development
Rick Holmes/Clark Co. Public Works Comprehensive Planning
Tom Smith/Michael Baker Jr. Inc.
Karl Mohr/FEMA
Johnny Taylor/FEMA Region IX

COPIES: Martin Nicholson/CH2M HILL
Jon Fuller/CH2M HILL
[redacted]

FROM: Steve Walker/CH2M HILL

DATE: October 5, 1992

SUBJECT: Tropicana Wash Flood Insurance Study
[redacted]
September 9, 1992

PROJECT: RDD33832.A3.10

Attendees:

Gale Fraser/CCRFCD
Kevin Eubanks/CCRFCD
Robert Thompson/CCPW
Steve Walker/CH2M HILL
Ted Davis/CH2M HILL
Ken Erlanger/Wildan
Tom Brady/Wildan

A copy of the meeting agenda is attached. The following paragraphs summarize the discussion and directions provided to CH2M HILL by the Clark County Regional Flood Control District (CCRFCD).

1) **Project Status.** A project status report was delivered to the Flood Control District. The project is currently on schedule and on budget.

The floodway computations are scheduled to be completed next week. A draft report and draft delineations of the I-15 and UPRR breakout were submitted to Kevin Eubanks for a preliminary review, including the original work map.

The project completion date is November 18, 1992. No deviation from this schedule is anticipated.

2. **Mapping.** The Duck Creek/Blue Diamond mapping is done. We are waiting for direction from Michael Baker Jr. concerning their desired format for the deliverables.

   Blueline examples of the Tropicana Wash topographic mapping on photo bases were delivered to the District. Cross-section locations and planimetric features such as section corners and street names will be included in the electronic file. Floodplains and floodways will not be included in the electronic files, but rather, hand drafted until after final approval by FEMA.

3. **Approximate methods.** CH2M HILL requested direction concerning discharge limitation for approximate methods flood hazard mapping. The District has indicated that 300 cfs may be an appropriate cutoff for areas not to be mapped under this particular project. In many cases, this flowrate can be conveyed through streets and roadways. Robert Thompson concurred and this will be the cutoff used by CH2M HILL. The base map for the approximate methods will be the 1984 JMM topographic mapping. Steve Walker will talk to Tom Smith regarding the need for releases to use this mapping. The 300 cfs cutoff is not intended to set a precedent for the community according to Robert Thompson and Gale Fraser. The reports describe this cutoff as being based on the specific needs of the area - the watershed characteristics and existing low flow channels. The hydrology report will be revised to reflect the 300 cfs cutoff before submittal to FEMA.

4. **Detailed study reaches.** The District has received the preliminary work maps from Michael Baker Jr. Kevin Eubanks will review the Baker study to determine how that mapping will interface with this study. Kevin will provide us with a copy of Baker's study. Kevin had briefly reviewed the detailed methods 100-year flood plain delineations. He suggested that we check the discharge used at the railroad at section 63.979. The discharge in the computations may not match the special problem report.

   CH2M HILL will review the flow combination and model appropriately at each of the three confluences for the north central and south branches. The channel lengths will be reviewed at section 62.967. Kevin also asked that we research whether or not AE zone can be mapped without floodways, or does FEMA require that floodways be mapped for all detailed study sections? Steve will review and report back.

5. **Next meeting date.** The next meeting will be set following the preliminary floodway determination. Steve will call Kevin Eubanks to set a meeting date one week before the requested meeting.

MEMORANDUM CH2MHILL

TO: Kevin Eubanks/Clark County Regional Flood Control District
Bill Brandt/Clark County Public Works
Robert Thompson/Clark Co. Public Works Community Development
Rick Holmes/Clark Co. Public Works Comprehensive Planning
Tom Smith/Michael Baker Jr. Inc.
Karl Mohr/FEMA
Johnny Taylor/FEMA Region IX

COPIES: Martin Nicholson/CH2M HILL
Jon Fuller/CH2M HILL
[redacted]

FROM: Steve Walker/CH2M HILL

DATE: July 22, 1992

SUBJECT: Tropicana Wash Flood Insurance Study
[redacted]
July 14, 1992

PROJECT: RDD33832.A3.10

This memo will summarize Coordination and Progress Meeting No. 2 for the Tropicana Wash Flood Insurance Study. The meeting date was July 14, 1992. Attendees were:

Gale Fraser/CCRFCD
Kevin Eubanks/CCRFCD
Jon Fuller/CH2M HILL
Ted Davis/CH2M HILL
Steve Walker/CH2M HILL

A copy of the meeting agenda is attached. The following paragraph summarizes the discussions and direction provided to CH2M HILL by CCRFCD.

1) Project Status: A project status report was delivered to the Flood Control District.

The project is currently slightly ahead of schedule and on budget at this time. Gale Fraser directed the study contractor to break down the labor and expense items in the project billings by major project tasks.

2. Data Collection: A memorandum summarizing data collection activities and results was delivered to CCRFCD. This portion of the project is essentially

done, and report materials loaned to the study contractor by the District, will be returned to the District this week.

There has been, to date, no response from any of the agencies contacted requesting pertinent data to the project except for Clark County Public Works/Comprehensive Planning, FEMA, and the District.

3. Topographic Mapping: Preliminary blueline copies of topographic mapping prepared by CH2M HILL were submitted to the District. An extra copy was submitted for delivery to Robert Thompson at Clark County Public Works. Gale Fraser asked what the criteria was for determining when intermediate contours, or supplemental contours were added to the mapping, and suggested that a note should be added to the cover sheet describing the accuracy of the intermediate contours. Kevin Eubanks stated he had understood that supplemental contours would be shown throughout the map. CH2M HILL will verify.

4. Hydrology: A technical memorandum containing the draft hydrology report was submitted to the District for review. Kevin Eubanks requested a copy of the complete technical design notebook. Other comments to the draft report include the following:

   - The two regression equations used to estimate intermediate discharges should be plotted on the Corp of Engineer's regional regression analysis curve to provide for comparison of the two methods.

   - Drainage areas should be added to Table 3. Significant figures on Table 3 should be reduced to plus or minus 10 cfs.

   - A threshold of 100 cfs should be used for determining approximate method stream reaches to be mapped. Therefore, all discharges less than 100 cfs should be eliminated from the table, and corresponding stream reaches will not be mapped.

   There is now going to be a state reviewer from the Nevada Department of Water Resources. The reviewer will be Bob Fally. He will be serving as the Nevada State FEMA coordinator. Kevin Eubanks will contact Mr. Fally to determine what level of involvement he wishes to have. The community review of all deliverables will include the CCRFCD and Bob Thompson and Bill Brandt at Clark County Public Works.

The report should differentiate between those drainage areas where SDN 5 was used as opposed to SDN 6. SDN 5 was used for drainage areas greater then 10 square miles.

5. Approximate Methods: A memorandum summarizing the approximate methods procedures was submitted to the District as well as preliminary results shown on work maps. There was discussion as to the impact of the proposed approximate methods flood limits on individual properties located within the flood plains. The District requested that we submit the original technical documentation study notebook for the approximate methods for their review.

6. Other Business: The preliminary findings of the breakover analysis at the railroad and at I-15 was discussed. The results of the preliminary hydraulic analysis indicate that the capacity of the culvert under the railroad does not agree with that assumed for the flood insurance study hydrology report.

Based on the results of an HY8 analysis, the capacity of this culvert at maximum headwater is approximately 600-700 cfs as opposed to 1600 indicated in the flood insurance study hydrology report. After discussion, the study contractor was directed to use the flood insurance study discharges for the detailed hydraulics of the reach between the railroad and I-15. However, the results of our hydraulic analysis would be used to determine the flow rate diverted northerly for the breakover analysis. This recommendation is consistent with standard FEMA approach for analyzing flow impounded by levees as normally applied to railroad embankments.

A similar situation occurred at I-15 where studies by others indicated that the capacity of the box culvert under I-15 and extending downstream to Koval Lane is approximately 2900 cfs. Subsequent to the completion of those other reports, the entrance to the culvert has been reconstructed and jersey barriers have been installed raising the effective maximum headwater by approximately 2 1/2-feet. The estimated box capacity of 2900 cfs is not reflected in the FIS hydrology report, which assumes 5100 cfs at the outlet of the culvert.

It was recommended that the study contractor calibrate an HY8 model of the culvert entrance to match the previous studies, i.e. 2900 cfs, then increase the effective headwater depth by 2 1/2 feet, and use the resultant discharge as the new culvert capacity. The resulting discharge would then be used for the detailed hydraulics from the outlet of the culvert at Koval Lane to the confluence with Airport Wash. At the confluence of Airport Wash, the

use 2nd for Breakout

discharge would be increased to match the approved flood insurance study hydrology report discharge rates.

A special problem report will be prepared by the consultant, and submitted to the District for coordination with Tom Smith at Michael Baker, Jr.

7. Next meeting date: Steve Walker and Kevin Eubanks will meet on July 22, 1992, to discuss Kevin's comments to the hydrology and approximate methods. These documents will then be finalized and submitted to Clark County Public Works for review. The hydrology report will also be forwarded to Michael Baker Jr. for FEMA review. At that time, the meeting date for the next coordinating meeting will be set. It was tentatively scheduled for August 19, 1992.

MEMORANDUM CH2MHILL

TO: Kevin Eubanks/Clark County Regional Flood Control District

COPIES: Bill Brandt/Clark County Public Works
Robert Thompson/Clark County Public Works Community Development
Rick Holmes/Clark County Public Works Comprehensive Planning
Tom Smith/Michael Baker, Jr., Inc.
Karl Mohr/FEMA Washington
Johnny Taylor/FEMA Region IX
Martin Nicholson/CH2M HILL
TSDN

FROM: Steve Walker/CH2M HILL

DATE: June 29, 1992

SUBJECT: Tropicana Wash Flood Insurance Study
[redacted]

PROJECT: PHX33832.A3.10

This memo will summarize the coordination and progress for the Tropicana Wash Flood Insurance Study project. The meeting date was June 24, 1992. Attendees were:

Kevin Eubanks/CCRFCD
Jon Fuller/CH2M HILL
Steve Walker/CH2M HILL
Ted Davis/CH2M HILL

A copy of the meeting agenda is attached.

1. Project Status

A status report was submitted and is attached herewith. The project is on schedule. The only delay has been obtaining FIS hydrology work maps. These have now been obtained and no other project delays are anticipated.

SRW noted the volume of hydrology reports and suggested we only research the reports we know to have useful information. The rest of the reports would be catalogued for future reference. KE suggested we eliminate all reports prior to the new hydrology manual published in 1989 and look only at the reports covering the larger developments. KE also suggested that the Spear channel report by BTA may not have too much pertinent information. A report for Valley View Drive may be helpful.

2. Agency Notification

Notices have been sent out and published in the local newspapers. Copies are attached.

3. Hydrology

JEF reviewed the estimated discharges for each concentration point CH2M HILL plans on using for detailed studies. A draft memo describing sources of information was submitted to KE for comment. CH2M HILL requested direction on the use of "breakout" discharges from Blue Diamond Wash into the Tropicana Wash as provided by Baker. KE suggested using the higher of the discharges from FIS or Baker. JEF described the method used to estimate discharge values for intermediate concentration points in North, Central, and South Tropicana Washes (linear interpolation of discharges for subwatersheds as a function of area using the watershed areas from FIS HEC-1). KE concurred with the approach, but noted that South and Central at Jones did not add up to FIS Q of 2600 cfs. KE suggested area-weighting based on T4 drainage area rather than from an area at a point further downstream, as was done by JEF. JEF agreed. KE also suggested CH2M HILL try splitting the HEC-1 model and rerunning subbasins to obtain the additional analysis points. JEF noted that there may be some difficulty since the kinematic wave method was used, but agreed to check it out.

A conference call was placed with Michael Baker Jr. the project TEC (Mifflin and Smith). Baker directed CH2M HILL not to combine flow rates shown on the maps previously provided CH2M HILL, via CCRFCD, with local flows from Tropicana. The two "breakout" flows from Blue Diamond of 5230cfs and 3310cfs should not be combined at I-15 because the probablistic fan methodology would predict the flow at only one of the points at one time, and not both of them coincidentally. Detailed analysis of South Tropicana should use intermediate discharges derived from the adopted FIS discharges published in the JMM report, Table 6.3, without the breakout flowrate of 3310cfs.

JEF described the linear area-weighting approach of calculating flows at intermediate analysis points from the original HEC-1 flows. Baker suggested plotting the flow versus area relationship and determining a best fit line or curve. JEF had done this and the limited data points (5) plotted in a widely scattered fashion without good correlation. Baker said to submit a hydrology report and they would review the methods used; the final decision was really up to Karl Mohr of FEMA.

5. Approximate Methods Study Reaches

JEF summarized the methods being used to estimate water surface elevations for the approximate study reaches. Single section HEC-2 runs are being used to estimate normal depth. Cross section geometry and channel slopes are derived from the 1984 JMM topo augmented by field measurement of bottom width depth and "n" values.

6. Next Meeting Date

The next meeting date will be July 15, 1992 at CCRFCD at 10:00 am. SRW will submit an agenda by Monday July 13, 1992.

Clark County Regional Flood Control District

TROPICANA WASH FLOOD INSURANCE STUDY

COORDINATION MEETING AGENDA

June 24, 1992

- PROJECT STATUS

  Status report is attached

- AGENCY AND COMMUNITY COORDINATION

  Notification letter and news release are attached

- HYDROLOGY

  Break over assumptions to be coordinated with Tom Smith/Michael Baker Jr.

- APPROXIMATE METHODS

  Example of methods and results

- OTHER BUSINESS

- NEXT MEETING DATE

jtk/FLOOD/069222.51

Draft

Announcement of Intent to Perform Flood Elevation Study

The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

This study will examine and evaluate the flood hazard areas and determine flood elevations for those areas. These elevations will then be used to determine flood insurance rates used by the Federal Emergency Management Agency.

This announcement is intended to inform all interested persons and communities of the commencement of this study so that they may have an opportunity to bring any of their concerns, as well as any relevant technical information, to the attention of the CCRFCD. Comments that you believe should be considered during the course of the study should be addressed to Mr. Kevin Eubanks, P.E. at the CCRFCD, 301 E. Clark Ave., Suite 301, Las Vegas, NV 89101. These comments will be forwarded to the study contractor.

Addresses:

Rick Holmes/Clark Co. Comprehensive Planning
Bill Quinn/U.S. Corps of Engineers
Gary Ryan/Bureau of Land Management
Mary Jo Elpers/U.S. Fish & Wildlife
Butch Padilla/Nevada Dept. of Wildlife
Dennis Cederburg/Clark Co. Public Works
Daniel Hitch/U.S. Geological Services
Soil Conservation Service
Tom Donaldson/McCarren Int'l Airport

This notice will also be published in the Las Vegas Review-Journal and the Las Vegas Sun.

jtk/FLOOD/069223.51

TROPICANA WASH FIS

Kick-off Meeting Agenda
June 10,1992

- Team Organization and Coordination
- Project Schedule
- Public Notification
- Data collection

  - CCRFCD Reports
  - CCPW Reports
  - Topographic Mapping
  - Agency Request for Information

- Community Information

  - Planned Flood Control Features
  - Areas of Rapid Development
  - Reports of Flood Damage or Hazards
  - Evidence of Land Subsidence in the Study Area

- Blue Diamond/Duck Creek
- Status of Aerial Mapping
- Status of Hydrology
- Other Issues
- Next Coordination Meeting

Project Schedule

The project schedule is attached. The major milestones are:

• Notice-to-Proceed	May 20, 1992
• CCO Kick-off Meeting	June 10, 1992
• Hydrology Tech Memo to CCRFCD	July 3, 1992
• Preliminary topo	July 10, 1992
• Approximate Methods Delineations	July 31, 1992
• Detailed Study Delineations	Sept. 16, 1992
• FEMA Submittal	Nov. 18, 1992

Draft

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The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

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Daniel Hitch/U.S. Geological Services
Soil Conservation Service
Tom Donaldson/McCarren Int'l Airport

This notice will also be published in the Las Vegas Review-Journal and the Las Vegas Sun.

ANNOUNCEMENT OF INTENT TO PERFORM FLOOD ELEVATION STUDY

The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

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This announcement is intended to inform all interested persons and communities of the commencement of this study so that they may have an opportunity to bring any of their concerns, as well as any relevant technical information, to the attention of the CCRFCD. Comments that you believe should be considered during the course of the study should be addressed to Mr. Kevin Eubanks, P.E. at the CCRFCD, 301 E. Clark Ave., Suite 300, Las Vegas, NV 89101. These comments will be forwarded to the study contractor.

PUB: June 19 - 25, 1992, incl.
Las Vegas Review-Journal

INVITATION TO BID

MEMORANDUM CH2MHILL

TO: Kevin Eubanks/Clark County Regional Flood Control District

COPIES: Bill Brandt/Clark County Public Works
Robert Thompson/Clark County Public Works Community Development
Rick Holmes/Clark County Public Works Comprehensive Planning
Tom Smith/Michael Baker, Jr., Inc.
Karl Mohr/FEMA Washington
Johnny Taylor/FEMA Region IX
Martin Nicholson/CH2M HILL

FROM: Steve Walker/CH2M HILL

DATE: June 24, 1992

SUBJECT: Tropicana Wash Flood Insurance Study [redacted]

PROJECT: RDD33832.A3.10

This memo will summarize the kick-off meeting for the Tropicana Wash Flood Insurance Study project. The meeting date was June 10, 1992. Attendees were:

Kevin Eubanks/CCRFCD
Gale Fraser/CCRFCD
Bill Brandt/CCPW
Robert Thompson/CCPW
Jon Fuller/CH2M HILL
Steve Walker/CH2M HILL
Ted Davis/CH2M HILL

A copy of the meeting agenda is attached.

Team Organization and Coordination

- Primary contact points for the project will be Kevin Eubanks/CCRFCD and Steve Walker/CH2M HILL. Steve will submit all memos, meeting minutes, correspondence, and project deliverables to Kevin with copies to Bill Brandt and Robert Thompson. Additional copies of correspondence and meeting minutes will be sent to Tom Smith at Michael Baker, Jr.; Karl Moore/FEMA in Washington; Johnny Taylor at FEMA/Region IX; and Rick Holmes at CCPW Comprehensive Planning.

- Two copies of technical memorandums will be submitted to Kevin. The number of copies of the final report to be produced will be decided prior to preparing the final report.

Schedule

- As of this date, the aerial photgrammetry and ground control surveys are complete. Topographic mapping is in progress and on schedule. A memo to Steve Walker from Tim Pool was submitted to Kevin. The planned completion date for the project is mid-November (submittal to FEMA). A project schedule and milestone list is attached.

Public Notification

- A draft public notice and list of addressees for informational request was submitted. The list of addressees was amended to include Rick Holmes/CCPW Comprehensive Planning; Rick Donnelson/USCOE was replaced by Mark Turnak in the Phoenix COE office; Renora Wycoff/BLM was replaced by Gary Ryan; and Tom Donnelson/McCaren Airport was added. The amended list is attached.

Data Collection

- Kevin provided a design report for Valley View. This is a new report that has just been reviewed. It includes a section on related studies. A number of reports that may provide useful information for this study were discussed including a report on the Excaliber-MGM Grand box culvert by Church Engineering, and a report by Summit Engineering on the Universal Resort.

- Most of the other useful drainage studies for the area can be obtained through Robert Thompson. We will be able to photocopy portions of documents from their maps and records room. CCRFCD has provided materials to Public Works for this purpose so no charges for the copying will be assessed. CCPW project reports will be available through Bill Brandt.

- Gale Fraser indicated that all report copies obtained from CCRFCD are to be returned to the District as soon as possible and all reports must be kept and used in the Las Vegas area.

Community Information

- The status of ongoing and proposed development and drainage improvements in the area was discussed. The area west of I-15 is subject to rapid development; however, this will be somewhat limited by a new moratorium on community wells. This law will require that homeowners provide their own wells instead of sharing them and no well may be placed on a property of less than one acre. This will serve to limit the density in the affected area.

- The Master Plan describes all of the currently planned flood control improvements; a new 10-year plan should be available within a few days. No major facilities are planned for the watershed within one year of the planned completion of the study.

- Regarding historical flood damage, it was suggested that Pat Brown/CCPW would be able to provide that type of information. It was further suggested that NDOT be contacted concerning road damage at Rainbow, I-15, Paradise, Flamingo, and Tropicana Boulevards. Information should be available on the flooding that occurred on June 10, 1991.

- None of the meeting attendees was aware of any documented land subsidence in the study area. It was suggested that Terry Johnson, Road Maintenance Section of CCPW, might be a good source for that type of information.

Blue Diamond/Duck Creek Project Status

- Michael Baker, Jr. did not prepare new hydrology for the Blue Diamond/Duck Creek Project. They are evaluating the flow splits and have estimated resulting discharges at the UPRR.

- There has been a discrepancy in the naming convention for some of the washes; specifically with regard to the unnamed wash, which has been called the South Branch of Tropicana Wash on at least one document. Gale Fraser requested that we prepare a new exhibit as soon as possible that would definitively identify the washes and our nomenclature so that this could be coordinated with Michael Baker, Jr. This exhibit will also show flood insurance study discharges as well as the current discharges from Baker's work.

Status of Aerial Mapping and Photography

This was covered earlier in the project schedule report.

Hydrology

- Jon Fuller requested a better hydrology watershed map from the JMM report because the map in the flood insurance study and in the master plan do not show all those sub-watersheds and are not at an accurate or reproducible scale. Kevin indicated that he had spoken to Mike Bagstad/JMM about this issue and that we could call Mike Bagstad directly. No storage routing would be performed at the UPRR crossing. If necessary, the HEC-1 model will be changed to reflect the two culvert crossings at the railroad as opposed to the one which is shown now. Culvert routings will be prepared and ponding elevations will be used to estimate the flood limits upstream of the railroad.

- The flow splits for the I-15 culvert which connects to the Excaliber-MGM Box Culvert will derived from the MGM Box Culvert report by Church Engineering which we will obtain from Robert Thompson.

- For the hydraulics on the approximate methods reaches, the COE area discharge curve will be used to develop preliminary discharges. Depths will be based on the energy grade line. The results, based on these methods, will be reviewed and coordinated with CCRFCD to be sure that the results are reasonable and appropriate.

Other Issues

Notification of future coordination meetings will be done by Kevin Eubanks. Meetings will be scheduled by Steve and Kevin, and CCRFCD will make the appropriate notifications. The next meeting is set for Wednesday, July 25. The topics at that meeting will be Preliminary Results of the Hydrology and the Approximate Method Hydraulics.

Windshield Survey

Following this meeting, Robert Thompson, Kevin Eubanks, Ted Davis, and Steve Walker conducted a "windshield survey" of the watershed. Kevin and Robert provided the following comments concerning various structures and modeling challenges.

- **Continental Hotel**

  The culvert under the Continental Hotel does not have sufficient capacity, and water typically flows in the parking lot above the box culvert. A wall at the downstream end of that parking lot empounds a significant amount of water. The box culvert has significant deposition of silt in the flow of each cell and relatively dense downstream vegetation. Maintenance of the channel of the box is performed by the County on an irregular basis. It was suggested that the "n" value for the model reflect the existing vegetation in the channel and the bottom elevations in the culverts reflect the current deposition of silt. In general, design assumptions for clogging factors at culverts will be used based on the type of upstream vegetation. It will be accomplished by increasing the model width of the piers; however, no bulking factor for sediment load will be used.

- **Airport Channel at Tropicana Wash**

  New topo has been prepared for the discount golf and tennis shop. It is available from Robert. A new barrel is being added to the airport channel culvert under Harmon Road.

- **Harmon Road Culvert Crossing**

  Robert believes that the bridge under Harmon is under capacity. A drainage report was prepared four years ago indicating the channel was under capacity upstream of the bridge.

- **MGM Box Culvert**

  Information is available from NDOT and the Universal Resort drawings by Summit Engineering and the Excaliber Design Plan. The back portion of the Excaliber Resort is apparently in the floodplain.

- **West of I-15**

  The Speer channel at Cameron Road has an estimated 50-50 flow split. Flow paths in this area are poorly defined.

- **Other Comments**

  Upstream of the industrial area, development is relatively sparse. However, a number of single units and small developments encroach into the floodplain. There appears to be some risk of significant erosion-related hazards to some home sites.

Tropica[illegible] FIS
Project Schedule

04-27-92

1992 Jun | Jul | Aug | Sep | Oct | Nov | Dec | 1993 Jan | Feb

06-02-92 Tropicana Wash FIS 12-11-92

06-02-92 06-29-92 Data Collection

06-02-92 Public Notice 06-08-92

06-09-92 Windshield Survey 06-09-92

06-10-92 CCO meeting 06-10-92

06-11-92 Field Reconnaisance 06-24-92

06-25-92 Tech Memo 1 06-29-92

06-02-92 Survey and Mapping 09-09-92

06-02-92 06-29-92 Ground Control

06-12-92 Photography 06-18-92

06-19-92 07-16-92 Preliminary Mapping

07-22-92 Digitize Cross sections 08-11-92

08-12-92 09-09-92 Final Maps and Electronic Files

06-02-92 Hydrology 07-17-92

06-02-92 Develop Discharges 06-11-92

06-12-92 Tech Memo 3 06-12-92

06-15-92 CCRFCD Review 1 06-19-92

06-22-92 FEMA review 1 07-17-92

07-20-92 Hydraulics 09-16-92

07-20-92 Approximate Study reaches 08-07-92

07-20-92 Hydraulic computations 07-31-92

08-03-92 CCRFCD Review 2 08-07-92

07-20-92 Detailed Reaches 09-16-92

07-20-92 Locate Cross sections 07-21-92

07-22-92 Model Preparation 07-28-92

07-29-92 CCRFCD Review 3 08-04-92

07-20-92 Culvert Hydraulics 07-31-92

08-12-92 HEC-2 analyses 08-25-92

08-26-92 CCRFCD Coord/review 4 09-01-92

09-02-92 Floodway definition 09-16-92

09-17-92 Final Products 12-11-92

09-17-92 Workmap preparation 09-30-92

09-17-92 Profile Preparation 09-30-92

10-01-92 Draft Report 10-14-92

10-15-92 CCRFCD Review 5 10-28-92

10-29-92 Revision and Deliverable Preparation 11-11-92

11-12-92 FEMA Submittal 11-18-92

11-19-92 ARC/INFO translations 12-11-92

Plan | Res. Delay | Today

Review Meeting

June 24, 1993

TROPICANA WASH & TRIBUTARIES
Discussion Items For Teleconference
June 24, 1993

Participants: Kevin Eubanks & Gale Fraser - Clark County Regional Flood Control District (CCRFCD), Steve Walker, Ted Davis - CH2M HILL, Tom Smith & Mary Rhoads - Michael Baker Jr., Inc. (MBJ)

Please note that items that need to be responded to are highlighted in underlined italics. Responses are highlighted in bold type.

General:

A. Handle comments and responses via fax to speed up process and incorporate detailed study into preliminary FIRMs, if possible.

B. 100-year natural run must represent actual conditions incorporating overflows or flow splits. If flow is not contained by natural cross-section, flow split must be analyzed to determine effect on BFEs.

C. Floodways can be analyzed two ways in areas of overflows or flow splits:
   1. Confine total 100-year flow to main channel and compare encroached elevation to 100-year natural (reduced by flow splits). If surcharge is less than 1.0 feet at all sections, then floodway is acceptable.
   2. Complete encroachment run for main channel with reduced flows (reduced by flow splits) and compare with 100-year natural (reduced by flow splits) run, if surcharge is less than 1.0 foot, floodway is acceptable as long as the overflow areas are set aside for flow conveyance. This could be done in two possible ways:
      a. Compute actual conveyance areas and show as floodways (or areas reserved for flow conveyance) on FIRM.
      b. Provide note on FIRM explaining that overflow areas are required for flow conveyance and any development in this area must consider downstream impacts on main channel.

CCRFCD indicated that the note on the FIRM would identify to the community the potential floodplain management implications.

D. Flows used in revision (HEC-2 model)

U/S of UPRR	CH2M HILL	Comparison to JMM
North Branch - u/s of C. Branch	1450	
South Branch - u/s of C. Branch	1800	
Central Branch - u/s of S. Branch	1000	
Central Branch - d/s of S. Branch	3300	3300±
Central Branch - d/s of N. Branch	4100	
Central Branch - u/s of UPRR	4100	4600±
Central Branch - d/s of UPRR	2420 *	2700±

UPRR to I-15	CH2M HILL	JMM
Trop. Wash - d/s of UPRR	2420 *	2700±
Trop. Wash - u/s of Valley View	2700 *	2700±
Trop. Wash - u/s of I-15	5100	5100 **

* Value is too high if the UPRR culvert only passes 750 cfs.

** Results from basin-wide storm contribution from Unnamed Wash.

Koval Lane To Confluence With Flamingo Wash

Trop. Wash - d/s Koval Lane	3324	5100 ***
Trop. Wash - u/s Airport Wash	3324	5100 ***
Trop. Wash - d/s Airport Wash	5300	5300
Trop. Wash - u/s conf w/Flam. Wash	5300	5300

*** Due to basin-wide storm contribution from Unnamed Wash (from Blue Diamond) and combining of sub-areas immediately downstream of UPRR culvert. Actual flow through this area is represented by outflow from the UPRR culvert.

- The main concern is the flow of 2700 cfs used between the UPRR and I-15 when the culvert capacity is only 750 cfs. Two options were discussed. Either use 750 cfs or if the UPRR would not hold the flow use 4100 cfs. *CCRFCD said they would look at the effects of using the total flow.*

E. Review status of previous questions:

- Proposed culverts were included in model
  - When will they be complete? End of June
  - When will send as-builts? Already sent construction plans. *CCRFCD will send as-builts as soon as they are available (6-8 weeks).*

- Phone call report 5/25/93
  (previous questions asked by MBJ)
  #12 At x-sections V, AE, AZ, and North trib A, the topwidths don't seem to match.
  #13 At 2 split flow locations, Qs determined by split flow don't match Qs in Floodway runs. Why?

CH2M HILL agreed previously to review and respond to these 2 items.

F. Culverts at UPRR

As discussed in a Memo from CH2M HILL to CCRFCD dated June 24, 1992, p. 4, the HEC-1 model reflects only 1 culvert at U.P.R.R. The memo states that "if necessary, the HEC-1 will be changed to reflect the two culvert crossings as opposed to the one which is shown now."

Special Problem Report #1 dated July 22, 1992
- CH2M HILL cap. 700
- JMM cap. 1600 -- JMM used 2 culverts 1600 & 750 = 2350

Are there 1 or 2 culverts? CH2M HILL explained that there is only one main culvert which can convey flow through the UPRR to the Central Branch of Tropicana Wash. That is the one referred to in the Special Problem Report #1.

Split Flows/Overflow Areas:

I. U/S of UPRR

A. For Central Tropicana Wash:
- At x-section BG(64.179), flows in HEC-2 decrease from 3300 to 2050. Hand calculations indicate:
  - 900 cfs flows out of ROB down Diablo Road toward UPRR
  - 350 cfs flows out of LOB in the ditch along road and re-enters at x-section BF.
  - x-section BF(64.137) flows increase from 2050 to 2400, because of the 350 cfs re-entering.

- *X-sections BD and BE*
  - will water be confined on left overbank?

- *For x-sections AY(63.866), AZ(63.884), BA(63.907), BC(63.979) - will water on right overbank be confined?*

- *For x-sections AZ(63.884), BA(63.907), BB(63.945), BC(63.979) - will water on left be confined?*

B. For North Branch Tropicana Wash:

- *For x-sections B (90.188), C (90.203), D (90.2159), will water be confined on right overbank?*

- For Zone A area between North and Central branches, the flow gets out at x-section G and does not get back in. The exact amount of Q breaking out wasn't determined. *CCRFCD will look at this area in more detail and get back to us.*

E. Tropicana Wash:

- x-section AW(63.682) 4100 cfs -- appears that significant % of flow will leave here on LOB not reflected in HEC-2, may flow down Arville St. If this is correct, the concern is that the BFEs may be too high and a split flow analyses should be conducted. CH2M HILL explained that the culvert headwater elevation at Arville St. was plugged into the HEC-2 resulting in an increase in elevation. Backup calculations are from HY8. Q will be back in by x-section 63.585. *CCRFCD will look at this area and respond.*

2. Between UPRR and I-15

A. Between x-sections AO (62.936) and AQ (63.060) flow split was modeled in HEC-2. 452 cfs leaves and comes back in at x-section AM (62.859). Since this flow returns, is the flooding d/s between Tropicana Ave. and Tropicana Wash from the 3380 overflow? yes.

For floodway, total Q was not forced back in. Surcharges are low. Use of total flow may not increase surcharges over 1 foot.

CCRFCD agreed to try total flow in floodway run.

B. Just u/s of I-15, the 3380 splits at Industrial Rd. with 1400 splitting to the south. Is the flow from Trop. Wash confined to south of Trop. Ave.? yes

C. Don't have HEC-2 along I-15 to show how flow splits over into Dunes golf course. Was done with single x-sections using Manning's equation.

D. What was the basis of the starting water surface elevation at the UPRR?
HY8 analysis of culvert. Elevation of flow when culvert is overtopping was used for starting elevation. We were referred to sheet 13 of 19 in hydraulic notebook.

3. D/S Reach below I-15 culvert exit

A. *x-sections X (60.936) - AF (61.166), why Zone A? Does the water get out at Harmon Ave.?* We don't have any backup for this area.

There is a small culvert under Harmon Ave. There wasn't any backup provided. These Zone A areas were defined by ineffective flow areas. We discussed that there are several possibilities for how to handle this area.

CCRFCD agreed to check out this area and get back to us either with support for present mapping or revised information.

B. *At x-sections V (60.903) and W (60.912), a private road is modeled in HEC-2. Does flow get out here?*

C. x-sections G (60.135), H (60.170), bridge is modeled in HEC-2 and split flow is also modeled. 460 cfs break out to the right. Does it continue down Flamingo Rd.? yes Where does it go? it continues down Flamingo Rd.

SECTION 4

GENERAL CORRESPONDENCE

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT



Virginia Valentine, P.E.
Chief Engineer/General Manager

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Bruce L. Woodbury
Clark County

July 29, 1993

RECEIVED
AUG - 6 1993
CH2M HILL/PHOENIX

Mr. Steven R. Walker, P.E.
2030 E. Flamingo Road #250
Las Vegas, Nevada 89119

Tropicana Flood Insurance Study
Notice To Proceed

Dear Mr. Walker:

This letter will serve as official notice to proceed with Task Number 1 of Section III, Special Services, of the Agreement for Professional Services entered into between the District and CH^{2}M Hill on May 14, 1992. These services include additional hydrologic and hydraulic analyses that deviate slightly from the original scope which are necessary to meet requirements set forth by FEMA's Technical Evaluation Contractor. The supplemental services authorized by this notice will be in conformance with the general task outline presented in your July 23, 1993 letter to me at a cost not to exceed $5,600.

If you should have any questions, please contact Kevin Eubanks

Sincerely,

for VIRGINIA VALENTINE, P.E.
General Manager/Chief Engineer

cc: Martin Nicholson, CH^{2}M Hill

VBV:KLE:jwp

File: Tropicana FIS

301 E. Clark Avenue, Suite 301 • Las Vegas, Nevada 89101
(702) 455-3139 • FAX: (702) 455-3870

Federal Emergency Management Agency

Washington, D.C. 20472

JUL 29 1993

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Jay Bingham
Chairman, Clark County Board
of Commissioners
225 East Bridger Avenue
Las Vegas, Nevada 89155

Re: Preliminary Flood Insurance Study (FIS)/Flood Insurance Rate Map (FIRM) for Clark County, Nevada and Incorporated Areas

Dear Mr. Bingham:

We are pleased to present you with three copies of the referenced preliminary FIS report and FIRM for your review and comment. The FIS report and FIRM have been produced in our countywide format, which means that flooding information for the entire county is presented.

The enclosed version of the FIRM has been prepared directly from the effective FIRMs and Flood Boundary and Floodway Maps (FBFMs) for the county and incorporated areas using a process that involves capturing data in a digital (computer-readable) format and plotting map panels using a specialized computer technology. In so doing, we have incorporated all essential information from the previously effective FIRMs and FBFMs.

In addition to preparing the FIS report in our countywide format, please note that we have made other format revisions to the FIS report and FIRM as well. Road and highway names and centerline data in digital format have been obtained from the Clark County Geographic Information System Office for use in this study. The specific revisions that have been made are summarized in Section 10.0 of the FIS report.

The preliminary FIS report and maps will be the basis for the final community coordination meeting. The purpose of the final community coordination meeting will be to present the revised report and maps and give your community a chance to comment or ask questions. The FIS report and maps are transmitted at this time to give your community an opportunity to review them. We will contact you shortly to schedule a final community coordination meeting. In the meantime, we encourage you to circulate the report and maps as widely as possible among elected officials and staff so that they will have had the opportunity to thoroughly review them prior to the final community coordination meeting.

During the course of preparing the countywide version of the FIS report and FIRM, we determined that modifications to, or additions of, base (100-year) flood elevations (BFEs) were appropriate. Therefore, following the final community coordination meeting, we will initiate a statutory 90-day appeal period for the revised and/or new BFEs. You will receive a letter

approximately 2 weeks prior to the start of the 90-day appeal period which will detail the appeal process. The letter will list the BFEs to be published in your local newspaper in a "Notice of Proposed Flood Elevation Determinations," and will provide the first and second publication dates. The appeal period will start on the second publication date. During the appeal period, community officials and/or other interested parties may submit scientific or technical information that would serve to refute the proposed modified or additional BFEs.

Approximately 2 weeks following the end of the 90-day appeal period, we will initiate preparation of the FIS report and FIRM for final printing. The new FIS report and FIRM for your community will become effective approximately 6 months later. Prior to the effective date, you will be notified that you should review your existing floodplain ordinances and modify the ordinances as necessary to reflect any changes in the FIS report/FIRM, including reference to the new map date. About 3 weeks prior to the effective date, your community will receive printed copies of the report and maps.

If you have any questions regarding the enclosed report and maps, please contact the Chief, Natural and Technological Hazards Division, Federal Emergency Management Agency, in San Francisco, California, at (415) 923-7175, or Mr. Karl Mohr of my staff in Washington, D.C. at (202) 646-2770.

Sincerely,

William R. Locke
Chief, Risk Studies Division
Federal Insurance Administration

Enclosures

cc: Mr. Gale Wm. Fraser II, P.E.
Assistant General Manager
Clark County Regional Flood
Control District

[redacted]
CH2M Hill, Inc.

Mr. Thomas W. Smith, P.E.
Michael Baker Jr., Inc.

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT



— RECEIVED —
JUL 23 1993
CH2M HILL/PHOENIX

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Clark County

July 21, 1993

Mr. Steven R. Walker, P.E.
CH²M Hill
2030 E. Flamingo Road #250
Las Vegas, Nevada 89119

Tropicana Flood Insurance Study

Dear Mr. Walker:

This letter is written as a follow-up and summary of discussions regarding how to proceed with mapping of the Tropicana Wash between the UPRR and I-15. Revision to previous mapping efforts is necessary to address review comments and gain approval from FEMA's technical evaluation contractor, Baker Engineers. Baker's comments regarded the discrepancy between the flow rates determined by the breakout analysis upstream of the UPRR and those used for the floodplain and floodway hydraulic models downstream of the UPRR. The scope of services originally called for mapping of the reach between the UPRR and I-15 with detailed methods using flow rates obtained from the FIS Hydrology Report and determination of a breakout flow rate externally for use in approximate mapping of the breakout flow path upstream of the UPRR. Although conservative, the original approach may deviate from reality.

Options for mapping of the subject reach were discussed with Baker Engineers, CH²M Hill, Clark County Public Works and the District. In order to map the flood hazards as realistically as possible between the UPRR and I-15, the flow through discharges that were determined by the overflow analysis of the UPRR culvert at the main Tropicana Wash will be used. The contribution of flow from other culverts under the UPRR south of the main Tropicana Wash will be determined by applying the HY8 culvert analysis program or a similar method. If appropriate, such flow contributions will be considered in the total flow rate used for detailed analysis of the main Tropicana Wash downstream of the UPRR. If such flow contributions are determined to have negligible impact on the main Tropicana Wash, documentation to support that finding will be included in the technical back up. Additionally, the draft FIRM will include a note identifying the breakout area upstream of the UPRR stating that it must be preserved. (e.g. BREAKOUT AREA - NOT TO BE OBSTRUCTED OR ALTERED)

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(702) 455-3139 • FAX: (702) 455-3870

In that the above described efforts are additional and deviate from the original scope, they may be completed upon authorization from the General Manager under Supplemental Services Task 1, Additional Hydrologic. Upon reciept of a detailed cost estimate for completion of this work, authorization will be forwarded to you.

If you should have any questions, please do not hesitate to call.

VIRGINIA VALENTINE, P.E.
General Manager/Chief Engineer

BY: Kevin L. Eubanks, P.E.
Senior Engineer

cc: Ted Davis, CH2M Hill
Robert Thompson, Clark County Public Works Community Dev.
Tom Smith, Michael Baker Jr., Inc.
Karl Mohr, FEMA Washington
Les Sakumoto, FEMA Region IX

KLE:jwp

File: Tropicana FIS

CH2M HILL TRANSMITTAL

TO Michael Baker Jr.
3601 Eisenhower Ave, ste 600
Alexandria, Virginia 22304

FROM Henry Allen
CH2M Hill
1620 W. Fountainhead Pkwy
Suite

ATTN Reza Rashidmanati

DATE 5/27/93

RE Tropicana Wash, E.I.S.

PROJECT NUMBER RDD33832.A3.20

WE ARE SENDING YOU

☐ ATTACHED ☐ UNDER SEPARATE COVER VIA _____

☐ SHOP DRAWINGS ☐ DOCUMENTS ☐ TRACINGS

☐ PRINTS ☐ SPECIFICATIONS ☐ CATALOGS

☐ COPY OF LETTER ☐ _____

QUANTITY	DESCRIPTION
1	Copy of notebook Vol 2.2A - Hydraulics - includes: Data sheets, Field sheets, cross-sections, discharge rating, Approximate method HEC-2 outputs
	Bluelines of sheets 1, 2, 19, 20 & 23 showing locations of approx. method sections
1	copy of portion of sheet 4 with floodplain & floodway highlighted
	Breakout Analysis calculations
	11"x17" copies showing cross-section location for Breakout Analysis

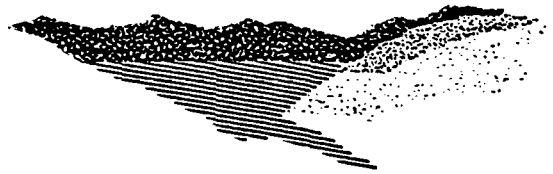
IF MATERIAL RECEIVED IS NOT AS LISTED, PLEASE NOTIFY US AT ONCE

REMARKS _____

COPY TO _____

REV 1/87 FORM 6

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT



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MAY 2 6 1993
CH2M HILL/PHOENIX

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Clark County

May 24, 1993

Mr. Massoud Rezakhani
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, Virginia 22304

Tropicana Wash and Tributaries FIS Restudy
Clark County, Nevada
Case No. 93-09-280P

Dear Mr. Rezakhani:

Enclosed are the construction plans for Special Improvement District No. 67 which you requested. The plans include the box culvert at Tropicana Wash and Arville. This project is presently under construction at the direction of Clark County Public Works Department and is expected to be completed by the end of June, 1993. Once completed, I will either forward certification that the Arville culvert was constructed according to plan or a set of as-built plans as necessary. It is our intention to map the Tropicana Wash floodplain with the Arville culvert and all portions of S.I.D. 67 in place. Therefore, a revised HEC-2 run without the improvements is not included. Should it be determined that there is a need for such a HEC-2 model in the future, one will be provided immediately.

It is my understanding the Chairman of the Clark County Board of Commissioners will be sending the official community acknowledgement shortly.

If you require additional information to adequately address these issues, or if I can be of any further assistance, please call.

VIRGINIA VALENTINE, P.E.
General Manager/Chief Engineer

BY: Ke Eub
Kevin Eubanks, P.E.
Senior Engineer

Enclosure

cc: w/o enclosure:
William R. Locke, FEMA, Washington, D.C.
Karl Mohr, FEMA, Washington, D.C.
Johnny Taylor, FEMA Region IX
Les Sakamoto, FEMA Region IX
Virginia Valentine, Regional Flood Control District
Gale Wm. Fraser, II, Regional Flood Control District
Bill Brandt, Clark County Public Works
Robert Thompson, Clark County Public Works
Richard Holmes, Clark County Comprehensive Planning
Steven R. Walker, CH2M Hill

KLE:jwp

File:Trop/Flam FIS

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CH2M HILL/PHOENIX

JAY BINGHAM
Chairman

Board of County Commissioners

CLARK COUNTY BRIDGER BUILDING
225 BRIDGER AVENUE
LAS VEGAS, NEVADA 89155
(702) 455-3500 FAX: (702) 383-6041

May 18, 1993

William R. Locke, Chief
Risk Studies Division
Federal Insurance Administration
Federal Emergency Management Agency
Washington, D.C. 20472

CASE NO. 93-09-280P
TROPICANA WASH AND TRIBUTARIES FIS RE-STUDY
CLARK COUNTY, NEVADA

This letter will serve as formal written request to consider revision of the flood insurance rate maps affected by the re-study of the Tropicana Wash and tributaries in accordance with Section 65.4 of the National Flood Insurance Program regulations. Technical data was prepared by CH_2M Hill and submitted by the Clark County Regional Flood Control District on February 2, 1993.

If you should have any questions or require any further information, please contact Kevin Eubanks of the Clark County Regional Flood Control District at (702) 455-3139.

Sincerely,

Jay Bingham

Jay Bingham
Chairman

JB:MJM:iam

cc: Karl Mohr, FEMA, Washington, D.C.
Johnny Taylor, FEMA Region IX
Virginia Valentine, Regional Flood Control District
M. J. Manning, Clark County Public Works
Richard Holmes, Clark County Comprehensive Planning
Steven R. Walker, CH_2M Hill

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REGIONAL FLOOD CONTROL DISTRICT



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Clark County

March 22, 1993

Thomas W. Smith, P.E.
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, Virginia 22304

Tropicana Wash and Tributaries FIS Restudy
Clark County, Nevada
Case No. 93-09-280P

Dear Mr. Smith:

Enclosed with this letter are data developed by CH2M Hill to address the topographic issues raised regarding the 1984 maps prepared under the direction of James M. Montgomery Engineers, Inc. and the maps prepared under the direction of CH2M Hill for the Blue Diamond/Duck Creek study in 1992. I hope this data adequately addresses your concerns as discussed in several telephone conversations, your letter dated December 11, 1992, and the March 4, 1993 letter from William R. Locke.

Also enclosed is a letter from CH2M Hill correcting the description in the draft FIS of the vertical datum used to develop the topographic maps for the Tropicana Wash Flood Insurance Study.

With regard to the vertical datum differences between topographic maps used for detailed and approximate method floodplain delineations in the Tropicana study mentioned in Mr. Locke's letter dated March 4, 1993, Section 3.2 of the Draft FIS went on to state that these datum differences had no impact on the detailed study reaches. It seems that approximate floodplain delineations (without BFEs) are independent of topographic datum, and thus, no revision or further clarification should be necessary. Perhaps to avoid confusion, the last three sentences in paragraph three of Section 3.2 could be deleted.

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If you require additional information to adequately address these issues or if I can be of any further assistance, please call.

VIRGINIA VALENTINE, P.E.
General Manager/Chief Engineer

BY: _____
Kevin Eubanks, P.E.
Senior Engineer

Enclosures

KLE:jwp

cc: W/o Enclosures:
William R. Locke, FEMA, Washington, D.C.
Karl Mohr, FEMA, Washington, D.C.
Johnny Taylor, FEMA Region IX
Massoud Rezakhani, Michael Baker, Jr.
Virginia Valentine, Regional Flood Control District
Gale Wm. Fraser, II, Regional Flood Control District
Bill Brandt, Clark County Public Works
Robert Thompson, Clark County Public Works
Richard Holmes, Clark County Comprehensive Planning
Steven R. Walker, CH2M Hill

File: Tropicana FIS

MEMORANDUM

CH2MHILL

TO: Kevin Eubanks/CCRFCD

COPIES: Steve Walker/CH2M HILL
Tim Pool/CH2M HILL
Bill Avery/WESCO

FROM: Ted Davis/CH2M HILL

DATE: March 15, 1993

SUBJECT: Blue Diamond/Duck Creek Mapping
Check Profiles

PROJECT: RDD33832.A4.10

INTRODUCTION

This memorandum transmits the field survey check results on the 1992 aerial mapping of the Duck Creek and Blue Diamond areas. The mapped areas are shown in Figure 1. This package contains the following:

- Descriptions of ERM's
- Check Profiles
- Check elevations along Windmill Lane
- Copies of field survey notes

Surveying and aerial mapping was prepared under the guidelines of FEMA Document No. 37, Flood Insurance Study Guidelines and Specifications for Study Contractors, dated March 1991. Topographic maps show 4-foot contour intervals with supplemental 2-foot contours interpolated in certain areas to aid in future studies. The mapping accuracy is based on the 4-foot contour interval with an accuracy of plus or minus 1/2 of the contour interval, or in this case, 2 feet.

SURVEY CONTROL

Horizontal survey control was tied to the State Plane Coordinate System (NAD 1983) by using the Global Positioning System at each of the aerial control points.

The current Clark County datum and associated bench marks were used for vertical control throughout the mapping area. Control points were tied into the County Datum by field levels with a check made by the Global positioning System. Clark County bench marks are based on the National Geodetic Vertical Datum of 1929 (NGVD 29) as received from the Clark County Surveyor's Office.

ERM DESCRIPTIONS

The following elevation references were established in the field for future use. Note that ERM 1 and ERM 2 were also used in the 1984 mapping.

ERM 1 — RR spike set in power pole on south side near base. Pole located in northeast quadrant of the intersection of Las Vegas Boulevard and Warm Springs Road. (Elevation 2233.20)

ERM 2 — GLO Brass Cap 1.0 foot below existing grade at Gomer Road and 36 feet east of Las Vegas Boulevard. Section Corner. (Elevation 2246.52)

ERM 3 — Spike in power pole 0.3 feet above grade, 200 feet east of Haven Street on North Side of Serene Avenue. (Elevation 2224.66)

ERM 4 — Northeast corner of slab around sewer manhole # PSP 38 on east side of Gilespie Street and approximately 1300 feet north of Serene Avenue. (Elevation 2217.23)

ERM 5 — Northwest corner of vault on east side of Fairfield Avenue approximately 300 feet south of Shelbourne Avenue. (Elevation 2191.57)

ERM 6 — CCBM OC 21 9SWS, northeast corner of Las Vegas Boulevard and Windmill Lane. Aluminum plate in top of curb. (Elevation 2240.69)

ERM 7 — CCBM OC 21 9SSE6, transformer pad on north side of Windmill Lane approximately 150 feet west of Placid Street. (Elevation 2194.08)

ERM 8 Centerline intersections of Gilespie Street and Windmill Lane, rim of well monument, PLS 6625, 1992. (Elevation 2206.95)

ERM 9 CCBM OC 21 15NWS, Brass Cap, southeast corner of Windmill Lane and Bermuda Road. (Elevation 2173.87)

ERM 10 North nut on lower flange of fire hydrant on northeast quadrant of Eldorado Street and Bates Street. (Elevation 2151.35)

CHECK PROFILES

Check profiles were performed in the field to confirm mapping accuracy. Profile locations are shown in Exhibits 1, 2 and 3 and the plots are shown in Exhibits 4 through 7. In accordance with FEMA 37 and the specified mapping accuracy of ± 2 feet, 90 percent of the points checked should be within 2 feet of the measured field elevations. The remaining points should be within 4 feet, which is the contour interval.
The field profiles of Exhibits 3 through 6 show that the mapping was prepared within the required guidelines. Over half of the points checked fell within 6 inches of the field profile.

WINDMILL LANE SPOT CHECKS

In the letter from Baker dated December 11, 1992, there were questions involving actual field elevations and differences in mapping elevations between the 1984 and the 1992 mapping. One area of specific concern was along Windmill Lane. Subsequent field surveys confirmed the elevations shown on the 1992 mapping. Exhibit 1 shows the locations of the field check elevations. The results are as follows with mapping elevations interpolated from the contours.

- Intersection of Windmill Lane and Las Vegas Boulevard.
  Field elevation = 2240.69 (Clark County Bench Mark)
  Mapping spot elevation = 2241.3

- Intersection of Windmill and Giles.
  Field elevation = 2232.69
  Mapping elevation 2233.6

- Intersection of Windmill and Haven
  Field elevation = 2224.45
  Mapping spot elevation = 2224.8

- Intersection of Windmill and Rancho Destino
  Field elevation = 2218.42
  Mapping elevation = 2218.6

- Intersection of Windmill and Gilespie
  Field elevation = 2206.95
  mapping elevation = 2208.0

- Intersection of Windmill and LaCienaga
  Field elevation = 2199.96
  Mapping elevation = 2200.8

- Intersection of Windmill and Placid
  Field elevation = 2191.88
  Mapping elevation = 2193.3

- Intersection of Windmill and Bermuda
  Field elevation = 2173.87
  Mapping elevation = 2176.0

- Windmill Lane 150 ft. West of Placid
  Field elevation = 2194.08 (Clark County Bench Mark)
  Mapping contour = 2194.9

DATUM CHECK

As a partial check between the 1984 and 1992 mapping, two of the ERM's used for the 1984 mapping were located in the field and used as an elevation check. The following results were obtained from the field survey.

- 1984 - ERM 28, Elevation 2233.19
  1992 - ERM 1, Elevation 2233.20

- 1984 - ERM 35, Elevation 2246.34
  1992 - ERM 2, Elevation 2246.52

Based on measurements from these two ERM's, it appears both mapping projects were prepared to a similar datum.

SUMMARY

Results of the check profiles indicate the 1992 mapping was properly prepared to FEMA 37 guidelines with elevations based on the current Clark County Datum (NGVD 1929). This datum appears to be similar to the datum used for the 1984 mapping based on the ERM check.

Based on the field spot elevations along Windmill Lane, the 1992 mapping appears to properly represent actual field elevations along the road.

Although we are unable to comment on the 1984 mapping or the changes that may have taken place due to development or re-grading, some discrepancies may be expected due to mapping accuracies alone. Assuming the 1984 mapping was also prepared to an accuracy of plus or minus 2 feet, some elevations could differ as much as 4 feet between the mapped contours.

Engineers
Planners
Economists
Scientists

March 15, 1993

RDD33832.A3.10

Clark County Regional Flood Control District
301 East Clark Avenue, Suite 301
Las Vegas, Nevada 89101

Attention: Mr. Kevin Eubanks, P.E.

Dear Kevin:

Subject: Tropicana Wash FIS - Vertical Datum

The purpose of this letter is to correct the vertical datum listed in the draft FIS text for Tropicana Wash. The text is located in Section 8, Volume III, of the Technical Support Data Notebook. On Page 11, Section 3.2, the third paragraph of the report, the description of the vertical control should be changed to:

> Vertical control is based on the National Geodetic Vertical Datum of 1929 (NGVD 1929) and horizontal control is tied into the Nevada State Plane Coordinate System (NAD 1983).

We confirmed this datum with the County Surveyor's Office as being their datum at the time of the study. We will make the appropriate changes in the final FIS.

Please feel free to call me if you have any questions.

Sincerely,

CH2M HILL NEVADA

R. Ted Davis, P.E.
Project Engineer

CH2M HILL Las Vegas Office 2030 East Flamingo Road, Suite 250 Las Vegas, Nevada 89119 702.369.6175 Fax 702.369.1107

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT

— RECEIVED —
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February 2, 1993

RECEIVED
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CH2M HILL
LAS VEGAS

Thomas W. Smith, P.E.
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, Virginia 22304

Tropicana Wash and Tributaries FIS Restudy
Clark County, Nevada

Dear Mr. Smith:

At the request of Mr. Karl Mohr, I am transmitting the above referenced study for your review as Technical Evaluation Contractor to the Federal Emergency Management Agency. This transmittal includes the draft work maps (10 sheets) and the Technical Support Data Notebook (Volume I through III of III), Section 8 of which is the draft FIS report text.

The District will make every effort to assist you from this point so that final maps can be published as early as possible. However, the District would like to be given the opportunity to review and give final approval prior to issuance of the Preliminary Flood Insurance Study without incurring any response time limits as mentioned in FEMA Document No. 37. Please direct any comments or questions you may have to me so that I may coordinate a timely response.

Please provide the District with a tentative schedule for review, response, Preliminary Study issuance, final CCO meeting, community review period, public notice, map effective date and any other milestones that you deem pertinent. Such a schedule will provide valuable planning information and will assist the District in coordinating the issuance of effective maps for the Tropicana Wash and the Blue Diamond/Duck Creek system concurrently. Concurrent release of these maps and studies will reduce transition times and any confusion.

301 E. Clark Avenue, Suite 301 • Las Vegas, Nevada 89101
(702) 455-3139 • FAX: (702) 455-3870

If I can be of any further assistance, please call.

Sincerely,

Kevin Eubanks, P.E.
Senior Engineer

Enclosures

KLU:jwp

cc: W/O Enclosures:
Karl Mohr, FEMA, Washington, D.C.
Johnny Taylor, FEMA Region IX
Virginia Bax-Valentine, Regional Flood Control District
Gale Wm. Fraser, II, Regional Flood Control District
Bill Brandt, Clark County Public Works
Robert Thompson, Clark County Public Works
Richard Holmes, Clark County Comprehensive Planning
Steven R. Walker, CH2M Hill

MEMORANDUM CH2MHILL

TO: Kevin Eubanks/CCRFCD

COPIES: Steve Walker/CH2M HILL
Ted Davis/CH2M HILL

FROM: Jon Fuller/CH2M HILL

DATE: November 6, 1992

SUBJECT: Break Out Analysis

PROJECT: RDD33832.A0

This memorandum describes the methodology used to determine approximate flood limits for flows which break out of Tropicana Wash from the Union Pacific Railroad (UPRR) to Flamingo Wash.

Introduction

Break out flows occur at two principal locations within the study area during the base flood. These two locations are at the UPRR culvert and at the Interstate 15 (I-15) culverts. The occurence of break out flows also was documented in the Las Vegas Valley Flood Insurance Study (FIS). Break out flow rates used in this analysis were described in a hydrology report prepared for the Tropicana Wash FIS. Break out flow rates were estimated using the computer program HY-8, which was developed by the Federal Highways Administration to model culvert hydraulics.

General Description

Break out flow at the UPRR culvert flows north along the railroad grade for several hundred feet until it is captured by Tropicana Avenue. The flow then follows grade along Tropicana Avenue to the east, flowing generally within the right of way. At Industrial Road, flow in Tropicana Avenue splits to the north and south. Runoff which splits to the south rejoins Tropicana Wash just upstream of I-15 at the I-15 culvert. Runoff which splits to the north, flows along Industrial Road eventually entering and crossing the I-15 right of way between the Tropicana Avenue Overpass and the Flamingo Road Overpass.

Break out flow at the I-15 culvert flows into the depressed median of I-15 flows north in the median, although a small portion (approximately 200 cfs) crosses I-15 and enters ditches which surround the Excaliber Hotel property. Runoff remaining in the median flows north through the Tropicana Avenue Overpass. After crossing under the Tropicana Avenue Overpass, flow begins to spill to the east out of the I-15 right of way into the Dunes Hotel Golf Course. At this point, runoff from the UPRR break out which split to the north at the Tropicana Avenue - Industrial Road intersection joins the I-15 break out

and also spills into the Dunes Hotel Golf Course. The minor percentage of runoff which does not enter the Dunes Hotel Golf Course continues north under the Flamingo Road Overpass and enters the Flamingo Wash.

From the Dunes Hotel Golf Course, the break out runoff flows generally east through streets and around heavily developed sections of unincorporated Clark County. Portions of the runoff probably enter storm drains, pond in topographically depressed areas, or are temporarily stored in backwater zones. Most of the remaining flow eventually drains into Flamingo Wash near the confluence with Tropicana Wash.

Hydrologic Analysis

Basic hydrologic data were obtained from the Las Vegas Valley Flood Insurance Study Hydrology Report as described in the final Tropicana Wash FIS Hydrology Memorandum to Kevin Eubanks/CCRFCD dated November 5, 1992. Discharge rates for the break out anlayses were obtained by subtraction of culvert or cross section capactity from the adopted FIS discharge rates. Where two or more break out flows combined, peak discharges were added. Accounting of flow rates assured that recombined break out flows were not double-counted, and that the level of detail required for an approximate methods study was maintained.

Hydraulic Analysis

Approximate water surface elevations and flood limits for the break out discharges were modeled using HEC-2, HY-8, recent aerial photography and topographic maps, and engineering judgement. The relatively "channelized" reaches were analyzed with HEC-2. These more channelized reaches included a reach from the UPRR culvert to Tropicana Avenue, a reach along Tropicana Avenue from the UPRR to Industrial Road, a reach from Tropicana Avenue north along Industrial Road to I-15, and a reach from the I-15 culvert along the median to the Flamingo Road Overpass.

Flow splits at road intersections, such as at Tropicana Avenue and Industrial Road, were determined using HY-8 rating curves. Rating curves were developed for each half of the flow area. The horizontal water surface elevation at which the total section could convey the total runoff was determined. The flow rate in each half at this water surface elevation was used as the split flow amount. Rating curves of this type were developed for flow splits at Tropicana Avenue and Wynn Road, Tropicana Avenue and Industrial Road, the I-15 median and flow into the Excaliber property, and Las Vegas Boulevard and Flamingo Road.

Flow split rates from the I-15 median to the Dunes Hotel Golf Course were determined

using the split flow option of HEC-2. Flow out of the east right of way of I-15 was modeled as a normal depth weir. Elevations and lengths for the split flow normal depth weir were determined from the topographic mapping prepared for this project. Weir coefficients were estimated from data collected from aerial photography and field visits.

Single section ratings using HEC-2 were used in heavily urbanized areas located downstream of I-15 and the Dunes Hotel Golf Course. Engineering judgement, and recent aerial photography and topographic mapping were used to determine limits of effective flow, probable flow directions, and location of ponding areas in single section ratings as well as for multiple section HEC-2 runs.

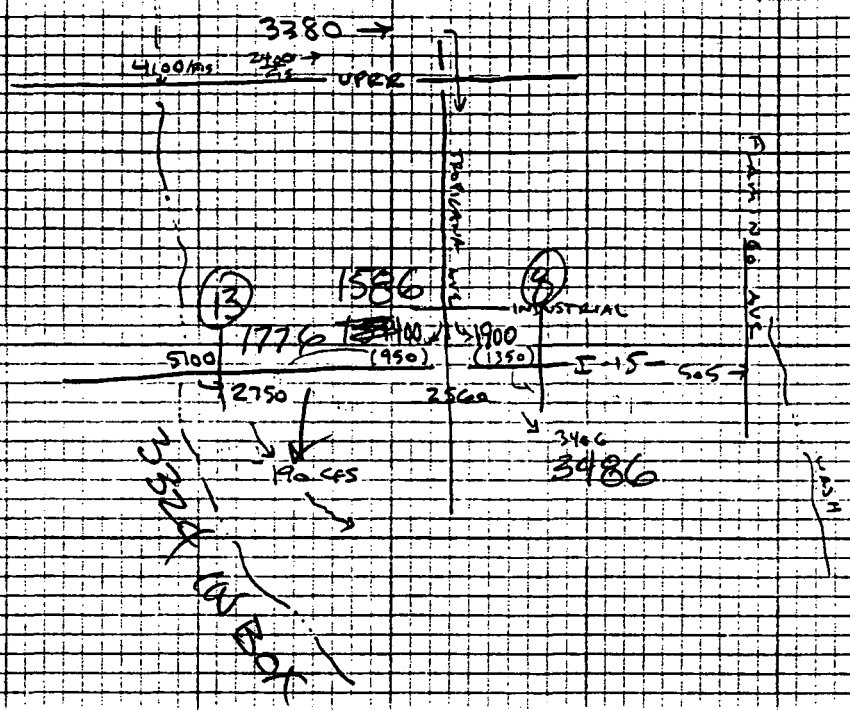
Results

Approximate flood limits for break out flows along Tropicana Wash between the UPRR and Flamingo Wash were determined using a variety of detailed and approximate methods. These flood limits are shown on Figure ___. These flood limits are recommended for encorporation into the Tropicana Wash FIS.

SUBJECT TROPICANA FLS BY JSE DATE 3/19

BREAK OUT MAPPING SHEET OF

DISCHARGE SCHEMATIC PROJECT NO. RDD33832.A2.60



○ THE 5100 CFS AT I-15 ASSUMES ONLY 2400 BREAKS OUT AT UPPER. SINCE CHAN. REDID UPPER CULVERT HYDRAULICS & DETERMINED 3380 (NOT 2400) BREAKS OUT, NEED TO RECOMPUTE SPLIT AT INDUSTRIAL BEFORE ADDING TO I-15 OVERFLOW (USE 2400 AT SPLIT)

X 13 1586

X 8 3486

SUBJECT TROPICANA FLS - UPRR BREAKOUT BY JEF DATE 8-17-92
SHEET 1 OF
PROJECT NO. RDD33832.A2.50

① OBJECTIVE

1) Determine flood limits of flow which breaks out of Tropicana Wash at the UPRR & I-15

② PROCEDURES

1) Estimate Q from HY8 culvert analysis. Do not use flow rate determined from FIS & other report (Mapping only)

2) Determine flood limits using weir ratings of same sections

3) RUN HEC2 along Tropicana Ave.

4) RUN HEC2 along I-15

5) DETERMINE flow splits at each section where flow divides using normal depth calculations

6) Use FIS Q's as basis for selection

③ DISCHARGES

1. UPRR $Q_{CULVERT}$ = 714 cfs
$Q_{BREAKOUT}$ = 3380 cfs
WSEL = 2213.6 (43m TYP.)

} SEE HYDRA CALC. SHEET DATED 7/16/92

2 I-15 $Q_{CULVERT}$ = 3324
$Q_{BREAKOUT}$ = 1776
WSEL = 2154.7

W/O JERSEY BARRIER
2900
2200

SUBJECT TROPICANA FIS BY JEF DATE 8-17

SHEET 2 OF

PROJECT NO. RDD32832

FLOOD LIMITS

① REACH 1 - TROP WASH C UPRR TO TROPICANA AVE

A) WEIR SECTION (XN1)

ELEV	2216	2214	2212	2209	2217	2214
STN	0	205	295	510	550	580

B) SECTION 2.0 (XN2)

ELEV	2218	2216	2214	2212	2208	2204	2204	2208
STN	0	210	380	455	930	1320	1410	1450

C) SECTION 3.0 (XN 3)

ELEV	2216	2214	2212	2208	2204	2201	2202	2203
STN	0	70	490	795	940	980	1465	1660

D) TROP AVE - UPRR WEIR (XN4)

ELEV	2216	2214	2212	2208	2204	2200	2199	2200	2200	220
STN	0	160	450	760	1040	1070	1100	1150	1750	1780

② REACH 2 - TROPICANA AVE US UPRR TO I-15

A) SECTION 5

B) SECTION 6

ELEV	2200	2196	2198	2198	2200
STN	0	80	265	355	430

C) SECTION 7

ELEV	2195	2185	2185	2202
STN	0	100	195	230

D) SECTION 8

ELEV	2196	2180	2180	2196
STN	0	30	120	150

TOMORROW

→ OVERBANK N VALUES - .04 - SOME PAVEMENT, SOME OBSTRUCTIONS

→ CHANGE Q AT WEIR? YES - RATE BY % OF TOTAL WEIR LENGTH

→ INEFFECTIVE FLOW AREAS X3 04 - LEFT - QUANTIFY @ FROM TOPO t = 10000

③ COMPARE TO ACOE

④ CONTACT AN X3 CARDS

SUBJECT TROPICANA FLS BY JEF DATE 8-17

BREAKOUT SHEET 3 OF

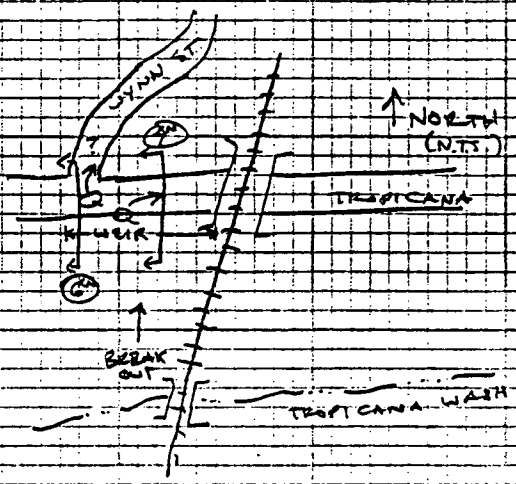
PROJECT NO. 223832.A2.50

(REACH 2)

2D RUN HEC2 USR Q = 3380 CFS. *** DOES BREAKOVER FROM MAIN BRANCH SPILL INTO TROPICANA AVE? NO - SEE MAIN RUN
IF SO INCREASE Q APPROPRIATELY & RE-RUN

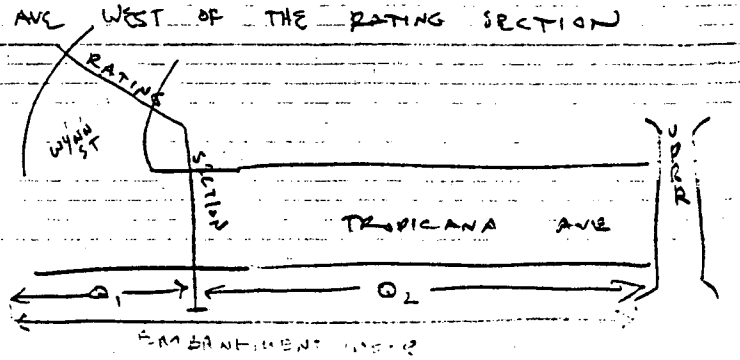
2D DEFINE INEFFECTIVE FLOW AREAS BY EXAMINING AERIAL - WHERE BUDGS & WALLS EXIST = INEFFECTIVE FLOW

2D WILL SOME Q ESCAPE DOWN WYNN ST (VALLEY VIEW?) TO THE NORTH FROM TROPICANA



ANALYSIS OF WYNN RD FLOW:

1. RATE WEIR OVER TROPICANA AVE. EMBANKMENT
2. AT XN (7) HEC [TROPAVE1.DAT] INDICATES ENTIRE 3380 CFS CAN BE CONVEYED. THEREFORE, ANY Q FLOW OVER TROP. AVE. EMBANKMENT EAST OF XN (7) WILL FLOW DOWN TROPICANA AVE. DEPTH AT XN (7) IS 3.30' PER HEC2. THEREFORE, ASSUME NO FLOW DOWN WYNN ST IS POSSIBLE UNTIL DEPTH OF ROAD SECTION IS LESS THAN 3.5 FT
3. LOCATE A SECTION AT POINT WHERE WYNN ST & TROPICANA AVE. JOIN - RATE EACH ROAD SEPARATELY (CONSTRUCT RATING CURVE FOR EACH). THE SUM OF FLOW AT ONE WSEL SHOULD EQUAL THE PERCENT OF FLOW FALLING OVER THE WEIR/EMBANKMENT INTO TROPICANA AVE WEST OF THE RATING SECTION



$Q_{TOT} = Q_1 + Q_2$

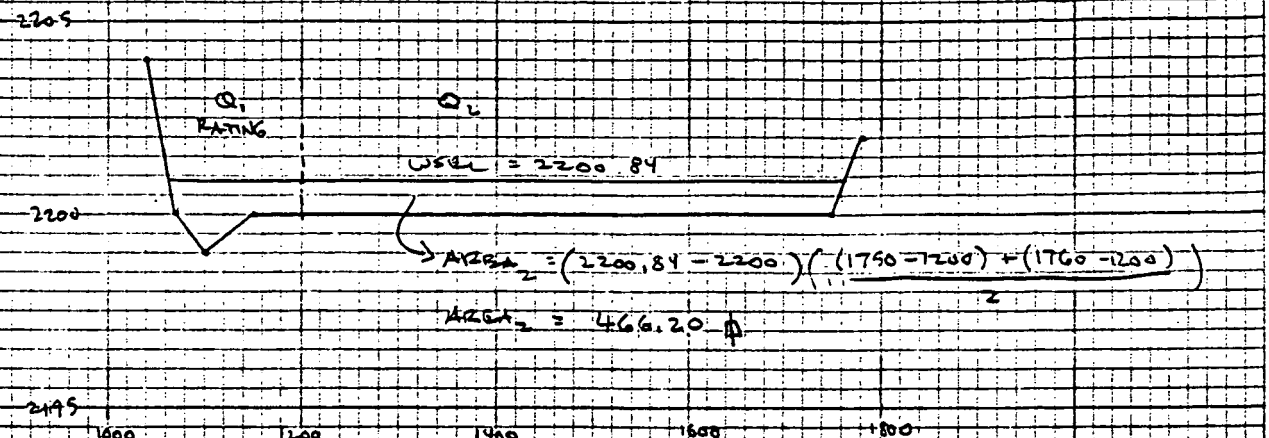
SUBJECT TROPICANA FIS BY JEE DATE 8/17

SHEET 4 OF

PROJECT NO. RDD 33832.A2.50

(REACH 2)

TRAP AVE WEIR / EMBANKMENT



$AREA_2 = (2200.84 - 2200)\left(\frac{(1750-1200)+(1760-1200)}{2}\right)$

$AREA_2 = 466.20$ ft²

From HEC2, TOTAL FLOW AREA = 618

$\therefore AREA_1 = 151.80$ ft²

BY AREA PERCENTAGE $\frac{151.80}{618} = 25\%$

FLOW: 25% OF 3350 = 838 CFS

RATING CURVE - USE HY8 [TRAP-80.INP -TW] 8-8-92

1. TROPICANA AVE TAILWATER CURVE

BED ELEV = 2195

BW = 90

Z = 3

S_o = .027

BLEV	Q	V
0	2195.0	0
80	.17	5.1
160	.26	6.7
240	.34	7.8
320	.40	8.8
400	.46	9.6
480	.51	10.3
560	.56	10.9
640	.61	11.5
720	.65	12.0
800	.69	12.5

2. WYNN AVE [WYNN-80.INP -TW]

ELEV = 2196

BW = 90

Z = 5

$S_o = \frac{4}{330} = .012$

ENTIRE Q CONTAINED IN TROPICANA AVE (800 CFS WSEL = 2195.69 (INVERT OF WYNN = 2197)

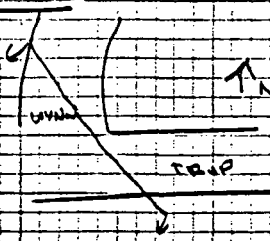
THE 2ND APPROACH - ANGLE SECTION AS SHOWN IN SKETCH ON NEXT PAGE

SUBJECT Tropicana F.S BY JEF DATE 8/17

SHEET 5 OF

PROJECT NO. RDD33532.A2.50

REACH 2



ELEV	2200	2196	2200
STN	0	300	530

(HYB FILE TROP-502-TW1)

S = .02

AT 810 CFS WSEL = 2197.4 VEL = 11 FT/S

BY INTERPOLATING FROM TABLE, THIS WSEL IS AT THE TROPICANA R-O-W THEREFORE NO Q DOWN WINN ST

CONCLUSION: ALL BYPASSOUT CONTAINED IN TROPICANA

REACH 3

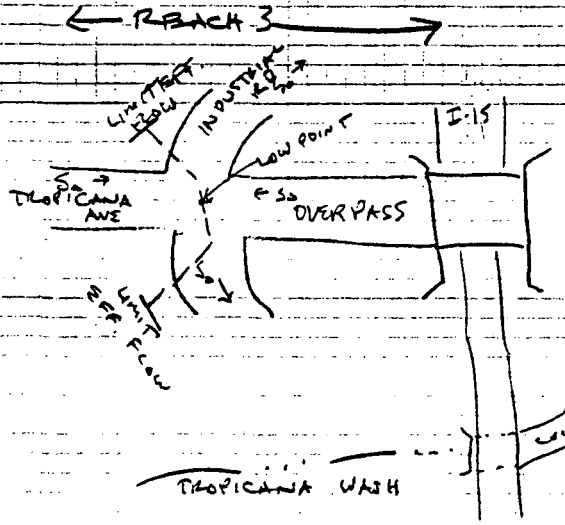
Q AT I-15 CULVERT INLET = 5100 CFS PER FLS HYDROLOGY REPORT

FOR Q=5100 CFS, 3324 CFS ENTERS CULVERT & 1776 CFS WEIRS OVER JERSEY BARRIER AT A WSEL OF 2154.7

THIS WSEL IS LESS THAN PIP ELEVATION OF 2156 AT TROPICANA AT INDUSTRIAL AVE. THEREFORE, ONLY TROPICANA AVE Q OF 3380 CFS WILL BE CONSIDERED AT INTERSECTION SPLIT FLOW.

DETERMINE SPLIT AT INDUSTRIAL RD.:

1. LOCATE XN THRU INTERSECTION. BEND ENDS OF SECTION TO BE ⊥ TO FLOW GOING DOWN INDUSTRIAL RD (EITHER NORTH OR SOUTH)



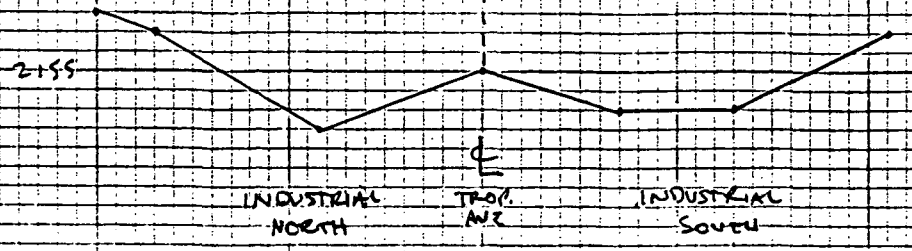
ELEV	2156.5	2156	2157.5	2155	2154	2154	2156
STN	0	30	115	200	270	330	410

SUBJECT TROPICANA FIS BY JEF DATE 8/17

SHEET 6 OF

PROJECT NO. RDD33832.A2.50

(REACH 3)



$S_o = .030$ $S_o = 0$ $S_o = 0.014$

$Q_{TOTAL} = 3380$ CFS

$N = 0.015$

0 200 400

RATING CURVE FOR NORTH [NORTH.TW] SOUTH [SOUTH.T

Q	ELEV	ELEV
0	2153.5	2154.0
400	4.43	4.62
800	4.70	4.88
1200	4.90	5.07
1600	5.05	5.21
2000	5.17	5.35
2400	5.29	5.47
2800	5.39	5.58
3200	5.49	5.68
3600	5.58	5.78
4000	5.67	5.88

(SAME SECTION AT 2400 CFS) FIS Q'S

$Q_{SOUTH} = 950$

$Q_{NORTH} = 1350$ } NOT USED

WSEL = 2154.96

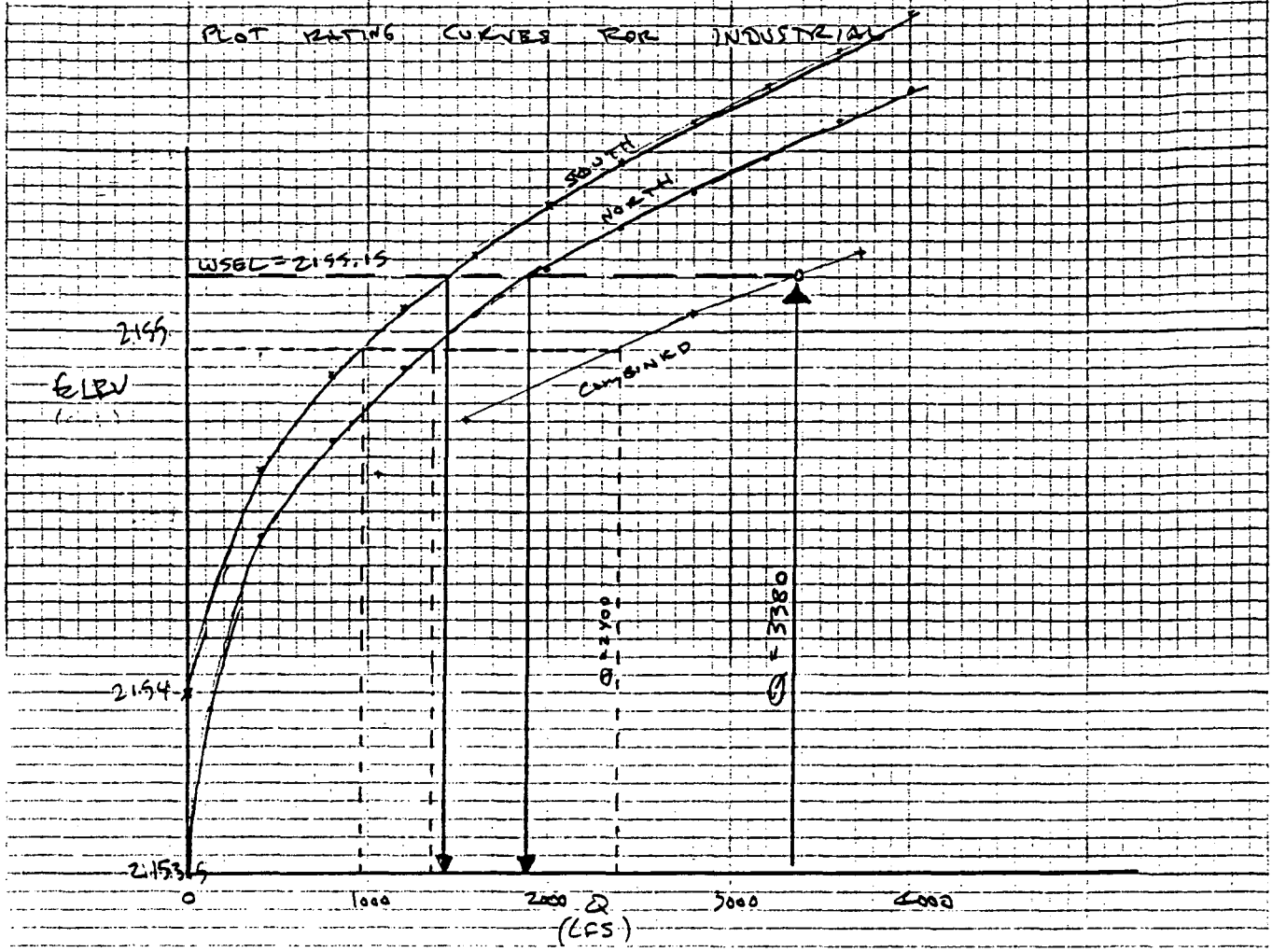
SUBJECT TROPICANA ELS BY JEE DATE 8/17

SHEET 7 OF

PROJECT NO. R0033872.A2.50

(REACH 3)

PLOT RATING CURVES FOR INDUSTRIAL



Q_{NORTH} = 1900 CFS

Q_{SOUTH} = 1440 CFS

Q_{SOUTH} - FLOODPLAIN MERGES W/ DETAILED STUDY

Q_{NORTH} - BECOMES REACH 4

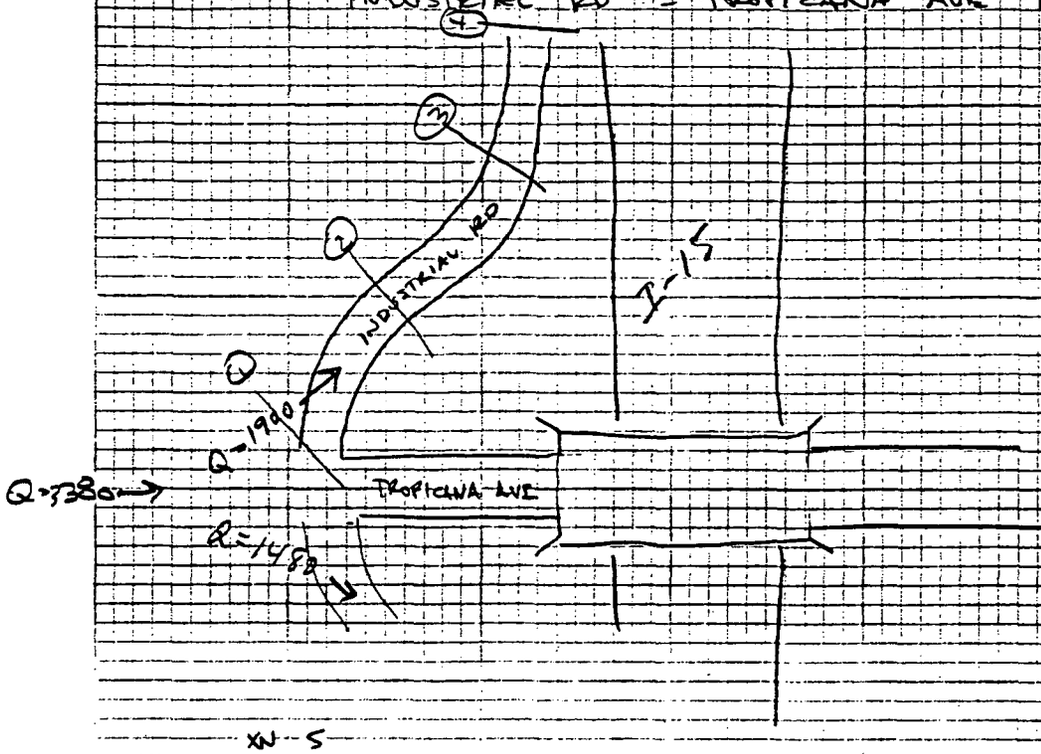
SUBJECT TROPICANA FLS BY JEE DATE 8-17-92

SHEET 8 OF

PROJECT NO. RDD33832.A2.50

REACH 4 Q = 1900 CFS

INDUSTRIAL RD - TROPICANA AVE TO I-15



XN 5

ELEV	2134	2132	2130	2129.3	2130	2131.8
STN	0	95	205	300	315	355

XN 4

ELEV	2136	2134.4	2134	2133.1	2134	2133.8	2134
STN	0	100	180	190	205	230	275

XN 3

ELEV	2144	2140	2140	2139.1	2140	2143.4	2144
STN	0	130	395	420	440	510	550

.04 .02 .04

XN 2

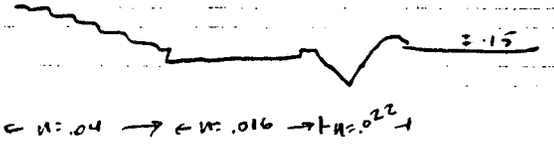
ELEV	2156	2152	2148	2146.2	2146.4	2146	2160
STN	0	25	100	200	290	495	540

.04 .016 .024

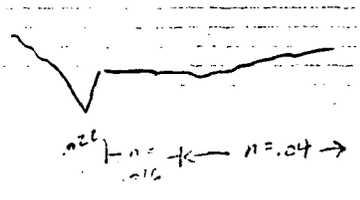
XN 1

SEE REACH - SPLIT SECTION

XN 5 & 4



XN 3 & 2



SUBJECT TROPICANA EIS BY JEF DATE 8/17

SHEET 9 OF

PROJECT NO. RDD 33832.A2 60

(REACH 4)

RUN HEC2 "NORTH 50.DAT"

REACH 5 I-15: TROPICANA WASH TO FLAMINGO AVE

Q OVER JERSEY BARRIER = 1780 CFS

Q FROM TROPICANA AVE = 1410 CFS

XN 1

ELEV	2132	2128	2124	2124	2125
STN	0	85	100	305	320

XN 2

			LWEIR			
ELEV	2132	2128	2126	2124.9	2126	2126
STN	0	40	120	175	219	275

XN 3

						LWEIR		
ELEV	2130	2128	2126	2125.7	2126	2127.6	2126	2124.6
STN	0	145	170	180	190	230	265	280

2126 2127.8

300 350

XN 4

					LWEIR				
ELEV	2130	2128	2126.9	2128	2128.8	2126	2126.9	2128	2129
STN	0	225	325	340	380	415	440	460	500

XN 5

				LWEIR			
ELEV	2132	2130	2128	2129.9	2128.5	2130	2130
STN	0	130	350	410	465	495	525

XN 6

	LWEIR					
ELEV	2131.8	2130	2129.8	2130	2131.7	
STN	0	40	55	70	115	
	(355)	(395)	(410)	(480)	(595)	

JOIN TO NORTH-50.DAT XN# 5 FOR C-SECTION

XN 7

ELEV	2135	2134	2132.5	2134	2134.6
STN	0	30	95	85	120

XN 8

ELEV	2140	2138	2136	2138	2140
STN	0	70	100	120	165

XN 9

ELEV	2160	2144	2140	2139.5	2140	2143.5
STN	0	20	100	120	130	220

XN 10

ELEV	2160	2144	2144	2160
STN	0	45	250	700

3/90 1700 66

SUBJECT TROPICANA F.S BY SEE DATE 8/17

SHEET 19 OF

PROJECT NO. RDD 33522 A2.60

(REACH 5)

XN 11

ELEV	2152	2147.6	2147.4	2147.3	2152
STN	0	45	110	195	250

XN 12

ELEV	2152	2150	2149	2150	2151.3
STN	0	15	40	55	105

XN 13

ELEV	2156.9	2156	2154.6	2156	2156.1
STN	0	40	70	95	120

XN 14

ELEV	2160	2158	2160
STN	0	60	120

WEIR OVER I-15 CULVERT ENTRANCE / WEIR PROFILE

OBTAINED BY ADDING 2.5 FT TO RAMP PROFILE

ELEV	2160	2156	2152	2149.7 2150	2152	2154	2156	2160
ELEV+2.5	2162.5	2158.5	2154.5	2152.2 2152.5	2154.5	2156.5	2158.5	2162.5
STN	0	110	280	495 540	675	880	1035	1570

(1) Q = 1780 + 1410 = 3190 CFS

WEIR ELEV'N HY8 I15CULV.INP

WEIR COEFF = 2.7 (SIMULATED USING CULVERT = 0.1 FT CMP W/ VERY HIGH TW

SPILLOVER ELEVATION = 2155.17 ≈ 2155.2

NOT DOUBLE COUNTING BREAK OUT

(2) Q = 1780 + 950 = 2730 USE 2750 CFS

WEIR ELEV'N = 2154.97 I15CULV2.INP

= 2155.0

SUBJECT TROPICANA E.S. BY JEF DATE 8/17

SHEET 12 OF

PROJECT NO. RDD33832.A2.60

(REACH 5)

PROCEDURE

(1) RUN HEC2 TO SEE IF BACKWATER CONDITION EXISTS ALONG I-15 "N" IS-BO.DAT"

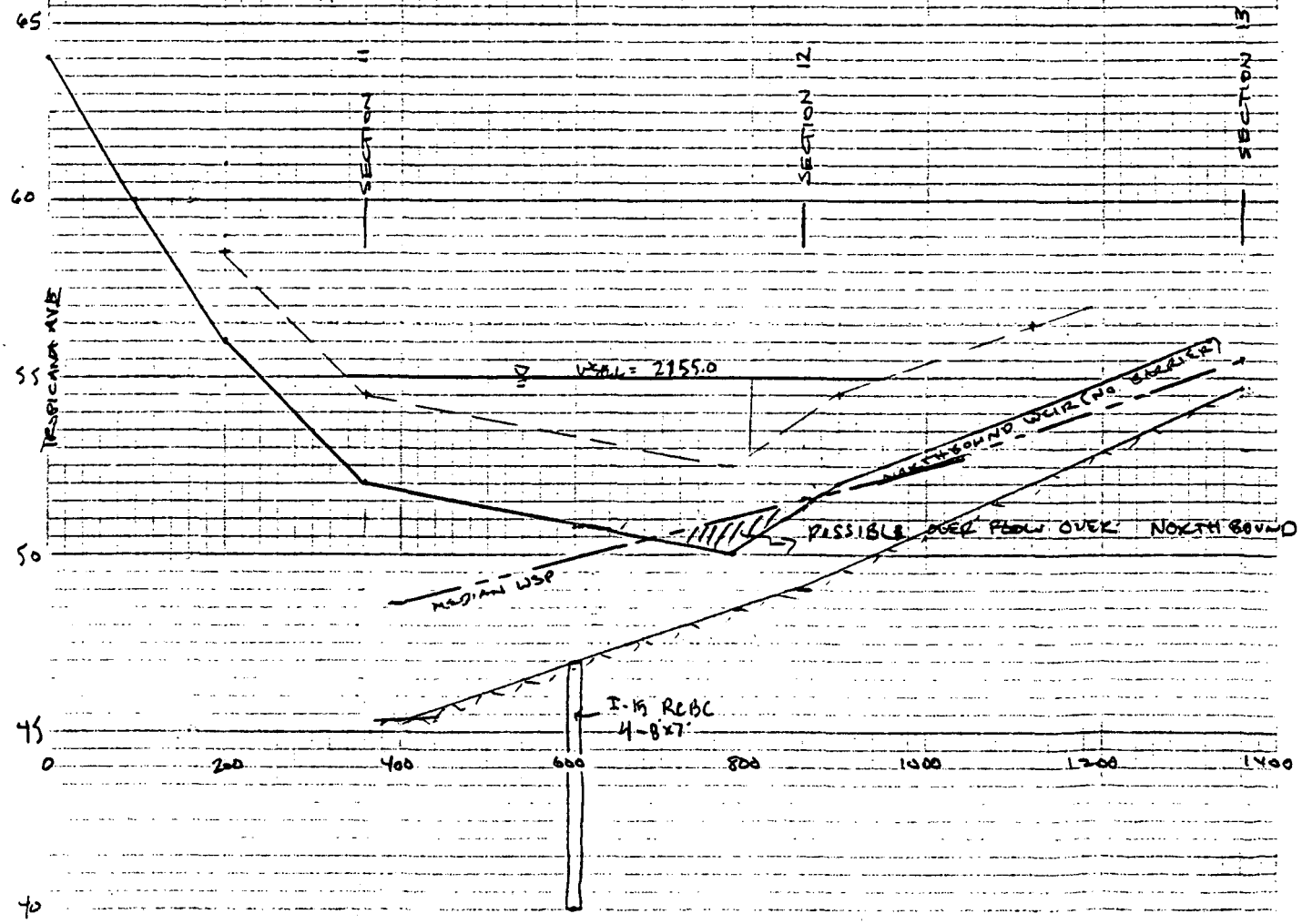
RESULTS: CRITICAL DEPTH ASSUMED AT XNS 6, 7, 8, 11, 12, 13
NO BACKWATER EXCEPT UNDER TROPICANA AVE UNDERPASS

(2) DETERMINE NORMAL DEPTH RATINGS FOR XNS 11, 12, 13

XN	Q	WSE	FILE	
11	2750	2148.6*	IISXN11.DAT	
12	775		IISXN12.DAT	COMBINE
13	1 0 USE 75		IISXN13.DAT	IISRSA.DAT

* = CRITICAL DEPTH

NORTHBOUND I-15 OVERFLOW WEIR PROFILE



NORTHBOUND (NB) BREAKOUT - RATE AS WEIR

L = 200'

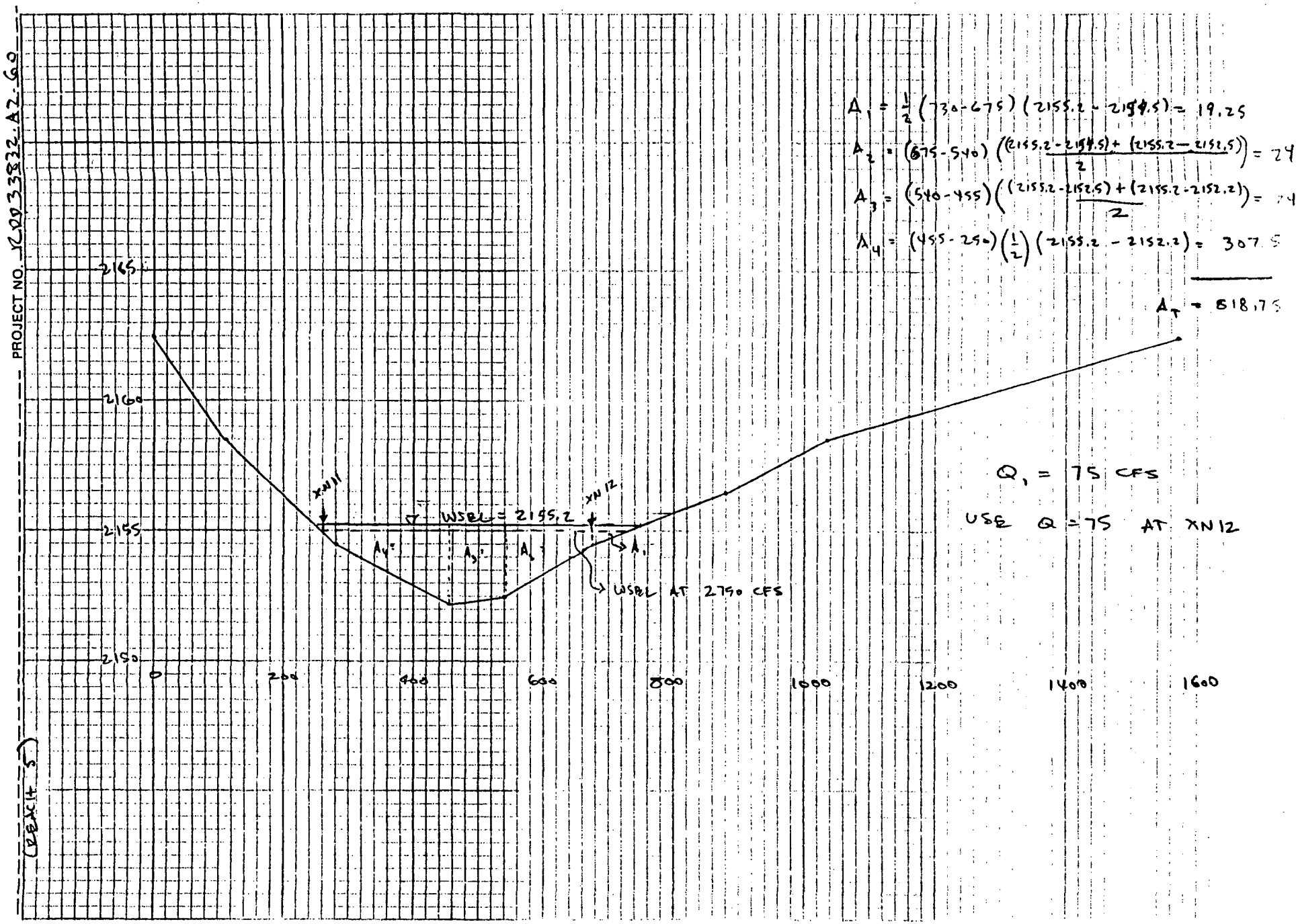
H = 0.5'

$Q = CLH^{3/2}$

C = 3.7

SUBJECT Oroville FIS BY JEF DATE 8/17

PROJECT NO. 4209338822.A2.60 SHEET 11 OF



$A_1 = \frac{1}{2}(730-675)(2155.2-2154.5) = 19.25$

$A_2 = (675-540)\left(\frac{(2155.2-2154.5)+(2155.2-2152.5)}{2}\right) = 249.$

$A_3 = (540-455)\left(\frac{(2155.2-2152.5)+(2155.2-2152.2)}{2}\right) = 247$

$A_4 = (455-250)\left(\frac{1}{2}\right)(2155.2-2152.2) = 307.5$

$A_T = 818.75$

$Q_1 = 75$ CFS

USE $Q = 75$ AT XN12

SUBJECT TROPICANA FLS BY JEF DATE 8/19

SHEET 13 OF

PROJECT NO. RDD33872.A2.6

(REACH 5)

SECTION 7 & 9 WERE ASSUMED CRITICAL

DO SPLIT FLOW FROM SECTION 6 TO 10 [I15R56.DAT]

(MAX Q TO XN 7 = 2560)

SPLITFLOW WEIR XN:	6	7	8	9
ELEV:	2131.7	2134.6	2149	2148.5
STN	2500	2920	3360	3660

XN	1	2	3	4	5
ELEV	2125	2126	2127.8	2129	2130
STN	0	500	1000	1500	2000

ADD IN SECTION 5 FROM REACH 4 TO REACH 5 - SECTION 6

XN	Q_{XN}	Q_{SF}
1	505	271
2	776	543
3	1319	248
4	1567	414
5	1981	437
6	2418 (RSCO)	699
7	1766	726
8	2492	68
9	2560	0

Σ = 3406

Summary

(1) 190 CFS FLOWS OVER I-15 TO EXCALIBER AREA WILL BE LESS THAN 1 FT DEEP - NO FEMA MAPPING (190 CFS AT 1 FT/S - NEED ONLY 190 FT AT 1FT DEPTH - HAVE ~ 800 FT WIDE "SHEET" FLOW IN P.A.A.L.'s)

(2) FLOW ALONG I-15 NORTH BREAKS OVER INTO GOLF COURSE

(3) APPROX 500 CFS FLOWS NORTH

SUBJECT TROPICANA FIS BY JEF DATE 8/19

SHEET 14 OF

PROJECT NO. R0033832.A2.50

BREAKOUT

REACH 6 I-15 - FLAMINGO AVE OVERPASS TO FLAMINGO

BASED PHOTO & TOPO INTERPRETATION, CO REMAINS IN I-15 R-O-W & FLOWS INTO FLAMINGO WASH CHANNEL

REACH 7 OVERLAND FLOW I-15 TO

DETERMINE OVERBANK FLOW DIRECTIONS

SECTION 1

ELEV	STN	
2120	0	.045
2116	340	
2113	570	
2110.5	705	.99
2110.5	1350	
2110	1460	.045
2110	2320	
2112	2460	
2114	2660	
2116	2990	
2118	3180	
2120	3680	
2124	4300	

OVER-1 .DAT

SECTION 2

ELEV	2108	2103.2	2103.2	2108
STN	0	90	190	235

SECTION 3

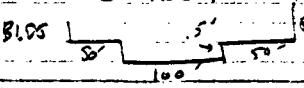
ELEV	2108	2107	2107.4	2106	2105
STN	0	150	270	550	1050

n=.99

SPLIT AT CORNER OF FLAMINGO & LAS VEGAS BLVD

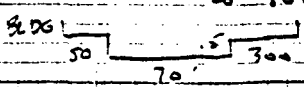
RATING CURVE FOR VEGAS BLVD

$S_o = .0011$



FLAMINGO

$S_o = .02$



	Q	
2505.5	0	2104
2506.04	320	4.6
6.47	640	4.8
6.82	960	4.9
7.14	1280	5.0
7.41	1600	5.1
7.66	1920	5.2
7.90	2240	5.2
8.13	2560	5.3

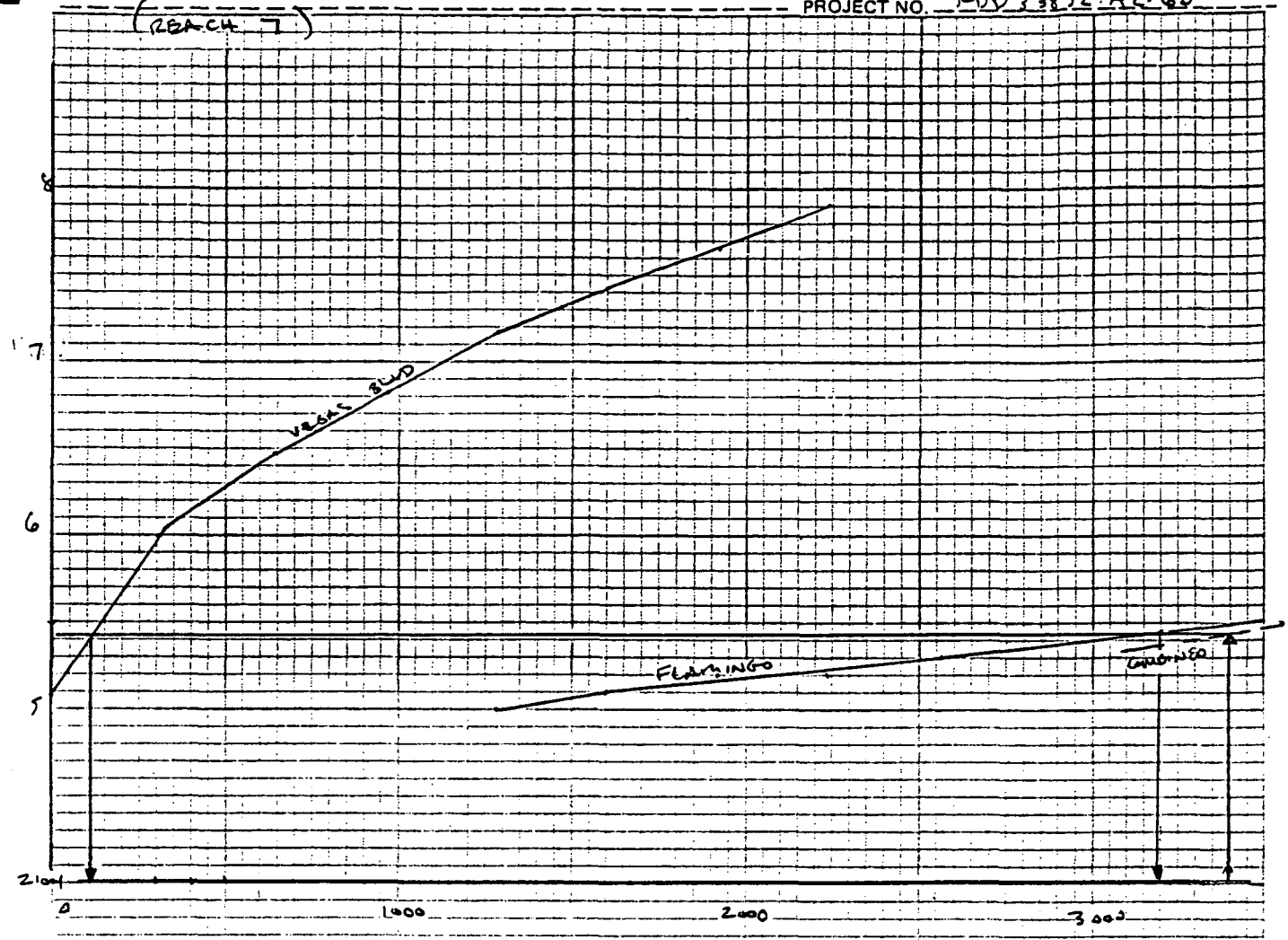
ENT

SUBJECT TROPICANA FLS BY JBF DATE 8/19

SHEET 15 OF

PROJECT NO. RDD 33832.A2.60

(REACH 7)



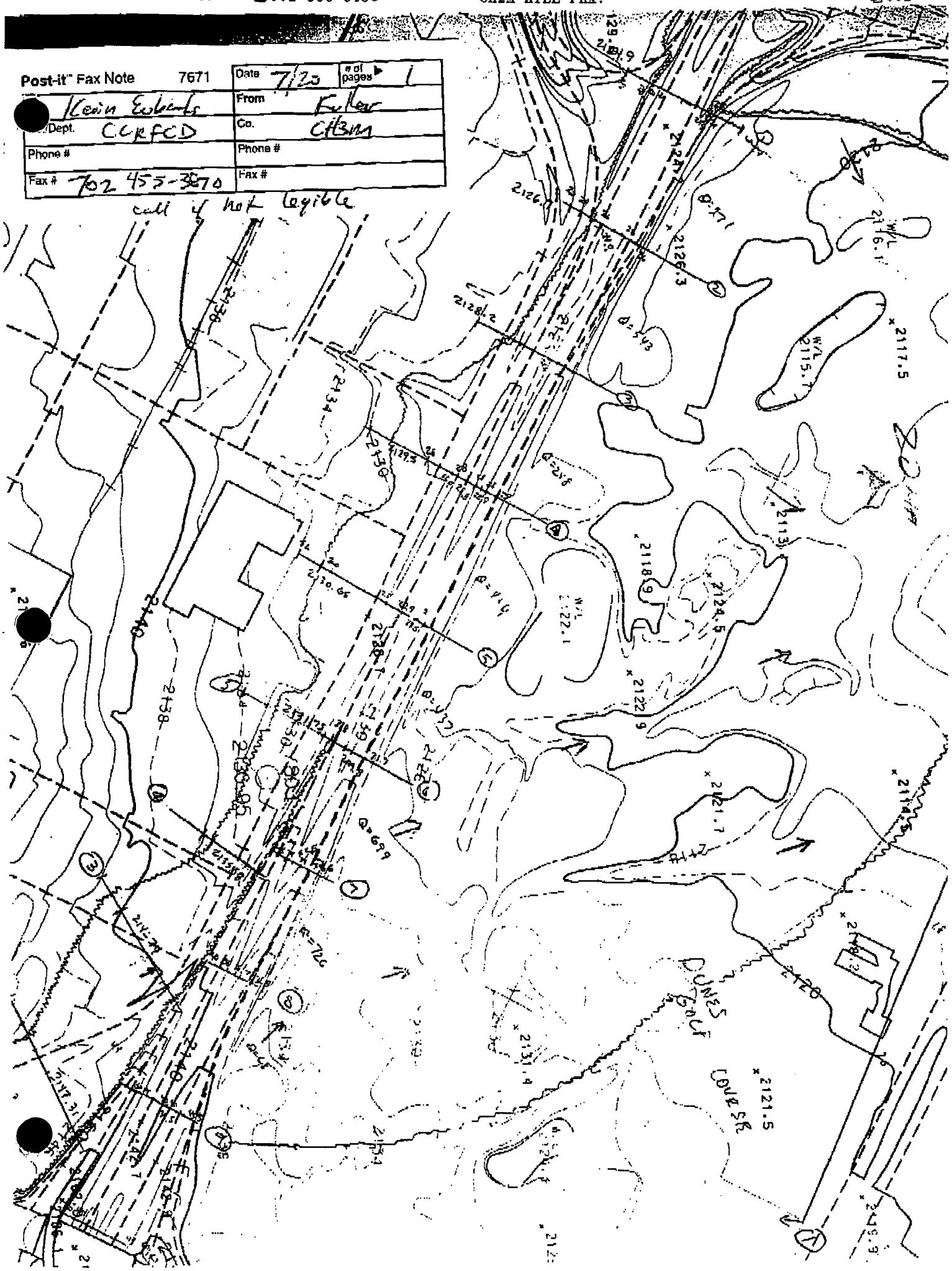
$Q_{FLAMINGO}$ = 3250 CFS

Q_{VEGAS} = 150 CFS

[redacted]

Post-it™ Fax Note 7671	Date 7/25	# of pages ▶ 1
To Kevin Edwards	From Fuller	
Dept. CCRFCD	Co. CH2M	
Phone #	Phone #	
Fax # 602 455-3670	Fax #	

call if not legible



TRANSMITTAL

TO CH2M Hill
PHX

ATTN Steve Walker

RE Las Vegas Flood Plain Restudy AP 17724

DATE 9-4-92

PROJ. NO. RDD 33832.A4.10

CH2M HILL
Redding Office
2525 Airpark Drive, Redding, California 96001
P.O. Box 492478, Redding, California 96049
916/243/5831

WE ARE SENDING THE FOLLOWING MATERIAL TO YOU SHIPPED VIA:

FED EX: ☒ Priority 1 ☐ Standard Air
UPS: ☐ Red Label ☐ Blue Label ☐ Ground
SURFACE: ☐ Truck ☐ Bus
FIRST CLASS MAIL ☐
OTHER ☐ _____

QUANTITY	DESCRIPTION
	5 24" x 36" mylar photoplan sheets. Approximate scale: 1"= 400'.
	Prepared from aerial photography dated 5-30-92.
	One set of 5 1"= 400' topo/ planimetric plots.
	Photoplans have been scaled and registered as closely as possible to these plots.
	One set of 5 1"= 400' ± photo enlargements used in sheet preparation.

IF MATERIAL RECEIVED IS NOT LISTED, PLEASE NOTIFY US AT ONCE

REMARKS _____

COPY TO _____ BY Bob Bryan

COPY DISTRIBUTION
1. WHITE-SHIPPING 2. YELLOW-FILE 3. CHRONO FILE

REV 6/89 FORM 6

Engineers
Planners
Economists
Scientists

August 17, 1992

RDD33832.A3.10

Clark County Regional Flood Control District
301 Clark Street Suite 300
Las Vegas, NV 89101

Attention: Mr. Kevin Eubanks, P.E.

Dear Kevin:

Subject: Tropicana Wash Flood Insurance Study
Topographic Mapping

As we discussed, CH2M HILL has received a number of requests for copies of the topographic mapping being prepared for the Tropicana Wash Flood Insurance Study. We have recently provided preliminary copies of the topographic mapping for this project in both hard copy and digital format for your use in performing reviews of our preliminary work products. CH2M HILL is pleased to provide this preliminary topographic mapping product for your use and distribution as you deem appropriate. We request however, that you make any potential users aware of the following limitations on the accuracy of the mapping:

- This mapping is preliminary. At this stage of the project, it has not been subjected to quality control review nor have the check profiles been completed.

- As a preliminary work product, discrepancies and errors in the mapping are to be expected.

- This mapping is being prepared for a flood insurance study as part of the regular phase of the National Flood Insurance Program, and is intended to meet the specifications outlined in FEMA 37, Guidelines and Specifications for Study Contractors. As such, the scale, the contour interval, and the required level of accuracy are not appropriate for design, and may not be appropriate for other uses.

- The supplemental contours on the topo are interpolated, and are intended to meet the standard guidelines for accuracy of 4-foot contour interval topographic mapping of ±2 feet.

If you have any questions, please give Ted Davis or me a call at 369-6175.

Sincerely,

CH2M HILL NEVADA

Steven R. Walker, P.E.
Project Manager

LAS/jtk/FLOOD/TOPOMAP.LTR

cc: Martin Nicholson/CH2M HILL
Tim Pool/CH2M HILL
Ted Davis/CH2M HILL

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT



— RECEIVED —
AUG 5 1992
CH2M HILL/PHOENIX

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Chief Engineer/General Manager

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City of Las Vegas

Jan Laverty Jones
City of Las Vegas

Tom R. Leavitt
City of Mesquite

Bruce L. Woodbury
Clark County

August 3, 1992

Martin Nicholson, P.E.
CH2M Hill
2030 E. Flamingo Road #250
Las Vegas, Nevada 89119

Tropicana Flood Insurance Study
Hydrologic Documentation

Dear Mr. Nicholson:

The District's review of the hydrologic documentation for the Tropicana Wash Flood Insurance Study has been completed. The procedures, documentation and conclusions were found acceptable for use as the study proceeds. The following comments are offered for your consideration:

1) To clarify the statement on page 5 of the Memorandum, the District advises, with concurrence from Michael Baker Jr.(MBJ), that the Tropicana Wash discharges adopted from the FIS Hydrology Report by James M. Montgomery (JMM), should be applied as the Tropicana floodplain delineation study proceeds. The adopted discharges include flow contributions from the Blue Diamond Wash ("...existing Blue Diamond discharges...") and are comparable to the discharges developed by MBJ.

2) Table 3 could be expanded to include drainage area in order to provide a direct correlation to the Corps of Engineers regional regression curve. Discussions are underway to determine an appropriate discharge limit for delineation of approximate methods floodplains.

3) Documentation Abstract:

a) Was an SDN#5 hyetograph used for watersheds exceeding 10 square miles?

b) The aerial mapping supplied by CH2M Hill should be described as 4 foot contour with supplemental 2 foot contours so as not to be misleading regarding the level of accuracy. A full explanation of the use of supplemental contour should be included.

c) Community Reviewer should list:

The District, Attention: Kevin Eubanks

and add:

Clark County Public Works, Engineering Division
6655 W. Sahara, Bldg C-204
Las Vegas, Nevada 89102
Attention: William C. Brandt, P.E.

Clark County Public Works
Community Development Division
401 East Fourth, Las Vegas, Nevada 89101
Attention: Robert Thompson, P.E.

d) Coordination of Flow Rates should be the District, Attention: Gale Fraser and Kevin Eubanks. This heading could include Michael Baker Jr.,Inc. inasmuch as they participated in this area.

e) An additional heading should be added, "Coordination With Other Restudies in Progress: Duck Creek/Blue Diamond", Michael Baker Jr.,Inc., Attention: Tom Smith, P.E.

Thank you for the opportunity to review this information. If you should have any questions, please do not hesitate to call.

Sincerely,

Kevin L. Eubanks, P.E.
Senior Engineer

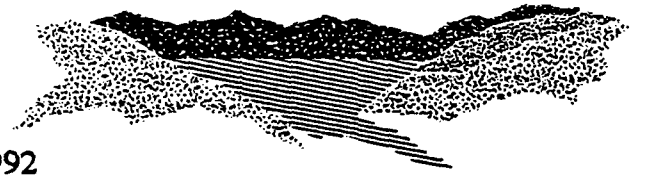
KLE:caj

cc: Steve Walker, CH2M Hill
Ted Davis, CH2M Hill
Henry Allen, CH2M Hill

FILE: Tropicana FIS

JLC
RD033832

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT



Virginia Bax-Valentine, P.E.
Chief Engineer/General Manager

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City of Mesquite

Bruce L. Woodbury
Clark County

July 23, 1992

— RECEIVED —
JUL 31 1992
CH2M HILL/PHOENIX

Denis Cederburg, P.E.,
Clark County Public Works
6655 E. Sahara Avenue
Las Vegas, NV 89102

Tropicana Wash Flood Insurance Study

Dear Mr. Cederburg:

As you may be aware, the District is proceeding with the flood insurance study (FIS) of the Tropicana Wash. FEMA guidelines for study contractors require consideration of projects planned to be completed within two years of completion of the FIS. Of particular concern at this time are the flood control improvements proposed in conjunction with Special Improvement District No. 67. Please advise the District as to the construction schedule for this project. If construction for this project is planned to commence within two years, please forward a copy of the final construction plans and design calculations to the District at your earliest convenience so that they can be made available to our study contractor for consideration as the FIS proceeds. If the S.I.D. flood control improvements are not included in the development of flood zones and base flood elevations at this time, map revisions may have to be pursued by the County at a later date, independent of this study.

If there are any other flood control projects that you would like considered as this FIS proceeds, please advise the District. Your prompt attention to this matter is greatly appreciated. Should you have any questions, please contact me or Kevin Eubanks.

Sincerely,

Gale Wm. Fraser, II

Gale Wm. Fraser, II, P.E.
Assistant General Manager

GWF:KLE:caj

cc: Steve Walker, CH2M Hill

FILE: Tropicana FIS

RECEIVED
JUL 27 1992
CH2M HILL

MEMORANDUM CH2MHILL

TO: Kevin Eubanks/CCRFCD

COPIES: Steve Walker/CH2M HILL
Ted Davis/CH2M HILL
Henry Allen/CH2M HILL
Bill Brandt/Clark County Public Works
Robert Thompson/Clark Co. Public Works Community Dev.
Rick Holmes/Clark Co. Public Works Comprehensive Planning
Tom Smith/Michael Baker, Jr., Inc.
Karl Mohr/FEMA Washington
Johnny Taylor/FEMA Region IX
Martin Nicholson/CH2M HILL

FROM: Jon Fuller/CH2M HILL

DATE: July 8, 1992

SUBJECT: Tropicana Wash
Approximate Methods Floodplain Delineation

PROJECT: RDD33832.A2.80

Introduction

This memorandum describes the procedures used for and preliminary results of floodplain delineation by approximate methods for the Tropicana Wash Flood Insurance Study. Approximate delineation methods were used to define floodplain limits for the following stream reaches (Figure 1):

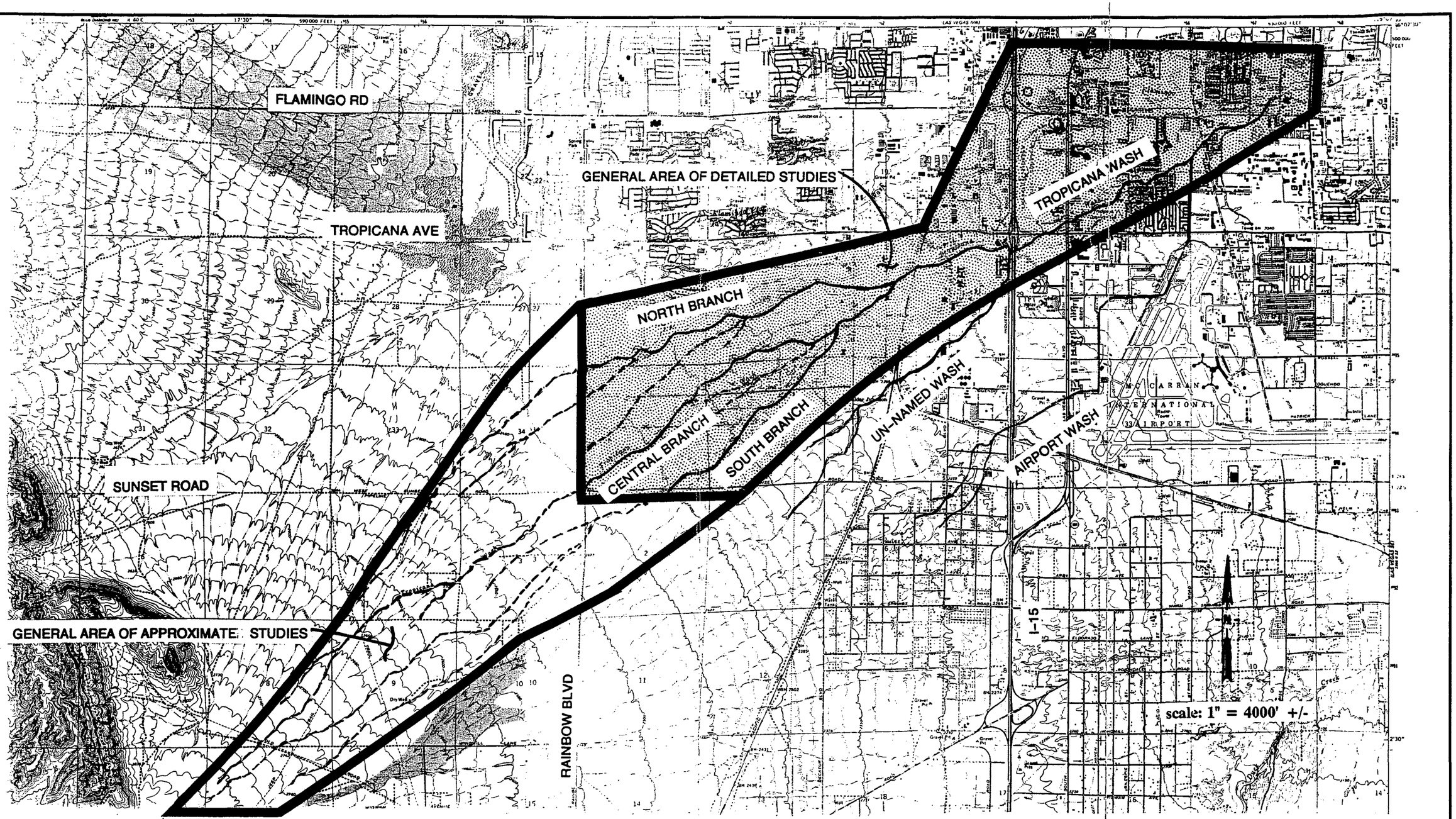
- North Branch of Tropicana Wash upstream of Rainbow Boulevard and tributaries to the North Branch downstream of Rainbow Boulevard
- Central Branch of Tropicana Wash upstream of Rainbow Boulevard and tributaries to the Central Branch downstream of Rainbow Boulevard
- South Branch of Tropicana Wash upstream of Sunset Road and tributaries to the Central Branch downstream of Sunset Road

Procedures

Approximate floodplain zones were mapped using a variety of hydraulic, hydrologic, and geomorphic techniques. First, second order or greater stream reaches within the study area were identified on recent 1:9600 aerial photography prepared as part of this study. Second order stream reaches are stream segments which are formed by the confluence of first order streams. First order streams are stream segments which have no identified tributaries. Second, the drainage area for the representative concentration points for each stream reach were measured by planimeter, using the 1:9600 aerial photography. Third, 100-year discharge rates for each concentration point were determined using a regional discharge vs. area regression equation developed by the Corps of Engineers for the Las Vegas Valley. Fourth, field visits were made to obtain hydraulic and geomorphic data for representative cross sections within each reach. Data collected during field visits included Mannings' "n" values, channel bottom widths, bed and bank conditions, high water marks and signs of recent flow, and observation of features which could alter or obstruct flow. Fifth, Mannings' ratings of each cross section were performed using HEC2 and channel geometry gathered in the field and from 1984 1:4800 4-ft contour interval topography provided by the CCRFCD. Sixth, 100-year flood limits at each rating section were plotted on the 1:4800 topography. Finally, flood limits for the reaches were determined by interpolating flood limits between ratings sections using geomorphic, visual, and hydrologic characteristics of the washes. Adjustments will be made where approximate method delineations interface with detailed delineations, upon completion of detailed analyses.

Summary

Preliminary maps of proposed approximate method delineations are attached for review and comment. The level of detail of approximate methods areas mapped is intended to reflect direction provided by CCRFCD during project scoping meetings. Example computation sheets are attached. Complete documentation will be provided upon request or upon completion of the FIS.



Key

- Reaches studied by detailed methods
- Reaches studied by approximate methods
- Area of new mapping limits.

FIGURE 1

STUDY LIMITS

FLOOD INSURANCE STUDY FOR TROPICANA WASH
CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

CH2M HILL

Engineers
Planners
Economists
Scientists

June 19, 1992

RDD33832.A0

McCarren Int'l Airport
5795 Paradise Rd.
Las Vegas, NV 89101

Attention: Mr. Tom Donaldson, Administration

Subject: Announcement of Intent to
Perform Flood Elevation Study

The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

This study will examine and evaluate the flood hazard areas and determine flood elevations for those areas. These elevations will then be used to determine flood insurance rates used by the Federal Emergency Management Agency.

This letter and subsequent media announcements are intended to inform all interested persons and communities of the commencement of this study so that they may have an opportunity to bring any of their concerns, as well as any relevant technical information, to the attention of the CCRFCD. Comments that you believe should be considered during the course of the study should be addressed to Mr. Kevin Eubanks, P.E. at the CCRFCD, 301 E. Clark Ave., Suite 300, Las Vegas, NV 89101. These comments will be fowarded to the study contractor.

Sincerely,

CH2M HILL NEVADA

R. Ted Davis for

Steven R. Walker, P.E.
Project Manager

jtk/FLOOD/069210.51

cc: Kevin Eubanks/CCRFCD
Tom Smith/MBJ
John Taylor/FEMA
Karl Mohr/FEMA

CH2M HILL Las Vegas Office 2030 East Flamingo Road, Suite 250 Las Vegas, Nevada 89119 702.369.6175 Fax 702.369.1107

Engineers
Planners
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Scientists

June 19, 1992

RDD33832.A0

Clark County Comprehensive Planning
225 Bridger Ave.
Las Vegas, NV 89101

Attention: Mr. Rick Holmes

Subject: Announcement of Intent to
Perform Flood Elevation Study

The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

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Sincerely,

CH2M HILL NEVADA

R. Ted Davis for

Steven R. Walker, P.E.
Project Manager

jtk/FLOOD/069210.51

cc: Kevin Eubanks/CCRFCD
Tom Smith/MBJ
John Taylor/FEMA
Karl Mohr/FEMA

CH2M HILL Las Vegas Office 2030 East Flamingo Road, Suite 250 Las Vegas, Nevada 89119 702.369.6175 Fax 702.369.1107

Engineers
Planners
Economists
Scientists

June 19, 1992

RDD33832.A0

Nevada Dept. of Water Resources
1515 E. Tropicana
Las Vegas, NV 89119

Attention: Mr. Bill Quinn

Subject: Announcement of Intent to
Perform Flood Elevation Study

The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

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Sincerely,

CH2M HILL NEVADA

R. Ted Davis for

Steven R. Walker, P.E.
Project Manager

jtk/FLOOD/069210.51

cc: Kevin Eubanks/CCRFCD
Tom Smith/MBJ
John Taylor/FEMA
Karl Mohr/FEMA

CH2M HILL Las Vegas Office 2030 East Flamingo Road, Suite 250 Las Vegas, Nevada 89119 702.369.6175 Fax 702.369.1107

Engineers
Planners
Economists
Scientists

June 19, 1992

RDD33832.A0

U.S. Corps of Engineers
650 Capitol Mall Room 6524
Sacramento, CA 95814-4794

Attention: Mr. Kevin Roukey

Subject: Announcement of Intent to
Perform Flood Elevation Study

The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

This study will examine and evaluate the flood hazard areas and determine flood elevations for those areas. These elevations will then be used to determine flood insurance rates used by the Federal Emergency Management Agency.

This letter and subsequent media announcements are intended to inform all interested persons and communities of the commencement of this study so that they may have an opportunity to bring any of their concerns, as well as any relevant technical information, to the attention of the CCRFCD. Comments that you believe should be considered during the course of the study should be addressed to Mr. Kevin Eubanks, P.E. at the CCRFCD, 301 E. Clark Ave., Suite 300, Las Vegas, NV 89101. These comments will be fowarded to the study contractor.

Sincerely,

CH2M HILL NEVADA

R. Ted Davis for

Steven R. Walker, P.E.
Project Manager

jtk/FLOOD/069210.51

cc: Kevin Eubanks/CCRFCD
Tom Smith/MBJ
John Taylor/FEMA
Karl Mohr/FEMA

CH2M HILL Las Vegas Office 2030 East Flamingo Road, Suite 250 Las Vegas, Nevada 89119 702.369.6175 Fax 702.369.1107

Engineers
Planners
Economists
Scientists

June 19, 1992

RDD33832.A0

U.S. Bureau of Land Management
4765 Vegas Drive
Las Vegas, NV 89126

Attention: Mr. Gary Ryan

Subject: Announcement of Intent to
Perform Flood Elevation Study

The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

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Sincerely,

CH2M HILL NEVADA

R. Ted Davis for

Steven R. Walker, P.E.
Project Manager

jtk/FLOOD/069210.51

cc: Kevin Eubanks/CCRFCD
Tom Smith/MBJ
John Taylor/FEMA
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CH2M HILL Las Vegas Office 2030 East Flamingo Road, Suite 250 Las Vegas, Nevada 89119 702.369.6175 Fax 702.369.1107

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June 19, 1992

RDD33832.A0

U.S. Fish & Wildlife
1500 N. Decatur
Las Vegas, NV 89102

Attention: Ms. Mary Jo Elpers

Subject: Announcement of Intent to
Perform Flood Elevation Study

The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

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Sincerely,

CH2M HILL NEVADA

R. Ted Davis for

Steven R. Walker, P.E.
Project Manager

jtk/FLOOD/069210.51

cc: Kevin Eubanks/CCRFCD
Tom Smith/MBJ
John Taylor/FEMA
Karl Mohr/FEMA

CH2M HILL Las Vegas Office 2030 East Flamingo Road, Suite 250 Las Vegas, Nevada 89119 702.369.6175 Fax 702.369.1107

Engineers
Planners
Economists
Scientists

June 19, 1992

RDD33832.A0

Nevada Dept. of Wildlife
4747 Vegas Drive
Las Vegas, NV 89106

Attention: Mr. Butch Padillia

Subject: Announcement of Intent to
Perform Flood Elevation Study

The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

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Sincerely,

CH2M HILL NEVADA

Steven R. Walker, P.E.
Project Manager

jtk/FLOOD/069210.51

cc: Kevin Eubanks/CCRFCD
Tom Smith/MBJ
John Taylor/FEMA
Karl Mohr/FEMA

CH2M HILL Las Vegas Office 2030 East Flamingo Road, Suite 250 Las Vegas, Nevada 89119 702.369.6175 Fax 702.369.1107

Engineers
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Scientists

June 19, 1992

RDD33832.A0

Clark County Public Works
6655 W. Sahara Ave.
Marbeya Business Park
Bldg. C Room 204
Las Vegas, NV 89102

Attention: Mr. Dennis Cederburg

Subject: Announcement of Intent to
Perform Flood Elevation Study

The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

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Sincerely,

CH2M HILL NEVADA

A. Ted Davis for

Steven R. Walker, P.E.
Project Manager

jtk/FLOOD/069210.51

cc: Kevin Eubanks/CCRFCD
Tom Smith/MBJ
John Taylor/FEMA
Karl Mohr/FEMA

CH2M HILL Las Vegas Office 2030 East Flamingo Road, Suite 250 Las Vegas, Nevada 89119 702.369.6175 Fax 702.369.1107

Engineers
Planners
Economists
Scientists

June 19, 1992

RDD33832.A0

U.S. Geological Services
Water Resources Division
1500 E. Tropicana
Las Vegas, NV 89119

Attention: Mr. Daniel Hitch

Subject: Announcement of Intent to
Perform Flood Elevation Study

The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

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Sincerely,

CH2M HILL NEVADA

R. Ted Davis for

Steven R. Walker, P.E.
Project Manager

jtk/FLOOD/069210.51

cc: Kevin Eubanks/CCRFCD
Tom Smith/MBJ
John Taylor/FEMA
Karl Mohr/FEMA

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Engineers
Planners
Economists
Scientists

June 19, 1992

RDD33832.A0

USDA Soil Conservation Service
1100 E. Sahara Ave.
Almond Tree Lane-Suite 310
Las Vegas, NV 89104

Attention: Mr. James R. Ayres

Subject: Announcement of Intent to
Perform Flood Elevation Study

The Clark County Regional Flood Control District (CCRFCD) has contracted CH2M HILL to perform a floodplain delineation study for the Tropicana Wash from Rainbow Blvd. to the confluence with the Flamingo Wash.

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Sincerely,

CH2M HILL NEVADA

Steven R. Walker, P.E.
Project Manager

jtk/FLOOD/069210.51

cc: Kevin Eubanks/CCRFCD
Tom Smith/MBJ
John Taylor/FEMA
Karl Mohr/FEMA

CH2M HILL Las Vegas Office 2030 East Flamingo Road, Suite 250 Las Vegas, Nevada 89119 702.369.6175 Fax 702.369.1107

MEMORANDUM CH2MHILL

TO: Steve Walker/PHX

COPIES: Ted Davis/LAS
Bill Fox/RDD
Egon Harrasser/RDD

FROM: Tim Pool/RDD

DATE: June 8, 1992

SUBJECT: Clark County F.I.S.

PROJECT: RDD33832.A0

We have obtained suitable photography for the Clark County F.I.S. The project was flown on May 30, 1992. Enclosed is the one set of photography listed as a deliverable in my memo dated April 28, 1992.

Flight #1	Exposures 1-9	1:14400	Tropicana Wash
Flight #2	Exposures 1-5	1:14400	Blue Diamond Wash
Flight #3	Exposures 1-4	1:14400	Duck Creek
Flight #4	Exposures 1-6	1:24000	Tropicana Wash
Flight #5	Exposures 1-4	1:24000	Blue Diamond & Duck Creek

We are proceeding with work on the Tropicana Wash Study Area. The Blue Diamond Wash, South Branch Blue Diamond Wash, and Duck Creek Study Areas were flown; however, no further activities will be undertaken.

At this time I would like to review our internal procedures, deliverables, and schedule. This is for Tropicana Wash only.

The 2X enlargements are complete and will be in Las Vegas by June 9, 1992. The survey control will be complete and in Redding by June 9, 1992. If there are no survey problems, we will proceed with the photogrammetric mapping. We will complete the contour mapping by July 10, 1992. This mapping will meet our accuracy standards, but will not be final edited to FEMA standards.

These preliminary Microstation files will be sent to Las Vegas for use in the study. Las Vegas will locate the X-sections on a hard copy of the mapping and return them to Redding. We will need two weeks to complete the X-sections and return them to Las Vegas in "GR" format.

While the Microstation files are in Las Vegas, you will need to add all required survey and study data. The files will then be final edited and composited with the rectified photos in Redding. These will be the final deliverables and no changes can be made

to the files after the process is complete. The rectified composite process will take about two weeks to complete.

The above is how we plan the through-put on this project. I am open to suggestions or changes that will help the schedule or budget. The schedule for the deliverables will depend on the interaction between Las Vegas and Redding. I would like you to use the time figures supplied above to produce a schedule that fits your requirements. I would also like to review the final schedule.

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT

— RECEIVED —
MAY 18 1992
CH2M HILL/PHOENIX

Virginia Bax-Valentine, P.E.
Chief Engineer/General Manager

BOARD OF DIRECTORS

Michael R. Harris
Chairman
City of Henderson

Thalia M. Dondero
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Clark County

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City of North Las Vegas

Scott Higginson
City of Las Vegas

Jan Laverty Jones
City of Las Vegas

Tom R. Leavitt
City of Mesquite

Bruce L. Woodbury
Clark County

May 15, 1992

Mr. Martin Nicholson, P.E.
2030 E. Flamingo Road #250
Las Vegas, NV 89119

Tropicana Flood Insurance Study
Notice To Proceed

Dear Mr. Nicholson:

At their May 14, 1992 meeting, the Clark County Regional Flood Control District Board approved and authorized the Chairman to sign the **Agreement for Professional Services** between the District and CH2M Hill to perform a Flood Insurance Restudy of the Tropicana Wash and Tributaries. Please find attached an original signed copy of the executed Agreement for your files. The District has retained a copy for their files.

This letter will serve as notice to proceed on May 20, 1992 with the Basic Services as outlined in the Agreement.

The District looks forward to working with CH2M Hill on this project. If you should have any questions, please feel free to contact either Kevin Eubanks or Gale Fraser.

Sincerely,

Virginia Bax-Valentine, P.E.
General Manager/Chief Engineer

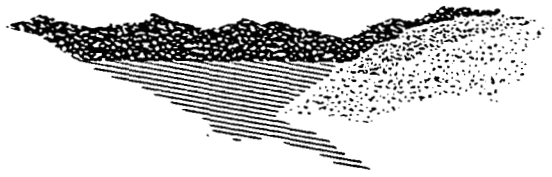
VBV:KLE:caj

cc: Steve Walker, CH2M Hill Phoenix, (w/o enclosure)

FILE: Tropicana FIS

301 E. Clark Avenue, Suite 301 • Las Vegas, Nevada 89101
(702) 455-3139 • FAX: (702) 455-3870

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT



— RECEIVED —
MAY 18 1992
CH2M HILL/PHOENIX

Virginia Bax-Valentine, P.E.
Chief Engineer/General Manager

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City of North Las Vegas

Scott Higginson
City of Las Vegas

Jan Laverty Jones
City of Las Vegas

Tom R. Leavitt
City of Mesquite

Bruce L. Woodbury
Clark County

May 13, 1992

Martin Nicholson, P.E.
2030 E. Flamingo Road #250
Las Vegas, NV 89119

Tropicana Flood Insurance Study

Dear Mr. Nocholson:

Enclosed please find a copy of Michael Baker Jr.'s schedule for completing their study of the Duck Creek/Blue Diamond area. If you should have any questions, please give me a call.

VIRGINIA BAX-VALENTINE, P.E.
General Manager/Chief Engineer

BY: _____
Kevin L. Eubanks, P.E.
Senior Engineer

KLE:caj

cc: Steve Walker, CH2M Hill Phoenix (w/enclosure)

Enclosure

FILE: Tropicana FIS

CLARK COUNTY, NEVADA RESTUDY
DUCK CREEK HYDROLOGIC UNIT
5/1/92

Notes on Project Schedule

The following comments and notes apply to the applicable "Milestone Dates and Meetings" noted on the attached project schedule:

2. Initial field review and coordination was completed the week of February 24, 1992. Additional field review and coordination was scheduled after completion of the hydraulic analyses in July. However, if additional topographic data is obtained for the areas of study by CCRFCD, this task may be delayed until the new data is available. Plans for this will be reviewed in June.

3. FEMA will provide the CCRFCD with any impacts that the FEMA (Baker) restudy may have on the CCRFCD (CH2MHILL) study. At this point, the only impact identified may be to some approximate study streams for the CCRFCD study adjacent to the Blue Diamond fan.

4. FEMA will submit copies of the draft work maps to CCRFCD for their information, review and use. These maps will show the draft flooding information for all areas of study in the FEMA (Baker) restudy. This information will be revised during August and September with the new topographic information and/or results of field review as warranted.

5. FEMA will submit the revised work maps to CCRFCD for their information, review, and use. This information will be combined with the information generated in the CCRFCD study (when available) to produce revised preliminary FIRMs for this area of Clark County.

Attachment (Project Scheduled Revised 5/1/92)

EXHIBIT A

Flood Insurance Study
Restudy
Tropicana Wash and Tributaries

SCOPE OF WORK

I. PROJECT DESCRIPTION

The project involves mapping of flood insurance rate zones, floodplains and floodways for approximately 12 miles of the Tropicana Wash riverine system and 7 to 8 square miles of sheet flooding zones. In addition, approximately 5 square miles of the Tropicana Wash watershed downstream of UPRR will be evaluated to identify areas subject to ponding and sheet flooding. The study reaches and areas are generally described below and shown on Figure 1:

A. Tropicana Wash
   1. Confluence with Flamingo Wash to UPRR (3.6 mi.) - detailed study
   2. North Branch
      a. UPRR to Jones Boulevard (1.9 mi.) - detailed study
      b. Jones Boulevard to Rainbow Boulevard - detailed study (1.1 mi.)
      c. Rainbow Blvd. to Blue Diamond - approximate study
   3. Central Branch
      a. UPRR to Decatur Boulevard (1.1 mi.) - detailed study
      b. Decatur Boulevard to Rainbow Boulevard (2.3 mi.) - detailed study
      c. Rainbow Boulevard to Blue Diamond - approximate study
   4. South Branch
      a. Decatur Boulevard to Sunset Road (2.0 mi.) - detailed study
      b. Sunset Road to Blue Diamond - approximate study

B. UPRR Breakout - UPRR to Flamingo Wash (3.3 mi.)

The consultant will identify, analyze and define alluvial fan and sheet flooding areas and develop a backwater model of the riverine study reaches to determine floodplain

and floodway delineations for the 100-year peak flow rates. Floodplain and floodway delineations will be reconciled with current applicable flood insurance study delineations. All work will be performed in accordance with The Federal Emergency Management Agency's (FEMA) Document No. 37, **Flood Insurance Study Guidelines and Specifications for Study Contractors** dated March, 1991 (FEMA Document No. 37). Discharge values for 100-year peak flows will be provided to the consultant as obtained from the Clark County Regional Flood Control District (District, CCRFCD) adopted **Las Vegas Valley Flood Insurance Study Hydrology Report**, dated September 1991, prepared by James M. Montgomery Consulting Engineers, Inc.

Work under this scope must be reviewed and accepted by FEMA prior to finalization of this contract. As a part of this requirement, the Consultant shall be responsible for Public Notification regarding this project. Work under this scope to complete the FEMA submittals will be completed within 240 days from the date of the notice to proceed. This schedule includes 60 days for District reviews. Work under this scope to coordinate with FEMA during the review process and prepare final submittals to FEMA, will be completed within 365 days from the date of notice to proceed.

II. BASIC SERVICES

Without limiting the generality of the foregoing, the Consultant shall perform the following basic services as part of its performance under this section:

Task 1 - Data Collection

1.1 The Consultant will collect and review pertinent data from FEMA, the District, NDOT and Clark County Public Works Department. Pertinent data under this task will include previous flood control design reports for public and private projects within the study area; historical flooding information; as-built plans for existing structures; FEMA Flood Insurance Rate Maps and Letter of Map Revision and/or Amendments and supporting data; other pertinent information.

1.2 A written summary of the data collection effort will be submitted to the District for information purposes.

1.3 The Consultant will investigate the existence of available topographic information; determine the quality of the information as compared to the standards referenced in FEMA Document No. 37, Appendix 4, and make a recommendation as to the need for the development of additional topographic maps by either photogrammetric and/or land survey methods.

1.4 The Consultant will submit a project schedule showing coordination meetings and completion dates for each of the tasks in this contract.

Task 2 - Floodplain, Floodway and Alluvial Fan Delineations

2.1 The consultant will conduct field reconnaissance of the full study reach. This will include observation of channel and floodplain conditions for estimation of Manning's "n" values; photographic documentation of floodplain characteristics; determination of channel bank stations; observation of possible overflow areas; identification and measurement of levees or other flood control structures; and measurement of bridge dimensions. A written summary of the field inspection, including photographs to document "n" value estimation will be submitted to the District for review and approval.

2.2 The hydrology for the subject drainage basins has been completed under separate contract and is presented in the document entitled **Las Vegas Valley Flood Insurance Study Hydrology Report**, dated September 1991, prepared by James M. Montgomery Consulting Engineers, Inc. (FIS Hydrology Study). The FIS Hydrology study has been adopted by the CCRFCD board. The consultant will be provided with a copy of the FIS Hydrology Study, supporting appendices and a computer diskette containing model input. The 100-year discharges presented in the FIS hydrology study will be briefly reviewed by the consultant and used for completion of the hydraulic analysis. No revisions or modifications to this model are included in this task except as described below:

a. The consultant will use data from the FIS hydrologic model to develop an area vs. discharge curve or regression equation. This relationship, or similar regional area vs discharge relationships as approved by the District, will be used to estimate discharges for additional concentration points of areas of approximate study and detailed study reaches with drainage areas of less than one square mile, or 20% of the FIS subwatershed. For larger watersheds, individual subwatershed models from the FIS HEC-1 model will be modified to provide concentration points where required for this study. The FIS model will not be modified to include the subwatershed changes made for this task and no recalibration of the model is proposed. Any additional revision or modification of the FIS hydrology that may be required, may be performed under Task 1, Special Services. These services would only be performed upon written authorization by the District. Any additional hydrologic calculations authorized under Special Services will be

submitted to the District for review and approval prior to commencing the affected hydraulic analysis.

2.3 New topographic maps developed for this contract will be vertically tied to NAVD 29 (datum used by Clark County) prior to encoding hydraulic models.

2.4 For riverine reaches, existing Clark County survey control markers will be identified and described for use as elevation reference markers (ERMs). In remote areas, Bureau of Land Management or other government markers will be used where available. Some markers may have to be established in the field. ERM description, location and elevation will be tabulated and submitted with the FIS report.

2.5 Floodplain and floodway delineations and base flood elevations (BFEs) will be determined for the 100-year flood for each riverine reach studied by detailed methods using the most recent version of the U.S. Army Corps of Engineers HEC-2 Water Surface Profiles computer model and/or methodologies acceptable to FEMA and the District. These models will simulate the effects of floodplain geomorphology, flow changes, bridges, culverts, hydraulic roughness, effective flow limitations, split flows, and other considerations to most realistically and accurately represent flooding conditions to the level of detail consistent with standard practices for FIS preparation. The consultant will analyze "approximate study" reaches and shallow flooding areas and prepare the study and maps according to the guidelines outlined in FEMA Document No. 37. For the study reach referred to as the "UPRR Breakout," 100-year flow paths and approximate flood limits and depths will be provided. No BFE or floodway delineations will be prepared for this reach.

Bridges and culverts will be modeled in compliance with modeling requirements for the appropriate method. Where multiple bridges occur, each bridge will be modeled separately.

Cross section stationing will be from left to right looking downstream. Cross sections in "detailed study" reaches will be spaced at 500 foot intervals unless geographic or physical constraints dictate otherwise. Identification of cross sections shall be in river miles, increasing in the upstream direction from each confluence and will be consistent with existing FIS stationing. The location and alignment of cross sections and channel centerline will be submitted to the District for review and approval prior to digitizing cross section data. Cross section orientation may need to be altered after initial profile executions to ensure proper orientation perpendicular to flow per FEMA criteria.

Cross sections will be plotted using a pen plotter or equivalent. The plots will show water surface elevations, ineffective flow areas, roughness values, encroachments, channel stationing and all other pertinent input and output data.

For floodplains identified as ponding areas, the area will be analyzed using the storage routing methods within the HEC-1 computer program to determine ponding elevations.

2.6 The consultant will prepare work maps and models of the 100-year floodplain and floodway during the course of the hydraulic analysis for review by the District during progress meetings. Floodways will be determined by application of the equal conveyance encroachment methods with maximum surcharge of one (1) foot and will be finalized by exclusively applying encroachment method 1.

2.7 Flood limits for those reaches to be mapped by "approximate methods" will be estimated using Manning's equation for normal depth of flow.

2.8 Flood zones will be established according to FEMA criteria.

Task 3 Coordination

3.1 The consultant will coordinate and participate in regular progress meetings with the District and the impacted communities at least monthly and at milestones in the development of the riverine and alluvial fan hydraulic analyses. As a part of this requirement, the consultant shall be responsible for Public Notification regarding this project.

3.2 The consultant will submit maps, reports and the hydraulic analyses to applicable government agency reviewers through the District.

3.3 The consultant will coordinate with FEMA and FEMAs Technical Evaluation Contractor (TEC) throughout the restudy effort in order to proceed in the most time efficient manner.

3.4 The consultant will be responsible for responding to and interacting with FEMAs TEC throughout the review and community appeals process as outlined in FEMA document No. 37.

Task 4 Survey and Aerial Mapping

4.1 Aerial survey and mapping will be provided by the consultant as part of this contract. Quality control of aerial surveys will be per FEMA Document No. 37, Flood Insurance Study Guidelines and Specifications for Study Contractors, dated March 1991.

4.1.1 Prepare topographic mapping with a 4-foot contour interval at a scale of 1-inch = 400-feet. Supplemental 2-foot contours will be provided at the level of accuracy required for 4-foot contours. The area for new topographic mapping is shown on attached Figure 1, as the "general area of detailed studies."

4.1.2 Ground Control

a. The consultant shall provide elevation control using NAVD 1929.

b. The consultant will systematically set panel points and establish horizontal and vertical control throughout the areas to be mapped. Surveys will be tied to the State Plane Coordinate System (NAD 1983) and/or the Clark County Road Centerline Coordinate System. Field control will use existing documented Clark County survey points where possible and be of an adequate density and location to meet the requirements of FEMA Document No. 37. The data for the Clark County monuments used for this work will be taken from existing records, and will not be field verified.

c. The consultant is responsible for obtaining all necessary rights-of-entry for the study area. The District will assist as may be necessary.

4.1.3 Digital contour and planimetric data developed under this task shall be delivered to the District in ARC/INFO compatible format on 3 1/2 inch, 1.44 Mb, high density diskette or TK50 magnetic tape.

4.1.4 The consultant will provide the District permanent non-erasable topographic 24" x 36" or larger mylar sheets at the scale and contour interval specified in Task 4.1.1. A cover sheet will be provided with project title, date of topography and sheet index. Each sheet of topography will include at a minimum a north arrow, scale, photo date, section and quarter corners, street names, State Plane Coordinate information, major drainage

features, corporate and town boundaries, cross section lines, channel centerline station, 100-year flood limits, description and elevation of control points and ERMs and reference marks used in ground control.

Task 5 Final Products

All reports and map copies will be submitted in triplicate.

5.1 Mapping

a. Available topography identified as acceptable under Task 1.3 will be reproduced from their source and delivered to the District in a durable reproducible form acceptable to the District.

b. Additional topographic maps, contact prints, photo mylars, etc. will be delivered to the District as required by the Supplemental Services Section and authorized per Task 1.3.

c. Final work maps will be prepared in ARC/INFO compatible format tied to State Plane Coordinate System, NAD 1983 and/or Clark County Road Centerline Coordinate System and the vertical NAVD 1929 on 3 1/2 inch, 1.44 Mb, high density diskette or TK50 magnetic tape. When new topographic mapping is produced, the mapping will be included in the digital format.

5.2 a. The consultant will produce a final report incorporating all previous comments from the District, FEMA and other reviewers. Six hard copies of the report and appendices will be delivered.

b. Report text in Wordperfect 5.1 format on a 3 1/2 inch 1.44 Mg, diskette compatible with IBM personal computers.

c. Three copies of the Technical Support Data Notebook.

5.3 The final report for the alluvial fan/flood-plain/floodway mapping study will include, but is not limited to, the following:

I. Introduction
   a. Purpose of Study
   b. Authority for Study
   c. Coordination and Acknowledgements

II. Area Studied
   a. Scope of Study

b. Community Description
c. Principal Flood Problems
d. Flood Protection Measures

III. Engineering Methods
a. Hydrologic Analysis
b. Hydraulic Analysis
c. Alluvial Fan Analysis

IV. Floodplain Management Applications
a. Floodplains
b. Floodways
c. Alluvial Fans

V. Insurance Applications

VI. Other Studies

VII. Bibliography

Appendices - Supporting Technical Data

III. SPECIAL SERVICES

The Engineer shall perform the following special services if, as, and when requested in writing by the General Manager to be completed within the time period specified in each special service task listed below, and within 365 days from Notice to Proceed given under Section V of this AGREEMENT for Basic Services.

Task 1 Supplemental Hydrology

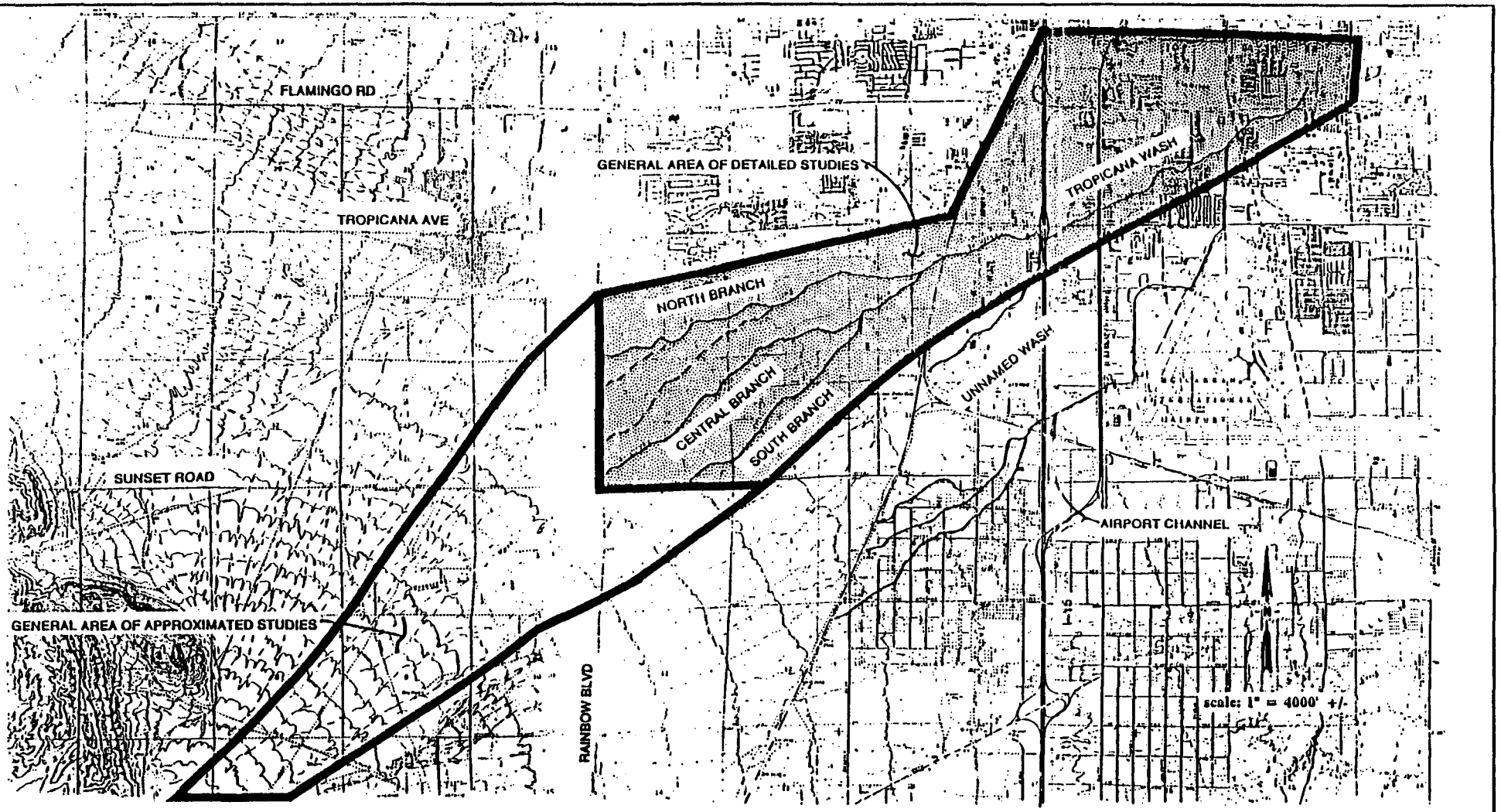
Supplemental hydrologic and hydraulic analysis shall be provided as required and directed by the General Manager. Work under this task shall be completed within 60 days from receipt of written authorization from the General Manager.

Task 2 ARC/INFO GIS Data Conversion

The Consultant shall convert all digital data into ARC/INFO GIS coverages using parameters and format developed by the District in cooperation with CH2M HILL staff. Work for this task will be completed within 45 days from receipt of written authorization from the General Manager.

Task 3 Survey and Aerial Mapping - Duck Creek Area

The Consultant will provide survey and aerial mapping services to the general requirements specified under Task 4, for all or any portion of the Blue Diamond/Duck Creek area shown in attached Figure 2. Mapping shall be completed within 100 days from receipt of written authorization from the General Manager.



Note

New mapping required to reflect changed ground conditions from recent development, areas requiring greater topographic detail, and areas not previously mapped.

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING.

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

Key

Reaches studied by detailed methods

Reaches studied by approximate methods

Area of new mapping limits.

FIGURE 1

STUDY AND MAPPING LIMITS

TROPICANA WASH FLOOD INSURANCE RESTUDY
CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

CH2MHILL

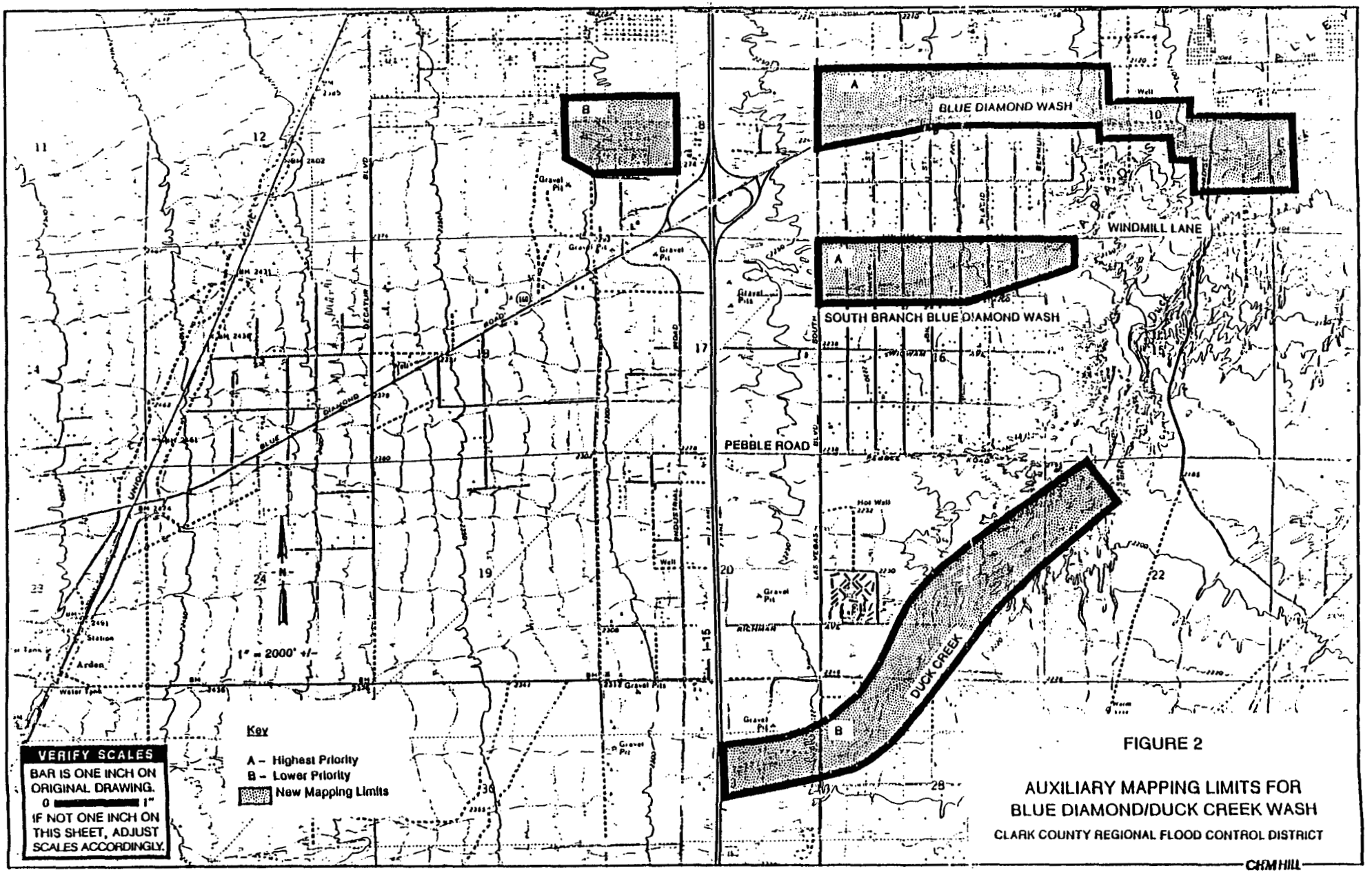


FIGURE 2

AUXILIARY MAPPING LIMITS FOR
BLUE DIAMOND/DUCK CREEK WASH

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

CH2M HILL

SECTION 5

HYDROLOGIC ANALYSES

Study Contractor: CH2M HILL

HYDROLOGIC ANALYSES INDEX

CLARK COUNTY, NEVADA
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

HYDROLOGIC ANALYSES INDEX

FLOODING SOURCE/ STREAM NAME	HYDROLOGIC METHOD/ MODEL USED	METHOD/MODEL ANALYSIS DATE	EXHIBIT NO. PAPER COPY	FLOPPY DISKETTES
TROPICANA WASH	Summary Memo		5-1	
	Computation Sheets		5-2	
10/90	HEC-1 FILE Director (Jmm)		5-3	5-18
10/90	HEC-1 - Local Storm (Jmm)		5-4	
10/90	HEC-1 - Basin Wide Storm (Jmm)		5-5	
10/90	HEC-1	√NORTH1A.OUT	5-6	
10/90	HEC-1	√NORTHT3A.OUT	5-7	
10/90	HEC-1	√NORTH.OUT	5-8	
10/90	HEC-1	√CENT-T5A.OUT	5-9	
10/90	HEC-1	√CENT-T6A.OUT	5-10	
10/90	HEC-1	√CENT-T6B.OUT	5-11	
10/90	HEC-1	√CEN-T6B1	5-12	
10/90	HEC-1	√CENTRAL.OUT	5-13	
10/90	HEC-1	√SOUTH 5B.OUT	5-14	
10/90	HEC-1	√SOUTH 6C.OUT	5-15	
10/90	HEC-1	√LTR100.OUT	5-16	
10/90	HEC-1	√BTR100.OUT	5-17	

EXHIBIT 5-1

SUMMARY MEMO

MEMORANDUM CH2MHILL

TO: Kevin Eubanks/CCRFCD

COPIES: Steve Walker/CH2M HILL
Ted Davis/CH2M HILL
Henry Allen/CH2M HILL
Bill Brandt/Clark County Public Works
Robert Thompson/Clark Co. Public Works Community Dev.
Rick Holmes/Clark Co. Public Works Comprehensive Planning
Tom Smith/Michael Baker, Jr., Inc.
Karl Mohr/FEMA Washington
Johnny Taylor/FEMA Region IX
Martin Nicholson/CH2M HILL

FROM: Jon Fuller/CH2M HILL

DATE: November 5, 1992

SUBJECT: Tropicana Wash Hydrology

PROJECT: RDD33832.A2.50

Introduction

This memorandum summarizes hydrologic information used in the Tropicana Wash Floodplain Delineation Study performed by CH2M HILL for the Clark County Regional Flood Control District (CCRFCD). Most of the hydrologic information used in this study was obtained from the Las Vegas Valley Flood Insurance Study (FIS) Hydrology Report[1] which has been accepted by FEMA and adopted by the CCRFCD. The Las Vegas Valley FIS Hydrology Report provides 100-year flow rate estimates for floodplain delineation studies in Clark County, Nevada. For our purposes in preparing the Tropicana Wash floodplain delineation study, some supplemental hydrologic information was required. This memorandum documents the source of the 100-year discharges recommended for delineating floodplain areas within the Tropicana Wash watershed.

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[1] Clark County Regional Flood Control District, "*Las Vegas Valley Flood Insurance Study Hydrology Report*", Report prepared by James M. Montgomery and Associates, September, 1991.

Watershed Description

Tropicana Wash is located in the unincorporated portions of Clark County, west of the city of Las Vegas, Nevada (Figure 1). The headwaters of Tropicana Wash are located on the eastern slopes of the Bird Spring Range piedmont. Three main branches of Tropicana Wash convey runoff on the sparsely developed piedmont: the North, Central, and South Branches. Downstream of Jones Boulevard, near the confluence of the three branches, portions of the washes have been channelized or diverted in association with recent medium to high density development. Undersized culverts[2] at the Union Pacific Railroad (UPRR) and at Interstate 15 (I-15) cause some runoff to be diverted to the north, where it flows as unconfined runoff through urbanized areas until it rejoins Tropicana Wash downstream or enters Flamingo Wash. Runoff which is conveyed through the UPRR and I-15 flows in improved channels and box culverts to the confluence with Flamingo Wash.

Rainfall and runoff occur infrequently in the 21 square mile Tropicana Wash watershed. However, intense summer rainstorms can produce flash flooding, particularly in the more urbanized areas downstream of the UPRR. The flood of record which occurred on July 3, 1975 was estimated at 1,700 cfs at I-15[3]. Several other runoff events on Tropicana Wash have been recorded since the early 1970's.

Sources of Information

The CCRFCD has prepared a report containing detailed hydrologic analyses for most of Clark County[4] which was reviewed and accepted by FEMA for use in preparing floodplain mapping. New detailed hydrologic analyses are not within the scope of this study. Therefore, hydrologic data were obtained from previous analyses that have been accepted by the CCRFCD or by FEMA. The appropriate data used for this study are summarized in the table shown on Figure 1. Sources of the existing hydrologic data included:

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[2] According to the 1991 FIS Hydrology Report

[3] James M. Montgomery, Inc., *Las Vegas Wash and Tributaries Overflow Study, Clark County, Nevada,* Report Prepared for the US Army Corps of Engineers - Los Angeles District and the Clark Co. Regional Flood Control District, September, 1988.

[4] Clark County Regional Flood Control District, "*Las Vegas Valley Flood Insurance Study Hydrology Report*", Report prepared by James M. Montgomery and Associates, September, 1991.

- Adopted FIS 100-year discharges for Tropicana Wash from the CCRFCD Las Vegas Valley FIS Hydrology Report. These discharges are designated by "FIS" in the fourth column of the table.

- HEC1 computer models previously developed for the Clark County Flood Insurance Study. This HEC1 hydrologic analysis was based on information prepared by the Corps of Engineers, and used procedures outlined in the CCRFCD Hydrologic Criteria and Drainage Design Manual. These discharges are designated by "FIS HEC1" in the fourth column of the table.

- Hydrologic data describing Blue Diamond alluvial fan flooding provided by Michael Baker, Jr., Inc. (MBJ).

- I-15/Excalibur/MGM box culvert hydraulic analysis prepared by Church Engineers of Nevada and provided by Clark County Public Works. These discharges are designated by "Church Eng." in the fourth column of the table.

- Area-discharge regression curve developed by the Corps of Engineers (COE) for the Las Vegas Valley. The discharge estimates obtained from applying the COE curve which were used for areas of approximate method floodplain delineation are shown in the table of Figure 3. The table of discharges corresponds to the various stream reaches shown in the figure.

Hydrologic Data

To complete this study, additional hydrologic data were required to augment the existing information. Discharge rates for the Tropicana Wash FIS were obtained from existing CCRFCD-approved reports wherever possible. However, this floodplain delineation study required more detailed watershed delineations than were used for the adopted Las Vegas Valley FIS Hydrology Report. Figure 1 shows the more detailed watershed boundaries as compared to the FIS Hydrology Report boundaries shown in Figure 2. The names of the wash channels have also been modified as shown in Figure 1. In addition, this study included approximate floodplain delineations on small washes not specifically analyzed in the Clark County FIS. Finally, a flow rate for the breakout discharge at the I-15 culvert crossing was not determined in the FIS Hydrology Report, although other studies have determined that the I-15 culvert does not have capacity for the 100-year flow.[5] Breakout discharges

[5] See Special Problem Reports #1 and #2 for additional information on breakout discharge rates at the UPRR and I-15.

occur where the regulatory discharge exceeds the capacity of a culvert or channel, and the excess flows overland away from the main channel. Breakout discharges have been defined by others at the UPRR railroad crossing and the I-15 culvert inlet.

New or revised hydrologic data were obtained from several sources. First, for small washes to be mapped using approximate methods, 100-year discharge rates were estimated using a COE area-discharge regression curve provided by the CCRFCD. Resulting flowrates are shown in Figure 3.

To obtain estimates for the breakout flows at the I-15 culvert, the computer model HY8 was used to reconstruct the capacity curve previously computed for the MGM culvert.[6] Since construction of the culvert, Jersey barriers were added along I-15 effectively raising the allowable headwater on the culvert. A new culvert capacity was therefore estimated using the higher headwater. Breakout flows were computed as the difference between the culvert capacity and the hydrologic flow estimated at the culvert entrance.

For the areas studied by detailed methods, 100-year flow rates were taken directly from the FIS Hydrology report or derived from the FIS HEC1 model from which the report was prepared. Hydrologic data derived from the FIS HEC1 model include the following:

- Existing concentration points. Some concentration points required for this study were used in the HEC1 model, but were not listed in the FIS Hydrology Report. Data for these concentration points were read directly from the HEC1 output, using the appropriate depth-area reduction factor listed in the HEC1 input file. HEC1 output files are attached in the appendix to this memorandum.

- New concentration points. Estimates of 100-year flow rates were determined in two ways. First, least-squares regression equations relating drainage area and discharge were developed using adopted 100-year flow rates from the subwatersheds used in the HEC1 model. A correlation coefficient of about .95 was determined from the HEC1 output data. Second, the HEC1 model was modified to reflect the basin area and watershed length for each new concentration point needed. All other basin parameters for the subwatersheds used in the existing HEC1 model remained unchanged. Correlation with adopted flow rates for nearby concentration points and engineering judgement was used to select the 100-year flow rates recommended for this study.

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[6]Church Engineering of Nevada, *Hydraulic Analysis of the MGM Grand Box Culvert,* October, 1991

Complete calculation sheets describing flow rates for new concentration points are attached in the appendix to this memorandum.

- Modified HEC1. Apparent changes in the flow paths between the UPRR and I-15 necessitated a slight modification of the HEC1 model. The original HEC1 model indicated that the Central and North Branches combine at I-15. Recent topographic and photographic evidence suggest that these tributaries combine immediately at or downstream of the UPRR. Therefore, the HEC1 model was modified so that the hydrographs from the two watersheds were added immediately after routing through the UPRR. The FIS routing upstream and downstream of the UPRR remained unchanged. Calculation sheets and HEC1 output files are attached in the appendix to this memorandum.

- Blue Diamond Alluvial Fan Flow. The adopted FIS discharges for Tropicana Wash at concentration points T10 and T11 (Figure 2) include some runoff from Blue Diamond Wash. New hydrologic information provided by MBJ from the on-going Blue Diamond FIS indicates that flooding from Blue Diamond Wash may also impact the South Branch of Tropicana Wash, and the Unnamed Wash at the UPRR. The adopted FIS discharges included flow contributions from Blue Diamond Wash and are comparable to the discharges developed by MBJ for the Blue Diamond Wash FIS. Therefore, CH2M HILL was directed to use the Tropicana Wash discharges adopted in the FIS Hydrology Report.

Results

Flow estimates using procedures outlined above and proposed for use in the Tropicana Wash Floodplain Delineation Study are summarized in Figure 1. The figure also shows the associated watershed boundaries and concentration points. Figure 3 shows the various stream reaches studied by approximate methods and the corresponding flow estimates for each reach.

Conclusion

The 100-year discharge rates summarized in Figures 1 and 3 are recommended for use in the Tropicana Wash Floodplain Delineation Study. These flow rates were determined from existing studies and information approved by CCRFCD or FEMA.

DOCUMENTATION ABSTRACT

SECTION 1: GENERAL INFORMATION

Community Name:	Clark County, Nevada (Unincorporated Areas)
NFIP Community Number:	320003
County & State:	Clark County, Nevada
FEMA Study Date:	September, 1991 (Hydrology) September 29, 1989 (FIRM)
Study Contractor:	CH2M HILL 2030 E. Flamingo Rd., Suite 250 Las Vegas, NV Attn: Ted Davis, P.E. (702)369-6175
Review Contractor:	Michael Baker, Jr., Inc. 3601 Eisenhower Ave., Suite 600 Alexandria, VA 22304 Attn: Tom Smith, P.E. (703)960-8800
State Reviewer:	Nevada Department of Water Resources Attn: Bob Fally
Community Reviewer:	Clark Co. Regional Flood Control District Attn: Kevin Eubanks, P.E. 301 E. Clark Ave, Suite 301 Las Vegas, NV 89101 (702)455-3870 Clark County Public Works, Engineering Division 6655 W. Sahara, Bldg C-204 Las Vegas, Nevada 89102 Attn: William C. Brandt, P.E. Clark County Public Works Community Development Division

401 E. Fourth St.
Las Vegas, Nevada 89101
Attn: Robert Thompson, P.E.

Study Areas:	Tropicana Wash - FIRM Panels 1216, 1212, 1229 North Tropicana Wash - FIRM Panel 1216, 1212 Central Tropicana Wash - FIRM Panel 1216, 1212 South Tropicana Wash - FIRM Panel 1216, 1212 Unnamed Tributaries to Tropicana Wash Area mapped as unnumbered A Zone
Study Type:	Tropicana Wash - Detailed Riverine Study North Tropicana Wash - Detailed Riverine Study Central Tropicana Wash - Detailed Riverine Study South Tropicana Wash - Detailed Riverine Study Unnamed Tribs. to Tropicana Wash - Approximate Study

SECTION 2: MAPPING INFORMATION

USGS Quad Sheets:	Las Vegas SW, Nevada; 7.5 minute; 1984 Blue Diamond SE, Nevada; 7.5 minute, 1983
Additional Maps:	James M. Montgomery, 1984, 1:4800, 4 ft. C.I. CH2M HILL, 1992, 1:4800, 4 ft. C.I. (w/ supplemental 2 ft.)

SECTION 3: HYDROLOGY

Source of Hydrologic Data:	Las Vegas Valley Flood Insurance Study Hydrology Report James M. Montgomery, Inc., September, 1991
Hydrologic Methodology:	HEC1, 4-1-88 Version (by others) Corps of Engineers Equation (Approximate Areas Only)
Storm Duration:	6 Hours (by others)
Hyetograph:	Clark County SDN #3 (by others, basins < 10 sq.mi.) Clark County SDN #5 (by others, basins > 10 sq.mi.)
Flood Frequency:	100-year
Gage Calibration:	None Available

Rainfall:	2.77 inch (6-Hr., actual depth function of basin size)
Unique Conditions:	Diversions by undersized culverts at UPRR and I-15. Diversion flow rates determined by others.
Special Problems:	Study required discharges at concentration points not specifically analyzed in FIS Hydrology Report. Modified HEC1 model slightly for needed flow rates. UPRR Diversion Flow Rate: Special Problem Report #1 I-15 Diversion Flow Rate: Special Problem Report #2
Coordination of Flow Rates:	Clark Co. Regional Flood Control District 301 E. Clark Ave, Suite 301 Las Vegas, NV 89101 (702)455-3870 Attn: Gale Fraser, P.E. Kevin Eubanks, P.E. Michael Baker, Jr., Inc 3601 Eisenhower St., Suite 600 Alexandria, VA 22304 (703)960-8800 Attn: Tom Smith, P.E.

Coordination with Studies in Progress:

Blue Diamond Wash FIS
Michael Baker, Jr., Inc
3601 Eisenhower St., Suite 600
Alexandria, VA 22304
(703)960-8800
Attn: Tom Smith, P.E.

EXHIBIT 5-2

COMPUTATION SHEETS

SIEHILL SUBJECT

BY

DATE

PROJECT NO.

SHT ... OF

TROP HYDROL

① SEE MEMO

② a) USE FIS

b) MODIFY FIS HEC1 (NEW C.P.'S)

c) ADD BLUE DIAMOND

d) ADD BREAK OUT @ UPER

390 403Y

SUBJECT TROPICANA WASH - HYDROLOGY HYDROLOGIC COMPUTATIONS

BY JBF DATE 7-6-92

SHEET 1 OF

PROJECT NO. RDD33832.A2.50

① OBJECTIVES

(1) DETERMINE Q100 FOR NEEDED CONCENTRATION PTS FOR FLS HEC2

② METHODOLOGY

(1) USE ADOPTED FCD Q100 (Jmm, 1991) WHEREVER POSSIBLE

(2) MODIFY FLS HEC1 WHERE NEEDED
- @ UPRR

(3) RUN HEC1 FOR INDIVIDUAL SUB BASINS NOT MODELED BY FLS HEC1

(4) USE COE REGRESSION EQUATION FOR Q100 FOR APPROXIMATE METHOD STUDY.

COMPARISON OF EXISTING CONDITION 100-YEAR DISCHARGES FOR TROPICANA WASH FIS HYDROLOGY

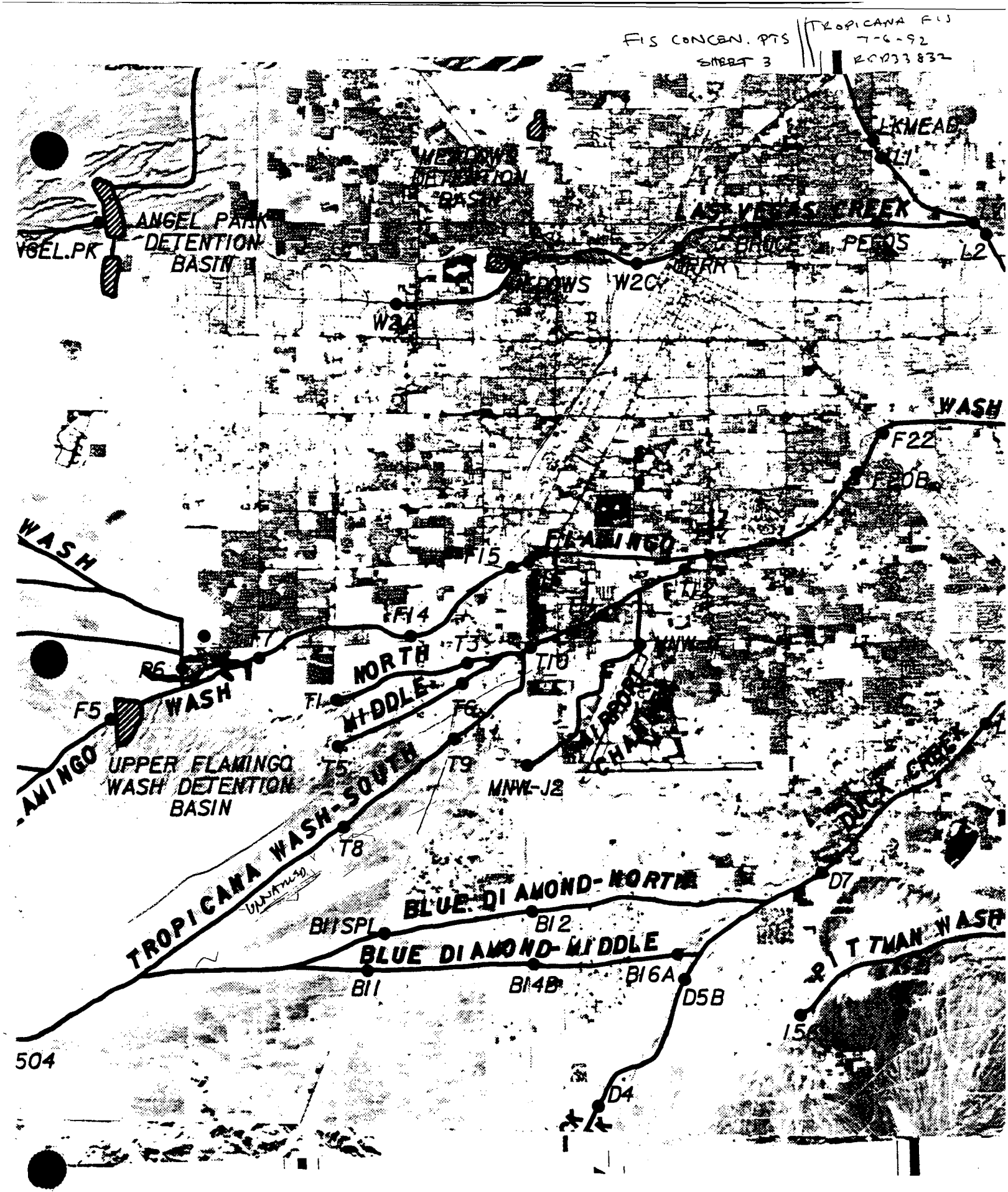
FIS Hydrology					COE Computed Probability						Adopted
CP/Node	Area	Storm	DARF	Flow	CP/Node	Area	DARF	Flow	Notes	Description	Discharge
T8	1.2*	1	0.65	5370					1	S.B. Tropicana W at Jones	5400
T9	2.1*	1	0.65	5300					1	S.B. Tropicana W u/s UPRR	5300
T9	2.1*	1	0.65	5300	CP4	2.8		3000	1,2,3	S.B. Tropicana W d/s UPRR	5300
T5	4.2	2	0.9	2640						M.B. Tropicana W at Jones	2600
T6	5.5	2	0.9	3300						M.B. Tropicana W u/s UPRR	3300
T6	5.5	2	0.9	750					3	M.B. Tropicana W d/s UPRR	750
T6OF	8.2	2	0.9	2550	CP7	8.3		2400		Overflow along UPRR	2600
T1	1.6	2	0.95	1200						N.B. Tropicana W at Jones	1200
T3	2.6	2	0.93	4050						N.B. Tropicana W u/s UPRR	4100
T3	2.6	2	0.93	1660	CP9	10.9		3100	3	N.B. Tropicana W d/s UPRR	1700
T10	11*	1	0.63	5110	CP10	12.3		4800	1,2,3	Tropicana W at I-15	5100
T11	12.1*	1	0.63	5110	CP29	13.4		4800	1,2,3	Tropicana W at Koval	5100
MNW-J2	5.4	1	0.9	266						Airport Channel at I-15	270
MNW-M	8	1	0.88	787						Airport Channel at Tropicana	~~790~~
T12	20.8*	1	0.63	5250	CP30	20.3		4800	1,2	Tropicana W at Flamingo W	5300

* Drainage area does not include contribution from Upper Blue Diamond watershed (69.5 sq mi)
Storm #1 = Basin-wide storm Storm #2 = Flamingo/Tropicana Storm Storm #3 = Valley Storm

Notes:
1. FIS flow is higher than COE due to corrected (larger) Upper Blue Diamond drainage area; also, higher percentage of flow splits to Tropicana at the higher inflow.
2. FIS drainage area differs due to refined drainage boundaries from McCarran Airport drainage studies.
3. FIS model incorporates flow splits revised by COE for Feasiblity Study, but these were not included in "Computed Probability" modeling.

TROPICANA FIS
7-6-92
ROD 33872
SHEET 2

FIS @ 100
FROM FIS HYDROLOGY
REPORT


FLS CONCEN. PTS
SHEET 3
TROPICANA FLS
7-6-92
LKMEAD
L1
WESTERN DETENTION BASIN
LAS VEGAS CREEK
ANGEL PARK DETENTION BASIN
VGEL.PK
BRUCE
PECOS
L2
W2C
W2A
WASH
F22
F20B
FLAMINGO
F15
F14
T3
T10
NORTH
MIDDLE
R6
F5
WASH
F1
F6
T5
T9
MNWL-J2
UPPER FLAMINGO WASH DETENTION BASIN
T8
TROPICANA WASH-SOUTH
BLUE DIAMOND-NORTH
D7
B11SPL
B12
BLUE DIAMOND-MIDDLE
B11
B14B
B16A
D5B
I5A
504
D4

I-15 CULVERT CAPACITY

TROPICANA FIS
7-6-92
KDD 33632
SHEET 4

TABLE 2
OFFSITE PEAK FLOWS

Source	100-Year	10-Year
Basin 1	107	55
Basin 2	120	62

The 100-year depth of flow associated with these flow quantities is 0.90 feet for Tropicana Avenue and 0.91 feet for Harmon Avenue. Both offsite basins were analyzed assuming fully developed conditions.

B. Regional Flows

Our analysis of the Tropicana Wash structure through the MGM site included the assessment of this system from Interstate 15 to a point downstream of the existing Harmon Avenue bridge structure. The elements of that system include:

CHURCH ENGIN. OF NEVADA 9-91; MGM REPORT TO CLARK CO.

1. A currently enclosed bridge structure that conveys the wash beneath Interstate 15, a distance of approximately 275 feet. The maximum headwater elevation at that location is approximately 2153.8. The maximum flow rate that can be accommodated by that structure, four 8' x 7' RCB culverts is approximately 2900 cfs.

2. A closed conduit that collects flows at the downstream side of Interstate 15 and conveys them approximately 950 feet, across the Excalibur Hotel Property to Tropicana Avenue. This segment of the system is also comprised of four 8' x 7' RCB culverts and includes five inflow points from storm drain facilities. The total inflow from these five structures is approximately 60 cfs.

SUBJECT TROPICANA: HYDROLOGY BY VEF DATE 6/22/92
SHEET 5 OF
PROJECT NO. RDD33832.A0

① APPROACH

(1.) USE EXISTING FIS Q's & HEC1 WHEREVER POSSIBLE PER INSTRUCTION OF CCRFCD

(2) INCORPORATE RESULTS OF BAKER'S ONGOING FIS STUDY FOR BLUE DIAMOND WASH, PER INSTRUCTION OF CCRFCD

(3) DETERMINE INTERMEDIATE Q'S FOR DETAILED ANALYSES BY RATIO'S OF AREAS FROM JMM HEC1. USE WATERSHED MAP PROVIDED BY JMM.

② RESULTS - BY CONCENTRATION POINT

	D.A.	Q100	SOURCE
A) TROPICANA @ FLAMINGO WASH (T12)	20.8	5300	FIS
B) TROPICANA @ KOVAL RD (T11)	12.1	5100	FIS
C) TROPICANA @ I-15 INLET	11.0	5100	FIS
[1.] Q INTO CULVERT	-	2900	MGM Rpt
[2.] Q BREAKOUT	-	2200	FIS - MGM (5100 - 2900)
*[redacted] USE BAKER (5330 + 3310) OR FIS (5100)? FIS INCLUDES A BREAKOUT FROM COE DATA (p 6-3 FIS)			NO PER BAKER PHONE CONF. ON 6-24-
D) TROPICANA: I-15 TO UPRR (T10)	8.9	2700	JMM HEC 1
E) TROPICANA @ UPRR			
[1] D/S SIDE	8.1	2420	MODIFY JMM HEC1
[2] U/S SIDE	8.1	4100	FIS
[3] BREAKOUT	-	2400	JMM HEC1
F) NORTH TROPICANA @ CONFLUENCE W/ SOUTH & CENTRAL BRANCH (T3)	2.6	1450	JMM HEC 1

SUBJECT TROPICANA - HYDROLOGY BY JEF DATE 6-29
SHEET 6 OF
PROJECT NO. RDD33832.A2.10

METHODS OF INTERPOLATING DISCHARGES FOR UPPER TROPICANA (U/S UPRR)

① INTERPOLATE HEC1 RESULTS FROM FIS CONCENTRATION POINTS

② Q100 ESTIMATES - VARIOUS METHODS (CFS) - SUMMARY

CONC. PT. - SEE FIG #1	D.AREA mi²	LINEAR Q-A	LOG-LOG Q-A	INTERPOLATE HEC1	FIS	MODIFY HEC1	Q RECOMMENDED
NORTH TROP @ CENTRAL TW	2.6	1610	1580		1450	1440	1450
@ CONF #1	1.8	1120	1040	1260	-	1220	1250
@ JONES BLVD	1.6	990	910	-	1200	1200	1200
@ CONF #2	1.1	680	600	850	-	870	850
CENTRAL TROP @ NORTH TW	5.5	3410	3700	-	3300	3210	3300
@ SOUTH TW	1.7	1050	980	1100	-	810	1000
@ CONF #1	1.1	680	600	720	-	540	640
@ JONES BLVD	0.9	560	480	600	-	470	530
SOUTH TROP @ CENTRAL	2.9	1800	1790	1900	-	1780	1800
@ JONES BLVD	2.4	1490	1450	1570	-	1510	1500

* T5: CENTRAL @ JONES PROB WON'T ADD TO FIS ADOPTED Q DUE TO DIFFERENCE IN AREA (APPROX 0.3 mi² DRAINS TO T6 NOT THRU CENTRAL OR SOUTH BRANCHES OF THIS STUDY)

③ PLOT Jmm HEC1 Q's

→ USE LTROP100.DAT FILE (FIS BY JMM) - LOCAL STORM CONTROLS

BASIN	AREA	Q100	SOURCE	
T8	1.2	110 (.95)	Jmm HEC1	} NOT ACTUALLY IN CH2M HILL STUDY AREA
T9	2.1	160 (.95)	Jmm HEC1	
T5	1.0	660 (.95)	Jmm HEC1	
T6	1.3	800 (.95)	Jmm HEC1	
T1	1.6	1200	FIS TABLE 6-3	
T3	1.0	360	Jmm HEC1	
T10	0.8	380	Jmm HEC1	
T4	3.2	2290 (.93)	Jmm HEC1	
CUMM AREA AT CP.			FIS TABLE 6.3	
Σ T5	4.2	2600		
Σ T6	5.5	3300		
Σ T3	2.6	1500 (.95)	Jmm HEC1	

* D/S OF T3 OVERFLOWS, DIVERSIONS, & BLUE DIAMOND IMPACTS ADOPTED Q'S. THEREFORE ADOPTED Q'S ARE NOT APPLICABLE TO THIS STUDY.

LOTUS FILES: TROP-DIS.WK1 - DATA + REGRESSIONS
TROPQLIN.PIC } GRAPHS { LINEAR AREA v. Q
TROPQLOG.PIC } LOG AREA - LOG Q

→ DEVELOP REGRESSION EQUATION FROM LTROP100.DAT RESULTS (HEC1)
(ELIMINATE T8 & T9 - OUTLIERS & NOT ACTUALLY IN STUDY AREA)

SUBJECT TROPICANA - HYDROLOGY BY JBF DATE 7-1
SHEET 7 OF
PROJECT NO. RDD3382.A2.50

JMM HEC 1 DATA (CON'TIN) x = AREA, y = Q100

a) LINEAR RELATION

* CONSTANT = 0 = b
X COEFF = 619.3 = m
R^2 = 0.97

$y = mx + b$

$Q_{100} = 620A$

b) LOG-LOG

CONSTANT = 2.729 = b
X COEFF = 1.133 = m
R^2 = 0.94

$y = bx^m$

$\log y = \log b + m \log x$

$y = .536 x^{1.133}$

* CONSTANT = ZERO SO THAT WHEN AREA = 0, Q100 = 0

④ MODIFY HEC 1 BASINS

① ASSUME LOSS RATE DOESN'T CHANGE FOR SUBWATERSHED (= ENDIVIDED BASIN) LOSS RATE GIVEN ON LS RECORD (LS,2 = CURVE NUMBER, SCS)

② ASSUME OVERLAND FLOW LENGTH DOESN'T CHANGE BY SUBDIVIDING WATERSHED. (UK RECORD UNCHANGED)

③ ASSUME COLLECTOR CHANNEL DOESN'T CHANGE BY SUBDIVIDING CHANNEL (V-SHAPED TRIB TO MAIN CHANNEL, ∴ 1ST RL RECORD UNCHANGED)

④ MODIFY REACH LENGTH BASED ON MEASURED DISTANCE TO CONCENTRATION PT ON USGS QUAD. CALIBRATE VS. JMM REACH LENGTH. ASSUME OTHER CHANNEL DIMENSIONS REMAIN THE SAME.

NEW LENGTHS:

	CP		LENGTH, MAIN CHL (FT)			SUBBASIN AREA (ΣA)	
T3	NORTH TROP.	@ CENTRAL	(T3)	-	(AS IS)	0.8	(2.6)
T3-A		@ CONF #1	(T3)	2500		0.2	(1.8)
T1		@ JONES	(T1)	-	(AS IS)	0.5	(1.6)
T1-A		@ CONF. #2	(T1)	10200		1.1	
TC	CENTRAL TROP	@ NORTH TROP	(TC)	-	(AS IS)		(5.5)
TC-A		@ SOUTH TROP	(TC)	5800		0.6	(1.7)
TC-B		@ CONF #1	(TC)	5300		0.2	(1.1)
TS-A		@ JONES	(TS)	-	(AS IS)	0.9	
TC-C	SOUTH TROP	@ CENTRAL	(TC)	8300		0.5	(2.9)
TS-B		@ JONES	(TS)	-	(AS IS)	2.4	

③ ASSUME BASIN T4 LENGTH & CHANNEL DIMENSION REMAINS THE SAME AS JMM/FIS MODEL, BUT CHANGE AREA TO REFLECT PORTION WHICH DRAIN TO CENTRAL OR SOUTH BRANCH

SUBJECT TROPICANA - HYDROLOGY BY JEF DATE 7-2

SHEET 8 OF

PROJECT NO. RDD32532.A2.50

HEC1 - MODIFIED (CONTIN.)

MODEL CONFIGURATION Δ = CHANGE

			Q100	DARF	
a) NORTH TROPICANA					
NORTHT1A.DAT	T1-A	Δ BA ; Δ LENGTH	868	(.95)	
NORTHT1.DAT	T1	NO Δ	1200	(FIS)	
NORTHT3A.DAT	T3-A	T1 + [Δ BA-T3 + Δ LENGTH]	1218	(.95)	
NORTH.DAT	T3	NO Δ	1442	(JMM/FIS HEC1)	
b) CENTRAL TROPICANA					
CENT-T5A.DAT	T5-A	ΔT4 AREA, ΔT5 AREA	471	(.95)	T4 AREA = 0.7 T5 AREA = 0.2
CENT-T6A.DAT	T6-B	ADD ΔT6 AREA TO T-5A + ROUTE T5 TO T6A, ΔROUTDIST.	544	(.95)	T6 AREA = 0.7
CENT-T6B.DAT	T6-A	ADD ΔT6 AREA TO T6A + ROUTE T5 TO T6B Δ T5 AREA	814	(.95)	T5 AREA = 0.5 T6 AREA = 0.5
CEN-T6B1.DAT [T6A]		[(ALTERNATIVE APPROACH)	777	(.95)	OR T5 = 0.2 T6 = 0.8]
CENTRAL.DAT	T6	NO Δ	3212	(.90)	JMM/FIS HEC1
c) SOUTH TROPICANA					
SOUTHT5B.DAT	T6C	ΔT4 AREA, ΔT5 AREA	1511	(.93)	T4 AREA = 2.1 T5 AREA = 0.3
SOUTHT6C.DAT	T5B	ΔT5 & T6 AREA, ΔT6 LENGTH ΔROUT DIST T5 TO T6C	1775	(.93)	T5 AREA = 0.5 T6 AREA = 0.2

④ INTERPOLATE AREAS FROM JMM/FIS HEC1

a) NORTH TROP @ CONFL. #1

AREA = 1.8 mi²

FIS AREA @ T1: 1.56 Q = 1200
T3: 0.99+T1 Q = 1450 } Δ = 250

INCREM DIFF TO CONFL #1 AREA = 0.24

$$\frac{0.24}{0.99} = \frac{x}{250}$$

$$x = 61$$

∴ Q @ CONF #1 = 1200 + 60 = 1260 CFS

b) NORTH TROP @ CONFL #2

AREA = 1.1 mi²

FIS AREA @ T1 = 1.56 ; Q = 1200

$$\frac{1.1}{1.56} = \frac{x}{1200}$$

$$x = 846$$

SUBJECT TROPICANA - HYDROLOGY BY JEF DATE 7-2

SHEET 9 OF

PROJECT NO. R01 33832.A2.50

INTERPOLATE HEC 1 (CONTIN.)

c) CENTRAL @ SOUTH TROP

AREA = 1.7 mi²

FIS AREA @ T5 = 4.22, Q = 2600 CFS

@ T4 = 3.22 Q = 2250 CFS

$\frac{1.7}{3.22} = \frac{X}{2250}$ or $\frac{1.7}{4.22} = \frac{X}{2600}$

$X = 1188$ $X = 1047$

USE Q = 1100 CFS

d) CENTRAL @ CONFL #1

AREA = 1.1 mi²

$\frac{1.1}{3.22} = \frac{X}{2250}$ or $\frac{1.1}{4.22} = \frac{X}{2600}$

$X = 769$ $X = 678$

USE Q = 720 CFS

e) CENTRAL @ JONES

AREA = 0.9 mi²

X = 629 OR 555

USE Q = 600 CFS

f) SOUTH @ CENTRAL

AREA = 2.9 mi²

X = 2026 OR 1787

USE Q = 1900 CFS

g) SOUTH @ CONFL #1

AREA = 2.4 mi²

X = 1677 OR 1479

USE Q = 1570 CFS

Tropicana Wash – Hydrology

Basin	Area	Q100		Q100	log Q100		log Q100	log Area
T8	1.2	110	1000000	110	2.04	100000	2.04	0.08
T9	2.1	160	1000000	160	2.20	100000	2.20	0.32
T5	1	660	1000000	660	2.82	100000	2.82	0.00
T6	1.3	800	1000000	800	2.90	100000	2.90	0.11
T1	1.6	1200	1000000	1200	3.08	100000	3.08	0.20
T3	1	360	1000000	360	2.56	100000	2.56	0.00
T10	0.8	380	1000000	380	2.58	100000	2.58	-0.10
T4	3.2	2250	1000000	2250	3.35	100000	3.35	0.51
T5-C	4.2	1000000	2600	2600	100000	3.41	3.41	0.62
T6-C	5.5	1000000	3300	3300	100000	3.52	3.52	0.74
T3-C	2.6	1000000	1500	1500	100000	3.18	3.18	0.41

Linear Regression Output:	
Constant	0
Std Err of Y Est	166.3346
R Squared	0.974932
No. of Observations	9
Degrees of Freedom	8
X Coefficient(s)	619.3089
Std Err of Coef.	19.63274

Log-Log Regression Output:	
Constant	2.729041
Std Err of Y Est	0.093882
R Squared	0.938303
No. of Observations	9
Degrees of Freedom	7
X Coefficient(s)	1.133101
Std Err of Coef.	0.109818

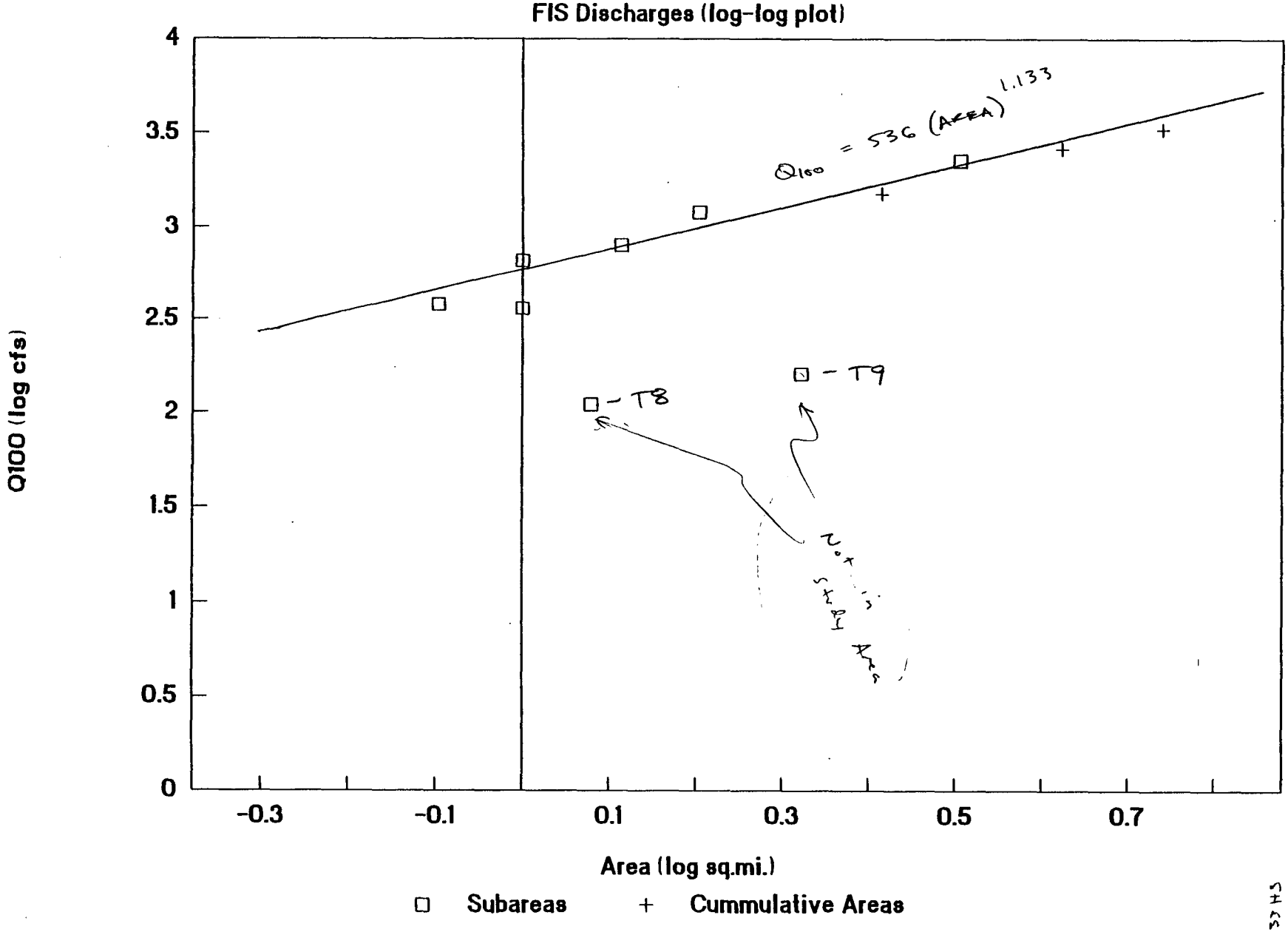
NOTE: ① VALUES OF 1000000 OR 100000 USED IN COLUMNS 3, 4, 6, 7 ARE USE TO DISTINGUISH VALUES ON PLOTS ONLY, REGRESSIONS ARE FROM COLUMNS 2 vs. 5 & 8 vs 7

② BASINS T8 & T9 WERE ELIMINATED AS OUTLIERS - NOT PART OF THIS STUDY - NOT USED IN REGRESSION - SEE PLOTS

REGRESSION FIS Q USED LATVS

TROPICANA FIS
7-6-92
RODRIGUEZ
SHEET 10

Tropicana Wash Hydrology

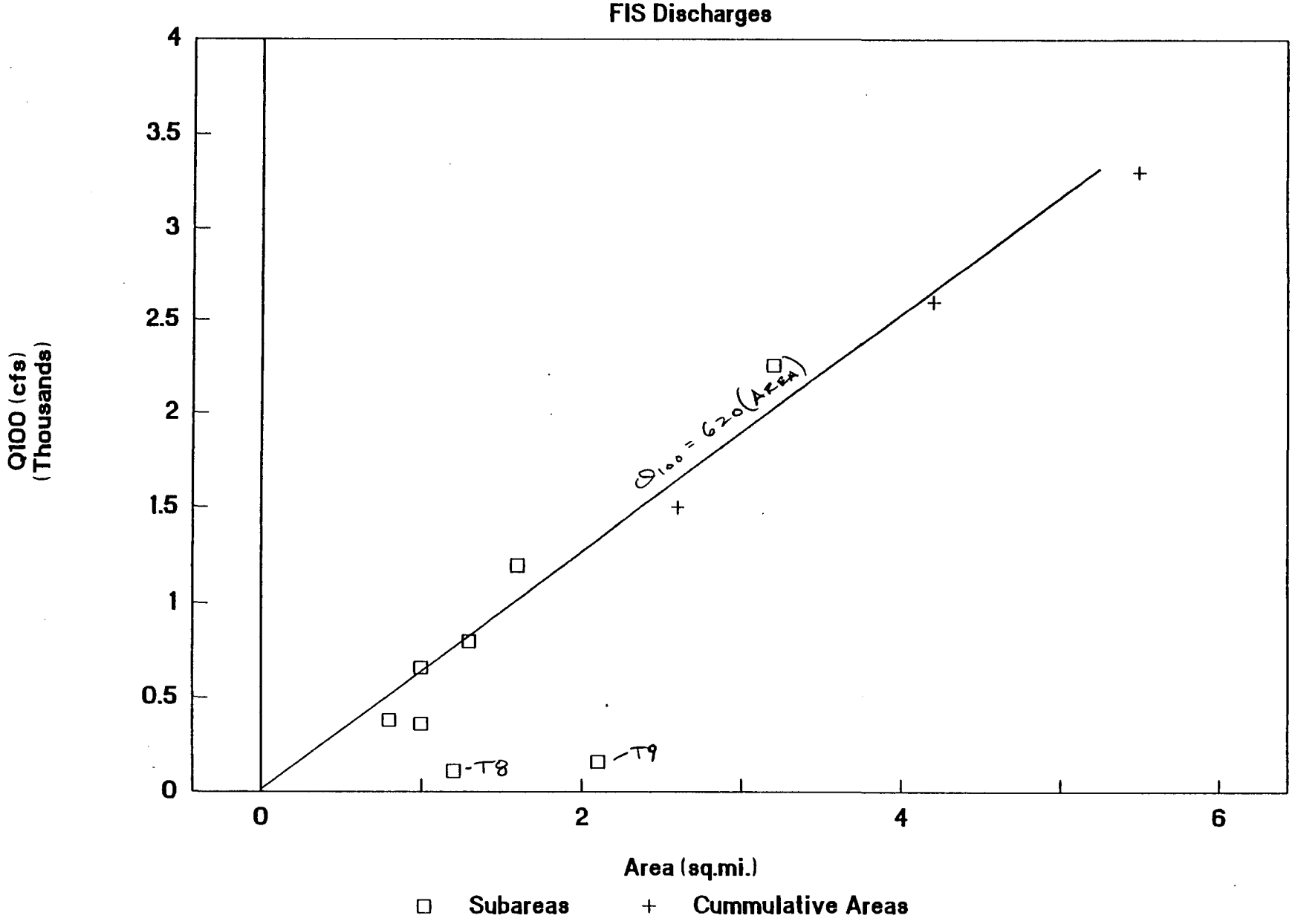


TROPICANA FIS
7-6-92
R00333532

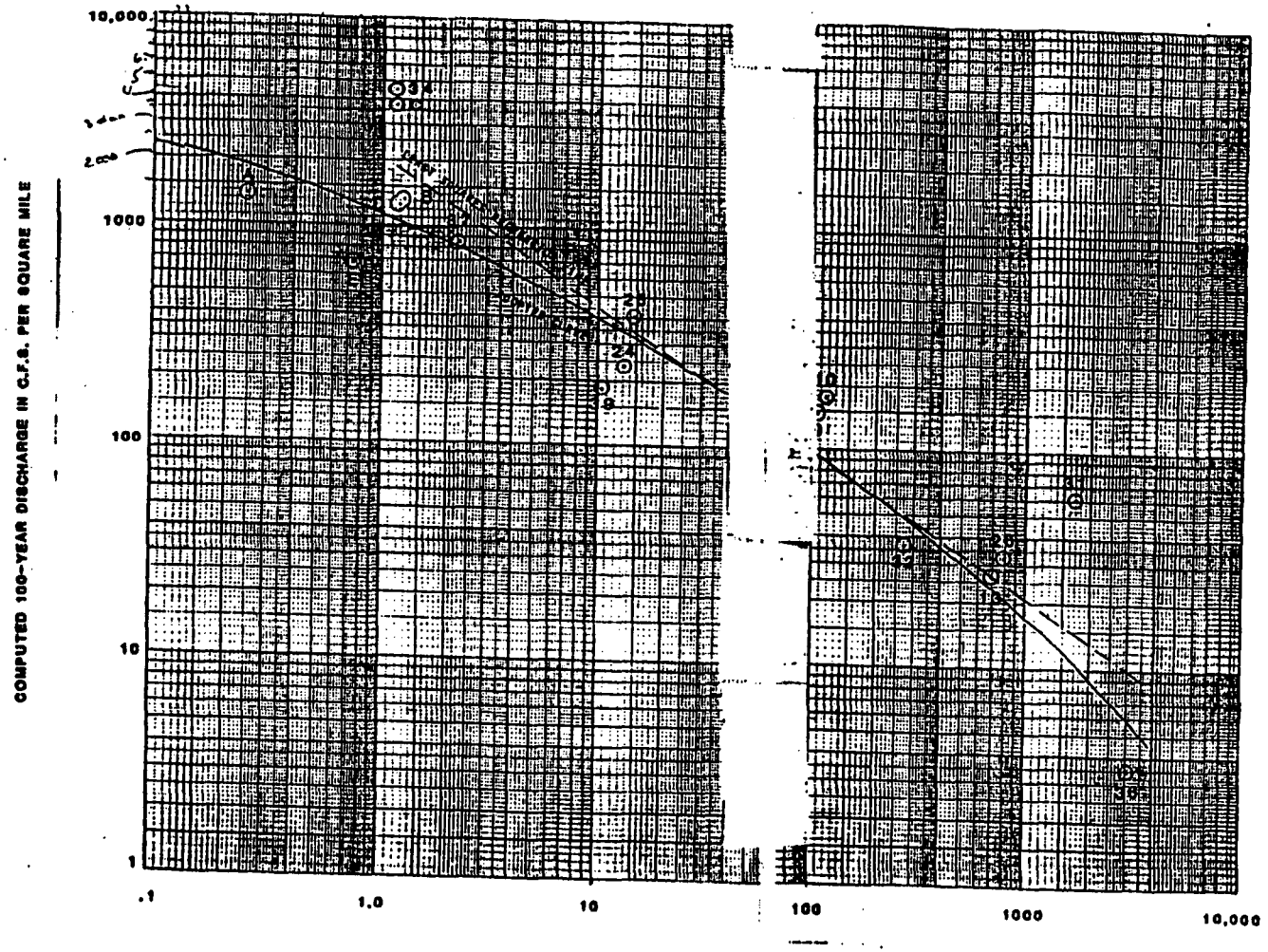
Plot of FIS
Q vs Area

SHEET 11

Tropicana Wash Hydrology



TROPICANA FLS
7-6-92
800338732
PLOT OF FIS
Q vs. AREA
SHEET 12



STREAMGAUGES USED IN REGIONAL ANALYSIS (ANALYTICAL ANALYSIS)

8. FLAMINGO WASH @ LAS VEGAS
9. FLAMINGO WASH @ MARYLAND PKWY
10. FLAMINGO WASH NEAR MOUTH
13. LAS VEGAS WASH @ N. LAS VEGAS
24. TYSON WASH TR. NEAR QUARZITE
25. SACTO WASH TR. NEAR TOPOC
26. SACTO WASH NR. YUCCA, ARIZONA
31. SAN FELIPE CRK NR. WESTMORELND
32. SALT CREEK NEAR MECCA, CALIF.
34. CARUTHERS CRK NR. IVANPAH, CA
36. AHARGOSA RIVER @ TECOPA
37. AHARGOSA R TR. #1 NR. JOHNNIE
38. SALT WELLS CRK NR. WESTEND, CA
39. NINEMILE CREEK NEAR BROWN, CA

STREAMGAUGES USED TO HELP SHAPE CURVE (GRAPHICAL ANALYSIS)

A. BOON CREEK NEAR BARSTOW, CA
B. DETRITAL WASH NR. CHLORIDE, AZ
C. LAS VEGAS WASH TR. NR. HENDERSON
D. LAS VEGAS WASH TR. S. OF NELLIS
E. BEACON CREEK AT GLENDALE, CA

LAS VEGAS FEASIBILITY STUDY

Computed Probability

COMPUTED 100-YEAR PEAK DISCHARGE VERSUS DRAINAGE AREA

US ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

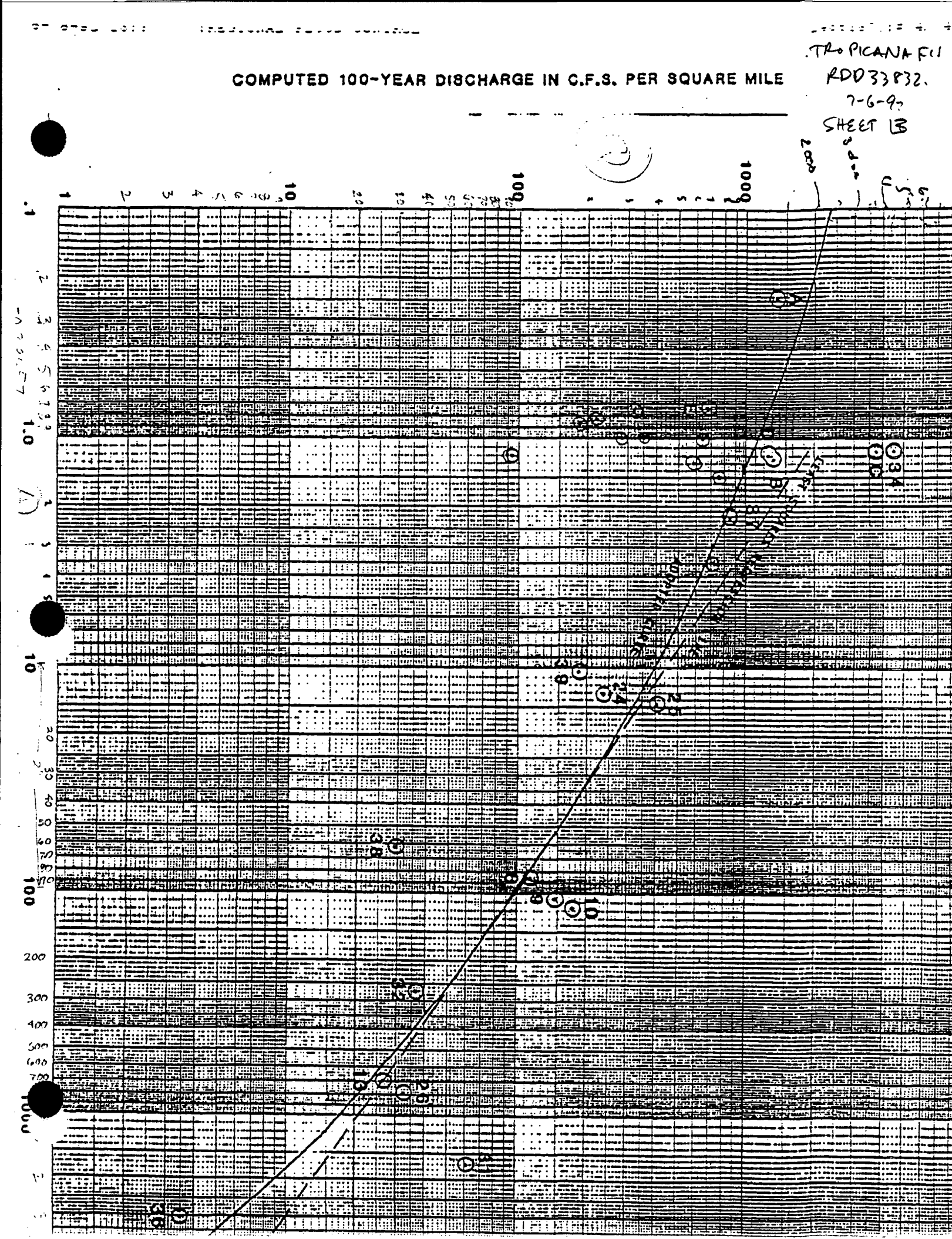
PLATE 34

REGIONAL FLOOD CONTROL

Subset I
KDD 33832
Tropicana FIS

TROPICANA FLI
RDD 33832.
7-6-9?
SHEET 13

COMPUTED 100-YEAR DISCHARGE IN C.F.S. PER SQUARE MILE



TROPICANA FIS
ROD 33832
SHEET 14
7-6-92

SUBJECT _____ PROJECT NO. _____

CH2M HILL

Main Sea.	Tribs	str. Order (sec's)	√'d in field	photo #	basin delineated lt. bk.	basin delineated rt. bk.	Area	Locate Section(s) on topo ✓	cross-sect. drawn	HEC-2 file	CWSEL	Plot water boundaries
NM-5	NT-5-a	✓ 3	✓		✓	✓	3.49	✓	✓	✓	2415.1	✓
	b	✓ 3	✓		✓	✓	30.17	✓	✓	✓	2438.1	✓
	c	✓ 2	✓		✓	✓	17.54	✓	✓	✓	2461.5	✓
	d	1			✓	✓	45.66					
	e	1			✓	✓	31.30					
	f	✓ 2	✓		✓	✓	44.52	✓	✓	✓	2465.1	✓
	g	1			✓	✓	30.86					
	h	1			✓	✓	23.46					
	i	✓ 2	✓		✓	✓	32.79	✓	✓	✓	2490.4	✓
	j	✓✓ 2	✓✓		✓	✓	47.14	u/s ✓ d/s ✓	✓	✓ ✓	(u: 2505.0 (d: 2485.1	✓
	k	1			✓	✓	21.75					✓
	l	1			✓	✓	15.26					
	m	1			✓	✓	18.22					
CM-1	–											
CM-2	CT-2-a	✓ 3	✓		✓	✓	94.05	✓	✓	✓	2301.9	✓
	b	? 2			✓	✓	65.81					
	c	1			✓	✓	10.25					
	d	1			✓	✓	16.95					
	e	✓ 2	✓		✓	✓	60.24	✓	✓	✓	2320.0	
	f	✓ 2	✓		✓	✓	22.22	✓	✓	✓	2370.7	
	g	1			✓	✓	19.13					
	h	1			✓	✓	23.91					
	i	1			✓	✓	109.77					
CM-3	CT-3-a	✓ 2	✓		✓	✓	14.57	✓	✓	✓	2477.4	
	b	✓ 2	✓		✓	✓	12.07	✓	✓	✓	2512.7	
	c	1			✓	✓	6.15					
	d	1			✓	✓	11.56					
	e	1			✓	✓	29.38					
CM-4	CT-4-a	✓ 3	✓		✓	✓	2.85	✓	✓	✓	2560.9	
	b	✓ 2	✓		✓	✓	7.06	✓	✓	✓	2568.2	
	c	✓ 2	✓		✓	✓	79.93	✓	✓	✓	2586.1	
	d	1			✓	✓	97.92					
	e	1			✓	✓	178.42					
	f	1			✓	✓	48.28					
	g	✓ 2	✓✓		✓	✓	32.91	u/s ✓ d/s ✓ u/s ✓ d/s ✓	✓	✓ ✓	(u/s: 2600.9 (d/s: 2567.4	
	h	1			✓	✓	37.73					
	i	1			✓	✓	58.75					

TROPICANA FLS
RDD 33832
7-6-92
SHEET 15

SUBJECT Tropicana Wash - Drainage basin info for approximate method PROJECT NO. 1

Mod. Seq	Trib		Str. order	Visible in field	Basin #	basin delineated ft. bk	basin delineated pt. bk	Area, ac.	locate ✓ section(s) on topo	cross-sect. drawn	HEC-2 file	CWSEL
SM-1	ST-1	a	✓ 2	✓		✓	✓	1.25	✓	✓	✓	2449.1
		b	1			✓	✓	17.90				(RRd = 2459.3)
Rainbow Rd. (RRd)		c	✓ 2	✓		✓	✓	1.71	✓	✓	? (same)	use ↗
		d	✓ 2	✓		✓	✓	14.57	✓	✓	✓	2465.5
		e	✓ 2	✓		✓	✓	80.16	✓	✓	✓	2508.9
		f	1			✓	✓	13.67				
		g	1			✓	✓	46.46				
		h	1			✓	✓	22.43				
		i	1			✓	✓	33.14				
SM-2	ST-2	a	✓ 3	✓		✓	✓	10.25	✓	✓	✓	2469.7
		b	✓ 3	✓		✓	✓	35.53	✓	✓	✓	2480.3
		c	1			✓	✓	25.73				
		d	✓ 3	✓		✓	✓	62.40	✓	✓	✓	2552.6
		e	✓ 2	✓		✓	✓	54.09	✓	✓	✓	2573.3
		f	✓ 2	✓		✓	✓	7.06	✓	✓	✓	2633.4
		g	1			✓	✓	69.57				
		h	✓ 2	✓		✓	✓	56.25	✓	✓	✓	2645.8
		i	1			✓	✓	36.06				
		j	1			✓	✓	94.40				
		k	1			✓	✓	37.46				
		l	✓ 2	✓		✓	✓	33.48	✓	✓	✓	2582.6
		m	✓ 2	✓		✓	✓	3.87	✓	✓	✓	2604.9
		n	1			✓	✓	3.42				
		o	1			✓	✓	17.65				
		p	1			✓	✓	15.03				
		q	✓✓✓ 2	✓✓✓		✓	✓	248.38	✓	✓	✓	1 see ST-2-a 2 2557.3 3 2603.3
		r	1			✓	✓	45.66				
		s	2*			✓	✓	12.75				
		t	1			✓	✓	9.72				
↓ order of flow		u	2			✓	✓	34.94				
		v	1			✓	✓	34.73				
		w	2			✓	✓	25.05				
		x	1			✓	✓	36.21				
		y	1			✓	✓	15.33				

* was stream order 1, became 0.2 when streams t-y were added

TROPICANA FIS
7-6-92

SHEET 16

SUBJECT PROJECT NO.

Note: NM-4 means North Tropicana wash, Main Branch - 4th segment
NT-4-d " " " " , Tributary, - " " , sub-segment d

North Tropicana Main Seg.	Tribs	str. order	Ved in field	photo #	basin delineated lt. bk.	basin delineated rt. bk.	Area, ac.	locate section(s) on topo	cross-sect. drawn	HEC-2 file	CWSEL	Plot water boundaries
NM-1	NT-1-a	2	✓		✓	✓	26.30	✓	✓	✓	2295.32	✓
	b	1			✓	✓	66.27					
	c	1			✓	✓	134.98					
NM-2	NT-2-a	3	✓		✓	✓	16.74	✓	✓	✓	2343.29	✓
	b	1			✓	✓	18.45					
	c	3	✓		✓	✓	66.73	✓	✓	✓	2380.69	✓
	d	2	✓		✓	✓	16.17	✓	✓	✓	2428.60	✓
	e	1			✓	✓	13.80					
	f	1			✓	✓	29.58					
	g	2	✓		✓	✓	2.67	✓	✓	✓	2424.71	✓
	h	1			✓	✓	11.39					
	i	1			✓	✓	14.46					
NM-3	NT-3-a	2	✓		✓	✓	26.08	✓	✓	✓	2349.18	✓
	b	1			✓	✓	56.02					
	c	2	✓		✓	✓	48.28	✓	✓	✓	2413.41	✓
	d	1			✓	✓	39.74					
	e	2			✓	✓	13.21	✓	✓	✓	2443.91	✓
	f	1			✓	✓	19.57					
	g	1			✓	✓	10.82					
NM-4	NT-4-a	2	✓		✓	✓	2.62	use NT-4-b	✓	✓	2367.23	✓
	b	2	✓		✓	✓	5.12	✓	✓	✓	2374.17	✓
	c	2	✓✓		✓	✓	136.87	u/s ✓ d/s ✓	✓ ✓	✓ ✓	u:2506.3/d:2417.9	✓ ✓
	d	2	✓✓		✓	✓	111.12	u/s ✓ d/s ✓	✓ ✓	✓ ✓	u:2577.2/d:2535.9	✓ ✓
	e	1			✓	✓	12.41					
	f	2	✓		✓	✓	19.93	✓	✓	✓	2617.9	✓
	g	1			✓	✓	25.73					
	k	1			✓	✓	5.88					
	i	1			✓	✓	87.45					
	j	1			✓	✓	41.33					
	k	1			✓	✓	18.56					

NM

NT-1: $a < \begin{matrix} b \\ c \end{matrix}$

NT-2: $a < \begin{matrix} b \\ c \end{matrix} < \begin{matrix} d & e \\ g & h \end{matrix} < \begin{matrix} & f \\ & i \end{matrix}$

NT-3: $a < \begin{matrix} b \\ c \end{matrix} < \begin{matrix} d \\ e \end{matrix} < \begin{matrix} f \\ g \end{matrix}$

NT-4: $a < \begin{matrix} b \\ k \end{matrix} < \begin{matrix} c \\ j \end{matrix} < \begin{matrix} d \\ i \end{matrix} < \begin{matrix} e \\ f \end{matrix} < \begin{matrix} g \\ h \end{matrix}$

NT-5: $a < \begin{matrix} b \\ i \end{matrix} < \begin{matrix} c & d \\ f & e \end{matrix} < \begin{matrix} g \\ h \end{matrix} < \begin{matrix} j \\ m \end{matrix} < \begin{matrix} k \\ l \end{matrix}$

CM

CT-2: $a < \begin{matrix} b \\ c \end{matrix} < \begin{matrix} c \\ d \end{matrix} < \begin{matrix} f \\ i \end{matrix} < \begin{matrix} g \\ h \end{matrix}$

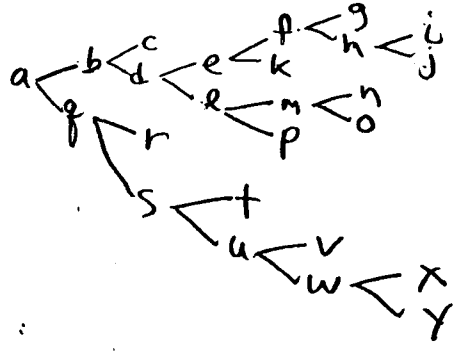
CT-3: $a < \begin{matrix} b \\ e \end{matrix} < \begin{matrix} e \\ d \end{matrix}$

CT-4: $a < \begin{matrix} b \\ g \end{matrix} < \begin{matrix} c & d \\ f & e \end{matrix} < \begin{matrix} h \\ i \end{matrix}$

SM

ST-1: $a < \begin{matrix} b \\ c \end{matrix} < \begin{matrix} d & e \\ i & h \end{matrix} < \begin{matrix} & t \\ & g \end{matrix}$

ST-2:



Tributary Schematic

TRIBUTARY #1
7-6-92
SHEET 1 of 1

SUBJECT TROPICANA FIS - HEC 1 BY JEF DATE 6-12

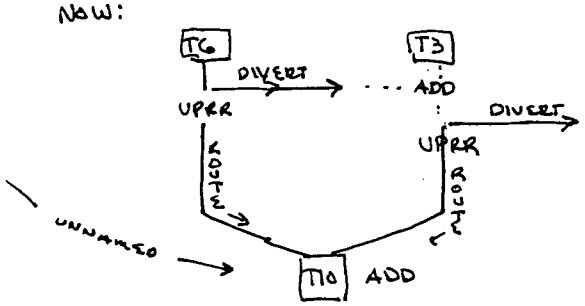
SHEET 18 OF

PROJECT NO. RDD 33832.A0

① MODIFICATIONS TO Jmm HEC1 NEEDED

① COMBINE T6 + T3 IMMEDIATELY AFTER "ROUTING" THRU UPRR

NOW:



MODIFY Jmm FILE "LTROP100.DAT"

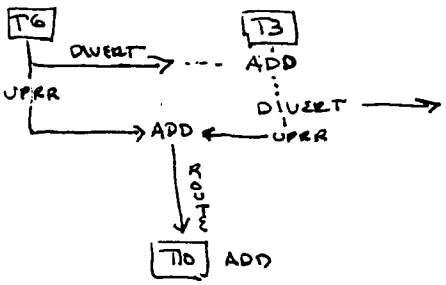
NEW NAME = LTR100.DAT
= BTR100.DAT

a) DELETE MUSKINGUM ROUTING OF T6 THRU T10

b) ADD HC FOR T3+T6

c) Δ HC 4 TO HC 3 AT T10 + T9 + (T3+T6)

SHOULD BE:



	LTR100.OUT	Jmm HEC1	BTR100.OUT
T3+T6 :	2420	N/A	(1496)
T10 :	375	375	(118)
(T3+T6)+T10 :	2672	N/A	(1538)
T3-10 + T9 :	(2745)	~2600	5103

② ASSUME OVERFLOWS / BREAKOUTS AT UPRR & I-15 DO NOT AFFECT PEAK, SINCE NOT ROUTED, TO REACHES D/S OF I-15

③ Q BETWEEN I-15 & UPRR. DO NOT ADD IN UNNAMED WASH AT I-15 (FIRST ADD THREE T6, T3, T10)

④ BREAKOUT Q. 2400 CFS AT UPRR. USE SAME VALUE AT I-15 QCAP = 2900 CFS I-15 CULVERT. THE 2370 CFS FROM CHURCH RPT. PROB. INCLUDES SOME OF THE 2400 CFS WHICH BREAKS OUT AT UPRR UPSTREAM OF I-15

SUBJECT Tropicana Wash

BY HMA DATE 7/17/92

SHEET NO. 1 OF 4

PROJECT NO. RDO 33832

Plot HEC-1 regression equations (sheet 3 and 4) on Corp of Engineer (COE) curve (sheet 2) to compare.

- equations: 1) $Q_{100} = 620\,A$ A = area in mi^2

2) $Q_{100} = 536\,A^{1.133}$

- C.O.E. curve plots Area (mi^2) vs. Q_{100}/mi^2 Q_{100} in cfs

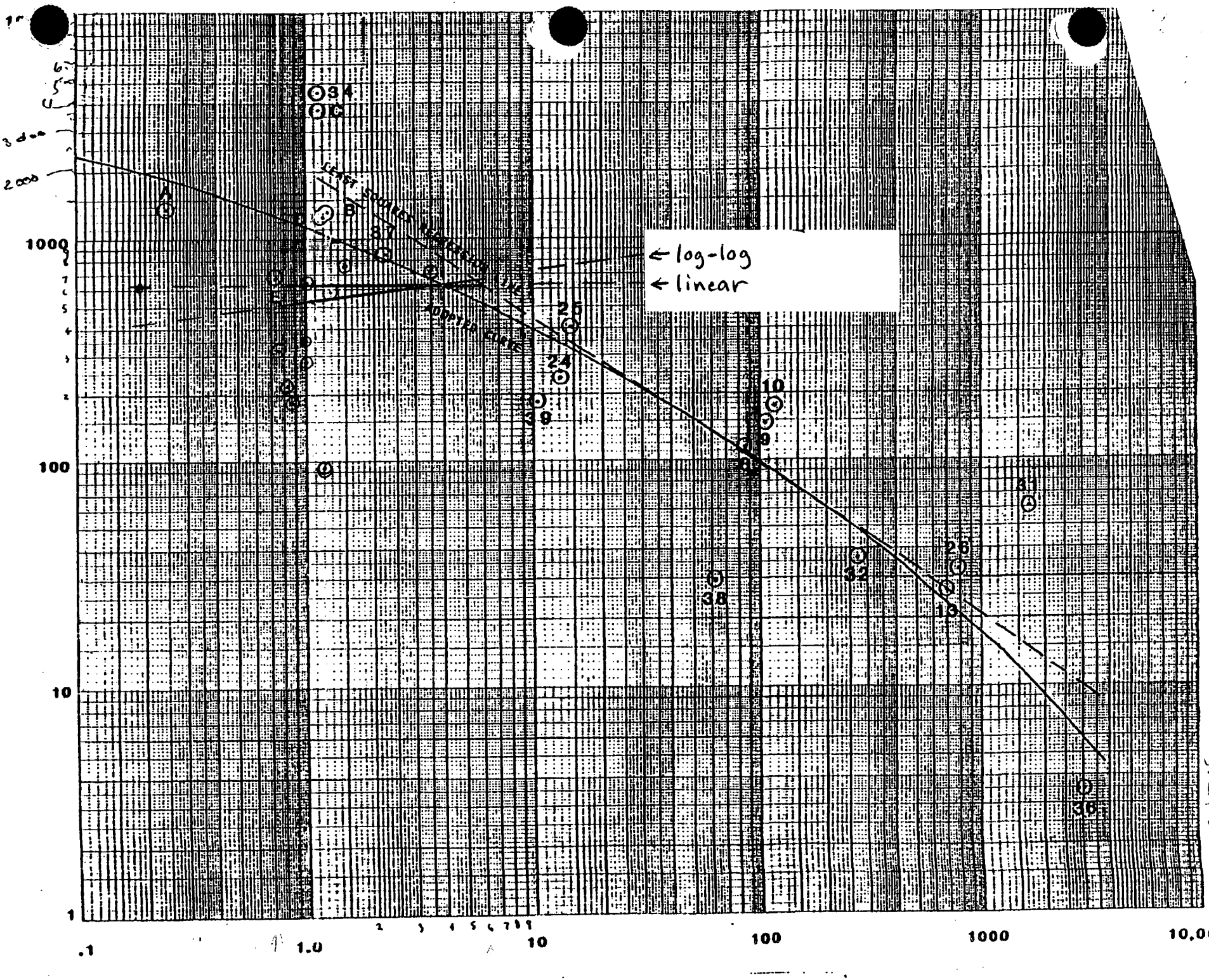
So need to convert regression equations in to Q_{100}/mi^2 equations:

1) $Q_{100}/mi^2 = 620\,A/A = 620$

2) $536\,A^{1.133}/A = 536\,A^{(1.133-1)} = 536\,A^{0.133}$

Results:

the linear equation plots as a horizontal line and the log-log plot has a positive slope. Respectively, these say that the discharge is directly proportional to basin size or it increases with increasing basin size. Since neither of these are observed to be true, the COE curve was used to estimate discharges.


COMPUTED 100-YEAR DISCHARGE IN C.F.S. PER SQUARE MILE
DRAINAGE AREA IN SQUARE MILES
.1
1.0
10
100
1000
10,00
1
10
100
1000
log-log
linear
SHEET 2 OF 4

SUBJECT TRUCKEE - HYDROLOGY BY JBF DATE 7-1

SHEET 3 OF

PROJECT NO. 0033821.12.10

JMM HEC I DATA (CONTIN)

x = AREA
y = Q100

a) LINEAR REGRESSION

CONSTANT = 0 = b
X COEFF = 619.3 = m
R^2 = 0.97

$y = mx + b$

$Q_{100} = 620A$

CONSTANT = ZERO SO THAT WHEN AREA = 0, Q100 = 0

b) LOG-LOG

CONSISTANT = 2.729 = b
X COEFF = 1.133 = m
R^2 = 0.94

$y = bx^m$

$\log y = \log b + m \log x$

$y = 536 x^{1.133}$

(4) MODIFY HEC II BASINS

(1) ASSUME LOSS RATE DOESN'T CHANGE FOR SUBWATERSHED (= ENTITLED BASIN)
LOSS RATE GIVEN ON LS RECORD (LS,2 = CURVE NUMBER, SCS)

(2) ASSUME OVERLAND FLOW LENGTH DOESN'T CHANGE BY SUBDIVIDING WATERSHED (UC RECORD UNCHANGED)

(3) ASSUME COLLECTOR CHANNEL DOESN'T CHANGE BY SUBDIVIDING CHANNEL (V-SHAPED TRIB TO MAIN CHANNEL, ∴ 1ST UC RECORD UNCHANGED)

(4) MODIFY REACH LENGTH BASED ON MEASURED DISTANCE TO CONCENTRATION PT ON USGS QUAD. CALIBRATE VS. JMM REACH LENGTH. ASSUME OTHER CHANNEL DIMENSIONS REMAIN THE SAME.

NEW LENGTHS:

CP			LENGTH MAIN CHL (FT)			SUBBASIN AREA (SA)	
T3	NORTH TRIB	@ CONFLUX	(T3)	-	(AS IS)	0.8	(2.6)
T3-A		@ CONF #1	(T3)	25100		0.2	(1.8)
T1		@ JONES	(T1)	-	(AS IS)	0.5	(1.6)
T1-A		@ CONF. #2	(T1)	10200		1.1	
T4	CENTRAL TRIB	@ NORTH TRIB	(T4)	-	(AS IS)		(5.5)
T6-A		@ SOUTH TRIB	(T6)	5800		0.6	(1.1)
T6-B		@ CONF #1	(T6)	5300		0.2	(1.1)
T5-A		@ JONES	(T5)	-	(AS IS)	0.9	
T6-C	SOUTH TRIB	@ CENTRAL	(T6)	8300		0.5	(2.9)
T5-B		@ JONES	(T5)	-	(AS IS)	2.4	

(5) ASSUME BASIN T4 LENGTH & CHANNEL DIMENSION REMAINS THE SAME AS JMM/FLS MODEL, BUT CHANGE AREA TO REFLECT PORTION WHICH DRAIN TO CENTRAL OR SOUTH BRANCH

Tropicana Wash – Hydrology

Basin	Area	Q100		Q100	log Q100		log Q100	log Area
T8	1.2	110	1000000	110	2.04	100000	2.04	0.08
T9	2.1	160	1000000	160	2.20	100000	2.20	0.32
T5	1	660	1000000	660	2.82	100000	2.82	0.00
T6	1.3	800	1000000	800	2.90	100000	2.90	0.11
T1	1.6	1200	1000000	1200	3.08	100000	3.08	0.20
T3	1	360	1000000	360	2.56	100000	2.56	0.00
T10	0.8	380	1000000	380	2.58	100000	2.58	-0.10
T4	3.2	2250	1000000	2250	3.35	100000	3.35	0.51
T5-C	4.2	1000000	2600	2600	100000	3.41	3.41	0.62
T6-C	5.5	1000000	3300	3300	100000	3.52	3.52	0.74
T3-C	2.6	1000000	1500	1500	100000	3.18	3.18	0.41

Linear Regression Output:	
Constant	0
Std Err of Y Est	166.3346
R Squared	0.974932
No. of Observations	9
Degrees of Freedom	8
X Coefficient(s)	619.3089
Std Err of Coef.	19.63274

Log-Log Regression Output:	
Constant	2.729041
Std Err of Y Est	0.093882
R Squared	0.938303
No. of Observations	9
Degrees of Freedom	7
X Coefficient(s)	1.133101
Std Err of Coef.	0.109818

NOTE: ① VALUES OF 1000000 OR 100000 USED IN COLUMNS 3, 4, 6, 7 ARE USE TO DISTINGUISH VALUES ON PLOTS ONLY, REGRESSIONS ARE FROM COLUMNS 2 vs. 5 & 8 vs 7

② BASINS T8 & T9 WERE ELIMINATED AS OUTLIERS - NOT PART OF THIS STUDY - NOT USED IN REGRESSION - SEE PLOTS

REGRESSION #1 IS ONLY USED VALUES

TROPICANA FLS
7-6-92
RDD73832
SHEET #4

SUBJECT Tropicana Wash

BY HMA DATE 6/13/22

SHEET NO. 1 OF 4

PROJECT NO. RDD 33852

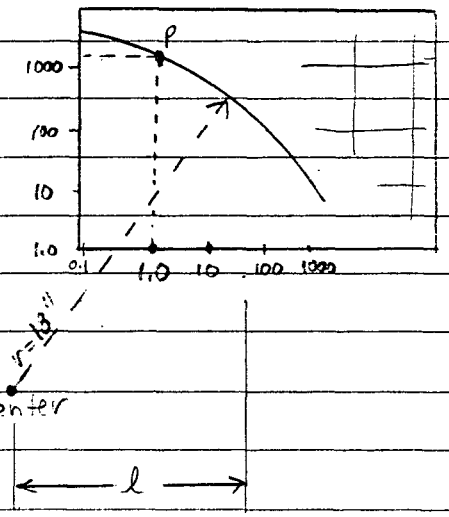
Goal: Find an equation that represents the adopted curve for estimating discharge (see attached)

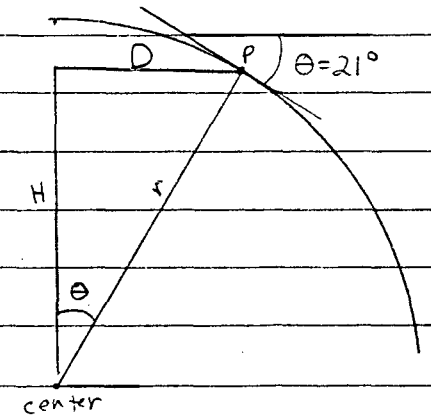
- a linear regression was tried but there was too much error as areas got below 0.1 mi^2

- tried to match highway curves with the adopted curve:
  - enlarged graph paper slightly so that 1 cycle = 2"
  - found that an 18" radius curve matches the adopted curve very closely between $0.1\ mi^2 \leq A \leq 100\ mi^2$

Procedure

1) locate center of 18"r curve w.r.t. a point on the graph.
   - graph point, chose $x = 1.0\ mi^2$ + thus $y = 1130^{\pm}$





D = horiz. distance from center to Point P or curve

$= r \sin\theta$, θ = ∠ of tangent from horizontal @ P = 21°

$= 18" \sin 21$

$= 6.45"$

l = vertical distance from center to P

$= r \cos\theta = 18" \cos 21° = 16.80"$

Also, distance from P to horizontal axis = 6.1" (measured)

therefore, distance from center to horizontal axis $= 16.3" - 6.1" = 10.7"$

2) Relate a given basin area to a point on the arc.

so:

Basin Area	Equiv. distance from center
10^{-2}	2.45"
$10^{-1} = 0.1$	4.45"
$10^{0} = 1.0$	6.45"
$10^{1} = 10$	8.45"
10^{2}	10.45"
10^{3}	12.45"

Set "1.0" on graph as origin so, here, x = 0 (subtract 6.45" from distances) then:

Basin Area	x
10^{-2}	-4"
10^{-1}	-2"
10^{0}	0
10^{1}	2"
10^{2}	4"

or Basin Area, $A = 10^{x/2}$ where x = distance from origin in inches.

Then, $x = 2 \log A = \log A^2$

l = distance from center to same basin area on graph

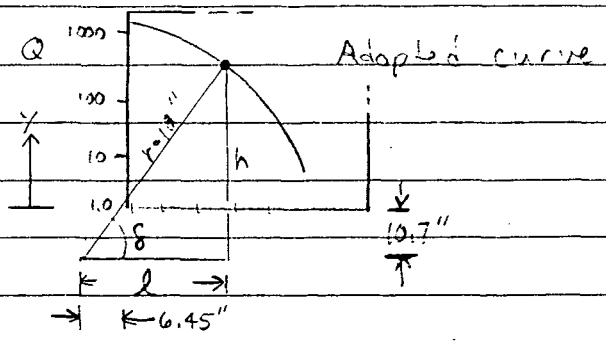
$= 6.45" + \log A^2$

SUBJECT Tar Wash

BY HMA DATE 6/10/22

SHEET NO. 3 OF 4

PROJECT NO. [illegible]



so $l = 6.45 + \log A^2$

$h = l \tan \delta$

and $\delta = \cos^{-1} \frac{l}{r}$

$\therefore h = l \tan\left(\cos^{-1} \frac{l}{r}\right)$

y = distance from horiz. axis where Q = 1.0 to Q in question

$= h - 10.7"$

$= l \tan\left(\cos^{-1} \frac{l}{r}\right) - 10.7$

then, similarly as was found for x,

$y = \log Q^2$ or $Q = 10^{y/2}$

so: $Q = 10^{y/2}$

$= 10^{\frac{1}{2}\left(l \tan\left(\cos^{-1} \frac{l}{r}\right) - 10.7\right)}$

$= 10^{\frac{1}{2}\left[(6.45 + \log A^2) \tan\left(\cos^{-1}\left(\frac{6.45 - \log A^2}{13}\right)\right) - 10.7\right]}$

COMPUTED 100-YEAR DISCHARGE IN C.F.S. PER SQUARE MILE

4 of 4

SUBJECT Tropicana Wash — Approx. Methods — Tributary Network schematic

BY HMA DATE 6/18/92

SHEET 1 OF 1

PROJECT NO. RDD 33832

ST

ST-1

ST-2

CT

CT-2

CT-3

CT-4

NT

NT-1

NT-2

NT-3

NT-4

NT-5

TROPICANA WASH 33832
Approximate Methods Hydrology

North Tropicana Wash

Main Seg.	Tribs	Indiv. Trib. Basin Area, acres	Cumul. Trib. Basin Area, acres	Cumul. Trib. Basin Area, sq. mi.	cfs/ sq. mi.	Q, cfs
NM-1	NT-1-a	26.30	227.05	0.355	1628	577
	NT-1-b	66.27	66.27	0.104	2327	241
	NT-1-c	134.48	134.48	0.210	1914	402
	Sum=	227.05				
NM-2	NT-2-a	16.74	189.08	0.295	1725	510
	NT-2-b	18.45	18.45	0.029	3097	89
	NT-2-c	66.73	153.89	0.240	1838	442
	NT-2-d	16.17	58.64	0.092	2400	220
	NT-2-e	13.89	13.89	0.022	3262	71
	NT-2-f	28.58	28.58	0.045	2835	127
	NT-2-g	2.67	28.52	0.045	2836	126
	NT-2-h	11.39	11.39	0.018	3375	60
	NT-2-i	14.46	14.46	0.023	3239	73
	Sum=	189.08				
NM-3	NT-3-a	26.08	208.72	0.326	1672	545
	NT-3-b	56.02	56.02	0.088	2428	212
	NT-3-c	48.28	126.62	0.198	1948	385
	NT-3-d	39.74	39.74	0.062	2635	164
	NT-3-e	13.21	38.60	0.060	2653	160
	NT-3-f	14.57	14.57	0.023	3235	74
	NT-3-g	10.82	10.82	0.017	3404	58
	Sum=	208.72				
NM-4	NT-4-a	2.62	470.03	0.734	1266	930
	NT-4-b	5.12	448.85	0.701	1288	903
	NT-4-c	136.87	402.40	0.629	1340	842
	NT-4-d	111.13	178.08	0.278	1758	489
	NT-4-e	12.41	12.41	0.019	3326	65
	NT-4-f	19.93	54.54	0.085	2444	208
	NT-4-g	25.73	25.73	0.040	2898	117
	NT-4-h	8.88	8.88	0.014	3512	49
	NT-4-i	87.45	87.45	0.137	2162	295
	NT-4-j	41.33	41.33	0.065	2612	169
	NT-4-k	18.56	18.56	0.029	3093	90
	Sum=	470.03				
NM-5	NT-5-a	3.49	412.16	0.644	1328	855
	NT-5-b	30.17	273.51	0.427	1531	654
	NT-5-c	17.54	144.50	0.226	1874	423
	NT-5-d	45.66	45.66	0.071	2551	182
	NT-5-e	81.30	81.30	0.127	2205	280
	NT-5-f	44.52	98.84	0.154	2091	323
	NT-5-g	30.86	30.86	0.048	2789	134
	NT-5-h	23.46	23.46	0.037	2954	108
	NT-5-i	32.79	135.16	0.211	1911	404
	NT-5-j	47.14	84.15	0.131	2185	287
	NT-5-k	21.75	21.75	0.034	2999	102
	NT-5-l	15.26	15.26	0.024	3208	76
	NT-5-m	18.22	18.22	0.028	3104	88
	Sum=	412.16				

Central Tropicana Wash

Main Seg.	Tribs	Indiv. Trib. Basin Area, acres	Cumul. Trib. Basin Area, acres	Cumul. Trib. Basin Area, sq. mi.	cfs/ sq. mi.	Q, cfs
CM-2	CT-2-a	94.05	432.23	0.675	1306	882
	CT-2-b	65.81	92.91	0.145	2127	309
	CT-2-c	10.25	10.25	0.016	3434	55
	CT-2-d	16.85	16.85	0.026	3150	83
	CT-2-e	60.24	245.27	0.383	1587	608
	CT-2-f	32.22	75.26	0.118	2251	265
	CT-2-g	19.13	19.13	0.030	3075	92
	CT-2-h	23.91	23.91	0.037	2942	110
	CT-2-i	109.77	109.77	0.172	2030	348
	Sum=	432.23				
CM-3	CT-3-a	14.57	73.67	0.115	2264	261
	CT-3-b	12.07	29.72	0.046	2811	131
	CT-3-c	6.15	6.15	0.010	3703	36
	CT-3-d	11.50	11.50	0.018	3369	61
	CT-3-e	29.38	29.38	0.046	2818	129
	Sum=	73.67				
CM-4	CT-4-a	2.85	543.85	0.850	1200	1020
	CT-4-b	7.06	411.61	0.643	1329	855
	CT-4-c	79.93	356.27	0.557	1398	778
	CT-4-d	97.92	97.92	0.153	2096	321
	CT-4-e	178.42	178.42	0.279	1757	490
	CT-4-f	48.28	48.28	0.075	2517	190
	CT-4-g	32.91	129.39	0.202	1936	391
	CT-4-h	37.73	37.73	0.059	2657	157
	CT-4-i	58.75	58.75	0.092	2399	220
	Sum=	543.85				

South Tropicana Wash

Main Seg.	Tribs	Indiv. Trib. Basin Area, acres	Cumul. Trib. Basin Area, acres	Cumul. Trib. Basin Area, sq. mi.	cfs/ sq. mi.	Q, cfs
SM-1	ST-1-a	1.25	236.38	0.369	1606	593
	ST-1-b	17.99	17.99	0.028	3112	87
	ST-1-c	1.71	217.14	0.339	1651	560
	ST-1-d	14.57	182.29	0.285	1745	497
	ST-1-e	80.16	145.29	0.227	1870	425
	ST-1-f	18.67	18.67	0.029	3090	90
	ST-1-g	46.46	46.46	0.073	2541	184
	ST-1-h	22.43	22.43	0.035	2981	104
	ST-1-i	33.14	33.14	0.052	2745	142
	Sum=	236.38				
SM-2	ST-2-a	10.25	1029.92	1.609	933	1502
	ST-2-b	35.53	557.00	0.870	1189	1035
	ST-2-c	25.73	25.73	0.040	2898	117
	ST-2-d	62.40	495.74	0.775	1242	962
	ST-2-e	54.09	354.89	0.555	1400	776
	ST-2-f	7.06	263.34	0.411	1550	638
	ST-2-g	69.57	69.57	0.109	2298	250
	ST-2-h	56.25	186.71	0.292	1732	505
	ST-2-i	36.06	36.06	0.056	2694	152
	ST-2-j	94.40	94.40	0.148	2117	312
	ST-2-k	37.46	37.46	0.059	2671	156
	ST-2-l	33.48	78.45	0.123	2226	273
	ST-2-m	3.87	29.94	0.047	2807	131
	ST-2-n	8.42	8.42	0.013	3540	47
	ST-2-o	17.65	17.65	0.028	3123	86
	ST-2-p	15.03	15.03	0.023	3217	76
	ST-2-q	248.38	462.67	0.723	1274	921
	ST-2-r	45.66	45.66	0.071	2551	182
	ST-2-s	12.75	168.63	0.263	1788	471
	ST-2-t	9.72	9.72	0.015	3463	53
	ST-2-u	34.84	148.16	0.228	1867	426
	ST-2-v	34.73	34.73	0.054	2717	147
	ST-2-w	25.05	76.59	0.120	2241	268
	ST-2-x	36.21	36.21	0.057	2692	152
	ST-2-y	15.33	15.33	0.024	3205	77
	Sum=	1029.92				

EXHIBIT 5-3

HEC - 1 FILE DIRECTORY

(JMM)

TROPICANA FIS
LOD33032
7-6-92
SHEET 19

DIRECTORY OF HEC1 FILES FOR TROPICANA WASH

MODIFIED HEC1 FILES FOR UPPER TROPICANA WASH Q100

T1A.DAT - NORTH TROPICANA AT CONFLUENCE #2 SEE MAP
T1.DAT - " " AT JONES (FIS BASIN T1)
NORTHT3A.DAT - " " AT CONFLUENCE #1 SEE MAP
NORTH.DAT - " " AT UPRR
CENT-T5A.DAT - CENTRAL TROPICANA AT JONES
CENT-T6A.DAT - " " AT CONFLUENCE #1
CENT-T6B.DAT - " " AT SOUTH TROPICANA
CEN-T6B1.DAT - " " AT SO. TROP ALTERNATIVE COMPUTATION
CENTRAL.DAT - " " AT UPRR
SOUTHT5B.DAT - SOUTH TROPICANA AT CONFLUENCE #1
SOUTHT6C.DAT - " " AT CENTRAL TROPICANA

MODIFIED HEC1 FILES FOR TROPICANA WASH BETWEEN UPRR & I-15

LTR100.DAT - MODIFIED JMM LTROP100.DAT TO COMBINE T6 & T5 AT UPRR THEN
ROUTE THRU T10. LOCAL STORM.
BTR100.DAT - SAME AS LTR100.DAT EXCEPT USED JMM BDTR100.DAT FILES AS START
FILE. REGIONAL STORM WITH BLUE DIAMOND BREAKOVER.

ALL OTHER FILES PROVIDED BY CCRFCD FROM JMM FIS REPORT

EXHIBIT 5-4

HEC - 1 LOCAL STORM

(JMM)

```
1*****************************************
*                                       *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
*            FEBRUARY 1981              *
*          REVISED 01 APR 88            *
*                                       *
*  RUN DATE  06/08/1992  TIME  11:50:32 *
*                                       *
*****************************************
```

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

```
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

              *DIAGRAM
    1         ID    INPUT FILE = LTROP100.DAT
    2         ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3         ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4         ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5         ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
    6         ID         100-YEAR 6-HR STORM (SDN #3)
    7         ID         JMM    OCTOBER 1990
    8         ID
    9         ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   10         ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   11         ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   12         ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   13         ID
   14         ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   15         ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   16         ID
   17         ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   18         ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   19         ID
   20         ID         SUBBASIN         AREA (SQMI)         DARF
```

```
21        ID        --------          ----------          ----
22        ID          T1,T8             1.0,1.2           0.95
23        ID          T3,T9             2.6,2.1           0.93
24        ID          T5,T6,J2          4.2,5.5,5.4       0.90
25        ID          MNW-M               8.0             0.88
26        ID
27        ID
28        IT      5       0       0     120
29        IO      5
30        JR    PREC    0.95    0.93    0.90    0.88
          *  *** NO CONTRIBUTION FROM UPPER BLUE DIAMOND FOR FLAMINGO/RED ROCK STORM ***

31        KK      T8 RUNOFF FROM T8
32        BA    1.22
33        PC    0.00    0.02   0.057    0.07   0.087   0.108   0.124   0.130   0.130   0.130
34        PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
35        PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
36        PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
37        PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
38        PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
39        PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
40        PC   0.998   0.999   1.000
41        PB    2.77
42        LS       0    65.6
43        UK     600    .015    0.15     100
44        RK    2000    .018    .030     .14                          1
45        RK   18000   .0161    .030             TRAP      75       5      NO

46        KK      T9 ROUTE T8 TO T9
47        RM       2    0.52    0.15
1                                    HEC-1 INPUT                                    PAGE  2

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

48        KK      T9 RUNOFF FROM T9
49        BA    0.87
50        LS       0    73.1
51        UK     600    .010    0.15     100
52        RK    4000    .010    .030    0.12                          1
53        RK   10200   .0134    .030             TRAP      30       5

54        KK      T9 COMBINE T8 AND T9
55        HC       2

56        KK    T9OF DIVERT OVERFLOW
57        DT    T9OF
58        DI       0    5480   11000   15000
59        DQ       0       0    2700    2700

60        KK     T10 ROUTE T9 THRU T10
61        RM       3    0.21    0.10

62        KK      T4 RUNOFF FROM T4
63        BA    3.22
64        LS       0    87.6
65        UK     500    .015    0.15     100
66        RK    2700   .0190    .030    0.25                          1
67        RK   20000   .0185    .030             TRAP      75       5      NO
```

```
 68          KK     T5 ROUTE T4 TO T5
 69          RK   6500    .013    .030           TRAP      30       2

 70          KK     T5 RUNOFF FROM T5
 71          BA   1.00
 72          LS      0    87.0
 73          UK    600    .010    0.15     100
 74          RK   2500    .012    .030    0.21                     1
 75          RK   6500    .013    .030           TRAP      30       2

 76          KK     T5 COMBINE T4 AND T5
 77          HC      2

 78          KK     T6 ROUTE T5 TO T6
 79          RK  10800    .012    .030           TRAP      30       5

 80          KK     T6 RUNOFF FROM T6
 81          BA   1.30
 82          LS      0    86.9
 83          UK    600    .010    0.15     100
 84          RK   6000    .012    .030    .400                     1
 85          RK  10800    .012    .030           TRAP      30       5

 86          KK     T6 COMBINE T5 AND T6
 87          HC      2
```



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

 88          KK    T9OF RECALL T9OF
 89          DR    T9OF

 90          KK     T6 ROUTE T9OF THRU T6
 91          RM      3    0.23    0.15

 92          KK     T6 COMBINE T6 AND T9OF
 93          HC      2

 94          KK     T6 DIVERT OVERFLOW ALONG UPRR
 95          KM        UPRR 114" CMP CULVERT - 750 CFS CAPACITY
 96          DT    T6OF
 97          DI      0     750    1500   10000
 98          DQ      0       0     750    9250

 99          KK    T10 ROUTE T6 THRU T10
100          RM      2    0.18    0.15

101          KK     T1 RUNOFF FROM T1
102          BA   1.56
103          LS      0      88
104          UK    600    .020    0.15     100
105          RK   4000   .0200    .030    0.28                     1
106          RK  13200    .017    .030           TRAP      50       5      NO

107          KK     T3 ROUTE T1 TO T3
108          RK  10000   .0106    .032           TRAP      30       5

109          KK     T3 RUNOFF FROM T3
110          BA   0.99
```

```
111          LS      0    78.9
112          UK    500    .010    0.15     100
113          RK   3000    .010    .030    0.16                      1
114          RK  10000   .0106    .032            TRAP      30      5

115          KK     T3 COMBINE T1 AND T3
116          HC      2

117          KK    T6OF RECALL DIVERTED OVERFLOW FROM T6
118          DR    T6OF

119          KK     T3 ROUTE T6OF THRU T3
120          RM      1    0.08    0.15

121          KK     T3 COMBINE T6OF AND T3
122          HC      2

123          KK    T3OF DIVERT FLOW IN EXCESS OF CULVERT CAPACITY
124          KM         BASED ON COE RATING CURVE FROM FEASIBILITY STUDY
125          KM         DQ FLOWS NORTHEASTERLY, REJOINING FW NEAR PARADISE RD
126          DT    T3OF
127          DI      0    1400    1900    3200    5500   19000
128          DQ      0       0     420    1650    3650   14700
1                                        HEC-1 INPUT                                        PAGE  4

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

129          KK     T10 ROUTE T3 THRU T10 (TRWA0272)
130          RK    3800   .0132    .040            TRAP    17.5      2

131          KK     T10 RUNOFF FROM T10
132          BA    0.82
133          LS      0    78.0       0       0      98       0
134          UK    700    .013    0.15      78
135          UK    400    .011     .10      22
136          RK   1100    .012    .020    .120                      1
137          RK   3000    .008    .020     .50                      1
138          RK   3500   0.010    .030            TRAP      30      2

139          KK     T10 COMBINE T3, T6, T9 AND T10
140          HC      4

141          KK    T10R ROUT T10 THRU T11 (TRWA0235)
142          RK   1160    .010    .015            TRAP      32      0

143          KK       .   (TRWA0145-0218)
144          RK   4700   .0095    .030            TRAP      90    1.5

145          KK     T11 RUNOFF FROM T11
146          BA    1.09
147          LS      0    68.6       0       0      98       0
148          UK    800    .010    0.30      61
149          UK    500    .010    0.10      39
150          RK   3200   .0080    .020    0.17                      1
151          RK   5400   .0104    .030            TRAP     100      5     NO

152          KK     T11 COMBINE T11 AND T10R
153          HC      2
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154          KK    T11R ROUT  T11 THRU T12 (TRWA0117)
155          RK    1130   .0088    .015            TRAP     1.5       2

156          KK       .   (TRWA0000-0034+)
157          RK    6500    .012    .040            TRAP     100      2.5

158          KK     T12 RUNOFF FROM T12
159          BA    0.77
160          LS       0    74.4       0       0      98       0
161          UK     500    .008    0.18      65
162          UK     200    0.01    0.10      35
163          RK    2200    .008    .023    0.12                    1
164          RK    3000    .007    .025     .24             20     2
165          RK    6600   .0103    .032                     30     5

166          KK     T12 ADD T12 AND T11R
167          HC       2
1                                        HEC-1 INPUT                                        PAGE  5

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

168          KK    T3OF RECALL DIVERSION FROM T3
169          DR    T3OF

170          KK     T12 ROUTE T3OF TO T12
171          RM      20    1.99    0.10

172          KK     T12 COMBINE T3OF AND T12
173          HC       2
             *  *** DATA FOR SUBAREAS MNW-B THRU MNW-M TAKEN FROM NIMBUS HEC-1 ANALYSIS
             *      FOR NORTHWEST MCCARRAN AIRPORT DRAINAGE STUDY (WITH SMALL MODIFICATIONS)

174          KK   MNW-B RUNOFF FROM B
175          BA    0.68
176          LS              65      10
177          UD     2.4

178          KK    DIVB FLOW SPLIT AT I-15; BCULV IS FLOW CONVEYED BY CULVERT
179          DT   BCULV
180          DI       0      22     100     500
181          DQ       0      22      22      22

182          KK   RDIVB ROUTE DIVB TO CULVERT AT I15 AND C
183          RK     600    .004     .05       0       0       5

184          KK   MNW-C RUNOFF AT C
185          BA    0.69
186          LS              65      17
187          UD     2.0

188          KK   MNW-C COMBINE DIVB+C
189          HC       2

190          KK   MNW-C PONDING STORAGE ROUTING AT I-15
191          RS       1    STOR       0
192          SA       0     .28     .92    2.02    3.19    3.44    5.37    9.09
193          SQ       0       8      25      35      40      78     360    1342
194          SE      54      55      56      57   57.43      58      59      60
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195          KK    DIVC FLOW SPLIT AT C THRU AND AROUND CULVERT
196          DT   CCULV
197          DI       0       8      25      35      40      78     360    1342
198          DQ       0       8      25      35      40      45      55      65

199          KK   RDIVC ROUTE DIVC NORTH TO D
200          RK     650    .004     .05       0       0       0      20

201          KK   MNW-D RUNOFF FROM D
202          BA     .05
203          LS              66      10
204          UD     .40
1                                        HEC-1 INPUT                                                    PAGE  6

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


205          KK   MNW-D COMBINE DIVC AND D
206          HC       2

207          KK    DIVD DIVERT FLOW TO NORTH; DCULV CROSSES I-15
208          DT   DCULV
209          DI       0      28     100     500
210          DQ       0      28      28      28

211          KK   RDIVD ROUTE DIVERTED FLOW NORTH TO E
212          RK     800    .004     .05       0        0       0      20

213          KK   MNW-E RUNOFF FROM E
214          BA    0.05
215          LS              65      18
216          UD    0.38

217          KK   MNW-E COMBINE DIVD + E
218          HC       2

219          KK   ECULV DIVIDE FLOW AT I-15 CULVERT; ECULV CROSSES I-15 INTO MNW-I
220          DT   ECULV
221          DI       0      28     100     500
222          DQ       0      28      28      28

223          KK   RDIVE ROUTE FLOW FROM DIVE NORTH ALONG I-15
224          RK    1200    .007     .05       0       0       0       4

225          KK  MNW-FG RUNOFF FROM FG
226          BA    0.36
227          LS              66      17
228          UD    1.24

229          KK  MNW-FG COMBINE EDIV + FG
230          HC       2

231          KK    DIVG DIVERT FLOW NORTH; GCULV CROSSES I-15 INTO SUBAREA I
232          DT   GCULV
233          DI       0      50      60     100     150     250
234          DQ       0      50      60      60      60      60

235          KK   RDIVG ROUTE DIVG NORTH TO AIRPORT CHANNEL
236          RK    2200    .009    .040       0       0       0      10
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237          KK  MNW-J1 RUNOFF FROM J1
238          BA    2.37
239          LS              70
240          UD    2.67

241          KK  MNW-J2 ROUTE J1 TO J2
242          RK   10000    .012     .04                      10       2
1                                    HEC-1 INPUT                                                    PAGE  7

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


243          KK  MNW-J2 RUNOFF FROM J2
244          BA    1.21
245          LS              70      10
246          UD    1.22

247          KK  MNW-J2 COMBINE J1+J2
248          HC       2

249          KK     CP1 COMBINE J2 + RDIVG
250          HC       2

251          KK    RCP1 ROUTE CP1 TO LAS VEGAS BLVD (CP3)
252          RK    2600    .008     .04       0       0      20       1

253          KK    RTNE RETURN FLOW FROM CULVERT E
254          DR   ECULV

255          KK    RTNE DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
256          BA    0.01
257          LS       0      50
258          UD     0.1

259          KK    RTNE COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
260          HC       2

261          KK   RRTNE ROUTE ECULV TO OUTLET OF I
262          RK    3900    .013     .05       0       0       0      50

263          KK    RTNG RETURN FLOW FROM CULVERT G
264          DR   GCULV

265          KK    RTNG DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
266          BA    0.01
267          LS       0      50
268          UD     0.1

269          KK    RTNG COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
270          HC       2

271          KK   RRTNG ROUTE GCULV TO OUTLET OF I
272          RK    2500    .013    0.05       0       0       0      50

273          KK  MNW-I1 RUNOFF FROM I1
274          BA    0.25
275          LS              78      15
276          UD    0.58

277          KK     CP2 COMBINE HYDROGRAPHS AT LAS VEGAS BLVD AND UPRR
```

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

 279          KK    RCP2 ROUTE CP2 TO AIRPORT CHANNEL AND LAS VEGAS BLVD (CP3)
 280          RK    2500    .009     .05       0       0       0       4

 281          KK  MNW-I2 RUNOFF FROM I2
 282          BA    0.14
 283          LS              77       1
 284          UD    0.38

 285          KK     CP3 COMBINE FLOW FROM B-I2 AT LAS VEGAS BLVD AND AIRPORT CHANNEL
 286          HC       3

 287          KK    RCP3 ROUTE CPE TO OUTLET OF K
 288          RK    7300     .01     .04       0       0       5       2

 289          KK   MNW-K RUNOFF FROM K
 290          BA    1.43
 291          LS              66      25
 292          UD    1.55

 293          KK     CP4 COMBINE HYDROGRAPHS FOR AIRPORT CHANNEL AND TAXIWAY S
 294          HC       2

 295          KK    RCP4 ROUTE FLOW TO TROPICANA BLVD
 296          RK    3300     .01     .03       0       0      20       4

 297          KK   MNW-L RUNOFF FROM L
 298          BA    0.27
 299          LS              77      60
 300          UD    0.42

 301          KK   MNW-M RUNOFF FROM M
 302          BA    0.49
 303          LS              84      56
 304          UD    0.83

 305          KK     CP5 COMBINE ALL HYDROGRAPHS AT OUTLET AT BOX CULVERT AT TROPICANA
 306          HC       3
              *  *** END OF DATA FROM NIMBUS NORTHWEST MCCARRAN HEC-1 DATA ***
              *

 307          KK     T12 ROUTE MNW-L TO T12 (TRMC0009)
 308          RK    2640   .0045    .040            TRAP      18     1.5

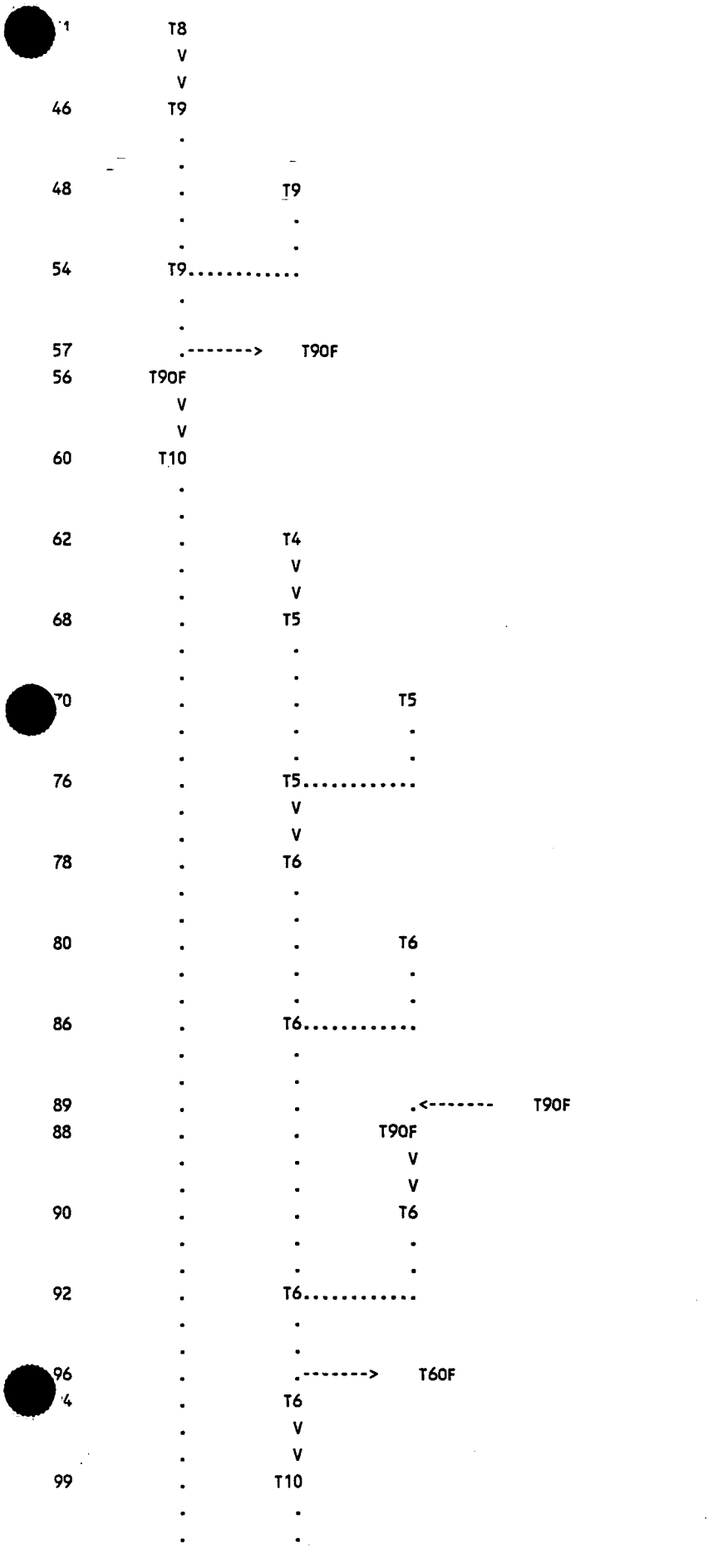
 309          KK       .   (TRWA0000-0034)
 310          RK    5000    .012    .040            TRAP     100     2.5

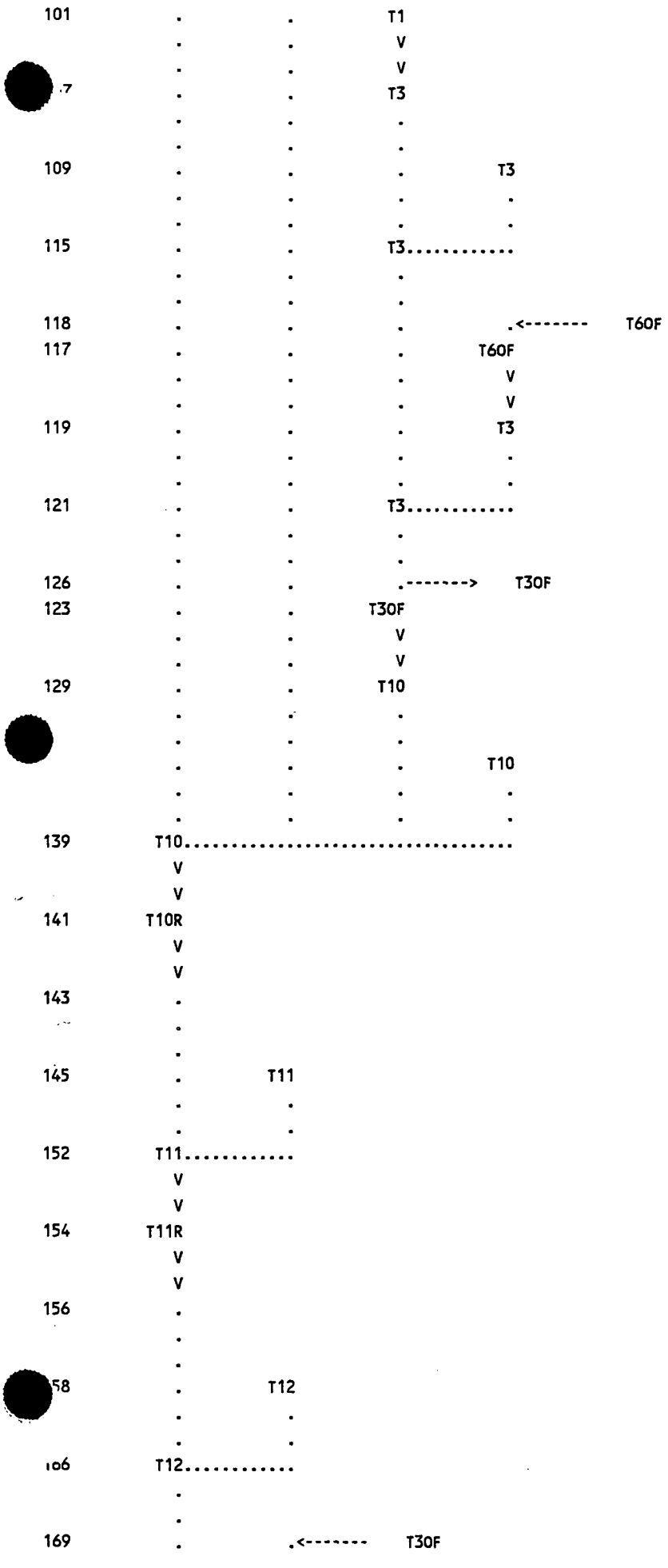
 311          KK     T12 COMBINE MNW-L AND T12
 312          KM         AIRPORT CHANNEL + TROPICANA WASH
 313          HC       2
 314          ZZ
```

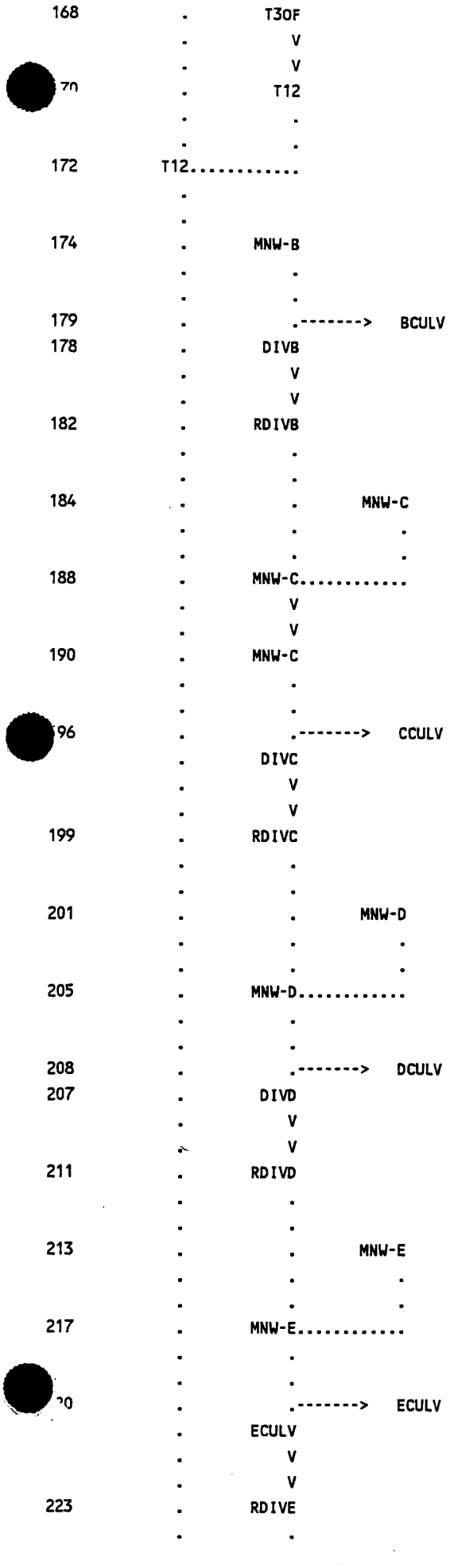
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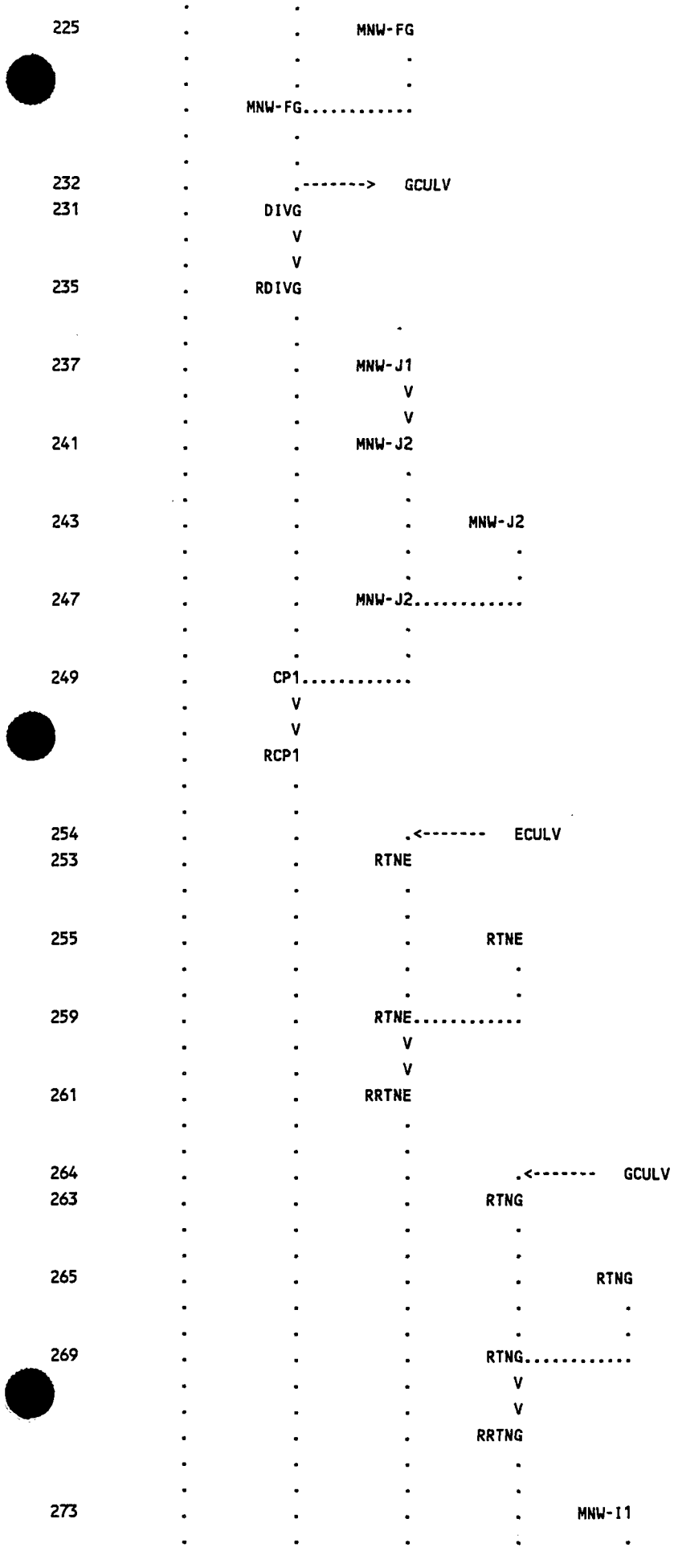
SCHEMATIC DIAGRAM OF STREAM NETWORK

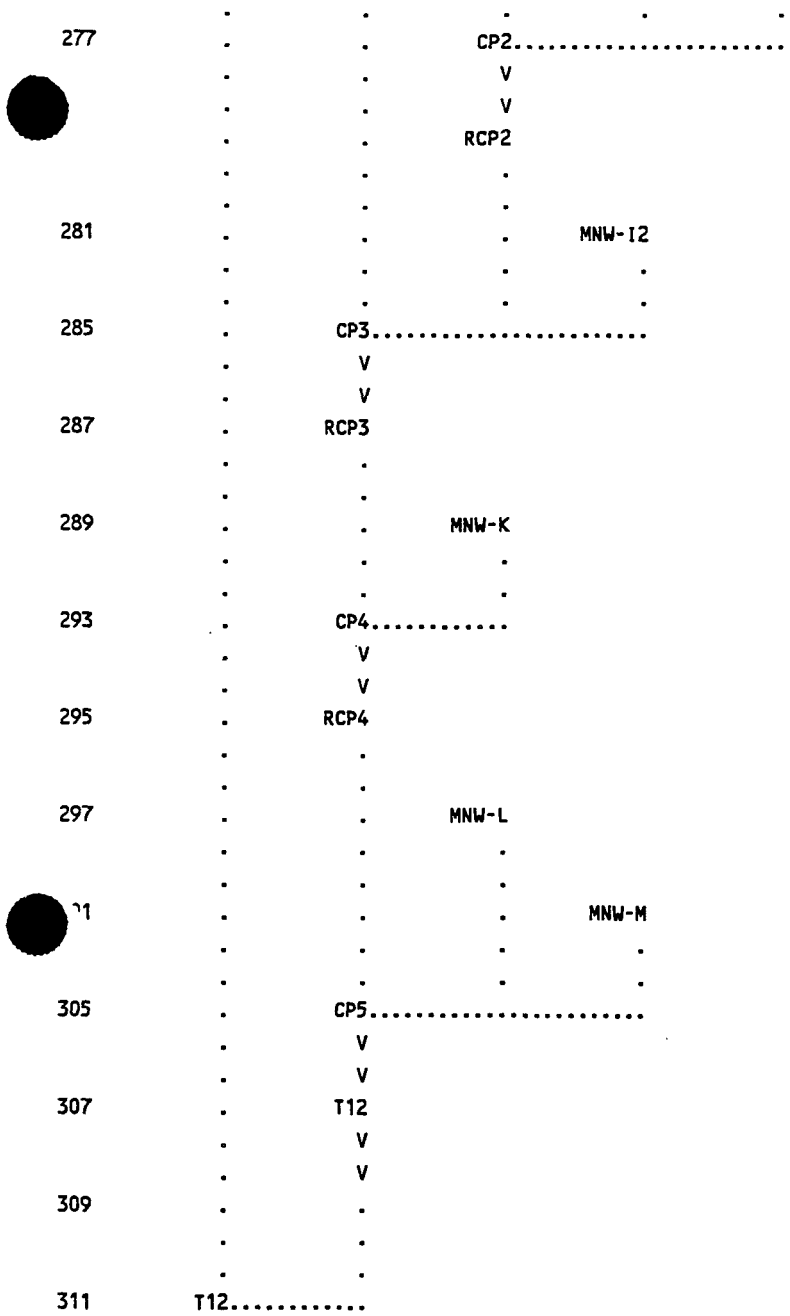
INPUT LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW


NO.
(.) CONNECTOR
(<---) RETURN OF DIVERTED OR PUMPED FLOW
T8
T9
T9
T9
T9
T90F
T90F
T10
T4
T5
T5
T5
T6
T6
T6
T90F
T90F
T6
T6
T60F
T6
T10


101
T1
V
V
7
T3
109
T3
115
T3.....
118
.<-------
T60F
117
T60F
V
V
119
T3
121
T3.....
126
.------->
T30F
123
T30F
V
V
129
T10
T10
139
T10.....
V
V
141
T10R
V
V
143
145
T11
152
T11.....
V
V
154
T11R
V
V
156
58
T12
106
T12.....
169
.<-------
T30F


168
T3OF
170
T12
172
T12
174
MNW-B
179
BCULV
178
DIVB
182
RDIVB
184
MNW-C
188
MNW-C
190
MNW-C
196
CCULV
DIVC
199
RDIVC
201
MNW-D
205
MNW-D
208
DCULV
207
DIVD
211
RDIVD
213
MNW-E
217
MNW-E
220
ECULV
ECULV
223
RDIVE


225 MNW-FG
MNW-FG
232 GCULV
231 DIVG
235 RDIVG
237 MNW-J1
241 MNW-J2
243 MNW-J2
247 MNW-J2
249 CP1
RCP1
254 ECULV
253 RTNE
255 RTNE
259 RTNE
261 RRTNE
264 GCULV
263 RTNG
265 RTNG
269 RTNG
RRTNG
273 MNW-I1



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  06/08/1992  TIME  11:50:32 *
*                                       *
*****************************************
```

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

INPUT FILE = LTROP100.DAT

CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE

RED ROCK/FLAMINGO/TROPICANA WATERSHED

EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
100-YEAR 6-HR STORM (SDN #3)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
T1,T8	1.0,1.2	0.95
T3,T9	2.6,2.1	0.93
T5,T6,J2	4.2,5.5,5.4	0.90
MNW-M	8.0	0.88

29 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

.T HYDROGRAPH TIME DATA

NMIN	5	MINUTES IN COMPUTATION INTERVAL
IDATE	1 0	STARTING DATE
ITIME	0000	STARTING TIME
NQ	120	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1 0	ENDING DATE
NDTIME	0955	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 9.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN	1	NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.95 .93 .90 .88

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .95	RATIO 2 .93	RATIO 3 .90	RATIO 4 .88
HYDROGRAPH AT								
+	T8	1.22	1	FLOW	111.	102.	89.	82.
				TIME	5.33	5.42	5.50	5.58
ROUTED TO								
+	T9	1.22	1	FLOW	101.	93.	82.	75.
				TIME	5.92	6.00	6.08	6.17
HYDROGRAPH AT								
+	T9	.87	1	FLOW	161.	151.	137.	129.
				TIME	4.58	4.67	4.75	4.83
2 COMBINED AT								
+	T9	2.09	1	FLOW	193.	179.	159.	147.
				TIME	5.50	5.50	5.50	5.50
SION TO								
+	T9OF	2.09	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT								
+	T9OF	2.09	1	FLOW	193.	179.	159.	147.
				TIME	5.50	5.50	5.50	5.50
ROUTED TO								
+	T10	2.09	1	FLOW	192.	178.	159.	147.
				TIME	5.67	5.75	5.75	5.67
HYDROGRAPH AT								
+	T4	3.22	1	FLOW	2344.	2247.	2075.	1989.
				TIME	3.92	3.92	4.00	4.00
ROUTED TO								
+	T5	3.22	1	FLOW	2284.	2197.	2022.	1942.
				TIME	4.00	4.00	4.08	4.08
HYDROGRAPH AT								
+	T5	1.00	1	FLOW	656.	639.	588.	561.
				TIME	3.92	3.92	3.92	3.92
COMBINED AT								
	T5	4.22	1	FLOW	2912.	2812.	2581.	2461.
				TIME	4.00	4.00	4.00	4.08
ROUTED TO								
+	T6	4.22	1	FLOW	2845.	2758.	2526.	2406.
				TIME	4.17	4.17	4.17	4.25

HYDROGRAPH AT								
	T6	1.30	1	FLOW	798.	769.	720.	690.
				TIME	4.00	4.08	4.08	4.08
2 COMBINED AT								
+	T6	5.52	1	FLOW	3584.	3483.	3212.	3059.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT								
+	T90F	.00	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO								
+	T6	.00	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
2 COMBINED AT								
+	T6	5.52	1	FLOW	3584.	3483.	3212.	3059.
				TIME	4.17	4.17	4.17	4.17
DIVERSION TO								
+	T60F	5.52	1	FLOW	2834.	2733.	2462.	2309.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT								
+	T6	5.52	1	FLOW	750.	750.	750.	750.
				TIME	3.83	3.83	3.92	3.92
) TO								
+	T10	5.52	1	FLOW	750.	750.	750.	750.
				TIME	4.92	4.92	5.08	5.00
HYDROGRAPH AT								
+	T1	1.56	1	FLOW	1202.	1156.	1092.	1031.
				TIME	3.92	3.92	3.92	3.92
ROUTED TO								
+	T3	1.56	1	FLOW	1141.	1112.	1047.	997.
				TIME	4.08	4.08	4.17	4.17
HYDROGRAPH AT								
+	T3	.99	1	FLOW	357.	332.	300.	280.
				TIME	4.17	4.17	4.25	4.25
2 COMBINED AT								
+	T3	2.55	1	FLOW	1490.	1442.	1344.	1270.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT								
+	T60F	.00	1	FLOW	2834.	2733.	2462.	2309.
				TIME	4.17	4.17	4.17	4.17
TED TO								
	T3	.00	1	FLOW	2727.	2621.	2364.	2200.
				TIME	4.25	4.25	4.25	4.33
2 COMBINED AT								
+	T3	2.55	1	FLOW	4127.	3975.	3643.	3425.
				TIME	4.17	4.25	4.25	4.25

DIVERSION TO								
+	T3OF	2.55	1	FLOW	2457.	2324.	2035.	1845.
				TIME	4.17	4.25	4.25	4.25
H. GRAPH AT								
+	T3OF	2.55	1	FLOW	1671.	1651.	1608.	1579.
				TIME	4.17	4.25	4.25	4.25
ROUTED TO								
+	T10	2.55	1	FLOW	1670.	1647.	1597.	1573.
				TIME	4.25	4.25	4.33	4.33
HYDROGRAPH AT								
+	T10	.82	1	FLOW	375.	358.	345.	325.
				TIME	3.75	3.75	3.67	3.75
4 COMBINED AT								
+	T10	10.98	1	FLOW	2739.	2696.	2622.	2579.
				TIME	4.25	4.25	4.33	4.33
ROUTED TO								
+	T10R	10.98	1	FLOW	2732.	2692.	2618.	2572.
				TIME	4.33	4.33	4.33	4.42
ROUTED TO								
+	.	10.98	1	FLOW	2720.	2681.	2612.	2565.
				TIME	4.42	4.42	4.42	4.42
GRAPH AT								
+	T11	1.09	1	FLOW	558.	533.	510.	495.
				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT								
+	T11	12.07	1	FLOW	2921.	2868.	2792.	2732.
				TIME	4.33	4.33	4.33	4.42
ROUTED TO								
+	T11R	12.07	1	FLOW	2911.	2862.	2789.	2724.
				TIME	4.42	4.42	4.42	4.42
ROUTED TO								
+	.	12.07	1	FLOW	2908.	2851.	2777.	2722.
				TIME	4.50	4.50	4.58	4.58
HYDROGRAPH AT								
+	T12	.77	1	FLOW	436.	420.	401.	385.
				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT								
+	T12	12.84	1	FLOW	3075.	3010.	2921.	2858.
				TIME	4.50	4.50	4.58	4.58
ROGRAPH AT								
	T3OF	.00	1	FLOW	2457.	2324.	2035.	1845.
				TIME	4.17	4.25	4.25	4.25
ROUTED TO								
+	T12	.00	1	FLOW	1198.	1110.	938.	825.
				TIME	6.25	6.25	6.25	6.25

EXHIBIT 5-5

HEC - 1 BASIN WIDE STORM

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          FEBRUARY 1981                *
*         REVISED 01 APR 88             *
*                                       *
* RUN DATE  06/08/1992  TIME  11:38:49  *
*                                       *
*****************************************
```

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

```
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


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

              *DIAGRAM
    1         ID    INPUT FILE = BDTROP100.DAT
    2         ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3         ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4         ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5         ID     BASIN-WIDE STORM - TROPICANA AREA ONLY
    6         ID         100-YEAR 6-HR STORM (SDN #5)
    7         ID         JMM    OCTOBER 1990
    8         ID
    9         ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   10         ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   11         ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   12         ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   13         ID
   14         ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   15         ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   16         ID
   17         ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   18         ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   19         ID
   20         ID         SUBBASIN        AREA (SQMI)        DARF
   21         ID         --------        -----------        ----
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 22          ID          B504,T8,T9      69.5,70.8,71.6        0.65
 23          ID          T10,T11,T12     80.5,81.6,90.4        0.63
 24          ID
 25          ID
 26          IT       5        0        0      100
 27          IO       5
 28          JR    PREC     0.65     0.63

 29          KK     B71 RUNOFF FROM B71
 30          BA    7.99
 31          PC    .000     .020     .059     .080     .110     .144     .150     .160     .168     .171
 32          PC    .180     .182     .187     .190     .197     .202     .210     .220     .230     .241
 33          PC    .250     .259     .265     .280     .290     .300     .305     .309     .310     .317
 34          PC    .321     .327     .333     .346     .361     .381     .408     .430     .477     .514
 35          PC    .561     .630     .710     .720     .731     .752     .779     .790     .795     .804
 36          PC    .810     .820     .826     .840     .859     .889     .910     .938     .966     .970
 37          PC    .974     .979     .981     .983     .985     .989     .990     .992     .993     .996
 38          PC    .997     .999    1.00
 39          PB    3.48
 40          LS       0       85
 41          UD    0.86

 42          KK    B501 ROUTE B17 TO B501
 43          RM       4     0.32     0.15

 44          KK    B501 RUNOFF FROM B501
 45          BA   10.66
 46          PB    3.48
 47          LS       0       85
 48          UD    0.87
```



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

 49          KK    B591 COMBINE B71 AND B501
 50          HC       2

 51          KK     B72 ROUTE B501 TO B72
 52          RM       3     0.26     0.15

 53          KK     B72 RUNOFF FROM B72
 54          BA    8.12
 55          PB    3.48
 56          LS       0       87
 57          UD    1.03

 58          KK     B72 COMBINE B501 AND B72
 59          HC       2

 60          KK    B503 ROUTE B72 TO B503
 61          RM       4     0.36     0.15

 62          KK    B502 RUNOFF FROM B502
 63          BA   27.35
 64          PB    3.48
 65          LS       0       85
 66          UD    1.40

 67          KK    B503 ROUTE B502 TO B503
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 68          RM       4    0.36    0.15

 69          KK     B73 RUNOFF FROM B73
 70          BA    2.69
 71          PB    3.34
 72          LS       0      86
 73          UD    0.52

 74          KK    B503 ROUTE B73 TO B503
 75          RM       4    0.36    0.15

 76          KK    B503 RUNOFF FROM B503
 77          BA    8.07
 78          PB    3.26
 79          LS       0      85
 80          UD    0.77

 81          KK    B503 COMBINE B72, B502, B73, AND B503
 82          HC       4

 83          KK    B504 ROUTE B503 TO B504
 84          RM       6    0.47    0.15

 85          KK    B504 RUNOFF FROM B504
 86          BA    4.65
 87          PB    3.14
 88          LS       0      85
 89          UD    0.96
```



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


 90          KK    B504 COMBINE B503 AND B504
 91          HC       2

 92          KK      T7 ROUTE B504 TO T7
 93          RM       7    0.60    0.15

 94          KK      T7 DIVERT UP TO 30% OF FLOW TO TROPICANA WASH
 95          KM         COE FLOW SPLIT DATA
 96          DT    TROP
 97          DI       0    1000    2770    6350    8190   12000   16000
 98          DQ       0     260     750    1840    2400    4080    6240

 99          KK  T7TROP RECALL TROPICANA PORTION OF BLUE DIAMOND FLOW
100          DR    TROP

101          KK      T8 ROUTE T7TROP TO T8
102          RM       9    0.75    0.15

103          KK      T8 RUNOFF FROM T8
104          BA    1.22
105          PB    2.77
106          LS       0    65.6
107          UK     600    .015    0.15     100
108          RK    2000    .018    .030     .14                    1
109          RK   18000   .0161    .030            TRAP      75       5      NO

110          KK      T8 COMBINE T7TROP AND T8
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111          HC       2

112          KK      T9 ROUTE T8 TO T9
113          RM       6    0.52    0.15

114          KK      T9 RUNOFF FROM T9
115          BA    0.87
116          LS       0    73.1
117          UK     600    .010    0.15     100
118          RK    4000    .010    .030    0.12                      1
119          RK   10200   .0134    .030            TRAP      30      5

120          KK      T9 COMBINE T8 AND T9
121          HC       2

122          KK    T9OF DIVERT OVERFLOW
123          DT    T9OF
124          DI       0    5480   11000   15000
125          DQ       0       0    2700    2700

126          KK     T10 ROUTE T9 THRU T10
127          RM       3    0.21    0.10
1                                    HEC-1 INPUT                                          PAGE  4

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


128          KK      T4 RUNOFF FROM T4
129          BA    3.22
130          LS       0    87.6
131          UK     500    .015    0.15     100
132          RK    2700   .0190    .030    0.25                      1
133          RK   20000   .0185    .030            TRAP      75      5      NO

134          KK      T5 ROUTE T4 TO T5
135          RK    6500    .013    .030            TRAP      30      2

136          KK      T5 RUNOFF FROM T5
137          BA    1.00
138          LS       0    87.0
139          UK     600    .010    0.15     100
140          RK    2500    .012    .030    0.21                      1
141          RK    6500    .013    .030            TRAP      30      2

142          KK      T5 COMBINE T4 AND T5
143          HC       2

144          KK      T6 ROUTE T5 TO T6
145          RK   10800    .012    .030            TRAP      30      5

146          KK      T6 RUNOFF FROM T6
147          BA    1.30
148          LS       0    86.9
149          UK     600    .010    0.15     100
150          RK    6000    .012    .030    .400                      1
151          RK   10800    .012    .030            TRAP      30      5

152          KK      T6 COMBINE T5 AND T6
153          HC       2
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```
154          KK    T9OF RECALL T9OF
155          DR    T9OF

156          KK      T6 ROUTE T9OF THRU T6
157          RM       3    0.23    0.15

158          KK      T6 COMBINE T6 AND T9OF
159          HC       2

160          KK      T6 DIVERT OVERFLOW ALONG UPRR
161          KM         UPRR 114" CMP CULVERT - 750 CFS CAPACITY
162          DT    T6OF
163          DI       0     750    1500   10000
164          DQ       0       0     750    9250

165          KK     T10 ROUTE T6 THRU T10
166          RM       2    0.18    0.15
1                                      HEC-1 INPUT                                          PAGE  5

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


167          KK      T1 RUNOFF FROM T1
168          BA    1.56
169          LS       0      88
170          UK     600    .020    0.15     100
171          RK    4000   .0200    .030    0.28                        1
172          RK   13200    .017    .030            TRAP      50       5      NO

173          KK      T3 ROUTE T1 TO T3
174          RK   10000   .0106    .032            TRAP      30       5

175          KK      T3 RUNOFF FROM T3
176          BA    0.99
177          LS       0    78.9
178          UK     500    .010    0.15     100
179          RK    3000    .010    .030    0.16                        1
180          RK   10000   .0106    .032            TRAP      30       5

181          KK      T3 COMBINE T1 AND T3
182          HC       2

183          KK    T6OF RECALL DIVERTED OVERFLOW FROM T6
184          DR    T6OF

185          KK      T3 ROUTE T6OF THRU T3
186          RM       1    0.08    0.15

187          KK      T3 COMBINE T6OF AND T3
188          HC       2

189          KK    T3OF DIVERT FLOW IN EXCESS OF CULVERT CAPACITY
190          KM         BASED ON COE RATING CURVE FROM FEASIBILITY STUDY
191          KM         DQ FLOWS NORTHEASTERLY, REJOINING FW NEAR PARADISE RD
192          DT    T3OF
193          DI       0    1400    1900    3200    5500   19000
194          DQ       0       0     420    1650    3650   14700

195          KK     T10 ROUTE T3 THRU T10 (TRWA0272)
196          RK    3800   .0132    .040            TRAP    17.5       2
```

```
197          KK     T10 RUNOFF FROM T10
198          BA    0.82
199          LS       0    78.0       0       0      98       0
200          UK     700    .013    0.15      78
201          UK     400    .011     .10      22
202          RK    1100    .012    .020    .120                  1
203          RK    3000    .008    .020     .50                  1
204          RK    3500   0.010    .030            TRAP      30       2

205          KK     T10 COMBINE T3, T6, T9 AND T10
206          HC       4
```



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


207          KK    T10R ROUT T10 THRU T11 (TRWA0235)
208          RK    1160    .010    .015            TRAP      32       0

209          KK       .   (TRWA0145-0218)
210          RK    4700   .0095    .030            TRAP      90     1.5

211          KK     T11 RUNOFF FROM T11
212          BA    1.09
213          LS       0    68.6       0       0      98       0
214          UK     800    .010    0.30      61
215          UK     500    .010    0.10      39
216          RK    3200   .0080    .020    0.17                  1
217          RK    5400   .0104    .030            TRAP     100       5     NO

218          KK     T11 COMBINE T11 AND T10R
219          HC       2

220          KK    T11R ROUT  T11 THRU T12 (TRWA0117)
221          RK    1130   .0088    .015            TRAP     1.5       2

222          KK       .   (TRWA0000-0034+)
223          RK    6500    .012    .040            TRAP     100     2.5

224          KK     T12 RUNOFF FROM T12
225          BA    0.77
226          LS       0    74.4       0       0      98       0
227          UK     500    .008    0.18      65
228          UK     200    0.01    0.10      35
229          RK    2200    .008    .023    0.12                  1
230          RK    3000    .007    .025     .24            20       2
231          RK    6600   .0103    .032                   30       5

232          KK     T12 ADD T12 AND T11R
233          HC       2

234          KK    T30F RECALL DIVERSION FROM T3
235          DR    T30F

236          KK     T12 ROUTE T30F TO T12
237          RM      20    1.99    0.10

238          KK     T12 COMBINE T30F AND T12
239          HC       2
```

```
                * *** DATA FOR SUBAREAS MNW-B THRU MNW-M TAKEN FROM NIMBUS HEC-1 ANALYSIS
                *     FOR NORTHWEST MCCARRAN AIRPORT DRAINAGE STUDY (WITH SMALL MODIFICATIONS)

  240           KK   MNW-B RUNOFF FROM B
  241           BA    0.68
  242           LS              65      10
  243           UD     2.4
1                                        HEC-1 INPUT                                        PAGE  7

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


  244           KK    DIVB FLOW SPLIT AT I-15; BCULV IS FLOW CONVEYED BY CULVERT
  245           DT   BCULV
  246           DI       0       22      100      500
  247           DQ       0       22       22       22

  248           KK   RDIVB ROUTE DIVB TO CULVERT AT I15 AND C
  249           RK     600     .004      .05        0        0        5

  250           KK   MNW-C RUNOFF AT C
  251           BA    0.69
  252           LS              65      17
  253           UD     2.0

  254           KK   MNW-C COMBINE DIVB+C
  255           HC       2

  256           KK   MNW-C PONDING STORAGE ROUTING AT I-15
  257           RS       1    STOR        0
  258           SA       0      .28      .92     2.02     3.19     3.44     5.37     9.09
  259           SQ       0       8       25       35       40       78      360     1342
  260           SE      54      55       56       57    57.43       58       59       60

  261           KK    DIVC FLOW SPLIT AT C THRU AND AROUND CULVERT
  262           DT   CCULV
  263           DI       0       8       25       35       40       78      360     1342
  264           DQ       0       8       25       35       40       45       55       65

  265           KK   RDIVC ROUTE DIVC NORTH TO D
  266           RK     650     .004      .05        0        0        0       20

  267           KK   MNW-D RUNOFF FROM D
  268           BA     .05
  269           LS              66      10
  270           UD     .40

  271           KK   MNW-D COMBINE DIVC AND D
  272           HC       2

  273           KK    DIVD DIVERT FLOW TO NORTH; DCULV CROSSES I-15
  274           DT   DCULV
  275           DI       0       28      100      500
  276           DQ       0       28       28       28

  277           KK   RDIVD ROUTE DIVERTED FLOW NORTH TO E
  278           RK     800     .004      .05        0        0        0       20

  279           KK   MNW-E RUNOFF FROM E
  280           BA    0.05
```

```
281          LS              65      18
282          UD    0.38
```



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

283          KK   MNW-E COMBINE DIVD + E
284          HC      2

285          KK   ECULV DIVIDE FLOW AT I-15 CULVERT; ECULV CROSSES I-15 INTO MNW-I
286          DT   ECULV
287          DI       0      28     100     500
288          DQ       0      28      28      28

289          KK   RDIVE ROUTE FLOW FROM DIVE NORTH ALONG I-15
290          RK    1200    .007     .05       0       0       0       4

291          KK  MNW-FG RUNOFF FROM FG
292          BA    0.36
293          LS              66      17
294          UD    1.24

295          KK  MNW-FG COMBINE EDIV + FG
296          HC      2

297          KK    DIVG DIVERT FLOW NORTH; GCULV CROSSES I-15 INTO SUBAREA I
298          DT   GCULV
299          DI       0      50      60     100     150     250
300          DQ       0      50      60      60      60      60

301          KK   RDIVG ROUTE DIVG NORTH TO AIRPORT CHANNEL
302          RK    2200    .009    .040       0       0       0      10

303          KK  MNW-J1 RUNOFF FROM J1
304          BA    2.37
305          LS              70
306          UD    2.67

307          KK  MNW-J2 ROUTE J1 TO J2
308          RK   10000    .012     .04                      10       2

309          KK  MNW-J2 RUNOFF FROM J2
310          BA    1.21
311          LS              70      10
312          UD    1.22

313          KK  MNW-J2 COMBINE J1+J2
314          HC      2

315          KK     CP1 COMBINE J2 + RDIVG
316          HC      2

317          KK    RCP1 ROUTE CP1 TO LAS VEGAS BLVD (CP3)
318          RK    2600    .008     .04       0       0      20       1
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9.......10
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319          KK    RTNE RETURN FLOW FROM CULVERT E
320          DR   ECULV

321          KK    RTNE DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
322          BA    0.01
323          LS       0      50
324          UD     0.1

325          KK    RTNE COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
326          HC       2

327          KK   RRTNE ROUTE ECULV TO OUTLET OF I
328          RK    3900    .013     .05       0       0       0      50

329          KK    RTNG RETURN FLOW FROM CULVERT G
330          DR   GCULV

331          KK    RTNG DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
332          BA    0.01
333          LS       0      50
334          UD     0.1

335          KK    RTNG COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
336          HC       2

337          KK   RRTNG ROUTE GCULV TO OUTLET OF I
338          RK    2500    .013    0.05       0       0       0      50

339          KK  MNW-I1 RUNOFF FROM I1
340          BA    0.25
341          LS              78      15
342          UD    0.58

343          KK     CP2 COMBINE HYDROGRAPHS AT LAS VEGAS BLVD AND UPRR
344          HC       3

345          KK    RCP2 ROUTE CP2 TO AIRPORT CHANNEL AND LAS VEGAS BLVD (CP3)
346          RK    2500    .009     .05       0       0       0       4

347          KK  MNW-I2 RUNOFF FROM I2
348          BA    0.14
349          LS              77       1
350          UD    0.38

351          KK     CP3 COMBINE FLOW FROM B-I2 AT LAS VEGAS BLVD AND AIRPORT CHANNEL
352          HC       3

353          KK    RCP3 ROUTE CPE TO OUTLET OF K
354          RK    7300     .01     .04       0       0       5       2
1                                        HEC-1 INPUT                                    PAGE 10

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

355          KK   MNW-K RUNOFF FROM K
356          BA    1.43
357          LS              66      25
358          UD    1.55

359          KK     CP4 COMBINE HYDROGRAPHS FOR AIRPORT CHANNEL AND TAXIWAY S
```

```
360          HC       2

361          KK    RCP4 ROUTE FLOW TO TROPICANA BLVD
362          RK    3300     .01     .03       0       0      20       4

363          KK    MNW-L RUNOFF FROM L
364          BA    0.27
365          LS              77      60
366          UD    0.42

367          KK    MNW-M RUNOFF FROM M
368          BA    0.49
369          LS              84      56
370          UD    0.83

371          KK     CP5 COMBINE ALL HYDROGRAPHS AT OUTLET AT BOX CULVERT AT TROPICANA
372          HC       3
             *  *** END OF DATA FROM NIMBUS NORTHWEST MCCARRAN HEC-1 DATA ***
             •

373          KK     T12 ROUTE MNW-L TO T12 (TRMC0009)
374          RK    2640   .0045    .040            TRAP      18     1.5

375          KK       .   (TRWA0000-0034)
376          RK    5000    .012    .040            TRAP     100     2.5

377          KK     T12 COMBINE MNW-L AND T12
378          KM         AIRPORT CHANNEL + TROPICANA WASH
379          HC       2
380          ZZ
```

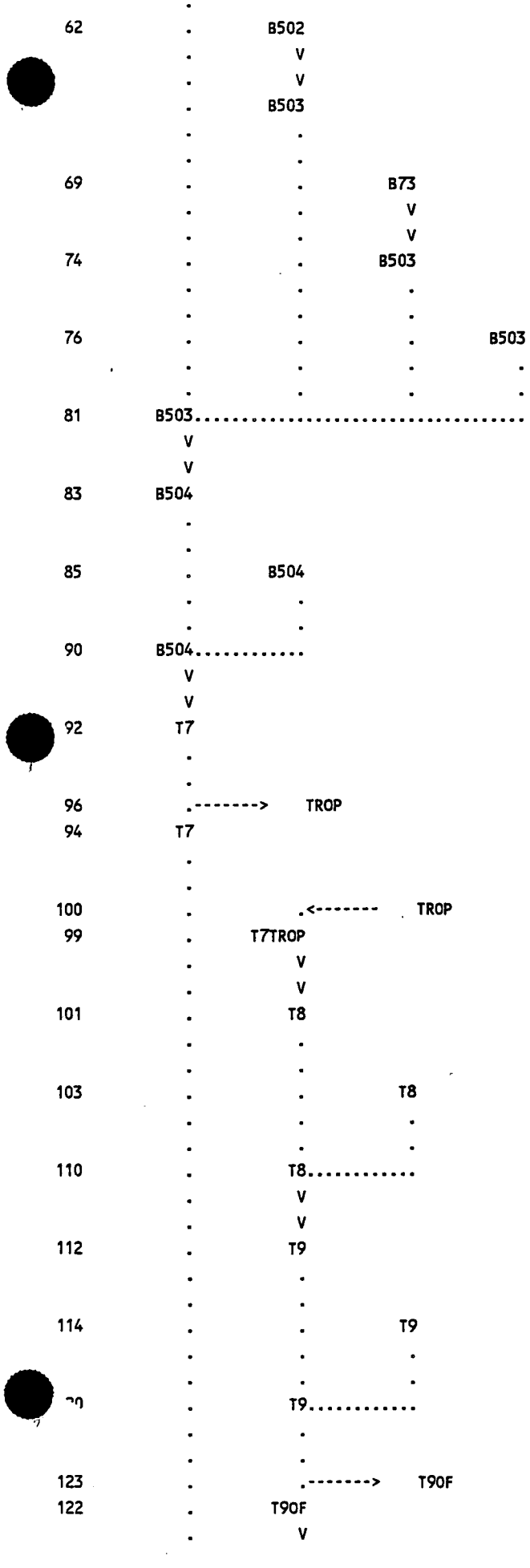
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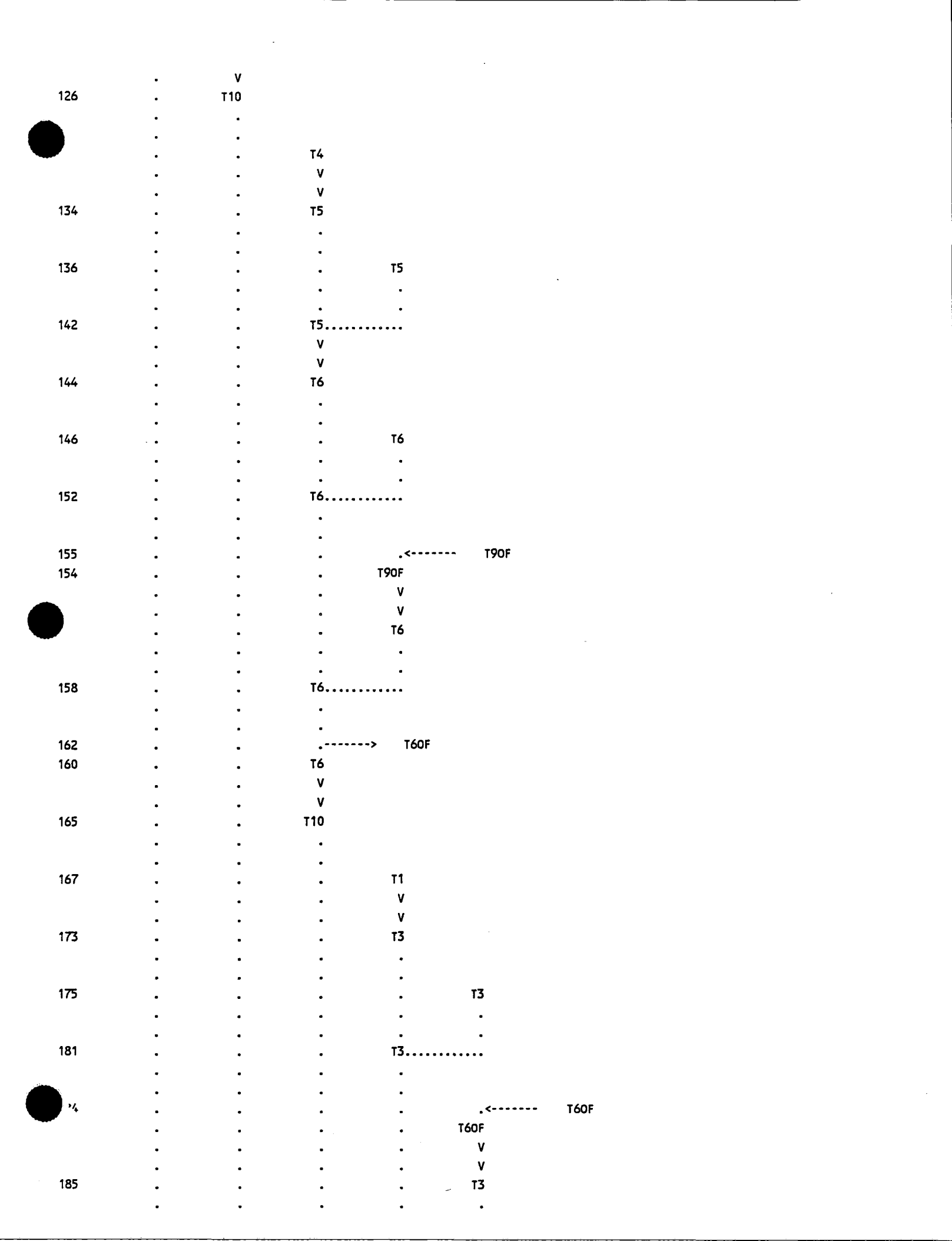
SCHEMATIC DIAGRAM OF STREAM NETWORK

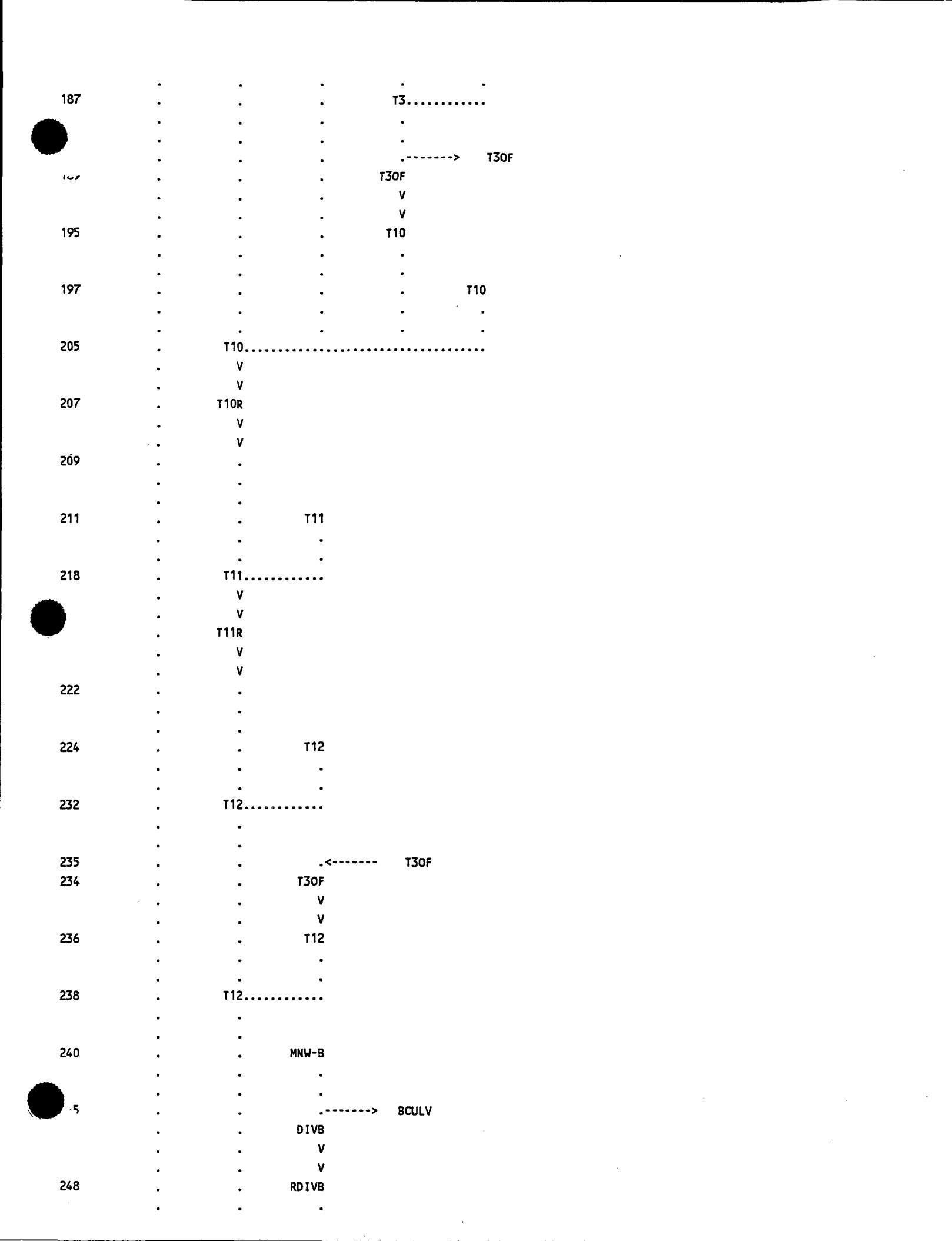
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INPUT
 LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

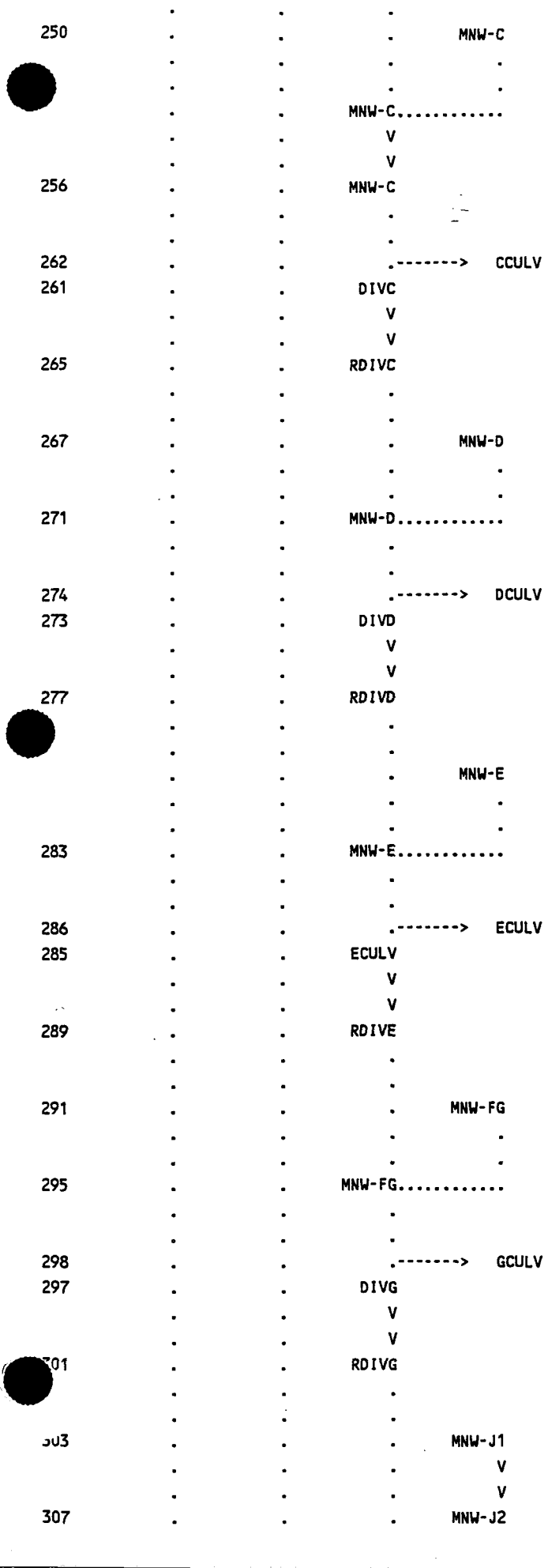
  NO.     (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

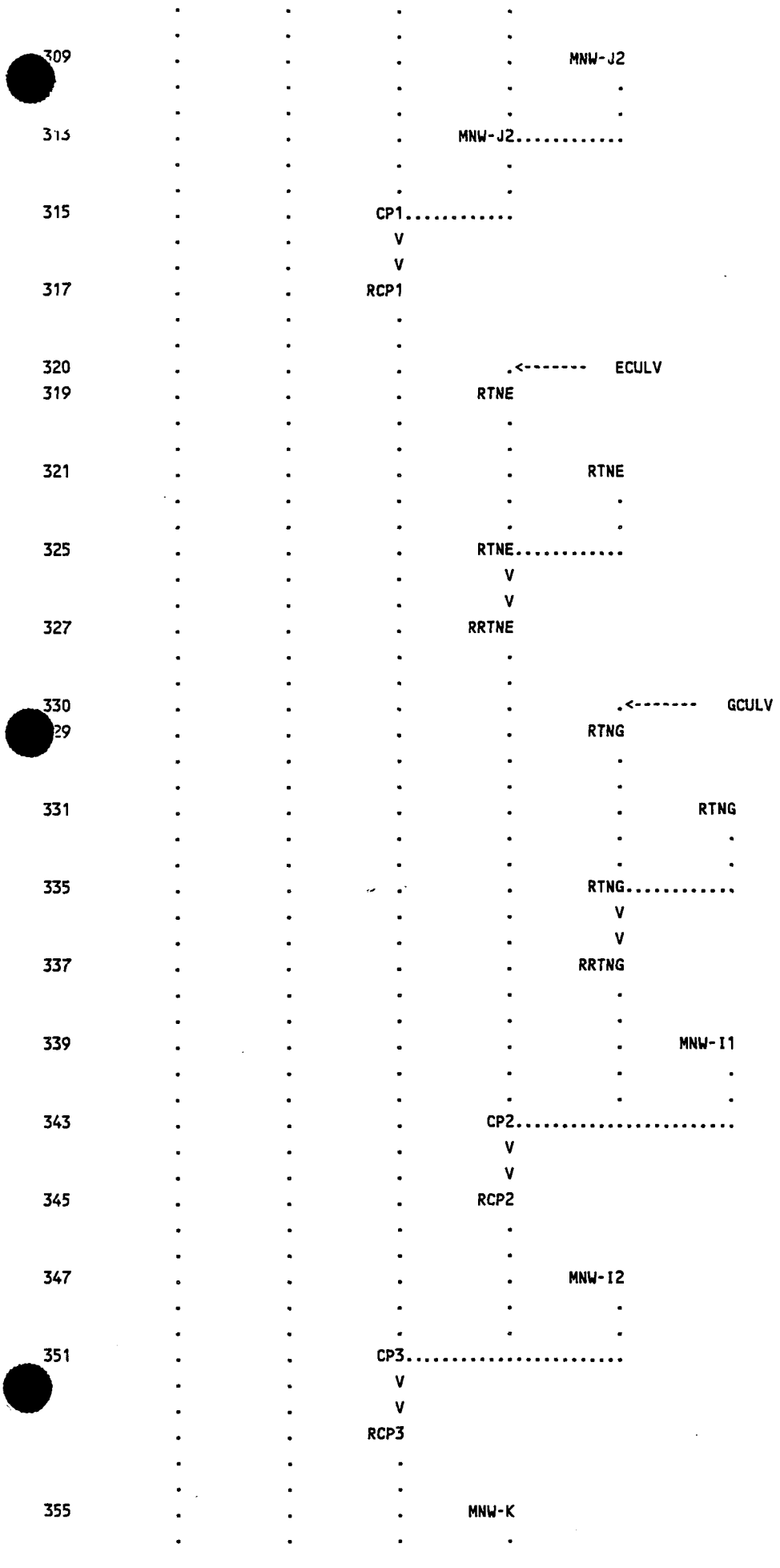
   29        B71
               V
               V
   42        B501
               .
               .
   44          .        B501
               .          .
               .          .
   49        B591.............
               V
               V
   51        B72
               .
               .
   53          .         B72
               .          .
               .          .
             B72.............
               V
               V
   60        B503
               .
```

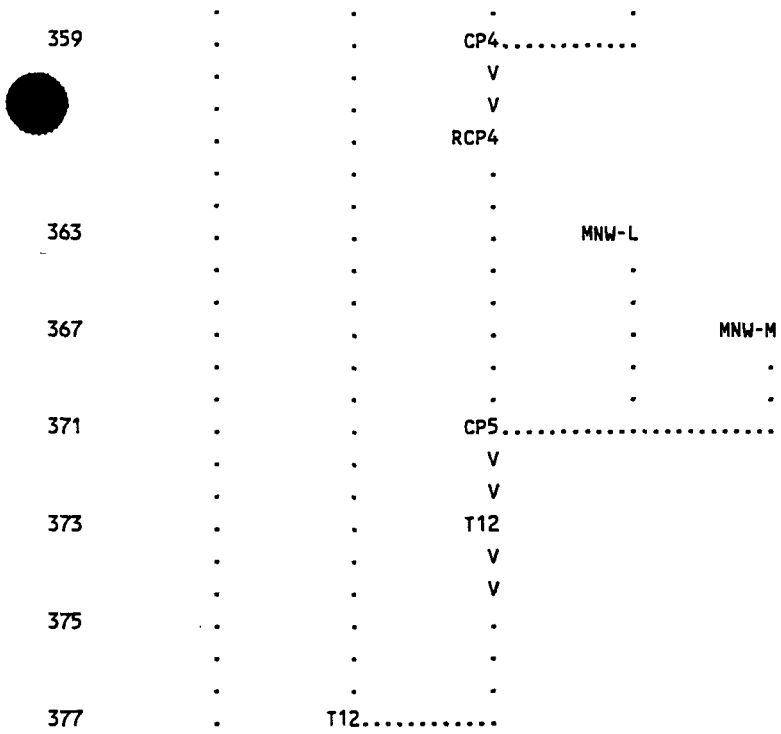

62 B502
69 B73
74 B503
76 B503
81 B503
83 B504
85 B504
90 B504
92 T7
96 TROP
94 T7
100 TROP
99 T7TROP
101 T8
103 T8
110 T8
112 T9
114 T9
T9
123 T90F
122 T90F


V
126 T10
T4
V
V
134 T5
136 T5
142 T5.....
V
V
144 T6
146 T6
152 T6.....
155 .<------- T90F
154 T90F
V
V
T6
158 T6.....
162 .-------> T60F
160 T6
V
V
165 T10
167 T1
V
V
173 T3
175 T3
181 T3.....
.<------- T60F
T60F
V
V
185 T3


187
T3
T3OF
T3OF
195
T10
197
T10
205
T10
207
T10R
209
211
T11
218
T11
T11R
222
224
T12
232
T12
235
T3OF
234
T3OF
236
T12
238
T12
240
MNW-B
5
BCULV
DIVB
248
RDIVB


250
MNW-C
MNW-C
256
MNW-C
262
CCULV
261
DIVC
265
RDIVC
267
MNW-D
271
MNW-D
274
DCULV
273
DIVD
277
RDIVD
MNW-E
283
MNW-E
286
ECULV
285
ECULV
289
RDIVE
291
MNW-FG
295
MNW-FG
298
GCULV
297
DIVG
RDIVG
MNW-J1
307
MNW-J2


309
MNW-J2
315
MNW-J2
315
CP1
317
RCP1
320
ECULV
319
RTNE
321
RTNE
325
RTNE
327
RRTNE
330
GCULV
329
RTNG
331
RTNG
335
RTNG
337
RRTNG
339
MNW-I1
343
CP2
345
RCP2
347
MNW-I2
351
CP3
355
MNW-K



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  06/08/1992  TIME  11:38:49 *
*                                       *
*****************************************
```

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

INPUT FILE = BDTROP100.DAT
CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
BASIN-WIDE STORM - TROPICANA AREA ONLY
100-YEAR 6-HR STORM (SDN #5)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF

B504,T8,T9	69.5,70.8,71.6	0.65
T10,T11,T12	80.5,81.6,90.4	0.63

IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN	5	MINUTES IN COMPUTATION INTERVAL
IDATE	1 0	STARTING DATE
ITIME	0000	STARTING TIME
NQ	100	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1 0	ENDING DATE
NDTIME	0815	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 8.25 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN	1	NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.65 .63

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION	
OPERATION	STATION	AREA	PLAN		RATIO 1	RATIO 2
					.65	.63
HYDROGRAPH AT						
+	B71	7.99	1	FLOW	2151.	2038.
				TIME	4.33	4.33
ROUTED TO						
	B501	7.99	1	FLOW	2099.	1989.
				TIME	4.67	4.67
HYDROGRAPH AT						
+	B501	10.66	1	FLOW	2854.	2703.
				TIME	4.33	4.33

2 COMBINED AT

+	B591	18.65	1	FLOW	4788.	4533.
				TIME	4.42	4.42

[redacted] TO

+	B72	18.65	1	FLOW	4710.	4461.
				TIME	4.75	4.75

HYDROGRAPH AT

+	B72	8.12	1	FLOW	2200.	2091.
				TIME	4.50	4.50

2 COMBINED AT

+	B72	26.77	1	FLOW	6830.	6475.
				TIME	4.67	4.67

ROUTED TO

+	B503	26.77	1	FLOW	6699.	6354.
				TIME	5.08	5.08

HYDROGRAPH AT

+	B502	27.35	1	FLOW	5732.	5440.
				TIME	5.25	5.25

ROUTED TO

+	B503	27.35	1	FLOW	5709.	5418.
				TIME	5.58	5.58

[redacted]ROGRAPH AT

	B73	2.69	1	FLOW	938.	890.
				TIME	3.92	3.92

ROUTED TO

+	B503	2.69	1	FLOW	878.	832.
				TIME	4.33	4.33

HYDROGRAPH AT

+	B503	8.07	1	FLOW	2062.	1949.
				TIME	4.17	4.25

4 COMBINED AT

+	B503	64.88	1	FLOW	14229.	13504.
				TIME	5.25	5.25

ROUTED TO

+	B504	64.88	1	FLOW	14074.	13358.
				TIME	5.75	5.75

HYDROGRAPH AT

+	B504	4.65	1	FLOW	979.	924.
				TIME	4.42	4.42

2 COMBINED AT

[redacted]	B504	69.53	1	FLOW	14803.	14046.
				TIME	5.67	5.67

ROUTED TO

+	T7	69.53	1	FLOW	14584.	13844.
				TIME	6.33	6.33

DIVERSION TO						
+	TROP	69.53	1	FLOW	5476.	5076.
				TIME	6.33	6.33
[redacted] APH AT						
+	T7	69.53	1	FLOW	9109.	8768.
				TIME	6.33	6.33
HYDROGRAPH AT						
+	T7TROP	.00	1	FLOW	5476.	5076.
				TIME	6.33	6.33
ROUTED TO						
+	T8	.00	1	FLOW	5352.	4958.
				TIME	7.08	7.08
HYDROGRAPH AT						
+	T8	1.22	1	FLOW	17.	14.
				TIME	7.33	7.58
2 COMBINED AT						
+	T8	1.22	1	FLOW	5368.	4970.
				TIME	7.08	7.08
ROUTED TO						
+	T9	1.22	1	FLOW	5284.	4890.
				TIME	7.58	7.58
[redacted]ROGRAPH AT						
	T9	.87	1	FLOW	49.	42.
				TIME	5.67	5.75
2 COMBINED AT						
+	T9	2.09	1	FLOW	5300.	4906.
				TIME	7.58	7.58
DIVERSION TO						
+	T9OF	2.09	1	FLOW	0.	0.
				TIME	.08	.08
HYDROGRAPH AT						
+	T9OF	2.09	1	FLOW	5300.	4906.
				TIME	7.58	7.58
ROUTED TO						
+	T10	2.09	1	FLOW	5268.	4877.
				TIME	7.83	7.83
HYDROGRAPH AT						
+	T4	3.22	1	FLOW	754.	687.
				TIME	4.17	4.25
ROUTED TO						
[redacted]	T5	3.22	1	FLOW	742.	685.
				TIME	4.25	4.33
HYDROGRAPH AT						
+	T5	1.00	1	FLOW	203.	187.
				TIME	4.17	4.17

2 COMBINED AT						
+	T5	4.22	1	FLOW	942.	867.
				TIME	4.25	4.33
.. TO						
+	T6	4.22	1	FLOW	937.	855.
				TIME	4.50	4.58
HYDROGRAPH AT						
+	T6	1.30	1	FLOW	251.	232.
				TIME	4.33	4.42
2 COMBINED AT						
+	T6	5.52	1	FLOW	1180.	1079.
				TIME	4.50	4.50
HYDROGRAPH AT						
+	T90F	.00	1	FLOW	0.	0.
				TIME	.08	.08
ROUTED TO						
+	T6	.00	1	FLOW	0.	0.
				TIME	.08	.08
2 COMBINED AT						
+	T6	5.52	1	FLOW	1180.	1079.
				TIME	4.50	4.50
'ERSION TO						
	T60F	5.52	1	FLOW	430.	329.
				TIME	4.50	4.50
HYDROGRAPH AT						
+	T6	5.52	1	FLOW	750.	750.
				TIME	4.25	4.33
ROUTED TO						
+	T10	5.52	1	FLOW	750.	750.
				TIME	5.42	5.33
HYDROGRAPH AT						
+	T1	1.56	1	FLOW	391.	360.
				TIME	4.08	4.17
ROUTED TO						
+	T3	1.56	1	FLOW	385.	354.
				TIME	4.42	4.42
HYDROGRAPH AT						
+	T3	.99	1	FLOW	105.	97.
				TIME	5.17	5.17
2 COMBINED AT						
+	T3	2.55	1	FLOW	449.	413.
				TIME	4.42	4.50
HYDROGRAPH AT						
+	T60F	.00	1	FLOW	430.	329.
				TIME	4.50	4.50

ROUTED TO						
+	T3	.00	1	FLOW	413.	316.
				TIME	4.58	4.67
INED AT						
+	T3	2.55	1	FLOW	847.	719.
				TIME	4.58	4.58
DIVERSION TO						
+	T3OF	2.55	1	FLOW	0.	0.
				TIME	.08	.08
HYDROGRAPH AT						
+	T3OF	2.55	1	FLOW	847.	719.
				TIME	4.58	4.58
ROUTED TO						
+	T10	2.55	1	FLOW	834.	710.
				TIME	4.58	4.67
HYDROGRAPH AT						
+	T10	.82	1	FLOW	118.	115.
				TIME	3.75	3.75
4 COMBINED AT						
+	T10	10.98	1	FLOW	5513.	5115.
				TIME	7.75	7.75
TED TO						
	T10R	10.98	1	FLOW	5508.	5112.
				TIME	7.83	7.83
ROUTED TO						
+	.	10.98	1	FLOW	5504.	5107.
				TIME	7.83	7.83
HYDROGRAPH AT						
+	T11	1.09	1	FLOW	217.	209.
				TIME	3.83	3.83
2 COMBINED AT						
+	T11	12.07	1	FLOW	5517.	5118.
				TIME	7.83	7.83
ROUTED TO						
+	T11R	12.07	1	FLOW	5512.	5114.
				TIME	7.92	7.92
ROUTED TO						
+	.	12.07	1	FLOW	5505.	5108.
				TIME	8.00	8.00
HYDROGRAPH AT						
	T12	.77	1	FLOW	158.	153.
				TIME	3.83	3.83
2 COMBINED AT						
+	T12	12.84	1	FLOW	5515.	5117.
				TIME	8.00	8.00

HYDROGRAPH AT						
+	T3OF	.00	1	FLOW	0.	0.
				TIME	.08	.08
R TO						
+	T12	.00	1	FLOW	0.	0.
				TIME	.08	.08
2 COMBINED AT						
+	T12	12.84	1	FLOW	5515.	5117.
				TIME	8.00	8.00
HYDROGRAPH AT						
+	MNW-B	.68	1	FLOW	24.	22.
				TIME	6.42	6.42
DIVERSION TO						
+	BCULV	.68	1	FLOW	22.	22.
				TIME	5.83	6.17
HYDROGRAPH AT						
+	DIVB	.68	1	FLOW	2.	0.
				TIME	6.42	6.42
ROUTED TO						
+	RDIVB	.68	1	FLOW	2.	0.
				TIME	6.50	6.58
ROGRAPH AT						
	MNW-C	.69	1	FLOW	38.	36.
				TIME	6.00	5.92
2 COMBINED AT						
+	MNW-C	1.37	1	FLOW	39.	36.
				TIME	6.17	5.92
ROUTED TO						
+	MNW-C	1.37	1	FLOW	33.	31.
				TIME	6.83	6.75
			** PEAK STAGES IN FEET **			
			1	STAGE	56.77	56.57
				TIME	6.83	6.75
DIVERSION TO						
+	CCULV	1.37	1	FLOW	33.	31.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	DIVC	1.37	1	FLOW	0.	0.
				TIME	.08	.08
ROUTED TO						
	RDIVC	1.37	1	FLOW	0.	0.
				TIME	.08	.08
HYDROGRAPH AT						
+	MNW-D	.05	1	FLOW	4.	3.
				TIME	5.08	5.08

2 COMBINED AT						
+	MNW-D	1.42	1	FLOW	4.	3.
				TIME	5.08	5.08
[redacted] ON TO						
+	DCULV	1.42	1	FLOW	4.	3.
				TIME	5.08	5.08
HYDROGRAPH AT						
+	DIVD	1.42	1	FLOW	0.	0.
				TIME	.08	.08
ROUTED TO						
+	RDIVD	1.42	1	FLOW	0.	0.
				TIME	.08	.08
HYDROGRAPH AT						
+	MNW-E	.05	1	FLOW	6.	5.
				TIME	3.75	3.75
2 COMBINED AT						
+	MNW-E	1.47	1	FLOW	6.	5.
				TIME	3.75	3.75
DIVERSION TO						
+	ECULV	1.47	1	FLOW	6.	5.
				TIME	3.75	3.75
[redacted]OGRAPH AT						
	ECULV	1.47	1	FLOW	0.	0.
				TIME	.08	.08
ROUTED TO						
+	RDIVE	1.47	1	FLOW	0.	0.
				TIME	.08	.08
HYDROGRAPH AT						
+	MNW-FG	.36	1	FLOW	24.	22.
				TIME	5.33	5.25
2 COMBINED AT						
+	MNW-FG	1.83	1	FLOW	24.	22.
				TIME	5.33	5.25
DIVERSION TO						
+	GCULV	1.83	1	FLOW	24.	22.
				TIME	5.33	5.25
HYDROGRAPH AT						
+	DIVG	1.83	1	FLOW	0.	0.
				TIME	.08	.08
ROUTED TO						
[redacted]	RDIVG	1.83	1	FLOW	0.	0.
				TIME	.08	.08
HYDROGRAPH AT						
+	MNW-J1	2.37	1	FLOW	65.	58.
				TIME	7.00	7.00

ROUTED TO						
+	MNW-J2	2.37	1	FLOW	65.	58.
				TIME	7.42	7.50
[redacted] APH AT						
+	MNW-J2	1.21	1	FLOW	79.	73.
				TIME	5.50	5.50
2 COMBINED AT						
+	MNW-J2	3.58	1	FLOW	102.	92.
				TIME	6.08	6.08
2 COMBINED AT						
+	CP1	5.41	1	FLOW	102.	92.
				TIME	6.08	6.08
ROUTED TO						
+	RCP1	5.41	1	FLOW	102.	92.
				TIME	6.17	6.17
HYDROGRAPH AT						
+	RTNE	.00	1	FLOW	6.	5.
				TIME	3.75	3.75
HYDROGRAPH AT						
+	RTNE	.01	1	FLOW	0.	0.
				TIME	.08	.08
[redacted] COMBINED AT						
	RTNE	.01	1	FLOW	6.	5.
				TIME	3.75	3.75
ROUTED TO						
+	RRTNE	.01	1	FLOW	5.	5.
				TIME	4.58	4.58
HYDROGRAPH AT						
+	RTNG	.00	1	FLOW	24.	22.
				TIME	5.33	5.25
HYDROGRAPH AT						
+	RTNG	.01	1	FLOW	0.	0.
				TIME	.08	.08
2 COMBINED AT						
+	RTNG	.01	1	FLOW	24.	22.
				TIME	5.33	5.25
ROUTED TO						
+	RRTNG	.01	1	FLOW	24.	22.
				TIME	5.58	5.50
HYDROGRAPH AT						
[redacted]	MNW-I1	.25	1	FLOW	43.	41.
				TIME	4.00	4.00
3 COMBINED AT						
+	CP2	.27	1	FLOW	59.	56.
				TIME	5.17	5.17

ROUTED TO						
+	RCP2	.27	1	FLOW	59.	56.
				TIME	5.25	5.33
APH AT						
+	MNW-I2	.14	1	FLOW	19.	18.
				TIME	3.83	3.83
3 COMBINED AT						
+	CP3	5.82	1	FLOW	149.	138.
				TIME	5.33	5.33
ROUTED TO						
+	RCP3	5.82	1	FLOW	149.	138.
				TIME	5.58	5.50
HYDROGRAPH AT						
+	MNW-K	1.43	1	FLOW	120.	114.
				TIME	5.42	5.42
2 COMBINED AT						
+	CP4	7.25	1	FLOW	268.	252.
				TIME	5.50	5.50
ROUTED TO						
+	RCP4	7.25	1	FLOW	268.	252.
				TIME	5.58	5.58
ROGRAPH AT						
	MNW-L	.27	1	FLOW	103.	99.
				TIME	3.75	3.75
HYDROGRAPH AT						
+	MNW-M	.49	1	FLOW	145.	139.
				TIME	4.25	4.25
3 COMBINED AT						
+	CP5	8.01	1	FLOW	404.	383.
				TIME	5.17	5.17
ROUTED TO						
+	T12	8.01	1	FLOW	403.	382.
				TIME	5.25	5.25
ROUTED TO						
+	.	8.01	1	FLOW	402.	381.
				TIME	5.42	5.42
2 COMBINED AT						
+	T12	20.85	1	FLOW	5659.	5250.
				TIME	8.00	8.00

NORMAL END OF HEC-1 ***

EXHIBIT 5-6

HEC - 1 NORTH 1A.OUT

```
1*****************************************
*                                       *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
*            FEBRUARY 1981              *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  07/02/1992  TIME  08:56:33 *
*                                       *
*****************************************
```

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

```
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    INPUT FILE = LTROP100.DAT
    2         ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3         ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4         ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5         ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
    6         ID         100-YEAR 6-HR STORM (SDN #3)
    7         ID         JMM    OCTOBER 1990
    8         ID
    9         ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   10         ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   11         ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   12         ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   13         ID
   14         ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   15         ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   16         ID
   17         ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   18         ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   19         ID
   20         ID         SUBBASIN         AREA (SQMI)         DARF
   21         ID         --------         -----------         ----
   22         ID          T1,T8            1.0,1.2           0.95
```

```
23          ID          T3,T9          2.6,2.1          0.93
24          ID          T5,T6,J2       4.2,5.5,5.4      0.90
25          ID          MNW-M          8.0              0.88
26          ID
27          ID
28          IT      5       0       0     120
29          IO      5
30          JR    PREC    0.95    0.93    0.90    0.88

31          KK      T1 RUNOFF FROM T1
32          BA    1.1
33          PC    0.00    0.02   0.057    0.07   0.087   0.108   0.124   0.130   0.130   0.130
34          PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
35          PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
36          PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
37          PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
38          PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
39          PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
40          PC   0.998   0.999   1.000
41          PB    2.77
42          LS       0      88
43          UK     600    .020    0.15     100
44          RK    4000   .0200    .030    0.28                            1
45          RK   10200    .017    .030            TRAP      50       5      NO
46          ZZ
```

```
1*****************************************                 *****************************************
*                                       *                 *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                 *    U.S. ARMY CORPS OF ENGINEERS       *
*             FEBRUARY 1981             *                 *  THE HYDROLOGIC ENGINEERING CENTER    *
*          REVISED 01 APR 88            *                 *          609 SECOND STREET            *
*                                       *                 *        DAVIS, CALIFORNIA 95616        *
*  RUN DATE  07/02/1992  TIME  08:56:33 *                 *           (916) 551-1748              *
*                                       *                 *                                       *
*****************************************                 *****************************************
```

```
INPUT FILE = LTROP100.DAT
 CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
 RED ROCK/FLAMINGO/TROPICANA WATERSHED
 EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
 FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
     100-YEAR 6-HR STORM (SDN #3)
     JMM    OCTOBER 1990

     BASIC DATA FILE BASED ON COE FILE S10P40X.
     MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
     BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
     AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

     COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
     IMPROVED CHANNELS FROM FACILITY INVENTORY.

 PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
 BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

     SUBBASIN          AREA (SQMI)          DARF
     --------          -----------          ----
```

T1,T8	1.0,1.2	0.95
T3,T9	2.6,2.1	0.93
T5,T6,J2	4.2,5.5,5.4	0.90
MNW-M	8.0	0.88

29 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		120	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0955	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 9.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN	1	NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.95 .93 .90 .88

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION			
OPERATION	STATION	AREA	PLAN		RATIO 1	RATIO 2	RATIO 3	RATIO 4
					.95	.93	.90	.88
HYDROGRAPH AT								
+	T1	1.10	1	FLOW	868.	834.	786.	749.
				TIME	3.83	3.83	3.92	3.92

*** NORMAL END OF HEC-1 ***

EXHIBIT 5-7

HEC -11 NORTH T3A.OUT

```
1*****************************************
*                                       *
*    FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              FEBRUARY 1981            *
*            REVISED 01 APR 88          *
*                                       *
*  RUN DATE  07/02/1992  TIME  09:10:08 *
*                                       *
*****************************************
```

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

```
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    INPUT FILE = LTROP100.DAT
  2           ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
  3           ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
  4           ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
  5           ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
  6           ID         100-YEAR 6-HR STORM (SDN #3)
  7           ID         JMM    OCTOBER 1990
  8           ID
  9           ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
 10           ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
 11           ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
 12           ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
 13           ID
 14           ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
 15           ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
 16           ID
 17           ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
 18           ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
 19           ID
 20           ID         SUBBASIN         AREA (SQMI)         DARF
 21           ID         --------         -----------         ----
 22           ID          T1,T8            1.0,1.2           0.95
```

```
   23          ID          T3,T9              2.6,2.1             0.93
   24          ID          T5,T6,J2           4.2,5.5,5.4         0.90
   25          ID           MNW-M               8.0               0.88
   26          ID
   27          ID
   28          IT       5       0       0     120
   29          IO       5
   30          JR    PREC    0.95    0.93    0.90    0.88

   31          KK      T1 RUNOFF FROM T1
   32          BA    1.56
   33          PC    0.00    0.02   0.057    0.07   0.087   0.108   0.124   0.130   0.130   0.130
   34          PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
   35          PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
   36          PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
   37          PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
   38          PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
   39          PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
   40          PC   0.998   0.999   1.000
   41          PB    2.77
   42          LS       0      88
   43          UK     600    .020    0.15     100
   44          RK    4000   .0200    .030    0.28                                1
   45          RK   13200    .017    .030            TRAP      50       5      NO

   46          KK      T3 ROUTE T1 TO T3
   47          RK   10000   .0106    .032            TRAP      30       5
1                                      HEC-1 INPUT                                    PAGE  2

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

   48          KK      T3 RUNOFF FROM T3
   49          BA     0.2
   50          LS       0    78.9
   51          UK     500    .010    0.15     100
   52          RK    3000    .010    .030    0.16                                1
   53          RK    2500   .0106    .032            TRAP      30       5

   54          KK      T3 COMBINE T1 AND T3
   55          HC       2
   56          ZZ
1*****************************************                 *****************************************
*                                       *                 *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                 *    U.S. ARMY CORPS OF ENGINEERS       *
*             FEBRUARY 1981             *                 *  THE HYDROLOGIC ENGINEERING CENTER    *
*           REVISED 01 APR 88           *                 *          609 SECOND STREET            *
*                                       *                 *        DAVIS, CALIFORNIA 95616        *
*  RUN DATE  07/02/1992  TIME  09:10:08 *                 *          (916) 551-1748               *
*                                       *                 *                                       *
*****************************************                 *****************************************

 INPUT FILE = LTROP100.DAT
 CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
 RED ROCK/FLAMINGO/TROPICANA WATERSHED
 EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
```

FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
100-YEAR 6-HR STORM (SDN #3)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
T1,T8	1.0,1.2	0.95
T3,T9	2.6,2.1	0.93
T5,T6,J2	4.2,5.5,5.4	0.90
MNW-M	8.0	0.88

29 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

.T HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		120	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0955	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 9.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN	1	NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.95 .93 .90 .88

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES

TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1	RATIO 2	RATIO 3	RATIO 4
					.95	.93	.90	.88
HYDROGRAPH AT								
+	T1	1.56	1	FLOW	1202.	1156.	1092.	1031.
				TIME	3.92	3.92	3.92	3.92
ROUTED TO								
+	T3	1.56	1	FLOW	1141.	1112.	1047.	997.
				TIME	4.08	4.08	4.17	4.17
HYDROGRAPH AT								
+	T3	.20	1	FLOW	77.	72.	65.	61.
				TIME	4.08	4.08	4.08	4.08
2 COMBINED AT								
+	T3	1.76	1	FLOW	1218.	1184.	1111.	1057.
				TIME	4.08	4.08	4.17	4.17

*** NORMAL END OF HEC-1 ***

EXHIBIT 5-8

NORTH.OUT

```
1*****************************************
*                                       *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
*           FEBRUARY 1981               *
*         REVISED 01 APR 88             *
*                                       *
*  RUN DATE  07/02/1992  TIME  09:13:27 *
*                                       *
*****************************************
```

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

```
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    INPUT FILE = LTROP100.DAT
    2         ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3         ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4         ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5         ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
    6         ID         100-YEAR 6-HR STORM (SDN #3)
    7         ID         JMM    OCTOBER 1990
    8         ID
    9         ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   10         ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   11         ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   12         ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   13         ID
   14         ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   15         ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   16         ID
   17         ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   18         ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   19         ID
   20         ID         SUBBASIN         AREA (SQMI)         DARF
   21         ID         --------         -----------         ----
   22         ID          T1,T8            1.0,1.2           0.95
```

```
 23          ID          T3,T9              2.6,2.1             0.93
 24          ID          T5,T6,J2           4.2,5.5,5.4         0.90
 25          ID           MNW-M               8.0               0.88
 26          ID
 27          ID
 28          IT      5        0       0     120
 29          IO      5
 30          JR    PREC     0.95    0.93    0.90    0.88

 31          KK       T1 RUNOFF FROM T1
 32          BA     1.56
 33          PC     0.00     0.02   0.057    0.07   0.087   0.108   0.124   0.130   0.130   0.130
 34          PC    0.130    0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
 35          PC    0.190    0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
 36          PC    0.251    0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
 37          PC    0.499    0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
 38          PC    0.860    0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
 39          PC    0.982    0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
 40          PC    0.998    0.999   1.000
 41          PB     2.77
 42          LS        0       88
 43          UK      600     .020    0.15     100
 44          RK     4000    .0200    .030    0.28                            1
 45          RK    13200     .017    .030            TRAP      50        5      NO

 46          KK       T3 ROUTE T1 TO T3
 47          RK    10000    .0106    .032            TRAP      30        5
```



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

 48          KK       T3 RUNOFF FROM T3
 49          BA     0.99
 50          LS        0     78.9
 51          UK      500     .010    0.15     100
 52          RK     3000     .010    .030    0.16                            1
 53          RK    10000    .0106    .032            TRAP      30        5

 54          KK       T3 COMBINE T1 AND T3
 55          HC        2
 56          ZZ
```

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  07/02/1992  TIME  09:13:27 *
*                                       *
*****************************************
```

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

INPUT FILE = LTROP100.DAT
CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT

FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
100-YEAR 6-HR STORM (SDN #3)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
T1,T8	1.0,1.2	0.95
T3,T9	2.6,2.1	0.93
T5,T6,J2	4.2,5.5,5.4	0.90
MNW-M	8.0	0.88

29 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

.T HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		120	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0955	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 9.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN	1	NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.95 .93 .90 .88

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES

TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .95	RATIO 2 .93	RATIO 3 .90	RATIO 4 .88
HYDROGRAPH AT								
+	T1	1.56	1	FLOW	1202.	1156.	1092.	1031.
				TIME	3.92	3.92	3.92	3.92
ROUTED TO								
+	T3	1.56	1	FLOW	1141.	1112.	1047.	997.
				TIME	4.08	4.08	4.17	4.17
HYDROGRAPH AT								
+	T3	.99	1	FLOW	357.	332.	300.	280.
				TIME	4.17	4.17	4.25	4.25
2 COMBINED AT								
+	T3	2.55	1	FLOW	1490.	1442.	1344.	1270.
				TIME	4.17	4.17	4.17	4.17

*** NORMAL END OF HEC-1 ***

EXHIBIT 5-9

CENT - T5A.OUT

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  07/02/1992  TIME  09:34:52 *
*                                       *
*****************************************
```

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

```
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    INPUT FILE = LTROP100.DAT
    2         ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3         ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4         ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5         ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
    6         ID         100-YEAR 6-HR STORM (SDN #3)
    7         ID         JMM    OCTOBER 1990
    8         ID
    9         ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   10         ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   11         ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   12         ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   13         ID
   14         ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   15         ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   16         ID
   17         ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   18         ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   19         ID
   20         ID         SUBBASIN         AREA (SQMI)         DARF
   21         ID         --------         -----------         ----
   22         ID          T1,T8            1.0,1.2           0.95
```

```
 23          ID          T3,T9              2.6,2.1             0.93
 24          ID          T5,T6,J2           4.2,5.5,5.4         0.90
 25          ID           MNW-M               8.0               0.88
 26          ID
 27          ID
 28          IT       5        0        0      120
 29          IO       5
 30          JR     PREC     0.95     0.93     0.90     0.88

 31          KK        T4 RUNOFF FROM T4
 32          BA      0.7
 33          PC     0.00     0.02    0.057     0.07    0.087    0.108    0.124    0.130    0.130    0.130
 34          PC    0.130    0.130    0.130    0.133    0.140    0.142    0.148    0.158    0.172    0.181
 35          PC    0.190    0.197    0.199    0.200    0.201    0.204    0.214    0.229    0.241    0.249
 36          PC    0.251    0.256    0.270    0.278    0.281    0.283    0.295    0.322    0.352    0.409
 37          PC    0.499    0.590    0.710    0.744    0.781    0.812    0.819    0.835    0.851    0.856
 38          PC    0.860    0.868    0.876    0.888    0.910    0.926    0.937    0.950    0.970    0.976
 39          PC    0.982    0.985    0.987    0.989    0.990    0.993    0.993    0.994    0.995    0.998
 40          PC    0.998    0.999    1.000
 41          PB     2.77
 42          LS        0     87.6
 43          UK      500     .015     0.15      100
 44          RK     2700    .0190     .030     0.25                                1
 45          RK    20000    .0185     .030             TRAP       75        5      NO

 46          KK        T5 ROUTE T4 TO T5
 47          RK     6500     .013     .030             TRAP       30        2
1                                          HEC-1 INPUT                                    PAGE  2

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

 48          KK        T5 RUNOFF FROM T5
 49          BA      0.2
 50          LS        0     87.0
 51          UK      600     .010     0.15      100
 52          RK     2500     .012     .030     0.21                                1
 53          RK     6500     .013     .030             TRAP       30        2

 54          KK        T5 COMBINE T4 AND T5
 55          HC        2
 56          ZZ
```

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  07/02/1992  TIME  09:34:52 *
*                                       *
*****************************************
```

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

INPUT FILE = LTROP100.DAT
CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT

FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
100-YEAR 6-HR STORM (SDN #3)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
T1,T8	1.0,1.2	0.95
T3,T9	2.6,2.1	0.93
T5,T6,J2	4.2,5.5,5.4	0.90
MNW-M	8.0	0.88

29 IO OUTPUT CONTROL VARIABLES
IPRNT 5 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

.T HYDROGRAPH TIME DATA
NMIN 5 MINUTES IN COMPUTATION INTERVAL
IDATE 1 0 STARTING DATE
ITIME 0000 STARTING TIME
NQ 120 NUMBER OF HYDROGRAPH ORDINATES
NDDATE 1 0 ENDING DATE
NDTIME 0955 ENDING TIME
ICENT 19 CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 9.92 HOURS

ENGLISH UNITS
DRAINAGE AREA SQUARE MILES
PRECIPITATION DEPTH INCHES
LENGTH, ELEVATION FEET
FLOW CUBIC FEET PER SECOND
STORAGE VOLUME ACRE-FEET
SURFACE AREA ACRES
TEMPERATURE DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.95 .93 .90 .88

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .95	RATIO 2 .93	RATIO 3 .90	RATIO 4 .88
HYDROGRAPH AT								
+	T4	.70	1	FLOW	388.	374.	348.	331.
				TIME	4.17	4.25	4.25	4.25
ROUTED TO								
+	T5	.70	1	FLOW	384.	366.	343.	327.
				TIME	4.33	4.42	4.42	4.42
HYDROGRAPH AT								
+	T5	.20	1	FLOW	126.	123.	114.	108.
				TIME	4.00	4.00	4.00	4.00
2 COMBINED AT								
+	T5	.90	1	FLOW	471.	449.	418.	399.
				TIME	4.33	4.33	4.33	4.42

*** NORMAL END OF HEC-1 ***

EXHIBIT 5-10

HEC - 1 CENT - T6A.OUT

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  07/02/1992  TIME  09:53:50 *
*                                       *
*****************************************
```

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

```
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   INPUT FILE = LTROP100.DAT
    2       ID    CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3       ID    RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4       ID    EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5       ID    FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
    6       ID        100-YEAR 6-HR STORM (SDN #3)
    7       ID        JMM    OCTOBER 1990
    8       ID
    9       ID        BASIC DATA FILE BASED ON COE FILE S10P40X.
   10       ID        MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   11       ID        BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   12       ID        AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   13       ID
   14       ID        COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   15       ID        IMPROVED CHANNELS FROM FACILITY INVENTORY.
   16       ID
   17       ID    PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   18       ID    BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   19       ID
   20       ID        SUBBASIN        AREA (SQMI)        DARF
   21       ID        --------        -----------        ----
   22       ID         T1,T8           1.0,1.2           0.95
```

```
23          ID          T3,T9           2.6,2.1          0.93
24          ID          T5,T6,J2        4.2,5.5,5.4      0.90
25          ID           MNW-M            8.0            0.88
26          ID
27          ID
28          IT      5       0       0     120
29          IO      5
30          JR    PREC    0.95    0.93    0.90    0.88

31          KK       T4 RUNOFF FROM T4
32          BA     0.7
33          PC    0.00    0.02   0.057    0.07   0.087   0.108   0.124   0.130   0.130   0.130
34          PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
35          PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
36          PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
37          PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
38          PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
39          PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
40          PC   0.998   0.999   1.000
41          PB    2.77
42          LS       0    87.6
43          UK     500    .015    0.15     100
44          RK    2700   .0190    .030    0.25                            1
45          RK   20000   .0185    .030            TRAP      75        5      NO

46          KK       T5 ROUTE T4 TO T5
47          RK    6500    .013    .030            TRAP      30        2
```



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

48          KK       T5 RUNOFF FROM T5
49          BA     0.2
50          LS       0    87.0
51          UK     600    .010    0.15     100
52          RK    2500    .012    .030    0.21                            1
53          RK    6500    .013    .030            TRAP      30        2

54          KK       T5 COMBINE T4 AND T5
55          HC        2

56          KK       T6 ROUTE T5 TO T6
57          RK    5300    .012    .030            TRAP      30        5

58          KK       T6 RUNOFF FROM T6
59          BA     0.2
60          LS       0    86.9
61          UK     600    .010    0.15     100
62          RK    6000    .012    .030    .400                            1
63          RK    5300    .012    .030            TRAP      30        5

64          KK       T6 COMBINE T5 AND T6
65          HC        2
66          ZZ
```

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*****************************************

*****************************************
*                                       *
*     U.S. ARMY CORPS OF ENGINEERS      *
*   THE HYDROLOGIC ENGINEERING CENTER   *
*           609 SECOND STREET           *
*                                       *
*****************************************
```

```
*                                   *
* RUN DATE  07/02/1992  TIME  09:53:50 *
*                                   *
*************************************
```

```
*                                       *
*       DAVIS, CALIFORNIA 95616         *
*          (916) 551-1748               *
*                                       *
*****************************************
```

```
INPUT FILE = LTROP100.DAT
 CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
 RED ROCK/FLAMINGO/TROPICANA WATERSHED
 EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
 FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
     100-YEAR 6-HR STORM (SDN #3)
     JMM    OCTOBER 1990

     BASIC DATA FILE BASED ON COE FILE S10P40X.
     MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
     BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
     AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

     COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
     IMPROVED CHANNELS FROM FACILITY INVENTORY.

 PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
 BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
```

SUBBASIN	AREA (SQMI)	DARF
T1,T8	1.0,1.2	0.95
T3,T9	2.6,2.1	0.93
T5,T6,J2	4.2,5.5,5.4	0.90
MNW-M	8.0	0.88

```
29 IO        OUTPUT CONTROL VARIABLES
                  IPRNT          5  PRINT CONTROL
                  IPLOT          0  PLOT CONTROL
                  QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                  NMIN          5  MINUTES IN COMPUTATION INTERVAL
                  IDATE     1    0  STARTING DATE
                  ITIME        0000  STARTING TIME
                    NQ         120  NUMBER OF HYDROGRAPH ORDINATES
                 NDDATE     1    0  ENDING DATE
                 NDTIME        0955  ENDING TIME
                 ICENT           19  CENTURY MARK

           COMPUTATION INTERVAL      .08 HOURS
               TOTAL TIME BASE     9.92 HOURS

     ENGLISH UNITS
          DRAINAGE AREA          SQUARE MILES
          PRECIPITATION DEPTH    INCHES
          LENGTH, ELEVATION      FEET
          FLOW                   CUBIC FEET PER SECOND
          STORAGE VOLUME         ACRE-FEET
```

SURFACE AREA ACRES
TEMPERATURE DEGREES FAHRENHEIT

MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.95 .93 .90 .88

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION			
OPERATION	STATION	AREA	PLAN		RATIO 1 .95	RATIO 2 .93	RATIO 3 .90	RATIO 4 .88
HYDROGRAPH AT								
+	T4	.70	1	FLOW	388.	374.	348.	331.
				TIME	4.17	4.25	4.25	4.25
TO								
+	T5	.70	1	FLOW	384.	366.	343.	327.
				TIME	4.33	4.42	4.42	4.42
HYDROGRAPH AT								
+	T5	.20	1	FLOW	126.	123.	114.	108.
				TIME	4.00	4.00	4.00	4.00
2 COMBINED AT								
+	T5	.90	1	FLOW	471.	449.	418.	399.
				TIME	4.33	4.33	4.33	4.42
ROUTED TO								
+	T6	.90	1	FLOW	464.	445.	415.	394.
				TIME	4.42	4.50	4.50	4.50
HYDROGRAPH AT								
+	T6	.20	1	FLOW	126.	122.	111.	107.
				TIME	4.00	4.00	4.08	4.08
2 COMBINED AT								
+	T6	1.10	1	FLOW	544.	522.	484.	461.
				TIME	4.42	4.42	4.50	4.50

NORMAL END OF HEC-1 ***

EXHIBIT 5-11

HEC - 1 CENT - T6B.OUT

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  07/02/1992  TIME  10:02:46 *
*                                       *
*****************************************
```

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

```
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    INPUT FILE = LTROP100.DAT
    2         ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3         ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4         ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5         ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
    6         ID         100-YEAR 6-HR STORM (SDN #3)
    7         ID         JMM    OCTOBER 1990
    8         ID
    9         ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   10         ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   11         ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   12         ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   13         ID
   14         ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   15         ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   16         ID
   17         ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   18         ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   19         ID
   20         ID         SUBBASIN        AREA (SQMI)        DARF
   21         ID         --------        -----------        ----
   22         ID          T1,T8           1.0,1.2           0.95
```

```
 23          ID          T3,T9            2.6,2.1            0.93
 24          ID          T5,T6,J2         4.2,5.5,5.4        0.90
 25          ID          MNW-M              8.0              0.88
 26          ID
 27          ID
 28          IT       5       0       0     120
 29          IO       5
 30          JR    PREC    0.95    0.93    0.90    0.88

 31          KK       T4 RUNOFF FROM T4
 32          BA      0.7
 33          PC     0.00    0.02   0.057    0.07   0.087   0.108   0.124   0.130   0.130   0.130
 34          PC    0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
 35          PC    0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
 36          PC    0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
 37          PC    0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
 38          PC    0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
 39          PC    0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
 40          PC    0.998   0.999   1.000
 41          PB     2.77
 42          LS        0    87.6
 43          UK      500    .015    0.15     100
 44          RK     2700   .0190    .030    0.25                            1
 45          RK    20000   .0185    .030            TRAP      75        5      NO

 46          KK       T5 ROUTE T4 TO T5
 47          RK     6500    .013    .030            TRAP      30        2
1                                      HEC-1 INPUT                                    PAGE  2

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

 48          KK       T5 RUNOFF FROM T5
 49          BA      0.5
 50          LS        0    87.0
 51          UK      600    .010    0.15     100
 52          RK     2500    .012    .030    0.21                            1
 53          RK     6500    .013    .030            TRAP      30        2

 54          KK       T5 COMBINE T4 AND T5
 55          HC        2

 56          KK       T6 ROUTE T5 TO T6
 57          RK     5800    .012    .030            TRAP      30        5

 58          KK       T6 RUNOFF FROM T6
 59          BA      0.5
 60          LS        0    86.9
 61          UK      600    .010    0.15     100
 62          RK     6000    .012    .030    .400                            1
 63          RK     5800    .012    .030            TRAP      30        5

 64          KK       T6 COMBINE T5 AND T6
 65          HC        2
 66          ZZ
1*****************************************  *****************************************
*                                       *  *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *  *    U.S. ARMY CORPS OF ENGINEERS       *
*             FEBRUARY 1981             *  *  THE HYDROLOGIC ENGINEERING CENTER    *
*           REVISED 01 APR 88           *  *          609 SECOND STREET            *
```

```
*                                   *                    *                                       *
* RUN DATE  07/02/1992  TIME  10:02:46 *                 *          DAVIS, CALIFORNIA 95616      *
*                                   *                    *            (916) 551-1748             *
*                                   *                    *                                       *
*************************************                    *****************************************
```

INPUT FILE = LTROP100.DAT
CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
100-YEAR 6-HR STORM (SDN #3)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
T1,T8	1.0,1.2	0.95
T3,T9	2.6,2.1	0.93
T5,T6,J2	4.2,5.5,5.4	0.90
MNW-M	8.0	0.88

29 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		120	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0955	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 9.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET

SURFACE AREA ACRES
TEMPERATURE DEGREES FAHRENHEIT

MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.95 .93 .90 .88

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION			
OPERATION	STATION	AREA	PLAN		RATIO 1 .95	RATIO 2 .93	RATIO 3 .90	RATIO 4 .88
HYDROGRAPH AT								
+	T4	.70	1	FLOW	388.	374.	348.	331.
				TIME	4.17	4.25	4.25	4.25
) TO								
+	T5	.70	1	FLOW	384.	366.	343.	327.
				TIME	4.33	4.42	4.42	4.42
HYDROGRAPH AT								
+	T5	.50	1	FLOW	328.	316.	291.	277.
				TIME	3.92	3.92	3.92	4.00
2 COMBINED AT								
+	T5	1.20	1	FLOW	593.	567.	527.	498.
				TIME	4.25	4.25	4.33	4.33
ROUTED TO								
+	T6	1.20	1	FLOW	587.	564.	524.	495.
				TIME	4.42	4.42	4.42	4.50
HYDROGRAPH AT								
+	T6	.50	1	FLOW	318.	307.	285.	273.
				TIME	4.00	4.00	4.00	4.00
2 COMBINED AT								
+	T6	1.70	1	FLOW	814.	780.	724.	685.
				TIME	4.25	4.25	4.25	4.33

*** NORMAL END OF HEC-1 ***

EXHIBIT 5-12

HEC - 1 CEN - T6B1

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  07/02/1992  TIME  10:10:47 *
*                                       *
*****************************************
```

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

```
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    INPUT FILE = LTROP100.DAT
  2       ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
  3       ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
  4       ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
  5       ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
  6       ID         100-YEAR 6-HR STORM (SDN #3)
  7       ID         JMM    OCTOBER 1990
  8       ID
  9       ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
 10       ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
 11       ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
 12       ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
 13       ID
 14       ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
 15       ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
 16       ID
 17       ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
 18       ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
 19       ID
 20       ID         SUBBASIN        AREA (SQMI)        DARF
 21       ID         --------        -----------        ----
 22       ID          T1,T8           1.0,1.2           0.95
```

```
 23          ID          T3,T9              2.6,2.1             0.93
 24          ID          T5,T6,J2           4.2,5.5,5.4         0.90
 25          ID           MNW-M               8.0               0.88
 26          ID
 27          ID
 28          IT       5        0        0      120
 29          IO       5
 30          JR    PREC     0.95     0.93     0.90     0.88

 31          KK       T4 RUNOFF FROM T4
 32          BA     0.7
 33          PC    0.00     0.02    0.057     0.07    0.087    0.108    0.124    0.130    0.130    0.130
 34          PC   0.130    0.130    0.130    0.133    0.140    0.142    0.148    0.158    0.172    0.181
 35          PC   0.190    0.197    0.199    0.200    0.201    0.204    0.214    0.229    0.241    0.249
 36          PC   0.251    0.256    0.270    0.278    0.281    0.283    0.295    0.322    0.352    0.409
 37          PC   0.499    0.590    0.710    0.744    0.781    0.812    0.819    0.835    0.851    0.856
 38          PC   0.860    0.868    0.876    0.888    0.910    0.926    0.937    0.950    0.970    0.976
 39          PC   0.982    0.985    0.987    0.989    0.990    0.993    0.993    0.994    0.995    0.998
 40          PC   0.998    0.999    1.000
 41          PB    2.77
 42          LS       0     87.6
 43          UK     500     .015     0.15      100
 44          RK    2700    .0190     .030     0.25                        1
 45          RK   20000    .0185     .030             TRAP      75       5       NO

 46          KK       T5 ROUTE T4 TO T5
 47          RK    6500     .013     .030             TRAP      30       2
1                                        HEC-1 INPUT                                        PAGE  2

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

 48          KK       T5 RUNOFF FROM T5
 49          BA      0.2
 50          LS        0     87.0
 51          UK      600     .010     0.15      100
 52          RK     2500     .012     .030     0.21                        1
 53          RK     6500     .013     .030             TRAP      30       2

 54          KK       T5 COMBINE T4 AND T5
 55          HC        2

 56          KK       T6 ROUTE T5 TO T6
 57          RK     5800     .012     .030             TRAP      30       5

 58          KK       T6 RUNOFF FROM T6
 59          BA      0.8
 60          LS        0     86.9
 61          UK      600     .010     0.15      100
 62          RK     6000     .012     .030     .400                        1
 63          RK     5800     .012     .030             TRAP      30       5

 64          KK       T6 COMBINE T5 AND T6
 65          HC        2
 66          ZZ
```

```
*****************************************          *****************************************
*                                       *          *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *          *     U.S. ARMY CORPS OF ENGINEERS      *
*             FEBRUARY 1981             *          *  THE HYDROLOGIC ENGINEERING CENTER    *
*           REVISED 01 APR 88           *          *           609 SECOND STREET           *
```

```
*                                   *
* RUN DATE  07/02/1992  TIME  10:10:47 *
*                                   *
*************************************
```

```
*                                   *
*        DAVIS, CALIFORNIA 95616    *
*          (916) 551-1748           *
*                                   *
*************************************
```

INPUT FILE = LTROP100.DAT
CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
100-YEAR 6-HR STORM (SDN #3)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
T1,T8	1.0,1.2	0.95
T3,T9	2.6,2.1	0.93
T5,T6,J2	4.2,5.5,5.4	0.90
MNW-M	8.0	0.88

29 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		120	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0955	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 9.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET

SURFACE AREA ACRES
TEMPERATURE DEGREES FAHRENHEIT

MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.95 .93 .90 .88

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION			
OPERATION	STATION	AREA	PLAN		RATIO 1 .95	RATIO 2 .93	RATIO 3 .90	RATIO 4 .88
HYDROGRAPH AT								
+	T4	.70	1	FLOW	388.	374.	348.	331.
				TIME	4.17	4.25	4.25	4.25
ROUTED TO								
+	T5	.70	1	FLOW	384.	366.	343.	327.
				TIME	4.33	4.42	4.42	4.42
HYDROGRAPH AT								
+	T5	.20	1	FLOW	126.	123.	114.	108.
				TIME	4.00	4.00	4.00	4.00
2 COMBINED AT								
+	T5	.90	1	FLOW	471.	449.	418.	399.
				TIME	4.33	4.33	4.33	4.42
ROUTED TO								
+	T6	.90	1	FLOW	463.	445.	415.	393.
				TIME	4.42	4.50	4.50	4.58
HYDROGRAPH AT								
+	T6	.80	1	FLOW	511.	491.	459.	436.
				TIME	3.92	4.00	4.00	4.00
2 COMBINED AT								
+	T6	1.70	1	FLOW	777.	744.	692.	655.
				TIME	4.25	4.33	4.33	4.33

NORMAL END OF HEC-1 ***

EXHIBIT 5-13

HEC - 1 CENTRAL.OUT

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  07/02/1992  TIME  10:14:30 *
*                                       *
*****************************************
```

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

```
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    INPUT FILE = LTROP100.DAT
    2         ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3         ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4         ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5         ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
    6         ID         100-YEAR 6-HR STORM (SDN #3)
    7         ID         JMM    OCTOBER 1990
    8         ID
    9         ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   10         ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   11         ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   12         ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   13         ID
   14         ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   15         ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   16         ID
   17         ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   18         ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   19         ID
   20         ID         SUBBASIN        AREA (SQMI)        DARF
   21         ID         --------        -----------        ----
   22         ID          T1,T8           1.0,1.2           0.95
```

```
23          ID          T3,T9           2.6,2.1          0.93
24          ID          T5,T6,J2        4.2,5.5,5.4      0.90
25          ID          MNW-M             8.0            0.88
26          ID
27          ID
28          IT       5       0       0     120
29          IO       5
30          JR    PREC    0.95    0.93    0.90    0.88

31          KK      T4 RUNOFF FROM T4
32          BA    3.22
33          PC    0.00    0.02   0.057    0.07   0.087   0.108   0.124   0.130   0.130   0.130
34          PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
35          PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
36          PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
37          PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
38          PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
39          PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
40          PC   0.998   0.999   1.000
41          PB    2.77
42          LS       0    87.6
43          UK     500    .015    0.15     100
44          RK    2700   .0190    .030    0.25                            1
45          RK   20000   .0185    .030            TRAP      75       5      NO

46          KK      T5 ROUTE T4 TO T5
47          RK    6500    .013    .030            TRAP      30       2
```



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

48          KK      T5 RUNOFF FROM T5
49          BA    1.00
50          LS       0    87.0
51          UK     600    .010    0.15     100
52          RK    2500    .012    .030    0.21                            1
53          RK    6500    .013    .030            TRAP      30       2

54          KK      T5 COMBINE T4 AND T5
55          HC       2

56          KK      T6 ROUTE T5 TO T6
57          RK   10800    .012    .030            TRAP      30       5

58          KK      T6 RUNOFF FROM T6
59          BA    1.30
60          LS       0    86.9
61          UK     600    .010    0.15     100
62          RK    6000    .012    .030    .400                            1
63          RK   10800    .012    .030            TRAP      30       5

64          KK      T6 COMBINE T5 AND T6
65          HC       2
66          ZZ
```



```
**************************************          **************************************
*                                    *          *                                    *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1) *          *    U.S. ARMY CORPS OF ENGINEERS    *
*           FEBRUARY 1981            *          *  THE HYDROLOGIC ENGINEERING CENTER *
*         REVISED 01 APR 88          *          *          609 SECOND STREET         *
```

```
*                                   *                    *                                   *
*  RUN DATE  07/02/1992  TIME  10:14:30 *                *         DAVIS, CALIFORNIA 95616   *
*                                   *                    *           (916) 551-1748          *
*                                   *                    *                                   *
     ***********************************                 ***************************************
```

INPUT FILE = LTROP100.DAT
CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
100-YEAR 6-HR STORM (SDN #3)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
T1,T8	1.0,1.2	0.95
T3,T9	2.6,2.1	0.93
T5,T6,J2	4.2,5.5,5.4	0.90
MNW-M	8.0	0.88

29 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		120	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0955	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 9.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET

SURFACE AREA ACRES
TEMPERATURE DEGREES FAHRENHEIT

MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.95 .93 .90 .88

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION			
OPERATION	STATION	AREA	PLAN		RATIO 1 .95	RATIO 2 .93	RATIO 3 .90	RATIO 4 .88
HYDROGRAPH AT								
+	T4	3.22	1	FLOW	2344.	2247.	2075.	1989.
				TIME	3.92	3.92	4.00	4.00
, TO								
+	T5	3.22	1	FLOW	2284.	2197.	2022.	1942.
				TIME	4.00	4.00	4.08	4.08
HYDROGRAPH AT								
+	T5	1.00	1	FLOW	656.	639.	588.	561.
				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT								
+	T5	4.22	1	FLOW	2912.	2812.	2581.	2461.
				TIME	4.00	4.00	4.00	4.08
ROUTED TO								
+	T6	4.22	1	FLOW	2845.	2758.	2526.	2406.
				TIME	4.17	4.17	4.17	4.25
HYDROGRAPH AT								
+	T6	1.30	1	FLOW	798.	769.	720.	690.
				TIME	4.00	4.08	4.08	4.08
2 COMBINED AT								
+	T6	5.52	1	FLOW	3584.	3483.	3212.	3059.
				TIME	4.17	4.17	4.17	4.17

NORMAL END OF HEC-1 ***

EXHIBIT 5-14

HEC - 1 SOUTH 5B.OUT

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  07/02/1992  TIME  10:22:42 *
*                                       *
*****************************************
```

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

```
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    INPUT FILE = LTROP100.DAT
    2         ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3         ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4         ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5         ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
    6         ID         100-YEAR 6-HR STORM (SDN #3)
    7         ID         JMM    OCTOBER 1990
    8         ID
    9         ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   10         ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   11         ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   12         ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   13         ID
   14         ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   15         ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   16         ID
   17         ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   18         ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   19         ID
   20         ID         SUBBASIN         AREA (SQMI)         DARF
   21         ID         --------         -----------         ----
   22         ID          T1,T8            1.0,1.2           0.95
```

```
         23          ID          T3,T9              2.6,2.1             0.93
         24          ID          T5,T6,J2           4.2,5.5,5.4         0.90
         25          ID           MNW-M               8.0               0.88
         26          ID
         27          ID
         28          IT       5       0       0     120
         29          IO       5
         30          JR    PREC    0.95    0.93    0.90    0.88

         31          KK      T4 RUNOFF FROM T4
         32          BA     2.1
         33          PC    0.00    0.02   0.057    0.07   0.087   0.108   0.124   0.130   0.130   0.130
         34          PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
         35          PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
         36          PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
         37          PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
         38          PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
         39          PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
         40          PC   0.998   0.999   1.000
         41          PB    2.77
         42          LS       0    87.6
         43          UK     500    .015    0.15     100
         44          RK    2700   .0190    .030    0.25                            1
         45          RK   20000   .0185    .030            TRAP      75        5      NO

         46          KK      T5 ROUTE T4 TO T5
         47          RK    6500    .013    .030            TRAP      30        2
1                                          HEC-1 INPUT                                    PAGE  2

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

         48          KK      T5 RUNOFF FROM T5
         49          BA     0.3
         50          LS       0    87.0
         51          UK     600    .010    0.15     100
         52          RK    2500    .012    .030    0.21                            1
         53          RK    6500    .013    .030            TRAP      30        2

         54          KK      T5 COMBINE T4 AND T5
         55          HC       2
         56          ZZ
```

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  07/02/1992  TIME  10:22:42 *
*                                       *
*****************************************
```

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

INPUT FILE = LTROP100.DAT
CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT

FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
100-YEAR 6-HR STORM (SDN #3)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
T1,T8	1.0,1.2	0.95
T3,T9	2.6,2.1	0.93
T5,T6,J2	4.2,5.5,5.4	0.90
MNW-M	8.0	0.88

29 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

.T HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		120	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0955	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 9.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN	1	NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.95 .93 .90 .88

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .95	RATIO 2 .93	RATIO 3 .90	RATIO 4 .88
HYDROGRAPH AT								
+	T4	2.10	1	FLOW	1434.	1374.	1291.	1225.
				TIME	4.00	4.00	4.00	4.00
ROUTED TO								
+	T5	2.10	1	FLOW	1404.	1337.	1264.	1207.
				TIME	4.08	4.08	4.17	4.17
HYDROGRAPH AT								
+	T5	.30	1	FLOW	191.	186.	173.	166.
				TIME	4.00	3.92	4.00	4.00
2 COMBINED AT								
+	T5	2.40	1	FLOW	1583.	1511.	1416.	1353.
				TIME	4.08	4.08	4.08	4.17

*** NORMAL END OF HEC-1 ***

EXHIBIT 5-15

HEC - 1 SOUTH 6C.OUT

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  07/02/1992  TIME  10:27:47 *
*                                       *
*****************************************
```

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

```
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    INPUT FILE = LTROP100.DAT
    2         ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3         ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4         ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5         ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
    6         ID         100-YEAR 6-HR STORM (SDN #3)
    7         ID         JMM    OCTOBER 1990
    8         ID
    9         ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   10         ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   11         ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   12         ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   13         ID
   14         ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   15         ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   16         ID
   17         ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   18         ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   19         ID
   20         ID         SUBBASIN        AREA (SQMI)        DARF
   21         ID         --------        -----------        ----
   22         ID          T1,T8           1.0,1.2           0.95
```

```
 23          ID          T3,T9            2.6,2.1            0.93
 24          ID          T5,T6,J2         4.2,5.5,5.4        0.90
 25          ID           MNW-M             8.0              0.88
 26          ID
 27          ID
 28          IT       5       0       0     120
 29          IO       5
 30          JR    PREC    0.95    0.93    0.90    0.88

 31          KK      T4 RUNOFF FROM T4
 32          BA     2.2
 33          PC    0.00    0.02   0.057    0.07   0.087   0.108   0.124   0.130   0.130   0.130
 34          PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
 35          PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
 36          PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
 37          PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
 38          PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
 39          PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
 40          PC   0.998   0.999   1.000
 41          PB    2.77
 42          LS       0    87.6
 43          UK     500    .015    0.15     100
 44          RK    2700   .0190    .030    0.25                            1
 45          RK   20000   .0185    .030            TRAP      75        5      NO

 46          KK      T5 ROUTE T4 TO T5
 47          RK    6500    .013    .030            TRAP      30        2
1                                    HEC-1 INPUT                                    PAGE  2

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

 48          KK      T5 RUNOFF FROM T5
 49          BA     0.5
 50          LS       0    87.0
 51          UK     600    .010    0.15     100
 52          RK    2500    .012    .030    0.21                            1
 53          RK    6500    .013    .030            TRAP      30        2

 54          KK      T5 COMBINE T4 AND T5
 55          HC       2

 56          KK      T6 ROUTE T5 TO T6
 57          RK    8300    .012    .030            TRAP      30        5

 58          KK      T6 RUNOFF FROM T6
 59          BA     0.2
 60          LS       0    86.9
 61          UK     600    .010    0.15     100
 62          RK    6000    .012    .030    .400                            1
 63          RK    8300    .012    .030            TRAP      30        5

 64          KK      T6 COMBINE T5 AND T6
 65          HC       2
 66          ZZ
1**************************************                **************************************
*                                    *                *                                    *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1) *                *    U.S. ARMY CORPS OF ENGINEERS    *
*           FEBRUARY 1981            *                *  THE HYDROLOGIC ENGINEERING CENTER *
*         REVISED 01 APR 88          *                *          609 SECOND STREET         *
```

```
*                                   *
*  RUN DATE  07/02/1992  TIME  10:27:47 *
*                                   *
     ***********************************
```


```
*        DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748              *
*                                       *
*****************************************
```


```
INPUT FILE = LTROP100.DAT
 CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
 RED ROCK/FLAMINGO/TROPICANA WATERSHED
 EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
 FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
     100-YEAR 6-HR STORM (SDN #3)
     JMM    OCTOBER 1990

     BASIC DATA FILE BASED ON COE FILE S10P40X.
     MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
     BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
     AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

     COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
     IMPROVED CHANNELS FROM FACILITY INVENTORY.

 PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
 BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

     SUBBASIN        AREA (SQMI)        DARF
     --------        -----------        ----
      T1,T8           1.0,1.2           0.95
      T3,T9           2.6,2.1           0.93
      T5,T6,J2        4.2,5.5,5.4       0.90
       MNW-M             8.0            0.88


29 IO        OUTPUT CONTROL VARIABLES
               IPRNT          5  PRINT CONTROL
               IPLOT          0  PLOT CONTROL
               QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
               NMIN           5  MINUTES IN COMPUTATION INTERVAL
              IDATE      1    0  STARTING DATE
              ITIME        0000  STARTING TIME
                 NQ         120  NUMBER OF HYDROGRAPH ORDINATES
             NDDATE      1    0  ENDING DATE
             NDTIME        0955  ENDING TIME
             ICENT           19  CENTURY MARK

          COMPUTATION INTERVAL      .08 HOURS
              TOTAL TIME BASE     9.92 HOURS

     ENGLISH UNITS
          DRAINAGE AREA          SQUARE MILES
          PRECIPITATION DEPTH    INCHES
          LENGTH, ELEVATION      FEET
          FLOW                   CUBIC FEET PER SECOND
          STORAGE VOLUME         ACRE-FEET
```

SURFACE AREA ACRES
TEMPERATURE DEGREES FAHRENHEIT

MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.95 .93 .90 .88

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION			
OPERATION	STATION	AREA	PLAN		RATIO 1 .95	RATIO 2 .93	RATIO 3 .90	RATIO 4 .88
HYDROGRAPH AT								
+	T4	2.20	1	FLOW	1517.	1443.	1369.	1291.
				TIME	4.00	4.00	4.00	4.00
TO								
+	T5	2.20	1	FLOW	1488.	1409.	1323.	1268.
				TIME	4.08	4.08	4.08	4.17
HYDROGRAPH AT								
+	T5	.50	1	FLOW	328.	316.	291.	277.
				TIME	3.92	3.92	3.92	4.00
2 COMBINED AT								
+	T5	2.70	1	FLOW	1780.	1696.	1595.	1513.
				TIME	4.08	4.08	4.08	4.08
ROUTED TO								
+	T6	2.70	1	FLOW	1735.	1668.	1576.	1495.
				TIME	4.17	4.25	4.25	4.25
HYDROGRAPH AT								
+	T6	.20	1	FLOW	116.	113.	104.	100.
				TIME	4.08	4.17	4.17	4.17
2 COMBINED AT								
+	T6	2.90	1	FLOW	1850.	1775.	1676.	1592.
				TIME	4.17	4.25	4.25	4.25

NORMAL END OF HEC-1 ***

EXHIBIT 5-16

HEC - 1 LTR 100.OUT

LTR100.DAT

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  06/15/1992  TIME  15:31:17 *
*                                       *
*****************************************
```

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

```
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

              *DIAGRAM
    1         ID    INPUT FILE = LTR100.DAT
    2         ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3         ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4         ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5         ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
    6         ID         100-YEAR 6-HR STORM (SDN #3)
    7         ID         CH2M JUNE, 1992 FROM JMM OCTOBER 1990 FILE SUPPLIED BY CCRFCD
    8         ID            FULLER (10785)
    9         ID
   10         ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   11         ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   12         ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   13         ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   14         ID
   15         ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   16         ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   17         ID
   18         ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   19         ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   20         ID
   21         ID         SUBBASIN         AREA (SQMI)         DARF
```

```
22          ID         --------          ----------          ----
23          ID           T1,T8             1.0,1.2           0.95
24          ID           T3,T9             2.6,2.1           0.93
25          ID           T5,T6,J2          4.2,5.5,5.4       0.90
26          ID            MNW-M               8.0            0.88
27          ID
28          ID
29          IT       5        0       0      120
30          IO       5
31          JR    PREC     0.95    0.93    0.90    0.88
            *  *** NO CONTRIBUTION FROM UPPER BLUE DIAMOND FOR FLAMINGO/RED ROCK STORM ***

32          KK       T8 RUNOFF FROM T8
33          BA     1.22
34          PC     0.00    0.02    0.057   0.07    0.087   0.108   0.124   0.130   0.130   0.130
35          PC     0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
36          PC     0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
37          PC     0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
38          PC     0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
39          PC     0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
40          PC     0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
41          PC     0.998   0.999   1.000
42          PB     2.77
43          LS        0     65.6
44          UK      600     .015    0.15     100
45          RK     2000     .018    .030     .14                             1
46          RK    18000    .0161    .030             TRAP      75        5      NO
1                                        HEC-1 INPUT                                          PAGE  2

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

47          KK       T9 ROUTE T8 TO T9
48          RM        2     0.52    0.15

49          KK       T9 RUNOFF FROM T9
50          BA     0.87
51          LS        0     73.1
52          UK      600     .010    0.15     100
53          RK     4000     .010    .030     0.12                            1
54          RK    10200    .0134    .030             TRAP      30        5

55          KK       T9 COMBINE T8 AND T9
56          HC        2

57          KK     T9OF DIVERT OVERFLOW
58          DT     T9OF
59          DI        0     5480    11000    15000
60          DQ        0        0     2700     2700

61          KK      T10 ROUTE T9 THRU T10
62          RM        3     0.21    0.10

63          KK       T4 RUNOFF FROM T4
64          BA     3.22
65          LS        0     87.6
66          UK      500     .015    0.15     100
67          RK     2700    .0190    .030     0.25                            1
68          RK    20000    .0185    .030             TRAP      75        5      NO
```

```
 69          KK     T5 ROUTE T4 TO T5
 70          RK   6500    .013    .030          TRAP      30       2

 71          KK     T5 RUNOFF FROM T5
 72          BA   1.00
 73          LS      0    87.0
 74          UK    600    .010    0.15     100
 75          RK   2500    .012    .030    0.21                     1
 76          RK   6500    .013    .030          TRAP      30       2

 77          KK     T5 COMBINE T4 AND T5
 78          HC      2

 79          KK     T6 ROUTE T5 TO T6
 80          RK  10800    .012    .030          TRAP      30       5

 81          KK     T6 RUNOFF FROM T6
 82          BA   1.30
 83          LS      0    86.9
 84          UK    600    .010    0.15     100
 85          RK   6000    .012    .030    .400                     1
 86          RK  10800    .012    .030          TRAP      30       5
1                                    HEC-1 INPUT                                    PAGE  3

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

 87          KK     T6 COMBINE T5 AND T6
 88          HC      2

 89          KK    T90F RECALL T90F
 90          DR    T90F

 91          KK     T6 ROUTE T90F THRU T6
 92          RM      3    0.23    0.15

 93          KK     T6 COMBINE T6 AND T90F
 94          HC      2

 95          KK     T6 DIVERT OVERFLOW ALONG UPRR
 96          KM        UPRR 114" CMP CULVERT - 750 CFS CAPACITY
 97          DT    T60F
 98          DI      0     750    1500   10000
 99          DQ      0       0     750    9250

100          KK     T1 RUNOFF FROM T1
101          BA   1.56
102          LS      0      88
103          UK    600    .020    0.15     100
104          RK   4000   .0200    .030    0.28                     1
105          RK  13200    .017    .030          TRAP      50       5      NO

106          KK     T3 ROUTE T1 TO T3
107          RK  10000   .0106    .032          TRAP      30       5

108          KK     T3 RUNOFF FROM T3
109          BA   0.99
110          LS      0    78.9
111          UK    500    .010    0.15     100
112          RK   3000    .010    .030    0.16                     1
```

```
113          RK   10000   .0106    .032           TRAP      30       5

114          KK      T3 COMBINE T1 AND T3
115          HC       2

116          KK    T6OF RECALL DIVERTED OVERFLOW FROM T6
117          DR    T6OF

118          KK      T3 ROUTE T6OF THRU T3
119          RM       1    0.08    0.15

120          KK      T3 COMBINE T6OF AND T3
121          HC       2

122          KK    T3OF DIVERT FLOW IN EXCESS OF CULVERT CAPACITY
123          KM         BASED ON COE RATING CURVE FROM FEASIBILITY STUDY
124          KM         DQ FLOWS NORTHEASTERLY, REJOINING FW NEAR PARADISE RD
125          DT    T3OF
126          DI       0    1400    1900    3200    5500   19000
127          DQ       0       0     420    1650    3650   14700
1                                        HEC-1 INPUT                                        PAGE  4

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


128          KK   T6+T3 COMBINE T6 AND T3 JUST AFTER UPRR CULVERT CONVEYANCE
129          HC       2

130          KK     T10 ROUTE T3+T6 THRU T10
131          RK    3800   .0132    .040           TRAP    17.5       2

132          KK     T10 RUNOFF FROM T10
133          BA    0.82
134          LS       0    78.0       0       0      98       0
135          UK     700    .013    0.15      78
136          UK     400    .011     .10      22
137          RK    1100    .012    .020    .120                      1
138          RK    3000    .008    .020     .50                      1
139          RK    3500   0.010    .030           TRAP      30       2

140          KK     T10 COMBINE T3+T6 AND T10
141          HC       2

142          KK     T10 COMBINE T3-T10 AND T9
143          HC       2

144          KK    T10R ROUT T10 THRU T11 (TRWA0235)
145          RK    1160    .010    .015           TRAP      32       0

146          KK       .   (TRWA0145-0218)
147          RK    4700   .0095    .030           TRAP      90     1.5

148          KK     T11 RUNOFF FROM T11
149          BA    1.09
150          LS       0    68.6       0       0      98       0
151          UK     800    .010    0.30      61
152          UK     500    .010    0.10      39
153          RK    3200   .0080    .020    0.17                      1
154          RK    5400   .0104    .030           TRAP     100       5      NO
```

```
155          KK     T11 COMBINE T11 AND T10R
156          HC       2

157          KK    T11R ROUT  T11 THRU T12 (TRWA0117)
158          RK    1130   .0088    .015            TRAP     1.5       2

159          KK       .   (TRWA0000-0034+)
160          RK    6500    .012    .040            TRAP     100      2.5

161          KK     T12 RUNOFF FROM T12
162          BA    0.77
163          LS       0    74.4       0       0      98       0
164          UK     500    .008    0.18      65
165          UK     200    0.01    0.10      35
166          RK    2200    .008    .023    0.12                     1
167          RK    3000    .007    .025     .24              20      2
168          RK    6600   .0103    .032                      30      5
1                                        HEC-1 INPUT                                                PAGE  5

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


169          KK     T12 ADD T12 AND T11R
170          HC       2

171          KK    T3OF RECALL DIVERSION FROM T3
172          DR    T3OF

173          KK     T12 ROUTE T3OF TO T12
174          RM      20    1.99    0.10

175          KK     T12 COMBINE T3OF AND T12
176          HC       2
             *  *** DATA FOR SUBAREAS MNW-B THRU MNW-M TAKEN FROM NIMBUS HEC-1 ANALYSIS
             *      FOR NORTHWEST MCCARRAN AIRPORT DRAINAGE STUDY (WITH SMALL MODIFICATIONS)

177          KK   MNW-B RUNOFF FROM B
178          BA    0.68
179          LS              65      10
180          UD     2.4

181          KK    DIVB FLOW SPLIT AT I-15; BCULV IS FLOW CONVEYED BY CULVERT
182          DT   BCULV
183          DI       0       22     100     500
184          DQ       0       22      22      22

185          KK   RDIVB ROUTE DIVB TO CULVERT AT I15 AND C
186          RK     600    .004     .05       0       0       5

187          KK   MNW-C RUNOFF AT C
188          BA    0.69
189          LS              65      17
190          UD     2.0

191          KK   MNW-C COMBINE DIVB+C
192          HC       2

193          KK   MNW-C PONDING STORAGE ROUTING AT I-15
194          RS       1    STOR       0
195          SA       0     .28     .92    2.02    3.19    3.44    5.37    9.09
```

```
196          SQ      0       8      25      35      40      78     360    1342
197          SE     54      55      56      57   57.43      58      59      60

198          KK    DIVC FLOW SPLIT AT C THRU AND AROUND CULVERT
199          DT   CCULV
200          DI      0       8      25      35      40      78     360    1342
201          DQ      0       8      25      35      40      45      55      65

202          KK   RDIVC ROUTE DIVC NORTH TO D
203          RK    650    .004     .05       0       0       0      20
1                                      HEC-1 INPUT                                    PAGE  6

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


204          KK   MNW-D RUNOFF FROM D
205          BA     .05
206          LS              66      10
207          UD     .40

208          KK   MNW-D COMBINE DIVC AND D
209          HC      2

210          KK    DIVD DIVERT FLOW TO NORTH; DCULV CROSSES I-15
211          DT   DCULV
212          DI      0      28     100     500
213          DQ      0      28      28      28

214          KK   RDIVD ROUTE DIVERTED FLOW NORTH TO E
215          RK    800    .004     .05       0       0       0      20

216          KK   MNW-E RUNOFF FROM E
217          BA    0.05
218          LS              65      18
219          UD    0.38

220          KK   MNW-E COMBINE DIVD + E
221          HC      2

222          KK   ECULV DIVIDE FLOW AT I-15 CULVERT; ECULV CROSSES I-15 INTO MNW-I
223          DT   ECULV
224          DI      0      28     100     500
225          DQ      0      28      28      28

226          KK   RDIVE ROUTE FLOW FROM DIVE NORTH ALONG I-15
227          RK   1200    .007     .05       0       0       0       4

228          KK  MNW-FG RUNOFF FROM FG
229          BA    0.36
230          LS              66      17
231          UD    1.24

232          KK  MNW-FG COMBINE EDIV + FG
233          HC      2

234          KK    DIVG DIVERT FLOW NORTH; GCULV CROSSES I-15 INTO SUBAREA I
235          DT   GCULV
236          DI      0      50      60     100     150     250
237          DQ      0      50      60      60      60      60
```

```
238          KK   RDIVG ROUTE DIVG NORTH TO AIRPORT CHANNEL
239          RK    2200    .009    .040       0       0       0      10

240          KK  MNW-J1 RUNOFF FROM J1
241          BA    2.37
242          LS              70
243          UD    2.67
1                                        HEC-1 INPUT                                        PAGE  7

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

244          KK  MNW-J2 ROUTE J1 TO J2
245          RK   10000    .012     .04                      10       2

246          KK  MNW-J2 RUNOFF FROM J2
247          BA    1.21
248          LS              70      10
249          UD    1.22

250          KK  MNW-J2 COMBINE J1+J2
251          HC       2

252          KK     CP1 COMBINE J2 + RDIVG
253          HC       2

254          KK    RCP1 ROUTE CP1 TO LAS VEGAS BLVD (CP3)
255          RK    2600    .008     .04       0       0      20       1

256          KK    RTNE RETURN FLOW FROM CULVERT E
257          DR   ECULV

258          KK    RTNE DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
259          BA    0.01
260          LS       0      50
261          UD     0.1

262          KK    RTNE COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
263          HC       2

264          KK   RRTNE ROUTE ECULV TO OUTLET OF I
265          RK    3900    .013     .05       0       0       0      50

266          KK    RTNG RETURN FLOW FROM CULVERT G
267          DR   GCULV

268          KK    RTNG DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
269          BA    0.01
270          LS       0      50
271          UD     0.1

272          KK    RTNG COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
273          HC       2

274          KK   RRTNG ROUTE GCULV TO OUTLET OF I
275          RK    2500    .013    0.05       0       0       0      50

276          KK  MNW-I1 RUNOFF FROM I1
277          BA    0.25
278          LS              78      15
```

```
 279          UD    0.58
1                                        HEC-1 INPUT                                        PAGE  8

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

 280          KK     CP2 COMBINE HYDROGRAPHS AT LAS VEGAS BLVD AND UPRR
 281          HC       3

 282          KK    RCP2 ROUTE CP2 TO AIRPORT CHANNEL AND LAS VEGAS BLVD (CP3)
 283          RK    2500    .009     .05       0       0       0       4

 284          KK  MNW-I2 RUNOFF FROM I2
 285          BA    0.14
 286          LS              77       1
 287          UD    0.38

 288          KK     CP3 COMBINE FLOW FROM B-I2 AT LAS VEGAS BLVD AND AIRPORT CHANNEL
 289          HC       3

 290          KK    RCP3 ROUTE CPE TO OUTLET OF K
 291          RK    7300     .01     .04       0       0       5       2

 292          KK   MNW-K RUNOFF FROM K
 293          BA    1.43
 294          LS              66      25
 295          UD    1.55

 296          KK     CP4 COMBINE HYDROGRAPHS FOR AIRPORT CHANNEL AND TAXIWAY S
 297          HC       2

 298          KK    RCP4 ROUTE FLOW TO TROPICANA BLVD
 299          RK    3300     .01     .03       0       0      20       4

 300          KK   MNW-L RUNOFF FROM L
 301          BA    0.27
 302          LS              77      60
 303          UD    0.42

 304          KK   MNW-M RUNOFF FROM M
 305          BA    0.49
 306          LS              84      56
 307          UD    0.83

 308          KK     CP5 COMBINE ALL HYDROGRAPHS AT OUTLET AT BOX CULVERT AT TROPICANA
 309          HC       3
              *  *** END OF DATA FROM NIMBUS NORTHWEST MCCARRAN HEC-1 DATA ***
              *

 310          KK     T12 ROUTE MNW-L TO T12 (TRMC0009)
 311          RK    2640   .0045    .040            TRAP      18     1.5

 312          KK       .   (TRWA0000-0034)
 313          RK    5000    .012    .040            TRAP     100     2.5
                                        HEC-1 INPUT                                        PAGE  9

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

 314          KK     T12 COMBINE MNW-L AND T12
```

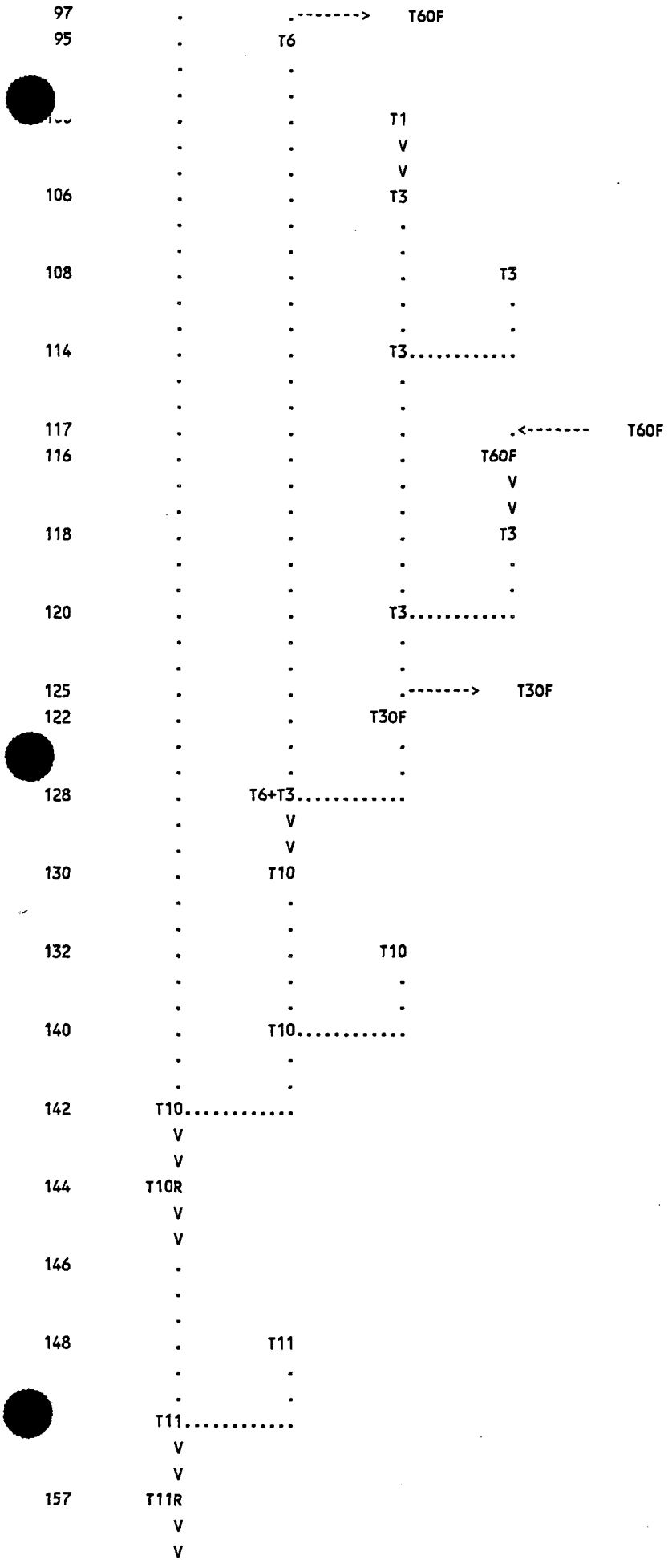
```
315          KM         AIRPORT CHANNEL + TROPICANA WASH
316          HC      2
317          ZZ
```

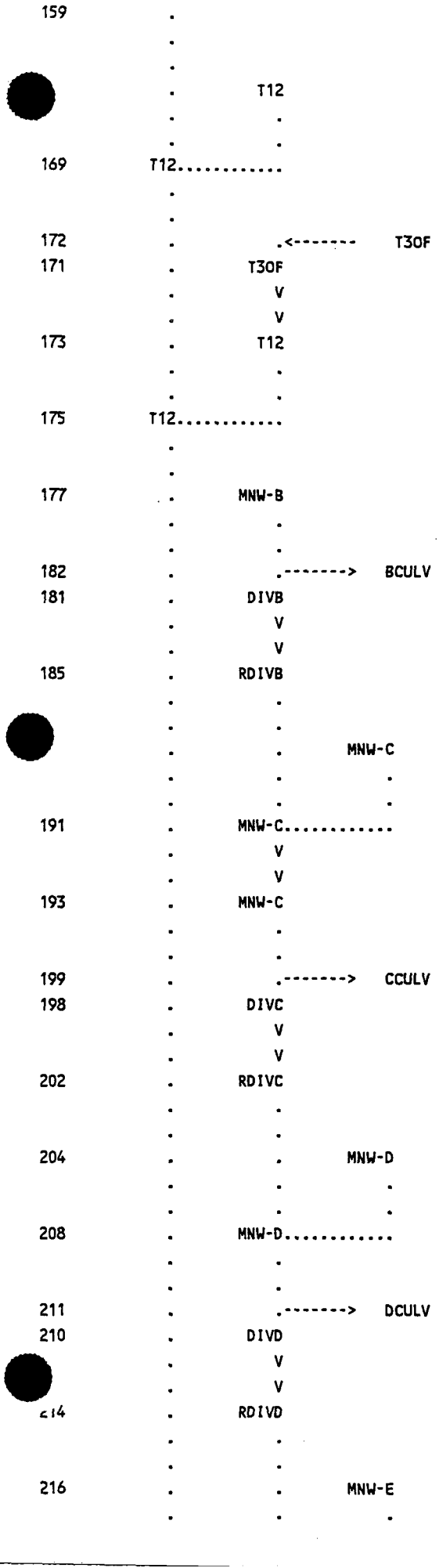
SCHEMATIC DIAGRAM OF STREAM NETWORK

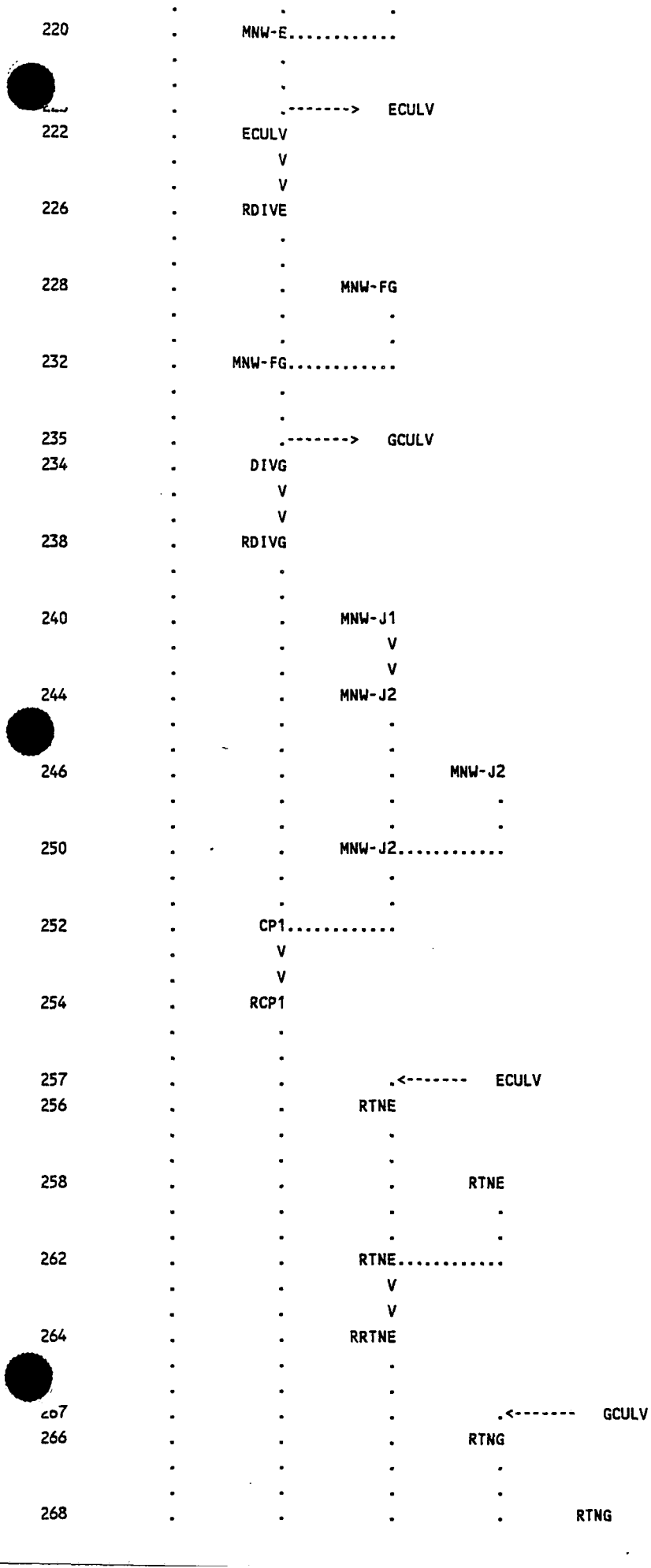
```
INPUT
 LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

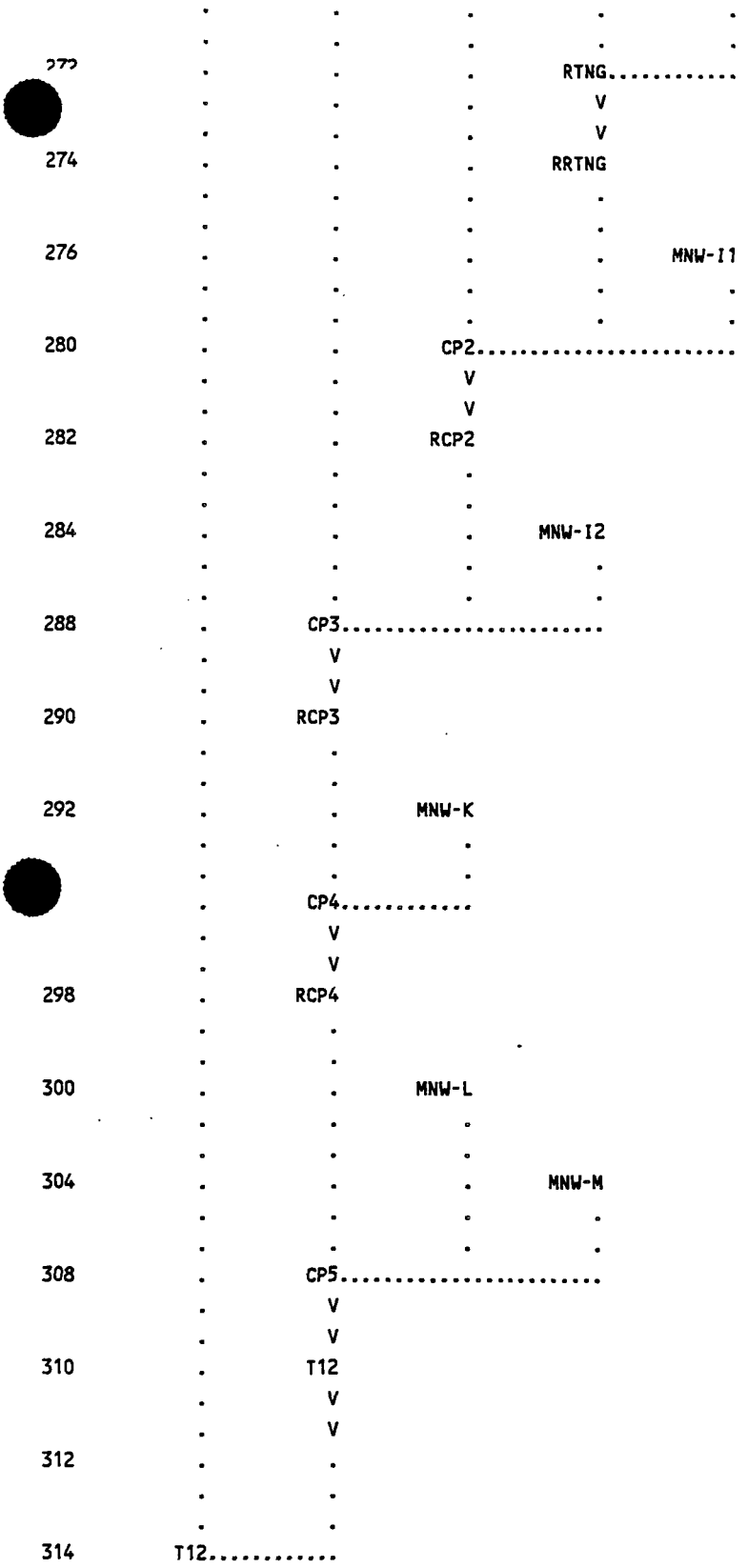
  NO.     (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   32         T8
               V
               V
   47         T9
               .
               .
   49          .          T9
               .           .
               .           .
   55         T9.....
               .
               .
   58          .------->    T90F
   57       T90F
               V
               V
   61         T10
               .
               .
               .          T4
               .           V
               .           V
   69          .          T5
               .           .
               .           .
   71          .           .          T5
               .           .           .
               .           .           .
   77          .          T5.....
               .           V
               .           V
   79          .          T6
               .           .
               .           .
   81          .           .          T6
               .           .           .
               .           .           .
   87          .          T6.....
               .           .
               .           .
   90          .           .           .<-------    T90F
   89          .           .        T90F
               .           .          V
               .           .          V
               .           .          T6
               .           .           .
               .           .           .
   93          .          T6.....
               .           .
               .           .
```


97
95
T6
T1
106
T3
108
T3
114
T3
117
T60F
116
T60F
118
T3
120
T3
125
T30F
122
T30F
128
T6+T3
130
T10
132
T10
140
T10
142
T10
144
T10R
146
148
T11
T11
157
T11R


159
T12
169
T12
172
T30F
171
T30F
173
T12
175
T12
177
MNW-B
182
BCULV
181
DIVB
185
RDIVB
MNW-C
191
MNW-C
193
MNW-C
199
CCULV
198
DIVC
202
RDIVC
204
MNW-D
208
MNW-D
211
DCULV
210
DIVD
214
RDIVD
216
MNW-E


220
MNW-E
ECULV
222
ECULV
226
RDIVE
228
MNW-FG
232
MNW-FG
235
GCULV
234
DIVG
238
RDIVG
240
MNW-J1
244
MNW-J2
246
MNW-J2
250
MNW-J2
252
CP1
254
RCP1
257
ECULV
256
RTNE
258
RTNE
262
RTNE
264
RRTNE
GCULV
266
RTNG
268
RTNG



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
**************************************
*                                    *
*   FLOOD HYDROGRAPH PACKAGE (HEC-1) *
*            FEBRUARY 1981           *
*          REVISED 01 APR 88         *
*                                    *
* RUN DATE 06/15/1992 TIME 15:31:17  *
**************************************
```


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

```
INPUT FILE = LTR100.DAT
 CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
 RED ROCK/FLAMINGO/TROPICANA WATERSHED
 EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
 FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- LOCAL TROPICANA AREA RUN
     100-YEAR 6-HR STORM (SDN #3)
     CH2M JUNE, 1992 FROM JMM OCTOBER 1990 FILE SUPPLIED BY CCRFCD
        FULLER (10785)

     BASIC DATA FILE BASED ON COE FILE S10P40X.
     MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
     BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
     AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

     COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
     IMPROVED CHANNELS FROM FACILITY INVENTORY.

 PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
 BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
```

SUBBASIN	AREA (SQMI)	DARF
T1,T8	1.0,1.2	0.95
T3,T9	2.6,2.1	0.93
T5,T6,J2	4.2,5.5,5.4	0.90
MNW-M	8.0	0.88

```
30 IO        OUTPUT CONTROL VARIABLES
                  IPRNT          5  PRINT CONTROL
                  IPLOT          0  PLOT CONTROL
                  QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                   NMIN          5  MINUTES IN COMPUTATION INTERVAL
                  IDATE      1   0  STARTING DATE
                  ITIME       0000  STARTING TIME
                     NQ        120  NUMBER OF HYDROGRAPH ORDINATES
                 NDDATE      1   0  ENDING DATE
                 NDTIME       0955  ENDING TIME
                  ICENT          19  CENTURY MARK

            COMPUTATION INTERVAL     .08 HOURS
                 TOTAL TIME BASE    9.92 HOURS

      ENGLISH UNITS
           DRAINAGE AREA          SQUARE MILES
           PRECIPITATION DEPTH    INCHES
           LENGTH, ELEVATION      FEET
           FLOW                   CUBIC FEET PER SECOND
           STORAGE VOLUME         ACRE-FEET
           SURFACE AREA           ACRES
```

TEMPERATURE DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.95 .93 .90 .88

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION			
OPERATION	STATION	AREA	PLAN		RATIO 1 .95	RATIO 2 .93	RATIO 3 .90	RATIO 4 .88
HYDROGRAPH AT								
+	T8	1.22	1	FLOW	111.	102.	89.	82.
				TIME	5.33	5.42	5.50	5.58
TO								
	T9	1.22	1	FLOW	101.	93.	82.	75.
				TIME	5.92	6.00	6.08	6.17
HYDROGRAPH AT								
+	T9	.87	1	FLOW	161.	151.	137.	129.
				TIME	4.58	4.67	4.75	4.83
2 COMBINED AT								
+	T9	2.09	1	FLOW	193.	179.	159.	147.
				TIME	5.50	5.50	5.50	5.50
DIVERSION TO								
+	T90F	2.09	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT								
+	T90F	2.09	1	FLOW	193.	179.	159.	147.
				TIME	5.50	5.50	5.50	5.50
ROUTED TO								
+	T10	2.09	1	FLOW	192.	178.	159.	147.
				TIME	5.67	5.75	5.75	5.67
HYDROGRAPH AT								
	T4	3.22	1	FLOW	2344.	2247.	2075.	1989.
				TIME	3.92	3.92	4.00	4.00
ROUTED TO								
+	T5	3.22	1	FLOW	2284.	2197.	2022.	1942.
				TIME	4.00	4.00	4.08	4.08

HYDROGRAPH AT								
+	T5	1.00	1	FLOW	656.	639.	588.	561.
				TIME	3.92	3.92	3.92	3.92
[redacted]BINED AT								
+	T5	4.22	1	FLOW	2912.	2812.	2581.	2461.
				TIME	4.00	4.00	4.00	4.08
ROUTED TO								
+	T6	4.22	1	FLOW	2845.	2758.	2526.	2406.
				TIME	4.17	4.17	4.17	4.25
HYDROGRAPH AT								
+	T6	1.30	1	FLOW	798.	769.	720.	690.
				TIME	4.00	4.08	4.08	4.08
2 COMBINED AT								
+	T6	5.52	1	FLOW	3584.	3483.	3212.	3059.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT								
+	T90F	.00	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO								
+	T6	.00	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
[redacted]BINED AT								
	T6	5.52	1	FLOW	3584.	3483.	3212.	3059.
				TIME	4.17	4.17	4.17	4.17
DIVERSION TO								
+	T60F	5.52	1	FLOW	2834.	2733.	2462.	2309.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT								
+	T6	5.52	1	FLOW	750.	750.	750.	750.
				TIME	3.83	3.83	3.92	3.92
HYDROGRAPH AT								
+	T1	1.56	1	FLOW	1202.	1156.	1092.	1031.
				TIME	3.92	3.92	3.92	3.92
ROUTED TO								
+	T3	1.56	1	FLOW	1141.	1112.	1047.	997.
				TIME	4.08	4.08	4.17	4.17
HYDROGRAPH AT								
+	T3	.99	1	FLOW	357.	332.	300.	280.
				TIME	4.17	4.17	4.25	4.25
2 COMBINED AT								
	T3	2.55	1	FLOW	1490.	1442.	1344.	1270.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT								
+	T60F	.00	1	FLOW	2834.	2733.	2462.	2309.
				TIME	4.17	4.17	4.17	4.17

ROUTED TO								
+	T3	.00	1	FLOW	2727.	2621.	2364.	2200.
				TIME	4.25	4.25	4.25	4.33
[redacted]BINED AT								
+	T3	2.55	1	FLOW	4127.	3975.	3643.	3425.
				TIME	4.17	4.25	4.25	4.25
DIVERSION TO								
+	T3OF	2.55	1	FLOW	2457.	2324.	2035.	1845.
				TIME	4.17	4.25	4.25	4.25
HYDROGRAPH AT								
+	T3OF	2.55	1	FLOW	1671.	1651.	1608.	1579.
				TIME	4.17	4.25	4.25	4.25
2 COMBINED AT								
+	T6+T3	8.07	1	FLOW	2421.	2401.	2358.	2329.
				TIME	4.17	4.25	4.25	4.25
ROUTED TO								
+	T10	8.07	1	FLOW	2420.	2397.	2347.	2323.
				TIME	4.25	4.25	4.33	4.33
HYDROGRAPH AT								
+	T10	.82	1	FLOW	375.	358.	345.	325.
				TIME	3.75	3.75	3.67	3.75
[redacted]BINED AT								
	T10	8.89	1	FLOW	2672.	2641.	2577.	2532.
				TIME	4.25	4.25	4.25	4.25
2 COMBINED AT								
+	T10	10.98	1	FLOW	2745.	2703.	2625.	2584.
				TIME	4.25	4.25	4.25	4.33
ROUTED TO								
+	T10R	10.98	1	FLOW	2736.	2697.	2625.	2578.
				TIME	4.33	4.33	4.33	4.33
ROUTED TO								
+	.	10.98	1	FLOW	2730.	2685.	2617.	2575.
				TIME	4.33	4.42	4.42	4.42
HYDROGRAPH AT								
+	T11	1.09	1	FLOW	558.	533.	510.	495.
				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT								
+	T11	12.07	1	FLOW	2936.	2881.	2803.	2748.
				TIME	4.33	4.33	4.33	4.33
ROUTED TO								
[redacted]	T11R	12.07	1	FLOW	2931.	2872.	2797.	2745.
				TIME	4.33	4.33	4.42	4.42
ROUTED TO								
+	.	12.07	1	FLOW	2920.	2869.	2792.	2737.
				TIME	4.50	4.50	4.50	4.58

HYDROGRAPH AT								
+	T12	.77	1	FLOW	436.	420.	401.	385.
				TIME	3.75	3.75	3.75	3.75
[redacted]MBINED AT								
+	T12	12.84	1	FLOW	3087.	3028.	2939.	2874.
				TIME	4.50	4.50	4.50	4.50
HYDROGRAPH AT								
+	T30F	.00	1	FLOW	2457.	2324.	2035.	1845.
				TIME	4.17	4.25	4.25	4.25
ROUTED TO								
+	T12	.00	1	FLOW	1198.	1110.	938.	825.
				TIME	6.25	6.25	6.25	6.25
2 COMBINED AT								
+	T12	12.84	1	FLOW	3087.	3028.	2939.	2874.
				TIME	4.50	4.50	4.50	4.50
HYDROGRAPH AT								
+	MNW-B	.68	1	FLOW	63.	60.	55.	53.
				TIME	6.25	6.25	6.25	6.25
DIVERSION TO								
+	BCULV	.68	1	FLOW	22.	22.	22.	22.
				TIME	4.50	4.50	4.58	4.58
[redacted]RAPH AT								
	DIVB	.68	1	FLOW	41.	38.	33.	31.
				TIME	6.25	6.25	6.25	6.25
ROUTED TO								
+	RDIVB	.68	1	FLOW	41.	38.	33.	31.
				TIME	6.33	6.33	6.33	6.33
HYDROGRAPH AT								
+	MNW-C	.69	1	FLOW	89.	85.	80.	77.
				TIME	5.83	5.83	5.83	5.83
2 COMBINED AT								
+	MNW-C	1.37	1	FLOW	127.	120.	111.	105.
				TIME	6.00	6.00	6.00	6.00
ROUTED TO								
+	MNW-C	1.37	1	FLOW	124.	118.	108.	101.
				TIME	6.25	6.25	6.33	6.33
			** PEAK STAGES IN FEET **					
			1	STAGE	58.16	58.14	58.11	58.08
				TIME	6.25	6.25	6.33	6.33
DIVERSION TO								
[redacted]	CCULV	1.37	1	FLOW	47.	46.	46.	46.
				TIME	6.25	6.25	6.33	6.33
HYDROGRAPH AT								
+	DIVC	1.37	1	FLOW	78.	71.	62.	55.
				TIME	6.25	6.25	6.33	6.33

ROUTED TO								
+	RDIVC	1.37	1	FLOW	78.	71.	61.	55.
				TIME	6.33	6.33	6.42	6.42
[redacted]RAPH AT								
+	MNW-D	.05	1	FLOW	14.	13.	12.	12.
				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT								
+	MNW-D	1.42	1	FLOW	78.	72.	62.	55.
				TIME	6.33	6.33	6.42	6.42
DIVERSION TO								
+	DCULV	1.42	1	FLOW	28.	28.	28.	28.
				TIME	5.58	5.67	5.83	5.92
HYDROGRAPH AT								
+	DIVD	1.42	1	FLOW	50.	44.	34.	27.
				TIME	6.33	6.33	6.42	6.42
ROUTED TO								
+	RDIVD	1.42	1	FLOW	50.	44.	34.	27.
				TIME	6.33	6.33	6.42	6.50
HYDROGRAPH AT								
+	MNW-E	.05	1	FLOW	18.	17.	16.	15.
				TIME	3.83	3.83	3.83	3.83
[redacted]BINED AT								
	MNW-E	1.47	1	FLOW	51.	44.	34.	27.
				TIME	6.33	6.33	6.42	6.50
DIVERSION TO								
+	ECULV	1.47	1	FLOW	28.	28.	28.	27.
				TIME	5.92	6.00	6.17	6.50
HYDROGRAPH AT								
+	ECULV	1.47	1	FLOW	23.	16.	6.	0.
				TIME	6.33	6.33	6.42	.08
ROUTED TO								
+	RDIVE	1.47	1	FLOW	22.	16.	6.	0.
				TIME	6.42	6.50	6.58	.08
HYDROGRAPH AT								
+	MNW-FG	.36	1	FLOW	63.	61.	57.	55.
				TIME	4.83	4.83	4.83	4.83
2 COMBINED AT								
+	MNW-FG	1.83	1	FLOW	63.	61.	57.	55.
				TIME	4.83	4.83	4.83	4.83
DIVERSION TO								
[redacted]	GCULV	1.83	1	FLOW	60.	60.	57.	55.
				TIME	4.58	4.75	4.83	4.83
HYDROGRAPH AT								
+	DIVG	1.83	1	FLOW	3.	1.	0.	0.
				TIME	4.83	4.83	.08	.08

ROUTED TO								
+	RDIVG	1.83	1	FLOW	3.	1.	0.	0.
				TIME	5.17	5.33	.08	.08
[redacted]RAPH AT								
+	MNW-J1	2.37	1	FLOW	199.	189.	173.	163.
				TIME	6.67	6.67	6.67	6.67
ROUTED TO								
+	MNW-J2	2.37	1	FLOW	199.	188.	173.	163.
				TIME	6.92	6.92	6.92	7.00
HYDROGRAPH AT								
+	MNW-J2	1.21	1	FLOW	218.	208.	194.	184.
				TIME	4.83	4.83	4.92	4.92
2 COMBINED AT								
+	MNW-J2	3.58	1	FLOW	298.	283.	261.	246.
				TIME	5.92	5.92	5.83	5.92
2 COMBINED AT								
+	CP1	5.41	1	FLOW	298.	283.	261.	246.
				TIME	5.92	5.92	5.83	5.92
ROUTED TO								
+	RCP1	5.41	1	FLOW	298.	283.	260.	246.
				TIME	5.92	6.00	6.00	6.00
[redacted]RAPH AT								
	RTNE	.00	1	FLOW	28.	28.	28.	27.
				TIME	5.92	6.00	6.17	6.50
HYDROGRAPH AT								
+	RTNE	.01	1	FLOW	0.	0.	0.	0.
				TIME	4.83	4.83	4.83	4.92
2 COMBINED AT								
+	RTNE	.01	1	FLOW	28.	28.	28.	27.
				TIME	5.92	6.00	6.17	6.50
ROUTED TO								
+	RRTNE	.01	1	FLOW	28.	28.	28.	26.
				TIME	6.67	6.92	7.00	7.00
HYDROGRAPH AT								
+	RTNG	.00	1	FLOW	60.	60.	57.	55.
				TIME	4.58	4.75	4.83	4.83
HYDROGRAPH AT								
+	RTNG	.01	1	FLOW	0.	0.	0.	0.
				TIME	4.83	4.83	4.83	4.92
2 COMBINED AT								
[redacted]	RTNG	.01	1	FLOW	60.	60.	57.	55.
				TIME	4.83	4.83	4.83	4.83
ROUTED TO								
+	RRTNG	.01	1	FLOW	60.	60.	57.	55.
				TIME	5.08	5.08	5.08	5.08

HYDROGRAPH AT								
+	MNW-I1	.25	1	FLOW	119.	115.	109.	104.
				TIME	4.08	4.08	4.08	4.08
[redacted]BINED AT								
+	CP2	.27	1	FLOW	148.	142.	133.	128.
				TIME	4.25	4.25	4.17	4.17
ROUTED TO								
+	RCP2	.27	1	FLOW	148.	141.	133.	128.
				TIME	4.42	4.33	4.33	4.33
HYDROGRAPH AT								
+	MNW-I2	.14	1	FLOW	67.	64.	60.	57.
				TIME	3.83	3.83	3.83	3.83
3 COMBINED AT								
+	CP3	5.82	1	FLOW	412.	392.	363.	345.
				TIME	5.33	5.33	5.33	5.33
ROUTED TO								
+	RCP3	5.82	1	FLOW	411.	391.	363.	344.
				TIME	5.50	5.50	5.50	5.50
HYDROGRAPH AT								
+	MNW-K	1.43	1	FLOW	270.	261.	247.	238.
				TIME	5.17	5.17	5.17	5.17
[redacted]'BINED AT								
	CP4	7.25	1	FLOW	677.	648.	605.	577.
				TIME	5.42	5.42	5.42	5.42
ROUTED TO								
+	RCP4	7.25	1	FLOW	676.	647.	604.	577.
				TIME	5.42	5.42	5.42	5.42
HYDROGRAPH AT								
+	MNW-L	.27	1	FLOW	236.	230.	221.	215.
				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT								
+	MNW-M	.49	1	FLOW	306.	298.	286.	279.
				TIME	4.25	4.25	4.25	4.25
3 COMBINED AT								
+	CP5	8.01	1	FLOW	883.	849.	801.	770.
				TIME	5.08	5.08	4.92	4.67
ROUTED TO								
+	T12	8.01	1	FLOW	882.	848.	801.	769.
				TIME	5.08	5.08	4.92	5.00
ROUTED TO								
[redacted]	.	8.01	1	FLOW	882.	848.	801.	769.
				TIME	5.17	5.25	5.08	5.17
2 COMBINED AT								
+	T12	20.85	1	FLOW	3914.	3828.	3703.	3614.
				TIME	4.50	4.50	4.58	4.58

*** NORMAL END OF HEC-1 ***

EXHIBIT 5-17

HEC - 1 BTR 100.OUT

```
1*****************************************
*                                       *
*  FLOOD HYDROGRAPH PACKAGE (HEC-1)     *
*           FEBRUARY 1981               *
*         REVISED 01 APR 88             *
*                                       *
*  RUN DATE  06/15/1992  TIME  15:13:58 *
*                                       *
*****************************************
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```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*          (916) 551-1748               *
*                                       *
*****************************************
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```
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

              *DIAGRAM
    1         ID    INPUT FILE = BDTROP100.DAT
    2         ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3         ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4         ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5         ID     BASIN-WIDE STORM - TROPICANA AREA ONLY
    6         ID         100-YEAR 6-HR STORM (SDN #5)
    7         ID         JMM    OCTOBER 1990
    8         ID         CH2M HILL JUNE 1992 MODIFY FOR TROPICANA STUDY - FULLER & ALLEN
    9         ID
   10         ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   11         ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   12         ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   13         ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   14         ID
   15         ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   16         ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   17         ID
   18         ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   19         ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   20         ID
   21         ID         SUBBASIN         AREA (SQMI)         DARF
```

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22          ID          --------          -----------          ----
23          ID          B504,T8,T9        69.5,70.8,71.6       0.65
24          ID          T10,T11,T12       80.5,81.6,90.4       0.63
25          ID
26          ID
27          IT      5       0       0     100
28          IO      5
29          JR    PREC    0.65    0.63

30          KK     B71 RUNOFF FROM B71
31          BA    7.99
32          PC    .000    .020    .059    .080    .110    .144    .150    .160    .168    .171
33          PC    .180    .182    .187    .190    .197    .202    .210    .220    .230    .241
34          PC    .250    .259    .265    .280    .290    .300    .305    .309    .310    .317
35          PC    .321    .327    .333    .346    .361    .381    .408    .430    .477    .514
36          PC    .561    .630    .710    .720    .731    .752    .779    .790    .795    .804
37          PC    .810    .820    .826    .840    .859    .889    .910    .938    .966    .970
38          PC    .974    .979    .981    .983    .985    .989    .990    .992    .993    .996
39          PC    .997    .999    1.00
40          PB    3.48
41          LS       0      85
42          UD    0.86

43          KK    B501 ROUTE B17 TO B501
44          RM       4    0.32    0.15

45          KK    B501 RUNOFF FROM B501
46          BA   10.66
47          PB    3.48
48          LS       0      85
49          UD    0.87
```



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

50          KK    B591 COMBINE B71 AND B501
51          HC       2

52          KK     B72 ROUTE B501 TO B72
53          RM       3    0.26    0.15

54          KK     B72 RUNOFF FROM B72
55          BA    8.12
56          PB    3.48
57          LS       0      87
58          UD    1.03

59          KK     B72 COMBINE B501 AND B72
60          HC       2

61          KK    B503 ROUTE B72 TO B503
62          RM       4    0.36    0.15

63          KK    B502 RUNOFF FROM B502
64          BA   27.35
65          PB    3.48
66          LS       0      85
67          UD    1.40
```

```
 68          KK    B503 ROUTE B502 TO B503
 69          RM       4    0.36    0.15

 70          KK     B73 RUNOFF FROM B73
 71          BA    2.69
 72          PB    3.34
 73          LS       0      86
 74          UD    0.52

 75          KK    B503 ROUTE B73 TO B503
 76          RM       4    0.36    0.15

 77          KK    B503 RUNOFF FROM B503
 78          BA    8.07
 79          PB    3.26
 80          LS       0      85
 81          UD    0.77

 82          KK    B503 COMBINE B72, B502, B73, AND B503
 83          HC       4

 84          KK    B504 ROUTE B503 TO B504
 85          RM       6    0.47    0.15

 86          KK    B504 RUNOFF FROM B504
 87          BA    4.65
 88          PB    3.14
 89          LS       0      85
 90          UD    0.96
```



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

 91          KK    B504 COMBINE B503 AND B504
 92          HC       2

 93          KK      T7 ROUTE B504 TO T7
 94          RM       7    0.60    0.15

 95          KK      T7 DIVERT UP TO 30% OF FLOW TO TROPICANA WASH
 96          KM         COE FLOW SPLIT DATA
 97          DT    TROP
 98          DI       0    1000    2770    6350    8190   12000   16000
 99          DQ       0     260     750    1840    2400    4080    6240

100          KK  T7TROP RECALL TROPICANA PORTION OF BLUE DIAMOND FLOW
101          DR    TROP

102          KK      T8 ROUTE T7TROP TO T8
103          RM       9    0.75    0.15

104          KK      T8 RUNOFF FROM T8
105          BA    1.22
106          PB    2.77
107          LS       0    65.6
108          UK     600    .015    0.15     100
109          RK    2000    .018    .030     .14                    1
110          RK   18000   .0161    .030          TRAP      75       5      NO
```

```
111          KK      T8 COMBINE T7TROP AND T8
112          HC       2

113          KK      T9 ROUTE T8 TO T9
114          RM       6    0.52    0.15

115          KK      T9 RUNOFF FROM T9
116          BA    0.87
117          LS       0    73.1
118          UK     600    .010    0.15     100
119          RK    4000    .010    .030    0.12                      1
120          RK   10200   .0134    .030            TRAP      30      5

121          KK      T9 COMBINE T8 AND T9
122          HC       2

123          KK    T9OF DIVERT OVERFLOW
124          DT    T9OF
125          DI       0    5480   11000   15000
126          DQ       0       0    2700    2700

127          KK     T10 ROUTE T9 THRU T10
128          RM       3    0.21    0.10
1                                   HEC-1 INPUT                                          PAGE  4

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

129          KK      T4 RUNOFF FROM T4
130          BA    3.22
131          LS       0    87.6
132          UK     500    .015    0.15     100
133          RK    2700   .0190    .030    0.25                      1
134          RK   20000   .0185    .030            TRAP      75      5      NO

135          KK      T5 ROUTE T4 TO T5
136          RK    6500    .013    .030            TRAP      30      2

137          KK      T5 RUNOFF FROM T5
138          BA    1.00
139          LS       0    87.0
140          UK     600    .010    0.15     100
141          RK    2500    .012    .030    0.21                      1
142          RK    6500    .013    .030            TRAP      30      2

143          KK      T5 COMBINE T4 AND T5
144          HC       2

145          KK      T6 ROUTE T5 TO T6
146          RK   10800    .012    .030            TRAP      30      5

147          KK      T6 RUNOFF FROM T6
148          BA    1.30
149          LS       0    86.9
150          UK     600    .010    0.15     100
151          RK    6000    .012    .030    .400                      1
152          RK   10800    .012    .030            TRAP      30      5

153          KK      T6 COMBINE T5 AND T6
154          HC       2
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155          KK    T9OF RECALL T9OF
156          DR    T9OF

157          KK      T6 ROUTE T9OF THRU T6
158          RM       3    0.23    0.15

159          KK      T6 COMBINE T6 AND T9OF
160          HC       2

161          KK      T6 DIVERT OVERFLOW ALONG UPRR
162          KM         UPRR 114" CMP CULVERT - 750 CFS CAPACITY
163          DT    T6OF
164          DI       0     750    1500   10000
165          DQ       0       0     750    9250

166          KK      T1 RUNOFF FROM T1
167          BA    1.56
168          LS       0      88
169          UK     600    .020    0.15     100
170          RK    4000   .0200    .030    0.28                      1
171          RK   13200    .017    .030            TRAP      50      5      NO
1                                          HEC-1 INPUT                                                PAGE  5

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

172          KK      T3 ROUTE T1 TO T3
173          RK   10000   .0106    .032            TRAP      30      5

174          KK      T3 RUNOFF FROM T3
175          BA    0.99
176          LS       0    78.9
177          UK     500    .010    0.15     100
178          RK    3000    .010    .030    0.16                      1
179          RK   10000   .0106    .032            TRAP      30      5

180          KK      T3 COMBINE T1 AND T3
181          HC       2

182          KK    T6OF RECALL DIVERTED OVERFLOW FROM T6
183          DR    T6OF

184          KK      T3 ROUTE T6OF THRU T3
185          RM       1    0.08    0.15

186          KK      T3 COMBINE T6OF AND T3
187          HC       2

188          KK    T3OF DIVERT FLOW IN EXCESS OF CULVERT CAPACITY
189          KM         BASED ON COE RATING CURVE FROM FEASIBILITY STUDY
190          KM         DQ FLOWS NORTHEASTERLY, REJOINING FW NEAR PARADISE RD
191          DT    T3OF
192          DI       0    1400    1900    3200    5500   19000
193          DQ       0       0     420    1650    3650   14700

194          KK   T3+T6 COMBINE T3 +T6 WHICH GETS THRU UPRR CULVERTS
195          HC       2

196          KK     T10 ROUTE T3 THRU T10 (TRWA0272)
```

```
197          RK   3800   .0132    .040          TRAP    17.5       2

198          KK    T10 RUNOFF FROM T10
199          BA   0.82
200          LS      0    78.0       0       0     98       0
201          UK    700    .013    0.15      78
202          UK    400    .011     .10      22
203          RK   1100    .012    .020    .120                     1
204          RK   3000    .008    .020     .50                     1
205          RK   3500   0.010    .030          TRAP      30       2

206          KK    T10 COMBINE T3+T6, and T10
207          HC      2

208          KK    T10 COMBINE T3-T10 WITH T9 (UNNAMED)
209          HC      2
1                                      HEC-1 INPUT                                    PAGE  6

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

210          KK   T10R ROUT T10 THRU T11 (TRWA0235)
211          RK   1160    .010    .015          TRAP      32       0

212          KK      .   (TRWA0145-0218)
213          RK   4700   .0095    .030          TRAP      90     1.5

214          KK    T11 RUNOFF FROM T11
215          BA   1.09
216          LS      0    68.6       0       0     98       0
217          UK    800    .010    0.30      61
218          UK    500    .010    0.10      39
219          RK   3200   .0080    .020    0.17                     1
220          RK   5400   .0104    .030          TRAP     100       5      NO

221          KK    T11 COMBINE T11 AND T10R
222          HC      2

223          KK   T11R ROUT  T11 THRU T12 (TRWA0117)
224          RK   1130   .0088    .015          TRAP     1.5       2

225          KK      .   (TRWA0000-0034+)
226          RK   6500    .012    .040          TRAP     100     2.5

227          KK    T12 RUNOFF FROM T12
228          BA   0.77
229          LS      0    74.4       0       0     98       0
230          UK    500    .008    0.18      65
231          UK    200    0.01    0.10      35
232          RK   2200    .008    .023    0.12                     1
233          RK   3000    .007    .025     .24              20       2
234          RK   6600   .0103    .032                      30       5

235          KK    T12 ADD T12 AND T11R
236          HC      2

237          KK   T30F RECALL DIVERSION FROM T3
238          DR   T30F

239          KK    T12 ROUTE T30F TO T12
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240          RM      20    1.99    0.10

241          KK     T12 COMBINE T3OF AND T12
242          HC       2
             *  *** DATA FOR SUBAREAS MNW-B THRU MNW-M TAKEN FROM NIMBUS HEC-1 ANALYSIS
             *       FOR NORTHWEST MCCARRAN AIRPORT DRAINAGE STUDY (WITH SMALL MODIFICATIONS)

243          KK   MNW-B RUNOFF FROM B
244          BA    0.68
245          LS              65      10
246          UD     2.4
1                                      HEC-1 INPUT                                      PAGE  7

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


247          KK    DIVB FLOW SPLIT AT I-15; BCULV IS FLOW CONVEYED BY CULVERT
248          DT   BCULV
249          DI       0      22     100     500
250          DQ       0      22      22      22

251          KK   RDIVB ROUTE DIVB TO CULVERT AT I15 AND C
252          RK     600    .004     .05       0       0       5

253          KK   MNW-C RUNOFF AT C
254          BA    0.69
255          LS              65      17
256          UD     2.0

257          KK   MNW-C COMBINE DIVB+C
258          HC       2

259          KK   MNW-C PONDING STORAGE ROUTING AT I-15
260          RS       1    STOR       0
261          SA       0     .28     .92    2.02    3.19    3.44    5.37    9.09
262          SQ       0       8      25      35      40      78     360    1342
263          SE      54      55      56      57   57.43      58      59      60

264          KK    DIVC FLOW SPLIT AT C THRU AND AROUND CULVERT
265          DT   CCULV
266          DI       0       8      25      35      40      78     360    1342
267          DQ       0       8      25      35      40      45      55      65

268          KK   RDIVC ROUTE DIVC NORTH TO D
269          RK     650    .004     .05       0       0       0      20

270          KK   MNW-D RUNOFF FROM D
271          BA     .05
272          LS              66      10
273          UD     .40

274          KK   MNW-D COMBINE DIVC AND D
275          HC       2

276          KK    DIVD DIVERT FLOW TO NORTH; DCULV CROSSES I-15
277          DT   DCULV
278          DI       0      28     100     500
279          DQ       0      28      28      28

280          KK   RDIVD ROUTE DIVERTED FLOW NORTH TO E
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```
281          RK     800    .004     .05       0        0        0       20

282          KK   MNW-E RUNOFF FROM E
283          BA    0.05
284          LS              65       18
285          UD    0.38
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

286          KK   MNW-E COMBINE DIVD + E
287          HC       2

288          KK   ECULV DIVIDE FLOW AT I-15 CULVERT; ECULV CROSSES I-15 INTO MNW-I
289          DT   ECULV
290          DI       0       28      100      500
291          DQ       0       28       28       28

292          KK   RDIVE ROUTE FLOW FROM DIVE NORTH ALONG I-15
293          RK    1200    .007     .05       0        0        0        4

294          KK  MNW-FG RUNOFF FROM FG
295          BA    0.36
296          LS              66       17
297          UD    1.24

298          KK  MNW-FG COMBINE EDIV + FG
299          HC       2

300          KK    DIVG DIVERT FLOW NORTH; GCULV CROSSES I-15 INTO SUBAREA I
301          DT   GCULV
302          DI       0       50       60      100      150      250
303          DQ       0       50       60       60       60       60

304          KK   RDIVG ROUTE DIVG NORTH TO AIRPORT CHANNEL
305          RK    2200    .009    .040       0        0        0       10

306          KK  MNW-J1 RUNOFF FROM J1
307          BA    2.37
308          LS              70
309          UD    2.67

310          KK  MNW-J2 ROUTE J1 TO J2
311          RK   10000    .012     .04                          10        2

312          KK  MNW-J2 RUNOFF FROM J2
313          BA    1.21
314          LS              70       10
315          UD    1.22

316          KK  MNW-J2 COMBINE J1+J2
317          HC       2

318          KK     CP1 COMBINE J2 + RDIVG
319          HC       2

320          KK    RCP1 ROUTE CP1 TO LAS VEGAS BLVD (CP3)
321          RK    2600    .008     .04       0        0       20        1
```

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

322       KK    RTNE RETURN FLOW FROM CULVERT E
323       DR   ECULV

324       KK    RTNE DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
325       BA    0.01
326       LS       0      50
327       UD     0.1

328       KK    RTNE COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
329       HC       2

330       KK   RRTNE ROUTE ECULV TO OUTLET OF I
331       RK    3900    .013     .05       0       0       0      50

332       KK    RTNG RETURN FLOW FROM CULVERT G
333       DR   GCULV

334       KK    RTNG DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
335       BA    0.01
336       LS       0      50
337       UD     0.1

338       KK    RTNG COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
339       HC       2

340       KK   RRTNG ROUTE GCULV TO OUTLET OF I
341       RK    2500    .013    0.05       0       0       0      50

342       KK  MNW-I1 RUNOFF FROM I1
343       BA    0.25
344       LS              78      15
345       UD    0.58

346       KK     CP2 COMBINE HYDROGRAPHS AT LAS VEGAS BLVD AND UPRR
347       HC       3

348       KK    RCP2 ROUTE CP2 TO AIRPORT CHANNEL AND LAS VEGAS BLVD (CP3)
349       RK    2500    .009     .05       0       0       0       4

350       KK  MNW-I2 RUNOFF FROM I2
351       BA    0.14
352       LS              77       1
353       UD    0.38

354       KK     CP3 COMBINE FLOW FROM B-I2 AT LAS VEGAS BLVD AND AIRPORT CHANNEL
355       HC       3

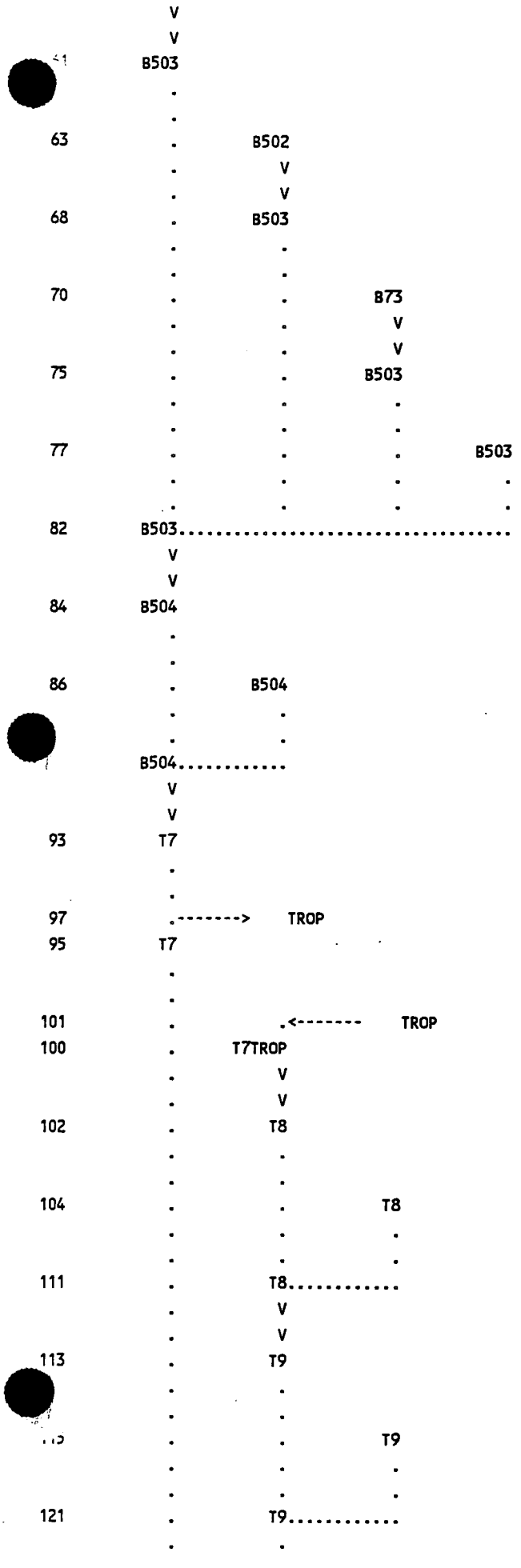
356       KK    RCP3 ROUTE CPE TO OUTLET OF K
357       RK    7300     .01     .04       0       0       5       2
```

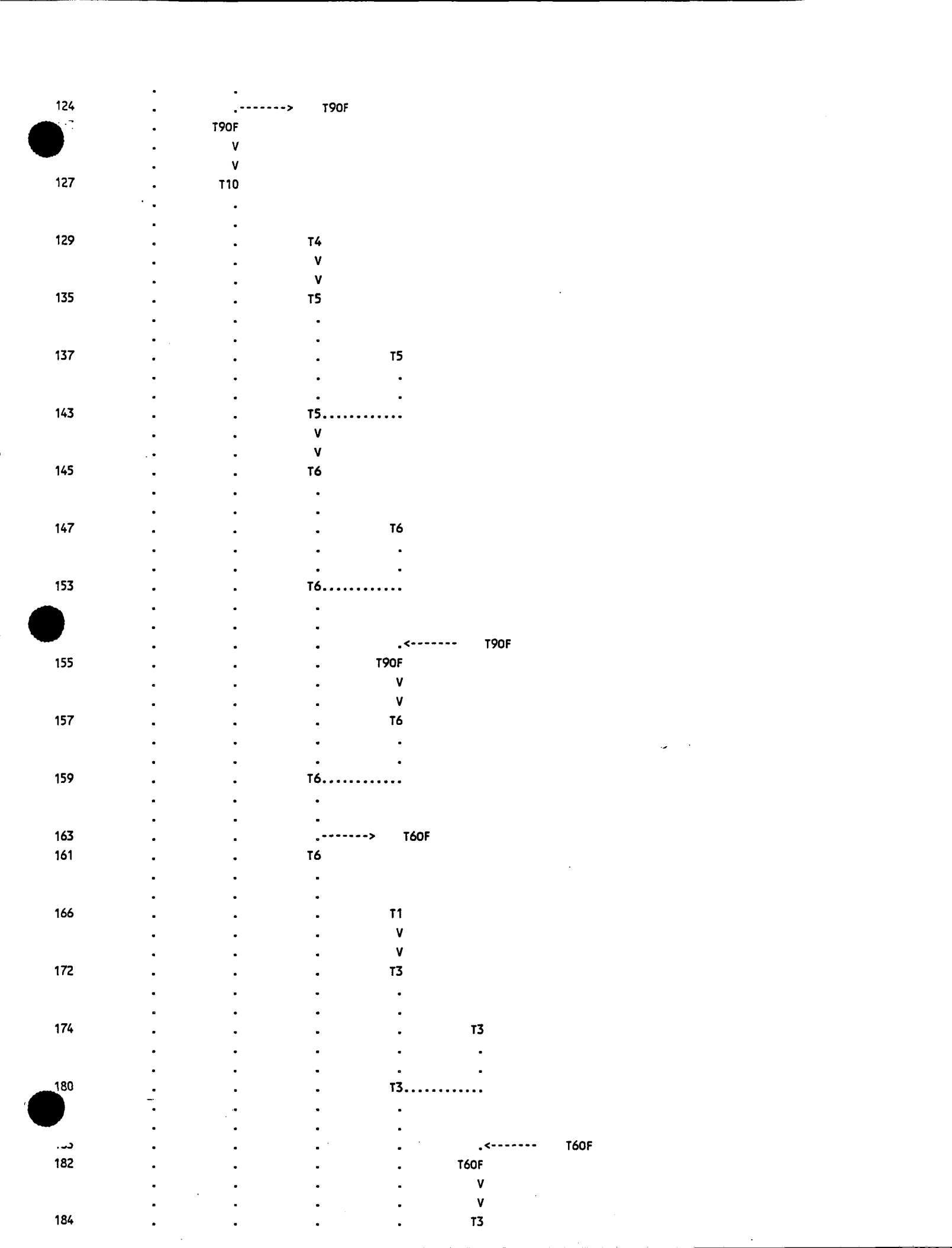


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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

358       KK   MNW-K RUNOFF FROM K
359       BA    1.43
```

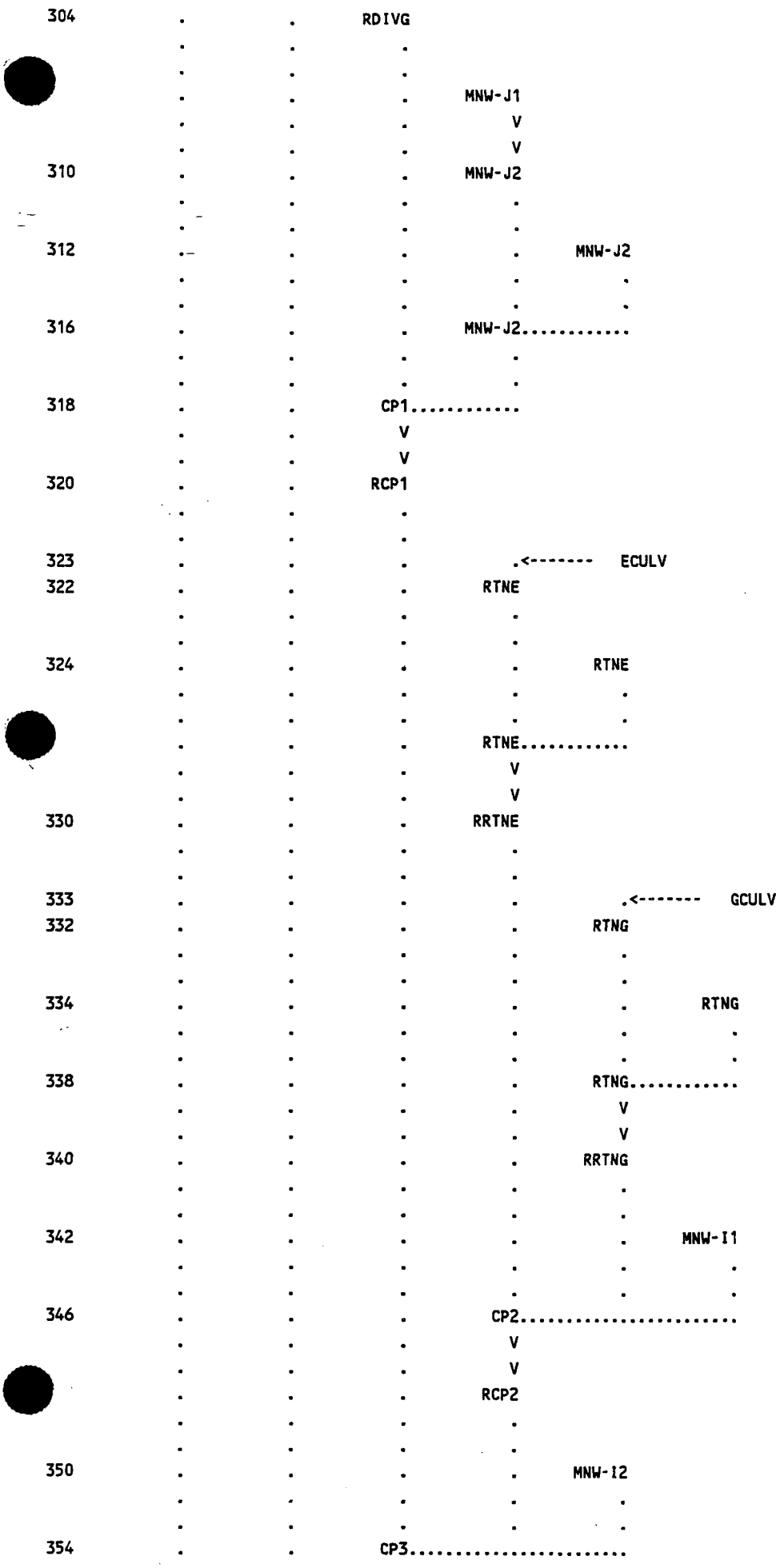
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360          LS              66      25
361          UD    1.55
362          KK     CP4 COMBINE HYDROGRAPHS FOR AIRPORT CHANNEL AND TAXIWAY S
363          HC       2
364          KK    RCP4 ROUTE FLOW TO TROPICANA BLVD
365          RK    3300     .01     .03       0       0      20       4
366          KK   MNW-L RUNOFF FROM L
367          BA    0.27
368          LS              77      60
369          UD    0.42
370          KK   MNW-M RUNOFF FROM M
371          BA    0.49
372          LS              84      56
373          UD    0.83
374          KK     CP5 COMBINE ALL HYDROGRAPHS AT OUTLET AT BOX CULVERT AT TROPICANA
375          HC       3
             *  *** END OF DATA FROM NIMBUS NORTHWEST MCCARRAN HEC-1 DATA ***
             *
376          KK     T12 ROUTE MNW-L TO T12 (TRMC0009)
377          RK    2640   .0045    .040            TRAP      18     1.5
378          KK       .   (TRWA0000-0034)
379          RK    5000    .012    .040            TRAP     100     2.5
380          KK     T12 COMBINE MNW-L AND T12
381          KM         AIRPORT CHANNEL + TROPICANA WASH
382          HC       2
383          ZZ
1
          SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW
   NO.     (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW
    30       B71
               V
               V
    43       B501
               .
               .
    45         .        B501
               .          .
               .          .
    50       B591.............
               V
               V
             B72
               .
               .
    54         .         B72
               .           .
               .           .
    59       B72.............
```

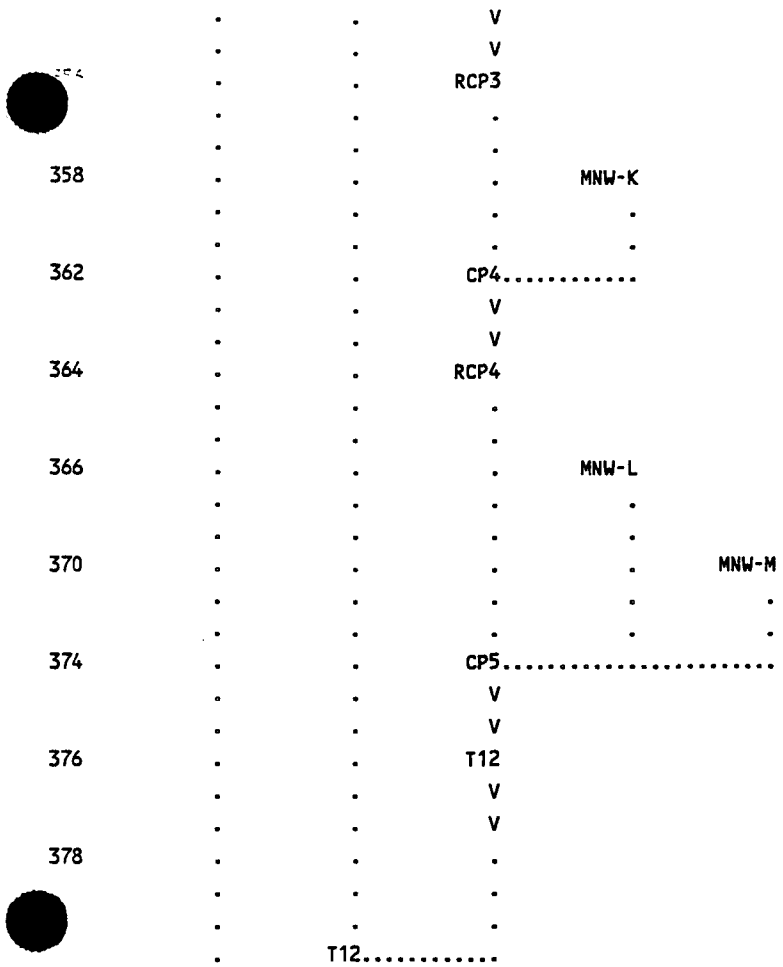

B503
B502
B503
B73
B503
B503
B503
B504
B504
T7
TROP
T7
TROP
T7TROP
T8
T8
T8
T9
T9
T9


124
T90F
T90F
127
T10
129
T4
135
T5
137
T5
143
T5
145
T6
147
T6
153
T6
155
T90F
157
T6
159
T6
163
T60F
161
T6
166
T1
172
T3
174
T3
180
T3
T60F
182
T60F
184
T3

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                .          .          .          .          .
                .          .          .          .          .
186             .          .          .       T3.....
                .          .          .          .
                .          .          .          .
191             .          .          .          .------->  T3OF
188             .          .          .       T3OF
                .          .          .          .
                .          .          .          .
194             .          .       T3+T6.....
                .          .          V
                .          .          V
196             .          .       T10
                .          .          .
                .          .          .
198             .          .          .       T10
                .          .          .          .
                .          .          .          .
206             .          .       T10.....
                .          .          .
                .          .          .
208             .       T10.....
                .         V
                .         V
210             .       T10R
                .         V
                .         V
212             .          .
                .          .
                .          .
214             .          .       T11
                .          .          .
                .          .          .
221             .       T11.....
                .         V
                .         V
223             .       T11R
                .         V
                .         V
225             .          .
                .          .
                .          .
227             .          .       T12
                .          .          .
                .          .          .
235             .       T12.....
                .          .
                .          .
238             .          .          .<-------  T3OF
237             .          .       T3OF
                .          .          V
                .          .          V
239             .          .       T12
                .          .          .
                .          .          .
241             .       T12.....
                .          .
                .          .
243             .          .       MNW-B
                .          .          .
```

```
                .                .                .
248             .                .                .-------->   BCULV
                .                .          DIVB
                .                .             V
                .                .             V
251             .                .          RDIVB
                .                .                .
                .                .                .
253             .                .                .       MNW-C
                .                .                .           .
                .                .                .           .
257             .                .          MNW-C.............
                .                .             V
                .                .             V
259             .                .          MNW-C
                .                .                .
                .                .                .
265             .                .                .-------->   CCULV
264             .                .          DIVC
                .                .             V
                .                .             V
268             .                .          RDIVC
                .                .                .
                .                .                .
270             .                .                .       MNW-D
                .                .                .           .
                .                .                .           .
274             .                .          MNW-D.............
                .                .                .
                .                .                .
277             .                .                .-------->   DCULV
276             .                .          DIVD
                .                .             V
                .                .             V
280             .                .          RDIVD
                .                .                .
                .                .                .
282             .                .                .       MNW-E
                .                .                .           .
                .                .                .           .
286             .                .          MNW-E.............
                .                .                .
                .                .                .
289             .                .                .-------->   ECULV
288             .                .          ECULV
                .                .             V
                .                .             V
292             .                .          RDIVE
                .                .                .
                .                .                .
294             .                .                .       MNW-FG
                .                .                .           .
                .                .                .           .
                .                .         MNW-FG.............
                .                .                .
                .                .                .
301             .                .                .-------->   GCULV
300             .                .          DIVG
                .                .             V
                .                .             V
```


304
RDIVG
MNW-J1
V
V
310
MNW-J2
312
MNW-J2
316
MNW-J2
318
CP1
V
V
320
RCP1
323
ECULV
322
RTNE
324
RTNE
RTNE
V
V
330
RRTNE
333
GCULV
332
RTNG
334
RTNG
338
RTNG
V
V
340
RRTNG
342
MNW-I1
346
CP2
V
V
RCP2
350
MNW-I2
354
CP3



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 APR 88           *
*                                       *
*  RUN DATE  06/15/1992  TIME  15:13:58 *
*                                       *
*****************************************
```

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

```
INPUT FILE = BDTROP100.DAT
 CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
 RED ROCK/FLAMINGO/TROPICANA WATERSHED
 EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
 BASIN-WIDE STORM - TROPICANA AREA ONLY
     100-YEAR 6-HR STORM (SDN #5)
     JMM    OCTOBER 1990
     CH2M HILL JUNE 1992 MODIFY FOR TROPICANA STUDY - FULLER & ALLEN

     BASIC DATA FILE BASED ON COE FILE S10P40X.
     MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
     BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
     AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
```

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
B504,T8,T9	69.5,70.8,71.6	0.65
T10,T11,T12	80.5,81.6,90.4	0.63

28 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		100	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0815	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 8.25 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN	1	NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.65 .63

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION	
TION	STATION	AREA	PLAN		RATIO 1	RATIO 2
					.65	.63
HYDROGRAPH AT						
+	B71	7.99	1	FLOW	2151.	2038.
				TIME	4.33	4.33

ROUTED TO						
+	B501	7.99	1	FLOW	2099.	1989.
				TIME	4.67	4.67
[redacted]GRAPH AT						
+	B501	10.66	1	FLOW	2854.	2703.
				TIME	4.33	4.33
2 COMBINED AT						
+	B591	18.65	1	FLOW	4788.	4533.
				TIME	4.42	4.42
ROUTED TO						
+	B72	18.65	1	FLOW	4710.	4461.
				TIME	4.75	4.75
HYDROGRAPH AT						
+	B72	8.12	1	FLOW	2200.	2091.
				TIME	4.50	4.50
2 COMBINED AT						
+	B72	26.77	1	FLOW	6830.	6475.
				TIME	4.67	4.67
ROUTED TO						
+	B503	26.77	1	FLOW	6699.	6354.
				TIME	5.08	5.08
[redacted]RAPH AT						
+	B502	27.35	1	FLOW	5732.	5440.
				TIME	5.25	5.25
ROUTED TO						
+	B503	27.35	1	FLOW	5709.	5418.
				TIME	5.58	5.58
HYDROGRAPH AT						
+	B73	2.69	1	FLOW	938.	890.
				TIME	3.92	3.92
ROUTED TO						
+	B503	2.69	1	FLOW	878.	832.
				TIME	4.33	4.33
HYDROGRAPH AT						
+	B503	8.07	1	FLOW	2062.	1949.
				TIME	4.17	4.25
4 COMBINED AT						
+	B503	64.88	1	FLOW	14229.	13504.
				TIME	5.25	5.25
ROUTED TO						
[redacted]	B504	64.88	1	FLOW	14074.	13358.
				TIME	5.75	5.75
HYDROGRAPH AT						
+	B504	4.65	1	FLOW	979.	924.
				TIME	4.42	4.42

2 COMBINED AT						
+	B504	69.53	1	FLOW	14803.	14046.
				TIME	5.67	5.67
[redacted] TO						
+	T7	69.53	1	FLOW	14584.	13844.
				TIME	6.33	6.33
DIVERSION TO						
+	TROP	69.53	1	FLOW	5476.	5076.
				TIME	6.33	6.33
HYDROGRAPH AT						
+	T7	69.53	1	FLOW	9109.	8768.
				TIME	6.33	6.33
HYDROGRAPH AT						
+	T7TROP	.00	1	FLOW	5476.	5076.
				TIME	6.33	6.33
ROUTED TO						
+	T8	.00	1	FLOW	5352.	4958.
				TIME	7.08	7.08
HYDROGRAPH AT						
+	T8	1.22	1	FLOW	17.	14.
				TIME	7.33	7.58
[redacted]MBINED AT						
+	T8	1.22	1	FLOW	5368.	4970.
				TIME	7.08	7.08
ROUTED TO						
+	T9	1.22	1	FLOW	5284.	4890.
				TIME	7.58	7.58
HYDROGRAPH AT						
+	T9	.87	1	FLOW	49.	42.
				TIME	5.67	5.75
2 COMBINED AT						
+	T9	2.09	1	FLOW	5300.	4906.
				TIME	7.58	7.58
DIVERSION TO						
+	T9OF	2.09	1	FLOW	0.	0.
				TIME	.08	.08
HYDROGRAPH AT						
+	T9OF	2.09	1	FLOW	5300.	4906.
				TIME	7.58	7.58
[redacted]OUTED TO						
[redacted]	T10	2.09	1	FLOW	5268.	4877.
				TIME	7.83	7.83
HYDROGRAPH AT						
+	T4	3.22	1	FLOW	754.	687.
				TIME	4.17	4.25

ROUTED TO						
+	T5	3.22	1	FLOW	742.	685.
				TIME	4.25	4.33
[redacted]RAPH AT						
+	T5	1.00	1	FLOW	203.	187.
				TIME	4.17	4.17
2 COMBINED AT						
+	T5	4.22	1	FLOW	942.	867.
				TIME	4.25	4.33
ROUTED TO						
+	T6	4.22	1	FLOW	937.	855.
				TIME	4.50	4.58
HYDROGRAPH AT						
+	T6	1.30	1	FLOW	251.	232.
				TIME	4.33	4.42
2 COMBINED AT						
+	T6	5.52	1	FLOW	1180.	1079.
				TIME	4.50	4.50
HYDROGRAPH AT						
+	T9OF	.00	1	FLOW	0.	0.
				TIME	.08	.08
[redacted] TO						
+	T6	.00	1	FLOW	0.	0.
				TIME	.08	.08
2 COMBINED AT						
+	T6	5.52	1	FLOW	1180.	1079.
				TIME	4.50	4.50
DIVERSION TO						
+	T6OF	5.52	1	FLOW	430.	329.
				TIME	4.50	4.50
HYDROGRAPH AT						
+	T6	5.52	1	FLOW	750.	750.
				TIME	4.25	4.33
HYDROGRAPH AT						
+	T1	1.56	1	FLOW	391.	360.
				TIME	4.08	4.17
ROUTED TO						
+	T3	1.56	1	FLOW	385.	354.
				TIME	4.42	4.42
HYDROGRAPH AT						
[redacted]	T3	.99	1	FLOW	105.	97.
				TIME	5.17	5.17
2 COMBINED AT						
+	T3	2.55	1	FLOW	449.	413.
				TIME	4.42	4.50

HYDROGRAPH AT						
+	T6OF	.00	1	FLOW	430.	329.
				TIME	4.50	4.50
[redacted] TO						
+	T3	.00	1	FLOW	413.	316.
				TIME	4.58	4.67
2 COMBINED AT						
+	T3	2.55	1	FLOW	847.	719.
				TIME	4.58	4.58
DIVERSION TO						
+	T3OF	2.55	1	FLOW	0.	0.
				TIME	.08	.08
HYDROGRAPH AT						
+	T3OF	2.55	1	FLOW	847.	719.
				TIME	4.58	4.58
2 COMBINED AT						
+	T3+T6	8.07	1	FLOW	1597.	1469.
				TIME	4.58	4.58
ROUTED TO						
+	T10	8.07	1	FLOW	1593.	1463.
				TIME	4.58	4.67
[redacted] GRAPH AT						
+	T10	.82	1	FLOW	118.	115.
				TIME	3.75	3.75
2 COMBINED AT						
+	T10	8.89	1	FLOW	1669.	1538.
				TIME	4.58	4.67
2 COMBINED AT						
+	T10	10.98	1	FLOW	5503.	5103.
				TIME	7.75	7.75
ROUTED TO						
+	T10R	10.98	1	FLOW	5498.	5100.
				TIME	7.83	7.83
ROUTED TO						
+	.	10.98	1	FLOW	5494.	5095.
				TIME	7.83	7.83
HYDROGRAPH AT						
+	T11	1.09	1	FLOW	217.	209.
				TIME	3.83	3.83
2 COMBINED AT						
[redacted]	T11	12.07	1	FLOW	5506.	5106.
				TIME	7.83	7.83
ROUTED TO						
+	T11R	12.07	1	FLOW	5501.	5103.
				TIME	7.92	7.92

ROUTED TO						
+	.	12.07	1	FLOW	5493.	5096.
				TIME	8.00	8.00
[redacted] RAPH AT						
+	T12	.77	1	FLOW	158.	153.
				TIME	3.83	3.83
2 COMBINED AT						
+	T12	12.84	1	FLOW	5503.	5106.
				TIME	8.00	8.00
HYDROGRAPH AT						
+	T3OF	.00	1	FLOW	0.	0.
				TIME	.08	.08
ROUTED TO						
+	T12	.00	1	FLOW	0.	0.
				TIME	.08	.08
2 COMBINED AT						
+	T12	12.84	1	FLOW	5503.	5106.
				TIME	8.00	8.00
HYDROGRAPH AT						
+	MNW-B	.68	1	FLOW	24.	22.
				TIME	6.42	6.42
[redacted] SION TO						
+	BCULV	.68	1	FLOW	22.	22.
				TIME	5.83	6.17
HYDROGRAPH AT						
+	DIVB	.68	1	FLOW	2.	0.
				TIME	6.42	6.42
ROUTED TO						
+	RDIVB	.68	1	FLOW	2.	0.
				TIME	6.50	6.58
HYDROGRAPH AT						
+	MNW-C	.69	1	FLOW	38.	36.
				TIME	6.00	5.92
2 COMBINED AT						
+	MNW-C	1.37	1	FLOW	39.	36.
				TIME	6.17	5.92
ROUTED TO						
+	MNW-C	1.37	1	FLOW	33.	31.
				TIME	6.83	6.75
			** PEAK STAGES IN FEET **			
[redacted]			1	STAGE	56.77	56.57
				TIME	6.83	6.75
DIVERSION TO						
+	CCULV	1.37	1	FLOW	33.	31.
				TIME	6.83	6.75

HYDROGRAPH AT						
+	DIVC	1.37	1	FLOW	0.	0.
				TIME	.08	.08
[redacted] TO						
+	RDIVC	1.37	1	FLOW	0.	0.
				TIME	.08	.08
HYDROGRAPH AT						
+	MNW-D	.05	1	FLOW	4.	3.
				TIME	5.08	5.08
2 COMBINED AT						
+	MNW-D	1.42	1	FLOW	4.	3.
				TIME	5.08	5.08
DIVERSION TO						
+	DCULV	1.42	1	FLOW	4.	3.
				TIME	5.08	5.08
HYDROGRAPH AT						
+	DIVD	1.42	1	FLOW	0.	0.
				TIME	.08	.08
ROUTED TO						
+	RDIVD	1.42	1	FLOW	0.	0.
				TIME	.08	.08
[redacted] GRAPH AT						
+	MNW-E	.05	1	FLOW	6.	5.
				TIME	3.75	3.75
2 COMBINED AT						
+	MNW-E	1.47	1	FLOW	6.	5.
				TIME	3.75	3.75
DIVERSION TO						
+	ECULV	1.47	1	FLOW	6.	5.
				TIME	3.75	3.75
HYDROGRAPH AT						
+	ECULV	1.47	1	FLOW	0.	0.
				TIME	.08	.08
ROUTED TO						
+	RDIVE	1.47	1	FLOW	0.	0.
				TIME	.08	.08
HYDROGRAPH AT						
+	MNW-FG	.36	1	FLOW	24.	22.
				TIME	5.33	5.25
[redacted] 2 COMBINED AT						
[redacted]	MNW-FG	1.83	1	FLOW	24.	22.
				TIME	5.33	5.25
DIVERSION TO						
+	GCULV	1.83	1	FLOW	24.	22.
				TIME	5.33	5.25

HYDROGRAPH AT						
+	DIVG	1.83	1	FLOW	0.	0.
				TIME	.08	.08
[redacted] TO						
+	RDIVG	1.83	1	FLOW	0.	0.
				TIME	.08	.08
HYDROGRAPH AT						
+	MNW-J1	2.37	1	FLOW	65.	58.
				TIME	7.00	7.00
ROUTED TO						
+	MNW-J2	2.37	1	FLOW	65.	58.
				TIME	7.42	7.50
HYDROGRAPH AT						
+	MNW-J2	1.21	1	FLOW	79.	73.
				TIME	5.50	5.50
2 COMBINED AT						
+	MNW-J2	3.58	1	FLOW	102.	92.
				TIME	6.08	6.08
2 COMBINED AT						
+	CP1	5.41	1	FLOW	102.	92.
				TIME	6.08	6.08
[redacted] TO						
+	RCP1	5.41	1	FLOW	102.	92.
				TIME	6.17	6.17
HYDROGRAPH AT						
+	RTNE	.00	1	FLOW	6.	5.
				TIME	3.75	3.75
HYDROGRAPH AT						
+	RTNE	.01	1	FLOW	0.	0.
				TIME	.08	.08
2 COMBINED AT						
+	RTNE	.01	1	FLOW	6.	5.
				TIME	3.75	3.75
ROUTED TO						
+	RRTNE	.01	1	FLOW	5.	5.
				TIME	4.58	4.58
HYDROGRAPH AT						
+	RTNG	.00	1	FLOW	24.	22.
				TIME	5.33	5.25
HYDROGRAPH AT						
[redacted]	RTNG	.01	1	FLOW	0.	0.
				TIME	.08	.08
2 COMBINED AT						
+	RTNG	.01	1	FLOW	24.	22.
				TIME	5.33	5.25

ROUTED TO						
+	RRTNG	.01	1	FLOW	24.	22.
				TIME	5.58	5.50
[redacted]RAPH AT						
+	MNW-I1	.25	1	FLOW	43.	41.
				TIME	4.00	4.00
3 COMBINED AT						
+	CP2	.27	1	FLOW	59.	56.
				TIME	5.17	5.17
ROUTED TO						
+	RCP2	.27	1	FLOW	59.	56.
				TIME	5.25	5.33
HYDROGRAPH AT						
+	MNW-I2	.14	1	FLOW	19.	18.
				TIME	3.83	3.83
3 COMBINED AT						
+	CP3	5.82	1	FLOW	149.	138.
				TIME	5.33	5.33
ROUTED TO						
+	RCP3	5.82	1	FLOW	149.	138.
				TIME	5.58	5.50
[redacted]GRAPH AT						
+	MNW-K	1.43	1	FLOW	120.	114.
				TIME	5.42	5.42
2 COMBINED AT						
+	CP4	7.25	1	FLOW	268.	252.
				TIME	5.50	5.50
ROUTED TO						
+	RCP4	7.25	1	FLOW	268.	252.
				TIME	5.58	5.58
HYDROGRAPH AT						
+	MNW-L	.27	1	FLOW	103.	99.
				TIME	3.75	3.75
HYDROGRAPH AT						
+	MNW-M	.49	1	FLOW	145.	139.
				TIME	4.25	4.25
3 COMBINED AT						
+	CP5	8.01	1	FLOW	404.	383.
				TIME	5.17	5.17
ROUTED TO						
[redacted]	T12	8.01	1	FLOW	403.	382.
				TIME	5.25	5.25
ROUTED TO						
+	.	8.01	1	FLOW	402.	381.
				TIME	5.42	5.42

2 COMBINED AT

+	T12	20.85	1	FLOW	5647.	5239.
				TIME	8.00	8.00

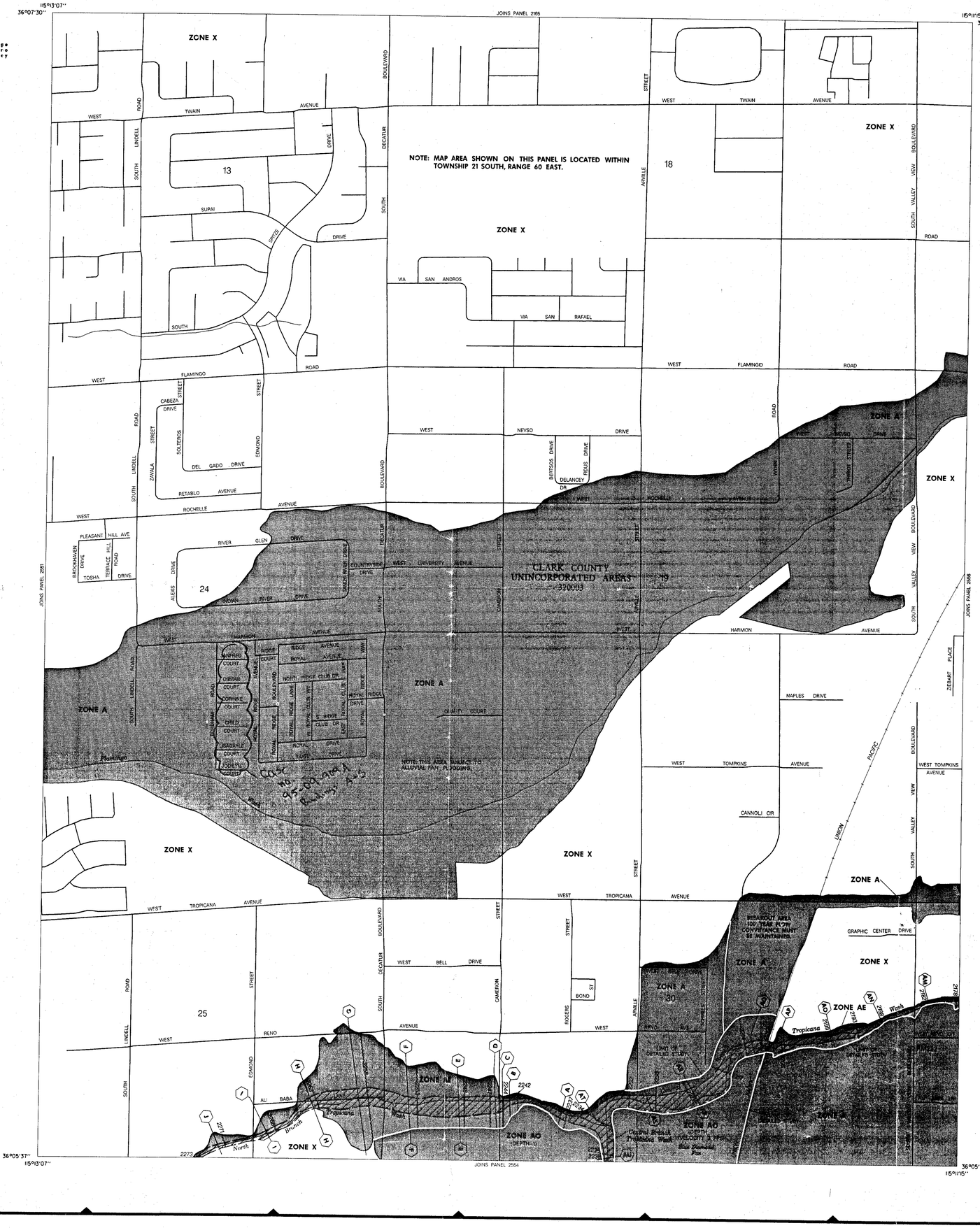
*** NORMAL END OF HEC-1 ***

EXHIBIT 5-18

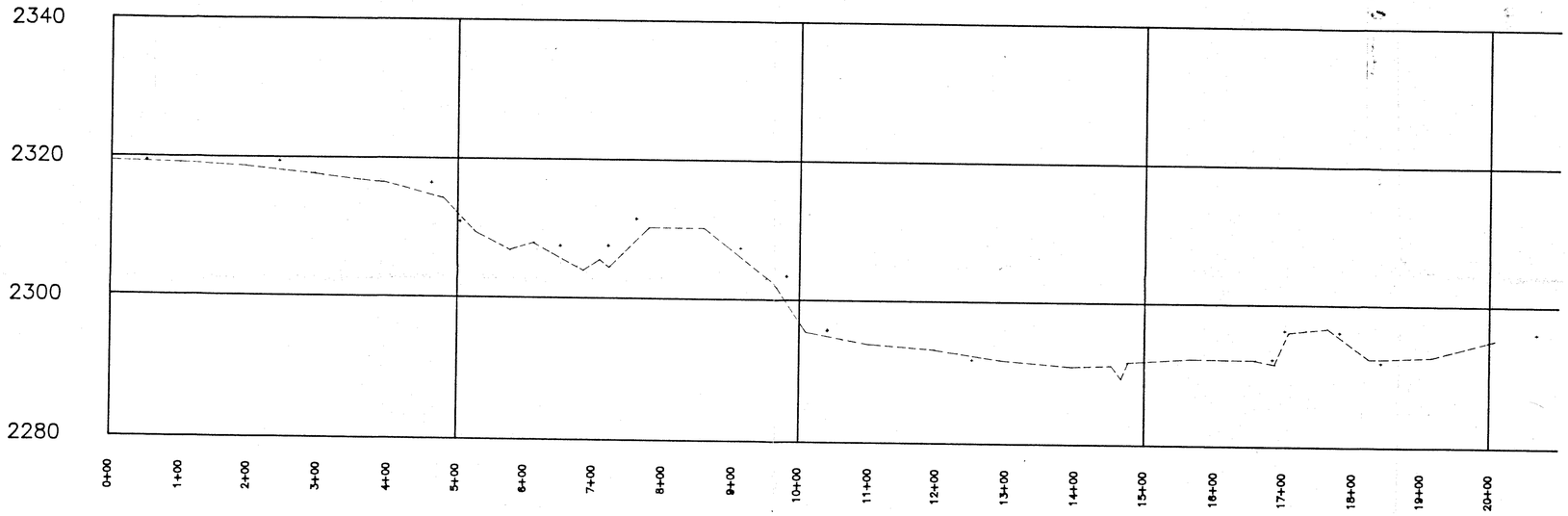
HEC - 1 COMPUTER FILES

ELEVATION REFERENCE MARKS

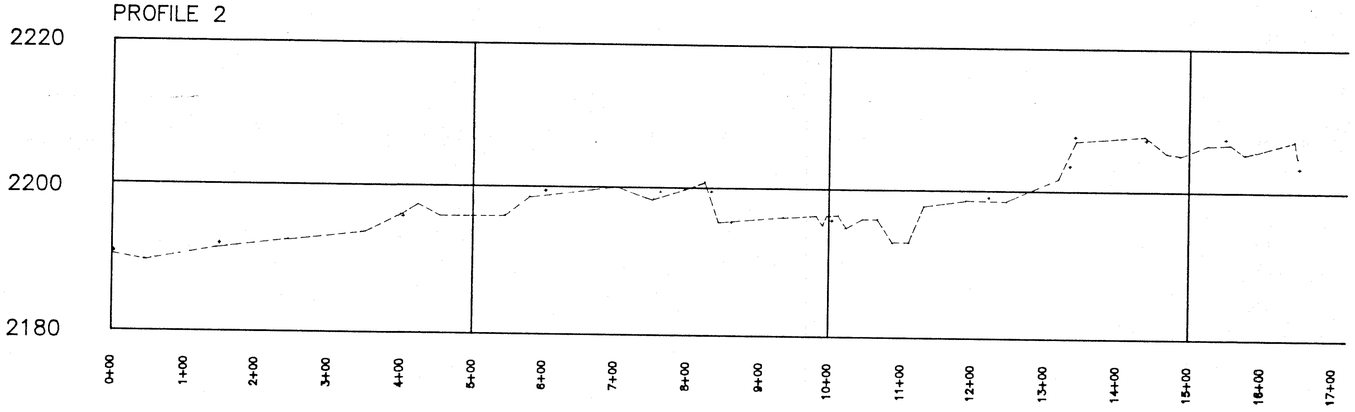
REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
RM222	2189.28	Northwest top of bolt upper flange of hydrant. South side of Rare Avenue and 350 feet east of Valley View Boulevard.



PROFILE 1



PROFILE 2



PROFILE 3



LEGEND

--------- FIELD PROFILE (9-21-92)

\+ INTERPOLATED AND SCALED LOCATION FROM 1" =400' SCALE MAPPING

SCALE:
HORIZ. 1" =100'
VERT. 1" =10'

CHECK PROFILES FOR

TROPICANA WASH

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD #80
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROFESSIONAL LAND SURVEYOR STATE OF NEVADA
WILLIAM
No. 5571
10/8/92

Clark County Regional
Flood Control District

FLOOD INSURANCE STUDY
RESTUDY
TROPICANA WASH AND TRIBUTARIES

Technical Support Data Notebook

Volume 2 of 3
Section 6

CH2M HILL

Technical Support Data Notebook

For

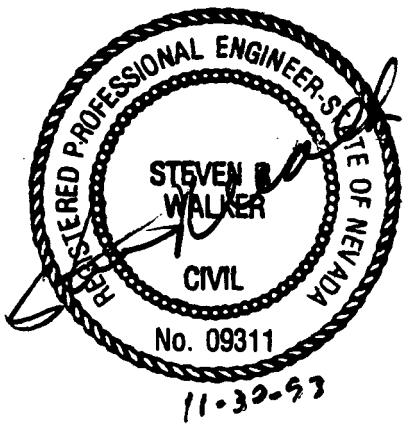
FLOOD INSURANCE STUDY

RESTUDY

TROPICANA WASH AND TRIBUTARIES

Clark County, Nevada
(Unincorporated Areas)

VOLUME II OF III



Submitted by:	Clark County Regional Flood Control District
Study Contractor:	CH2M HILL
Date Submitted:	January 20, 1993

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3	SECTION 3 MEETING MINUTES/REPORTS (Volume 1)
4	SECTION 4 GENERAL CORRESPONDENCE (Volume 1)
5	SECTION 5 HYDROLOGIC ANALYSES (Volume 1)
6	SECTION 6 HYDRAULIC ANALYSES (Volume 2)
7	SECTION 7 KEY TO CROSS-SECTION xs) LABELING (Volume 3)
8	SECTION 8 DRAFT FIS REPORT TEXT (Volume 3)
9	SECTION 9 MAPPING INFORMATION (Volume 3)
10	SECTION 10 MISCELLANEOUS REFERENCE MATERIALS (Volume 3)

THIS RUN EXECUTED 8JUL92 10:38:17

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

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


T1  CCRFCD Tropicana Wash F.I.S.;     RDD33832
T2  North Tropicana Wash, Approximate Methods
T3      NT-2-a.hc2

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0                                  0.0170                          510       2342

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1         43         8         55         26         56         13         14         15
      4        53         54

J5  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********

        J       -10

NC    0.040      0.040      0.040
X1        1          4        100        270
GR   2343.6        100     2341.9        160     2341.9        180     2343.3        270
```

THIS RUN EXECUTED 8JUL92 10:38:24

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

NT-2-a.hc2

SUMMARY PRINTOUT

SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
1.000	2343.29	510.00	1.39	0.00	4.13	0.00	0.00	510.00	0.00	158.03	111.08	269.11

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 8JUL92 10:46:27

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

T1 CCRFCD Tropicana Wash F.I.S.; RDD33832
T2 North Tropicana Wash, Approximate Methods
T3 NT-2-c.hc2

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	0	0	0	0.0145	0	0	442	2380.5	0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	1	43	8	55	26	56	13	14	15
4	53	54							

J5	LPRNT	NUMSEC	********REQUESTED SECTION NUMBERS********
	0	-10	

NC	0.025	0.025	0.025	0	0					
X1	1	8	150	500	0	0	0	0	0	0
GR	2381.7	0	2381.0	60	2381.0	150	2380.0	230	2380.0	250
GR	2380.4	310	2380.0	360	2381.1	500				

THIS RUN EXECUTED 8JUL92 10:46:35

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

NT-2-c.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	1.000	2380.69	442.00	0.69	0.00	3.74	0.00	0.00	442.00	0.00	273.81	174.49	448.30

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

THIS RUN EXECUTED 8JUL92 11:03:49

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

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


T1     CCRFCD Tropicana Wash F.I.S.; RDD33832
T2     North Tropicana Wash, Approximate Methods
T3      NT-3-a.hc2

J1  ICHECK    INQ       NINV      IDIR       STRT      METRIC    HVINS     Q         WSEL      FQ

       0         0         0         0     0.0074         0         0       545      2350         0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1        43         8        55        26        56        13        14        15
      4        53        54

J5  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********

        )       -10

NC    0.035     0.035     0.035         0         0
X1        1        11       125       285         0         0         0         0         0         0
GR   2364.0       100    2364.0       125    2360.0       140    2356.0       150    2352.0       190
GR   2348.0       220    2346.8       240    2346.8       255    2348.0       270    2360.0       285
GR   2364.0       405
```

THIS RUN EXECUTED 8JUL92 11:03:56

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

NT-3-a.hc2

SUMMARY PRINTOUT

SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
1.000	2349.18	545.00	2.38	0.00	5.24	0.00	0.00	545.00	0.00	60.33	211.15	271.48

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 8JUL92 11:48:10

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

```
T1     CCRFCD Tropicana Wash F.I.S.; RDD33832
T2     North Tropicana Wash, Approximate Methods
T3      NT-5-c.hc2

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

               0         0         0    0.0167         0         0       423      2461         0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1        43         8        55        26        56        13        14        15
      4        53        54

J5  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********

              -10

NC    0.030     0.030     0.030         0         0
X1        1         5       270       550         0         0         0         0         0
GR   2462.0       100    2462.0       270    2460.4       375    2460.4       390    2463.4       550
```

THIS RUN EXECUTED 8JUL92 11:48:17

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

NT-5-c.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	1.000	2461.53	423.00	1.13	0.00	4.54	0.00	0.00	423.00	0.00	149.67	300.71	450.38

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

THIS RUN EXECUTED 8JUL92 11:51:01

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

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


T1     CCRFCD Tropicana Wash F.I.S.; RDD33832
T2     North Tropicana Wash, Approximate Methods
T3      NT-5-f.hc2

J1  ICHECK    INQ       NINV      IDIR       STRT      METRIC    HVINS     Q         WSEL      FQ

               0         0         0     0.0148         0         0       323      2466         0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1        43         8        55        26        56        13        14        15
      4        53        54

J5  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********

      J       -10

NC    0.032     0.032     0.032         0         0
X1        1         6       350       500         0         0         0         0         0
GR   2468.0       100    2466.3       350    2463.7       405    2463.7       420    2466.8       500
GR   2468.0       670
```

THIS RUN EXECUTED 8JUL92 11:51:08

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

NT-5-f.hc2

SUMMARY PRINTOUT

SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
1.000	2465.08	323.00	1.38	0.00	4.93	0.00	0.00	323.00	0.00	79.88	375.78	455.65

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 8JUL92 11:56:16

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

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


T1     CCRFCD Tropicana Wash F.I.S.; RDD33832
T2     North Tropicana Wash, Approximate Methods
T3      NT-5-i.hc2

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

               0         0         0    0.0222         0         0       404      2440         0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1        43         8        55        26        56        13        14        15
      4        53        54

J5  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********

              -10

NC    0.035     0.035     0.035         0         0
X1        1         6       100       370         0         0         0         0         0
GR   2442.7       100    2440.0       220    2438.7       245    2438.7       260    2440.0       280
GR   2444.0       370
```

THIS RUN EXECUTED 8JUL92 11:56:23

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

NT-5-i.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	1.000	2440.36	404.00	1.66	0.00	5.40	0.00	0.00	404.00	0.00	84.25	203.90	288.15

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

THIS RUN EXECUTED 8JUL92 15:35:46

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

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


T1  CCRFCD Tropicana Wash F.I.S.;     RDD33832
T2  Central Tropicana Wash, Approximate Methods
T3      CT-2-a.hc2

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                                          0.0160                          882       2304

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1         43         8         55         26         56         13         14         15
      4         53        54

J5  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********

          1       -10

NC     0.037     0.037     0.037
X1         1        10       250       330
GR    2308.8       100    2308.0       170    2304.0       250    2300.0       280    2298.8       285
GR    2298.8       305    2300.0       310      2304       330      2308       480    2310.2       600
```

THIS RUN EXECUTED 8JUL92 15:35:53

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

CT-2-a.hc2

SUMMARY PRINTOUT

SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
1.000	2301.89	882.00	3.09	0.00	8.09	0.00	0.00	882.00	0.00	53.63	265.82	319.45

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 8JUL92 15:39:51

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

```
T1  CCRFCD Tropicana Wash F.I.S.;     RDD33832
T2  Central Tropicana Wash, Approximate Methods
T3      CT-2-e.hc2

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                                          0.0235                          608       2320

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

      38         1         43         8         55         26         56         13         14         15
       4         53        54

J5  LPRNT     NUMSEC                    ********REQUESTED SECTION NUMBERS********

                )       -10

NC    0.037     0.037     0.037
X1        1         8       340       500
GR   2329.3       100    2328.0       150    2324.0       340    2320.0       420    2317.5       450
GR   2317.5       460    2320.0       480    2322.7       500
```

THIS RUN EXECUTED 8JUL92 15:39:58

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

CT-2-e.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	1.000	2320.01	608.00	2.51	0.00	6.89	0.00	0.00	608.00	0.00	60.36	419.74	480.10

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

THIS RUN EXECUTED 8JUL92 15:55:22

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

T1 CCRFCD Tropicana Wash F.I.S.; RDD33832
T2 Central Tropicana Wash, Approximate Methods
T3 CT-4-a.hc2

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
					0.0211			1020	2564	

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	1	43	8	55	26	56	13	14	15
4	53	54							

J5	LPRNT	NUMSEC	********REQUESTED SECTION NUMBERS********						
	-10								

NC	0.032	0.032	0.032							
X1	1	10	430	600						
GR	2567.6	100	2564.0	340	2564.7	390	2564.0	430	2560.0	480
GR	2557.3	510	2557.3	530	2560.0	565	2564.0	600	2568.0	840

THIS RUN EXECUTED 8JUL92 15:55:29

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

CT-4-a.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	1.000	2559.97	1020.00	2.67	0.00	7.35	0.00	0.00	1020.00	0.00	84.17	480.39	564.55

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

THIS RUN EXECUTED 8JUL92 15:59:00

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

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


T1  CCRFCD Tropicana Wash F.I.S.;     RDD33832
T2  Central Tropicana Wash, Approximate Methods
T3      CT-4-b.hc2

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                                          0.0098                          855       2568

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1         43         8         55         26         56         13         14         15
      4         53        54

J5  LPRNT    NUMSEC                    ********REQUESTED SECTION NUMBERS********

                -10

NC    0.040     0.040     0.040
X1        1         8       140       290
GR   2574.9       100    2572.0       140    2568.0       160    2565.2       200    2565.2       210
GR   2568.0       250    2572.0       290    2576.0       430
```

THIS RUN EXECUTED 8JUL92 15:59:08

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

CT-4-b.hc2

SUMMARY PRINTOUT

SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
1.000	2568.24	855.00	3.04	0.00	5.29	0.00	0.00	855.00	0.00	93.55	158.82	252.37

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 8JUL92 16:01:42

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

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


T1  CCRFCD Tropicana Wash F.I.S.;     RDD33832
T2  Central Tropicana Wash, Approximate Methods
T3      CT-4-c.hc2

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                                          0.0145                          778       2588

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1         43         8         55         26         56         13         14         15
      4        53         54

J5  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********

                -10

NC    0.035     0.035     0.035
X1        1         8       310       460
GR   2594.2       100    2592.0       310    2588.0       360    2584.0       390    2584.0       430
GR   2588.0       445      2592       460    2595.6       580
```

THIS RUN EXECUTED 8JUL92 16:01:48

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

CT-4-c.hc2

SUMMARY PRINTOUT

SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
1.000	2586.08	778.00	2.08	0.00	7.24	0.00	0.00	778.00	0.00	63.40	374.40	437.80

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 8JUL92 16:13:12

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

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


T1     CCRFCD Tropicana Wash F.I.S.; RDD33832
T2     South Tropicana Wash, Approximate Methods
T3      ST-1-a.hc2

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                                          0.0108                          593       2452

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1         43         8         55         26         56         13         14         15
      4        53         54

J5  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********

                -10

NC    0.035      0.035      0.035
X1        1          5        280        470
GR   2460.0        100     2456.0        280     2447.2        350     2447.2        390     2454.7        470
```

THIS RUN EXECUTED 8JUL92 16:13:19

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

ST-1-a.hc2

SUMMARY PRINTOUT

SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
1.000	2449.06	593.00	1.86	0.00	5.55	0.00	0.00	593.00	0.00	74.68	335.18	409.87

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 8JUL92 16:23:10

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

T1 CCRFCD Tropicana Wash F.I.S.; RDD33832
T2 South Tropicana Wash, Approximate Methods
T3 ST-1-d.hc2

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
					0.0148			497	2467	

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38 1 43 8 55 26 56 13 14 15
4 53 54

J5	LPRNT	NUMSEC	********REQUESTED SECTION NUMBERS********
		-10	

NC	0.035	0.035	0.035							
X1	1	9	310	360						
GR	2473.0	100	2472.0	230	2468.0	310	2464.0	320	2463.1	336
GR	2463.1	340	2464.0	350	2468.0	360	2472.0	710		

THIS RUN EXECUTED 8JUL92 16:23:19

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

ST-1-d.hc2

SUMMARY PRINTOUT

SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
1.000	2465.52	497.00	2.42	0.00	7.47	0.00	0.00	497.00	0.00	37.58	316.21	353.79

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 8JUL92 16:31:08

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

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


T1     CCRFCD Tropicana Wash F.I.S.; RDD33832
T2     South Tropicana Wash, Approximate Methods
T3      ST-1-e.hc2

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                                          0.0154                          425       2510

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1         43         8         55         26         56         13         14         15
      4         53        54

J5  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********

          -10

NC    0.040     0.040     0.040
X1        1         7       340       380
GR   2513.2       100    2512.0       270    2508.0       340    2507.4       350    2507.4       370
GR   2508.0       380    2511.5       460
```

THIS RUN EXECUTED 8JUL92 16:31:18

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

ST-1-e.hc2

SUMMARY PRINTOUT

SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
1.000	2509.04	425.00	1.64	2.99	6.04	2.99	28.27	359.80	36.93	81.93	321.82	403.75

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 8JUL92 16:33:54

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

T1 CCRFCD Tropicana Wash F.I.S.; RDD33832
T2 South Tropicana Wash, Approximate Methods
T3 ST-2-a.hc2

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
					0.0364			1502	2470	

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	1	43	8	55	26	56	13	14	15
4	53	54							

J5	LPRNT	NUMSEC	********REQUESTED SECTION NUMBERS********
	-10		

NC	0.035	0.035	0.035							
X1	1	7	200	550						
GR	2472.5	100	2472.0	200	2468.0	305	2466.8	320	2466.8	340
GR	2468.0	350	2472.0	550						

THIS RUN EXECUTED 8JUL92 16:34:01

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

ST-2-a.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	1.000	2469.72	1502.00	2.92	0.00	6.57	0.00	0.00	1502.00	0.00	175.83	259.96	435.79

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

THIS RUN EXECUTED 8JUL92 16:44:18

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

T1 CCRFCD Tropicana Wash F.I.S.; RDD33832
T2 South Tropicana Wash, Approximate Methods
T3 ST-2-d.hc2

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
					0.0167			962	2552	

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	1	43	8	55	26	56	13	14	15
4	53	54							

J5	LPRNT	NUMSEC	********REQUESTED SECTION NUMBERS********						
	-10								

NC	0.032	0.032	0.032							
X1	1	10	450	640						
GR	2554.5	100	2552.0	450	2551.2	500	2551.2	508	2552.0	530
GR	2552.2	560	2552.0	580	2550.7	600	2552.0	640	2554.3	970

THIS RUN EXECUTED 8JUL92 16:44:27

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

ST-2-d.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	1.000	2552.55	962.00	1.85	2.23	4.97	2.23	47.70	865.43	48.88	346.55	372.69	719.23

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

THIS RUN EXECUTED 8JUL92 16:49:27

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

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


T1     CCRFCD Tropicana Wash F.I.S.; RDD33832
T2     South Tropicana Wash, Approximate Methods
T3      ST-2-e.hc2

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                                          0.0167                          776       2573

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1         43         8         55         26         56         13         14         15
      4         53        54

J5  LPRNT    NUMSEC                    *********REQUESTED SECTION NUMBERS*********

           -10

NC    0.035      0.035      0.035
X1        1          4        100       230
GR   2575.0        100     2571.2       160    2571.2        185    2574.3        230
```

THIS RUN EXECUTED 8JUL92 16:49:35

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

ST-2-e.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	1.000	2573.29	776.00	2.09	0.00	6.58	0.00	0.00	776.00	0.00	88.19	127.08	215.27

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

THIS RUN EXECUTED 8JUL92 16:52:18

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

ST-2-f.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	1.000	2633.39	638.00	1.69	0.00	5.80	0.00	0.00	638.00	0.00	105.44	203.30	308.73

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

THIS RUN EXECUTED 8JUL92 16:52:09

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

T1 CCRFCD Tropicana Wash F.I.S.; RDD33832
T2 South Tropicana Wash, Approximate Methods
T3 ST-2-f.hc2

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
					0.0188			638	2635.0	

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	1	43	8	55	26	56	13	14	15
4	53	54							

J5	LPRNT	NUMSEC	********REQUESTED SECTION NUMBERS********
		-10	

NC	0.030	0.030	0.030							
X1	1	5	100	330						
GR	2636.0	100	2631.7	270	2631.7	295	2636.0	330	2640.0	540

THIS RUN EXECUTED 8JUL92 16:58:03

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

ST-2-h.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	1.000	2645.82	505.00	1.82	0.00	5.24	1.45	0.00	490.86	14.14	148.19	113.69	261.87

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

T[redacted]NA WASH FIS
M[redacted]ngs "n" Computations
Flamingo to I-15

REACH	RIVER MI.	BASE N	IRREG.	OBSTRUCT	VEGETAT	MANNINGS N	COMMENTS
F1 CHAN	0	0.03	0.005	0.001	0.005	0.041	Flamingo d.s. of Cambridge
LOB		0.02	0	0.005	0.003	0.028	Bare graded soil
ROB		0.016	0	0.01		0.026	Parking lot
F2 CHAN	0.083	0.03	0.01	0.005	0.01	0.055	
LOB		0.03	0.01	0.005	0.003	0.048	Graded fill w/ construction debri
ROB		0.03	0.01	0.005	0.003	0.048	Graded fill w/ construction debri
T3 CHAN	60	0.03	0.015	0.01	0.025	0.08	
LOB		0.03	0.01	0.005	0.003	0.048	Graded fill w/ construction debri
ROB		0.03	0.01	0.005	0.003	0.048	Graded fill w/ construction debri
T4 CHAN	60.08	0.03	0.015	0.02	0.03	0.095	
LOB		0.03	0.01	0.005	0.003	0.048	Graded fill w/ construction debri
ROB		0.03	0.01	0.005	0.003	0.048	Graded fill w/ construction debri
						0	
T5 CHAN	60.135	0.03	0.005	0.002	0.025	0.062	Channel filled w/ cattails
LOB		0.02				0.02	Maintained grass
ROB		0.02				0.02	Maintained grass
T6 CHAN	60.170	0.025	0.005		0.002	0.032	
LOB		0.02	0.003		0.002	0.025	
ROB		0.02	0.003		0.002	0.025	
T7 CHAN	60.301	0.028	0.002			0.03	
LOB		0.02		0.005	0.002	0.027	
ROB		0.02		0.005	0.002	0.027	
T8 CHAN	60.397	0.03	0.01	0	0.025	0.065	— USED 0.05 in model
LOB		0.02		0.005	0.002	0.027	
ROB		0.02		0.005	0.002	0.027	
T9 CHAN	60.705	0.025	0.007		0.015	0.047	
LOB		0.02		0.005	0.002	0.027	

TF [redacted]NA WASH FIS
M[redacted]ngs "n" Computations
Flamingo to I-15

REACH	RIVER MI.	BASE N	IRREG.	OBSTRUCT	VEGETAT	MANNINGS N	COMMENTS
ROB		0.02		0.005	0.002	0.027	
T10 CHAN	60.867	0.02			0.002	0.022	Well maintained grass channel
LOB		0.02			0.002	0.022	used 0.10 IN MODEL
ROB		0.02			0.002	0.022	
T11 CHAN	60.936	0.02	0.002		0.003	0.025	Well maintained vegetated channel
LOB		0.02	0.002		0.003	0.025	0.10 IN MODEL
ROB		0.02	0.002		0.003	0.025	0.10 IN MODEL
T12 CHAN	61.079	0.015				0.015	Concrete channel
LOB		0.025				0.025	Grass and parkin lots. NH needed 0.1 IN MODEL
ROB		0.025				0.025	Grass and parkin lots. NH needed 0.1 IN MODEL
T13 CHAN	61.141	0.02	0.002		0.003	0.025	Low capacity channel NH needed
LOB		0.025				0.025	Street 0.10 IN MODEL
ROB		0.025				0.025	Parking area 0.10 IN MODEL
T14 CHAN	61.235	0.025	0.003		0.01	0.038	
LOB		0.025	0.003		0.002	0.03	
ROB		0.025	0.003		0.002	0.03	
T15 CHAN	61.339	0.025	0.008		0.01	0.043	
LOB		0.025	0	0.1	0	0.125	Flow blocked by parking garage
ROB		0.025	0.003		0.002	0.03	
T16 CHAN		0.025	0.01	0.005		0.04	
LOB		0.025	0	0.1	0	0.125	Flow blocked by parking garage
ROB		0.025	0.003		0.002	0.03	

TROPICANA WASH FIS
Mannings "n" Computations
I-15 to UPRR

REACH	RIVER MI.	BASE N	IRREG.	OBSTRUCT	VEGETAT	MANNINGS N	COMMENTS
T17 CHAN	62.566	0.028	0.005	0.01		0.043	
LOB		0.025				0.025	
ROB		0.025				0.025	
T18 CHAN	62.763	0.028	0.008	0.01		0.046	
LOB		0.025				0.025	
ROB		0.025				0.025	
T19 CHAN	62.859	0.024	0.005	0.003		0.032	
LOB		0.02		~~0.05~~ 0.05		~~0.05~~ 0.07	
ROB		0.02				0.02	Auto Salvage stored in overbank
T20 CHAN	63.061	0.028	0.01	0.005		0.043	
LOB		0.028	0.005	0.003		0.036	
ROB		0.028	0.005	0.003		0.036	
T21 CHAN	63.26	0.028	0.02	0.005		0.053	
LOB		0.028	0.02	0.01		0.058	
ROB		0.028	0.01	0.005		0.043	

TT [redacted]NA WASH FIS
M[redacted]gs "n" Computations
Central Tributary

REACH	RIVER MI.	BASE N	IRREG.	OBSTRUCT	VEGETAT	MANNINGS N	COMMENTS
T22 CHAN	63.411	0.028	0.012	0.005		0.045	
LOB		0.028	0.008	0.004		0.04	
ROB		0.028	0.01	0.004		0.042	
N1 CHAN	63.282	0.025	0.005	0.005		0.035	used 0.025 IN MODEL
LOB		0.025	0.01	0.02		0.055	
ROB		0.025	0.01	0.02		0.055	
N2 CHAN	63.801	0.022	0.004	0.002		0.028	
LOB		0.025	0.01	0.005		0.04	
ROB		0.025	0.01	0.02		0.055	
C1 CHAN	63.886	0.028	0.002	0.002	0	0.032	Maintained gravel bed channel
LOB		0.02		0.005		0.025	Parking lot
ROB		0.02		0.005		0.025	Parking lot
C2b CHAN	63.979	0.028	0.005	0.002		0.035	
LOB		0.02		0.01		0.03	Parking area
ROB		0.028	0.008	0.01	0.01	0.056	ROB blocked by fence & wall
C2 CHAN	64.137	0.028	0.008	0.01		0.046	Chan encroached by protruding wall
LOB		0.02	0	0.04		0.06	Parking area blocked by a fence
ROB		0.028	0.006	0.015	0.005	0.054	
C2a CHAN	64.179	0.028	0.002	0.004		0.034	
LOB		0.028	0.005	0.008	0.005	0.046	
ROB		0.028	0.005	0.008	0.005	0.046	
C5 CHAN	64.366	0.028	0.008		0.005	0.041	
LOB		0.028	0.01		0.005	0.043	Wall blocks flow
ROB		0.028	0.01	0.06		0.098	Construction suppliesstored in ROB
C7 CHAN	64.461	0.03	0.011	0.005		0.046	
LOB		0.03	0.008	0.005	0.002	0.045	
ROB		0.03	0.008	0.04		0.078	Construction materials stored in ROB

TF [redacted]NA WASH FIS
Ma[redacted]ngs "n" Computations
Central Tributary

REACH	RIVER MI.	BASE N	IRREG.	OBSTRUCT	VEGETAT	MANNINGS N	COMMENTS
C8 CHAN	64.563	0.022	0.006	0.002	0.002	0.032	
LOB		0.024	0.01	0.01	0.004	0.048	
ROB		0.024	0.01	0.01	0.004	0.048	
C9 CHAN	64.677	0.022	0.011	0.004		0.037	
LOB		0.022	0.015	0.015	0.003	0.055	dumped fill & debri in terraces
ROB		0.022	0.015	0.015	0.003	0.055	
C10 CHAN	64.784	0.022	0.011	0.008	0.003	0.044	No well defined channel
LOB		0.022	0.015	0.015	0.003	0.055	
ROB		0.022	0.015	0.015	0.003	0.055	
C11 CHAN	64.989	0.025	0.006	0.003	0.002	0.036	
LOB		0.025	0.01	0.01	0.005	0.05	
ROB		0.025	0.01	0.01	0.005	0.05	
C12 CHAN	65.089	0.025	0.01	0.005	0.005	0.045	
LOB		0.025	0.01	0.01	0.005	0.05	
ROB		0.025	0.01	0.01	0.005	0.05	
C13 CHAN	65.381	0.025	0.01	0.002	0.002	0.039	No well defined channel
LOB		0.025	0.01	0.005	0.005	0.045	
ROB		0.025	0.01	0.005	0.005	0.045	
C14 CHAN	65.573	0.025	0.005	0.002	0.002	0.034	
LOB		0.025	0.008	0.005	0.003	0.041	
ROB		0.025	0.008	0.005	0.003	0.041	

ROPICANA WASH FIS
Mannings "n" Computations
North Tributary

REACH	RIVER MI.	BASE N	IRREG.	OBSTRUCT	VEGETAT	MANNINGS N	COMMENTS
N3 CHAN	90	0.028	0.01	0.005	0.01	0.053	
LOB		0.028	0.02	0.02	0.01	0.078	
ROB		0.028	0.02	0.02	0.01	0.078	
N4 CHAN	90.093	0.028	0.01	0.005	0.01	0.053	
LOB		0.024		0.005	0.005	0.034	
ROB		0.028	0.02	0.02	0.01	0.078	
N5 CHAN	90.188	0.024	0.003	0	0	0.027	
LOB		0.024	0.002	0.003	0.003	0.032	
ROB		0.024	0.002	0.003	0.003	0.032	
N6 CHAN	90.215	0.025	0.003	0.003		0.031	
LOB		0.025		0.06		0.085	Stored buuilding materials
ROB		0.025				0.025	Graded and cleared area
N7 CHAN	90.284	0.025	0.008			0.033	
LOB		0.025		0.06		0.085	
ROB		0.025				0.025	
N8 CHAN	90.381	0.028	0.008	0.01	0.005	0.051	
LOB		0.028	0.005	0.015	0.01	0.058	
ROB		0.028	0.005	0.015	0.01	0.058	
N10 CHAN	90.476	0.025	0.008	0.005	0.002	0.04	
LOB		0.025	0.008	0.005	0.007	0.045	
ROB		0.025	0.008	0.005	0.007	0.045	
N11 CHAN	90.667	0.025	0.005	0.005		0.035	
LOB		0.025	0.005	0.005	0.01	0.045	
ROB		0.025	0.005	0.005	0.01	0.045	

TROPICANA WASH FIS
Mannings "n" Computations
North Tributary

REACH	RIVER MI.	BASE N	IRREG.	OBSTRUCT	VEGETAT	MANNINGS N	COMMENTS
N12 CHAN	90.886	0.025	0.005	0.005		0.035	
LOB		0.025	0.01	0.01	0.005	0.05	
ROB		0.025	0.01	0.01	0.005	0.05	
N13 CHAN	91.235	0.025	0.008	0	0.002	0.035	
LOB		0.025	0.01	0.002	0.015	0.052	
ROB		0.025	0.01	0.002	0.015	0.052	
N14 CHAN	91.53	0.025	0.005		0.005	0.035	Ponding area. No defined channel
LOB		0.025	0.005		0.01	0.04	
ROB		0.025	0.005		0.01	0.04	
N15 CHAN	91.63	0.025	0.005			0.03	Improved channel
LOB		0.025	0.005	0.005	0.005	0.04	Wall may block flow
ROB		0.025	0.005	0.005	0.005	0.04	
N16 CHAN	91.926	0.025	0.008	0.002	0.003	0.038	
LOB		0.025	0.01	0.002	0.008	0.045	
ROB		0.025	0.01	0.002	0.008	0.045	

T[redacted]NA WASH FIS
M[redacted]ngs "n" Computations
South Tributary

REACH	RIVER MI.	BASE N	IRREG.	OBSTRUCT	VEGETAT	MANNINGS N	COMMENTS
S1 CHAN	30	0.022	0.008	0.005		0.035	Used 0.032
LOB		0.028	0.008	0.01	0.004	0.05	0.048
ROB		0.028	0.008	0.01	0.004	0.05	0.048
S2 CHAN	30.191	0.025	0.008	0.005		0.038	Low flow channel only
LOB		0.025	0.01	0.02	0.005	0.06	Fill & debris in channel terraces
ROB		0.025	0.01	0.02	0.005	0.06	
S3 CHAN	30.292	0.025	0.008	0.002		0.035	
LOB		0.025	0.01	0.008	0.002	0.045	
ROB		0.025	0.01	0.008	0.002	0.045	
S4 CHAN	30.584	0.025	0.006	0.002		0.033	Maintained gravel bed channel
LOB		0.025	0.01	0.006	0.002	0.043	Parking lot
ROB		0.025	0.01	0.006	0.002	0.043	Parking lot
S5 CHAN	31.079	0.028	0.008	0.002		0.038	
LOB		0.028	0.008	0.008	0.002	0.046	Parking area
ROB		0.028	0.008	0.008	0.002	0.046	ROB blocked by fence & wall
S6 CHAN	31.272	0.025	0.008	0.002		0.035	Chan encroached by protruding wall
LOB		0.028	0.008	0.006	0.002	0.044	Parking area blocked by a fence
ROB		0.028	0.008	0.006	0.002	0.044	

EXHIBIT 6-2

HEC - 2 NATURAL CONDITION FILES

FLAM-NAT.hc2

- Flamingo Wash to I-15
- Natural Run

HEC2 S/N: 1916530021 HMVersion: 6.50 Data File: flam-nat.hc2

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**********************************************
*  -2 WATER SURFACE PROFILES                 *
*                                            *
*  Version   4.6.2;  May 1991                *
*                                            *
*  RUN DATE    30AUG93     TIME    16:53:39  *
**********************************************
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**************************************
*  U.S. ARMY CORPS OF ENGINEERS      *
*  HYDROLOGIC ENGINEERING CENTER     *
*  609 SECOND STREET, SUITE D        *
*  DAVIS, CALIFORNIA 95616-4687      *
*          (916) 756-1104            *
**************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
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::::::::::::::::::::::::::::::::::::::::::::::
:::                                        :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
:::                                        :::
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H A E S T A D M E T H O D S

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

THIS RUN EXECUTED 30AUG93 16:53:40

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

TROPICANA WASH FLOOD INSURANCE STUDY

by CH2M Hill, 1992 RDD33832

Notes:
-discharges were based on those in the "Las Vegas Valley Flood Insurance Study Hydrology Report" by James M. Montgomery, Inc., September, 1991 (see CH2M Hill memo dated July 13, 1992)

-Manning's "n" values were estimated by field observations of channels and floodplains in conjunction with methods recommended in "Open Channel Hydraulics" by Chow, 1959
-"n" values of 0.10 in NC cards were used to reflect the existence of buildings with landscaping
-"n" values of .999 in NH cards were used to block out large, individual buildings

-stations and elevations obtained from 400 scale topo created by CH2M Hill from aerial photographs

At I15, (the upstream end of this run), 5100 cfs approaches the box culvert under this road. The F.H.W.A. culvert analysis program, HY-8 was used to calculate the amount of water that ends up flowing through the culvert, which was 3324 cfs. This is the discharge until section 60.887 where water from Airport Wash increases the flow to 5300 cfs.

At Paradise Road, section 60.705, there is a large box culvert. HY-8 was used to calculate the flow into the culvert and the amount that overtopped the road. Of the 5300 cfs, 3430 went into the culvert while 1870 went over the road. The portion that overtops travels down both a driveway and a parking lot and recombines with the 3430 cfs at the outlet of the culvert at section 60.491.

SPLIT FLOW BEING PERFORMED

SF

Split Flow at Flamingo Road, road cross-section is outflow weir
NS 5 60.135 60.171 -1 0.015 .00593
NG 0 2023.0 .01 2022.3 55 2023.4 110 2022.3 110.01 2023.0

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T1  CCRFCD  TROPICANA WASH F.I.S.;  RDD33832
T2  Main Tropicana Wash, Detailed Methods
T3     Flam-Nat.hc2            From confluence at Flamingo Wash to Box Culvert

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                           0.0070        0                             1989

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    -1        0         -1        0         0         0         0         0         0         15


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38        1         43        8         55        26        56        13        14        15
     4        53        54
    38        1         43        39        4         53        27        21        22        28
    54
   100       150

QT       1       5300
NC    .028       .026       .041       0.3        0.5

   begins on Flamingo Wash just downstream of Cambridge

X1  00.000        15      9934.4    10065.2         0         0         0
GR  2003.3     9681.2     2003.0     9707.6     2000.0     9867.1     1999.2     9934.4     1997.3     9948.1
GR  1988.2     9966.6     1988.1     9979.8     1983.2     9984.2     1983.2    10000.0     1983.2    10017.5
GR  1987.0    10032.9     1997.6    10051.3     2001.6    10065.2     2002.9    10265.5     2004.3    10341.4


X1  00.066        11      9956.3    10061.0       340       360       350
X3      10
GR  2004.4     9595.1     2000.8     9823.3     1998.1     9956.3     1985.7     9979.5     1984.0    10000.0
GR  1985.7    10020.5     2003.2    10061.0     2002.8    10119.1     2002.2    10165.5     2003.1    10241.6
GR  2005.8    10377.8

  Box culvert for Flamingo Wash under Cambridge St.
```

EXHIBIT 6-1

MANNINGS n TABLE

SB	1.05	1.6	2.6	0	37.7	1.4	302.5	0	1986.5	1984.0
NC	.048	.048	.055							
X1	00.083	20	9955.9	10073.2	80	80	90			
X2			1	1995.0	1998.5					
X3	10			9797.3						
BT	-3	9956	1998.9		10000	1998.5		10073	1999.2	
GR	2007.3	9485.7	2007.0	9525.1	2006.3	9650.0	2004.4	9784.9	2007.7	9797.3
GR	2006.4	9866.4	2002.9	9884.8	2003.9	9902.5	2001.3	9902.8	2000.5	9955.9
GR	1989.4	9973.0	1987.3	9984.5	1986.5	10000.0	1986.7	10019.8	1993.1	10030.2
GR	1997.6	10043.7	2006.8	10073.2	2008.0	10091.8	2008.8	10159.1	2011.0	10317.3
X1	00.110	11	9910.1	10046.7	145	135	140			
GR	2010.1	9813.3	2007.9	9848.3	2007.2	9910.1	2003.5	9923.4	2002.2	9947.2
GR	1989.0	9980.7	1987.5	10000.0	1988.5	10015.8	2009.7	10046.7	2009.3	10081.8
GR	2012.1	10285.0								

Begin Tropicana Wash

NC	.048	.048	.080	0.1	0.3					
X1	60.000	13	9878.2	10040.0	160	200	180			
GR	2012.4	9727.7	2011.0	9797.6	2011.3	9878.2	2001.1	9915.5	2000.3	9927.1
GR	1992.7	9944.2	1992.7	9965.4	1993.7	9980.6	1990.3	10000.0	2009.6	10040.0
GR	2010.6	10083.8	2014.4	10209.2	2015.1	10342.3				
NC	.048	.048	.095							
X1	60.080	13	9919.2	10053.2	470	400	420			
X3	10									
GR	2023.9	9717.8	2021.9	9882.0	2020.1	9919.2	2008.7	9951.9	2007.4	9973.3
GR	2004.6	9982.4	2003.7	10000.0	2017.6	10053.2	2015.6	10146.3	2014.7	10256.7
GR	2017.2	10400.6	2018.9	10407.5	2019.7	10468.3				
NC	.02	.02	.062	0.3	0.5					
X1	60.135	10	9959.3	10041.9	305	295	295			
X3	10									
GR	2029.6	9680.1	2028.2	9762.3	2024.9	9842.6	2022.8	9959.3	2014.7	9976.9
GR	2013.9	10000.0	2013.9	10020.0	2021.5	10040.8	2021.8	10041.9	2021.2	10227.6

Box culvert for Tropicana Wash under Flamingo Rd.

SB	1.05	1.6	2.7	0	37.4	1.4	180	0	2014.3	2013.9
NC	.025	.025	.032							
X1	60.171	20	9968.8	10047.6	160	229	185			
X2			1	2019.3	2022.8					
X3	10					10379.7				
BT	-4	9750	2025.0		10083	2022.7		10132.9	2022.9	
BT		10327.3	2021.7							
GR	2026.6	9387.9	2030.0	9488.2	2030.3	9624.5	2029.4	9667.2	2024.5	9794.4
GR	2023.6	9873.0	2022.7	9941.5	2022.1	9967.8	2022.4	9968.8	2015.4	9981.0
GR	2014.3	10000.0	2014.5	10017.0	2020.8	10037.8	2022.5	10047.6	2022.9	10132.9
GR	2021.7	10327.3	2024.1	10379.7	2021.3	10604.4	2018.2	10652.0	2019.7	10762.4

encroachments in next section reflect 4:1 flow expansion

X1	60.219	15	9975.8	10034.9	190	320	255			
X3	10			9900		10070				
GR	2030.1	9473.0	2029.3	9616.4	2025.9	9668.6	2025.6	9788.0	2024.4	9875.1
GR	2025.1	9975.8	2020.6	9983.6	2019.2	10000.0	2020.0	10021.4	2026.3	10034.9
GR	2025.8	10049.7	2023.7	10117.3	2025.2	10212.7	2026.3	10232.3	2026.1	10292.9
X1	60.276	18	9923.0	10065.2	280	320	300			
X3	10									
GR	2029.6	9167.5	2029.6	9638.1	2028.1	9718.2	2027.6	9853.0	2027.6	9853.0
GR	2029.2	9923.0	2023.9	9954.1	2021.6	10000.0	2022.5	10050.1	2030.2	10065.2
GR	2028.7	10201.3	2028.9	10225.0	2033.1	10279.2	2031.6	10368.2	2031.0	10568.4
GR	2037.5	10626.2	2043.8	10690.2	2043.8	10715.4				

Box culvert for Tropicana Wash under Swenson St
-along edge of bridge deck is 3 ft. high barrier which blocks flow over road

SB	.9	1.6	2.6	0	74.5	2.5	295.2	0	2021.8	2021.6
NC	.027	.027	.030							
X1	60.301	23	9905.1	10076.9	130	160	135			
X2			1	2025.9	2028.4					
X3	10			9677.6						
BT	-3	9700	2032.0		10000	2028.4		10140	2032.0	
GR	2026.2	9168.2	2025.1	9284.7	2025.5	9406.4	2028.1	9413.9	2029.2	9456.1
GR	2029.2	9543.6	2030.5	9596.3	2030.5	9655.1	2031.2	9677.6	2030.4	9792.2
GR	2029.4	9882.9	2029.3	9905.1	2028.5	9932.2	2022.6	9942.4	2021.8	10000.0
GR	2022.6	10053.7	2029.8	10076.9	2030.4	10111.4	2029.9	10196.1	2030.9	10260.5
GR	2031.2	10349.4	2032.2	10649.1	2033.1	10973.1				

```
X1    60.345        20      9922.9    10053.0       260       200       230
X3        10                          9606.8                10234.5
GR    2029.3      9364.8    2028.8     9417.7    2030.4     9426.0    2030.1     9471.2    2033.1     9492.1
GR    2033.6      9551.5    2032.3     9561.2    2033.4     9606.8    2032.9     9667.0    2032.8     9922.9
GR    2031.9      9948.0    2030.0     9960.8    2024.9     9966.8    2024.1    10000.0    2024.2    10038.0
GR    2032.8     10053.0    2031.2    10161.2    2032.2    10234.5    2031.2    10292.2    2031.5    10456.8

NC      .027        .027       .05        .1        .3

X1    60.397        20      9958.9    10051.6       270       280       275
X3        10                          9553.1
GR    2031.4      9369.8    2031.1     9421.2    2032.8     9428.6    2033.4     9470.5    2035.3     9503.1
GR    2035.7      9553.1    2034.4     9559.0    2034.2     9667.6    2033.4     9942.4    2035.9     9958.9
GR    2025.0     10000.0    2025.5    10024.0    2035.1    10051.6    2034.5    10068.4    2036.0    10091.1
GR    2035.3     10230.7    2033.2    10239.5    2033.5    10313.2    2032.8    10400.1    2033.7    10570.4
```

High conveyance changes due to channel changes. Channel at 60.397 is improved with smooth sides and little vegetation. Channel at 60.446 is natural and irregular with dense, tall grass in the bottom.

```
X1    60.446        15      9949.6    10062.9       270       255       260
X3        10                          9600.0
GR    2035.3      9448.0    2038.7     9533.8    2038.3     9644.2      2036     9689.7      2036     9745.4
GR      2036      9822.1      2036     9859.1      2036     9914.9    2036.5     9949.6    2028.5     9972.9
GR    2027.1     10000.0    2027.9    10037.5    2039.1    10062.9    2041.0    10083.5    2041.3    10183.8
```

Section 60.491 is immediately downstream of the outlet of a large box culvert on Palos Verde alignment

```
X1    60.491        25      9937.6    10056.7       260       220       240
X3        10                                                10205.3
GR    2044.2      9332.7    2042.8     9377.0    2043.0     9441.4    2041.7     9505.5    2041.9     9546.4
GR    2043.7      9568.5    2042.1     9674.5    2042.0     9799.8    2039.2     9937.6    2035.6     9952.8
GR    2033.6      9965.7    2031.7    10000.0    2033.2    10024.2    2033.7    10038.0    2040.5    10056.7
GR    2042.8     10205.3    2039.7    10338.4    2038.5    10343.9    2037.5    10412.8    2037.9    10456.8
GR    2039.2     10470.6    2038.2    10573.1    2036.9    10637.8    2037.6    10740.3    2036.1    10801.4

NH        7         .027       9390       .999      9728       .020     9862.1       .020    10053.6       .020
NH    10100         .999      10410       .027     10487.2
```

The following 1870 cfs is that portion of the 5300 cfs that overflowed the road at section 60.705

```
QT        1         1870
```

The next two sections are over the box culvert

```
[redacted]0.587        16      9862.1    10053.6       515        500        505
X3 [redacted]  10                                              10187.3
GR    2044.2     9256.8     2043.5     9319.1     2043.8       9390     2044.2     9494.1     2043.0     9728.0
GR    2040.8       9820     2040.7     9825.5     2043.8     9862.1     2042.2     9968.4     2042.2    10000.0
GR    2042.2    10029.3     2043.1    10053.6     2043.3      10100     2043.7    10187.3     2043.7      10410
GR    2043.7    10487.2

NH         7       .027       9850       .999    10000.0        .02    10062.7       .020      10100       .999
NH     10194         .1    10358.7       .999    10724.2

X1    60.667         15    10000.0    10062.7       385        425        420
X3                                                             10194.0
GR    2046.5     9217.1     2045.8     9434.7     2043.4     9635.8     2043.5     9808.0     2043.8       9850
GR    2044.6     9952.6     2045.3    10000.0     2044.5    10022.3     2046.1    10062.7     2046.2      10100
GR    2046.3      10194     2045.7    10358.7     2044.6    10530.9     2045.4      10700     2045.5    10724.2

  Section 60.705 is the inlet of a large box culvert at the west side of
  Paradise Road

QT         1       5300

NH         3       .027       9876.2       .047    10238.3        .027      10485

X1    60.705         13      9970.2    10043.6       165        300        200
[redacted]     10
[redacted] following elevation was calculated from the FHWA culvert analysis
  program HY-8
X5         1     2048.9
GR    2050.3     9718.6     2048.2     9754.6     2048.0     9876.2     2043.7     9920.4     2043.2     9952.9
GR    2044.2     9970.2     2042.7    10000.0     2044.9    10043.6     2045.1    10097.1     2045.9    10238.3
GR    2047.8    10323.0       2048      10385       2050      10485

NH         4         0.1       9593.3       .027    9965.6        .047    10035.9       .027      10354.5

X1    60.800         27      9965.6    10035.9       535        355        505
X3        10
GR    2057.4     9073.1     2057.0     9230.3     2055.9     9461.6     2054.1     9522.7     2054.1     9554.5
GR    2054.7     9593.3     2053.4     9696.4     2049.1     9728.1     2048.7     9774.1     2047.5     9812.0
GR    2047.8     9866.3     2048.0     9916.9     2050.9     9949.8     2050.8     9965.6     2049.6     9975.1
GR    2047.8    10000.0     2048.0    10025.2     2050.7    10035.9     2049.6    10041.3     2048.6    10065.3
GR    2049.3    10098.9     2048.1    10132.6     2050.0    10148.6     2049.6    10161.5     2050.1    10174.0
GR    2052.6    10208.9     2051.8    10354.5

NC        .10       .022       .022         .3         .5

  Sections 60.866 through 60.912:
    Right bank was modified to reflect recent grading
[redacted]irport Wash is perpendicular to Tropicana Wash flow direction and was
[redacted]umed ineffective
```

X1	0.866	16	9951.0	10060.8	346	360	350			
X3	10					10060.8				
GR	2055.9	9206.7	2054.9	9416.1	2056.3	9436.9	2054.1	9523.7	2055.7	9725.4
GR	2056.6	9822.4	2057.3	9856.7	2057.8	9885.2	2056.7	9951.0	2050.3	9979.8
GR	2049.6	10000.0	2051.2	10028.7	2053.7	10060.8	2052.3	10272.8	2052.6	10423.7
GR	2051.4	10661.1								

NC		.10								
X1	60.887	20	9945.5	10065.0	110	108	110			
X3	10			9300		10150				
GR	2057.4	9054.8	2056.6	9256.3	2055.3	9457.6	2056.5	9704.3	2057.3	9845.4
GR	2059.1	9876.5	2058.7	9945.5	2051.3	9977.5	2049.8	10000.0	2050.9	10024.1
GR	2054.6	10034.1	2057.3	10046.1	2058.7	10065.0	2059.1	10144.3	2054.8	10164.2
GR	2054.8	10180.1	2054.8	10199.9	2055.2	10332.0	2053.7	10534.7	2054.6	10597.3

3324 cfs is the Q coming out of the box culvert under I-15

QT	1	3324								
X1	60.903	21	9940.3	10044.8	80	90	85			
X3	10			9880		10250				
GR	2057.5	9075.4	2056.1	9190.0	2057.4	9201.6	2057.8	9244.4	2055.6	9450.6
GR	2056.6	9643.7	2058.6	9940.3	2051.4	9967.9	2050.8	9984.0	2049.7	10000.0
GR	2050.3	10016.4	2051.1	10027.8	2058.4	10044.8	2058.8	10068.8	2059.0	10192.8
GR	2055.0	10212.6	2055.0	10228.5	2055.0	10246.7	2055.2	10316.3	2054.7	10499.7
GR	2054.6	10564.7								

Bridge over Tropicana Wash just downstream from Harbor Island Development
Bridge is called "Private Road #1" on the profiles

SB	1.25	1.6	2.6	0	50	2	366.8	0	2050.0	2049.7
X1	60.912	24	9934.0	10054.4	45	45	45			
X2			1	2057.6	2056.5					
X3	10			9870		10310				
BT	-6	9890	2056.5		9920	2056.5		9950	2061.0	
BT		10000	2061.0		10030	2056.5		10060	2056.5	
GR	2057.7	9069.0	2057.1	9080.3	2056.4	9127.0	2058.9	9144.3	2059.2	9193.5
GR	2060.2	9394.7	2057.7	9440.0	2057.7	9600.6	2056.4	9628.3	2058.2	9826.6
GR	2060.1	9863.8	2059.2	9934.0	2051.2	9976.2	2050.0	10000.0	2050.6	10016.5
GR	2058.7	10054.4	2058.9	10122.8	2060.3	10163.6	2056.6	10263.5	2054.7	10285.4
GR	2054.7	10297.6	2054.7	10316.6	2054.9	10460.5	2055.3	10520.7		

NC			.025	.1	.3					

[redacted]0.936	18	9934.1	10057.5	70	230	125				
X3 10			9930.5		10219.4					
GR 2059.1	9242.3	2058.8	9304.1	2059.8	9446.6	2061.4	9537.5	2058.0	9583.4	
GR 2058.2	9810.7	2061.1	9891.7	2060.1	9934.1	2051.9	9970.8	2050.9	10000.0	
GR 2051.6	10020.9	2060.3	10057.5	2060.3	10136.2	2060.3	10204.3	2063.0	10219.4	
GR 2062.8	10305.5	2059.4	10320.8	2059.4	10356.9					
X1 60.992	11	9946.7	10053.5	320	255	300				
X3			9780							
GR 2061.7	9396.5	2061.8	9596.7	2061.4	9786.1	2059.4	9946.7	2054.7	9969.6	
GR 2052.3	10000.0	2054.3	10027.7	2059.2	10053.5	2060.7	10108.7	2061.6	10293.1	
GR 2060.9	10346.9									
NC			.3	.5						
X1 61.036	15	9948.6	10047.0	215	235	228				
X3			9780							
GR 2064.4	9343.1	2065.0	9406.9	2063.3	9601.6	2062.2	9781.3	2059.9	9948.6	
GR 2055.5	9970.0	2053.6	10000.0	2054.7	10026.1	2061.4	10047.0	2062.2	10058.7	
GR 2065.9	10122.3	2065.0	10206.2	2067.0	10315.7	2061.4	10387.6	2060.6	10535.8	
X1 61.073	21	9954.6	10078.3	190	200	200				
[redacted] 10			9800		10560					
[redacted]2064.9	9405.8	2065.2	9446.7	2066.5	9615.9	2065.1	9702.0	2062.4	9856.8	
GR 2062.0	9943.7	2063.2	9954.6	2057.0	9973.5	2054.2	10000.0	2056.4	10033.0	
GR 2062.5	10053.3	2066.5	10078.3	2066.2	10161.2	2066.9	10206.6	2068.4	10247.3	
GR 2069.1	10507.9	2066.7	10542.9	2066.1	10638.9	2062.6	10653.2	2061.6	10679.2	
GR 2060.8	10773.4									

Bridge over Tropicana Wash at entrance to Harbor Island Hotel
Bridge is called "Private Road #2" on the profiles

SB 1.25	1.6	2.6	85	50.1	2.1	398.4	0	2054.2	2054.2
NC		.015							
X1 61.080	23	9968.5	10070.2	65	35	35			
X2		1	2062.5	2064.3					
X3 10			9780		10545				
GR 2064.5	9351.7	2065.1	9407.5	2064.8	9545.1	2065.5	9619.0	2065.5	9668.8
GR 2064.2	9767.8	2062.4	9890.3	2062.8	9942.4	2065.0	9968.5	2054.8	9975.3
GR 2054.1	10000.0	2054.7	10025.7	2063.6	10030.0	2065.8	10070.2	2065.5	10126.4
GR 2065.4	10139.8	2067.3	10186.4	2066.9	10257.6	2067.7	10326.8	2067.1	10558.4
GR 2065.3	10737.1	2062.3	10750.9	2062.2	10777.9				

There is a drop structure between sections 61.080 and 61.095

[redacted]

```
X1   61.095       20      9956.2    10048.1       85        40        78
X3        10                          9535                10535
GR   2068.2    9350.6    2068.7    9535.8    2066.7    9576.0    2066.9    9678.0    2063.4    9779.2
GR   2065.4    9943.1    2067.5    9956.2    2066.6    9967.8    2059.8    9973.3    2059.2    10000.
GR   2059.2   10033.2    2064.9   10037.5    2065.6   10048.1    2065.4   10063.7    2064.9   10141.
GR   2066.7   10220.3    2068.4   10313.7    2067.1   10446.8    2068.0   10563.4    2064.1   10825.


X1   61.118       22      9947.2    10056.1       155        78       120
X3        10                          9760                10070
GR   2068.0    9137.2    2066.5    9311.8    2068.7    9522.0    2068.5    9640.5    2070.1    9664.9
GR   2067.0    9724.0    2066.2    9829.3    2067.9    9901.1    2066.8    9929.7    2065.3    9947.2
GR   2061.0    9955.5    2057.9   10000.0    2059.9   10044.2    2064.1   10052.0    2065.3   10056.1
GR   2065.6   10143.3    2068.1   10180.5    2067.6   10278.2    2067.9   10410.4    2065.6   10504.0
GR   2066.4   10561.9    2065.5   10807.6

  Bridge over Tropicana Wash at Harmon

SB      1.05       1.6       2.6        80      62.5       2.5     246.0         0    2060.0    2057.9

NC                            .025

  Sections 61.142 to 61.237: encroachment limits put in on right overbank to
  reflect extent of effective flow due to expansion of flow area as channel
  [redacted]ns.

X1   61.142       20      9904.7    10056.3       150       165       130
X2                            1      2064.1    2065.9
X3        10                          9860                10070
GR   2069.9    9210.1    2068.0    9291.9    2069.3    9470.7    2068.8    9598.6    2070.8    9642.0
GR   2067.8    9766.8    2069.8    9793.3    2067.9    9877.6    2065.7    9904.7    2060.0    9965.0
GR   2060.0   10000.0    2060.0   10035.0    2065.4   10056.3    2068.1   10065.9    2066.8   10205.1
GR   2069.2   10264.1    2067.9   10421.4    2066.3   10466.3    2066.2   10557.7    2065.5   10614.8


NC                                    .1        .3

X1   61.166       18      9981.0    10014.6        60       140       125
X3                                    9880                10140
GR   2068.4    9232.9    2068.4    9232.9    2068.4    9276.4    2068.6    9382.6    2069.4    9568.0
GR   2069.9    9748.6    2068.7    9854.9    2066.5    9880.9    2066.0    9952.1    2065.7    9981.0
GR   2061.7   10000.0    2066.0   10014.6    2065.9   10036.2    2065.8   10111.2    2068.7   10129.5
GR   2068.5   10259.0    2070.3   10378.0    2067.7   10587.3


NC       .03        .03        .038

X1   61.237       12      9866.0    10062.9       410       330       375
X3        10                                                10334.9
G[redacted]  2080.1    9747.4    2080.5    9769.0    2079.6    9866.0    2072.3    9957.5    2069.1   10000.0
[redacted]  2069.8   10026.1    2075.2   10046.4    2075.9   10062.9    2072.2   10087.3    2073.7   10141.0
GR   2070.7   10158.0    2072.7   10334.9
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NC	.125	.030	.043							
X1	61.340	8	9982.8	10064.7	510	610	545			
X3				9960						
GR	2085.1	9634.6	2085.8	9750.1	2080.6	9982.8	2074.4	10000.0	2077.1	10017.1
GR	2078.2	10044.2	2084.6	10064.7	2084.8	10101.4				
X1	61.391	12	9941.4	10035.0	265	275	270			
X3	10			9941.4						
GR	2086.4	9674.6	2083.2	9744.0	2083.3	9941.4	2078.0	9949.8	2075.7	10000.0
GR	2078.4	10012.0	2086.7	10035.0	2090.2	10078.4	2090.6	10107.1	2089.3	10126.8
GR	2089.0	10172.1	2092.5	10337.7						

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

*PROF 1

CCHV= 0.300 CEHV= 0.500

*SECNO 0.000

0.000	8.55	1991.75	0.00	1989.00	1993.22	1.46	0.00	0.00	1999.20
4797.3	0.0	4797.3	0.0	0.0	494.3	0.0	0.0	0.0	2001.60
0.00	0.00	9.71	0.00	0.000	0.041	0.000	0.000	1983.20	9959.37
0.007023	0.	0.	0.	0	0	4	0.00	81.78	10041.15

FLOW DISTRIBUTION FOR SECNO= 0.00 CWSEL= 1991.75

STA= 9959. 10065.
PER Q= 100.0
AREA= 494.3
VEL= 9.7
DEPTH= 6.0

*SECNO 0.066

3[redacted]OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1998.10 ELREA= 2003.20

0.066	10.07	1994.07	0.00	0.00	1995.37	1.30	2.10	0.05	1998.10
4797.3	0.0	4797.3	0.0	0.0	524.5	0.0	4.1	0.6	2003.20
0.01	0.00	9.15	0.00	0.000	0.041	0.000	0.000	1984.00	9963.84
0.005189	340.	350.	360.	4	0	0	0.00	76.02	10039.87

FLOW DISTRIBUTION FOR SECNO= 0.07 CWSEL= 1994.07

STA= 9964. 10061.
PER Q= 100.0
AREA= 524.5
VEL= 9.1
DEPTH= 6.9

[redacted]

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

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.60	0.00	37.70	1.40	302.50	0.00	1986.50	1984.00

*SECNO 0.083

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2000.32	1996.50	0.18	244.	4536.	303.	309.	1995.00	1998.50	117.

[redacted]ENCROACHMENT STATIONS= 9797.3 10317.3 TYPE= 1 TARGET= -9797.300

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2000.50 ELREA= 2006.80

0.083	12.57	1999.07	0.00	0.00	1999.65	0.59	4.29	0.00	2000.50
4797.3	0.0	4797.3	0.0	0.0	779.9	0.0	5.4	0.8	2006.80
0.01	0.00	6.15	0.00	0.000	0.055	0.000	0.000	1986.50	9958.10
0.003180	80.	90.	80.	2	0	2	0.00	90.31	10048.41

FLOW DISTRIBUTION FOR SECNO= 0.08 CWSEL= 1999.07

STA= 9958. 10073.
PER Q= 100.0
AREA= 779.9
VEL= 6.2
DEPTH= 8.6

*SECNO 0.110

0.110	11.98	1999.48	0.00	0.00	2000.39	0.91	0.57	0.16	2007.20
4797.3	0.0	4797.3	0.0	0.0	625.2	0.0	7.7	1.1	2009.70
0.02	0.00	7.67	0.00	0.000	0.055	0.000	0.000	1987.50	9954.11
0.005476	145.	140.	135.	2	0	0	0.00	77.70	10031.80

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 0.11 CWSEL= 1999.48

STA= 9954. 10047.
PER Q= 100.0
AREA= 625.2
VEL= 7.7
DEPTH= 8.0

CCHV= 0.100 CEHV= 0.300
*SECNO 60.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.65

60.000	10.78	2001.08	0.00	0.00	2001.86	0.78	1.45	0.01	2011.30
4797.3	0.0	4797.3	0.0	0.0	676.6	0.0	10.4	1.5	2009.60
0.03	0.00	7.09	0.00	0.000	0.080	0.000	0.000	1990.30	9915.81
0.013079	160.	180.	200.	3	0	0	0.00	106.53	10022.34

[redacted]ISTRIBUTION FOR SECNO= 60.00 CWSEL= 2001.08

STA= 9916. 10040.
PER Q= 100.0
AREA= 676.6
VEL= 7.1
DEPTH= 6.4

*SECNO 60.080

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2020.10 ELREA= 2017.60

60.080	7.93	2011.63	2011.63	0.00	2013.95	2.32	11.31	0.46	2020.10
4797.3	0.0	4797.3	0.0	0.0	392.4	0.0	15.5	2.4	2017.60
0.04	0.00	12.22	0.00	0.000	0.095	0.000	0.000	2003.70	9943.49
0.084311	470.	420.	400.	3	19	0	0.00	86.88	10030.36

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 60.08 CWSEL= 2011.63

STA= 9943. 10053.
PER Q= 100.0
AREA= 392.4
VEL= 12.2
DEPTH= 4.5

CCHV= 0.300 CEHV= 0.500
*SECNO 60.135
3280 CROSS SECTION 60.13 EXTENDED 0.91 FEET

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2022.80 ELREA= 2021.80

0.135	8.21	2022.11	2022.11	0.00	2023.12	1.01	7.22	0.39	2022.80
4797.3	0.0	4157.5	639.8	0.0	496.2	112.6	18.9	3.6	2021.80
0.05	0.00	8.38	5.68	0.000	0.062	0.020	0.000	2013.90	9960.81
0.011463	305.	295.	295.	2	9	0	0.00	266.79	10227.60

FLOW DISTRIBUTION FOR SECNO= 60.13 CWSEL= 2022.11

STA= 9961. 10042. 10228.
PER Q= 86.7 13.3
AREA= 496.2 112.6
VEL= 8.4 5.7
DEPTH= 6.1 0.6

SPECIAL BRIDGE

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

5227 DOWNSTREAM ELEV IS 2020.77 , NOT 2022.11 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.70	0.00	37.40	1.40	180.00	0.00	2014.30	2013.90

*SECNO 60.171
3280 CROSS SECTION 60.17 EXTENDED 4.87 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.17

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
[redacted]3.65	2025.26	0.00	3417.	1885.	180.	180.	2019.30	2022.80	553.

3470 ENCROACHMENT STATIONS= 0.0 10379.7 TYPE= 1 TARGET= 10379.699

60.171	10.27	2024.57	0.00	0.00	2024.83	0.26	1.71	0.00	2022.40
5300.0	420.3	2978.3	1901.4	197.9	599.4	688.9	23.7	5.6	2022.50
0.06	2.12	4.97	2.76	0.025	0.032	0.025	0.000	2014.30	9792.54
0.000804	160.	185.	229.	2	0	6	0.00	587.16	10379.70

FLOW DISTRIBUTION FOR SECNO= 60.17 CWSEL= 2024.57

STA=	9793.	9873.	9942.	9968.	9969.	10048.	10133.	10327.	10380.
PER Q=	0.8	3.9	3.0	0.1	56.2	7.7	24.3	3.9	
AREA=	41.0	97.4	57.1	2.3	599.4	159.7	441.6	87.6	
VEL=	1.1	2.1	2.8	2.9	5.0	2.6	2.9	2.4	
DEPTH=	0.5	1.4	2.2	2.3	7.6	1.9	2.3	1.7	

*SECNO 60.219
3280 CROSS SECTION 60.22 EXTENDED 1.01 FEET

3301 HV CHANGED MORE THAN HVINS

[redacted]

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

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9900.0 10070.0 TYPE= 1 TARGET= 170.000

60.219	7.91	2027.11	2027.11	0.00	2028.55	1.44	0.42	0.59	2025.10
5300.0	1201.4	3854.7	243.9	172.2	365.6	48.6	30.1	7.9	2026.30
0.07	6.97	10.54	5.01	0.025	0.032	0.025	0.000	2019.20	9900.00
0.004816	190.	255.	320.	20	14	0	0.00	170.00	10070.00

FLOW DISTRIBUTION FOR SECNO= 60.22 CWSEL= 2027.11

STA=	9900.	9976.	10035.	10050.	10070.
PER Q=	22.7	72.7	1.3	3.3	
AREA=	172.2	365.6	15.7	33.0	
VEL=	7.0	10.5	4.3	5.4	
DEPTH=	2.3	6.2	1.1	1.6	

60.276

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2029.20 ELREA= 2030.20

60.276	7.38	2028.98	0.00	0.00	2029.76	0.77	1.00	0.20	2029.20
5300.0	0.0	5300.0	0.0	0.0	750.6	0.0	34.6	9.0	2030.20
0.08	0.00	7.06	0.00	0.000	0.032	0.000	0.000	2021.60	9924.27
0.002478	280.	300.	320.	5	0	0	0.00	138.55	10062.82

FLOW DISTRIBUTION FOR SECNO= 60.28 CWSEL= 2028.98

STA=	9924.	10065.
PER Q=	100.0	
AREA=	750.6	
VEL=	7.1	
DEPTH=	5.4	

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

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	74.50	2.50	295.20	0.00	2021.80	2021.60

*SECNO 60.301

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.63

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2036.99	2029.76	0.06	2219.	3086.	295.	295.	2025.90	2028.40	403.

3470 ENCROACHMENT STATIONS= 9677.6 10973.1 TYPE= 1 TARGET= -9677.600

60.301	9.72	2031.52	0.00	0.00	2031.70	0.17	1.94	0.00	2029.30
5300.0	365.7	4606.7	327.5	278.6	1293.4	295.8	38.8	10.5	2029.80
0.09	1.31	3.56	1.11	0.027	0.030	0.027	0.000	2021.80	9677.60
0.000358	130.	135.	160.	2	0	4	0.00	768.97	10446.57

FLOW DISTRIBUTION FOR SECNO= 60.30 CWSEL= 2031.52

STA=	9678.	9792.	9883.	9905.	10077.	10111.	10196.	10261.	10349.	10447.
PER Q=	1.3	4.0	1.6	86.9	1.2	2.8	1.5	0.5	0.1	
AREA=	83.0	147.3	48.3	1293.4	49.1	116.4	72.4	42.2	15.8	
VEL=	0.8	1.4	1.7	3.6	1.3	1.3	1.1	0.6	0.3	
DEPTH=	0.7	1.6	2.2	7.5	1.4	1.4	1.1	0.5	0.2	

*SECNO 60.345

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.30

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

3470 ENCROACHMENT STATIONS= 9606.8 10234.5 TYPE= 1 TARGET= 627.700

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2032.80 ELREA= 2032.80

60.345	6.98	2031.08	0.00	0.00	2032.53	1.45	0.19	0.64	2032.80
5300.0	0.0	5300.0	0.0	0.0	548.5	0.0	45.1	12.7	2032.80
0.10	0.00	9.66	0.00	0.000	0.030	0.000	0.000	2024.10	9953.54
0.003946	260.	230.	200.	3	0	0	0.00	96.45	10050.00

FLOW DISTRIBUTION FOR SECNO= 60.35 CWSEL= 2031.08

STA= 9954. 10053.
PER Q= 100.0
AREA= 548.5
VEL= 9.7
DEPTH= 5.7

[redacted] 0.100 CEHV= 0.300
*[redacted].0 60.397

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9553.1 10570.4 TYPE= 1 TARGET= -9553.100

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2035.90 ELREA= 2035.10

60.397	8.22	2033.22	2033.22	0.00	2035.89	2.67	2.15	0.37	2035.90
5300.0	0.0	5300.0	0.0	0.0	404.4	0.0	48.2	13.2	2035.10
0.10	0.00	13.11	0.00	0.000	0.050	0.000	0.000	2025.00	9969.00
0.022251	270.	275.	280.	20	11	0	0.00	77.20	10046.20

FLOW DISTRIBUTION FOR SECNO= 60.40 CWSEL= 2033.22

STA= 9969. 10052.
PER Q= 100.0
AREA= 404.4
VEL= 13.1
[redacted]TH= 5.2

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

*SECNO 60.446

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.05

3470 ENCROACHMENT STATIONS= 9600.0 10183.8 TYPE= 1 TARGET= -9600.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2036.50 ELREA= 2039.10

60.446	10.02	2037.12	0.00	0.00	2037.53	0.41	1.42	0.23	2036.50
5300.0	829.5	4470.5	0.0	294.8	817.4	0.0	52.7	14.7	2039.10
0.12	2.81	5.47	0.00	0.027	0.050	0.000	0.000	2027.10	9667.55
0.002396	270.	260.	255.	3	0	0	0.00	390.86	10058.41

FLOW DISTRIBUTION FOR SECNO= 60.45 CWSEL= 2037.12

[redacted]	9668.	9690.	9745.	9822.	9859.	9915.	9950.	10063.
PER Q=	0.4	3.4	4.7	2.3	3.4	1.4	84.3	
AREA=	12.4	62.4	85.9	41.4	62.5	30.2	817.4	
VEL=	1.8	2.9	2.9	2.9	2.9	2.5	5.5	
DEPTH=	0.6	1.1	1.1	1.1	1.1	0.9	7.5	

*SECNO 60.491
3280 CROSS SECTION 60.49 EXTENDED 1.79 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 0.0 10205.3 TYPE= 1 TARGET= 10205.299

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2039.20 ELREA= 2040.50

60.491	6.19	2037.89	2037.89	0.00	2040.04	2.16	1.33	0.52	2039.20
5300.0	0.0	5300.0	0.0	0.0	449.9	0.0	57.1	16.1	2040.50
0.12	0.00	11.78	0.00	0.000	0.050	0.000	0.000	2031.70	9943.15
0.023337	260.	240.	220.	20	14	0	0.00	106.36	10049.51

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

FLOW DISTRIBUTION FOR SECNO= 60.49 CWSEL= 2037.89

STA= 9943. 10057.
PER Q= 100.0
AREA= 449.9
VEL= 11.8
DEPTH= 4.2

1490 NH CARD USED
*SECNO 60.587

3265 DIVIDED FLOW

3280 CROSS SECTION 60.59 EXTENDED 0.14 FEET

3301 HV CHANGED MORE THAN HVINS

[redacted]ARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.40

3470 ENCROACHMENT STATIONS= 0.0 10187.3 TYPE= 1 TARGET= 10187.299

60.587	1.63	2043.83	0.00	0.00	2043.99	0.16	3.75	0.20	2043.80
1870.0	1131.5	675.3	63.2	340.2	217.6	59.0	63.3	21.0	2043.10
0.17	3.33	3.10	1.07	0.022	0.020	0.033	0.000	2042.20	9289.07
0.001472	515.	505.	500.	11	0	0	0.00	733.18	10187.30

FLOW DISTRIBUTION FOR SECNO= 60.59 CWSEL= 2043.83

STA= 9289. 9820. 9826. 9862. 10054. 10100. 10187.
PER Q= 43.0 5.5 12.0 36.1 3.3 0.0
AREA= 265.1 17.0 58.1 217.6 29.6 29.5
VEL= 3.0 6.0 3.9 3.1 2.1 0.0
DEPTH= 0.5 3.1 1.6 1.1 0.6 0.3

1490 NH CARD USED
*SECNO 60.667

[redacted]

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

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.47

3470 ENCROACHMENT STATIONS= 0.0 10194.0 TYPE= 1 TARGET= 10193.999

60.667	1.42	2044.82	0.00	0.00	2045.10	0.29	1.07	0.04	2045.30
1870.0	1865.2	4.8	0.0	433.5	2.7	0.0	68.1	26.5	2046.10
0.19	4.30	1.79	0.00	0.030	0.020	0.000	0.000	2043.40	9517.05
0.006750	385.	420.	425.	2	0	0	0.00	467.12	10030.31

FLOW DISTRIBUTION FOR SECNO= 60.67 CWSEL= 2044.82

STA=	9517.	9636.	9808.	9850.	9953.	9967.	10063.
PER Q=	16.2	70.1	13.1	0.3	0.0	0.3	
AREA=	84.1	235.4	49.0	63.3	1.6	2.7	
[redacted]L=	3.6	5.6	5.0	0.1	0.0	1.8	
[redacted]TH=	0.7	1.4	1.2	0.6	0.1	0.2	

1490 NH CARD USED
*SECNO 60.705
WATER EL=X5 CARD= 2048.900

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 6.43

60.705	6.20	2048.90	0.00	0.00	2049.03	0.13	0.36	0.02	2044.20
5300.0	1431.6	1328.2	2540.2	503.4	384.8	944.6	74.0	29.3	2044.90
0.21	2.84	3.45	2.69	0.045	0.047	0.041	0.000	2042.70	9742.60
0.001311	165.	200.	300.	0	0	0	0.00	687.39	10430.00

FLOW DISTRIBUTION FOR SECNO= 60.71 CWSEL= 2048.90

STA=	9743.	9755.	9876.	9920.	9953.	9970.	10044.	10097.	10238.	10323.	10385.	10430.
PER Q=	0.1	3.2	6.1	11.8	5.8	25.1	11.2	23.4	10.5	2.3	0.4	
AREA=	4.2	97.3	134.8	177.1	90.0	384.8	208.6	480.1	173.6	62.0	20.2	
VEL=	1.0	1.7	2.4	3.5	3.4	3.5	2.8	2.6	3.2	2.0	1.2	
DEPTH=	0.3	0.8	3.0	5.4	5.2	5.2	3.9	3.4	2.0	1.0	0.4	

[redacted]

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

1490 NH CARD USED
*SECNO 60.800

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

60.800	3.01	2050.81	2050.81	0.00	2051.36	0.55	0.98	0.12	2050.80
5300.0	3662.8	472.2	1165.0	565.5	147.4	235.2	88.4	35.1	2050.70
0.23	6.48	3.20	4.95	0.027	0.047	0.027	0.000	2047.80	9715.48
0.003856	535.	505.	355.	20	17	0	0.00	453.60	10183.94

FLOW DISTRIBUTION FOR SECNO= 60.80 CWSEL= 2050.81

STA=	9715.	9774.	9812.	9866.	9917.	9949.	10036.	10065.	10099.	10133.	10162.	10184.
PER Q=	9.4	12.9	23.9	19.4	3.6	8.9	4.0	6.1	7.6	3.5	0.9	
AREA=	98.8	102.8	171.7	147.4	44.9	147.4	44.7	62.6	71.2	41.3	15.6	
[redacted]EL=	5.0	6.6	7.4	7.0	4.3	3.2	4.7	5.2	5.6	4.5	3.0	
[redacted]TH=	1.7	2.7	3.2	2.9	1.4	2.1	1.5	1.9	2.1	1.4	0.7	

CCHV= 0.300 CEHV= 0.500
*SECNO 60.866
3280 CROSS SECTION 60.87 EXTENDED 4.40 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 0.0 10060.8 TYPE= 1 TARGET= 10060.799

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2056.70 ELREA= 100000.00

60.866	6.20	2055.80	2055.80	0.00	2057.97	2.16	1.47	0.81	2056.70
5300.0	0.0	5300.0	0.0	0.0	449.1	0.0	94.1	37.4	100000.00
0.24	0.00	11.80	0.00	0.000	0.022	0.000	0.000	2049.60	9955.03
0.004600	346.	350.	360.	20	17	0	0.00	105.76	10060.80

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

FLOW DISTRIBUTION FOR SECNO= 60.87 CWSEL= 2055.80

STA= 9955. 10061.
PER Q= 100.0
AREA= 449.1
VEL= 11.8
DEPTH= 4.2

*SECNO 60.887
3280 CROSS SECTION 60.89 EXTENDED 2.40 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9300.0 10150.0 TYPE= 1 TARGET= 850.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2058.70 ELREA= 2058.70

[redacted].887	7.20	2057.00	2057.00	0.00	2059.35	2.35	0.49	0.09	2058.70
[redacted]300.0	0.0	5300.0	0.0	0.0	431.0	0.0	95.2	37.6	2058.70
0.25	0.00	12.30	0.00	0.000	0.022	0.000	0.000	2049.80	9952.85
0.004325	110.	110.	108.	20	8	0	0.00	91.92	10044.77

FLOW DISTRIBUTION FOR SECNO= 60.89 CWSEL= 2057.00

STA= 9953. 10065.
PER Q= 100.0
AREA= 431.0
VEL= 12.3
DEPTH= 4.7

*SECNO 60.903
3280 CROSS SECTION 60.90 EXTENDED 5.22 FEET

3301 HV CHANGED MORE THAN HVINS

[redacted]

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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.60

3470 ENCROACHMENT STATIONS= 9880.0 10250.0 TYPE= 1 TARGET= 370.000

60.903	10.12	2059.82	0.00	0.00	2060.06	0.24	0.08	0.63	2058.60
3324.0	25.2	3123.2	175.6	86.0	778.0	379.9	96.8	38.1	2058.40
0.25	0.29	4.01	0.46	0.100	0.022	0.100	0.000	2049.70	9880.00
0.000251	80.	85.	90.	4	0	0	0.00	370.00	10250.00

FLOW DISTRIBUTION FOR SECNO= 60.90 CWSEL= 2059.82

STA=	9880.	9940.	10045.	10069.	10193.	10213.	10229.	10247.	10250.
PER Q=	0.8	94.0	0.2	0.8	0.8	1.5	1.8	0.2	
AREA=	86.0	778.0	29.3	114.4	55.9	76.7	87.8	15.9	
VEL=	0.3	4.0	0.3	0.2	0.5	0.7	0.7	0.4	
DEPTH=	1.4	7.4	1.2	0.9	2.8	4.8	4.8	4.8	

[redacted]SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	0.00	50.00	2.00	366.80	0.00	2050.00	2049.70

*SECNO 60.912

3265 DIVIDED FLOW

3280 CROSS SECTION 60.91 EXTENDED 4.91 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2060.41	2060.12	0.01	1553.	1788.	367.	365.	2057.60	2056.50	112.

3470 ENCROACHMENT STATIONS= 9870.0 10310.0 TYPE= 1 TARGET= 440.000

60.912	10.21	2060.21	0.00	0.00	2060.41	0.20	0.35	0.00	2059.20
3324.0	6.3	3071.7	246.0	38.3	814.1	532.3	98.2	38.5	2058.70
0.26	0.17	3.77	0.46	0.100	0.022	0.100	0.000	2050.00	9870.00
[redacted]00248	45.	45.	45.	2	0	3	0.00	434.83	10310.00

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

FLOW DISTRIBUTION FOR SECNO= 60.91 CWSEL= 2060.21

STA=	9870.	9934.	10054.	10123.	10161.	10264.	10285.	10298.	10310.
PER Q=	0.2	92.4	0.9	0.1	1.8	1.9	1.5	1.2	
AREA=	38.3	814.1	96.3	24.9	175.7	99.8	67.2	68.3	
VEL=	0.2	3.8	0.3	0.2	0.3	0.6	0.7	0.6	
DEPTH=	0.6	6.8	1.4	0.7	1.7	4.6	5.5	5.5	

CCHV= 0.100 CEHV= 0.300
*SECNO 60.936
3280 CROSS SECTION 60.94 EXTENDED 0.79 FEET

3470 ENCROACHMENT STATIONS= 9930.5 10219.4 TYPE= 1 TARGET= 288.900

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2060.10 ELREA= 2060.30

60.936	9.28	2060.18	0.00	0.00	2060.49	0.30	0.04	0.03	2060.10
3324.0	0.0	3324.0	0.0	0.2	752.1	0.0	101.9	39.6	2060.30
0.26	0.04	4.42	0.00	0.100	0.025	0.000	0.000	2050.90	9930.50
00504	70.	125.	230.	2	0	0	0.00	126.52	10057.02

FLOW DISTRIBUTION FOR SECNO= 60.94 CWSEL= 2060.18

STA=	9931.	9934.	10058.
PER Q=	0.0	100.0	
AREA=	0.2	752.1	
VEL=	0.0	4.4	
DEPTH=	0.0	6.1	

*SECNO 60.992

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.68

3470 ENCROACHMENT STATIONS= 9780.0 10346.9 TYPE= 1 TARGET= -9780.000

60.992	7.93	2060.23	0.00	0.00	2060.77	0.54	0.22	0.07	2059.40
3324.0	7.6	3310.1	6.2	27.8	559.4	19.6	106.5	40.7	2059.20
0.28	0.28	5.92	0.32	0.100	0.025	0.100	0.000	2052.30	9879.89
0.001105	320.	300.	255.	3	0	0	0.00	211.59	10091.48

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

FLOW DISTRIBUTION FOR SECNO= 60.99 CWSEL= 2060.23

STA=	9880.	9947.	10054. 10091.
PER Q=	0.2	99.6	0.2
AREA=	27.8	559.4	19.6
VEL=	0.3	5.9	0.3
DEPTH=	0.4	5.2	0.5

CCHV= 0.300 CEHV= 0.500
*SECNO 61.036

3470 ENCROACHMENT STATIONS= 9780.0 10535.8 TYPE= 1 TARGET= -9780.000

61.036	6.81	2060.41	0.00	0.00	2061.26	0.85	0.33	0.16	2059.90
3324.0	2.5	3321.5	0.0	9.2	447.5	0.0	109.3	41.6	2061.40
0.29	0.27	7.42	0.00	0.100	0.025	0.000	0.000	2053.60	9911.93
0.002023	215.	228.	235.	2	0	0	0.00	131.96	10043.89

FLOW DISTRIBUTION FOR SECNO= 61.04 CWSEL= 2060.41

S[redacted]	9912.	9949.	10047.
PER Q=	0.1	99.9	
AREA=	9.2	447.5	
VEL=	0.3	7.4	
DEPTH=	0.3	4.7	

*SECNO 61.073

3470 ENCROACHMENT STATIONS= 9800.0 10560.0 TYPE= 1 TARGET= 760.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2063.20 ELREA= 2066.50

61.073	6.51	2060.71	0.00	0.00	2061.99	1.28	0.52	0.21	2063.20
3324.0	0.0	3324.0	0.0	0.0	366.3	0.0	111.2	42.1	2066.50
0.29	0.00	9.07	0.00	0.000	0.025	0.000	0.000	2054.20	9962.17
0.003408	190.	200.	200.	2	0	0	0.00	85.19	10047.36

FLOW DISTRIBUTION FOR SECNO= 61.07 CWSEL= 2060.71

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

STA= 9962. 10078.
PER Q= 100.0
AREA= 366.3
VEL= 9.1
DEPTH= 4.3

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	85.00	50.10	2.10	398.40	0.00	2054.20	2054.20

*SECNO 61.080

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.94

CLASS A LOW FLOW

3420 BRIDGE W.S.= 2060.35 BRIDGE VELOCITY= 11.27 CALCULATED CHANNEL AREA= 295.

E.G.S	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2062.41	0.35	0.	3324.	398.	398.	2062.50	2064.30	0.

3470 ENCROACHMENT STATIONS= 9780.0 10545.0 TYPE= 1 TARGET= 765.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2065.00 ELREA= 2065.80

61.080	6.96	2061.06	0.00	0.00	2062.41	1.34	0.41	0.00	2065.00
3324.0	0.0	3324.0	0.0	0.0	357.4	0.0	111.5	42.2	2065.80
0.29	0.00	9.30	0.00	0.000	0.015	0.000	0.000	2054.10	9971.12
0.000908	65.	35.	35.	0	0	0	0.00	57.65	10028.77

FLOW DISTRIBUTION FOR SECNO= 61.08 CWSEL= 2061.06

STA= 9971. 10070.
PER Q= 100.0
AREA= 357.4
VEL= 9.3
DEPTH= 6.2

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

*SECNO 61.095

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9535.0 10535.0 TYPE= 1 TARGET= 1000.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2067.50 ELREA= 2065.60

61.095	4.62	2063.82	2063.82	0.00	2065.96	2.14	0.11	0.40	2067.50
3324.0	0.0	3324.0	0.0	0.0	283.0	0.0	112.1	42.3	2065.60
0.30	0.00	11.75	0.00	0.000	0.015	0.000	0.000	2059.20	9970.05
0.002218	85.	78.	40.	20	14	0	0.00	66.63	10036.68

FLOW DISTRIBUTION FOR SECNO= 61.10 CWSEL= 2063.82

ST= 9970. 10048.
PER Q= 100.0
AREA= 283.0
VEL= 11.7
DEPTH= 4.2

*SECNO 61.118
3280 CROSS SECTION 61.12 EXTENDED 0.69 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.24

3470 ENCROACHMENT STATIONS= 9760.0 10070.0 TYPE= 1 TARGET= 310.000

61.118	8.29	2066.19	0.00	0.00	2066.55	0.36	0.06	0.53	2065.30
3324.0	0.6	3321.2	2.3	4.6	685.8	12.0	113.4	42.6	2065.30
0.30	0.13	4.84	0.19	0.100	0.015	0.100	0.000	2057.90	9936.86
0.000212	155.	120.	78.	4	0	0	0.00	133.14	10070.00

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

FLOW DISTRIBUTION FOR SECNO= 61.12 CWSEL= 2066.19

STA=	9937.	9947.	10056.	10070.
PER Q=	0.0	99.9	0.1	
AREA=	4.6	685.8	12.0	
VEL=	0.1	4.8	0.2	
DEPTH=	0.4	6.3	0.9	

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.60	80.00	62.50	2.50	246.00	0.00	2060.00	2057.90

*SECNO 61.142
3280 CROSS SECTION 61.14 EXTENDED 2.92 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

[redacted]S	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2070.72	2066.58	0.03	911.	2413.	246.	246.	2064.10	2065.90	80.

3470 ENCROACHMENT STATIONS= 9860.0 10070.0 TYPE= 1 TARGET= 210.000

61.142	8.42	2068.42	0.00	0.00	2068.58	0.15	2.03	0.00	2065.70
3324.0	13.8	3305.2	5.0	49.7	1047.7	17.5	116.2	43.1	2065.40
0.31	0.28	3.15	0.28	0.100	0.025	0.100	0.000	2060.00	9860.00
0.000216	150.	130.	165.	2	0	2	0.00	210.00	10070.00

FLOW DISTRIBUTION FOR SECNO= 61.14 CWSEL= 2068.42

STA=	9860.	9878.	9905.	10056.	10066.	10070.
PER Q=	0.0	0.4	99.4	0.1	0.0	
AREA=	5.7	44.0	1047.7	16.1	1.4	
VEL=	0.1	0.3	3.2	0.3	0.1	
DEPTH=	0.3	1.6	6.9	1.7	0.3	

CCHV= 0.100 CEHV= 0.300

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

*SECNO 61.166
3280 CROSS SECTION 61.17 EXTENDED 1.18 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9880.0 10140.0 TYPE= 1 TARGET= 260.000

61.166	7.18	2068.88	2068.88	0.00	2070.34	1.45	0.07	0.39	2065.70
3324.0	565.1	2083.9	675.0	277.3	172.0	322.9	118.7	43.7	2066.00
0.32	2.04	12.12	2.09	0.100	0.025	0.100	0.000	2061.70	9880.00
0.004904	60.	125.	140.	20	12	0	0.00	260.00	10140.00

FLOW DISTRIBUTION FOR SECNO= 61.17 CWSEL= 2068.88

[redacted]	9880.	9881.	9952.	9981.	10015.	10036.	10111.	10130.	10140.
[redacted] Q=	0.1	11.2	5.8	62.7	4.1	14.9	1.3	0.0	
AREA=	2.1	187.5	87.7	172.0	63.4	227.6	29.9	2.0	
VEL=	0.8	2.0	2.2	12.1	2.1	2.2	1.4	0.3	
DEPTH=	2.3	2.6	3.0	5.1	2.9	3.0	1.6	0.2	

*SECNO 61.237
3280 CROSS SECTION 61.24 EXTENDED 1.51 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 0.0 10334.9 TYPE= 1 TARGET= 10334.899

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2079.60 ELREA= 2075.90

61.237	5.11	2074.21	2074.21	0.00	2075.76	1.55	2.96	0.03	2079.60
3324.0	0.0	3324.0	0.0	0.0	332.3	0.0	123.4	45.3	2075.90
0.33	0.00	10.00	0.00	0.000	0.038	0.000	0.000	2069.10	9933.62
0.014945	410.	375.	330.	20	19	0	0.00	109.05	10042.66

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

FLOW DISTRIBUTION FOR SECNO= 61.24 CWSEL= 2074.21

STA= 9934. 10063.
PER Q= 100.0
AREA= 332.3
VEL= 10.0
DEPTH= 3.0

*SECNO 61.340

3470 ENCROACHMENT STATIONS= 9960.0 10101.4 TYPE= 1 TARGET= -9960.000

61.340	7.46	2081.86	2081.56	0.00	2083.54	1.68	7.74	0.04	2080.60
3324.0	30.9	3293.1	0.0	22.8	314.8	0.0	127.6	46.5	2084.60
0.34	1.35	10.46	0.00	0.125	0.043	0.000	0.000	2074.40	9960.00
0.013532	510.	545.	610.	6	14	0	0.00	95.91	10055.91

FLOW DISTRIBUTION FOR SECNO= 61.34 CWSEL= 2081.86

9960. 9983. 10065.
Q= 0.9 99.1
AREA= 22.8 314.8
VEL= 1.4 10.5
DEPTH= 1.0 4.3

*SECNO 61.391

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.24

3470 ENCROACHMENT STATIONS= 9941.4 10337.7 TYPE= 1 TARGET= -9941.400

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2083.30 ELREA= 2086.70

61.391	8.79	2084.49	0.00	0.00	2085.05	0.55	1.39	0.11	2083.30
3324.0	0.0	3324.0	0.0	0.0	556.6	0.0	130.3	47.1	2086.70
0.36	0.00	5.97	0.00	0.000	0.043	0.000	0.000	2075.70	9941.40
0.002694	265.	270.	275.	3	0	0	0.00	87.48	10028.88

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

FLOW DISTRIBUTION FOR SECNO= 61.39 CWSEL= 2084.49

STA= 9941. 10035.
PER Q= 100.0
AREA= 556.6
VEL= 6.0
DEPTH= 6.4

TN Split Flow at Flamingo Road, road cross-section is outflow weir

TOTAL AREA	AVG VELOCITY	MAX DEPTH	AVG DEPTH	TOF WIDTH	TOP WIDTH
60.6	8.29	2.27	1.13	110.0	53.5

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
502.71	502.63	0.01	502.71	502.63	0.01	5	2022.106	2024.567	60.135	60.171

THIS RUN EXECUTED 30AUG93 16:56:39

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

Flam-Nat.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
	0.000	1991.75	4797.29	8.55	0.00	9.71	0.00	0.00	4797.29	0.00	81.78	9959.37	10041.15
	0.066	1994.07	4797.29	10.07	0.00	9.15	0.00	0.00	4797.29	0.00	76.02	9963.84	10039.87
	0.083	1999.07	4797.29	12.57	0.00	6.15	0.00	0.00	4797.29	0.00	90.31	9958.10	10048.41
	0.110	1999.48	4797.29	11.98	0.00	7.67	0.00	0.00	4797.29	0.00	77.70	9954.11	10031.80
*	60.000	2001.08	4797.29	10.78	0.00	7.09	0.00	0.00	4797.29	0.00	106.53	9915.81	10022.34
*	60.080	2011.63	4797.29	7.93	0.00	12.22	0.00	0.00	4797.29	0.00	86.88	9943.49	10030.36
*	60.135	2022.11	4797.29	8.21	0.00	8.38	5.68	0.00	4157.52	639.77	266.79	9960.81	10227.60
*	60.171	2024.57	5300.00	10.27	2.12	4.97	2.76	420.35	2978.29	1901.36	587.16	9792.54	10379.70
*	60.219	2027.11	5300.00	7.91	6.97	10.54	5.01	1201.39	3854.72	243.89	170.00	9900.00	10070.00
	60.276	2028.98	5300.00	7.38	0.00	7.06	0.00	0.00	5300.00	0.00	138.55	9924.27	10062.82
*	60.301	2031.52	5300.00	9.72	1.31	3.56	1.11	365.74	4606.73	327.53	768.97	9677.60	10446.57
*	60.345	2031.08	5300.00	6.98	0.00	9.66	0.00	0.00	5300.00	0.00	96.45	9953.54	10050.00
*	60.397	2033.22	5300.00	8.22	0.00	13.11	0.00	0.00	5300.00	0.00	77.20	9969.00	10046.20
*	60.446	2037.12	5300.00	10.02	2.81	5.47	0.00	829.48	4470.52	0.00	390.86	9667.55	10058.41
*	60.491	2037.89	5300.00	6.19	0.00	11.78	0.00	0.00	5300.00	0.00	106.36	9943.15	10049.51
	60.587	2043.83	1870.00	1.63	3.33	3.10	1.07	1131.48	675.27	63.25	733.18	9289.07	10187.30
*	60.667	2044.82	1870.00	1.42	4.30	1.79	0.00	1865.22	4.78	0.00	467.12	9517.05	10030.31

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	60.705	2048.90	5300.00	6.20	2.84	3.45	2.69	1431.59	1328.25	2540.16	687.39	9742.60	10430.00
*	60.800	2050.81	5300.00	3.01	6.48	3.20	4.95	3662.76	472.21	1165.03	453.60	9715.48	10183.94
*	60.866	2055.80	5300.00	6.20	0.00	11.80	0.00	0.00	5300.00	0.00	105.76	9955.03	10060.80
*	60.887	2057.00	5300.00	7.20	0.00	12.30	0.00	0.00	5300.00	0.00	91.92	9952.85	10044.77
*	60.903	2059.82	3324.00	10.12	0.29	4.01	0.46	25.17	3123.21	175.62	370.00	9880.00	10250.00
	60.912	2060.21	3324.00	10.21	0.17	3.77	0.46	6.35	3071.69	245.96	434.83	9870.00	10310.00
	60.936	2060.18	3324.00	9.28	0.04	4.42	0.00	0.01	3323.99	0.00	126.52	9930.50	10057.02
*	60.992	2060.23	3324.00	7.93	0.28	5.92	0.32	7.65	3310.13	6.22	211.59	9879.89	10091.48
	61.036	2060.41	3324.00	6.81	0.27	7.42	0.00	2.46	3321.53	0.00	131.96	9911.93	10043.89
	61.073	2060.71	3324.00	6.51	0.00	9.07	0.00	0.00	3324.00	0.00	85.19	9962.17	10047.36
*	61.080	2061.06	3324.00	6.96	0.00	9.30	0.00	0.00	3324.00	0.00	57.65	9971.12	10028.77
*	61.095	2063.82	3324.00	4.62	0.00	11.75	0.00	0.00	3324.00	0.00	66.63	9970.05	10036.68
*	61.118	2066.19	3324.00	8.29	0.13	4.84	0.19	0.57	3321.17	2.26	133.14	9936.86	10070.00
	61.142	2068.42	3324.00	8.42	0.28	3.15	0.28	13.83	3305.21	4.96	210.00	9860.00	10070.00
*	61.166	2068.88	3324.00	7.18	2.04	12.12	2.09	565.13	2083.89	674.98	260.00	9880.00	10140.00
*	61.237	2074.21	3324.00	5.11	0.00	10.00	0.00	0.00	3324.00	0.00	109.05	9933.62	10042.66
	61.340	2081.86	3324.00	7.46	1.35	10.46	0.00	30.95	3293.05	0.00	95.91	9960.00	10055.91
*	61.391	2084.49	3324.00	8.79	0.00	5.97	0.00	0.00	3324.00	0.00	87.48	9941.40	10028.88

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SUMMARY PRINTOUT

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST
	0.000	1991.75	4797.29	0.00	81.78	9959.37	0.00	9934.40	10065.20	0.00	10041.15
	0.066	1994.07	4797.29	350.00	76.02	9963.84	0.00	9956.30	10061.00	0.00	10039.87
	0.083	1999.07	4797.29	90.00	90.31	9958.10	9797.30	9955.90	10073.20	10317.30	10048.41
	0.110	1999.48	4797.29	140.00	77.70	9954.11	0.00	9910.10	10046.70	0.00	10031.80
*	60.000	2001.08	4797.29	180.00	106.53	9915.81	0.00	9878.20	10040.00	0.00	10022.34
*	60.080	2011.63	4797.29	420.00	86.88	9943.49	0.00	9919.20	10053.20	0.00	10030.36
*	60.135	2022.11	4797.29	295.00	266.79	9960.81	0.00	9959.30	10041.90	0.00	10227.60
*	60.171	2024.57	5300.00	185.00	587.16	9792.54	0.00	9968.80	10047.60	10379.70	10379.70
*	60.219	2027.11	5300.00	255.00	170.00	9900.00	9900.00	9975.80	10034.90	10070.00	10070.00
	60.276	2028.98	5300.00	300.00	138.55	9924.27	0.00	9923.00	10065.20	0.00	10062.82
*	60.301	2031.52	5300.00	135.00	768.97	9677.60	9677.60	9905.10	10076.90	10973.10	10446.57
*	60.345	2031.08	5300.00	230.00	96.45	9953.54	9606.80	9922.90	10053.00	10234.50	10050.00
*	60.397	2033.22	5300.00	275.00	77.20	9969.00	9553.10	9958.90	10051.60	10570.40	10046.20
*	60.446	2037.12	5300.00	260.00	390.86	9667.55	9600.00	9949.60	10062.90	10183.80	10058.41
*	60.491	2037.89	5300.00	240.00	106.36	9943.15	0.00	9937.60	10056.70	10205.30	10049.51
*	60.587	2043.83	1870.00	505.00	733.18	9289.07	0.00	9862.10	10053.60	10187.30	10187.30
*	60.667	2044.82	1870.00	420.00	467.12	9517.05	0.00	10000.00	10062.70	10194.00	10030.31
*	60.705	2048.90	5300.00	200.00	687.39	9742.60	0.00	9970.20	10043.60	0.00	10430.00
*	60.800	2050.81	5300.00	505.00	453.60	9715.48	0.00	9965.60	10035.90	0.00	10183.94
*	60.866	2055.80	5300.00	350.00	105.76	9955.03	0.00	9951.00	10060.80	10060.80	10060.80
*	60.887	2057.00	5300.00	110.00	91.92	9952.85	9300.00	9945.50	10065.00	10150.00	10044.77
*	60.903	2059.82	3324.00	85.00	370.00	9880.00	9880.00	9940.30	10044.80	10250.00	10250.00
	60.912	2060.21	3324.00	45.00	434.83	9870.00	9870.00	9934.00	10054.40	10310.00	10310.00
	60.936	2060.18	3324.00	125.00	126.52	9930.50	9930.50	9934.10	10057.50	10219.40	10057.02

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST
*	60.992	2060.23	3324.00	300.00	211.59	9879.89	9780.00	9946.70	10053.50	10346.90	10091.48
	61.036	2060.41	3324.00	228.00	131.96	9911.93	9780.00	9948.60	10047.00	10535.80	10043.89
	61.073	2060.71	3324.00	200.00	85.19	9962.17	9800.00	9954.60	10078.30	10560.00	10047.36
*	61.080	2061.06	3324.00	35.00	57.65	9971.12	9780.00	9968.50	10070.20	10545.00	10028.77
*	61.095	2063.82	3324.00	78.00	66.63	9970.05	9535.00	9956.20	10048.10	10535.00	10036.68
*	61.118	2066.19	3324.00	120.00	133.14	9936.86	9760.00	9947.20	10056.10	10070.00	10070.00
	61.142	2068.42	3324.00	130.00	210.00	9860.00	9860.00	9904.70	10056.30	10070.00	10070.00
*	61.166	2068.88	3324.00	125.00	260.00	9880.00	9880.00	9981.00	10014.60	10140.00	10140.00
*	61.237	2074.21	3324.00	375.00	109.05	9933.62	0.00	9866.00	10062.90	10334.90	10042.66
	61.340	2081.86	3324.00	545.00	95.91	9960.00	9960.00	9982.80	10064.70	10101.40	10055.91
*	61.391	2084.49	3324.00	270.00	87.48	9941.40	9941.40	9941.40	10035.00	10337.70	10028.88

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SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
	0.083	1996.50	1995.00	2000.32	1998.50	4535.83	243.52	30.00	0.18	12.57	1999.07	6.15	1999.65
*	60.171	2025.26	2019.30	2043.65	2022.80	1884.65	3417.20	30.00	0.00	10.27	2024.57	4.97	2024.83
*	60.301	2029.76	2025.90	2036.99	2028.40	3086.04	2219.01	30.00	0.06	9.72	2031.52	3.56	2031.70
	60.912	2060.12	2057.60	2060.41	2056.50	1787.60	1553.41	30.00	0.01	10.21	2060.21	3.77	2060.41
*	61.080	2062.41	2062.50	0.00	2064.30	3324.00	0.00	1.00	0.35	6.96	2061.06	9.30	2062.41
	61.142	2066.58	2064.10	2070.72	2065.90	2412.97	911.04	30.00	0.03	8.42	2068.42	3.15	2068.58

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SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	0.000	0.00	0.00	0.00	1983.20	4797.29	1991.75	0.00	1993.22	70.23	9.71	494.25	572.46
	0.066	350.00	0.00	0.00	1984.00	4797.29	1994.07	0.00	1995.37	51.89	9.15	524.48	665.97
	0.083	90.00	1998.50	1995.00	1986.50	4797.29	1999.07	0.00	1999.65	31.80	6.15	779.92	850.74
	0.110	140.00	0.00	0.00	1987.50	4797.29	1999.48	0.00	2000.39	54.76	7.67	625.24	648.27
*	60.000	180.00	0.00	0.00	1990.30	4797.29	2001.08	0.00	2001.86	130.79	7.09	676.59	419.48
*	60.080	420.00	0.00	0.00	2003.70	4797.29	2011.63	2011.63	2013.95	843.11	12.22	392.42	165.22
*	60.135	295.00	0.00	0.00	2013.90	4797.29	2022.11	2022.11	2023.12	114.63	8.38	608.83	448.06
*	60.171	185.00	2022.80	2019.30	2014.30	5300.00	2024.57	0.00	2024.83	8.04	4.97	1486.17	1869.27
*	60.219	255.00	0.00	0.00	2019.20	5300.00	2027.11	2027.11	2028.55	48.16	10.54	586.47	763.73
	60.276	300.00	0.00	0.00	2021.60	5300.00	2028.98	0.00	2029.76	24.78	7.06	750.56	1064.66
*	60.301	135.00	2028.40	2025.90	2021.80	5300.00	2031.52	0.00	2031.70	3.58	3.56	1867.74	2802.05
*	60.345	230.00	0.00	0.00	2024.10	5300.00	2031.08	0.00	2032.53	39.46	9.66	548.53	843.74
*	60.397	275.00	0.00	0.00	2025.00	5300.00	2033.22	2033.22	2035.89	222.51	13.11	404.42	355.31
*	60.446	260.00	0.00	0.00	2027.10	5300.00	2037.12	0.00	2037.53	23.96	5.47	1112.14	1082.73
*	60.491	240.00	0.00	0.00	2031.70	5300.00	2037.89	2037.89	2040.04	233.37	11.78	449.87	346.94
*	60.587	505.00	0.00	0.00	2042.20	1870.00	2043.83	0.00	2043.99	14.72	3.10	616.82	487.45
*	60.667	420.00	0.00	0.00	2043.40	1870.00	2044.82	0.00	2045.10	67.50	1.79	436.21	227.62
*	60.705	200.00	0.00	0.00	2042.70	5300.00	2048.90	0.00	2049.03	13.11	3.45	1832.70	1463.63
*	60.800	505.00	0.00	0.00	2047.80	5300.00	2050.81	2050.81	2051.36	38.56	3.20	948.19	853.48
*	60.866	350.00	0.00	0.00	2049.60	5300.00	2055.80	2055.80	2057.97	46.00	11.80	449.11	781.48
*	60.887	110.00	0.00	0.00	2049.80	5300.00	2057.00	2057.00	2059.35	43.25	12.30	430.98	805.89
*	60.903	85.00	0.00	0.00	2049.70	3324.00	2059.82	0.00	2060.06	2.51	4.01	1243.84	2099.00
	60.912	45.00	2056.50	2057.60	2050.00	3324.00	2060.21	0.00	2060.41	2.48	3.77	1384.69	2108.87
	60.936	125.00	0.00	0.00	2050.90	3324.00	2060.18	0.00	2060.49	5.04	4.42	752.26	1480.05

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	60.992	300.00	0.00	0.00	2052.30	3324.00	2060.23	0.00	2060.77	11.05	5.92	606.76	1000.12
	61.036	228.00	0.00	0.00	2053.60	3324.00	2060.41	0.00	2061.26	20.23	7.42	456.71	739.08
	61.073	200.00	0.00	0.00	2054.20	3324.00	2060.71	0.00	2061.99	34.08	9.07	366.31	569.35
*	61.080	35.00	2064.30	2062.50	2054.10	3324.00	2061.06	0.00	2062.41	9.08	9.30	357.45	1103.19
*	61.095	78.00	0.00	0.00	2059.20	3324.00	2063.82	2063.82	2065.96	22.18	11.75	283.01	705.86
*	61.118	120.00	0.00	0.00	2057.90	3324.00	2066.19	0.00	2066.55	2.12	4.84	702.34	2284.96
	61.142	130.00	2065.90	2064.10	2060.00	3324.00	2068.42	0.00	2068.58	2.16	3.15	1114.85	2262.92
*	61.166	125.00	0.00	0.00	2061.70	3324.00	2068.88	2068.88	2070.34	49.04	12.12	772.18	474.66
*	61.237	375.00	0.00	0.00	2069.10	3324.00	2074.21	2074.21	2075.76	149.45	10.00	332.34	271.90
	61.340	545.00	0.00	0.00	2074.40	3324.00	2081.86	2081.56	2083.54	135.32	10.46	337.62	285.74
*	61.391	270.00	0.00	0.00	2075.70	3324.00	2084.49	0.00	2085.05	26.94	5.97	556.60	640.45

[redacted]lat.hc2

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	0.000	4797.29	1991.75	0.00	0.00	2.75	81.78	0.00
	0.066	4797.29	1994.07	0.00	2.31	0.00	76.02	350.00
	0.083	4797.29	1999.07	0.00	5.00	0.00	90.31	90.00
	0.110	4797.29	1999.48	0.00	0.41	0.00	77.70	140.00
*	60.000	4797.29	2001.08	0.00	1.60	0.00	106.53	180.00
*	60.080	4797.29	2011.63	0.00	10.56	0.00	86.88	420.00
*	60.135	4797.29	2022.11	0.00	10.47	0.00	266.79	295.00
*	60.171	5300.00	2024.57	0.00	2.46	0.00	587.16	185.00
*	60.219	5300.00	2027.11	0.00	2.54	0.00	170.00	255.00
	60.276	5300.00	2028.98	0.00	1.87	0.00	138.55	300.00
*	60.301	5300.00	2031.52	0.00	2.54	0.00	768.97	135.00
*	60.345	5300.00	2031.08	0.00	-0.44	0.00	96.45	230.00
*	60.397	5300.00	2033.22	0.00	2.14	0.00	77.20	275.00
*	60.446	5300.00	2037.12	0.00	3.90	0.00	390.86	260.00
*	60.491	5300.00	2037.89	0.00	0.77	0.00	106.36	240.00
*	60.587	1870.00	2043.83	0.00	5.95	0.00	733.18	505.00
*	60.667	1870.00	2044.82	0.00	0.98	0.00	467.12	420.00
*	60.705	5300.00	2048.90	0.00	4.08	0.00	687.39	200.00
*	60.800	5300.00	2050.81	0.00	1.91	0.00	453.60	505.00
*	60.866	5300.00	2055.80	0.00	4.99	0.00	105.76	350.00
*	60.887	5300.00	2057.00	0.00	1.20	0.00	91.92	110.00
*	60.903	3324.00	2059.82	0.00	2.82	0.00	370.00	85.00
	60.912	3324.00	2060.21	0.00	0.39	0.00	434.83	45.00
	60.936	3324.00	2060.18	0.00	-0.02	0.00	126.52	125.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	60.992	3324.00	2060.23	0.00	0.05	0.00	211.59	300.00
	61.036	3324.00	2060.41	0.00	0.18	0.00	131.96	228.00
	61.073	3324.00	2060.71	0.00	0.30	0.00	85.19	200.00
*	61.080	3324.00	2061.06	0.00	0.35	0.00	57.65	35.00
*	61.095	3324.00	2063.82	0.00	2.75	0.00	66.63	78.00
*	61.118	3324.00	2066.19	0.00	2.37	0.00	133.14	120.00
	61.142	3324.00	2068.42	0.00	2.24	0.00	210.00	130.00
*	61.166	3324.00	2068.88	0.00	0.46	0.00	260.00	125.00
*	61.237	3324.00	2074.21	0.00	5.32	0.00	109.05	375.00
	61.340	3324.00	2081.86	0.00	7.65	0.00	95.91	545.00
*	61.391	3324.00	2084.49	0.00	2.63	0.00	87.48	270.00

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 60.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 60.080 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.080 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 60.135 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.135 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 60.171 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 60.171 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 60.219 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.219 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.219 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 60.301 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 60.345 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 60.397 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.397 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.397 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 60.446 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 60.491 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.491 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.491 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 60.587 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 60.667 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE SECNO= 60.705 PROFILE= 1 WSEL BASED ON X5 CARD
WARNING SECNO= 60.705 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 60.800 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.800 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.800 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 60.866 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.866 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.866 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 60.887 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.887 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.887 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 60.903 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 60.992 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 61.080 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 61.095 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 61.095 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 61.095 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 61.118 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 61.166 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 61.166 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 61.166 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 61.237 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 61.237 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 61.237 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 61.391 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

I15-2-N.HC2

• I-15 to UPRR
• Natural Run

HEC2 S/N: 1916530021 HMVersion: 6.50 Data File: i15-2-n.hc2

```
**********************************************
*  HEC-2 WATER SURFACE PROFILES              *
*                                            *
*  Version  4.6.2;  May 1991                 *
*                                            *
*  RUN DATE    12AUG93    TIME    14:08:37   *
**********************************************
```

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

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

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

HAESTAD METHODS

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

THIS RUN EXECUTED 12AUG93 14:08:37

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

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

TROPICANA WASH FLOOD INSURANCE STUDY

by CH2M Hill, 1992 RDD33832

Notes:

-Manning's "n" values were estimated by field observations of channels and floodplains in conjunction with methods recommended in "Open Channel Hydraulics" by Chow, 1959

-stations and elevations obtained from 400 scale topo created by CH2M Hill from aerial photographs

8/11/93
-Changed discharges. Used just the flow that comes through the culverts under the UPRR, except at I15 where some of the flow coming down Tropicana was added.

```
T1   CCRFCD  TROPICANA WASH F.I.S.;   RDD33832
T2   Main Tropicana Wash, Detailed Methods
T3      I15-2-N.hc2              From I-15 up to the culvert at UPRR


J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                                       0         0              2154.7         0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1         0        -1         0         0         0         0         0         0         15


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1        43         8        55        26        56        13        14        15
      4        53        54       100       150


QT        1       2243
NC     .025       .025       .043       0.1        0.3
```

Starting W.S.El. in following X5 card obtained by routing discharge at I-15 through the box culvert under the road using the F.H.W.A. culvert analysis program HY-8.

X1	62.566	11	9845.7	10136.1	0	0	0			
X5	1	2154.7								
GR	2147.6	9634.7	2147.8	9704.9	2146.6	9792.0	2146.9	9845.7	2142.4	9933.3
GR	2139.8	9987.0	2139.1	10000.0	2138.1	10020.3	2147.3	10136.1	2149.1	10300.6
GR	2154.0	10580.2								
X1	62.668	20	9982	10029.7	470	550	540			
X3	10			9932						
GR	2156.0	9430.3	2155.8	9503.6	2155.2	9515.8	2155.0	9541.5	2155.0	9575.7
GR	2155.2	9685.6	2155.2	9735.4	2154.3	9891.8	2153.9	9982.0	2151.0	9992.4
GR	2151.0	10000.0	2151.0	10006.4	2156.6	10029.7	2157.6	10092.0	2156.9	10144.1
GR	2154.5	10166.4	2154.1	10184.5	2154.7	10261.9	2160.6	10348.3	2160.1	10419.7
QT	1	800								
NC	.025	.025	.046							
X1	62.763	9	9943.5	10033.7	505	495	500			
GR	2166.4	9750.3	2167.3	9943.5	2159.0	9968.0	2158.3	10000.	2159.1	10016.
GR	2167.1	10033.7	2167.1	10075.0	2179.5	10102.0	2180.6	10555.		
NC	.02	.07	.032	.3	.5					
X1	62.859	9	9967.1	10027.2	500	505	505			
GR	2173.9	9820.3	2172.6	9967.1	2164.5	10000.0	2172.5	10027.2	2172.3	10064.
GR	2180.0	10087.5	2181.2	10114.5	2181.1	10533.0	2180.8	10551.2		
X1	62.906	15	9979.8	10024.9	240	180	250			
X3	10									
GR	2179.3	9942.9	2180.0	9957.2	2178.1	9979.8	2171.4	9989.3	2170.2	10000.0
GR	2171.1	10009.7	2179.1	10024.9	2179.3	10039.3	2181.1	10143.6	2180.5	10282.4
GR	2181.2	10307.2	2180.9	10433.6	2181.2	10489.5	2180.8	10515.7	2181.3	10705.5

Downstream-most of three railroad car bridges
-bridge is 9 ft. wide
-entered negligible pier width to force special bridge method

SB	.9	1.6	2.6		23	.01	191	1.7	2170.2	2170.2
X1	62.908				9	9	9			
X2			1	2176.0	2177.6					
X3	10									
BT	6	9970	2177.6		9975	2177.6		9975.01	2190	
BT	10015	2190		10015.01	2177.6		10030	2177.6		

Begin cross section at effective flow boundary defined by LOB development
Added station 9919 located @50 feet from left bank, based on field notes
Elevation interpolated from survey data

X1 62.937 15 9969.7 10021.9 110 110 151
X3 10 10100
GR 2179 9919 2179.9 9959.0 2180.0 9969.7 2171.7 9990.2 2171.1 10000.
GR 2172.0 10012. 2178.8 10021.9 2179.1 10031. 2179.4 10048. 2181.6 10063.
GR 2181.5 10185. 2180.2 10200.8 2182.4 10242. 2182.3 10366. 2181.9 10418.

Middle of three railroad car bridges
-bridge is 18 ft. wide (dual railroad cars)
-entered negligible pier width to force special bridge method

SB .9 1.6 2.6 23. .01 201 1.64 2171.1 2171.1
X1 62.940 18 18 18
X2 1 2177.2 2178.7
X3 10 10100
BT 6 9970 2178.7 9975 2178.7 9975.01 2190
BT 10015 2190 10015.01 2178.7 10030 2178.7

Begin section at effective flow boundary defined by 4:1 expansion and field
conditions, interpolate elevation and station from survey data

X1 62.967 12 9968.5 10035.6 120 160 142
X3 10 10085
GR 2180 9910 2181.1 9968.5 2173.1 9987.4 2173.1 10000. 2173.1 10009.
GR 2179.5 10019. 2182.6 10035.6 2181.7 10172. 2183.5 10215. 2183.9 10341.
[redacted]183.8 10392. 2185.4 10656.

Upstream-most of three railroad car bridges
-bridge is 9 ft. wide
-entered negligible pier width to force special bridge method

SB .9 1.6 2.6 23. .01 224 1.5 2173.1 2173.1

X1 62.969 9 9 9
X2 1 2179.9 2181.4
X3 10 10085
BT 6 9970 2181.4 9975 2181.4 9975.01 2190
BT 10015 2190 10015.01 2181.4 10030 2181.4

NC .036 .036 .043 .1 .3

X1 63.061 13 9960.8 10020.2 530 430 486
GR 2187.5 9779.4 2184.7 9960.8 2182.5 9982.3 2177.6 9991.3 2177.3 10000.0
GR 2177.7 10007.9 2184.3 10020.2 2186.8 10034.6 2187.4 10167.6 2188.3 10347.0
GR 2188.2 10384.4 2192.8 10416.4 2191.3 10606.0

X1 63.157 20 9968.4 10040.0 555 465 510
GR 2198.2 9629.1 2194.5 9717.6 2196.2 9784.2 2197.9 9828.5 2193.4 9887.3
[redacted]193.1 9924.6 2192.8 9968.4 2185.1 9983.7 2184.9 10000. 2185.5 10025.
[redacted]2192.1 10040.0 2191.8 10061.5 2193.7 10099.2 2193.2 10116. 2192.6 10147.
GR 2196.3 10233.5 2197.2 10252.1 2196.6 10314.6 2192.9 10357. 2198.2 10421.

NC .058 .043 .053

QT 1 710

X1 63.260 13 9986.3 10025.7 485 565 545

GR 2202.3 9709.9 2200.9 9748.6 2199.8 9904.0 2197.8 9986.3 2196.9 10000.

GR 2199.1 10025.7 2196.9 10085.8 2200.2 10144.1 2200.0 10173.4 2200.0 10317.

GR 2201.0 10344.0 2202.9 10386.2 2206.3 10450.2

X1 63.353 21 9955.1 10045 490 510 490

GR 2208.6 9587.2 2209.4 9684.5 2209.0 9756.6 2206.3 9784.0 2203.1 9827.6

GR 2201.8 9864.5 2201.5 9865.4 2201.5 9940.5 2203.9 9955.1 2199.2 9989.6

GR 2199.2 10000.0 2199.2 10012.2 2201.5 10045.0 2204.2 10093.2 2206.1 10132.2

GR 2209.7 10193.5 2208.8 10221.9 2207.2 10282.1 2207.0 10346.3 2209.4 10371.2

GR 2211.1 10550.7

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

*PROF 1

CCHV= 0.100 CEHV= 0.300
*SECNO 62.566
WATER EL=X5 CARD= 2154.700
3280 CROSS SECTION 62.57 EXTENDED 7.10 FEET

62.566	16.60	2154.70	0.00	2154.70	2154.70	0.00	0.00	0.00	2146.90
2243.0	592.0	1086.8	564.2	1571.5	3525.4	1949.9	0.0	0.0	2147.30
0.00	0.38	0.31	0.29	0.025	0.043	0.025	0.000	2138.10	9634.70
0.000003	0.	0.	0.	0	0	0	0.00	945.50	10580.20

FLOW DISTRIBUTION FOR SECNO= 62.57 CWSEL= 2154.70

STA=	9635.	9705.	9792.	9846.	10136.	10301.	10580.
[redacted] Q=	7.6	11.2	7.6	48.5	16.7	8.5
[redacted]EA=	491.4	653.2	426.9	3525.4	1069.2	880.7
VEL=	0.3	0.4	0.4	0.3	0.4	0.2
DEPTH=	7.0	7.5	7.9	12.1	6.5	3.1

*SECNO 62.668

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9932.0 10419.7 TYPE= 1 TARGET= -9932.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2153.90 ELREA= 2156.60

62.668	4.79	2155.79	2155.79	0.00	2157.18	1.38	0.01	0.41	2153.90
2243.0	894.6	1348.4	0.0	89.0	149.6	0.0	44.0	6.3	2156.60
0.02	10.05	9.01	0.00	0.025	0.043	0.000	0.000	2151.00	9932.00
0.013833	470.	540.	550.	20	17	0	0.00	94.34	10026.34

FLOW DISTRIBUTION FOR SECNO= 62.67 CWSEL= 2155.79

[redacted]

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

STA= 9932. 9982. 10030.
PER Q= 39.9 60.1
AREA= 89.0 149.6
VEL= 10.0 9.0
DEPTH= 1.8 3.4

*SECNO 62.763

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.60

62.763	3.64	2161.94	0.00	0.00	2162.25	0.31	4.97	0.11	2167.30
800.0	0.0	800.0	0.0	0.0	179.1	0.0	46.4	7.2	2167.10
0.05	0.00	4.47	0.00	0.000	0.046	0.000	0.000	2158.30	9959.31
0.004859	505.	500.	495.	3	0	0	0.00	62.99	10022.29

DISTRIBUTION FOR SECNO= 62.76 CWSEL= 2161.94

STA= 9959. 10034.
PER Q= 100.0
AREA= 179.1
VEL= 4.5
DEPTH= 2.8

CCHV= 0.300 CEHV= 0.500
*SECNO 62.859

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

62.859	4.90	2169.40	2169.40	0.00	2170.64	1.24	3.63	0.46	2172.60
800.0	0.0	800.0	0.0	0.0	89.6	0.0	48.0	7.8	2172.50
0.06	0.00	8.93	0.00	0.000	0.032	0.000	0.000	2164.50	9980.10
0.011735	500.	505.	505.	20	11	0	0.00	36.56	10016.66

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

FLOW DISTRIBUTION FOR SECNO= 62.86 CWSEL= 2169.40

STA= 9980. 10027.
PER Q= 100.0
AREA= 89.6
VEL= 8.9
DEPTH= 2.4

*SECNO 62.906
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2178.10 ELREA= 2179.10

62.906	3.94	2174.14	2174.14	0.00	2175.56	1.42	2.92	0.09	2178.10
800.0	0.0	800.0	0.0	0.0	83.7	0.0	48.5	8.0	2179.10
0.07	0.00	9.56	0.00	0.000	0.032	0.000	0.000	2170.20	9985.42
0.011656	240.	250.	180.	4	15	0	0.00	30.06	10015.48

FLOW DISTRIBUTION FOR SECNO= 62.91 CWSEL= 2174.14

STA= 9985. 10025.
PER Q= 100.0
AREA= 83.7
VEL= 9.6
DEPTH= 2.8

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	191.00	1.70	2170.20	2170.20

*SECNO 62.908
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2174.14 BRIDGE VELOCITY= 6.84 CALCULATED CHANNEL AREA= 117.

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

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2175.56	0.00	0.	800.	191.	191.	2176.00	2177.60	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2178.10 ELREA= 2179.10

62.908	3.94	2174.14	0.00	0.00	2175.56	1.42	0.00	0.00	2178.10
800.0	0.0	800.0	0.0	0.0	83.7	0.0	48.5	8.0	2179.10
0.07	0.00	9.56	0.00	0.000	0.032	0.000	0.000	2170.20	9985.42
0.011656	9.	9.	9.	0	0	0	0.00	30.06	10015.48

FLOW DISTRIBUTION FOR SECNO= 62.91 CWSEL= 2174.14

STA= 9985. 10025.
Q= 100.0
A= 83.7
VEL= 9.6
DEPTH= 2.8

*SECNO 62.937

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.94

3470 ENCROACHMENT STATIONS= 0.0 10100.0 TYPE= 1 TARGET= 10099.999

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2180.00 ELREA= 2178.80

62.937	5.02	2176.12	0.00	0.00	2176.64	0.52	0.82	0.27	2180.00
800.0	0.0	800.0	0.0	0.0	137.8	0.0	48.9	8.1	2178.80
0.08	0.00	5.81	0.00	0.000	0.032	0.000	0.000	2171.10	9979.27
0.003100	110.	151.	110.	2	0	0	0.00	38.73	10018.00

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

FLOW DISTRIBUTION FOR SECNO= 62.94 CWSEL= 2176.12

STA= 9979. 10022.
PER Q= 100.0
AREA= 137.8
VEL= 5.8
DEPTH= 3.6

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	201.00	1.64	2171.10	2171.10

*SECNO 62.940
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2176.12 BRIDGE VELOCITY= 5.11 CALCULATED CHANNEL AREA= 157.

	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2176.64	0.00	0.	800.	201.	201.	2177.20	2178.70	0.

3470 ENCROACHMENT STATIONS= 0.0 10100.0 TYPE= 1 TARGET= 10099.999

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2180.00 ELREA= 2178.80

62.940	5.02	2176.12	0.00	0.00	2176.64	0.53	0.00	0.00	2180.00
800.0	0.0	800.0	0.0	0.0	137.6	0.0	49.0	8.1	2178.80
0.08	0.00	5.82	0.00	0.000	0.032	0.000	0.000	2171.10	9979.29
0.003113	18.	18.	18.	0	0	0	0.00	38.71	10018.00

FLOW DISTRIBUTION FOR SECNO= 62.94 CWSEL= 2176.12

STA= 9979. 10022.
PER Q= 100.0
AREA= 137.6
VEL= 5.8
DEPTH= 3.6

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

*SECNO 62.967

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.61

3470 ENCROACHMENT STATIONS= 0.0 10085.0 TYPE= 1 TARGET= 10084.999

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2181.10 ELREA= 2182.60

62.967	3.45	2176.55	0.00	0.00	2177.58	1.03	0.68	0.25	2181.10
800.0	0.0	800.0	0.0	0.0	98.1	0.0	49.3	8.2	2182.60
0.08	0.00	8.15	0.00	0.000	0.032	0.000	0.000	2173.10	9979.23
0.008367	120.	142.	160.	0	0	0	0.00	35.17	10014.40

FLOW DISTRIBUTION FOR SECNO= 62.97 CWSEL= 2176.55

ST.- 9979. 10036.
PER Q= 100.0
AREA= 98.1
VEL= 8.2
DEPTH= 2.8

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	224.00	1.50	2173.10	2173.10

*SECNO 62.969
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2176.55 BRIDGE VELOCITY= 8.24 CALCULATED CHANNEL AREA= 97.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2177.59	0.00	0.	800.	224.	226.	2179.90	2181.40	0.

3470 ENCROACHMENT STATIONS= 0.0 10085.0 TYPE= 1 TARGET= 10084.999

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2181.10 ELREA= 2182.60

62.969	3.45	2176.55	0.00	0.00	2177.59	1.04	0.01	0.00	2181.10
800.0	0.0	800.0	0.0	0.0	97.9	0.0	49.4	8.2	2182.60
0.08	0.00	8.17	0.00	0.000	0.032	0.000	0.000	2173.10	9979.25
0.008424	9.	9.	9.	0	0	0	0.00	35.14	10014.39

FLOW DISTRIBUTION FOR SECNO= 62.97 CWSEL= 2176.55

STA= 9979. 10036.
PER Q= 100.0
AREA= 97.9
VEL= 8.2
DEPTH= 2.8

CCHV= 0.100 CEHV= 0.300

*SECNO 63.061

63.061	4.32	2181.62	0.00	0.00	2182.66	1.04	5.07	0.00	2184.70
800.0	0.0	800.0	0.0	0.0	98.0	0.0	50.5	8.6	2184.30
0.10	0.00	8.16	0.00	0.000	0.043	0.000	0.000	2177.30	9983.92
0.013244	530.	486.	430.	3	0	0	0.00	31.29	10015.21

FLOW DISTRIBUTION FOR SECNO= 63.06 CWSEL= 2181.62

STA= 9984. 10020.
PER Q= 100.0
AREA= 98.0
VEL= 8.2
DEPTH= 3.1

*SECNO 63.157

63.157	3.00	2187.90	0.00	0.00	2188.50	0.59	5.80	0.04	2192.80
800.0	0.0	800.0	0.0	0.0	129.4	0.0	51.8	9.1	2192.10
0.12	0.00	6.18	0.00	0.000	0.043	0.000	0.000	2184.90	9978.13
0.009867	555.	510.	465.	4	0	0	0.00	52.34	10030.47

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

FLOW DISTRIBUTION FOR SECNO= 63.16 CWSEL= 2187.90

STA= 9978. 10040.
PER Q= 100.0
AREA= 129.4
VEL= 6.2
DEPTH= 2.5

*SECNO 63.260

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

63.260	1.87	2198.77	2198.77	0.00	2199.22	0.45	8.43	0.01	2197.80
710.0	53.1	208.1	448.8	19.5	40.0	78.9	53.5	10.4	2199.10
0.15	2.73	5.20	5.68	0.058	0.053	0.043	0.000	2196.90	9946.25
0.029565	485.	545.	565.	4	14	0	0.00	159.92	10118.90

FLOW DISTRIBUTION FOR SECNO= 63.26 CWSEL= 2198.77

STA= 9946. 9986. 10026. 10086. 10119.
PER Q= 7.5 29.3 38.4 24.8
AREA= 19.5 40.0 47.9 31.0
VEL= 2.7 5.2 5.7 5.7
DEPTH= 0.5 1.1 0.8 0.9

*SECNO 63.353

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.11

63.353	3.44	2202.64	0.00	0.00	2202.74	0.10	3.48	0.03	2203.90
710.0	145.3	549.5	15.2	100.4	196.2	11.6	56.0	12.5	2201.50
0.21	1.45	2.80	1.31	0.058	0.053	0.043	0.000	2199.20	9840.69
0.003065	490.	490.	510.	6	0	0	0.00	207.72	10065.33

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

FLOW DISTRIBUTION FOR SECNO= 63.35 CWSEL= 2202.64

STA=	9841.	9865.	9865.	9941.	9947.	10045.	10065.
PER Q=	1.1	0.2	18.6	0.5	77.4	2.1	
AREA=	10.0	0.9	85.5	3.9	196.2	11.6	
VEL=	0.8	1.4	1.5	1.0	2.8	1.3	
DEPTH=	0.4	1.0	1.1	0.6	2.4	0.6	

THIS RUN EXECUTED 12AUG93 14:08:41

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

I15-2-N.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	62.566	2154.70	2243.00	16.60	0.38	0.31	0.29	592.00	1086.80	564.20	945.50	9634.70	10580.20
*	62.668	2155.79	2243.00	4.79	10.05	9.01	0.00	894.60	1348.40	0.00	94.34	9932.00	10026.34
*	62.763	2161.94	800.00	3.64	0.00	4.47	0.00	0.00	800.00	0.00	62.99	9959.31	10022.29
*	62.859	2169.40	800.00	4.90	0.00	8.93	0.00	0.00	800.00	0.00	36.56	9980.10	10016.66
*	62.906	2174.14	800.00	3.94	0.00	9.56	0.00	0.00	800.00	0.00	30.06	9985.42	10015.48
	62.908	2174.14	800.00	3.94	0.00	9.56	0.00	0.00	800.00	0.00	30.06	9985.42	10015.48
*	62.937	2176.12	800.00	5.02	0.00	5.81	0.00	0.00	800.00	0.00	38.73	9979.27	10018.00
	62.940	2176.12	800.00	5.02	0.00	5.82	0.00	0.00	800.00	0.00	38.71	9979.29	10018.00
*	62.967	2176.55	800.00	3.45	0.00	8.15	0.00	0.00	800.00	0.00	35.17	9979.23	10014.40
	62.969	2176.55	800.00	3.45	0.00	8.17	0.00	0.00	800.00	0.00	35.14	9979.25	10014.39
	63.061	2181.62	800.00	4.32	0.00	8.16	0.00	0.00	800.00	0.00	31.29	9983.92	10015.21
	63.157	2187.90	800.00	3.00	0.00	6.18	0.00	0.00	800.00	0.00	52.34	9978.13	10030.47
*	63.260	2198.77	710.00	1.87	2.73	5.20	5.68	53.12	208.07	448.80	159.92	9946.25	10118.90
*	63.353	2202.64	710.00	3.44	1.45	2.80	1.31	145.27	549.53	15.20	207.72	9840.69	10065.33

[redacted]-N.hc2

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
62.908	2175.56	2176.00	0.00	2177.60	800.00	0.00	1.00	0.00	3.94	2174.14	9.56	2175.56
62.940	2176.64	2177.20	0.00	2178.70	800.00	0.00	1.00	0.00	5.02	2176.12	5.82	2176.64
62.969	2177.59	2179.90	0.00	2181.40	800.00	0.00	1.00	0.00	3.45	2176.55	8.17	2177.59

[redacted]-N.hc2

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	62.566	0.00	0.00	0.00	2138.10	2243.00	2154.70	0.00	2154.70	0.03	0.31	7046.85	13264.51
*	62.668	540.00	0.00	0.00	2151.00	2243.00	2155.79	2155.79	2157.18	138.33	9.01	238.63	190.71
*	62.763	500.00	0.00	0.00	2158.30	800.00	2161.94	0.00	2162.25	48.59	4.47	179.10	114.77
*	62.859	505.00	0.00	0.00	2164.50	800.00	2169.40	2169.40	2170.64	117.35	8.93	89.57	73.85
*	62.906	250.00	0.00	0.00	2170.20	800.00	2174.14	2174.14	2175.56	116.56	9.56	83.69	74.10
	62.908	9.00	2177.60	2176.00	2170.20	800.00	2174.14	0.00	2175.56	116.56	9.56	83.69	74.10
*	62.937	151.00	0.00	0.00	2171.10	800.00	2176.12	0.00	2176.64	31.00	5.81	137.75	143.67
	62.940	18.00	2178.70	2177.20	2171.10	800.00	2176.12	0.00	2176.64	31.13	5.82	137.55	143.38
*	62.967	142.00	0.00	0.00	2173.10	800.00	2176.55	0.00	2177.58	83.67	8.15	98.10	87.46
	62.969	9.00	2181.40	2179.90	2173.10	800.00	2176.55	0.00	2177.59	84.24	8.17	97.87	87.16
	63.061	486.00	0.00	0.00	2177.30	800.00	2181.62	0.00	2182.66	132.44	8.16	97.98	69.52
	63.157	510.00	0.00	0.00	2184.90	800.00	2187.90	0.00	2188.50	98.67	6.18	129.38	80.54
*	63.260	545.00	0.00	0.00	2196.90	710.00	2198.77	2198.77	2199.22	295.65	5.20	138.44	41.29
*	63.353	490.00	0.00	0.00	2199.20	710.00	2202.64	0.00	2202.74	30.65	2.80	308.14	128.24

N.hc2

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	62.566	2243.00	2154.70	0.00	0.00	0.00	945.50	0.00
*	62.668	2243.00	2155.79	0.00	1.09	0.00	94.34	540.00
*	62.763	800.00	2161.94	0.00	6.15	0.00	62.99	500.00
*	62.859	800.00	2169.40	0.00	7.46	0.00	36.56	505.00
*	62.906	800.00	2174.14	0.00	4.74	0.00	30.06	250.00
	62.908	800.00	2174.14	0.00	0.00	0.00	30.06	9.00
*	62.937	800.00	2176.12	0.00	1.98	0.00	38.73	151.00
	62.940	800.00	2176.12	0.00	0.00	0.00	38.71	18.00
*	62.967	800.00	2176.55	0.00	0.43	0.00	35.17	142.00
	62.969	800.00	2176.55	0.00	0.00	0.00	35.14	9.00
	63.061	800.00	2181.62	0.00	5.07	0.00	31.29	486.00
	63.157	800.00	2187.90	0.00	6.28	0.00	52.34	510.00
*	63.260	710.00	2198.77	0.00	10.87	0.00	159.92	545.00
*	63.353	710.00	2202.64	0.00	3.87	0.00	207.72	490.00

SUMMARY OF ERRORS AND SPECIAL NOTES

NOTE SECNO= 62.566 PROFILE= 1 WSEL BASED ON X5 CARD

CAUTION SECNO= 62.668 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.668 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 62.668 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 62.763 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 62.859 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.859 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 62.859 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 62.906 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.906 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 62.937 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 62.967 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 63.260 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 63.260 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 63.353 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

UPRR-NAT. hc2

- North, Central & South Branches upstream of UPRR
- Natural run

HEC2 S/N: 1916530021 HMVersion: 6.50 Data File: uprr-nat.hc2

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*******************************************
*  [redacted]-2 WATER SURFACE PROFILES     *
*                                          *
*  Version   4.6.2;  May 1991              *
*                                          *
*  RUN DATE    30AUG93    TIME   13:30:28  *
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*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104               *
*****************************************
```

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

```
::::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::::
:::                                        :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
:::                                        :::
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```
==============================
H A E S T A D   M E T H O D S
==============================
```

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

THIS RUN EXECUTED 30AUG93 13:30:28

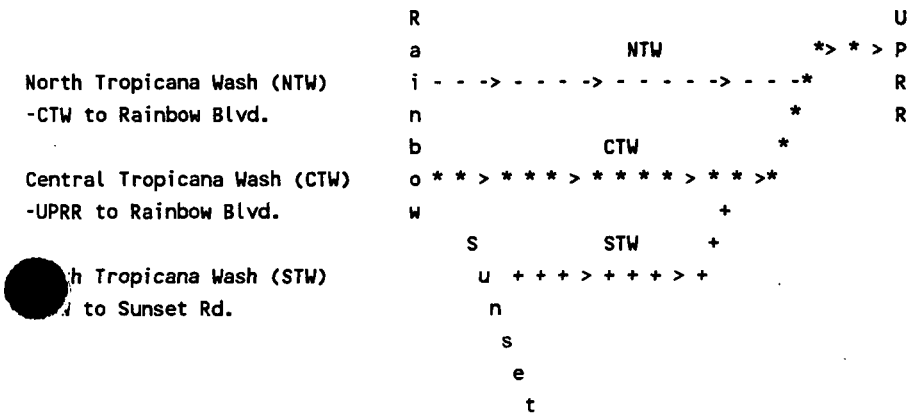
****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

TROPICANA WASH FLOOD INSURANCE STUDY

by CH2M Hill, 1992 RDD33832

Schematic:



Notes:
-discharges were based on those in the "Las Vegas Valley Flood Insurance Study Hydrology Report" by James M. Montgomery, Inc., September, 1991 (see CH2M Hill memo dated July 13, 1992)

-Manning's "n" values were estimated by field observations of channels and floodplains in conjunction with methods recommended in "Open Channel Hydraulics" by Chow, 1959

-stations and elevations obtained from 400 scale topo created by CH2M Hill from aerial photographs

Just downstream of section 64.366, a 66 inch RCP will be put in the Spear Channel. This pipe was estimated to remove 350 cfs from the storm discharge, reducing it from 3300 to 2950 cfs. Then, just downstream from the pipe inlet, at Cameron St., there is a flow split where a portion of the flow continues due east and the rest flows north up Cameron for about 600 feet before continuing east in the Tropicana Wash.
To calculate the amount of discharge in each channel, they were individually ed using the tailwater channel rating portion of the F.H.W.A. culvert alysis program HY-8. The rating curves were plotted and a common elevation was found where the sums of the channel flows at that elevation = 2950 cfs. The resulting discharge for Tropicana Wash of 2050 cfs was used in this run from section 64.366 to 64.179.

st downstream of section 64.179, the pipe flow combines with the channel flow. This raises the discharge up to 2400 cfs which it continues to be to section 63.866.

At section 63.682 a box culvert is proposed to go in under Arville St. with channel regrading upstream and downstream of the culvert. The GR input at sections 63.585 and 63.682 were modified to reflect the regrading and the channel "n" value was reduced to 0.025 at these sections. The discharge was routed through the culvert using the Special Bridge routine.

Also, at Arville St., some discharge leaves Tropicana Wash and flows north through the street. A split flow was performed (file = UPRR-WSF.HC2) and calculated that 281 cfs splits out but returns at section 63.411.

```
T1   CCRFCD  TROPICANA WASH F.I.S.;   RDD33832
T2   Central, North and South Tropicana Wash, Detailed Methods
T3      UPRR-Nat.hc2            UPRR to beginning of NTW, CTW & STW, natural

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                                       0         0              2213.6         0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    -1         0        -1         0         0         0         0         0         0         15

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1        43         8        55        26        56        13        14        15
      4        53        54
     38         1        43        39         4        53        27        21        22        28
     54        33
    100       150

QT       1      4100

NC     .04      .042      .045       0.1       0.3
X1   63.411       18    9951.2   10044.5         0         0         0
X3      10
```

Starting W.S.El. obtained by routing discharge at UPRR through the culvert using the F.H.W.A. culvert analysis program HY-8

```
X5       1    2213.6
GR  2214.0    9546.2  2213.9    9626.7  2209.1    9748.7  2209.6    9817.4  2215.0    9908.6
GR  2212.7    9951.2  2203.9    9979.5  2203.5   10000.0  2210.7   10044.5  2213.8   10091.7
```

[redacted]	213.3	10276.9	2214.5	10426.3	2218.3	10564.6	2219.6	10700.4	2217.2	10792.7
GR	2220.5	10815.9	2225.3	10878.1	2221.3	10933.9				

Sections 63.585 and 63.682 were modified (NC and GR) to reflect proposed channel grading

NH	3	.04	9808.8	.025	10169.9	.042	10777.7			
QT	1	3819								
X1	63.585	23	9983.3	10020.2	930	910	920			
X3	10					10488				
GR	2224.4	9308.5	2222.9	9588.5	2223.4	9689.2	2220.0	9778.8	2221.5	9808.8
GR	2218.0	9983.3	2215.2	9995.0	2215.2	10000.0	2215.2	10005.0	2217.7	10006.8
GR	2219.2	10020.2	2216.9	10076.8	2222.3	10169.9	2221.7	10271.4	2223.8	10349.4
GR	2220.7	10418.6	2226.7	10488.0	2221.4	10584.4	2220.8	10653.8	2222.7	10683.3
GR	2220.3	10711.0	2226.5	10745.2	2228.5	10777.7				
NH	3	.055	9867.1	.025	10110.5	.055	10627.0			
QT	1	4100								

Following left encroachment reflects 4:1 expansion

[redacted]llowing W.S.El. obtained by routing discharge through the proposed box culvert at Arville St. using the Special Culvert routine.

X1	63.682	18	9969.6	10035.4	450	500	510			
X3	10			9850						
X5	1	2230.90								
GR	2228.1	9295.9	2227.5	9457.7	2226.2	9525.5	2226.2	9751.0	2226.8	9867.1
GR	2225.8	9969.6	2220.9	9985.0	2220.9	10000.0	2220.9	10015.0	2226.0	10035.4
GR	2224.7	10098.1	2228.5	10110.5	2227.2	10291.8	2229.3	10302.0	2230.5	10337.7
GR	2230.8	10503.5	2232.9	10543.4	2233.9	10627.0				
NC	.04	.055	.028	.3	.5					

Following station is 63.801 but is abbreviated to allow room for "-" sign for beginning the North Tropicana Wash tributary run
-this section is at the confluence of the North and Central Tropicana Washes
-Q100 changes at the next section

X1	63.80	40	9894.9	10084.1	620	590	630			
X3	10									
GR	2241.3	8720.4	2242.1	8792.8	2241.0	8856.0	2239.5	9037.7	2238.5	9235.5
GR	2238.4	9411.5	2239.9	9475.0	2240.4	9584.1	2239.8	9646.2	2236.9	9727.9
GR	2233.1	9753.9	2233.1	9894.9	2231.5	9961.4	2229.1	9981.7	2228.4	10000.0
GR	2228.4	10015.1	2235.3	10052.4	2236.5	10084.1	2235.9	10096.0	2233.5	10123.2
[redacted]	232.8	10282.1	2231.7	10338.1	2232.1	10410.7	2235.1	10452.6	2235.0	10491.8
GR	2238.9	10541.6	2236.9	10911.1	2235.7	11107.0	2236.8	11165.7	2237.7	11327.0
GR	2237.8	11546.0	2237.0	11641.3	2239.6	11707.5	2238.8	11785.8	2236.6	11837.8

[redacted]235.0 11877.1 2238.8 11896.1 2239.8 12139.6 2240.0 12429.9 2241.0 12442.3

NC .025 .025 .032

The following Q is the sum of the stormflow that remained in Tropicana Wash after the flow split that occured up at Cameron St. (near sect. 64.366) plus the flow from the 66" pipe.
This section is just upstream of the confluence with the North TW

QT 1 2400

X1 63.866 10 9979.5 10016.3 355 340 345
X3 10
GR 2237.3 9744.2 2236.9 9833.1 2236.8 9973.3 2236.8 9973.3 2236.7 9979.5
GR 2230.8 9993.3 2230.8 10000.0 2230.8 10007.4 2235.7 10016.3 2233.4 10123.3

Bridge at Hacienda
Up & Downstream stream inverts have approximately 1 ft. of sediment deposition
Culvert maintenance assumed

SB 1.25 1.6 2.6 67 16 0.7 80.0 0 2231 2230.8
X1 63.884 8 9986.5 10009.7 95 85 90
X2 1 2236 2237.1
[redacted] 10 9830
GR 2237.0 9784.8 2236.9 9875.7 2236.4 9986.5 2231 9990.2 2231 10000.0
GR 2231 10005.9 2236.2 10009.7 2235.9 10117.1

X1 63.907 9 9976.9 10035.0 110 150 125
X3 9830.0 10070.0
GR 2240.1 9738.1 2240.5 9851.0 2238.5 9873.9 2237.4 9976.9 2233.1 9993.4
GR 2231.9 10000.0 2231.9 10011.5 2238.1 10035.0 2238.0 10212.1

X1 63.945 12 9970.6 10027.6 190 210 200
X3 10 9910.0 10070.0
GR 2238.2 9811.3 2238.6 9890.4 2240.3 9921.7 2238.5 9932.9 2238.8 9970.6
GR 2233.0 9989.4 2233.0 10000.0 2233.0 10008.7 2238.2 10027.6 2239.6 10051.5
GR 2240.8 10069.8 2238.5 10202.1

Footbridge across Tropicana Wash
-bridge is 5 ft. wide
-entered negligible pier width to use special bridge method

SB .9 1.6 2.6 58 22 .01 185 3.06 2233.00 2233.00
X1 63.946 12 9970.6 10027.6 5 5 5 .05
X2 1 2238 2240.4
X3 10 9910.0 10070.0
GR 2238.2 9811.3 2238.6 9890.4 2240.3 9921.7 2238.5 9932.9 2238.8 9970.6
GR 2233.0 9989.4 2233.0 10000.0 2233.0 10008.7 2238.2 10027.6 2239.6 10051.5
GR 2240.8 10069.8 2238.5 10202.1

[redacted]

```
NC      .03      .056      .035       .1        .3
X1   63.979        22    9971.6  10044.4       145       250       175
X3                                  9880                10276.2
GR   2241.6    9458.3    2240.8   9515.9    2237.6    9699.1    2240.4    9724.9    2240.7    9948.7
GR   2240.8    9971.6    2235.0   9990.9    2234.3   10000.0    2234.3   10008.9    2238.8   10025.2
GR   2239.6   10044.4    2240.0  10129.1    2242.0   10276.2    2238.8   10299.6    2240.4   10312.5
GR   2240.9   10489.0    2242.5  10744.8    2239.2   10790.3    2239.6   10860.5    2241.5   11051.7
GR   2243.4   11161.5    2243.9  11411.1

X1   64.084        15    9974.5  10013.5       460       590       555
X3                                  9925.0
GR   2243.8    9731.6    2244.5   9894.5    2243.5    9974.5    2238.9    9984.6    2238.3   10000.
GR   2244.7   10013.5    2246.8  10319.6    2247.5   10662.     2246.7   10678.     2248.3   10709.
GR   2249.8   10821.0    2249.2  11059.4    2248.0   11328.     2250.7   11348.     2251.0   11397.
  following higher coefficients are due to buildings encroaching into channel

NC                                  .3        .5
X1   64.113        21    9975.7  10046.1       150       145       150
X3                                  9925                10571
GR   2245.4    9678.3    2244.2   9900.4    2244.2    9975.7    2240.0    9989.7    2239.8   10000.0
GR   2239.8   10006.3    2244.7  10018.9    2246.7   10046.1    2246.7   10154.8    2248.2   10304.7
GR   2251.2   10571.0    2250.0  10602.5    2249.8   10661.6    2247.1   10667.6    2246.8   10693.7
GR   2251.6   10737.2    2252.3  10948.2    2250.1   11059.3    2251.0   11195.0    2253.6   11295.5
GR   2255.0   11401.6
NC      .06      .054      .046
X1   64.137        21    9991.4  10019.8       125       130       130
X3                                  9930                10641.5
GR   2250.2    9698.7    2250.2   9698.7    2250.5    9717.0    2250.1    9991.4    2243.1    9994.0
GR   2241.3   10000.0    2248.2  10019.8    2249.5   10118.4    2249.1   10284.7    2251.4   10524.6
GR   2251.9   10641.5    2249.4  10660.0    2248.7   10690.4    2252.5   10738.4    2253.4   10925.8
GR   2252.0   11023.3    2251.4  11119.0    2253.3   11200.5    2256.5   11297.0    2256.5   11351.1
GR   2259.2   11438.2

NC      .046      .046      .034       .1        .3

  The following Q is portion of the stormflow that remained in Tropicana Wash
  after the flow split that occured up at Cameron St. (near sect. 64.366)
  This does not include the flow from the 66" pipe

QT         1      2050

X1   64.179        25    9982.8  10021.8       240       195       220
X3        10                                            10535.0
GR   2249.7    9220.3    2248.8   9376.7    2248.4    9518.8    2249.9    9754.5    2249.6    9941.3
GR   2251.7    9982.8    2244.7  10000.0    2246.6   10011.4    2250.7   10021.8    2251.1   10034.5
GR   2249.7   10185.1    2250.7  10373.4    2254.0   10535.0    2253.0   10600.3    2250.0   10610.5
GR   2249.8   10627.8    2250.4  10650.8    2254.2   10708.0    2253.8   11001.2    2255.4   11021.7
GR   2256.3   11108.6    2253.9  11187.8    2255.7   11237.2    2261.8   11283.4    2267.0   11386.0
```

NC .043 .098 .041

The following section is upstream of the flow split and the inlet to the 66" pipe.

```
QT        1      3300

X1   64.366        15    9961.4   10022.0       735       950       990
X3                             9961.4
GR    2257.3    9394.0    2255.6    9574.6    2255.6    9574.6    2256.4    9683.3    2259.4    9961.4
GR    2254.3    9988.5    2251.8   10000.0    2253.0   10010.7    2257.2   10022.0    2257.5   10062.3
GR    2261.0   10089.     2265.0   10172.3    2266.1   10273.5    2267.5   10342.0    2269.5   10504.4

NC     .045      .078      .046
X1   64.461        12    9962.0   10043.5       495       500       500
X3       10
GR    2267.8    9608.3    2268.7    9685.9    2267.1    9962.0    2265.4    9979.1    2257.9    9990.0
GR    2255.7   10000.0    2267.5   10043.5    2266.8   10114.7    2268.8   10227.6    2270.6   10424.5
GR    2273.4   10505.9    2271.4   10650.5

NC     .048      .048      .032
```

Following station is 64.563 but is abbreviated to allow room for "-" sign for beginning the South Tropicana Wash tributary run

[redacted]is section is at the confluence of the South and Central Tropicana Washes

[redacted]00 changes at the next section

```
X1   64.56        17    9979.0   10026.4       540       530       535
X3       10
GR    2277.4    9845.8    2274.3    9878.4    2274.2    9927.9    2274.2    9928.0    2276.0    9964.3
GR    2274.9    9979.0    2265.3   10000.0    2267.5   10015.9    2271.9   10026.4    2271.0   10078.4
GR    2273.1   10156.8    2276.0   10172.8    2277.6   10247.9    2274.6   10268.2    2275.3   10291.3
GR    2275.3   10424.8    2278.8   10588.5

NC     .055      .055      .037
```

High conveyance change due to channel entrenchment

Following section is above the confluence with the South TW

```
QT        1      1000

X1   64.677        15    9911.2   10080.5       615       540       605
GR    2287.4    9652.8    2288.4    9765.0    2285.6    9851.6    2271.6    9911.2    2268.2   10000.0
GR    2269.6   10056.9    2270.7   10080.5    2270.6   10108.2    2272.1   10196.7    2278.2   10226.1
GR    2277.5   10258.9    2274.7   10277.5    2277.7   10293.0    2276.7   10310.5    2281.0   10365.8
```

Central TW @ Confluence #1 (confluence with a minor tributary)

```
Q[redacted]    1      640
NC    .055    .055    .044
X1  64.789      17  9966.6  10132.3     550     650     590
GR  2286.9  9501.1  2287.7   9558.0  2290.5  9671.9  2290.9  9779.8  2278.9  9819.2
GR  2275.7  9879.1  2277.6   9899.6  2275.6  9919.4  2276.6  9929.7  2277.3  9966.6
GR  2276.7  9993.7  2275.1  10000.0  2275.9 10006.5  2276.7 10132.3  2279.1 10245.8
GR  2286.7 10302.8  2288.0  10325.9

NC                          .1      .3
X1  64.889      23  9970.7  10031.4     515     530     530
GR  2292.7  9507.7  2291.3   9543.0  2292.2  9628.4  2288.5  9688.1  2289.2  9711.1
GR  2287.7  9723.7  2290.1   9761.7  2290.3  9788.8  2293.4  9830.1  2293.0  9901.4
GR  2288.8  9959.1  2284.3   9970.7  2284.2  9980.2  2281.9  9994.4  2281.3 10000.0
GR  2281.9 10006.0  2282.2  10021.7  2283.5 10031.4  2284.5 10043.3  2289.3 10060.2
GR  2289.2 10085.9  2288.1  10122.0  2291.6 10155.7

NC     .05     .05    .036
X1  64.989      26  9983.3  10012.4     545     505     525
X3                                      10119.1
GR  2295.7  9478.6  2296.1   9514.9  2296.0  9598.6  2296.4  9623.8  2294.4  9678.1
GR  2296.8  9727.0  2295.8   9767.2  2296.6  9816.6  2296.0  9868.7  2293.2  9898.9
GR  2294.5  9921.4  2291.9   9963.4  2291.7  9983.3  2288.5 10000.0  2290.5 10012.4
GR  2291.1 10051.8  2293.3  10089.7  2295.7 10119.1  2295.9 10168.9  2294.2 10212.0
GR  2291.0 10243.2  2294.4  10288.3  2292.8 10296.2  2293.7 10305.1  2293.2 10334.1
G[redacted]2296.1 10398.8

NC     .05     .05    .045
X1  65.089      16  9949.9  10031.1     505     570     530
GR  2301.9  9689.2  2301.9   9689.2  2302.1  9862.1  2301.8  9949.9  2296.6  9973.9
GR  2295.0 10000.0  2300.1  10031.1  2298.9 10048.7  2302.0 10075.6  2302.0 10105.8
GR  2299.2 10148.1  2302.1  10200.4  2302.2 10225.9  2300.0 10317.1  2309.0 10435.6
GR  2308.5 10481.7

X1  65.175      25  9944.2  10023.7     440     465     455
GR  2311.0  9726.1  2311.0   9726.1  2310.4  9753.0  2305.6  9806.7  2307.7  9831.3
GR  2307.3  9851.6  2308.5   9886.3  2306.8  9913.8  2306.4  9944.2  2302.5  9969.1
GR  2303.4  9984.3  2300.6  10000.0  2307.4 10023.7  2308.6 10056.4  2308.2 10077.8
GR  2309.9 10117.8  2312.7  10183.1  2311.2 10246.5  2312.2 10258.8  2312.0 10284.9
GR  2314.1 10316.8  2314.5  10403.7  2312.9 10427.0  2314.8 10449.5  2314.0 10476.9

X1  65.277      17  9960.7  10045.0     520     470     535
GR  2317.2  9747.1  2317.1   9843.1  2314.2  9934.3  2312.2  9960.7  2307.2  9989.8
GR  2307.1 10000.0  2308.2  10025.8  2310.5 10045.0  2310.5 10071.1  2313.1 10086.8
GR  2313.6 10122.6  2312.5  10137.1  2315.5 10170.7  2317.4 10204.1  2319.3 10336.1
GR  2318.7 10441.9  2318.9  10539.7

NC     .045    .045    .039
X1  65.381      16  9945.3  10081.9     530     510     550
X3       10
GR  2323.3  9715.5  2323.3   9715.5  2322.9  9742.5  2323.2  9787.4  2322.6  9882.7
[redacted]2322.0  9945.3  2318.3  10000.0  2319.1 10015.2  2317.9 10057.3  2319.9 10081.9
GR  2319.3 10116.7  2323.1  10252.0  2323.3 10337.7  2324.1 10363.4  2324.5 10390.4
GR  2324.7 10533.4
```

X1 65.483 16 9976.0 10018.2 555 530 540
GR 2330.3 9614.4 2331.3 9640.9 2331.0 9809.8 2329.9 9831.2 2329.9 9853.7
GR 2329.9 9880.6 2329.4 9904.8 2326.4 9952.0 2327.5 9976.0 2326.0 10000.0
GR 2327.5 10018.2 2328.5 10073.7 2328.6 10145.8 2330.1 10291.9 2333.3 10367.7
GR 2332.0 10450.0

NC .041 .041 .034
X1 65.573 11 9890.3 10140.6 450 505 475
X3 10
GR 2335.3 9525.1 2336.4 9599.0 2336.4 9707.8 2336.9 9890.3 2335.4 9958.7
GR 2334.2 10000.0 2333.8 10086.4 2336.7 10140.6 2335.7 10249.9 2335.1 10485.3
GR 2335.7 10586.0
Central TW @ Jones Blvd.

QT 1 530
X1 65.671 20 9992.6 10020.9 498 505 520
X3 10
GR 2342.5 9573.2 2342.1 9672.5 2342.7 9779.1 2343.6 9824.5 2343.1 9897.8
GR 2340.6 9960.9 2341.2 9992.6 2340.1 10000.0 2341.2 10020.9 2340.7 10050.4
GR 2342.0 10097.8 2343.0 10150.0 2343.1 10246.9 2343.5 10347.2 2344.3 10473.8
GR 2346.3 10481.0 2346.0 10538.1 2344.4 10594.8 2344.1 10664.7 2343.3 10876.2

X1 65.771 19 9970.7 10049.8 510 510 525
X3 9875.6 10190.4
GR 2350.2 9732.8 2349.1 9812.0 2350.0 9875.6 2348.9 9970.7 2347.1 10000.0
GR 2347.4 10012.0 2347.1 10032.5 2348.6 10049.8 2347.8 10072.7 2348.0 10135.8
GR 2349.1 10190.4 2347.6 10267.6 2349.5 10294.2 2350.8 10423.0 2349.8 10507.4
GR 2349.6 10635.1 2349.2 10865.1 2350.4 10922.0 2349.3 11089.4
Oquendo Road

X1 65.871 8 9935.5 10049.1 505 500 530
X3 9712.3
GR 2357.0 9411.6 2357.5 9585.4 2356.8 9712.3 2355.2 9854.0 2355.5 9935.5
GR 2355.0 10000.0 2355.5 10049.1 2357.5 10390.9

X1 65.972 18 9968.3 10087.4 525 510 530
X3 10
GR 2363.6 9497.9 2363.8 9499.0 2364.5 9703.2 2363.0 9761.4 2364.2 9818.7
GR 2362.1 9849.3 2363.8 9886.6 2363.6 9968.3 2361.9 9981.2 2362.0 10000.0
GR 2363.2 10087.4 2363.6 10205.2 2367.2 10238.5 2367.6 10281.2 2364.2 10344.6
GR 2364.5 10402.7 2367.2 10468.2 2365.8 10549.2

X1 66.073 8 9984.2 10028.4 530 515 535
X3 9801.6 10112.9
GR 2373.1 9801.6 2372.7 9878.5 2370.6 9905.5 2371.8 9924.3 2371.8 9984.2
GR 2370.6 10000.0 2372.0 10028.4 2372.6 10112.9

X1 66.181 26 9981.1 10078.1 590 545 570
X3 10
GR 2382.6 9242.7 2382.9 9321.1 2381.0 9423.9 2379.4 9573.4 2380.0 9653.7
GR 2381.5 9678.8 2381.5 9724.4 2379.9 9807.8 2379.6 9932.3 2381.3 9949.6
GR 2380.7 9981.1 2376.2 10000.0 2380.8 10010.0 2380.6 10037.8 2381 10078.1
GR 2380.5 10143.5 2380.3 10156.8 2380.0 10196.2 2379.7 10263.2 2379.9 10320.

[redacted]379.9 10342.4 2380.0 10378.4 2380.0 10482.1 2379.7 10567.9 2379.8 10609.
GR 2379.9 10772.0
Patrick Alignment

X1 66.276 20 9962.4 10084.1 500 490 500
X3 10
GR 2389.1 9472.3 2388.6 9536.0 2388.6 9676.6 2389.9 9721.8 2388.9 9777.6
GR 2390.1 9814.3 2387.5 9840.1 2388.9 9854.6 2389.5 9962.4 2388.6 9985.4
GR 2386.7 10000.0 2387.5 10012.6 2387.6 10039.7 2390.0 10084.1 2390.2 10164.1
GR 2388.6 10223.7 2388.1 10283.8 2389.7 10522.7 2390.5 10598.0 2389.4 10757.1

X1 66.369 18 9943.1 10118.2 495 500 495
X3 10
GR 2396.0 9681.5 2396.0 9681.5 2397.7 9830.2 2396.7 9854.3 2397.1 9943.1
GR 2396.0 9979.5 2395.4 10000.0 2395.8 10037.7 2396.5 10118.2 2395.7 10208.2
GR 2398.3 10331.5 2397.4 10376.5 2399.1 10496.6 2397.9 10566.0 2397.1 10626.8
GR 2399.3 10680.6 2399.3 10741.3 2398.4 10798.1

X1 66.470 25 9972.3 10030.9 480 525 530
X3 10
GR 2404.0 9407.0 2404.0 9472.7 2404.2 9595.6 2403.9 9655.8 2404.1 9721.1
GR 2404.8 9805.8 2405.6 9904.0 2403.2 9917.7 2403.6 9944.6 2403.6 9972.3
GR 2401.0 9993.1 2400.2 10000.0 2401.3 10013.2 2404.2 10030.9 2405.6 10099.0
GR 2404.2 10134.6 2405.5 10172.6 2402.4 10204.9 2404.4 10231.4 2405.4 10276.8
GR 2406.2 10396.2 2406.7 10450.6 2408.0 10538.6 2407.9 10666.2 2407.5 10750.3

[redacted]56.567 26 9971.5 10018.7 500 505 515
X3 10
GR 2409.6 9444.9 2410.1 9493.3 2409.0 9545.7 2410.7 9747.8 2409.6 9829.7
GR 2411.1 9887.8 2410.0 9940.3 2411.4 9971.5 2408.3 9985.6 2407.6 10000.0
GR 2410.9 10018.7 2410.9 10047.0 2411.9 10111.5 2410.4 10131.6 2411.4 10152.4
GR 2409.4 10179.9 2411.4 10198.8 2411.7 10224.9 2411.3 10276.2 2412.9 10383.1
GR 2412.4 10429.7 2413.2 10496.5 2412.6 10578.6 2413.2 10617.1 2414.1 10644.9
GR 2413.3 10777.9

X1 66.662 14 9898.3 10072.4 500 510 500
GR 2420.5 9385.4 2421.1 9449.3 2421.0 9547.8 2420.4 9672.4 2419.8 9809.2
GR 2418.2 9898.3 2414.6 9936.9 2414.7 10000.0 2415.4 10045.2 2418.4 10072.4
GR 2418.9 10094.2 2419.4 10134.7 2420.8 10348.4 2421.9 10615.3

X1 66.766 18 9896.4 10047.1 515 527 550
X3 10
GR 2427.7 9553.0 2428.4 9658.0 2427.8 9739.6 2429.1 9778.0 2428.9 9856.0
GR 2427.3 9896.4 2424.6 9917.9 2422.4 9949.7 2421.5 9967.9 2422.5 9982.3
GR 2421.8 10000.0 2421.8 10010.2 2426.7 10047.1 2429.2 10136.0 2429.1 10166.7
GR 2429.6 10347.0 2429.6 10421.4 2429.2 10480.5

X1 66.866 15 9956.6 10030.8 510 490 530
X3 10
GR 2434.8 9499.5 2436.0 9555.7 2436.4 9665.7 2435.8 9857.7 2432.8 9894.8
[redacted]2428.5 9918.0 2430.5 9956.6 2428.8 10000.0 2430.8 10030.8 2429.8 10061.7
[redacted]2436.4 10099.5 2437.6 10188.4 2438.3 10355.2 2438.3 10475.6 2437.4 10572.5

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X1    66.974       12     9975.0    10059.6       530        515        570
GR    2443.4     9599.4    2443.2     9679.2    2443.0     9752.4     2444.5     9868.2     2443.6     9926.6
GR    2438.2     9952.3    2438.8     9975.0    2436.4    10000.0     2437.8    10059.6     2441.8    10106.3
GR    2446.0    10250.8    2445.4    10507.4
  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  Begin North Tropicana Wash tributary run


NC      .04       .055       .028        .1         .3
QT        1       4100
X1   -63.80         40     9894.9    10084.1          0          0          0
X3       10
GR    2241.3     8720.4    2242.1     8792.8    2241.0     8856.0     2239.5     9037.7     2238.5     9235.5
GR    2238.4     9411.5    2239.9     9475.0    2240.4     9584.1     2239.8     9646.2     2236.9     9727.9
GR    2233.1     9753.9    2233.1     9894.9    2231.5     9961.4     2229.1     9981.7     2228.4    10000.0
GR    2228.4    10015.1    2235.3    10052.4    2236.5    10084.1     2235.9    10096.0     2233.5    10123.2
GR    2232.8    10282.1    2231.7    10338.1    2232.1    10410.7     2235.1    10452.6     2235.0    10491.8
GR    2238.9    10541.6    2236.9    10911.1    2235.7    11107.0     2236.8    11165.7     2237.7    11327.0
GR    2237.8    11546.0    2237.0    11641.3    2239.6    11707.5     2238.8    11785.8     2236.6    11837.8
GR    2235.0    11877.1    2238.8    11896.1    2239.8    12139.6     2240.0    12429.9     2241.0    12442.3

NC      .034       .078       .053
  NTW above confluence with the CTW
QT        1       1450
X1   90.093         13     9955.1    10105.4       450        540        490
X3       10
GR    2241.2     9823.6    2241.2     9823.6    2240.8     9931.2     2235.8     9955.1     2234.8    10000.0
GR    2237.0    10105.4    2237.8    10255.9    2239.0    10340.3     2238.6    10423.3     2238.3    10491.1
GR    2239.2    10546.4    2244.5    10601.2    2242.4    10798.1

NC      .032       .032       .027         .3         .5
X1   90.188         20     9980.3    10018.1       540        495        500
X3                                      9500                10147.8
GR    2246.9     9499.1    2246.8     9566.9    2245.1     9752.5     2243.7     9925.9     2242.2     9941.0
GR    2241.4     9980.3    2238.1     9992.2    2238.1    10000.0     2238.1    10009.0     2242.0    10018.1
GR    2242.3    10066.1    2242.7    10147.8    2241.6    10366.7     2242.0    10631.7     2241.9    10673.2
GR    2244.2    10691.3    2245.8    10739.3    2246.1    10820.3     2244.4    10839.8     2248.3    10925.0
  Right bank encroachments in sections 90.203 and 90.215 due to building

X1   90.203         12     9961.0    10025.0        80         75         80
X3       10                                                 10285
GR    2247.9     9456.4    2247.1     9706.9    2244.1     9961.0     2238.2     9987.1     2238.1    10000.0
GR    2238.1    10010.5    2243.2    10025.0    2242.1    10290.0     2242.9    10528.9     2242.8    10663.0
GR    2244.9    10819.5    2248.0    10918.0
  Culvert under Cameron St.

SB     1.25        1.6        2.6         50       27.6        3.6       96.0          0     2238.6     2238.1
  Culverts are partially filled with silt, set sediment elevation in X3.2 to be
    at lowest GR elevation.
N       .085       .025       .031
```

X[redacted]0.215	13	9975.3	10028.7	65	65	65				
X2		1	2242.6	2244.5						
X3	10	2239.8			10270					
GR	2248.3	9413.4	2246.5	9763.7	2244.9	9975.3	2242.0	9989.5	2240.8	10000.0
GR	2239.8	10010.7	2244.2	10028.7	2244.5	10279.0	2244.4	10543.0	2244.2	10656.2
GR	2245.8	10676.5	2246.4	10810.4	2248.9	10907.7				
NC	.085	.025	.033	.1	.3					
X1	90.284	18	9980.0	10016.3	370	375	365			
X3	10					10289.7				
GR	2251.3	9132.2	2250.4	9317.9	2252.1	9376.2	2252.0	9563.6	2248.2	9770.4
GR	2248.5	9980.0	2246.2	10000.0	2248.3	10016.3	2245.9	10216.0	2249.8	10289.7
GR	2249.1	10504.2	2247.4	10579.5	2246.9	10651.4	2251.6	10959.7	2252.6	11153.8
GR	2251.8	11301.9	2256.1	11314.1	2256.1	11336.4				
NC	.058	.058	.051							
X1	90.381	20	9990.9	10007.9	515	500	510			
X3				9805		10237.3				
GR	2259.0	9343.5	2258.9	9362.3	2256.4	9559.0	2253.4	9575.8	2254.9	9591.9
GR	2254.2	9617.3	2253.0	9631.6	2254.5	9641.7	2254.6	9717.5	2253.0	9747.3
GR	2254.7	9805.0	2253.2	9847.4	2253.4	9886.8	2252.1	9922.4	2253.1	9990.9
GR	2250.6	10000.0	2252.6	10007.9	2251.8	10026.2	2253.1	10058.2	2253.6	10237.3
NC	.045	.045	.04							
X1	90.476	29	9991.9	10012.1	510	500	505			
X[redacted]	10					10537.5				
G[redacted]2262.9	8835.5	2263.0	8996.0	2260.9	9150.9	2259.7	9279.7	2258.3	9306.5	
GR	2257.6	9351.4	2259.8	9360.0	2258.6	9368.8	2258.1	9552.1	2258.6	9779.8
GR	2256.9	9972.0	2258.1	9991.9	2257.3	10000.0	2258.7	10012.1	2259.1	10037.0
GR	2258.0	10206.1	2256.6	10404.2	2258.3	10457.6	2257.6	10481.6	2258.9	10537.5
GR	2258.5	10641.2	2257.2	10657.7	2258.6	10685.9	2258.2	10724.9	2261.4	10739.2
GR	2262.8	10838.8	2269.5	10967.4	2264.3	11012.7	2267.0	11129.4		
X1	90.570	12	9991.3	10014.3	505	485	495			
X3	10									
GR	2265.5	9359.4	2265.3	9460.6	2264.1	9638.2	2262.0	9921.4	2261.7	9974.4
GR	2263.1	9991.3	2260.3	10000.0	2264.4	10014.3	2263.9	10070.7	2264.8	10200.4
GR	2266.8	10448.6	2267.1	10618.3						
NC	.045	.045	.035							
X1	90.667	30	9970.9	10037.5	520	500	510			
X3	10			9771						
GR	2272.9	9102.9	2273.1	9108.9	2273.5	9211.7	2273.5	9329.5	2272.0	9370.2
GR	2273.0	9434.5	2270.0	9479.1	2270.4	9668.5	2268.4	9700.2	2268.2	9736.4
GR	2269.7	9771.0	2268.8	9871.5	2266.6	9955.7	2267.8	9970.9	2264.1	10000.0
GR	2266.0	10023.2	2268.6	10037.5	2266.7	10048.3	2267.6	10059.1	2270.3	10077.1
GR	2270.7	10105.6	2273.3	10150.4	2273.4	10202.1	2275.2	10279.1	2272.8	10321.3
GR	2277.0	10408.9	2278.6	10512.5	2278.0	10642.5	2276.4	10665.7	2279.3	10709.2

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X1    90.760       26     9968.3   10035.3       465       515       495
X3        10
GR    2281.0    9083.7    2281.5    9282.3    2275.6    9357.6    2275.1    9419.0    2276.3    9522.8
GR    2274.1    9616.4    2278.1    9700.1    2274.9    9754.1    2274.3    9789.2    2271.1    9867.6
GR    2270.2    9955.5    2270.6    9968.3    2267.8    9987.4    2267.2   10000.0    2267.2   10014.9
GR    2271.6   10035.3    2272.3   10062.9    2274.8   10077.0    2275.2   10098.3    2272.7   10116.9
GR    2277.4   10150.1    2280.0   10229.6    2282.9   10398.2    2281.7   10496.8    2282.6   10733.6
GR    2286.4   10882.6

NC                             .3        .5
X1    90.840       32     9958.8   10051.9       440       400       420
X3        10
GR    2289.2    8843.7    2291.4    8913.2    2289.7    8956.4    2285.2    9013.2    2286.8    9044.1
GR    2283.1    9066.9    2282.2    9171.5    2282.2    9307.0    2281.4    9488.0    2283.7    9520.4
GR    2281.9    9587.9    2279.6    9789.6    2277.7    9838.3    2277.5    9868.2    2279.3    9899.1
GR    2279.3    9952.4    2279.0    9958.8    2275.3    9977.7    2268.6    9992.8    2268.9   10000.0
GR    2269.9   10015.8    2274.3   10032.5    2277.2   10051.9    2277.5   10095.6    2277.5   10095.6
GR    2282.7   10289.3    2282.7   10352.5    2285.9   10389.4    2287.2   10536.8    2286.0   10666.4
GR    2287.9   10761.0    2288.8   10957.3
  Culvert under Hacienda Ave.
    -entered negligible pier width to use special bridge method
    -heavy silt deposits

SB    1.25       1.6       2.6         0        16       .01      78.8         0    2269.8    2268.6
X     0.863       38     9974.8   10024.6       120       120       120
X                           1    2274.7    2278.7
X3        10                                          10058.5
BT        -9      9974      2277                9988      2278      2270      9991      2278    2274.1
BT                9994      2278    2274.5      9998      2278    2275.2     10002      2278    2274.9
BT               10005      2278    2274.5     10008      2278      2270     10027      2276
GR    2288.8    8842.4    2285.6    8906.2    2283.8    9007.8    2283.3    9077.1    2286.4    9122.3
GR    2286.9    9197.9    2282.3    9220.0    2282.2    9276.2    2281.9    9330.0    2280.7    9364.0
GR    2280.6    9414.9    2282.0    9457.9    2280.2    9561.5    2281.7    9604.8    2279.5    9654.3
GR    2278.9    9723.1    2279.4    9766.3    2281.2    9830.8    2279.5    9846.8    2277.6    9877.3
GR    2277.4    9974.8    2269.8    9987.8    2269.8   10000.0    2269.8   10012.1    2276.1   10024.6
GR    2280.8   10058.5    2281.3   10078.9    2281.7   10093.2    2277.3   10111.4    2280.3   10135.6
GR    2281.2   10203.6    2284.9   10306.0    2284.5   10381.6    2286.0   10442.3    2287.3   10543.1
GR    2285.9   10634.9    2287.7   10700.3    2288.7   10770.8

NC       .05       .05      .035        .1        .3
X1    90.886       43     9898.3   10040.1       140       120       125
X3        10
GR    2289.1    8833.2    2289.1    8833.2    2288.2    8848.0    2290.3    8865.5    2286.9    8895.8
GR    2286.3    8941.5    2286.6    8973.9    2287.1    9042.9    2286.4    9055.1    2286.2    9105.1
GR    2287.7    9154.5    2289.4    9185.1    2289.1    9281.7    2287.4    9329.8    2281.1    9351.1
GR    2280.1    9551.6    2282.9    9570.2    2281.2    9659.2    2277.8    9689.5    2277.7    9752.6
GR    2280.1    9774.4    2286.8    9798.7    2286.8    9829.6    2284.3    9878.3    2285.6    9898.3
GR    2285.6    9898.3    2275.2    9935.6    2273.3    9969.4    2273.4    9981.8    2271.7    9993.5
GR    2271.7   10000.0    2271.7   10006.6    2284.3   10040.1    2284.3   10081.8    2283.8   10167.6
GR    2282.2   10183.7    2282.4   10201.8    2283.2   10255.4    2286.4   10316.8    2286.4   10381.0
G     2287.7   10528.1    2289.6   10622.8    2289.3   10727.5
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X1    90.953       35      9888.4    10133.7       330       390       350
X3       10
GR    2286.7     8968.0    2286.2     8982.7    2289.0     9008.1    2289.5     9031.3    2291.8     9086.8
GR    2290.7     9132.0    2292.2     9283.3    2289.7     9342.4    2291.1     9436.3    2289.3     9540.6
GR    2281.1     9568.0    2281.4     9632.2    2290.5     9678.2    2294.5     9735.9    2295.2     9772.1
GR    2292.2     9850.8    2290.5     9888.4    2276.9     9917.4    2276.6     9991.1    2274.1    10000.0
GR    2276.6    10009.0    2277.8    10079.5    2279.7    10093.9    2289.9    10133.7    2290.1    10160.8
GR    2287.3    10230.6    2289.0    10290.3    2290.2    10389.2    2291.0    10425.1    2291.0    10425.1
GR    2289.9    10462.7    2288.3    10500.0    2289.6    10558.3    2290.4    10693.0    2290.4    10909.0

X1    91.045       28      9988.8    10017.3       460       510       490
X3                                    9836.1
GR    2292.4     9173.8    2293.3     9242.2    2294.3     9311.6    2292.3     9347.3    2290.1     9396.4
GR    2292.3     9427.3    2291.6     9489.5    2287.0     9538.2    2288.3     9567.6    2285.1     9637.1
GR    2283.6     9707.4    2282.3     9765.1    2283.5     9836.1    2282.0     9862.7    2282.3     9887.7
GR    2281.6     9931.4    2281.4     9988.8    2278.7    10000.0    2283.4    10017.3    2284.6    10030.8
GR    2293.1    10038.0    2294.0    10061.0    2294.0    10120.5    2286.8    10164.5    2287.7    10205.4
GR    2291.3    10245.5    2292.0    10283.6    2293.6    10568.6

X1    91.134       35      9990.2    10021.9       470       490       470
X3                                    9845.0
GR    2295.5     9204.4    2296.0     9212.8    2293.7     9244.7    2296.2     9260.4    2295.5     9313.0
GR    2293.9     9417.5    2292.4     9494.2    2297.6     9556.0    2293.3     9581.7    2292.5     9605.1
GR    2292.0     9657.0    2289.4     9691.6    2288.6     9736.3    2292.8     9775.8    2287.8     9808.0
G     2290.0     9845.0    2287.0     9990.2    2284.6    10000.0    2287.9    10021.9    2287.2    10106.3
G     2289.2    10120.1    2288.3    10158.9    2288.7    10189.8    2288.3    10238.0    2290.1    10274.7
GR    2290.1    10346.7    2291.4    10398.5    2291.3    10460.2    2295.3    10538.3    2294.2    10597.8
GR    2296.4    10644.4    2294.7    10727.1    2296.2    10757.6    2297.8    10833.5    2300.1    10901.8

NC     .052       .052       .035
  North TW @ Confluence #1
QT       1       1250
X1    91.235       18      9986.9    10008.4       440       590       530
X3                                    9853.0
GR    2296.3     9350.3    2296.3     9350.3    2297.1     9426.5    2297.2     9467.4    2297.9     9604.5
GR    2296.0     9700.1    2294.9     9763.6    2293.1     9827.2    2295.1     9853.0    2293.3     9939.3
GR    2294.0     9951.1    2293.4     9986.9    2291.4    10000.0    2294.1    10008.4    2294.0    10048.3
GR    2294.2    10065.7    2295.3    10166.2    2296.4    10305.3

X1    91.337       39      9974.8    10022.6       530       480       540
X3       10
GR    2313.0     9693.9    2313.0     9693.9    2313.8     9710.2    2311.9     9730.3    2302.4     9800.6
GR    2298.0     9837.6    2299.3     9862.8    2300.7     9915.2    2297.4     9962.8    2299.2     9974.8
GR    2296.3    10000.0    2302.8    10022.6    2303.5    10035.5    2302.8    10059.4    2303.9    10083.2
GR    2303.6    10119.5    2304.3    10144.8    2301.6    10178.0    2302.4    10201.0    2301.6    10230.1
GR    2301.7    10282.0    2303.0    10337.8    2306.3    10395.9    2306.5    10463.4    2305.9    10485.9
GR    2302.4    10547.1    2304.9    10581.7    2304.4    10635.3    2302.0    10645.3    2303.3    10656.6
GR    2302.9    10697.5    2306.0    10716.6    2307.8    10748.0    2311.4    10779.0    2317.9    10823.7
GR    2318.0    10861.6    2317.1    10895.6    2319.1    10929.4    2320.0    11001.9
```

NH 3 .052 9972.2 .035 10041.2 .052 10905.4
X1 91.434 25 9972.2 10022.4 545 500 510
X3 10 10280
GR 2321.1 9493.1 2321.2 9524.5 2318.5 9585.2 2310.7 9652.5 2306.0 9726.2
GR 2306.5 9896.7 2304.3 9912.4 2305.5 9933.1 2305.2 9972.2 2302.9 9992.8
GR 2302.1 10000.0 2304.3 10022.4 2309.2 10041.2 2309.5 10074.5 2314.6 10198.8
GR 2319.9 10280.7 2317.4 10360.0 2310.3 10450.0 2307.8 10503.4 2305.9 10536.7
GR 2306.3 10594.0 2320.2 10699.0 2320.7 10785.1 2322.2 10834.3 2321.9 10905.4
North TW @ Jones Blvd.

QT 1 1200
NC .04 .04 .035
X1 91.530 27 9924.9 10015.7 510 505 510
X3 10
GR 2328.5 9242.0 2328.1 9369.9 2323.7 9447.8 2315.4 9591.5 2315.8 9705.5
GR 2315.7 9819.4 2313.8 9924.9 2311.1 9938.1 2309.0 9971.4 2310.7 9979.6
GR 2309.3 10000.0 2313.2 10015.7 2318.6 10109.5 2325.8 10132.9 2328.3 10173.0
GR 2328.4 10263.3 2326.8 10328.2 2316.8 10473.1 2317.7 10489.3 2313.1 10509.5
GR 2312.7 10523.0 2314.2 10529.4 2313.4 10548.0 2319.7 10595.8 2321.6 10640.8
GR 2327.7 10700.5 2329.1 10812.2

NC .04 .04 .03
X1 91.630 34 9955.9 10019.7 500 550 525
X3 10
GR 2330.9 9316.8 2331.4 9364.1 2330.2 9458.5 2325.5 9540.5 2327.5 9579.4
GR 2329.5 9635.4 2330.0 9701.3 2327.6 9742.3 2324.8 9829.6 2324.2 9894.1
GR 2320.1 9955.9 2314.8 9993.2 2314.3 10000.0 2314.8 10006.3 2317.1 10019.7
GR 2316.5 10066.6 2318.8 10100.6 2316.5 10119.2 2316.5 10135.8 2318.2 10154.7
GR 2316.8 10177.2 2318.9 10223.2 2333.1 10292.9 2334.6 10341.0 2336.5 10483.5
GR 2335.7 10553.2 2332.4 10586.5 2328.7 10622.7 2324.9 10670.4 2321.2 10693.5
GR 2325.3 10712.0 2334.0 10781.7 2336.2 10832.3 2336.8 10896.4

X1 91.733 28 9963.4 10025.6 600 490 545
GR 2338.8 9243.7 2339.0 9251.9 2339.1 9391.2 2337.8 9574.7 2339.1 9671.5
GR 2337.8 9739.1 2333.7 9775.6 2327.3 9836.3 2324.3 9894.2 2324.8 9963.4
GR 2321.1 9977.7 2319.7 10000.0 2319.7 10015.9 2323.1 10025.6 2323.7 10047.0
GR 2334.5 10148.2 2337.5 10176.9 2339.9 10226.6 2339.6 10281.1 2338.5 10315.6
GR 2339.4 10328.8 2338.6 10348.7 2339.9 10375.5 2340.8 10399.9 2339.1 10473.6
GR 2340.1 10502.4 2340.9 10533.2 2340.3 10622.4

X1 91.831 20 9968.1 10042.2 500 510 520
X3 10
GR 2347.5 9384.3 2347.5 9384.3 2344.4 9454.9 2344.2 9485.9 2346.8 9538.4
GR 2344.6 9788.9 2335.5 9819.2 2328.0 9861.2 2326.8 9952.0 2328.5 9968.1
GR 2321.7 9991.0 2320.8 10000.0 2321.1 10012.0 2340.0 10042.2 2341.9 10071.4
GR 2346.5 10102.4 2346.8 10166.7 2347.3 10251.1 2347.5 10519.9 2348.2 10594.4

NC .045 .045 .038
X1 91.926 19 9912.6 10067.8 510 490 500
GR 2351.8 9184.4 2353.6 9288.4 2354.9 9488.9 2353.0 9611.6 2351.1 9618.1
GR 2351.1 9638.8 2349.9 9658.8 2352.8 9686.1 2351.6 9817.3 2348.4 9912.6
GR 2328.4 9974.9 2327.3 10000.0 2326.3 10014.9 2350.6 10067.8 2353.1 10107.8
GR 2353.9 10159.5 2351.7 10194.1 2353.7 10349.4 2353.3 10546.9

X1 92.026 19 9982.8 10044.2 530 520 525
GR 2360.7 9148.5 2360.8 9155.2 2360.2 9341.8 2361.0 9423.7 2358.3 9451.5
GR 2358.3 9506.8 2356.5 9647.1 2355.0 9699.6 2355.0 9785.9 2355.8 9867.7
GR 2354.5 9884.9 2339.8 9909.5 2338.1 9934.1 2338.0 9982.8 2334.8 10000.0
GR 2336.1 10008.1 2354.0 10044.2 2359.1 10069.6 2360.0 10229.1

North TW @ Confluence #2

QT 1 850
X1 92.137 33 9976.0 10012.0 550 570 590
X3 10160.8
GR 2365.1 9504.1 2365.3 9567.5 2363.5 9573.4 2363.0 9596.9 2364.1 9842.1
GR 2356.4 9879.6 2353.5 9928.4 2352.3 9976.0 2343.7 9996.2 2343.7 10000.0
GR 2344.2 10005.6 2347.9 10012.0 2347.4 10030.3 2348.3 10082.8 2351.8 10139.5
GR 2353.0 10160.8 2347.2 10189.0 2345.1 10204.0 2345.7 10213.2 2344.6 10228.4
GR 2344.6 10238.8 2346.1 10248.6 2349.3 10264.5 2350.5 10322.5 2361.7 10418.1
GR 2367.7 10439.1 2366.0 10509.9 2368.2 10667.6 2368.2 10752.6 2369.0 10800.1
GR 2372.6 10849.2 2372.9 10911.3 2370.2 10994.5

Confluence with minor tributary. No affect on Q100.

X1 92.240 14 9988.8 10043.8 550 500 540
GR 2370.4 9055.5 2369.7 9129.2 2370.3 9367.3 2371.9 9447.3 2370.2 9789.0
GR 2358.2 9905.8 2356.2 9942.5 2352.8 9969.4 2352.8 9988.8 2350.0 10000.0
GR 2350.0 10011.2 2357.8 10020.5 2369.2 10043.8 2371.5 10139.0

X1 92.348 26 9987.7 10058.8 560 580 570
X3 10
GR 2376.4 9243.2 2376.5 9321.1 2375.4 9408.9 2375.6 9505.5 2374.5 9526.9
GR 2376.4 9573.6 2377.2 9672.7 2377.1 9867.1 2368.1 9920.7 2363.7 9987.7
GR 2358.1 10000.0 2358.1 10004.0 2360.3 10019.7 2364.3 10058.8 2369.7 10115.3
GR 2370.1 10115.5 2367.7 10163.0 2358.5 10212.6 2358.5 10223.9 2367.2 10243.5
GR 2371.8 10272.8 2371.1 10301.1 2367.6 10326.2 2370.1 10347.3 2377.0 10386.9
GR 2377.5 10488.0

X1 92.446 16 9975.2 10025.6 520 520 520
GR 2384.3 9327.5 2385.8 9493.3 2383.2 9592.8 2385.0 9887.8 2380.5 9926.5
GR 2371.9 9949.9 2369.0 9975.2 2368.5 9987.4 2366.7 9996.4 2366.1 10000.0
GR 2367.0 10005.9 2378.3 10025.6 2378.6 10065.3 2387.3 10110.3 2389.7 10189.0
GR 2388.9 10268.9

X1 92.545 25 9960.8 10038.7 510 550 525
GR 2390.6 9410.2 2391.7 9652.8 2391.5 9904.7 2386.4 9960.8 2377.1 9993.1
GR 2376.5 10000.0 2377.5 10008.7 2382.2 10017.2 2387.9 10038.7 2388.7 10058.3
GR 2391.8 10068.4 2392.7 10078.9 2392.7 10118.8 2393.6 10141.7 2394.7 10309.9
GR 2393.4 10334.8 2393.5 10355.6 2392.9 10401.9 2395.4 10428.6 2396.0 10476.5
GR 2397.1 10656.0 2395.5 10710.3 2395.8 10762.6 2397.3 10790.0 2398.1 10904.1

* *

Begin South Tropicana Wash tributary run

```
NC      .048      .048      .032        .1        .3
QT         1      3300
X1    -64.56        17    9979.0   10026.4         0         0         0
GR    2277.4    9845.8    2274.3    9878.4    2274.2    9927.9    2274.2    9928.0    2276.0    9964.3
GR    2274.9    9979.0    2265.3   10000.0    2267.5   10015.9    2271.9   10026.4    2271.0   10078.4
GR    2273.1   10156.8    2276.0   10172.8    2277.6   10247.9    2274.6   10268.2    2275.3   10291.3
GR    2275.3   10424.8    2278.8   10588.5
```

High conveyance change due to channel entrenchment

STW above confluence with the CTW

```
QT         1      1800

X1    30.093        13    9961.1   10041.7       480       500       490
GR    2280.7    9787.9    2281.5    9796.8    2273.9    9859.9    2279.0    9887.4    2270.1    9934.5
GR    2268.5    9961.1    2268.1   10000.0    2268.5   10041.7    2268.0   10053.1    2275.5   10070.2
GR    2276.5   10184.7    2280.5   10251.0    2282.3   10362.1

NC      .06       .06       .038
  West Russell Road
X1    30.191        25    9982.8   10049.5       520       480       520
GR    2288.8    9671.4    2288.0    9684.6    2289.5    9713.8    2289.1    9731.4    2285.6    9768.2
GR    2286.4    9838.3    2277.8    9852.8    2276.5    9866.1    2276.6    9892.3    2275.8    9956.4
GR    2276.5    9982.8    2275.1    9993.4    2274.7   10000.0    2274.7   10006.3    2275.8   10017.5
GR    2276.3   10029.8    2278.1   10049.5    2277.1   10065.4    2278.6   10088.1    2283.2   10117.9
GR    2283.8   10211.4    2288.2   10267.0    2289.4   10285.7    2290.1   10353.2    2288.9   10409.8

NC      .045      .045      .035
X1    30.292        27    9987.9   10018.4       500       510       530
GR    2286.2    9802.0    2286.5    9814.7    2286.1    9870.3    2292.1    9894.3    2293.5    9908.6
GR    2288.4    9954.7    2283.3    9960.8    2283.7    9987.9    2282.1   10000.0    2284.0   10018.4
GR    2283.3   10032.9    2283.5   10045.7    2284.4   10055.6    2285.2   10074.2    2284.4   10128.1
GR    2284.0   10164.5    2285.9   10189.0    2286.1   10274.1    2290.5   10299.9    2289.2   10330.2
GR    2292.9   10370.8    2292.6   10385.9    2289.3   10412.6    2290.7   10420.9    2288.1   10451.1
GR    2293.4   10473.7    2293.2   10542.7

X1    30.393        22    9978.7   10045.6       530       535       535
GR    2298.6    9654.1    2296.5    9673.7    2296.9    9685.4    2299.1    9705.9    2294.1    9733.2
GR    2295.8    9811.8    2294.6    9856.7    2295.7    9898.7    2294.0    9921.7    2292.0    9958.5
GR    2292.0    9978.7    2289.7    9987.3    2289.5   10000.0    2289.7   10018.1    2299.2   10045.6
GR    2300.2   10087.1    2301.2   10125.1    2300.0   10232.2    2301.0   10268.1    2299.9   10299.4
GR    2300.9   10328.0    2299.8   10363.0

X1    30.486        31    9953.1   10045.1       480       500       490
GR    2303.1    9346.2    2302.0    9413.0    2302.4    9499.5    2300.5    9618.9    2299.6    9630.4
GR    2299.6    9677.4    2302.1    9690.1    2304.5    9715.6    2304.5    9778.3    2303.3    9795.2
GR    2305.1    9826.2    2304.9    9898.5    2300.5    9927.6    2301.2    9953.1    2296.5    9981.4
GR    2295.5   10000.0    2296.3   10021.7    2297.7   10027.8    2298.4   10045.1    2297.7   10063.2
GR    2299.6   10073.8    2300.8   10099.5    2305.8   10132.4    2305.6   10183.9    2305.8   10210.2
GR    2306.7   10373.0    2305.6   10408.3    2305.6   10433.4    2307.1   10457.9    2305.8   10525.2
GR    2307.2   10664.2
```

NC	.043	.043	.033							
X1	30.584	28	9978.2	10044.3	530	510	520			
X3				9880.0		10090.6				
GR	2312.4	9333.2	2311.8	9360.8	2308.7	9412.4	2310.8	9429.2	2312.3	9474.6
GR	2312.2	9528.2	2310.7	9544.2	2312.4	9600.5	2313.1	9695.5	2309.8	9719.3
GR	2310.8	9752.0	2310.4	9784.0	2311.9	9798.4	2312.6	9814.1	2313.0	9880.0
GR	2312.2	9927.2	2309.7	9953.1	2309.2	9978.2	2306.6	10000.0	2306.3	10014.1
GR	2312.7	10044.3	2313.5	10090.6	2313.5	10124.1	2313.2	10198.2	2310.0	10270.6
GR	2312.7	10281.8	2313.6	10490.5	2313.8	10710.9				
X1	30.676	27	9976.6	10016.7	460	505	485			
GR	2318.0	9383.0	2317.2	9539.4	2317.2	9574.3	2318.0	9594.2	2319.2	9680.2
GR	2318.9	9763.0	2318.4	9829.6	2318.9	9922.6	2318.7	9964.1	2318.3	9976.6
GR	2313.5	9991.5	2313.0	10000.0	2313.3	10008.9	2315.7	10016.7	2316.4	10046.2
GR	2315.1	10070.9	2313.6	10109.8	2318.5	10125.1	2319.1	10206.0	2318.2	10234.1
GR	2319.2	10267.3	2319.4	10329.3	2317.0	10354.5	2319.4	10404.3	2318.9	10487.7
GR	2320.3	10580.3	2319.2	10690.4						
X1	30.779	24	9926.0	10071.8	490	555	545			
GR	2326.2	9588.7	2326.7	9591.8	2325.6	9655.4	2326.8	9697.6	2325.7	9753.4
GR	2325.9	9772.2	2327.4	9838.0	2327.0	9926.0	2323.7	9962.1	2320.7	9976.5
GR	2322.0	10000.0	2320.8	10023.3	2327.1	10053.3	2328.8	10071.8	2327.6	10130.5
GR	2327.4	10179.2	2326.2	10215.9	2327.9	10260.2	2327.6	10347.5	2328.1	10389.5
GR	2328.2	10497.3	2328.0	10546.0	2328.9	10597.3	2328.5	10676.3		
X1	30.872	22	9986.9	10024.1	505	470	490			
X3				9942.0						
GR	2331.5	9372.1	2330.9	9568.9	2330.2	9667.9	2330.4	9790.7	2332.6	9839.9
GR	2329.7	9850.8	2329.6	9920.8	2332.0	9941.0	2327.2	9967.7	2328.4	9974.6
GR	2328.6	9986.9	2326.0	10000.0	2328.0	10024.1	2327.8	10056.0	2329.3	10067.4
GR	2332.9	10142.7	2330.5	10176.3	2331.5	10200.4	2332.1	10277.8	2332.1	10420.1
GR	2330.8	10454.4	2332.9	10541.0						
X1	30.967	28	9969.6	10018.7	505	490	500			
X3	10									
GR	2336.6	9308.2	2337.6	9336.2	2337.6	9421.7	2336.7	9434.6	2336.7	9482.0
GR	2338.1	9510.2	2337.8	9572.3	2336.7	9590.9	2337.6	9620.7	2339.2	9761.4
GR	2337.9	9777.2	2338.1	9799.1	2337.8	9901.0	2335.0	9916.4	2337.6	9923.7
GR	2338.1	9969.6	2334.2	9985.5	2333.7	10000.0	2334.0	10008.8	2335.4	10018.7
GR	2335.4	10044.6	2334.0	10083.1	2338.0	10105.2	2338.8	10148.1	2338.3	10230.2
GR	2338.7	10274.8	2338.7	10360.5	2339.1	10434.5				
NC	.046	.046	.038							
X1	31.079	32	9970.0	10015.9	560	580	590			
X3						10087.0				
GR	2344.7	9069.5	2345.0	9123.4	2345.3	9202.1	2345.7	9271.2	2345.2	9382.6
GR	2347.1	9412.3	2345.2	9440.6	2345.6	9571.8	2344.7	9662.1	2346.3	9671.2
GR	2347.4	9737.3	2343.5	9764.1	2343.1	9810.7	2343.9	9838.1	2343.0	9861.3
GR	2344.6	9929.5	2344.7	9970.0	2341.7	9989.6	2341.4	10000.0	2342.0	10009.0
GR	2342.8	10015.9	2342.8	10040.4	2343.2	10072.2	2346.0	10087.0	2345.9	10155.8
GR	2345.7	10366.0	2344.2	10422.4	2344.2	10463.4	2345.3	10478.6	2344.9	10594.2
GR	2344.3	10635.3	2344.9	10775.4						

[redacted]

X1	31.173	35	9972.8	10031.1	515	530	500			
X3	10									
GR	2351.6	9211.8	2351.7	9266.7	2353.4	9341.2	2352.7	9372.8	2352.8	9442.6
GR	2354.0	9600.9	2352.7	9680.6	2352.4	9758.5	2350.4	9800.8	2351.3	9813.4
GR	2350.7	9851.1	2352.1	9890.1	2351.6	9959.0	2351.4	9972.8	2347.5	9987.1
GR	2347.1	10000.0	2347.3	10016.4	2348.6	10031.1	2348.9	10053.5	2351.5	10072.9
GR	2350.4	10116.2	2351.7	10171.9	2351.0	10204.1	2352.3	10218.4	2353.0	10411.7
GR	2353.6	10537.4	2352.7	10596.9	2353.0	10688.3	2353.9	10732.1	2353.7	10838.1
GR	2352.5	10910.5	2352.4	10974.0	2351.5	11021.5	2352.2	11046.6	2352.1	11046.6
NC	.044	.044	.035							
X1	31.272	35	9946.7	10029.7	520	520	520			
X3	10									
GR	2357.7	9396.4	2356.9	9407.6	2357.3	9476.7	2357.5	9613.2	2357.6	9747.5
GR	2356.8	9768.6	2356.7	9880.6	2353.1	9905.8	2352.6	9915.8	2352.6	9929.7
GR	2357.6	9942.1	2357.7	9946.7	2351.0	9990.9	2350.0	10000.0	2350.4	10007.5
GR	2354.4	10012.3	2358.9	10029.7	2359.8	10282.9	2358.1	10315.2	2359.8	10340.3
GR	2359.3	10355.1	2360.6	10425.1	2359.5	10479.6	2360.2	10516.9	2360.1	10551.4
GR	2358.3	10583.9	2359.2	10595.8	2359.6	10622.6	2358.9	10638.1	2359.2	10651.4
GR	2358.4	10682.1	2359.9	10753.5	2360.0	10796.0	2360.4	10828.0	2359.9	10864.7
X1	31.368	27	9941.0	10030.6	495	520	510			
X3	10									
GR	2366.1	9831.5	2363.9	9906.7	2364.2	9941.0	2359.4	9957.6	2357.1	9971.1
[redacted]	2359.4	9983.9	2357.0	10000.0	2358.9	10011.2	2364.3	10030.6	2366.1	10049.4
[redacted]	2365.7	10083.0	2364.5	10116.9	2365.8	10137.9	2365.2	10215.8	2363.9	10244.7
GR	2364.9	10255.3	2365.0	10327.9	2364.1	10331.4	2365.8	10365.0	2364.7	10421.8
GR	2365.5	10447.5	2365.2	10556.5	2364.9	10574.8	2366.2	10583.3	2365.8	10617.3
GR	2366.5	10732.6	2366.3	10857.3						

South TW above Jones Blvd.

QT	1	1500								
X1	31.465	25	9937.6	10029.9	500	520	510			
X3	10									
GR	2373.4	9308.4	2374.0	9486.0	2372.7	9505.8	2374.1	9534.2	2374.4	9617.9
GR	2372.5	9669.9	2373.7	9752.2	2373.3	9836.1	2371.4	9879.9	2372.6	9937.6
GR	2368.4	9963.2	2367.4	10000.0	2367.7	10017.6	2372.6	10029.9	2372.5	10074.4
GR	2368.4	10091.2	2372.3	10127.7	2372.8	10165.6	2372.2	10197.9	2371.8	10219.5
GR	2373.7	10240.8	2374.1	10343.6	2375.3	10580.8	2375.9	10644.7	2375.9	10691.0
X1	31.565	18	9970.7	10027.2	530	540	530			
GR	2380.9	9534.3	2381.1	9536.5	2379.5	9662.5	2380.3	9676.9	2380.4	9805.7
GR	2378.5	9840.6	2378.3	9891.1	2378.3	9970.7	2373.3	9985.2	2372.4	10000.0
GR	2372.4	10012.6	2374.6	10027.2	2374.5	10054.9	2373.7	10100.6	2377.8	10107.1
GR	2376.3	10122.2	2378.7	10145.7	2379.1	10221.4				
X1	31.664	26	9971.6	10036.2	520	518	520			
GR	2388.1	9456.9	2389.1	9479.5	2386.5	9527.8	2388.0	9541.6	2388.6	9580.0
GR	2387.9	9627.4	2386.6	9641.9	2388.2	9670.8	2387.7	9883.6	2386.5	9921.6
[redacted]	2382.5	9932.1	2381.6	9951.6	2382.5	9971.6	2380.6	9990.4	2380.6	10000.0
[redacted]	2380.9	10005.6	2381.4	10011.9	2382.7	10036.2	2384.0	10065.8	2383.8	10097.4
GR	2386.2	10120.4	2386.7	10151.6	2385.6	10162.1	2386.6	10231.9	2386.9	10286.9
GR	2386.8	10398.0								

X1	31.761	20	9974.3	10044.8	520	505	515			
X3	10									
GR	2396.2	9606.9	2396.3	9621.4	2396.1	9692.4	2395.7	9755.4	2394.0	9789.3
GR	2395.5	9818.1	2395.3	9896.6	2392.4	9974.3	2388.7	9986.5	2386.9	10000.0
GR	2388.8	10014.5	2391.0	10044.8	2390.6	10101.4	2387.9	10111.8	2387.9	10128.3
GR	2394.1	10145.0	2395.2	10151.6	2395.7	10287.2	2395.2	10432.4	2395.5	10481.1
Sunset Blvd										
X1	31.860	28	9956.2	10054.0	510	525	520			
X3	10									
GR	2403.3	9340.1	2403.3	9340.1	2401.4	9387.2	2403.0	9414.0	2403.2	9528.6
GR	2401.6	9542.1	2401.4	9569.4	2401.0	9599.0	2403.1	9611.5	2403.4	9674.8
GR	2402.3	9693.8	2404.0	9761.0	2401.8	9915.6	2396.3	9932.3	2397.7	9956.2
GR	2396.1	9989.3	2394.5	10000.0	2395.2	10009.5	2395.6	10038.1	2399.4	10054.0
GR	2403.3	10148.8	2403.4	10189.5	2404.0	10249.0	2400.7	10269.8	2404.2	10309.6
GR	2405.0	10414.0	2404.4	10428.9	2404.1	10512.2				
X1	31.963	21	9952.6	10033.5	510	510	545			
GR	2413.8	9151.1	2414.2	9190.6	2413.2	9323.3	2412.7	9423.6	2412.0	9594.9
GR	2410.8	9649.5	2411.9	9703.3	2411.7	9734.3	2411.6	9744.1	2413.0	9797.8
GR	2412.9	9879.4	2410.6	9952.6	2401.9	9983.0	2402.4	10000.0	2403.3	10025.0
GR	2406.9	10033.5	2408.1	10068.1	2408.0	10149.9	2410.0	10177.3	2413.0	10269.7
GR	2413.8	10358.4								

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

*PROF 1

CCHV= 0.100 CEHV= 0.300
*SECNO 63.411
WATER EL=X5 CARD= 2213.600

3265 DIVIDED FLOW

63.411	10.10	2213.60	0.00	2213.60	2213.76	0.16	0.00	0.00	2212.70
4100.0	1648.2	2354.7	97.1	691.9	642.2	86.3	0.0	0.0	2210.70
0.00	2.38	3.67	1.12	0.040	0.045	0.042	0.000	2203.50	9634.32
0.000967	0.	0.	0.	0	0	0	0.00	553.26	10314.26

FLOW DISTRIBUTION FOR SECNO= 63.41 CWSEL= 2213.60

STA=	9634.	9749.	9817.	9885.	9951.	10045.	10089.	10277.	10314.
[redacted]Q=	12.4	21.6	6.0	0.1	57.4	2.2	0.1	0.0	
[redacted]EA=	257.4	292.0	135.1	7.5	642.2	64.0	16.7	5.6	
VEL=	2.0	3.0	1.8	0.7	3.7	1.4	0.3	0.3	
DEPTH=	2.3	4.3	2.0	0.1	6.9	1.5	0.1	0.2	

1490 NH CARD USED
*SECNO 63.585

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 0.0 10488.0 TYPE= 1 TARGET= 10487.999

63.585	5.25	2220.45	2220.45	0.00	2221.42	0.97	1.71	0.24	2218.00
3819.0	753.7	1304.2	1761.1	154.1	131.5	244.3	20.7	9.0	2219.20
0.03	4.89	9.92	7.21	0.025	0.025	0.025	0.000	2215.20	9766.99
0.005432	930.	920.	910.	20	11	0	0.00	297.51	10137.97

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 63.58 CWSEL= 2220.45

STA=	9767.	9779.	9788.	9983.	10020.	10077.	10138.
PER Q=	0.1	0.1	19.6	34.2	27.9	18.2	
AREA=	2.6	2.0	149.4	131.5	135.7	108.5	
VEL=	1.0	1.0	5.0	9.9	7.8	6.4	
DEPTH=	0.2	0.2	0.8	3.6	2.4	1.8	

1490 NH CARD USED
*SECNO 63.682
WATER EL=X5 CARD= 2230.900

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 6.35

3470 ENCROACHMENT STATIONS= 9850.0 10627.0 TYPE= 1 TARGET= -9850.000

63.682	10.00	2230.90	0.00	0.00	2230.98	0.08	0.21	0.09	2225.80
4100.0	1018.6	1746.5	1334.9	542.3	568.3	1058.5	35.8	14.3	2226.00
0.10	1.88	3.07	1.26	0.027	0.025	0.035	0.000	2220.90	9850.00
[redacted]00155	450.	510.	500.	0	0	0	0.00	655.40	10505.40

FLOW DISTRIBUTION FOR SECNO= 63.68 CWSEL= 2230.90

STA=	9850.	9970.	10035.	10098.	10292.	10505.
PER Q=	24.8	42.6	19.7	12.0	0.8	
AREA=	542.3	568.3	348.0	606.3	104.2	
VEL=	1.9	3.1	2.3	0.8	0.3	
DEPTH=	4.5	8.6	5.5	3.1	0.5	

CCHV= 0.300 CEHV= 0.500
*SECNO 63.800

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2233.10 ELREA= 2236.50

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
63.800	5.55	2233.95	2233.95	0.00	2234.99	1.04	0.29	0.48	2233.10
4100.0	313.0	3787.0	0.0	121.9	445.6	0.0	55.1	21.0	2236.50
0.12	2.57	8.50	0.00	0.040	0.028	0.000	0.000	2228.40	9748.10
0.006050	620.	630.	590.	20	11	0	0.00	296.98	10045.09

FLOW DISTRIBUTION FOR SECNO= 63.80 CWSEL= 2233.95

STA=	9748.	9754.	9895.	10084.
PER Q=	0.1	7.5	92.4	
AREA=	2.5	119.5	445.6	
VEL=	1.6	2.6	8.5	
DEPTH=	0.4	0.8	3.0	

*SECNO 63.866
3280 CROSS SECTION 63.87 EXTENDED 2.81 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.56

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2236.70 ELREA= 2235.70

63.866	5.41	2236.21	0.00	0.00	2237.17	0.96	2.15	0.02	2236.70
2400.0	0.0	1215.5	1184.5	0.0	136.9	177.6	58.5	22.7	2235.70
0.13	0.00	8.88	6.67	0.000	0.032	0.025	0.000	2230.80	9980.65
0.006631	355.	345.	340.	3	0	0	0.00	142.65	10123.30

FLOW DISTRIBUTION FOR SECNO= 63.87 CWSEL= 2236.21

STA=	9981.	10016.	10123.
PER Q=	50.6	49.4	
AREA=	136.9	177.6	
VEL=	8.9	6.7	
DEPTH=	3.8	1.7	

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

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	67.00	16.00	0.70	80.00	0.00	2231.00	2230.80

*SECNO 63.884
3280 CROSS SECTION 63.88 EXTENDED 4.98 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 7.48

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
[redacted]8.57	2242.06	0.26	1304.	1103.	80.	77.	2236.00	2237.10	67.

3470 ENCROACHMENT STATIONS= 9830.0 10117.1 TYPE= 1 TARGET= -9830.000

63.884	9.88	2240.88	0.00	0.00	2240.93	0.05	3.76	0.00	2236.40
2400.0	1070.6	398.4	931.0	649.4	209.3	518.7	60.3	23.2	2236.20
0.14	1.65	1.90	1.79	0.025	0.032	0.025	0.000	2231.00	9830.00
0.000119	95.	90.	85.	2	0	4	0.00	287.10	10117.10

FLOW DISTRIBUTION FOR SECNO= 63.88 CWSEL= 2240.88

STA=	9830.	9876.	9987.	10010.	10117.
PER Q=		11.5	33.1	16.6	38.8
AREA=		180.7	468.7	209.3	518.7
VEL=		1.5	1.7	1.9	1.8
DEPTH=		4.0	4.2	9.0	4.8

*SECNO 63.907
3280 CROSS SECTION 63.91 EXTENDED 2.86 FEET

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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.51

3470 ENCROACHMENT STATIONS= 9830.0 10070.0 TYPE= 1 TARGET= 240.000

63.907	8.96	2240.86	0.00	0.00	2241.00	0.14	0.03	0.05	2237.40
2400.0	827.7	1342.2	230.1	339.1	388.5	96.9	63.5	23.9	2238.10
0.16	2.44	3.46	2.37	0.025	0.032	0.025	0.000	2231.90	9830.00
0.000454	110.	125.	150.	2	0	0	0.00	240.00	10070.00

FLOW DISTRIBUTION FOR SECNO= 63.91 CWSEL= 2240.86

STA=	9830.	9851.	9874.	9977.	10035.	10070.
PER Q=	0.2	2.0	32.2	55.9	9.6	
AREA=	8.3	31.1	299.7	388.5	96.9	
VEL=	0.7	1.6	2.6	3.5	2.4	
DEPTH=	0.4	1.4	2.9	6.7	2.8	

[redacted] 63.945
[redacted]ROSS SECTION 63.94 EXTENDED 2.38 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.60

3470 ENCROACHMENT STATIONS= 9910.0 10070.0 TYPE= 1 TARGET= 160.000

63.945	7.88	2240.88	0.00	0.00	2241.26	0.38	0.14	0.12	2238.80
2400.0	366.3	1856.6	177.1	111.1	345.4	59.7	66.5	24.8	2238.20
0.17	3.30	5.37	2.97	0.025	0.032	0.025	0.000	2233.00	9910.00
0.001257	190.	200.	210.	2	0	0	0.00	160.00	10070.00

FLOW DISTRIBUTION FOR SECNO= 63.94 CWSEL= 2240.88

STA=	9910.	9922.	9933.	9971.	10028.	10052.	10070.
PER Q=	0.8	1.9	12.6	77.4	6.5	0.8	
AREA=	10.5	16.6	84.0	345.4	47.3	12.4	
VEL=	1.8	2.7	3.6	5.4	3.3	1.6	
DEPTH=	0.9	1.5	2.2	6.1	2.0	0.7	

[redacted]

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

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	58.00	22.00	0.01	185.00	3.06	2233.00	2233.00

*SECNO 63.946
3280 CROSS SECTION 63.95 EXTENDED 4.34 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.04

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2245.06	2241.26	0.00	661.	1740.	185.	186.	2238.00	2240.40	58.

[redacted]

3470 ENCROACHMENT STATIONS= 9910.0 10070.0 TYPE= 1 TARGET= 160.000

63.946	9.89	2242.94	0.00	0.00	2243.08	0.13	1.82	0.00	2238.85
2400.0	586.2	1467.5	346.3	233.2	460.3	145.2	66.6	24.8	2238.25
0.17	2.51	3.19	2.39	0.025	0.032	0.025	0.000	2233.05	9910.00
0.000302	5.	5.	5.	2	0	2	0.00	160.00	10070.00

FLOW DISTRIBUTION FOR SECNO= 63.95 CWSEL= 2242.94

STA=	9910.	9922.	9933.	9971.	10028.	10052.	10070.	10070.
PER Q=	2.5	3.8	18.0	61.1	10.3	4.1	0.0	
AREA=	34.1	39.1	160.0	460.3	95.5	49.3	0.4	
VEL=	1.8	2.4	2.7	3.2	2.6	2.0	0.3	
DEPTH=	2.9	3.5	4.2	8.1	4.0	2.7	2.1	

CCHV= 0.100 CEHV= 0.300
*SECNO 63.979

3470 ENCROACHMENT STATIONS= 9880.0 10276.2 TYPE= 1 TARGET= 396.200

63.979	8.75	2243.05	0.00	0.00	2243.15	0.10	0.07	0.00	2240.80
2400.0	420.9	1333.0	646.1	217.6	433.9	577.7	71.2	26.1	2239.60
0.19	1.93	3.07	1.12	0.030	0.035	0.056	0.000	2234.30	9880.00
0.000498	145.	175.	250.	2	0	0	0.00	396.20	10276.20

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 63.98 CWSEL= 2243.05

STA=	9880.	9949.	9972.	10044.	10129.	10276.
PER Q=	13.3	4.2	55.5	14.9	12.0	
AREA=	164.9	52.8	433.9	275.6	302.1	
VEL=	1.9	1.9	3.1	1.3	1.0	
DEPTH=	2.4	2.3	6.0	3.3	2.1	

*SECNO 64.084

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9925.0 11397.0 TYPE= 1 TARGET= -9925.000

64.084	7.16	2245.46	2245.46	0.00	2246.66	1.20	0.65	0.33	2243.50
2400.0	432.9	1921.1	46.0	81.8	202.2	42.4	81.0	29.9	2244.70
[redacted]0.21	5.29	9.50	1.09	0.030	0.035	0.056	0.000	2238.30	9925.00
[redacted]06050	460.	555.	590.	20	15	0	0.00	199.63	10124.63

FLOW DISTRIBUTION FOR SECNO= 64.08 CWSEL= 2245.46

STA=	9925.	9975.	10014.	10125.
PER Q=	18.0	80.0	1.9	
AREA=	81.8	202.2	42.4	
VEL=	5.3	9.5	1.1	
DEPTH=	1.7	5.2	0.4	

CCHV= 0.300 CEHV= 0.500
*SECNO 64.113

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

3470 ENCROACHMENT STATIONS= 9925.0 10571.0 TYPE= 1 TARGET= 646.000

[redacted]

[redacted]CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
64.113	7.21	2247.01	0.00	0.00	2247.50	0.48	0.62	0.22	2244.20
2400.0	740.8	1634.6	24.6	142.6	283.1	38.7	82.4	30.7	2246.70
0.21	5.20	5.77	0.64	0.030	0.035	0.056	0.000	2239.80	9925.00
0.002980	150.	150.	145.	3	0	0	0.00	260.96	10185.96

FLOW DISTRIBUTION FOR SECNO= 64.11 CWSEL= 2247.01

STA=	9925.	9976.	10046.	10155.	10186.
PER Q=	30.9	68.1	0.9	0.1	
AREA=	142.6	283.1	33.9	4.9	
VEL=	5.2	5.8	0.7	0.4	
DEPTH=	2.8	4.0	0.3	0.2	

*SECNO 64.137
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

[redacted]NCROACHMENT STATIONS= 9930.0 10641.5 TYPE= 1 TARGET= 711.500

[redacted].137	9.06	2250.36	2250.36	0.00	2250.96	0.60	0.57	0.06	2250.10
2400.0	10.0	1353.8	1036.2	13.2	169.8	407.8	84.0	31.8	2248.20
0.22	0.76	7.97	2.54	0.060	0.046	0.054	0.000	2241.30	9930.00
0.007331	125.	130.	130.	20	13	0	0.00	486.08	10416.08

FLOW DISTRIBUTION FOR SECNO= 64.14 CWSEL= 2250.36

STA=	9930.	9991.	10020.	10118.	10285.	10416.
PER Q=	0.4	56.4	19.2	18.0	6.0	
AREA=	13.2	169.8	148.9	176.2	82.7	
VEL=	0.8	8.0	3.1	2.4	1.7	
DEPTH=	0.2	6.0	1.5	1.1	0.6	

CCHV= 0.100 CEHV= 0.300
*SECNO 64.179

3470 ENCROACHMENT STATIONS= 0.0 10535.0 TYPE= 1 TARGET= 10534.999

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2251.70 ELREA= 2250.70

[redacted]

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
64.179	6.97	2251.67	0.00	0.00	2251.97	0.30	0.98	0.03	2251.70
2050.0	0.0	960.3	1089.7	0.0	159.7	501.1	86.9	33.9	2250.70
0.23	0.00	6.01	2.17	0.000	0.034	0.046	0.000	2244.70	9982.87
0.003108	240.	220.	195.	3	0	0	0.00	438.06	10420.93

FLOW DISTRIBUTION FOR SECNO= 64.18 CWSEL= 2251.67

STA=	9983.	10022.	10035.	10185.	10373.	10421.
PER Q=	46.8	0.7	19.7	31.5	1.3	
AREA=	159.7	9.8	191.4	276.9	23.1	
VEL=	6.0	1.5	2.1	2.3	1.1	
DEPTH=	4.1	0.8	1.3	1.5	0.5	

*SECNO 64.366

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9961.4 10504.4 TYPE= 1 TARGET= -9961.400

64.366	7.65	2259.45	2259.45	0.00	2261.27	1.82	6.65	0.46	2259.40
3300.0	0.0	3028.5	271.5	0.0	268.4	98.9	98.3	40.0	2257.20
0.26	0.00	11.28	2.75	0.000	0.041	0.098	0.000	2251.80	9961.40
0.013797	735.	990.	950.	4	8	0	0.00	115.75	10077.15

FLOW DISTRIBUTION FOR SECNO= 64.37 CWSEL= 2259.45

STA=	9961.	10022.	10062.	10077.
PER Q=	91.8	7.5	0.8	
AREA=	268.4	84.5	14.4	
VEL=	11.3	2.9	1.7	
DEPTH=	4.4	2.1	1.0	

*SECNO 64.461

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2267.10 ELREA= 2267.50

64.461	10.28	2265.98	0.00	0.00	2267.48	1.50	6.18	0.03	2267.10
3300.0	0.0	3300.0	0.0	0.0	336.0	0.0	102.3	41.0	2267.50
0.27	0.00	9.82	0.00	0.000	0.046	0.000	0.000	2255.70	9973.19
0.011137	495.	500.	500.	2	0	0	0.00	64.74	10037.92

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

FLOW DISTRIBUTION FOR SECNO= 64.46 CWSEL= 2265.98

STA= 9973. 10044.
PER Q= 100.0
AREA= 336.0
VEL= 9.8
DEPTH= 5.2

*SECNO 64.560
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2274.90 ELREA= 2271.90

64.560	8.31	2273.61	2273.61	0.00	2274.94	1.33	4.36	0.02	2274.90
3300.0	0.0	2437.7	862.3	0.0	231.3	235.5	107.2	42.5	2271.90
0.29	0.00	10.54	3.66	0.000	0.032	0.048	0.000	2265.30	9981.82
0.006228	540.	535.	530.	1	13	0	0.00	177.80	10159.62

DISTRIBUTION FOR SECNO= 64.56 CWSEL= 2273.61

STA= 9982. 10026. 10078. 10157. 10160.
PER Q= 73.9 13.9 12.2 0.0
AREA= 231.3 112.4 122.4 0.7
VEL= 10.5 4.1 3.3 1.0
DEPTH= 5.2 2.2 1.6 0.3

*SECNO 64.677

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.84

64.677	7.13	2275.33	0.00	0.00	2275.34	0.01	0.27	0.13	2271.60
1000.0	7.4	776.8	215.8	29.6	970.4	509.5	120.4	45.8	2270.70
0.52	0.25	0.80	0.42	0.055	0.037	0.055	0.000	2268.20	9895.32
0.000039	615.	605.	540.	3	0	0	0.00	324.40	10280.76

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

FLOW DISTRIBUTION FOR SECNO= 64.68 CWSEL= 2275.33

STA=	9895.	9911.	10081.	10108.	10197.	10212.	10278.	10281.
PER Q=	0.7	77.7	6.1	14.9	0.6	0.0	0.0	
AREA=	29.6	970.4	129.7	352.3	25.2	1.3	1.0	
VEL=	0.3	0.8	0.5	0.4	0.2	0.1	0.1	
DEPTH=	1.9	5.7	4.7	4.0	1.6	0.0	0.3	

*SECNO 64.789

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

64.789	1.83	2276.93	2276.93	0.00	2277.27	0.34	0.06	0.10	2277.30
640.0	164.4	474.0	1.6	42.6	96.5	1.3	131.9	49.7	2276.70
0.56	3.86	4.91	1.25	0.055	0.044	0.055	0.000	2275.10	9856.04
0.037832	550.	590.	650.	20	14	0	0.00	237.37	10143.27

FLOW DISTRIBUTION FOR SECNO= 64.79 CWSEL= 2276.93

STA=	9856.	9879.	9892.	9919.	9930.	9947.	10132.	10143.
PER Q=	8.4	4.9	5.5	6.2	0.7	74.1	0.2	
AREA=	14.2	8.2	8.8	8.6	2.9	96.5	1.3	
VEL=	3.8	3.8	4.0	4.6	1.6	4.9	1.2	
DEPTH=	0.6	0.6	0.3	0.8	0.2	0.6	0.1	

CCHV= 0.100 CEHV= 0.300
*SECNO 64.889

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.19

64.889	3.46	2284.76	0.00	0.00	2285.12	0.36	7.85	0.01	2284.30
640.0	0.2	621.5	18.3	0.3	127.1	9.2	133.6	51.6	2283.50
0.59	0.86	4.89	1.98	0.055	0.044	0.055	0.000	2281.30	9969.50
0.007881	515.	530.	530.	7	0	0	0.00	74.73	10044.23

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

FLOW DISTRIBUTION FOR SECNO= 64.89 CWSEL= 2284.76

STA=	9970.	9971.	10031.	10043.	10044.
PER Q=	0.0	97.1	2.8	0.0	
AREA=	0.3	127.1	9.1	0.1	
VEL=	0.9	4.9	2.0	0.6	
DEPTH=	0.2	2.1	0.8	0.1	

*SECNO 64.989
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 0.0 10119.1 TYPE= 1 TARGET= 10119.099

64.989	3.50	2292.00	2292.00	0.00	2292.63	0.63	4.88	0.08	2291.70
640.0	4.3	454.1	181.6	4.1	62.8	54.3	135.1	52.6	2290.50
0.61	1.06	7.23	3.34	0.050	0.036	0.050	0.000	2288.50	9961.76
0.011257	545.	525.	505.	6	5	0	0.00	105.56	10067.32

[redacted]ISTRIBUTION FOR SECNO= 64.99 CWSEL= 2292.00

STA=	9962.	9983.	10012.	10052.	10067.
PER Q=	0.7	71.0	26.3	2.0	
AREA=	4.1	62.8	47.3	7.0	
VEL=	1.1	7.2	3.6	1.9	
DEPTH=	0.2	2.2	1.2	0.5	

*SECNO 65.089

65.089	3.40	2298.40	0.00	0.00	2298.92	0.52	6.28	0.01	2301.80
640.0	0.0	640.0	0.0	0.0	110.8	0.0	136.5	53.6	2300.10
0.64	0.00	5.78	0.00	0.000	0.045	0.000	0.000	2295.00	9965.58
0.012237	505.	530.	570.	4	0	0	0.00	55.18	10020.75

FLOW DISTRIBUTION FOR SECNO= 65.09 CWSEL= 2298.40

STA=	9966.	10031.
PER Q=	100.0	
AREA=	110.8	
VEL=	5.8	
DEPTH=	2.0	

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

*SECNO 65.175

65.175	3.97	2304.57	0.00	0.00	2305.13	0.57	6.20	0.01	2306.40
640.0	0.0	640.0	0.0	0.0	106.1	0.0	137.7	54.2	2307.40
0.66	0.00	6.03	0.00	0.000	0.045	0.000	0.000	2300.60	9955.89
0.015258	440.	455.	465.	5	0	0	0.00	57.94	10013.83

FLOW DISTRIBUTION FOR SECNO= 65.18 CWSEL= 2304.57

STA= 9956. 10024.
PER Q= 100.0
AREA= 106.1
VEL= 6.0
DEPTH= 1.8

*SECNO 65.277

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.46

[redacted].277	3.15	2310.25	0.00	0.00	2310.56	0.31	5.40	0.03	2312.20
[redacted]40.0	0.0	640.0	0.0	0.0	143.6	0.0	139.2	55.0	2310.50
0.69	0.00	4.46	0.00	0.000	0.045	0.000	0.000	2307.10	9972.03
0.007172	520.	535.	470.	5	0	0	0.00	70.91	10042.94

FLOW DISTRIBUTION FOR SECNO= 65.28 CWSEL= 2310.25

STA= 9972. 10045.
PER Q= 100.0
AREA= 143.6
VEL= 4.5
DEPTH= 2.0

*SECNO 65.381
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2322.00 ELREA= 2319.90

65.381	1.87	2319.77	2319.77	0.00	2320.32	0.55	6.51	0.07	2322.00
640.0	0.0	640.0	0.0	0.0	107.1	0.0	140.8	56.1	2319.90
0.72	0.00	5.98	0.00	0.000	0.039	0.000	0.000	2317.90	9978.29
0.023105	530.	550.	510.	3	17	0	0.00	102.00	10080.29

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 65.38 CWSEL= 2319.77

STA= 9978. 10082.
PER Q= 100.0
AREA= 107.1
VEL= 6.0
DEPTH= 1.0

*SECNO 65.483

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.45

65.483	2.33	2328.33	0.00	0.00	2328.68	0.35	8.34	0.02	2327.50
640.0	241.6	361.3	37.1	62.6	66.8	19.3	142.4	57.6	2327.50
0.75	3.86	5.41	1.93	0.045	0.039	0.045	0.000	2326.00	9921.58
0.010953	555.	540.	530.	5	0	0	0.00	142.86	10064.45

FLOW DISTRIBUTION FOR SECNO= 65.48 CWSEL= 2328.33

[redacted] 9922. 9952. 9976. 10018. 10064.
PER Q= 15.5 22.2 56.5 5.8
AREA= 29.4 33.2 66.8 19.3
VEL= 3.4 4.3 5.4 1.9
DEPTH= 1.0 1.4 1.6 0.4

*SECNO 65.573
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2336.90 ELREA= 2336.70

65.573	1.27	2335.07	2335.07	0.00	2335.51	0.44	6.53	0.03	2336.90
640.0	0.0	640.0	0.0	0.0	120.4	0.0	143.8	59.2	2336.70
0.77	0.00	5.32	0.00	0.000	0.034	0.000	0.000	2333.80	9970.09
0.018106	450.	475.	505.	4	11	0	0.00	140.02	10110.11

FLOW DISTRIBUTION FOR SECNO= 65.57 CWSEL= 2335.07

[redacted]

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

STA= 9970. 10141.
PER Q= 100.0
AREA= 120.4
VEL= 5.3
DEPTH= 0.9

*SECNO 65.671

65.671	1.85	2341.95	0.00	0.00	2342.17	0.23	6.65	0.02	2341.20
530.0	177.7	180.7	171.5	55.6	36.5	57.3	145.4	61.0	2341.20
0.81	3.19	4.95	3.00	0.041	0.034	0.041	0.000	2340.10	9927.08
0.009178	498.	520.	505.	5	0	0	0.00	168.54	10095.62

FLOW DISTRIBUTION FOR SECNO= 65.67 CWSEL= 2341.95

STA= 9927. 9961. 9993. 10021. 10050. 10096.
PER Q= 11.4 22.2 34.1 19.0 13.4
AREA= 22.7 33.0 36.5 29.2 28.0
VEL= 2.7 3.6 4.9 3.4 2.5
[redacted]PTH= 0.7 1.0 1.3 1.0 0.6

*SECNO 65.771

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9875.6 10190.4 TYPE= 1 TARGET= 314.801

65.771	1.44	2348.54	2348.54	0.00	2348.87	0.33	5.95	0.03	2348.90
530.0	0.0	368.0	162.0	0.0	70.5	55.1	147.1	63.1	2348.60
0.84	0.00	5.22	2.94	0.000	0.034	0.041	0.000	2347.10	9976.61
0.014797	510.	525.	510.	3	19	0	0.00	183.32	10162.46

FLOW DISTRIBUTION FOR SECNO= 65.77 CWSEL= 2348.54

STA= 9977. 10050. 10073. 10136. 10162.
PER Q= 69.4 3.3 24.8 2.5
AREA= 70.5 7.8 40.2 7.2
VEL= 5.2 2.3 3.3 1.8
DEPTH= 1.0 0.3 0.6 0.3

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

*SECNO 65.871

3470 ENCROACHMENT STATIONS= 9712.3 10390.9 TYPE= 1 TARGET= -9712.300

65.871	0.95	2355.95	0.00	0.00	2356.13	0.18	7.24	0.02	2355.50
530.0	194.8	309.5	25.7	72.9	78.8	16.9	148.8	66.1	2355.50
0.89	2.67	3.93	1.52	0.041	0.034	0.041	0.000	2355.00	9788.10
0.013130	505.	530.	500.	5	0	0	0.00	336.89	10125.00

FLOW DISTRIBUTION FOR SECNO= 65.87 CWSEL= 2355.95

STA=	9788.	9854.	9936.	10049.	10125.
PER Q=		9.9	26.8	58.4	4.8
AREA=		24.5	48.4	78.8	16.9
VEL=		2.1	2.9	3.9	1.5
DEPTH=		0.4	0.6	0.7	0.2

*SECNO 65.972
7185 MINIMUM SPECIFIC ENERGY
[redacted]CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2363.60 ELREA= 2363.20

65.972	1.49	2363.39	2363.39	0.00	2363.78	0.39	7.57	0.06	2363.60
530.0	0.0	525.3	4.7	0.0	104.1	5.1	150.5	69.2	2363.20
0.92	0.00	5.05	0.93	0.000	0.034	0.041	0.000	2361.90	9969.92
0.015691	525.	530.	510.	4	14	0	0.00	172.24	10142.17

FLOW DISTRIBUTION FOR SECNO= 65.97 CWSEL= 2363.39

STA=	9970.	10087.	10142.
PER Q=	99.1	0.9	
AREA=	104.1	5.1	
VEL=	5.0	0.9	
DEPTH=	0.9	0.1	

*SECNO 66.073
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

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

3470 ENCROACHMENT STATIONS= 9801.6 10112.9 TYPE= 1 TARGET= 311.301

66.073	1.70	2372.30	2372.30	0.00	2372.65	0.35	8.41	0.00	2371.80
530.0	263.4	258.3	8.3	69.4	45.9	6.4	151.9	71.3	2372.00
0.95	3.79	5.63	1.29	0.041	0.034	0.041	0.000	2370.60	9883.61
0.015824	530.	535.	515.	3	8	0	0.00	187.35	10070.96

FLOW DISTRIBUTION FOR SECNO= 66.07 CWSEL= 2372.30

STA=	9884.	9906.	9924.	9984.	10028.	10071.
PER Q=	14.4	19.0	16.3	48.7	1.6	
AREA=	18.6	20.7	30.1	45.9	6.4	
VEL=	4.1	4.9	2.9	5.6	1.3	
DEPTH=	0.9	1.1	0.5	1.0	0.2	

*SECNO 66.181

3265 DIVIDED FLOW

[redacted]ROSS SECTION 66.18 EXTENDED 0.93 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2380.70 ELREA= 2381.00

66.181	4.63	2380.83	2380.83	0.00	2380.85	0.02	1.71	0.03	2380.70
530.0	423.9	106.1	0.0	357.2	74.6	0.0	155.6	76.0	2381.00
1.08	1.19	1.42	0.00	0.041	0.034	0.000	0.000	2376.20	9439.78
0.001192	590.	570.	545.	12	26	0	0.00	500.02	10060.98

FLOW DISTRIBUTION FOR SECNO= 66.18 CWSEL= 2380.83

STA=	9440.	9573.	9654.	9668.	9808.	9932.	9945.	9981.	10078.
PER Q=	18.0	23.2	0.8	3.2	33.4	1.3	0.0	20.0	
AREA=	95.6	90.7	5.8	22.5	134.5	7.7	0.4	74.6	
VEL=	1.0	1.4	0.7	0.8	1.3	0.9	0.2	1.4	
DEPTH=	0.7	1.1	0.4	0.2	1.1	0.6	0.0	0.9	

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

*SECNO 66.276

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2389.50 ELREA= 2390.00

66.276	2.14	2388.84	2388.84	0.00	2389.39	0.55	1.49	0.16	2389.50
530.0	0.0	530.0	0.0	0.0	89.1	0.0	158.6	79.3	2390.00
1.10	0.00	5.95	0.00	0.000	0.034	0.000	0.000	2386.70	9979.30
0.016988	500.	500.	490.	20	14	0	0.00	83.31	10062.61

FLOW DISTRIBUTION FOR SECNO= 66.28 CWSEL= 2388.84

STA= 9979. 10084.
Q= 100.0
EA= 89.1
VEL= 5.9
DEPTH= 1.1

*SECNO 66.369
3280 CROSS SECTION 66.37 EXTENDED 0.61 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2397.10 ELREA= 2396.50

66.369	1.20	2396.60	0.00	0.00	2396.78	0.17	7.35	0.04	2397.10
530.0	0.0	362.6	167.4	0.0	99.3	65.0	160.0	81.4	2396.50
1.14	0.00	3.65	2.57	0.000	0.034	0.041	0.000	2395.40	9959.44
0.013049	495.	495.	500.	6	0	0	0.00	291.73	10251.18

FLOW DISTRIBUTION FOR SECNO= 66.37 CWSEL= 2396.60

STA=	9959.	10118.	10208.	10251.
PER Q=	68.4	22.6	9.0	
AREA=	99.3	45.6	19.5	
VEL=	3.7	2.6	2.4	
DEPTH=	0.6	0.5	0.5	

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

*SECNO 66.470

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2403.60 ELREA= 2404.20

66.470	2.94	2403.14	0.00	0.00	2403.87	0.72	6.93	0.16	2403.60
530.0	0.0	530.0	0.0	0.0	77.7	0.0	161.5	83.5	2404.20
1.17	0.00	6.82	0.00	0.000	0.034	0.000	0.000	2400.20	9975.99
0.013125	480.	530.	525.	4	0	0	0.00	48.43	10024.42

FLOW DISTRIBUTION FOR SECNO= 66.47 CWSEL= 2403.14

STA= 9976. 10031.
PER Q= 100.0
AREA= 77.7
VEL= 6.8
[redacted]TH= 1.6

*SECNO 66.567
3280 CROSS SECTION 66.57 EXTENDED 0.88 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2411.40 ELREA= 2410.90

66.567	2.88	2410.48	2410.48	0.00	2411.35	0.87	7.06	0.05	2411.40
530.0	0.0	530.0	0.0	0.0	70.6	0.0	162.4	84.0	2410.90
1.18	0.00	7.51	0.00	0.000	0.034	0.000	0.000	2407.60	9975.70
0.014337	500.	515.	505.	4	8	0	0.00	40.60	10016.30

FLOW DISTRIBUTION FOR SECNO= 66.57 CWSEL= 2410.48

STA= 9976. 10019.
PER Q= 100.0
AREA= 70.6
VEL= 7.5
DEPTH= 1.7

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

*SECNO 66.662

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.44

66.662	1.39	2415.99	0.00	0.00	2416.22	0.23	4.80	0.06	2418.20
530.0	0.0	530.0	0.0	0.0	138.9	0.0	163.6	85.0	2418.40
1.22	0.00	3.81	0.00	0.000	0.034	0.000	0.000	2414.60	9922.00
0.006874	500.	500.	510.	5	0	0	0.00	128.55	10050.55

FLOW DISTRIBUTION FOR SECNO= 66.66 CWSEL= 2415.99

STA= 9922. 10072.
PER Q= 100.0
AREA= 138.9
VEL= 3.8
DEPTH= 1.1

*SECNO 66.766
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2427.30 ELREA= 2426.70

66.766	1.76	2423.26	2423.26	0.00	2423.80	0.54	5.64	0.10	2427.30
530.0	0.0	530.0	0.0	0.0	89.5	0.0	165.0	86.3	2426.70
1.25	0.00	5.92	0.00	0.000	0.034	0.000	0.000	2421.50	9937.34
0.016881	515.	550.	527.	20	11	0	0.00	83.82	10021.16

FLOW DISTRIBUTION FOR SECNO= 66.77 CWSEL= 2423.26

STA= 9937. 10047.
PER Q= 100.0
AREA= 89.5
VEL= 5.9
DEPTH= 1.1

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

*SECNO 66.866

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2430.50 ELREA= 2430.80

66.866	1.82	2430.62	0.00	0.00	2430.91	0.29	7.08	0.03	2430.50
530.0	227.3	302.7	0.0	55.8	68.2	0.0	166.3	87.6	2430.80
1.28	4.07	4.44	0.00	0.041	0.034	0.000	0.000	2428.80	9906.52
0.011004	510.	530.	490.	6	0	0	0.00	121.64	10028.16

FLOW DISTRIBUTION FOR SECNO= 66.87 CWSEL= 2430.62

STA=	9907.	9918.	9957.	10031.
PER Q=	9.0	33.8	57.1	
AREA=	12.2	43.6	68.2	
VEL=	3.9	4.1	4.4	
DEPTH=	1.1	1.1	1.0	

*SECNO 66.974

[redacted]DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

66.974	1.87	2438.27	2438.27	0.00	2438.83	0.55	7.44	0.08	2438.80
530.0	0.0	527.7	2.3	0.1	88.1	1.3	167.7	88.9	2437.80
1.31	0.05	5.99	1.76	0.041	0.034	0.041	0.000	2436.40	9951.96
0.016284	530.	570.	515.	4	8	0	0.00	87.69	10065.11

FLOW DISTRIBUTION FOR SECNO= 66.97 CWSEL= 2438.27

STA=	9952.	9955.	10060.	10065.
PER Q=	0.0	99.6	0.4	
AREA=	0.1	88.1	1.3	
VEL=	0.0	6.0	1.8	
DEPTH=	0.0	1.1	0.2	

CCHV= 0.100 CEHV= 0.300
*SECNO -63.800

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

CCHV= 0.300 CEHV= 0.500
*SECNO 90.188
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9500.0 10147.8 TYPE= 1 TARGET= 647.800

90.188	4.99	2243.09	2243.09	0.00	2243.74	0.65	2.17	0.21	2241.40
1450.0	155.6	1102.2	192.2	54.7	151.2	93.3	177.4	95.5	2242.00
1.37	2.84	7.29	2.06	0.032	0.027	0.032	0.000	2238.10	9932.04
0.002882	540.	500.	495.	2	16	0	0.00	215.76	10147.80

FLOW DISTRIBUTION FOR SECNO= 90.19 CWSEL= 2243.09

STA=	9932.	9941.	9980.	10018.	10066.	10148.
PER Q=	0.4	10.3	76.0	7.4	5.8	
AREA=	4.0	50.7	151.2	45.1	48.2	
VEL=	1.4	3.0	7.3	2.4	1.7	
DEPTH=	0.4	1.3	4.0	0.9	0.6	

[redacted]0 90.203

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.81

3470 ENCROACHMENT STATIONS= 0.0 10285.0 TYPE= 1 TARGET= 10284.999

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2244.10 ELREA= 2243.20

90.203	5.71	2243.81	0.00	0.00	2243.99	0.18	0.12	0.14	2244.10
1450.0	0.0	1000.6	449.4	0.0	248.3	298.3	178.1	96.0	2243.20
1.37	0.00	4.03	1.51	0.000	0.027	0.032	0.000	2238.10	9962.29
0.000883	80.	80.	75.	4	0	0	0.00	322.71	10285.00

FLOW DISTRIBUTION FOR SECNO= 90.20 CWSEL= 2243.81

STA=	9962.	10025.	10285.
PER Q=	69.0	31.0	
AREA=	248.3	298.3	
VEL=	4.0	1.5	
DEPTH=	4.0	1.1	

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

START TRIB COMP
-63.800 63.800 2233.947
7185 MINIMUM SPECIFIC ENERGY

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2233.10 ELREA= 2236.50

-63.800	5.55	2233.95	2233.92	0.00	2234.99	1.04	0.00	0.00	2233.10
4100.0	313.0	3787.0	0.0	121.9	445.6	0.0	167.7	88.9	2236.50
1.31	2.57	8.50	0.00	0.040	0.028	0.000	0.000	2228.40	9748.10
0.006050	0.	0.	0.	0	20	0	0.00	296.98	10045.09

FLOW DISTRIBUTION FOR SECNO= -63.80 CWSEL= 2233.95

STA=	9748.	9754.	9895. 10084.
PER Q=	0.1	7.5	92.4
AREA=	2.5	119.5	445.6
VEL=	1.6	2.6	8.5
DEPTH=	0.4	0.8	3.0

*[redacted]0 90.093

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.32

90.093	3.13	2237.93	0.00	0.00	2238.16	0.24	3.09	0.08	2235.80
1450.0	40.7	1327.6	81.7	10.7	330.5	78.7	173.2	92.4	2237.00
1.34	3.80	4.02	1.04	0.034	0.053	0.078	0.000	2234.80	9944.97
0.007183	450.	490.	540.	3	0	0	0.00	319.33	10264.30

FLOW DISTRIBUTION FOR SECNO= 90.09 CWSEL= 2237.93

STA=	9945.	9955. 10105.	10256.	10264.
PER Q=	2.8	91.6	5.6	0.0
AREA=	10.7	330.5	78.2	0.5
VEL=	3.8	4.0	1.0	0.2
DEPTH=	1.1	2.2	0.5	0.1

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

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2241.44 , NOT 2243.81 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	50.00	27.60	3.60	96.00	0.00	2238.60	2238.10

*SECNO 90.215

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.93

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2249.48	2245.46	0.00	422.	1034.	96.	96.	2242.60	2244.50	50.

3470 ENCROACHMENT STATIONS= 0.0 10270.0 TYPE= 1 TARGET= 10269.999

90.215	6.85	2246.65	0.00	0.00	2246.69	0.05	2.70	0.00	2244.90
1450.0	52.0	517.2	880.7	202.3	252.0	555.4	179.3	96.6	2244.20
1.38	0.26	2.05	1.59	0.085	0.031	0.025	0.000	2239.80	9735.24
0.000237	65.	65.	65.	2	0	2	0.00	534.76	10270.00

FLOW DISTRIBUTION FOR SECNO= 90.21 CWSEL= 2246.65

STA=	9735.	9975.	10029. 10270.
PER Q=	3.6	35.7	60.7
AREA=	202.3	252.0	555.4
VEL=	0.3	2.1	1.6
DEPTH=	0.8	4.7	2.3

CCHV= 0.100 CEHV= 0.300
*SECNO 90.284
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 0.0 10289.7 TYPE= 1 TARGET= 10289.699

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2248.50 ELREA= 2248.30

90.284	2.10	2248.30	2248.30	0.00	2248.61	0.31	0.23	0.08	2248.50
1450.0	0.0	113.8	1336.2	0.0	36.3	294.4	185.0	100.1	2248.30
1.41	0.00	3.13	4.54	0.000	0.033	0.025	0.000	2246.20	9981.73
0.004569	370.	365.	375.	20	26	0	0.00	279.65	10261.38

FLOW DISTRIBUTION FOR SECNO= 90.28 CWSEL= 2248.30

STA=	9982.	10016.	10216.	10261.
PER Q=		7.8	75.1	17.0
AREA=		36.3	239.9	54.5
VEL=		3.1	4.5	4.5
DEPTH=		1.1	1.2	1.2

*SECNO 90.381
3280 CROSS SECTION 90.38 EXTENDED 0.14 FEET

[redacted]20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9805.0 10237.3 TYPE= 1 TARGET= 432.300

90.381	3.14	2253.74	2253.74	0.00	2254.17	0.43	4.86	0.04	2253.10
1450.0	605.5	276.8	567.7	134.8	34.1	139.3	188.7	104.0	2252.60
1.43	4.49	8.12	4.08	0.058	0.051	0.058	0.000	2250.60	9832.13
0.032087	515.	510.	500.	20	17	0	0.00	405.16	10237.30

FLOW DISTRIBUTION FOR SECNO= 90.38 CWSEL= 2253.74

STA=	9832.	9847.	9887.	9922.	9991.	10008.	10026.	10058.	10237.
PER Q=	0.5	3.2	11.1	27.0	19.1	11.9	15.5	11.8	
AREA=	4.1	17.3	35.2	78.1	34.1	28.2	41.3	69.8	
VEL=	1.9	2.7	4.6	5.0	8.1	6.1	5.4	2.4	
DEPTH=	0.3	0.4	1.0	1.1	2.0	1.5	1.3	0.4	

*SECNO 90.476

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

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF

3470 ENCROACHMENT STATIONS= 0.0 10537.5 TYPE= 1 TARGET= 10537.499

90.476	1.41	2258.71	2258.62	0.00	2258.76	0.05	3.52	11.95	2258.10
1450.0	557.2	29.7	863.1	392.7	16.7	428.8	195.4	113.0	2258.70
1.51	1.42	1.78	2.01	0.045	0.040	0.045	0.000	2257.30	9298.71
0.002963	510.	505.	500.	20	20	0	0.00	1133.33	10529.20

FLOW DISTRIBUTION FOR SECNO= 90.48 CWSEL= 2258.71

STA=	9299.	9351.	9552.	9780.	9972.	9992.	10012.	10404.	10458.	10529.
PER Q=	3.6	4.3	5.1	22.1	3.4	2.0	45.8	9.7	4.1	
AREA=	35.6	67.9	81.3	183.9	24.0	16.7	317.1	67.1	44.5	
VEL=	1.5	0.9	0.9	1.7	2.0	1.8	2.1	2.1	1.3	
[redacted]TH=	0.7	0.3	0.4	1.0	1.2	0.8	0.8	1.3	0.6	

*SECNO 90.570
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2263.10 ELREA= 2264.40

90.570	3.13	2263.43	2263.43	0.00	2263.91	0.48	3.19	0.13	2263.10
1450.0	1206.4	243.6	0.0	239.2	32.1	0.0	201.7	121.1	2264.40
1.54	5.04	7.58	0.00	0.045	0.040	0.000	0.000	2260.30	9728.47
0.022829	505.	495.	485.	20	17	0	0.00	282.45	10010.92

FLOW DISTRIBUTION FOR SECNO= 90.57 CWSEL= 2263.43

STA=	9728.	9921.	9974.	9991.	10014.
PER Q=	38.0	39.1	6.1	16.8	
AREA=	138.0	83.8	17.4	32.1	
VEL=	4.0	6.8	5.1	7.6	
DEPTH=	0.7	1.6	1.0	1.6	

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

*SECNO 90.667

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.01

3470 ENCROACHMENT STATIONS= 9771.0 10709.2 TYPE= 1 TARGET= -9771.000

90.667	4.52	2268.62	0.00	0.00	2269.10	0.47	5.19	0.00	2267.80
1450.0	263.6	1104.5	81.9	99.9	179.6	29.9	205.1	123.9	2268.60
1.56	2.64	6.15	2.74	0.045	0.035	0.045	0.000	2264.10	9878.27
0.005651	520.	510.	500.	7	0	0	0.00	187.64	10065.92

FLOW DISTRIBUTION FOR SECNO= 90.67 CWSEL= 2268.62

STA=	9878.	9956.	9971.	10038.	10048.	10059.	10066.
PER Q=	13.5	4.7	76.2	1.7	3.5	0.4	
AREA=	78.3	21.6	179.6	10.5	15.9	3.5	
VEL=	2.5	3.1	6.1	2.4	3.2	1.6	
DEPTH=	1.0	1.4	2.7	1.0	1.5	0.5	

[redacted]0 90.760

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2270.60 ELREA= 2271.60

90.760	4.17	2271.37	0.00	0.00	2272.00	0.62	2.85	0.04	2270.60
1450.0	163.1	1286.9	0.0	77.1	193.0	0.0	208.4	125.9	2271.60
1.59	2.12	6.67	0.00	0.045	0.035	0.000	0.000	2267.20	9860.87
0.005975	465.	495.	515.	4	0	0	0.00	173.38	10034.25

FLOW DISTRIBUTION FOR SECNO= 90.76 CWSEL= 2271.37

STA=	9861.	9868.	9956.	9968.	10035.
PER Q=	0.0	9.0	2.2	88.8	
AREA=	0.9	63.7	12.5	193.0	
VEL=	0.7	2.1	2.5	6.7	
DEPTH=	0.1	0.7	1.0	2.9	

CCHV= 0.300 CEHV= 0.500
*SECNO 90.840

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2279.00 ELREA= 2277.20

90.840	5.39	2273.99	0.00	0.00	2275.06	1.07	2.84	0.22	2279.00
1450.0	0.0	1450.0	0.0	0.0	174.7	0.0	210.5	127.0	2277.20
1.60	0.00	8.30	0.00	0.000	0.035	0.000	0.000	2268.60	9980.65
0.007667	440.	420.	400.	2	0	0	0.00	50.67	10031.32

FLOW DISTRIBUTION FOR SECNO= 90.84 CWSEL= 2273.99

STA= 9981. 10052.
PER Q= 100.0
AREA= 174.7
VEL= 8.3
DEPTH= 3.4

SPECIAL BRIDGE

[redacted]K	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	1.60	2.60	0.00	16.00	0.01	78.80	0.00	2269.80	2268.60

*SECNO 90.863

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.01

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2282.40	2275.80	0.00	317.	1144.	79.	78.	2274.70	2278.70	53.

3470 ENCROACHMENT STATIONS= 0.0 10058.5 TYPE= 1 TARGET= 10058.499

90.863	9.27	2279.07	0.00	0.00	2279.22	0.16	4.16	0.00	2277.40
[redacted]1450.0	159.0	1261.4	29.6	172.9	372.7	31.8	211.6	127.3	2276.10
[redacted]1.61	0.92	3.38	0.93	0.045	0.035	0.045	0.000	2269.80	9703.90
[redacted].000476	120.	120.	120.	2	0	3	0.00	225.93	10046.00

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

FLOW DISTRIBUTION FOR SECNO= 90.86 CWSEL= 2279.07

STA=	9704.	9723.	9738.	9877.	9975.	10025.	10046.
PER Q=	0.0	0.0	0.7	10.2	87.0	2.0	
AREA=	1.6	1.2	17.3	152.8	372.7	31.8	
VEL=	0.1	0.1	0.6	1.0	3.4	0.9	
DEPTH=	0.1	0.1	0.1	1.6	7.5	1.5	

CCHV= 0.100 CEHV= 0.300
*SECNO 90.886

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2285.60 ELREA= 2284.30

90.886	7.47	2279.17	0.00	0.00	2279.29	0.12	0.06	0.00	2285.60
1450.0	0.0	1450.0	0.0	0.0	516.2	0.0	213.2	127.8	2284.30
1.62	0.00	2.81	0.00	0.000	0.035	0.000	0.000	2271.70	9921.36
0.000538	140.	125.	120.	2	0	0	0.00	105.10	10026.46

[redacted]DISTRIBUTION FOR SECNO= 90.89 CWSEL= 2279.17

STA=	9921.	10040.
PER Q=	100.0	
AREA=	516.2	
VEL=	2.8	
DEPTH=	4.9	

*SECNO 90.953

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.56

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2290.50 ELREA= 2289.90

90.953	5.35	2279.45	0.00	0.00	2279.61	0.16	0.31	0.01	2290.50
1450.0	0.0	1450.0	0.0	0.0	448.5	0.0	217.0	129.0	2289.90
1.65	0.00	3.23	0.00	0.000	0.035	0.000	0.000	2274.10	9911.96
0.001735	330.	350.	390.	2	0	0	0.00	180.05	10092.01

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

FLOW DISTRIBUTION FOR SECNO= 90.95 CWSEL= 2279.45

STA= 9912. 10134.
PER Q= 100.0
AREA= 448.5
VEL= 3.2
DEPTH= 2.5

*SECNO 91.045

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9836.1 10568.6 TYPE= 1 TARGET= -9836.100

91.045	4.50	2283.20	2283.20	0.00	2283.90	0.71	1.79	0.16	2281.40
1450.0	802.0	648.0	0.0	190.8	72.5	0.0	221.0	130.9	2283.40
[redacted]1.68	4.20	8.94	0.00	0.050	0.035	0.000	0.000	2278.70	9841.47
[redacted]12880	460.	490.	510.	20	9	0	0.00	175.09	10016.55

FLOW DISTRIBUTION FOR SECNO= 91.04 CWSEL= 2283.20

STA= 9841. 9863. 9888. 9931. 9989. 10017.
PER Q= 2.1 6.3 14.7 32.2 44.7
AREA= 12.7 26.2 54.5 97.4 72.5
VEL= 2.4 3.5 3.9 4.8 8.9
DEPTH= 0.6 1.0 1.2 1.7 2.6

*SECNO 91.134

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9845.0 10901.8 TYPE= 1 TARGET= -9845.000

91.134	4.40	2289.00	2289.00	0.00	2289.46	0.46	4.60	0.02	2287.00
1450.0	251.2	680.2	518.6	97.0	91.6	189.0	224.5	133.8	2287.90
1.70	2.59	7.42	2.74	0.050	0.035	0.050	0.000	2284.60	9893.32
0.007590	470.	470.	490.	4	6	0	0.00	349.07	10252.31

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 91.13 CWSEL= 2289.00

STA=	9893.	9990.	10022.	10106.	10119.	10159.	10190.	10238.	10252.
PER Q=	17.3	46.9	28.1	1.9	0.9	1.7	2.7	0.4	
AREA=	97.0	91.6	122.5	11.2	10.6	15.5	24.2	5.0	
VEL=	2.6	7.4	3.3	2.4	1.3	1.6	1.6	1.3	
DEPTH=	1.0	2.9	1.5	0.9	0.3	0.5	0.5	0.4	

*SECNO 91.235
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9853.0 10305.3 TYPE= 1 TARGET= -9853.000

91.235	3.78	2295.18	2295.18	0.00	2295.65	0.46	4.52	0.00	2293.40
1250.0	511.4	459.5	279.1	156.0	56.9	108.2	228.7	137.8	2294.10
1.73	3.28	8.08	2.58	0.052	0.035	0.052	0.000	2291.40	9853.00
0.010238	440.	530.	590.	13	9	0	0.00	302.52	10155.52

[redacted]DISTRIBUTION FOR SECNO= 91.24 CWSEL= 2295.18

STA=	9853.	9939.	9951.	9987.	10008.	10048.	10066.	10156.
PER Q=	19.4	5.6	16.0	36.8	11.4	4.6	6.4	
AREA=	84.8	18.1	53.1	56.9	45.2	18.8	44.2	
VEL=	2.9	3.8	3.8	8.1	3.1	3.0	1.8	
DEPTH=	1.0	1.5	1.5	2.6	1.1	1.1	0.5	

*SECNO 91.337

3265 DIVIDED FLOW

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2299.20 ELREA= 2302.80

91.337	4.01	2300.31	0.00	0.00	2300.82	0.51	5.16	0.01	2299.20
1250.0	585.3	664.7	0.0	168.9	92.6	0.0	232.2	140.6	2302.80
1.76	3.47	7.18	0.00	0.052	0.035	0.000	0.000	2296.30	9818.16
0.009313	530.	540.	480.	3	0	0	0.00	175.69	10013.95

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

FLOW DISTRIBUTION FOR SECNO= 91.34 CWSEL= 2300.31

STA=	9818.	9838.	9863.	9901.	9963.	9975.	10023.
PER Q=	5.4	13.0	2.7	17.3	8.4	53.2	
AREA=	22.5	41.9	19.2	61.2	24.1	92.6	
VEL=	3.0	3.9	1.8	3.5	4.4	7.2	
DEPTH=	1.2	1.7	0.5	1.0	2.0	2.4	

1490 NH CARD USED
*SECNO 91.434

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 0.0 10280.0 TYPE= 1 TARGET= 10279.999

91.434	4.06	2306.16	2306.16	0.00	2306.93	0.77	4.66	0.08	2305.20
1250.0	186.8	1038.9	24.4	74.7	136.1	6.6	235.1	142.9	2304.30
[redacted]1.78	2.50	7.63	3.67	0.052	0.035	0.035	0.000	2302.10	9723.69
[redacted]J8609	545.	510.	500.	4	5	0	0.00	187.45	10029.54

FLOW DISTRIBUTION FOR SECNO= 91.43 CWSEL= 2306.16

STA=	9724.	9781.	9912.	9933.	9972.	10022.	10030.
PER Q=	0.2	2.5	6.4	5.8	83.1	1.9	
AREA=	4.6	12.3	26.1	31.7	136.1	6.6	
VEL=	0.5	2.5	3.1	2.3	7.6	3.7	
DEPTH=	0.1	0.1	1.3	0.8	2.7	0.9	

*SECNO 91.530
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2313.80 ELREA= 2313.20

91.530	3.14	2312.14	2312.14	0.00	2313.12	0.98	5.64	0.06	2313.80
1200.0	0.0	1200.0	0.0	0.0	150.7	0.0	237.2	144.4	2313.20
1.80	0.00	7.96	0.00	0.000	0.035	0.000	0.000	2309.00	9933.03
0.014904	510.	510.	505.	4	15	0	0.00	78.39	10011.42

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 91.53 CWSEL= 2312.14

STA=	9933.	10016.							
PER Q=	100.0								
AREA=	150.7								
VEL=	8.0								
DEPTH=	1.9								

*SECNO 91.630

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.43

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2320.10 ELREA= 2317.10

91.630	3.66	2317.96	0.00	0.00	2318.51	0.55	5.35	0.04	2320.10
[redacted]00.0	0.0	758.6	441.4	0.0	106.9	141.0	239.7	146.2	2317.10
1.82	0.00	7.09	3.13	0.000	0.030	0.040	0.000	2314.30	9970.93
0.007292	500.	525.	550.	6	0	0	0.00	206.22	10202.70

FLOW DISTRIBUTION FOR SECNO= 91.63 CWSEL= 2317.96

STA=	9971.	10020.	10067.	10088.	10119.	10136.	10152.	10177.	10203.
PER Q=	63.2	16.0	3.4	1.9	8.3	2.6	2.0	2.7	
AREA=	106.9	54.6	15.8	8.7	24.3	11.9	10.9	14.8	
VEL=	7.1	3.5	2.6	2.6	4.1	2.6	2.2	2.2	
DEPTH=	2.2	1.2	0.7	0.3	1.5	0.7	0.4	0.6	

*SECNO 91.733

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

91.733	3.32	2323.02	2323.02	0.00	2324.26	1.24	4.57	0.21	2324.80
1200.0	0.0	1200.0	0.0	0.0	134.3	0.0	242.0	147.7	2323.10
1.84	0.00	8.94	0.00	0.000	0.030	0.000	0.000	2319.70	9970.26
0.010135	600.	545.	490.	3	11	0	0.00	55.12	10025.38

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 91.73 CWSEL= 2323.02

STA= 9970. 10026.
PER Q= 100.0
AREA= 134.3
VEL= 8.9
DEPTH= 2.4

*SECNO 91.831

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.71

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2328.50 ELREA= 2340.00

91.831	5.65	2326.45	0.00	0.00	2327.19	0.74	2.88	0.05	2328.50
1200.0	0.0	1200.0	0.0	0.0	173.8	0.0	243.8	148.3	2340.00
1.86	0.00	6.90	0.00	0.000	0.030	0.000	0.000	2320.80	9974.99
0.003478	500.	520.	510.	3	0	0	0.00	45.56	10020.55

FLOW DISTRIBUTION FOR SECNO= 91.83 CWSEL= 2326.45

STA= 9975. 10042.
PER Q= 100.0
AREA= 173.8
VEL= 6.9
DEPTH= 3.8

*SECNO 91.926

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

91.926	3.94	2330.24	2330.24	0.00	2331.50	1.26	3.27	0.16	2348.40
1200.0	0.0	1200.0	0.0	0.0	133.3	0.0	245.6	148.9	2350.60
1.88	0.00	9.01	0.00	0.000	0.038	0.000	0.000	2326.30	9969.18
0.016493	510.	500.	490.	3	19	0	0.00	54.29	10023.47

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

FLOW DISTRIBUTION FOR SECNO= 91.93 CWSEL= 2330.24

STA= 9969. 10068.
PER Q= 100.0
AREA= 133.3
VEL= 9.0
DEPTH= 2.5

*SECNO 92.026
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

92.026	4.68	2339.48	2339.48	0.00	2340.39	0.90	7.28	0.04	2338.00
1200.0	356.8	843.2	0.0	83.6	97.2	0.0	247.5	149.8	2354.00
1.90	4.27	8.67	0.00	0.045	0.038	0.000	0.000	2334.80	9914.08
0.011783	530.	525.	520.	5	11	0	0.00	100.84	10014.92

FLOW DISTRIBUTION FOR SECNO= 92.03 CWSEL= 2339.48

[redacted] 9914. 9934. 9983. 10044.
[redacted]Q= 3.2 26.5 70.3
AREA= 13.8 69.8 97.2
VEL= 2.8 4.6 8.7
DEPTH= 0.7 1.4 3.0

*SECNO 92.137
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 0.0 10160.8 TYPE= 1 TARGET= 10160.799

92.137	4.93	2348.63	2348.63	0.00	2349.39	0.76	6.00	0.01	2352.30
850.0	0.0	689.0	161.0	0.0	89.9	59.6	249.6	151.2	2347.90
1.92	0.00	7.66	2.70	0.000	0.038	0.045	0.000	2343.70	9984.63
0.008637	550.	590.	570.	7	8	0	0.00	103.49	10088.12

FLOW DISTRIBUTION FOR SECNO= 92.14 CWSEL= 2348.63

STA= 9985. 10012. 10030. 10083. 10088.
PER Q= 81.1 6.4 12.5 0.1
AREA= 89.9 17.9 40.9 0.9
VEL= 7.7 3.0 2.6 0.9
DEPTH= 3.3 1.0 0.8 0.2

[redacted]

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

*SECNO 92.240
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

92.240	4.04	2354.04	2354.04	0.00	2355.08	1.04	5.40	0.09	2352.80
850.0	115.6	734.4	0.0	30.1	84.5	0.0	251.3	152.1	2369.20
1.94	3.84	8.69	0.00	0.045	0.038	0.000	0.000	2350.00	9959.59
0.011864	550.	540.	500.	3	15	0	0.00	56.42	10016.02

FLOW DISTRIBUTION FOR SECNO= 92.24 CWSEL= 2354.04

STA=	9960.	9969.	9989.	10044.
PER Q=	1.9	11.7	86.4	
AREA=	6.1	24.1	84.5	
VEL=	2.6	4.2	8.7	
DEPTH=	0.6	1.2	3.1	

*SECNO 92.348
7185 MINIMUM SPECIFIC ENERGY
[redacted]CRITICAL DEPTH ASSUMED
3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2363.70 ELREA= 2364.30

92.348	4.14	2362.24	2362.24	0.00	2363.33	1.09	8.09	0.01	2363.70
850.0	0.0	850.0	0.0	0.0	101.5	0.0	252.7	152.8	2364.30
1.96	0.00	8.38	0.00	0.000	0.038	0.000	0.000	2358.10	9990.91
0.017326	560.	570.	580.	3	8	0	0.00	47.75	10038.66

FLOW DISTRIBUTION FOR SECNO= 92.35 CWSEL= 2362.24

STA=	9991.	10059.
PER Q=	100.0	
AREA=	101.5	
VEL=	8.4	
DEPTH=	2.1	

*SECNO 92.446

92.446	4.35	2370.46	2370.44	0.00	2371.59	1.13	8.25	0.01	2369.00
850.0	29.7	820.3	0.0	9.2	94.6	0.0	253.9	153.4	2378.30
1.98	3.21	8.68	0.00	0.045	0.038	0.000	0.000	2366.10	9962.50
0.014569	520.	520.	520.	8	8	0	0.00	49.42	10011.92

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

FLOW DISTRIBUTION FOR SECNO= 92.45 CWSEL= 2370.46

STA= 9963. 9975. 10026.
PER Q= 3.5 96.5
AREA= 9.2 94.6
VEL= 3.2 8.7
DEPTH= 0.7 2.6

*SECNO 92.545
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

92.545	4.21	2380.71	2380.71	0.00	2382.06	1.35	8.02	0.06	2386.40
850.0	0.0	850.0	0.0	0.0	91.2	0.0	255.1	153.9	2387.90
1.99	0.00	9.32	0.00	0.000	0.038	0.000	0.000	2376.50	9980.56
0.016039	510.	525.	550.	3	8	0	0.00	33.95	10014.51

FLOW DISTRIBUTION FOR SECNO= 92.54 CWSEL= 2380.71

[redacted] 9981. 10039.
[redacted]Q= 100.0
AREA= 91.2
VEL= 9.3
DEPTH= 2.7

CCHV= 0.100 CEHV= 0.300
*SECNO -64.560
START TRIB COMP
-64.560 64.560 2273.612
7185 MINIMUM SPECIFIC ENERGY

-64.560	8.31	2273.61	2273.58	0.00	2274.94	1.33	0.00	0.00	2274.90
3300.0	0.0	2437.7	862.3	0.0	231.3	235.5	255.1	153.9	2271.90
1.99	0.00	10.54	3.66	0.000	0.032	0.048	0.000	2265.30	9981.82
0.006228	0.	0.	0.	0	17	0	0.00	177.80	10159.62

FLOW DISTRIBUTION FOR SECNO= -64.56 CWSEL= 2273.61

STA= 9982. 10026. 10078. 10157. 10160.
PER Q= 73.9 13.9 12.2 0.0
AREA= 231.3 112.4 122.4 0.7
VEL= 10.5 4.1 3.3 1.0
DEPTH= 5.2 2.2 1.6 0.3

[redacted]

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

*SECNO 30.093

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.20

30.093	7.41	2275.41	0.00	0.00	2275.48	0.07	0.41	0.13	2268.50
1800.0	290.4	1324.4	185.2	253.0	573.4	144.3	263.2	155.9	2268.50
2.06	1.15	2.31	1.28	0.048	0.032	0.048	0.000	2268.00	9847.33
0.000181	480.	490.	500.	3	0	0	0.00	184.35	10070.00

FLOW DISTRIBUTION FOR SECNO= 30.09 CWSEL= 2275.41

STA=	9847.	9860.	9868.	9935.	9961.	10042.	10053.	10070.
Q=	0.2	0.1	3.3	12.6	73.6	7.0	3.3	
EA=	9.5	6.2	74.7	162.6	573.4	81.7	62.7	
VEL=	0.3	0.3	0.8	1.4	2.3	1.5	0.9	
DEPTH=	0.8	0.8	1.1	6.1	7.1	7.2	3.7	

*SECNO 30.191

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

30.191	3.08	2277.78	2277.78	0.00	2278.47	0.69	0.31	0.19	2276.50
1800.0	804.2	984.2	11.7	184.9	121.0	7.2	270.8	158.3	2278.10
2.08	4.35	8.14	1.63	0.060	0.038	0.060	0.000	2274.70	9853.01
0.018299	520.	520.	480.	20	15	0	0.00	214.07	10075.68

FLOW DISTRIBUTION FOR SECNO= 30.19 CWSEL= 2277.78

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

STA=	9853.	9866.	9892.	9956.	9983.	10050.	10065.	10076.
PER Q=	1.2	6.9	25.6	11.1	54.7	0.3	0.3	
AREA=	8.4	32.2	101.2	43.0	121.0	3.7	3.5	
VEL=	2.5	3.8	4.5	4.6	8.1	1.6	1.6	
DEPTH=	0.6	1.2	1.6	1.6	1.9	0.2	0.3	

*SECNO 30.292

30.292	3.41	2285.51	2285.51	0.00	2286.18	0.66	7.70	0.00	2283.70
1800.0	329.7	671.5	798.8	57.5	77.0	183.9	274.5	160.9	2284.00
2.10	5.73	8.73	4.34	0.045	0.035	0.045	0.000	2282.10	9958.15
0.012406	500.	530.	510.	8	8	0	0.00	225.87	10184.02

FLOW DISTRIBUTION FOR SECNO= 30.29 CWSEL= 2285.51

STA=	9958.	9961.	9988.	10018.	10033.	10046.	10056.	10074.	10128.	10165.	10184.
PER Q=	0.5	17.8	37.3	8.4	9.1	4.2	2.2	6.3	11.7	2.5	
AREA=	2.9	54.6	77.0	27.0	27.1	15.5	13.3	38.5	47.8	14.8	
VEL=	3.3	5.9	8.7	5.6	6.1	4.9	2.9	2.9	4.4	3.0	
[redacted]TH=	1.1	2.0	2.5	1.9	2.1	1.6	0.7	0.7	1.3	0.8	

*SECNO 30.393

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

30.393	4.12	2293.62	2293.62	0.00	2294.83	1.21	5.89	0.16	2292.00
1800.0	216.6	1583.4	0.0	56.8	169.8	0.0	277.8	162.9	2299.20
2.12	3.81	9.32	0.00	0.045	0.035	0.000	0.000	2289.50	9928.71
0.009877	530.	535.	535.	3	11	0	0.00	100.73	10029.44

FLOW DISTRIBUTION FOR SECNO= 30.39 CWSEL= 2293.62

STA=	9929.	9959.	9979.	10046.
PER Q=	3.8	8.2	88.0	
AREA=	24.1	32.7	169.8	
VEL=	2.8	4.5	9.3	
DEPTH=	0.8	1.6	3.3	

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

*SECNO 30.486

30.486	3.78	2299.28	2299.28	0.00	2300.39	1.11	5.55	0.01	2301.20
1800.0	0.0	1680.1	119.9	0.0	193.3	29.4	280.3	164.0	2298.40
2.14	0.00	8.69	4.08	0.000	0.035	0.045	0.000	2295.50	9964.63
0.013131	480.	490.	500.	4	11	0	0.00	107.42	10072.05

FLOW DISTRIBUTION FOR SECNO= 30.49 CWSEL= 2299.28

STA=	9965.	10045.	10063.	10072.
PER Q=	93.3	5.4	1.2	
AREA=	193.3	22.4	7.0	
VEL=	8.7	4.4	3.2	
DEPTH=	2.4	1.2	0.8	

*SECNO 30.584
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

ENCROACHMENT STATIONS= 9880.0 10090.6 TYPE= 1 TARGET= 210.600

30.584	4.58	2310.88	2310.88	0.00	2312.10	1.22	5.77	0.03	2309.20
1800.0	170.5	1629.5	0.0	43.1	177.0	0.0	283.0	165.2	2312.70
2.15	3.95	9.21	0.00	0.043	0.033	0.000	0.000	2306.30	9940.87
0.009484	530.	520.	510.	13	11	0	0.00	94.85	10035.71

FLOW DISTRIBUTION FOR SECNO= 30.58 CWSEL= 2310.88

STA=	9941.	9953.	9978.	10044.
PER Q=	0.9	8.5	90.5	
AREA=	7.2	35.9	177.0	
VEL=	2.4	4.3	9.2	
DEPTH=	0.6	1.4	3.1	

*SECNO 30.676
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

30.676	3.78	2316.78	2316.78	0.00	2317.73	0.94	5.16	0.03	2318.30
1800.0	0.0	913.7	886.3	0.0	97.0	157.7	285.6	166.5	2315.70
2.17	0.00	9.42	5.62	0.000	0.033	0.043	0.000	2313.00	9981.30
0.011817	460.	485.	505.	3	13	0	0.00	138.44	10119.74

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

FLOW DISTRIBUTION FOR SECNO= 30.68 CWSEL= 2316.78

STA=	9981.	10017.	10046.	10071.	10110.	10120.
PER Q=	50.8	3.7	5.4	35.7	4.4	
AREA=	97.0	21.7	25.6	94.7	15.8	
VEL=	9.4	3.1	3.8	6.8	5.0	
DEPTH=	2.7	0.7	1.0	2.4	1.6	

*SECNO 30.779
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

30.779	3.68	2324.38	2324.38	0.00	2325.58	1.20	6.54	0.08	2327.00
1800.0	0.0	1800.0	0.0	0.0	204.7	0.0	288.5	168.0	2328.80
2.19	0.00	8.79	0.00	0.000	0.033	0.000	0.000	2320.70	9954.71
0.012074	490.	545.	555.	3	8	0	0.00	85.62	10040.33

FLOW DISTRIBUTION FOR SECNO= 30.78 CWSEL= 2324.38

S[redacted]	9955.	10072.
Q=	100.0	
AREA=	204.7	
VEL=	8.8	
DEPTH=	2.4	

*SECNO 30.872

3470 ENCROACHMENT STATIONS= 9942.0 10541.0 TYPE= 1 TARGET= -9942.000

30.872	4.06	2330.06	2330.02	0.00	2331.00	0.94	5.40	0.03	2328.60
1800.0	283.3	1023.9	492.8	57.7	110.1	92.4	291.1	169.2	2328.00
2.21	4.91	9.30	5.33	0.043	0.033	0.043	0.000	2326.00	9951.77
0.010166	505.	490.	470.	5	8	0	0.00	131.63	10083.39

FLOW DISTRIBUTION FOR SECNO= 30.87 CWSEL= 2330.06

STA=	9952.	9968.	9975.	9987.	10024.	10056.	10067.	10083.
PER Q=	5.6	5.2	5.0	56.9	22.4	4.4	0.6	
AREA=	22.8	15.6	19.2	110.1	69.1	17.3	6.1	
VEL=	4.4	5.9	4.7	9.3	5.8	4.6	1.8	
DEPTH=	1.4	2.3	1.6	3.0	2.2	1.5	0.4	

[redacted]

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

*SECNO 30.967
3280 CROSS SECTION 30.97 EXTENDED 0.24 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2338.10 ELREA= 2335.40

30.967	3.14	2336.84	2336.84	0.00	2337.79	0.96	5.79	0.00	2338.10
1800.0	0.0	951.3	848.7	0.0	103.4	141.6	294.0	170.6	2335.40
2.23	0.00	9.20	5.99	0.000	0.033	0.043	0.000	2333.70	9974.76
0.013506	505.	500.	490.	3	15	0	0.00	124.01	10098.77

FLOW DISTRIBUTION FOR SECNO= 30.97 CWSEL= 2336.84

STA=	9975.	10019.	10045.	10083.	10099.
PER Q=	52.8	10.6	30.4	6.2	
AREA=	103.4	37.2	82.2	22.2	
[redacted]EL=	9.2	5.1	6.7	5.0	
[redacted]H=	2.4	1.4	2.1	1.4	

*SECNO 31.079

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 0.0 10087.0 TYPE= 1 TARGET= 10086.999

31.079	3.18	2344.58	0.00	0.00	2345.04	0.46	7.20	0.05	2344.70
1800.0	621.1	705.6	473.3	174.0	99.9	99.4	298.1	173.3	2342.80
2.26	3.57	7.06	4.76	0.046	0.038	0.046	0.000	2341.40	9756.63
0.011409	560.	590.	580.	2	0	0	0.00	281.15	10079.53

FLOW DISTRIBUTION FOR SECNO= 31.08 CWSEL= 2344.58

STA=	9757.	9764.	9811.	9838.	9861.	9929.	10016.	10040.	10072.	10080.
PER Q=	0.5	13.6	6.0	5.5	8.8	39.2	12.4	13.2	0.8	
AREA=	4.1	60.0	29.8	26.4	53.7	99.9	43.8	50.5	5.1	
VEL=	2.3	4.1	3.6	3.8	3.0	7.1	5.1	4.7	2.7	
DEPTH=	0.5	1.3	1.1	1.1	0.8	2.2	1.8	1.6	0.7	

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

*SECNO 31.173

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2351.40 ELREA= 2348.60

31.173	3.71	2350.81	2350.81	0.00	2351.88	1.07	6.02	0.18	2351.40
1800.0	0.0	1478.4	321.6	0.0	166.4	66.4	301.7	175.7	2348.60
2.27	0.00	8.88	4.84	0.000	0.038	0.046	0.000	2347.10	9974.98
0.012260	515.	500.	530.	3	11	0	0.00	126.19	10133.63

FLOW DISTRIBUTION FOR SECNO= 31.17 CWSEL= 2350.81

[redacted]	9975.	10031.	10054.	10068.	10116.	10134.
PER Q=	82.1	14.8	2.6	0.2	0.2	
AREA=	166.4	46.1	13.6	3.3	3.5	
VEL=	8.9	5.8	3.4	1.2	1.2	
DEPTH=	3.0	2.1	1.0	0.1	0.2	

*SECNO 31.272

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2357.70 ELREA= 2358.90

31.272	6.13	2356.13	0.00	0.00	2357.31	1.18	5.40	0.03	2357.70
1800.0	0.0	1800.0	0.0	0.0	206.1	0.0	304.3	176.8	2358.90
2.29	0.00	8.73	0.00	0.000	0.035	0.000	0.000	2350.00	9957.07
0.008906	520.	520.	520.	3	0	0	0.00	61.91	10018.98

FLOW DISTRIBUTION FOR SECNO= 31.27 CWSEL= 2356.13

STA=	9957.	10030.
PER Q=	100.0	
AREA=	206.1	
VEL=	8.7	
DEPTH=	3.3	

[redacted]

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

*SECNO 31.368

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2364.20 ELREA= 2364.30

31.368	4.42	2361.42	2361.38	0.00	2362.78	1.36	5.41	0.05	2364.20
1800.0	0.0	1800.0	0.0	0.0	192.4	0.0	306.6	177.6	2364.30
2.31	0.00	9.36	0.00	0.000	0.035	0.000	0.000	2357.00	9950.62
0.012859	495.	510.	520.	4	19	0	0.00	69.62	10020.24

FLOW DISTRIBUTION FOR SECNO= 31.37 CWSEL= 2361.42

STA= 9951. 10031.
PER Q= 100.0
AREA= 192.4
VEL= 9.4
DEPTH= 2.8

*SECNO 31.465
[redacted]MINIMUM SPECIFIC ENERGY
[redacted]CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2372.60 ELREA= 2372.60

31.465	3.12	2370.52	2370.52	0.00	2371.70	1.18	6.80	0.02	2372.60
1500.0	0.0	1500.0	0.0	0.0	172.2	0.0	308.8	178.4	2372.60
2.32	0.00	8.71	0.00	0.000	0.035	0.000	0.000	2367.40	9950.29
0.013930	500.	510.	520.	9	19	0	0.00	74.38	10024.67

FLOW DISTRIBUTION FOR SECNO= 31.47 CWSEL= 2370.52

STA= 9950. 10030.
PER Q= 100.0
AREA= 172.2
VEL= 8.7
DEPTH= 2.3

*SECNO 31.565

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

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.47

31.565	3.66	2376.06	0.00	0.00	2376.60	0.54	4.84	0.06	2378.30
1500.0	0.0	960.1	539.9	0.0	142.0	135.8	311.5	179.7	2374.60
2.35	0.00	6.76	3.98	0.000	0.035	0.044	0.000	2372.40	9977.20
0.006412	530.	530.	540.	5	0	0	0.00	127.14	10104.34

FLOW DISTRIBUTION FOR SECNO= 31.57 CWSEL= 2376.06

STA=	9977.	10027.	10055.	10101.	10104.
PER Q=	64.0	9.9	25.3	0.8	
AREA=	142.0	41.8	89.6	4.4	
VEL=	6.8	3.6	4.2	2.7	
DEPTH=	2.8	1.5	2.0	1.2	

*[redacted]O 31.664
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

31.664	3.04	2383.64	2383.64	0.00	2384.53	0.89	4.67	0.10	2382.50
1500.0	338.6	1137.8	23.6	64.3	138.7	10.0	314.4	181.2	2382.70
2.37	5.26	8.20	2.37	0.044	0.035	0.044	0.000	2380.60	9929.12
0.013519	520.	520.	518.	20	15	0	0.00	128.39	10057.51

FLOW DISTRIBUTION FOR SECNO= 31.66 CWSEL= 2383.64

STA=	9929.	9932.	9952.	9972.	10036.	10058.
PER Q=	0.3	11.0	11.3	75.9	1.6	
AREA=	1.7	30.9	31.7	138.7	10.0	
VEL=	2.6	5.3	5.3	8.2	2.4	
DEPTH=	0.6	1.6	1.6	2.1	0.5	

*SECNO 31.761
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY

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

3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2392.40 ELREA= 2391.00

31.761	4.12	2391.02	2391.02	0.00	2391.71	0.69	6.28	0.02	2392.40
1500.0	0.0	937.1	562.9	0.0	132.4	95.7	317.0	182.9	2391.00
2.39	0.00	7.08	5.88	0.000	0.035	0.044	0.000	2386.90	9978.84
0.011121	520.	515.	505.	20	26	0	0.00	157.87	10136.71

FLOW DISTRIBUTION FOR SECNO= 31.76 CWSEL= 2391.02

STA=	9979.	10045.	10101.	10112.	10128.	10137.
PER Q=	62.5	1.1	6.3	26.1	4.0	
AREA=	132.4	12.6	18.4	51.5	13.1	
VEL=	7.1	1.3	5.1	7.6	4.6	
DEPTH=	2.0	0.2	1.8	3.1	1.6	

*SECNO 31.860
[redacted]INIMUM SPECIFIC ENERGY
3[redacted]RITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2397.70 ELREA= 2399.40

31.860	3.48	2397.98	2397.98	0.00	2398.86	0.89	6.42	0.06	2397.70
1500.0	105.8	1394.2	0.0	27.7	179.7	0.0	319.6	184.5	2399.40
2.41	3.82	7.76	0.00	0.044	0.035	0.000	0.000	2394.50	9927.20
0.013745	510.	520.	525.	3	15	0	0.00	120.85	10048.05

FLOW DISTRIBUTION FOR SECNO= 31.86 CWSEL= 2397.98

STA=	9927.	9932.	9956.	10054.
PER Q=	1.0	6.1	92.9	
AREA=	4.3	23.4	179.7	
VEL=	3.4	3.9	7.8	
DEPTH=	0.8	1.0	2.0	

*SECNO 31.963
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
31.963	3.76	2405.66	2405.66	0.00	2407.00	1.35	7.38	0.14	2410.60
1500.0	0.0	1500.0	0.0	0.0	161.0	0.0	321.9	185.7	2406.90
2.42	0.00	9.31	0.00	0.000	0.035	0.000	0.000	2401.90	9969.87
0.013398	510.	545.	510.	4	8	0	0.00	60.70	10030.57

FLOW DISTRIBUTION FOR SECNO= 31.96 CWSEL= 2405.66

STA= 9970. 10034.
PER Q= 100.0
AREA= 161.0
VEL= 9.3
DEPTH= 2.7

THIS RUN EXECUTED 30AUG93 13:32:21

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

UPRR-Nat.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	63.411	2213.60	4100.00	10.10	2.38	3.67	1.12	1648.20	2354.73	97.06	553.26	9634.32	10314.26
*	63.585	2220.45	3819.00	5.25	4.89	9.92	7.21	753.70	1304.23	1761.07	297.51	9766.99	10137.97
*	63.682	2230.90	4100.00	10.00	1.88	3.07	1.26	1018.63	1746.50	1334.87	655.40	9850.00	10505.40
	63.800	2233.95	4100.00	5.55	2.57	8.50	0.00	313.00	3787.00	0.00	296.98	9748.10	10045.09
*	63.866	2236.21	2400.00	5.41	0.00	8.88	6.67	0.00	1215.46	1184.54	142.65	9980.65	10123.30
*	63.884	2240.88	2400.00	9.88	1.65	1.90	1.79	1070.59	398.38	931.03	287.10	9830.00	10117.10
*	63.907	2240.86	2400.00	8.96	2.44	3.46	2.37	827.66	1342.22	230.12	240.00	9830.00	10070.00
*	63.945	2240.88	2400.00	7.88	3.30	5.37	2.97	366.28	1856.62	177.10	160.00	9910.00	10070.00
*	63.946	2242.94	2400.00	9.89	2.51	3.19	2.39	586.15	1467.50	346.35	160.00	9910.00	10070.00
	63.979	2243.05	2400.00	8.75	1.93	3.07	1.12	420.92	1333.00	646.09	396.20	9880.00	10276.20
*	64.084	2245.46	2400.00	7.16	5.29	9.50	1.09	432.93	1921.10	45.97	199.63	9925.00	10124.63
*	64.113	2247.01	2400.00	7.21	5.20	5.77	0.64	740.76	1634.64	24.61	260.96	9925.00	10185.96
*	64.137	2250.36	2400.00	9.06	0.76	7.97	2.54	10.01	1353.76	1036.23	486.08	9930.00	10416.08
	64.179	2251.67	2050.00	6.97	0.00	6.01	2.17	0.00	960.26	1089.74	438.06	9982.87	10420.93
*	64.366	2259.45	3300.00	7.65	0.00	11.28	2.75	0.00	3028.47	271.53	115.75	9961.40	10077.15
	64.461	2265.98	3300.00	10.28	0.00	9.82	0.00	0.00	3300.00	0.00	64.74	9973.19	10037.92
*	64.560	2273.61	3300.00	8.31	0.00	10.54	3.66	0.00	2437.74	862.26	177.80	9981.82	10159.62

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	64.677	2275.33	1000.00	7.13	0.25	0.80	0.42	7.42	776.81	215.77	324.40	9895.32	10280.76
*	64.789	2276.93	640.00	1.83	3.86	4.91	1.25	164.41	474.00	1.59	237.37	9856.04	10143.27
*	64.889	2284.76	640.00	3.46	0.86	4.89	1.98	0.24	621.50	18.26	74.73	9969.50	10044.23
*	64.989	2292.00	640.00	3.50	1.06	7.23	3.34	4.34	454.10	181.56	105.56	9961.76	10067.32
	65.089	2298.40	640.00	3.40	0.00	5.78	0.00	0.00	640.00	0.00	55.18	9965.58	10020.75
	65.175	2304.57	640.00	3.97	0.00	6.03	0.00	0.00	640.00	0.00	57.94	9955.89	10013.83
*	65.277	2310.25	640.00	3.15	0.00	4.46	0.00	0.00	640.00	0.00	70.91	9972.03	10042.94
*	65.381	2319.77	640.00	1.87	0.00	5.98	0.00	0.00	640.00	0.00	102.00	9978.29	10080.29
*	65.483	2328.33	640.00	2.33	3.86	5.41	1.93	241.56	361.30	37.14	142.86	9921.58	10064.45
*	65.573	2335.07	640.00	1.27	0.00	5.32	0.00	0.00	640.00	0.00	140.02	9970.09	10110.11
	65.671	2341.95	530.00	1.85	3.19	4.95	3.00	177.74	180.71	171.54	168.54	9927.08	10095.62
*	65.771	2348.54	530.00	1.44	0.00	5.22	2.94	0.00	368.03	161.97	183.32	9976.61	10162.46
	65.871	2355.95	530.00	0.95	2.67	3.93	1.52	194.79	309.55	25.66	336.89	9788.10	10125.00
*	65.972	2363.39	530.00	1.49	0.00	5.05	0.93	0.00	525.25	4.75	172.24	9969.92	10142.17
*	66.073	2372.30	530.00	1.70	3.79	5.63	1.29	263.43	258.25	8.32	187.35	9883.61	10070.96
*	66.181	2380.83	530.00	4.63	1.19	1.42	0.00	423.89	106.11	0.00	500.02	9439.78	10060.98
*	66.276	2388.84	530.00	2.14	0.00	5.95	0.00	0.00	530.00	0.00	83.31	9979.30	10062.61
	66.369	2396.60	530.00	1.20	0.00	3.65	2.57	0.00	362.64	167.36	291.73	9959.44	10251.18
	66.470	2403.14	530.00	2.94	0.00	6.82	0.00	0.00	530.00	0.00	48.43	9975.99	10024.42
*	66.567	2410.48	530.00	2.88	0.00	7.51	0.00	0.00	530.00	0.00	40.60	9975.70	10016.30
*	66.662	2415.99	530.00	1.39	0.00	3.81	0.00	0.00	530.00	0.00	128.55	9922.00	10050.55
*	66.766	2423.26	530.00	1.76	0.00	5.92	0.00	0.00	530.00	0.00	83.82	9937.34	10021.16
	66.866	2430.62	530.00	1.82	4.07	4.44	0.00	227.30	302.70	0.00	121.64	9906.52	10028.16
*	66.974	2438.27	530.00	1.87	0.05	5.99	1.76	0.01	527.70	2.29	87.69	9951.96	10065.11
*	-63.800	2233.95	4100.00	5.55	2.57	8.50	0.00	313.00	3787.00	0.00	296.98	9748.10	10045.09
*	90.093	2237.93	1450.00	3.13	3.80	4.02	1.04	40.75	1327.57	81.68	319.33	9944.97	10264.30

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	90.188	2243.09	1450.00	4.99	2.84	7.29	2.06	155.57	1102.19	192.24	215.76	9932.04	10147.80
*	90.203	2243.81	1450.00	5.71	0.00	4.03	1.51	0.00	1000.60	449.40	322.71	9962.29	10285.00
*	90.215	2246.65	1450.00	6.85	0.26	2.05	1.59	52.04	517.23	880.73	534.76	9735.24	10270.00
*	90.284	2248.30	1450.00	2.10	0.00	3.13	4.54	0.00	113.76	1336.24	279.65	9981.73	10261.38
*	90.381	2253.74	1450.00	3.14	4.49	8.12	4.08	605.54	276.80	567.66	405.16	9832.13	10237.30
*	90.476	2258.71	1450.00	1.41	1.42	1.78	2.01	557.22	29.66	863.11	1133.33	9298.71	10529.20
*	90.570	2263.43	1450.00	3.13	5.04	7.58	0.00	1206.41	243.59	0.00	282.45	9728.47	10010.92
*	90.667	2268.62	1450.00	4.52	2.64	6.15	2.74	263.63	1104.51	81.86	187.64	9878.27	10065.92
	90.760	2271.37	1450.00	4.17	2.12	6.67	0.00	163.12	1286.88	0.00	173.38	9860.87	10034.25
	90.840	2273.99	1450.00	5.39	0.00	8.30	0.00	0.00	1450.00	0.00	50.67	9980.65	10031.32
*	90.863	2279.07	1450.00	9.27	0.92	3.38	0.93	159.02	1261.42	29.56	225.93	9703.90	10046.00
	90.886	2279.17	1450.00	7.47	0.00	2.81	0.00	0.00	1450.00	0.00	105.10	9921.36	10026.46
	90.953	2279.45	1450.00	5.35	0.00	3.23	0.00	0.00	1450.00	0.00	180.05	9911.96	10092.01
*	91.045	2283.20	1450.00	4.50	4.20	8.94	0.00	802.02	647.98	0.00	175.09	9841.47	10016.55
*	91.134	2289.00	1450.00	4.40	2.59	7.42	2.74	251.17	680.21	518.62	349.07	9893.32	10252.31
*	91.235	2295.18	1250.00	3.78	3.28	8.08	2.58	511.44	459.50	279.05	302.52	9853.00	10155.52
	91.337	2300.31	1250.00	4.01	3.47	7.18	0.00	585.26	664.74	0.00	175.69	9818.16	10013.95
*	91.434	2306.16	1250.00	4.06	2.50	7.63	3.67	186.76	1038.88	24.37	187.45	9723.69	10029.54
*	91.530	2312.14	1200.00	3.14	0.00	7.96	0.00	0.00	1200.00	0.00	78.39	9933.03	10011.42
*	91.630	2317.96	1200.00	3.66	0.00	7.09	3.13	0.00	758.65	441.35	206.22	9970.93	10202.70
*	91.733	2323.02	1200.00	3.32	0.00	8.94	0.00	0.00	1200.00	0.00	55.12	9970.26	10025.38
*	91.831	2326.45	1200.00	5.65	0.00	6.90	0.00	0.00	1200.00	0.00	45.56	9974.99	10020.55
*	91.926	2330.24	1200.00	3.94	0.00	9.01	0.00	0.00	1200.00	0.00	54.29	9969.18	10023.47
*	92.026	2339.48	1200.00	4.68	4.27	8.67	0.00	356.85	843.15	0.00	100.84	9914.08	10014.92
	92.137	2348.63	850.00	4.93	0.00	7.66	2.70	0.00	689.00	161.00	103.49	9984.63	10088.12
*	92.240	2354.04	850.00	4.04	3.84	8.69	0.00	115.65	734.35	0.00	56.42	9959.59	10016.02

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	92.348	2362.24	850.00	4.14	0.00	8.38	0.00	0.00	850.00	0.00	47.75	9990.91	10038.66
	92.446	2370.46	850.00	4.35	3.21	8.68	0.00	29.68	820.32	0.00	49.42	9962.50	10011.92
*	92.545	2380.71	850.00	4.21	0.00	9.32	0.00	0.00	850.00	0.00	33.95	9980.56	10014.51
*	-64.560	2273.61	3300.00	8.31	0.00	10.54	3.66	0.00	2437.74	862.26	177.80	9981.82	10159.62
*	30.093	2275.41	1800.00	7.41	1.15	2.31	1.28	290.45	1324.37	185.18	184.35	9847.33	10070.00
*	30.191	2277.78	1800.00	3.08	4.35	8.14	1.63	804.17	984.16	11.67	214.07	9853.01	10075.68
	30.292	2285.51	1800.00	3.41	5.73	8.73	4.34	329.72	671.52	798.76	225.87	9958.15	10184.02
*	30.393	2293.62	1800.00	4.12	3.81	9.32	0.00	216.63	1583.37	0.00	100.73	9928.71	10029.44
	30.486	2299.28	1800.00	3.78	0.00	8.69	4.08	0.00	1680.09	119.91	107.42	9964.63	10072.05
*	30.584	2310.88	1800.00	4.58	3.95	9.21	0.00	170.48	1629.52	0.00	94.85	9940.87	10035.71
*	30.676	2316.78	1800.00	3.78	0.00	9.42	5.62	0.00	913.73	886.27	138.44	9981.30	10119.74
*	30.779	2324.38	1800.00	3.68	0.00	8.79	0.00	0.00	1800.00	0.00	85.62	9954.71	10040.33
	30.872	2330.06	1800.00	4.06	4.91	9.30	5.33	283.34	1023.90	492.75	131.63	9951.77	10083.39
*	30.967	2336.84	1800.00	3.14	0.00	9.20	5.99	0.00	951.27	848.73	124.01	9974.76	10098.77
	31.079	2344.58	1800.00	3.18	3.57	7.06	4.76	621.14	705.59	473.27	281.15	9756.63	10079.53
*	31.173	2350.81	1800.00	3.71	0.00	8.88	4.84	0.00	1478.39	321.61	126.19	9974.98	10133.63
	31.272	2356.13	1800.00	6.13	0.00	8.73	0.00	0.00	1800.00	0.00	61.91	9957.07	10018.98
	31.368	2361.42	1800.00	4.42	0.00	9.36	0.00	0.00	1800.00	0.00	69.62	9950.62	10020.24
*	31.465	2370.52	1500.00	3.12	0.00	8.71	0.00	0.00	1500.00	0.00	74.38	9950.29	10024.67
*	31.565	2376.06	1500.00	3.66	0.00	6.76	3.98	0.00	960.07	539.93	127.14	9977.20	10104.34
*	31.664	2383.64	1500.00	3.04	5.26	8.20	2.37	338.58	1137.84	23.58	128.39	9929.12	10057.51
*	31.761	2391.02	1500.00	4.12	0.00	7.08	5.88	0.00	937.13	562.87	157.87	9978.84	10136.71
*	31.860	2397.98	1500.00	3.48	3.82	7.76	0.00	105.77	1394.23	0.00	120.85	9927.20	10048.05
*	31.963	2405.66	1500.00	3.76	0.00	9.31	0.00	0.00	1500.00	0.00	60.70	9969.87	10030.57

[redacted]at.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	K*CHSL
*	63.411	2213.60	4100.00	0.00	553.26	9634.32	0.00	9951.20	10044.50	0.00	10314.26	0.00
*	63.585	2220.45	3819.00	920.00	297.51	9766.99	0.00	9983.30	10020.20	10488.00	10137.97	12.72
*	63.682	2230.90	4100.00	510.00	655.40	9850.00	9850.00	9969.60	10035.40	10627.00	10505.40	11.18
*	63.800	2233.95	4100.00	630.00	296.98	9748.10	0.00	9894.90	10084.10	0.00	10045.09	11.90
*	63.866	2236.21	2400.00	345.00	142.65	9980.65	0.00	9979.50	10016.30	0.00	10123.30	6.96
*	63.884	2240.88	2400.00	90.00	287.10	9830.00	9830.00	9986.50	10009.70	10117.10	10117.10	2.22
*	63.907	2240.86	2400.00	125.00	240.00	9830.00	9830.00	9976.90	10035.00	10070.00	10070.00	7.20
*	63.945	2240.88	2400.00	200.00	160.00	9910.00	9910.00	9970.60	10027.60	10070.00	10070.00	5.50
*	63.946	2242.94	2400.00	5.00	160.00	9910.00	9910.00	9970.60	10027.60	10070.00	10070.00	10.01
[redacted]	63.979	2243.05	2400.00	175.00	396.20	9880.00	9880.00	9971.60	10044.40	10276.20	10276.20	7.14
*	64.084	2245.46	2400.00	555.00	199.63	9925.00	9925.00	9974.50	10013.50	11397.00	10124.63	7.21
*	64.113	2247.01	2400.00	150.00	260.96	9925.00	9925.00	9975.70	10046.10	10571.00	10185.96	10.00
*	64.137	2250.36	2400.00	130.00	486.08	9930.00	9930.00	9991.40	10019.80	10641.50	10416.08	11.54
	64.179	2251.67	2050.00	220.00	438.06	9982.87	0.00	9982.80	10021.80	10535.00	10420.93	15.45
*	64.366	2259.45	3300.00	990.00	115.75	9961.40	9961.40	9961.40	10022.00	10504.40	10077.15	7.17
	64.461	2265.98	3300.00	500.00	64.74	9973.19	0.00	9962.00	10043.50	0.00	10037.92	7.80
*	64.560	2273.61	3300.00	535.00	177.80	9981.82	0.00	9979.00	10026.40	0.00	10159.62	17.94
*	64.677	2275.33	1000.00	605.00	324.40	9895.32	0.00	9911.20	10080.50	0.00	10280.76	4.79
*	64.789	2276.93	640.00	590.00	237.37	9856.04	0.00	9966.60	10132.30	0.00	10143.27	11.70
*	64.889	2284.76	640.00	530.00	74.73	9969.50	0.00	9970.70	10031.40	0.00	10044.23	11.70
*	64.989	2292.00	640.00	525.00	105.56	9961.76	0.00	9983.30	10012.40	10119.10	10067.32	13.71
	65.089	2298.40	640.00	530.00	55.18	9965.58	0.00	9949.90	10031.10	0.00	10020.75	12.26
[redacted]	65.175	2304.57	640.00	455.00	57.94	9955.89	0.00	9944.20	10023.70	0.00	10013.83	12.31
*	65.277	2310.25	640.00	535.00	70.91	9972.03	0.00	9960.70	10045.00	0.00	10042.94	12.15

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	K*CHSL
*	65.381	2319.77	640.00	550.00	102.00	9978.29	0.00	9945.30	10081.90	0.00	10080.29	19.64
*	65.483	2328.33	640.00	540.00	142.86	9921.58	0.00	9976.00	10018.20	0.00	10064.45	15.00
*	65.573	2335.07	640.00	475.00	140.02	9970.09	0.00	9890.30	10140.60	0.00	10110.11	16.42
	65.671	2341.95	530.00	520.00	168.54	9927.08	0.00	9992.60	10020.90	0.00	10095.62	12.12
*	65.771	2348.54	530.00	525.00	183.32	9976.61	9875.60	9970.70	10049.80	10190.40	10162.46	13.33
	65.871	2355.95	530.00	530.00	336.89	9788.10	9712.30	9935.50	10049.10	10390.90	10125.00	14.91
*	65.972	2363.39	530.00	530.00	172.24	9969.92	0.00	9968.30	10087.40	0.00	10142.17	13.02
*	66.073	2372.30	530.00	535.00	187.35	9883.61	9801.60	9984.20	10028.40	10112.90	10070.96	16.26
*	66.181	2380.83	530.00	570.00	500.02	9439.78	0.00	9981.10	10078.10	0.00	10060.98	9.82
*	66.276	2388.84	530.00	500.00	83.31	9979.30	0.00	9962.40	10084.10	0.00	10062.61	21.00
	66.369	2396.60	530.00	495.00	291.73	9959.44	0.00	9943.10	10118.20	0.00	10251.18	17.58
	66.470	2403.14	530.00	530.00	48.43	9975.99	0.00	9972.30	10030.90	0.00	10024.42	9.06
*	66.567	2410.48	530.00	515.00	40.60	9975.70	0.00	9971.50	10018.70	0.00	10016.30	14.37
*	66.662	2415.99	530.00	500.00	128.55	9922.00	0.00	9898.30	10072.40	0.00	10050.55	14.00
*	66.766	2423.26	530.00	550.00	83.82	9937.34	0.00	9896.40	10047.10	0.00	10021.16	12.55
	66.866	2430.62	530.00	530.00	121.64	9906.52	0.00	9956.60	10030.80	0.00	10028.16	13.77
*	66.974	2438.27	530.00	570.00	87.69	9951.96	0.00	9975.00	10059.60	0.00	10065.11	13.33
*	-63.800	2233.95	4100.00	0.00	296.98	9748.10	0.00	9894.90	10084.10	0.00	10045.09	0.00
*	90.093	2237.93	1450.00	490.00	319.33	9944.97	0.00	9955.10	10105.40	0.00	10264.30	13.06
*	90.188	2243.09	1450.00	500.00	215.76	9932.04	9500.00	9980.30	10018.10	10147.80	10147.80	6.60
*	90.203	2243.81	1450.00	80.00	322.71	9962.29	0.00	9961.00	10025.00	10285.00	10285.00	0.00
*	90.215	2246.65	1450.00	65.00	534.76	9735.24	0.00	9975.30	10028.70	10270.00	10270.00	26.15
*	90.284	2248.30	1450.00	365.00	279.65	9981.73	0.00	9980.00	10016.30	10289.70	10261.38	17.53
*	90.381	2253.74	1450.00	510.00	405.16	9832.13	9805.00	9990.90	10007.90	10237.30	10237.30	8.63
*	90.476	2258.71	1450.00	505.00	1133.33	9298.71	0.00	9991.90	10012.10	10537.50	10529.20	13.27
*	90.570	2263.43	1450.00	495.00	282.45	9728.47	0.00	9991.30	10014.30	0.00	10010.92	6.06

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	K*CHSL
*	90.667	2268.62	1450.00	510.00	187.64	9878.27	9771.00	9970.90	10037.50	10709.20	10065.92	7.45
	90.760	2271.37	1450.00	495.00	173.38	9860.87	0.00	9968.30	10035.30	0.00	10034.25	6.26
	90.840	2273.99	1450.00	420.00	50.67	9980.65	0.00	9958.80	10051.90	0.00	10031.32	3.33
*	90.863	2279.07	1450.00	120.00	225.93	9703.90	0.00	9974.80	10024.60	10058.50	10046.00	10.00
	90.886	2279.17	1450.00	125.00	105.10	9921.36	0.00	9898.30	10040.10	0.00	10026.46	15.20
*	90.953	2279.45	1450.00	350.00	180.05	9911.96	0.00	9888.40	10133.70	0.00	10092.01	6.86
*	91.045	2283.20	1450.00	490.00	175.09	9841.47	9836.10	9988.80	10017.30	10568.60	10016.55	9.39
*	91.134	2289.00	1450.00	470.00	349.07	9893.32	9845.00	9990.20	10021.90	10901.80	10252.31	12.55
*	91.235	2295.18	1250.00	530.00	302.52	9853.00	9853.00	9986.90	10008.40	10305.30	10155.52	12.83
	91.337	2300.31	1250.00	540.00	175.69	9818.16	0.00	9974.80	10022.60	0.00	10013.95	9.07
*	91.434	2306.16	1250.00	510.00	187.45	9723.69	0.00	9972.20	10022.40	10280.00	10029.54	11.37
*	91.530	2312.14	1200.00	510.00	78.39	9933.03	0.00	9924.90	10015.70	0.00	10011.42	13.53
	91.630	2317.96	1200.00	525.00	206.22	9970.93	0.00	9955.90	10019.70	0.00	10202.70	10.10
*	91.733	2323.02	1200.00	545.00	55.12	9970.26	0.00	9963.40	10025.60	0.00	10025.38	9.91
*	91.831	2326.45	1200.00	520.00	45.56	9974.99	0.00	9968.10	10042.20	0.00	10020.55	2.12
*	91.926	2330.24	1200.00	500.00	54.29	9969.18	0.00	9912.60	10067.80	0.00	10023.47	11.00
*	92.026	2339.48	1200.00	525.00	100.84	9914.08	0.00	9982.80	10044.20	0.00	10014.92	16.19
*	92.137	2348.63	850.00	590.00	103.49	9984.63	0.00	9976.00	10012.00	10160.80	10088.12	15.08
*	92.240	2354.04	850.00	540.00	56.42	9959.59	0.00	9988.80	10043.80	0.00	10016.02	11.67
*	92.348	2362.24	850.00	570.00	47.75	9990.91	0.00	9987.70	10058.80	0.00	10038.66	14.21
	92.446	2370.46	850.00	520.00	49.42	9962.50	0.00	9975.20	10025.60	0.00	10011.92	15.38
*	92.545	2380.71	850.00	525.00	33.95	9980.56	0.00	9960.80	10038.70	0.00	10014.51	19.81
*	-64.560	2273.61	3300.00	0.00	177.80	9981.82	0.00	9979.00	10026.40	0.00	10159.62	0.00
*	30.093	2275.41	1800.00	490.00	184.35	9847.33	0.00	9961.10	10041.70	0.00	10070.00	5.51
	30.191	2277.78	1800.00	520.00	214.07	9853.01	0.00	9982.80	10049.50	0.00	10075.68	12.88
	30.292	2285.51	1800.00	530.00	225.87	9958.15	0.00	9987.90	10018.40	0.00	10184.02	13.96

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	K*CHSL
*	30.393	2293.62	1800.00	535.00	100.73	9928.71	0.00	9978.70	10045.60	0.00	10029.44	13.83
	30.486	2299.28	1800.00	490.00	107.42	9964.63	0.00	9953.10	10045.10	0.00	10072.05	12.24
*	30.584	2310.88	1800.00	520.00	94.85	9940.87	9880.00	9978.20	10044.30	10090.60	10035.71	20.77
*	30.676	2316.78	1800.00	485.00	138.44	9981.30	0.00	9976.60	10016.70	0.00	10119.74	13.81
*	30.779	2324.38	1800.00	545.00	85.62	9954.71	0.00	9926.00	10071.80	0.00	10040.33	14.13
	30.872	2330.06	1800.00	490.00	131.63	9951.77	9942.00	9986.90	10024.10	10541.00	10083.39	10.82
*	30.967	2336.84	1800.00	500.00	124.01	9974.76	0.00	9969.60	10018.70	0.00	10098.77	15.40
	31.079	2344.58	1800.00	590.00	281.15	9756.63	0.00	9970.00	10015.90	10087.00	10079.53	13.05
*	31.173	2350.81	1800.00	500.00	126.19	9974.98	0.00	9972.80	10031.10	0.00	10133.63	11.40
	31.272	2356.13	1800.00	520.00	61.91	9957.07	0.00	9946.70	10029.70	0.00	10018.98	5.58
	31.368	2361.42	1800.00	510.00	69.62	9950.62	0.00	9941.00	10030.60	0.00	10020.24	13.73
*	31.465	2370.52	1500.00	510.00	74.38	9950.29	0.00	9937.60	10029.90	0.00	10024.67	20.39
*	31.565	2376.06	1500.00	530.00	127.14	9977.20	0.00	9970.70	10027.20	0.00	10104.34	9.43
*	31.664	2383.64	1500.00	520.00	128.39	9929.12	0.00	9971.60	10036.20	0.00	10057.51	15.77
*	31.761	2391.02	1500.00	515.00	157.87	9978.84	0.00	9974.30	10044.80	0.00	10136.71	12.23
*	31.860	2397.98	1500.00	520.00	120.85	9927.20	0.00	9956.20	10054.00	0.00	10048.05	14.62
*	31.963	2405.66	1500.00	545.00	60.70	9969.87	0.00	9952.60	10033.50	0.00	10030.57	13.58

[redacted]at.hc2

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	63.884	2242.06	2236.00	2258.57	2237.10	1102.69	1304.38	30.00	0.26	9.88	2240.88	1.90	2240.93
*	63.946	2241.26	2238.00	2245.06	2240.40	1740.08	660.50	30.00	0.00	9.89	2242.94	3.19	2243.08
*	90.215	2245.46	2242.60	2249.48	2244.50	1034.41	422.29	30.00	0.00	6.85	2246.65	2.05	2246.69
*	90.863	2275.80	2274.70	2282.40	2278.70	1143.72	316.56	30.00	0.00	9.27	2279.07	3.38	2279.22

[redacted]lat.hc2

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	63.411	0.00	0.00	0.00	2203.50	4100.00	2213.60	0.00	2213.76	9.67	3.67	1420.46	1318.19
*	63.585	920.00	0.00	0.00	2215.20	3819.00	2220.45	2220.45	2221.42	54.32	9.92	529.84	518.14
*	63.682	510.00	0.00	0.00	2220.90	4100.00	2230.90	0.00	2230.98	1.55	3.07	2169.10	3291.77
*	63.800	630.00	0.00	0.00	2228.40	4100.00	2233.95	2233.95	2234.99	60.50	8.50	567.53	527.13
*	63.866	345.00	0.00	0.00	2230.80	2400.00	2236.21	0.00	2237.17	66.31	8.88	314.48	294.73
*	63.884	90.00	2237.10	2236.00	2231.00	2400.00	2240.88	0.00	2240.93	1.19	1.90	1377.49	2203.58
*	63.907	125.00	0.00	0.00	2231.90	2400.00	2240.86	0.00	2241.00	4.54	3.46	824.50	1125.98
*	63.945	200.00	0.00	0.00	2233.00	2400.00	2240.88	0.00	2241.26	12.57	5.37	516.21	676.84
*	63.946	5.00	2240.40	2238.00	2233.05	2400.00	2242.94	0.00	2243.08	3.02	3.19	838.67	1381.82
	63.979	175.00	0.00	0.00	2234.30	2400.00	2243.05	0.00	2243.15	4.98	3.07	1229.25	1075.48
*	64.084	555.00	0.00	0.00	2238.30	2400.00	2245.46	2245.46	2246.66	60.50	9.50	326.42	308.56
*	64.113	150.00	0.00	0.00	2239.80	2400.00	2247.01	0.00	2247.50	29.80	5.77	464.43	439.67
*	64.137	130.00	0.00	0.00	2241.30	2400.00	2250.36	2250.36	2250.96	73.31	7.97	590.78	280.31
	64.179	220.00	0.00	0.00	2244.70	2050.00	2251.67	0.00	2251.97	31.08	6.01	660.90	367.72
*	64.366	990.00	0.00	0.00	2251.80	3300.00	2259.45	2259.45	2261.27	137.97	11.28	367.33	280.95
	64.461	500.00	0.00	0.00	2255.70	3300.00	2265.98	0.00	2267.48	111.37	9.82	335.97	312.70
*	64.560	535.00	0.00	0.00	2265.30	3300.00	2273.61	2273.61	2274.94	62.28	10.54	466.85	418.16
*	64.677	605.00	0.00	0.00	2268.20	1000.00	2275.33	0.00	2275.34	0.39	0.80	1509.51	1606.37
*	64.789	590.00	0.00	0.00	2275.10	640.00	2276.93	2276.93	2277.27	378.32	4.91	140.44	32.90
*	64.889	530.00	0.00	0.00	2281.30	640.00	2284.76	0.00	2285.12	78.81	4.89	136.61	72.09
*	64.989	525.00	0.00	0.00	2288.50	640.00	2292.00	2292.00	2292.63	112.57	7.23	121.18	60.32
	65.089	530.00	0.00	0.00	2295.00	640.00	2298.40	0.00	2298.92	122.37	5.78	110.78	57.86
	65.175	455.00	0.00	0.00	2300.60	640.00	2304.57	0.00	2305.13	152.58	6.03	106.05	51.81
*	65.277	535.00	0.00	0.00	2307.10	640.00	2310.25	0.00	2310.56	71.72	4.46	143.55	75.57

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	65.381	550.00	0.00	0.00	2317.90	640.00	2319.77	2319.77	2320.32	231.05	5.98	107.09	42.10
*	65.483	540.00	0.00	0.00	2326.00	640.00	2328.33	0.00	2328.68	109.53	5.41	148.68	61.15
*	65.573	475.00	0.00	0.00	2333.80	640.00	2335.07	2335.07	2335.51	181.06	5.32	120.39	47.56
	65.671	520.00	0.00	0.00	2340.10	530.00	2341.95	0.00	2342.17	91.78	4.95	149.40	55.32
*	65.771	525.00	0.00	0.00	2347.10	530.00	2348.54	2348.54	2348.87	147.97	5.22	125.68	43.57
	65.871	530.00	0.00	0.00	2355.00	530.00	2355.95	0.00	2356.13	131.30	3.93	168.64	46.25
*	65.972	530.00	0.00	0.00	2361.90	530.00	2363.39	2363.39	2363.78	156.91	5.05	109.17	42.31
*	66.073	535.00	0.00	0.00	2370.60	530.00	2372.30	2372.30	2372.65	158.24	5.63	121.74	42.13
*	66.181	570.00	0.00	0.00	2376.20	530.00	2380.83	2380.83	2380.85	11.92	1.42	431.79	153.52
*	66.276	500.00	0.00	0.00	2386.70	530.00	2388.84	2388.84	2389.39	169.88	5.95	89.10	40.66
	66.369	495.00	0.00	0.00	2395.40	530.00	2396.60	0.00	2396.78	130.49	3.65	164.35	46.40
	66.470	530.00	0.00	0.00	2400.20	530.00	2403.14	0.00	2403.87	131.25	6.82	77.66	46.26
*	66.567	515.00	0.00	0.00	2407.60	530.00	2410.48	2410.48	2411.35	143.37	7.51	70.61	44.26
*	66.662	500.00	0.00	0.00	2414.60	530.00	2415.99	0.00	2416.22	68.74	3.81	138.95	63.93
*	66.766	550.00	0.00	0.00	2421.50	530.00	2423.26	2423.26	2423.80	168.81	5.92	89.49	40.79
	66.866	530.00	0.00	0.00	2428.80	530.00	2430.62	0.00	2430.91	110.04	4.44	124.01	50.52
*	66.974	570.00	0.00	0.00	2436.40	530.00	2438.27	2438.27	2438.83	162.84	5.99	89.53	41.53
*	-63.800	0.00	0.00	0.00	2228.40	4100.00	2233.95	2233.92	2234.99	60.50	8.50	567.53	527.13
*	90.093	490.00	0.00	0.00	2234.80	1450.00	2237.93	0.00	2238.16	71.83	4.02	419.87	171.09
*	90.188	500.00	0.00	0.00	2238.10	1450.00	2243.09	2243.09	2243.74	28.82	7.29	299.27	270.08
*	90.203	80.00	0.00	0.00	2238.10	1450.00	2243.81	0.00	2243.99	8.83	4.03	546.60	487.83
*	90.215	65.00	2244.50	2242.60	2239.80	1450.00	2246.65	0.00	2246.69	2.37	2.05	1009.71	941.87
*	90.284	365.00	0.00	0.00	2246.20	1450.00	2248.30	2248.30	2248.61	45.69	3.13	330.72	214.51
*	90.381	510.00	0.00	0.00	2250.60	1450.00	2253.74	2253.74	2254.17	320.87	8.12	308.18	80.95
*	90.476	505.00	0.00	0.00	2257.30	1450.00	2258.71	2258.62	2258.76	29.63	1.78	838.16	266.38
*	90.570	495.00	0.00	0.00	2260.30	1450.00	2263.43	2263.43	2263.91	228.29	7.58	271.35	95.97

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	90.667	510.00	0.00	0.00	2264.10	1450.00	2268.62	0.00	2269.10	56.51	6.15	309.44	192.89
	90.760	495.00	0.00	0.00	2267.20	1450.00	2271.37	0.00	2272.00	59.75	6.67	270.07	187.58
	90.840	420.00	0.00	0.00	2268.60	1450.00	2273.99	0.00	2275.06	76.67	8.30	174.71	165.60
*	90.863	120.00	2278.70	2274.70	2269.80	1450.00	2279.07	0.00	2279.22	4.76	3.38	577.41	664.82
	90.886	125.00	0.00	0.00	2271.70	1450.00	2279.17	0.00	2279.29	5.38	2.81	516.16	625.01
*	90.953	350.00	0.00	0.00	2274.10	1450.00	2279.45	0.00	2279.61	17.35	3.23	448.46	348.10
*	91.045	490.00	0.00	0.00	2278.70	1450.00	2283.20	2283.20	2283.90	128.80	8.94	263.29	127.77
*	91.134	470.00	0.00	0.00	2284.60	1450.00	2289.00	2289.00	2289.46	75.90	7.42	377.65	166.44
*	91.235	530.00	0.00	0.00	2291.40	1250.00	2295.18	2295.18	2295.65	102.38	8.08	321.13	123.54
	91.337	540.00	0.00	0.00	2296.30	1250.00	2300.31	0.00	2300.82	93.13	7.18	261.42	129.53
*	91.434	510.00	0.00	0.00	2302.10	1250.00	2306.16	2306.16	2306.93	86.09	7.63	217.41	134.72
*	91.530	510.00	0.00	0.00	2309.00	1200.00	2312.14	2312.14	2313.12	149.04	7.96	150.69	98.29
	91.630	525.00	0.00	0.00	2314.30	1200.00	2317.96	0.00	2318.51	72.92	7.09	247.95	140.52
*	91.733	545.00	0.00	0.00	2319.70	1200.00	2323.02	2323.02	2324.26	101.35	8.94	134.28	119.20
*	91.831	520.00	0.00	0.00	2320.80	1200.00	2326.45	0.00	2327.19	34.78	6.90	173.81	203.48
*	91.926	500.00	0.00	0.00	2326.30	1200.00	2330.24	2330.24	2331.50	164.93	9.01	133.26	93.44
*	92.026	525.00	0.00	0.00	2334.80	1200.00	2339.48	2339.48	2340.39	117.83	8.67	180.90	110.55
*	92.137	590.00	0.00	0.00	2343.70	850.00	2348.63	2348.63	2349.39	86.37	7.66	149.58	91.46
*	92.240	540.00	0.00	0.00	2350.00	850.00	2354.04	2354.04	2355.08	118.64	8.69	114.67	78.04
*	92.348	570.00	0.00	0.00	2358.10	850.00	2362.24	2362.24	2363.33	173.26	8.38	101.49	64.58
	92.446	520.00	0.00	0.00	2366.10	850.00	2370.46	2370.44	2371.59	145.69	8.68	103.80	70.42
*	92.545	525.00	0.00	0.00	2376.50	850.00	2380.71	2380.71	2382.06	160.39	9.32	91.25	67.12
*	-64.560	0.00	0.00	0.00	2265.30	3300.00	2273.61	2273.58	2274.94	62.28	10.54	466.85	418.16
*	30.093	490.00	0.00	0.00	2268.00	1800.00	2275.41	0.00	2275.48	1.81	2.31	970.69	1338.52
*	30.191	520.00	0.00	0.00	2274.70	1800.00	2277.78	2277.78	2278.47	182.99	8.14	312.98	133.06
	30.292	530.00	0.00	0.00	2282.10	1800.00	2285.51	2285.51	2286.18	124.06	8.73	318.35	161.61

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	30.393	535.00	0.00	0.00	2289.50	1800.00	2293.62	2293.62	2294.83	98.77	9.32	226.64	181.12
	30.486	490.00	0.00	0.00	2295.50	1800.00	2299.28	2299.28	2300.39	131.31	8.69	222.64	157.08
*	30.584	520.00	0.00	0.00	2306.30	1800.00	2310.88	2310.88	2312.10	94.84	9.21	220.08	184.83
*	30.676	485.00	0.00	0.00	2313.00	1800.00	2316.78	2316.78	2317.73	118.17	9.42	254.69	165.59
*	30.779	545.00	0.00	0.00	2320.70	1800.00	2324.38	2324.38	2325.58	120.74	8.79	204.69	163.81
	30.872	490.00	0.00	0.00	2326.00	1800.00	2330.06	2330.02	2331.00	101.66	9.30	260.21	178.52
*	30.967	500.00	0.00	0.00	2333.70	1800.00	2336.84	2336.84	2337.79	135.06	9.20	245.02	154.89
	31.079	590.00	0.00	0.00	2341.40	1800.00	2344.58	0.00	2345.04	114.09	7.06	373.27	168.52
*	31.173	500.00	0.00	0.00	2347.10	1800.00	2350.81	2350.81	2351.88	122.60	8.88	232.85	162.57
	31.272	520.00	0.00	0.00	2350.00	1800.00	2356.13	0.00	2357.31	89.06	8.73	206.08	190.73
	31.368	510.00	0.00	0.00	2357.00	1800.00	2361.42	2361.38	2362.78	128.59	9.36	192.35	158.73
*	31.465	510.00	0.00	0.00	2367.40	1500.00	2370.52	2370.52	2371.70	139.30	8.71	172.17	127.09
	31.565	530.00	0.00	0.00	2372.40	1500.00	2376.06	0.00	2376.60	64.12	6.76	277.81	187.33
*	31.664	520.00	0.00	0.00	2380.60	1500.00	2383.64	2383.64	2384.53	135.19	8.20	213.01	129.01
*	31.761	515.00	0.00	0.00	2386.90	1500.00	2391.02	2391.02	2391.71	111.21	7.08	228.08	142.24
*	31.860	520.00	0.00	0.00	2394.50	1500.00	2397.98	2397.98	2398.86	137.45	7.76	207.35	127.95
*	31.963	545.00	0.00	0.00	2401.90	1500.00	2405.66	2405.66	2407.00	133.98	9.31	161.05	129.59

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SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	63.411	4100.00	2213.60	0.00	0.00	0.00	553.26	0.00
*	63.585	3819.00	2220.45	0.00	6.85	0.00	297.51	920.00
*	63.682	4100.00	2230.90	0.00	10.45	0.00	655.40	510.00
*	63.800	4100.00	2233.95	0.00	3.05	0.00	296.98	630.00
*	63.866	2400.00	2236.21	0.00	2.26	0.00	142.65	345.00
*	63.884	2400.00	2240.88	0.00	4.67	0.00	287.10	90.00
*	63.907	2400.00	2240.86	0.00	-0.02	0.00	240.00	125.00
*	63.945	2400.00	2240.88	0.00	0.02	0.00	160.00	200.00
*	63.946	2400.00	2242.94	0.00	2.06	0.00	160.00	5.00
	63.979	2400.00	2243.05	0.00	0.11	0.00	396.20	175.00
*	64.084	2400.00	2245.46	0.00	2.41	0.00	199.63	555.00
*	64.113	2400.00	2247.01	0.00	1.55	0.00	260.96	150.00
*	64.137	2400.00	2250.36	0.00	3.35	0.00	486.08	130.00
	64.179	2050.00	2251.67	0.00	1.31	0.00	438.06	220.00
*	64.366	3300.00	2259.45	0.00	7.78	0.00	115.75	990.00
	64.461	3300.00	2265.98	0.00	6.54	0.00	64.74	500.00
*	64.560	3300.00	2273.61	0.00	7.63	0.00	177.80	535.00
*	64.677	1000.00	2275.33	0.00	1.72	0.00	324.40	605.00
*	64.789	640.00	2276.93	0.00	1.60	0.00	237.37	590.00
*	64.889	640.00	2284.76	0.00	7.83	0.00	74.73	530.00
*	64.989	640.00	2292.00	0.00	7.24	0.00	105.56	525.00
	65.089	640.00	2298.40	0.00	6.40	0.00	55.18	530.00
	65.175	640.00	2304.57	0.00	6.17	0.00	57.94	455.00
*	65.277	640.00	2310.25	0.00	5.68	0.00	70.91	535.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	65.381	640.00	2319.77	0.00	9.52	0.00	102.00	550.00
*	65.483	640.00	2328.33	0.00	8.57	0.00	142.86	540.00
*	65.573	640.00	2335.07	0.00	6.73	0.00	140.02	475.00
	65.671	530.00	2341.95	0.00	6.88	0.00	168.54	520.00
*	65.771	530.00	2348.54	0.00	6.59	0.00	183.32	525.00
	65.871	530.00	2355.95	0.00	7.41	0.00	336.89	530.00
*	65.972	530.00	2363.39	0.00	7.44	0.00	172.24	530.00
*	66.073	530.00	2372.30	0.00	8.92	0.00	187.35	535.00
*	66.181	530.00	2380.83	0.00	8.53	0.00	500.02	570.00
*	66.276	530.00	2388.84	0.00	8.01	0.00	83.31	500.00
	66.369	530.00	2396.60	0.00	7.76	0.00	291.73	495.00
	66.470	530.00	2403.14	0.00	6.54	0.00	48.43	530.00
*	66.567	530.00	2410.48	0.00	7.33	0.00	40.60	515.00
*	66.662	530.00	2415.99	0.00	5.51	0.00	128.55	500.00
*	66.766	530.00	2423.26	0.00	7.26	0.00	83.82	550.00
	66.866	530.00	2430.62	0.00	7.37	0.00	121.64	530.00
*	66.974	530.00	2438.27	0.00	7.65	0.00	87.69	570.00
*	-63.800	4100.00	2233.95	0.00	-204.32	0.00	296.98	0.00
*	90.093	1450.00	2237.93	0.00	3.98	0.00	319.33	490.00
*	90.188	1450.00	2243.09	0.00	5.16	0.00	215.76	500.00
*	90.203	1450.00	2243.81	0.00	0.72	0.00	322.71	80.00
*	90.215	1450.00	2246.65	0.00	2.84	0.00	534.76	65.00
*	90.284	1450.00	2248.30	0.00	1.66	0.00	279.65	365.00
*	90.381	1450.00	2253.74	0.00	5.44	0.00	405.16	510.00
*	90.476	1450.00	2258.71	0.00	4.97	0.00	1133.33	505.00
*	90.570	1450.00	2263.43	0.00	4.72	0.00	282.45	495.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	90.667	1450.00	2268.62	0.00	5.19	0.00	187.64	510.00
	90.760	1450.00	2271.37	0.00	2.75	0.00	173.38	495.00
	90.840	1450.00	2273.99	0.00	2.61	0.00	50.67	420.00
*	90.863	1450.00	2279.07	0.00	5.08	0.00	225.93	120.00
	90.886	1450.00	2279.17	0.00	0.10	0.00	105.10	125.00
*	90.953	1450.00	2279.45	0.00	0.28	0.00	180.05	350.00
*	91.045	1450.00	2283.20	0.00	3.75	0.00	175.09	490.00
*	91.134	1450.00	2289.00	0.00	5.80	0.00	349.07	470.00
*	91.235	1250.00	2295.18	0.00	6.18	0.00	302.52	530.00
	91.337	1250.00	2300.31	0.00	5.13	0.00	175.69	540.00
*	91.434	1250.00	2306.16	0.00	5.85	0.00	187.45	510.00
*	91.530	1200.00	2312.14	0.00	5.98	0.00	78.39	510.00
*	91.630	1200.00	2317.96	0.00	5.83	0.00	206.22	525.00
*	91.733	1200.00	2323.02	0.00	5.06	0.00	55.12	545.00
*	91.831	1200.00	2326.45	0.00	3.43	0.00	45.56	520.00
*	91.926	1200.00	2330.24	0.00	3.79	0.00	54.29	500.00
*	92.026	1200.00	2339.48	0.00	9.25	0.00	100.84	525.00
*	92.137	850.00	2348.63	0.00	9.14	0.00	103.49	590.00
*	92.240	850.00	2354.04	0.00	5.41	0.00	56.42	540.00
*	92.348	850.00	2362.24	0.00	8.20	0.00	47.75	570.00
	92.446	850.00	2370.46	0.00	8.22	0.00	49.42	520.00
*	92.545	850.00	2380.71	0.00	10.26	0.00	33.95	525.00
*	-64.560	3300.00	2273.61	0.00	-107.10	0.00	177.80	0.00
*	30.093	1800.00	2275.41	0.00	1.80	0.00	184.35	490.00
*	30.191	1800.00	2277.78	0.00	2.37	0.00	214.07	520.00
	30.292	1800.00	2285.51	0.00	7.73	0.00	225.87	530.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	30.393	1800.00	2293.62	0.00	8.10	0.00	100.73	535.00
	30.486	1800.00	2299.28	0.00	5.66	0.00	107.42	490.00
*	30.584	1800.00	2310.88	0.00	11.60	0.00	94.85	520.00
*	30.676	1800.00	2316.78	0.00	5.90	0.00	138.44	485.00
*	30.779	1800.00	2324.38	0.00	7.59	0.00	85.62	545.00
	30.872	1800.00	2330.06	0.00	5.68	0.00	131.63	490.00
*	30.967	1800.00	2336.84	0.00	6.78	0.00	124.01	500.00
	31.079	1800.00	2344.58	0.00	7.74	0.00	281.15	590.00
*	31.173	1800.00	2350.81	0.00	6.23	0.00	126.19	500.00
	31.272	1800.00	2356.13	0.00	5.32	0.00	61.91	520.00
	31.368	1800.00	2361.42	0.00	5.29	0.00	69.62	510.00
*	31.465	1500.00	2370.52	0.00	9.10	0.00	74.38	510.00
	31.565	1500.00	2376.06	0.00	5.54	0.00	127.14	530.00
*	31.664	1500.00	2383.64	0.00	7.58	0.00	128.39	520.00
*	31.761	1500.00	2391.02	0.00	7.39	0.00	157.87	515.00
*	31.860	1500.00	2397.98	0.00	6.96	0.00	120.85	520.00
*	31.963	1500.00	2405.66	0.00	7.68	0.00	60.70	545.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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NOTE     SECNO=     63.411  PROFILE=  1  WSEL BASED ON X5 CARD

CAUTION  SECNO=     63.585  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     63.585  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     63.585  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

NOTE     SECNO=     63.682  PROFILE=  1  WSEL BASED ON X5 CARD
WARNING  SECNO=     63.682  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION  SECNO=     63.800  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     63.800  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     63.800  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING  SECNO=     63.866  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=     63.884  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=     63.907  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=     63.945  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

W[redacted]G SECNO=     63.946  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION  SECNO=     64.084  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     64.084  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     64.084  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING  SECNO=     64.113  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION  SECNO=     64.137  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     64.137  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     64.137  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=     64.366  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     64.366  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=     64.560  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     64.560  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING  SECNO=     64.677  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION  SECNO=     64.789  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     64.789  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     64.789  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

W[redacted]G SECNO=     64.889  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

C[redacted]ON SECNO=     64.989  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     64.989  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING  SECNO=     65.277  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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CAUTION SECNO= 65.381 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 65.381 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 65.483 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 65.573 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 65.573 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 65.771 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 65.771 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 65.972 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 65.972 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 66.073 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 66.073 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 66.181 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 66.181 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 66.276 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 66.276 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 66.276 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 66.567 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 66.567 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 66.662 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 66.766 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 66.766 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 66.766 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 66.974 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 66.974 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= -63.800 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 90.093 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 90.188 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.188 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 90.203 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 90.215 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 90.215 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 90.284 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.284 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 90.284 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 90.381 PROFILE= 1 CRITICAL DEPTH ASSUMED

[redacted]ON SECNO= 90.381 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CA[redacted]ON SECNO= 90.381 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 90.476 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 90.476 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 90.570 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.570 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 90.570 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 90.667 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 90.863 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 90.953 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 91.045 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.045 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 91.045 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 91.134 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.134 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 91.235 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.235 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted]ON SECNO= 91.434 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.434 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 91.530 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.530 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 91.630 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 91.733 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.733 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 91.831 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 91.926 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.926 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 92.026 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 92.026 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 92.137 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 92.137 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 92.240 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 92.240 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted]ON SECNO= 92.348 PROFILE= 1 CRITICAL DEPTH ASSUMED
C[redacted]ON SECNO= 92.348 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 92.545 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 92.545 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= -64.560 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 30.093 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 30.191 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.191 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 30.191 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 30.393 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.393 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.584 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.584 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.676 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.676 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.779 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.779 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.967 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.967 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 31.173 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.173 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 31.465 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.465 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 31.565 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 31.664 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.664 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 31.664 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 31.761 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.761 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 31.761 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 31.860 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.860 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 31.963 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.963 PROFILE= 1 MINIMUM SPECIFIC ENERGY

EXHIBIT 6-3

HEC - 2 ENCROACHMENT FILES

FLAM-ENC.hc2

- Flamingo Wash to I-15
- Floodway run

HEC2 S/N: 1916530021 HMVersion: 6.50 Data File: flam-enc.hc2

```
*******************************************
*  [redacted]-2 WATER SURFACE PROFILES     *
*                                          *
*  Version   4.6.2;  May 1991              *
*                                          *
*  RUN DATE    30AUG93    TIME   16:58:18  *
*******************************************
```

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

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

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

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

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

THIS RUN EXECUTED 30AUG93 16:58:18

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

TROPICANA WASH FLOOD INSURANCE STUDY

by CH2M Hill, 1992 RDD33832

Notes:
-discharges were based on those in the "Las Vegas Valley Flood Insurance Study Hydrology Report" by James M. Montgomery, Inc., September, 1991 (see CH2M Hill memo dated July 13, 1992)

-Manning's "n" values were estimated by field observations of channels and floodplains in conjunction with methods recommended in "Open Channel Hydraulics" by Chow, 1959
-"n" values of 0.10 in NC cards were used to reflect the existence of buildings with landscaping
-"n" values of .999 in NH cards were used to block out large, individual buildings

-stations and elevations obtained from 400 scale topo created by CH2M Hill from aerial photographs

At I15, (the upstream end of this run), 5100 cfs approaches the box culvert under this road. The F.H.W.A. culvert analysis program, HY-8 was used to calculate the amount of water that ends up flowing through the culvert, which was 3324 cfs. This is the discharge until section 60.887 where water from Airport Wash increases the flow to 5300 cfs.
At Paradise Road, section 60.705, there is a large box culvert. HY-8 was used to calculate the flow into the culvert and the amount that overtopped the road. Of the 5300 cfs, 3430 went into the culvert while 1870 went over the road. The portion that overtops travels down both a driveway and a parking lot and recombines with the 3430 cfs at the outlet of the culvert at section 60.491.

```
T1   CCRFCD  TROPICANA WASH F.I.S.;   RDD33832
T2   Main Tropicana Wash, Detailed Methods
T3      Flam-Enc.HC2            From Flamingo Wash to B.C. w/encroachments


J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

              2                             0         0                             2001.08

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1         0        -1         0         0                   0         0         0
```

VARIABLE CODES FOR SUMMARY PRINTOUT

38 1 43 8 55 26 56 13 14 15
4 53 54
38 1 43 39 4 53 27 21 22 28
54
100 200

Q=4797.3 cfs estimated from a previous run (FLAM-NAT.HC2) where a split-flow analysis was performed at Flamingo Rd. to estimate the amount of flow downstream of the road after some flow was lost when the road was overtopped.

```
QT       4    4797.3    4797.3    4797.3    4797.3

  Begin run at confluence of Flamingo Wash and Tropicana Wash

NC    .048      .048      .080       0.1       0.3

ET                         6.1                          9912     10024

X1  60.000        13    9878.2   10040.0         0         0         0
GR  2012.4    9727.7    2011.0    9797.6    2011.3    9878.2    2001.1    9915.5    2000.3    9927.1
GR  1992.7    9944.2    1992.7    9965.4    1993.7    9980.6    1990.3   10000.0    2009.6   10040.0
GR  2010.6   10083.8    2014.4   10209.2    2015.1   10342.3

NC    .048      .048      .095

ET                         6.1                          9919.2   10053.2
X1  60.080        13    9919.2   10053.2       470       400       420
X3      10
GR  2023.9    9717.8    2021.9    9882.0    2020.1    9919.2    2008.7    9951.9    2007.4    9973.3
GR  2004.6    9982.4    2003.7   10000.0    2017.6   10053.2    2015.6   10146.3    2014.7   10256.7
GR  2017.2   10400.6    2018.9   10407.5    2019.7   10468.3


NC     .02       .02       .062       0.3       0.5

ET                         6.1                          9959     10042
X1  60.135        10    9959.3   10041.9       305       295       295
X3      10
GR  2029.6    9680.1    2028.2    9762.3    2024.9    9842.6    2022.8    9959.3    2014.7    9976.9
GR  2013.9   10000.0    2013.9   10020.0    2021.5   10040.8    2021.8   10041.9    2021.2   10227.6
```

[redacted]culvert for Tropicana Wash under Flamingo Rd.

```
SB    1.05      1.6       2.7         0       37.4       1.4       180         0     2014.3     2013.9

NC    .025      .025      .032

  Following Q is the flow upstream of Flamingo Road where the split-flow occurs

QT       4      5300      5300      5300      5300
ET             4.1       6.1    9625.0   10379.7    9968.8   10047.6
X1  60.171        20    9968.8   10047.6       160       229       185
X2                          1    2019.3    2022.8
X3      10
BT      -4      9750    2025.0              10083    2022.7              10132.9    2022.9
BT           10327.3    2021.7
GR  2026.6    9387.9    2030.0    9488.2    2030.3    9624.5    2029.4    9667.2    2024.5    9794.4
GR  2023.6    9873.0    2022.7    9941.5    2022.1    9967.8    2022.4    9968.8    2015.4    9981.0
GR  2014.3   10000.0    2014.5   10017.0    2020.8   10037.8    2022.5   10047.6    2022.9   10132.9
GR  2021.7   10327.3    2024.1   10379.7    2021.3   10604.4    2018.2   10652.0    2019.7   10762.4

  encroachments reflect 4:1 flow expansion


ET             4.1       6.1      9900     10070      9935     10055
X1  60.219        15    9975.8   10034.9       190       320       255
X[redacted]      10
G[redacted]2030.1    9473.0    2029.3    9616.4    2025.9    9668.6    2025.6    9788.0    2024.4    9875.1
GR  2025.1    9975.8    2020.6    9983.6    2019.2   10000.0    2020.0   10021.4    2026.3   10034.9
GR  2025.8   10049.7    2023.7   10117.3    2025.2   10212.7    2026.3   10232.3    2026.1   10292.9


ET                       6.1                         9923     10066
X1  60.276        18    9923.0   10065.2       280       320       300
X3      10
GR  2029.6    9167.5    2029.6    9638.1    2028.1    9718.2    2027.6    9853.0    2027.6    9853.0
GR  2029.2    9923.0    2023.9    9954.1    2021.6   10000.0    2022.5   10050.1    2030.2   10065.2
GR  2028.7   10201.3    2028.9   10225.0    2033.1   10279.2    2031.6   10368.2    2031.0   10568.4
GR  2037.5   10626.2    2043.8   10690.2    2043.8   10715.4

  Box culvert for Tropicana Wash under Swenson St
    -along edge of bridge deck is 3 ft. high barrier which blocks flow over road

SB       .9       1.6       2.6         0       74.5       2.5       295.2         0     2021.8     2021.6

NC    .027      .027      .030

ET             4.1       6.1    9677.6   10970.0    9905.1   10076.9
X1  60.301        23    9905.1   10076.9       130       160       135
X2                          1    2025.9    2028.4
X3      10
BT      -3      9700    2032.0              10000    2028.4              10140    2032.0
[redacted]2026.2    9168.2    2025.1    9284.7    2025.5    9406.4    2028.1    9413.9    2029.2    9456.1
GR  2029.2    9543.6    2030.5    9596.3    2030.5    9655.1    2031.2    9677.6    2030.4    9792.2
GR  2029.4    9882.9    2029.3    9905.1    2028.5    9932.2    2022.6    9942.4    2021.8   10000.0
```

G[redacted]	022.6	10053.7	2029.8	10076.9	2030.4	10111.4	2029.9	10196.1	2030.9	10260.5
G[redacted]	2031.2	10349.4	2032.2	10649.1	2033.1	10973.1				

ET		4.1	6.1	9606.8	10234.5	9922.9	10053.0			
X1	60.345	20	9922.9	10053.0	260	200	230			
X3	10									
GR	2029.3	9364.8	2028.8	9417.7	2030.4	9426.0	2030.1	9471.2	2033.1	9492.1
GR	2033.6	9551.5	2032.3	9561.2	2033.4	9606.8	2032.9	9667.0	2032.8	9922.9
GR	2031.9	9948.0	2030.0	9960.8	2024.9	9966.8	2024.1	10000.0	2024.2	10038.0
GR	2032.8	10053.0	2031.2	10161.2	2032.2	10234.5	2031.2	10292.2	2031.5	10456.8

NC	.027	.027	.05	.1	.3

ET		4.1	6.1	9553.1	10568.0	9958.9	10051.6			
X1	60.397	20	9958.9	10051.6	270	280	275			
X3	10									
GR	2031.4	9369.8	2031.1	9421.2	2032.8	9428.6	2033.4	9470.5	2035.3	9503.1
GR	2035.7	9553.1	2034.4	9559.0	2034.2	9667.6	2033.4	9942.4	2035.9	9958.9
GR	2025.0	10000.0	2025.5	10024.0	2035.1	10051.6	2034.5	10068.4	2036.0	10091.1
GR	2035.3	10230.7	2033.2	10239.5	2033.5	10313.2	2032.8	10400.1	2033.7	10570.4

High conveyance changes due to channel changes. Channel at 60.397 is improved with smooth sides and little vegetation. Channel at 60.446 is [redacted]ural and irregular with dense, tall grass in the bottom.

ET		4.1	6.1	9600.0	10180.0	9949.6	10062.9			
X1	60.446	15	9949.6	10062.9	270	255	260			
X3	10									
GR	2035.3	9448.0	2038.7	9533.8	2038.3	9644.2	2036	9689.7	2036	9745.4
GR	2036	9822.1	2036	9859.1	2036	9914.9	2036.5	9949.6	2028.5	9972.9
GR	2027.1	10000.0	2027.9	10037.5	2039.1	10062.9	2041.0	10083.5	2041.3	10183.8

Section 60.491 is immediately downstream of the outlet of a large box culvert on the Palos Verde alignment

ET		4.1	6.1	9335.0	10205.3	9937.6	10056.7			
X1	60.491	25	9937.6	10056.7	260	220	240			
X3	10									
GR	2044.2	9332.7	2042.8	9377.0	2043.0	9441.4	2041.7	9505.5	2041.9	9546.4
GR	2043.7	9568.5	2042.1	9674.5	2042.0	9799.8	2039.2	9937.6	2035.6	9952.8
GR	2033.6	9965.7	2031.7	10000.0	2033.2	10024.2	2033.7	10038.0	2040.5	10056.7
GR	2042.8	10205.3	2039.7	10338.4	2038.5	10343.9	2037.5	10412.8	2037.9	10456.8
GR	2039.2	10470.6	2038.2	10573.1	2036.9	10637.8	2037.6	10740.3	2036.1	10801.4

```
NH       7      .027      9390      .999      9728      .020      9862.1      .020      10053.6      .020
NH   10100      .999     10410      .027   10487.2

  The following 1870 cfs is that portion of the 5300 cfs that overflowed the
  road at section 60.705
QT       4      1870      1870      1870      1870

  The next two sections are over the box culvert
ET                4.1       6.1    9260.0   10187.3    9862.1   10053.6
X1    60.587       16    9862.1   10053.6       515       500       505
X3       10
GR    2044.2    9256.8    2043.5    9319.1    2043.8      9390    2044.2    9494.1    2043.0    9728.0
GR    2040.8      9820    2040.7    9825.5    2043.8    9862.1    2042.2    9968.4    2042.2   10000.0
GR    2042.2   10029.3    2043.1   10053.6    2043.3     10100    2043.7   10187.3    2043.7     10410
GR    2043.7   10487.2

NH       7      .027      9850      .999     10000.0       .02   10062.7      .020      10100      .999
NH   10194        .1   10358.7      .999     10724.2

ET                4.1       6.1    9220.0     10194      9700   10062.7
X1    60.667       15   10000.0   10062.7       385       425       420
GR    2046.5    9217.1    2045.8    9434.7    2043.4    9635.8    2043.5    9808.0    2043.8      9850
GR    2044.6    9952.6    2045.3   10000.0    2044.5   10022.3    2046.1   10062.7    2046.2     10100
GR    2046.3     10194    2045.7   10358.7    2044.6   10530.9    2045.4     10700    2045.5   10724.2

  Section 60.705 is the inlet of a large box culvert at the west side of
  Paradise Road

QT       4      5300      5300      5300      5300

NH       3      .027    9876.2      .047   10238.3      .027     10485

ET                          6.1                          9910     10200
X1    60.705       13    9970.2   10043.6       165       300       200
X3       10
  The following elevation was calculated from the FHWA culvert analysis
  program HY-8
X5       1    2048.9    2049.9
GR    2050.3    9718.6    2048.2    9754.6    2048.0    9876.2    2043.7    9920.4    2043.2    9952.9
GR    2044.2    9970.2    2042.7   10000.0    2044.9   10043.6    2045.1   10097.1    2045.9   10238.3
GR    2047.8   10323.0      2048     10385      2050     10485

NH       4       0.1    9593.3      .027    9965.6      .047   10035.9      .027      10354.5

ET                          6.1                          9839     10036
X1    60.800       27    9965.6   10035.9       535       355       505
X3       10
GR    2057.4    9073.1    2057.0    9230.3    2055.9    9461.6    2054.1    9522.7    2054.1    9554.5
GR    2054.7    9593.3    2053.4    9696.4    2049.1    9728.1    2048.7    9774.1    2047.5    9812.0
GR    2047.8    9866.3    2048.0    9916.9    2050.9    9949.8    2050.8    9965.6    2049.6    9975.1
```

[redacted]	2047.8	10000.0	2048.0	10025.2	2050.7	10035.9	2049.6	10041.3	2048.6	10065.3
[redacted]	2049.3	10098.9	2048.1	10132.6	2050.0	10148.6	2049.6	10161.5	2050.1	10174.0
GR	2052.6	10208.9	2051.8	10354.5						
NC	.10	.022	.022	.3	.5					

Sections 60.866 through 60.912:
Right bank was modified to reflect recent grading
Airport Wash is perpendicular to Tropicana Wash flow direction and was assumed ineffective

ET		4.1	6.1	9210.0	10060.8	9951.0	10060.8			
X1	60.866	16	9951.0	10060.8	346	360	350			
X3	10									
GR	2055.9	9206.7	2054.9	9416.1	2056.3	9436.9	2054.1	9523.7	2055.7	9725.4
GR	2056.6	9822.4	2057.3	9856.7	2057.8	9885.2	2056.7	9951.0	2050.3	9979.8
GR	2049.6	10000.0	2051.2	10028.7	2053.7	10060.8	2052.3	10272.8	2052.6	10423.7
GR	2051.4	10661.1								
NC		.10								
ET		4.1	6.1	9300.0	10150.0	9945.5	10065.0			
X1	60.887	20	9945.5	10065.0	110	108	110			
[redacted]	10									
[redacted]	2057.4	9054.8	2056.6	9256.3	2055.3	9457.6	2056.5	9704.3	2057.3	9845.4
GR	2059.1	9876.5	2058.7	9945.5	2051.3	9977.5	2049.8	10000.0	2050.9	10024.1
GR	2054.6	10034.1	2057.3	10046.1	2058.7	10065.0	2059.1	10144.3	2054.8	10164.2
GR	2054.8	10180.1	2054.8	10199.9	2055.2	10332.0	2053.7	10534.7	2054.6	10597.3

3324 cfs is the Q coming out of the box culvert at I-15

QT	4	3324	3324	3324	3324					
ET		4.1	6.1	9880.0	10250.0	9940.3	10044.8			
X1	60.903	21	9940.3	10044.8	80	90	85			
X3	10									
GR	2057.5	9075.4	2056.1	9190.0	2057.4	9201.6	2057.8	9244.4	2055.6	9450.6
GR	2056.6	9643.7	2058.6	9940.3	2051.4	9967.9	2050.8	9984.0	2049.7	10000.0
GR	2050.3	10016.4	2051.1	10027.8	2058.4	10044.8	2058.8	10068.8	2059.0	10192.8
GR	2055.0	10212.6	2055.0	10228.5	2055.0	10246.7	2055.2	10316.3	2054.7	10499.7
GR	2054.6	10564.7								

Bridge over Tropicana Wash just downstream from Harbor Island Development
Bridge is called "Private Road #1" on the profiles

[redacted]

	1.25	1.6	2.6	0	50	2	366.8	0	2050.0	2049.7
ET		4.1	6.1	9870.0	10310.0	9934.0	10054.4			
X1	60.912	24	9934.0	10054.4	45	45	45			
X2			1	2057.6	2056.5					
X3	10									
BT	-6	9890	2056.5		9920	2056.5		9950	2061.0	
BT		10000	2061.0		10030	2056.5		10060	2056.5	
GR	2057.7	9069.0	2057.1	9080.3	2056.4	9127.0	2058.9	9144.3	2059.2	9193.5
GR	2060.2	9394.7	2057.7	9440.0	2057.7	9600.6	2056.4	9628.3	2058.2	9826.6
GR	2060.1	9863.8	2059.2	9934.0	2051.2	9976.2	2050.0	10000.0	2050.6	10016.5
GR	2058.7	10054.4	2058.9	10122.8	2060.3	10163.6	2056.6	10263.5	2054.7	10285.4
GR	2054.7	10297.6	2054.7	10316.6	2054.9	10460.5	2055.3	10520.7		
NC			.025	.1	.3					
ET		4.1	6.1	9930.5	10219.4	9934.1	10057.5			
X1	60.936	18	9934.1	10057.5	70	230	125			
X3	10									
GR	2059.1	9242.3	2058.8	9304.1	2059.8	9446.6	2061.4	9537.5	2058.0	9583.4
GR	2058.2	9810.7	2061.1	9891.7	2060.1	9934.1	2051.9	9970.8	2050.9	10000.0
GR	2051.6	10020.9	2060.3	10057.5	2060.3	10136.2	2060.3	10204.3	2063.0	10219.4
GR	2062.8	10305.5	2059.4	10320.8	2059.4	10356.9				
ET		4.1	6.1	9780.0	10345.0	9946.7	10053.5			
X1	60.992	11	9946.7	10053.5	320	255	300			
GR	2061.7	9396.5	2061.8	9596.7	2061.4	9786.1	2059.4	9946.7	2054.7	9969.6
GR	2052.3	10000.0	2054.3	10027.7	2059.2	10053.5	2060.7	10108.7	2061.6	10293.1
GR	2060.9	10346.9								
NC				.3	.5					
ET		4.1	6.1	9780.0	10530.0	9948.6	10047.0			
X1	61.036	15	9948.6	10047.0	215	235	228			
GR	2064.4	9343.1	2065.0	9406.9	2063.3	9601.6	2062.2	9781.3	2059.9	9948.6
GR	2055.5	9970.0	2053.6	10000.0	2054.7	10026.1	2061.4	10047.0	2062.2	10058.7
GR	2065.9	10122.3	2065.0	10206.2	2067.0	10315.7	2061.4	10387.6	2060.6	10535.8
ET		4.1	6.1	9800.0	10560.0	9954.6	10078.3			
X1	61.073	21	9954.6	10078.3	190	200	200			
X3	10									
GR	2064.9	9405.8	2065.2	9446.7	2066.5	9615.9	2065.1	9702.0	2062.4	9856.8
GR	2062.0	9943.7	2063.2	9954.6	2057.0	9973.5	2054.2	10000.0	2056.4	10033.0
GR	2062.5	10053.3	2066.5	10078.3	2066.2	10161.2	2066.9	10206.6	2068.4	10247.3
GR	2069.1	10507.9	2066.7	10542.9	2066.1	10638.9	2062.6	10653.2	2061.6	10679.2
GR	2060.8	10773.4								

Bridge over Tropicana Wash at entrance to Harbor Island Hotel
Bridge is called "Private Road #2" on the profiles

SB 1.25 1.6 2.6 85 50.1 2.1 398.4 0 2054.2 2054.2

NC .015

ET 4.1 6.1 9780.0 10545.0 9968.5 10070.2
X1 61.080 23 9968.5 10070.2 65 35 35
X2 1 2062.5 2064.3
X3 10
GR 2064.5 9351.7 2065.1 9407.5 2064.8 9545.1 2065.5 9619.0 2065.5 9668.8
GR 2064.2 9767.8 2062.4 9890.3 2062.8 9942.4 2065.0 9968.5 2054.8 9975.3
GR 2054.1 10000.0 2054.7 10025.7 2063.6 10030.0 2065.8 10070.2 2065.5 10126.4
GR 2065.4 10139.8 2067.3 10186.4 2066.9 10257.6 2067.7 10326.8 2067.1 10558.4
GR 2065.3 10737.1 2062.3 10750.9 2062.2 10777.9

There is a drop structure between sections 61.080 and 61.095

ET 4.1 6.1 9535.0 10535.0 9956.2 10048.1
X1 61.095 20 9956.2 10048.1 85 40 78
X3 10
GR 2068.2 9350.6 2068.7 9535.8 2066.7 9576.0 2066.9 9678.0 2063.4 9779.2
GR 2065.4 9943.1 2067.5 9956.2 2066.6 9967.8 2059.8 9973.3 2059.2 10000.
GR 2059.2 10033.2 2064.9 10037.5 2065.6 10048.1 2065.4 10063.7 2064.9 10141.
GR 2066.7 10220.3 2068.4 10313.7 2067.1 10446.8 2068.0 10563.4 2064.1 10825.

ET 4.1 6.1 9760.0 10070.0 9947.2 10056.1
X1 61.118 22 9947.2 10056.1 155 78 120
X3 10
GR 2068.0 9137.2 2066.5 9311.8 2068.7 9522.0 2068.5 9640.5 2070.1 9664.9
GR 2067.0 9724.0 2066.2 9829.3 2067.9 9901.1 2066.8 9929.7 2065.3 9947.2
GR 2061.0 9955.5 2057.9 10000.0 2059.9 10044.2 2064.1 10052.0 2065.3 10056.1
GR 2065.6 10143.3 2068.1 10180.5 2067.6 10278.2 2067.9 10410.4 2065.6 10504.0
GR 2066.4 10561.9 2065.5 10807.6

Bridge over Tropicana Wash at Harmon

SB 1.05 1.6 2.6 80 62.5 2.5 246.0 0 2060.0 2057.9

NC .025

Sections 61.142 to 61.237: encroachment limits put in on right overbank to reflect extent of effective flow due to expansion of flow area as channel widens.

ET 4.1 6.1 9860.0 10070.0 9904.7 10056.3
X1 61.142 20 9904.7 10056.3 150 165 130
X2 1 2064.1 2065.9
X3 10
GR 2069.9 9210.1 2068.0 9291.9 2069.3 9470.7 2068.8 9598.6 2070.8 9642.0
GR 2067.8 9766.8 2069.8 9793.3 2067.9 9877.6 2065.7 9904.7 2060.0 9965.0
GR 2060.0 10000.0 2060.0 10035.0 2065.4 10056.3 2068.1 10065.9 2066.8 10205.1

[redacted]2069.2	10264.1	2067.9	10421.4	2066.3	10466.3	2066.2	10557.7	2065.5	10614.8

NC				.1	.3					
ET		4.1	6.1	9880.0	10140.0	9951.0	10034.0			
X1	61.166	18	9981.0	10014.6	60	140	125			
GR	2068.4	9232.9	2068.4	9232.9	2068.4	9276.4	2068.6	9382.6	2069.4	9568.0
GR	2069.9	9748.6	2068.7	9854.9	2066.5	9880.9	2066.0	9952.1	2065.7	9981.0
GR	2061.7	10000.0	2066.0	10014.6	2065.9	10036.2	2065.8	10111.2	2068.7	10129.5
GR	2068.5	10259.0	2070.3	10378.0	2067.7	10587.3				

NC	.03	.03	.038							
ET		4.1	6.1	9770.0	10334.9	9866.0	10062.9			
X1	61.237	12	9866.0	10062.9	410	330	375			
X3	10									
GR	2080.1	9747.4	2080.5	9769.0	2079.6	9866.0	2072.3	9957.5	2069.1	10000.0
GR	2069.8	10026.1	2075.2	10046.4	2075.9	10062.9	2072.2	10087.3	2073.7	10141.0
GR	2070.7	10158.0	2072.7	10334.9						

NC	.125	.030	.043							
E[redacted]		4.1	6.1	9960.0	10100.0	9982.8	10064.7			
X[redacted]1.340		8	9982.8	10064.7	510	610	545			
GR	2085.1	9634.6	2085.8	9750.1	2080.6	9982.8	2074.4	10000.0	2077.1	10017.1
GR	2078.2	10044.2	2084.6	10064.7	2084.8	10101.4				

ET		4.1	6.1	9941.4	10335.0	9941.4	10035.0			
X1	61.391	12	9941.4	10035.0	265	275	270			
X3	10									
GR	2086.4	9674.6	2083.2	9744.0	2083.3	9941.4	2078.0	9949.8	2075.7	10000.0
GR	2078.4	10012.0	2086.7	10035.0	2090.2	10078.4	2090.6	10107.1	2089.3	10126.8
GR	2089.0	10172.1	2092.5	10337.7						

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

*PROF 1

CCHV= 0.100 CEHV= 0.300
*SECNO 60.000

60.000	10.78	2001.08	0.00	2001.08	2001.86	0.78	0.00	0.00	2011.30
4797.3	0.0	4797.3	0.0	0.0	676.7	0.0	0.0	0.0	2009.60
0.00	0.00	7.09	0.00	0.000	0.080	0.000	0.000	1990.30	9915.79
0.013073	0.	0.	0.	0	0	0	0.00	106.55	10022.34

*SECNO 60.080

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3[redacted]VERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2020.10 ELREA= 2017.60

60.080	7.94	2011.64	2011.64	0.00	2013.95	2.32	11.30	0.46	2020.10
4797.3	0.0	4797.3	0.0	0.0	392.6	0.0	5.2	0.9	2017.60
0.01	0.00	12.22	0.00	0.000	0.095	0.000	0.000	2003.70	9943.48
0.084194	470.	420.	400.	11	19	0	0.00	86.89	10030.37

CCHV= 0.300 CEHV= 0.500
*SECNO 60.135
3280 CROSS SECTION 60.13 EXTENDED 0.91 FEET

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2022.80 ELREA= 2021.80

60.135	8.21	2022.11	2022.11	0.00	2023.12	1.01	7.22	0.39	2022.80
4797.3	0.0	4157.5	639.8	0.0	496.2	112.6	8.5	2.1	2021.80
0.02	0.00	8.38	5.68	0.000	0.062	0.020	0.000	2013.90	9960.81
0.011463	305.	295.	295.	5	9	0	0.00	266.79	10227.60

[redacted]

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

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2020.77 , NOT 2022.11 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.70	0.00	37.40	1.40	180.00	0.00	2014.30	2013.90

*SECNO 60.171
3280 CROSS SECTION 60.17 EXTENDED 4.87 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.17

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

[redacted]S	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2043.65	2025.26	0.00	3417.	1885.	180.	180.	2019.30	2022.80	553.

3470 ENCROACHMENT STATIONS= 9625.0 10379.7 TYPE= 1 TARGET= 754.700

60.171	10.27	2024.57	0.00	0.00	2024.83	0.26	1.71	0.00	2022.40
5300.0	420.3	2978.3	1901.4	197.9	599.4	688.9	13.3	4.2	2022.50
0.03	2.12	4.97	2.76	0.025	0.032	0.025	0.000	2014.30	9792.54
0.000804	160.	185.	229.	2	0	6	0.00	587.16	10379.70

*SECNO 60.219
3280 CROSS SECTION 60.22 EXTENDED 1.01 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9900.0 10070.0 TYPE= 1 TARGET= 170.000

[redacted]60.219	7.91	2027.11	2027.11	0.00	2028.55	1.44	0.42	0.59	2025.10
[redacted]300.0	1201.4	3854.7	243.9	172.2	365.6	48.6	19.7	6.5	2026.30
0.04	6.97	10.54	5.01	0.025	0.032	0.025	0.000	2019.20	9900.00
0.004816	190.	255.	320.	20	14	0	0.00	170.00	10070.00

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

*SECNO 60.276

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2029.20 ELREA= 2030.20

60.276	7.38	2028.98	0.00	0.00	2029.76	0.77	1.00	0.20	2029.20
5300.0	0.0	5300.0	0.0	0.0	751.2	0.0	24.3	7.5	2030.20
0.05	0.00	7.06	0.00	0.000	0.032	0.000	0.000	2021.60	9924.24
0.002472	280.	300.	320.	2	0	0	0.00	138.58	10062.82

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
0.90	1.60	2.60	0.00	74.50	2.50	295.20	0.00	2021.80	2021.60

[redacted]0 60.301

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.63

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2036.99	2029.76	0.06	2219.	3086.	295.	295.	2025.90	2028.40	403.

3470 ENCROACHMENT STATIONS= 9677.6 10970.0 TYPE= 1 TARGET= 1292.400

60.301	9.72	2031.52	0.00	0.00	2031.70	0.17	1.94	0.00	2029.30
5300.0	365.7	4606.8	327.5	278.5	1293.3	295.8	28.4	9.0	2029.80
0.06	1.31	3.56	1.11	0.027	0.030	0.027	0.000	2021.80	9677.60
0.000358	130.	135.	160.	2	0	4	0.00	768.93	10446.53

*SECNO 60.345

[redacted]

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

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.30

3470 ENCROACHMENT STATIONS= 9606.8 10234.5 TYPE= 1 TARGET= 627.700

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2032.80 ELREA= 2032.80

60.345	6.98	2031.08	0.00	0.00	2032.53	1.45	0.19	0.64	2032.80
5300.0	0.0	5300.0	0.0	0.0	549.0	0.0	34.8	11.2	2032.80
0.07	0.00	9.65	0.00	0.000	0.030	0.000	0.000	2024.10	9953.51
0.003937	260.	230.	200.	3	0	0	0.00	96.49	10050.00

CCHV= 0.100 CEHV= 0.300
*SECNO 60.397

[redacted]HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9553.1 10568.0 TYPE= 1 TARGET= 1014.900

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2035.90 ELREA= 2035.10

60.397	8.22	2033.22	2033.22	0.00	2035.89	2.67	2.15	0.37	2035.90
5300.0	0.0	5300.0	0.0	0.0	404.4	0.0	37.8	11.8	2035.10
0.08	0.00	13.10	0.00	0.000	0.050	0.000	0.000	2025.00	9969.00
0.022248	270.	275.	280.	20	11	0	0.00	77.20	10046.20

*SECNO 60.446

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.05

[redacted]

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

3470 ENCROACHMENT STATIONS= 9600.0 10180.0 TYPE= 1 TARGET= 580.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2036.50 ELREA= 2039.10

60.446	10.02	2037.12	0.00	0.00	2037.53	0.41	1.41	0.23	2036.50
5300.0	832.1	4467.9	0.0	295.6	817.7	0.0	42.3	13.2	2039.10
0.09	2.82	5.46	0.00	0.027	0.050	0.000	0.000	2027.10	9667.49
0.002391	270.	260.	255.	3	0	0	0.00	390.92	10058.42

*SECNO 60.491
3280 CROSS SECTION 60.49 EXTENDED 1.79 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3[illegible] CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9335.0 10205.3 TYPE= 1 TARGET= 870.300

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2039.20 ELREA= 2040.50

60.491	6.19	2037.89	2037.89	0.00	2040.04	2.15	1.33	0.52	2039.20
5300.0	0.0	5300.0	0.0	0.0	449.9	0.0	46.7	14.7	2040.50
0.10	0.00	11.78	0.00	0.000	0.050	0.000	0.000	2031.70	9943.15
0.023327	260.	240.	220.	20	14	0	0.00	106.37	10049.51

1490 NH CARD USED
*SECNO 60.587

3265 DIVIDED FLOW

3280 CROSS SECTION 60.59 EXTENDED 0.14 FEET

3301 HV CHANGED MORE THAN HVINS

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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.40

3470 ENCROACHMENT STATIONS= 9260.0 10187.3 TYPE= 1 TARGET= 927.300

60.587	1.63	2043.83	0.00	0.00	2043.99	0.16	3.75	0.20	2043.80
1870.0	1131.6	675.2	63.2	340.0	217.5	59.0	52.9	19.6	2043.10
0.14	3.33	3.10	1.07	0.022	0.020	0.033	0.000	2042.20	9289.11
0.001473	515.	505.	500.	6	0	0	0.00	732.92	10187.30

1490 NH CARD USED
*SECNO 60.667

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.47

[redacted]ENCROACHMENT STATIONS= 9220.0 10194.0 TYPE= 1 TARGET= 974.000

60.667	1.42	2044.82	0.00	0.00	2045.10	0.29	1.07	0.04	2045.30
1870.0	1865.2	4.8	0.0	433.7	2.7	0.0	57.7	25.0	2046.10
0.17	4.30	1.79	0.00	0.030	0.020	0.000	0.000	2043.40	9517.02
0.006743	385.	420.	425.	4	0	0	0.00	467.19	10030.32

1490 NH CARD USED
*SECNO 60.705
WATER EL=X5 CARD= 2048.900

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 6.43

60.705	6.20	2048.90	0.00	0.00	2049.03	0.13	0.36	0.02	2044.20
5300.0	1431.6	1328.2	2540.2	503.4	384.8	944.6	63.6	27.8	2044.90
0.19	2.84	3.45	2.69	0.045	0.047	0.041	0.000	2042.70	9742.60
0.001311	165.	200.	300.	0	0	0	0.00	687.39	10430.00

1490 NH CARD USED
*SECNO 60.800

[redacted]

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

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

60.800	3.01	2050.81	2050.81	0.00	2051.36	0.55	0.98	0.12	2050.80
5300.0	3662.8	472.2	1165.0	565.5	147.4	235.2	78.1	33.7	2050.70
0.21	6.48	3.20	4.95	0.027	0.047	0.027	0.000	2047.80	9715.48
0.003856	535.	505.	355.	20	17	0	0.00	453.60	10183.94

CCHV= 0.300 CEHV= 0.500
*SECNO 60.866
3280 CROSS SECTION 60.87 EXTENDED 4.40 FEET

3301 HV CHANGED MORE THAN HVINS

3[redacted]20 TRIALS ATTEMPTED WSEL,CWSEL
3[redacted]ROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9210.0 10060.8 TYPE= 1 TARGET= 850.800

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2056.70 ELREA= 100000.00

60.866	6.20	2055.80	2055.80	0.00	2057.97	2.16	1.47	0.81	2056.70
5300.0	0.0	5300.0	0.0	0.0	449.1	0.0	83.7	35.9	100000.00
0.22	0.00	11.80	0.00	0.000	0.022	0.000	0.000	2049.60	9955.03
0.004600	346.	350.	360.	20	17	0	0.00	105.76	10060.80

*SECNO 60.887
3280 CROSS SECTION 60.89 EXTENDED 2.40 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9300.0 10150.0 TYPE= 1 TARGET= 850.000

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2058.70 ELREA= 2058.70

60.887	7.20	2057.00	2057.00	0.00	2059.35	2.35	0.49	0.09	2058.70
5300.0	0.0	5300.0	0.0	0.0	431.0	0.0	84.8	36.2	2058.70
0.22	0.00	12.30	0.00	0.000	0.022	0.000	0.000	2049.80	9952.85
0.004325	110.	110.	108.	20	8	0	0.00	91.92	10044.77

*SECNO 60.903
3280 CROSS SECTION 60.90 EXTENDED 5.22 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.60

[redacted] ENCROACHMENT STATIONS= 9880.0 10250.0 TYPE= 1 TARGET= 370.000

[redacted].903	10.12	2059.82	0.00	0.00	2060.06	0.24	0.08	0.63	2058.60
3324.0	25.0	3123.7	175.2	85.6	777.4	378.8	86.4	36.6	2058.40
0.22	0.29	4.02	0.46	0.100	0.022	0.100	0.000	2049.70	9880.00
0.000251	80.	85.	90.	3	0	0	0.00	370.00	10250.00

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	1.60	2.60	0.00	50.00	2.00	366.80	0.00	2050.00	2049.70

*SECNO 60.912

3265 DIVIDED FLOW

3280 CROSS SECTION 60.91 EXTENDED 4.91 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

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

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2060.41	2060.12	0.01	1553.	1788.	367.	365.	2057.60	2056.50	112.

3470 ENCROACHMENT STATIONS= 9870.0 10310.0 TYPE= 1 TARGET= 440.000

60.912	10.21	2060.21	0.00	0.00	2060.41	0.20	0.35	0.00	2059.20
3324.0	6.3	3071.7	245.9	38.2	814.1	532.2	87.8	37.1	2058.70
0.23	0.17	3.77	0.46	0.100	0.022	0.100	0.000	2050.00	9870.00
0.000248	45.	45.	45.	2	0	3	0.00	434.82	10310.00

CCHV= 0.100 CEHV= 0.300
*SECNO 60.936
3280 CROSS SECTION 60.94 EXTENDED 0.78 FEET

[redacted] ENCROACHMENT STATIONS= 9930.5 10219.4 TYPE= 1 TARGET= 288.900

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2060.10 ELREA= 2060.30

60.936	9.28	2060.18	0.00	0.00	2060.49	0.30	0.04	0.03	2060.10
3324.0	0.0	3324.0	0.0	0.1	751.6	0.0	91.5	38.1	2060.30
0.24	0.04	4.42	0.00	0.100	0.025	0.000	0.000	2050.90	9930.60
0.000505	70.	125.	230.	2	0	0	0.00	126.40	10057.01

*SECNO 60.992

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.68

3470 ENCROACHMENT STATIONS= 9780.0 10345.0 TYPE= 1 TARGET= 565.000

60.992	7.93	2060.23	0.00	0.00	2060.77	0.54	0.22	0.07	2059.40
3324.0	7.6	3310.1	6.2	27.8	559.3	19.6	96.2	39.3	2059.20
0.25	0.28	5.92	0.32	0.100	0.025	0.100	0.000	2052.30	9879.93
0.001105	320.	300.	255.	2	0	0	0.00	211.53	10091.46

CCHV= 0.300 CEHV= 0.500

[redacted]

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

*SECNO 61.036

3470 ENCROACHMENT STATIONS= 9780.0 10530.0 TYPE= 1 TARGET= 750.000

61.036	6.81	2060.41	0.00	0.00	2061.26	0.85	0.33	0.15	2059.90
3324.0	2.6	3321.4	0.0	9.6	448.4	0.0	98.9	40.2	2061.40
0.26	0.27	7.41	0.00	0.100	0.025	0.000	0.000	2053.60	9911.22
0.002010	215.	228.	235.	0	0	0	0.00	132.71	10043.92

*SECNO 61.073

3470 ENCROACHMENT STATIONS= 9800.0 10560.0 TYPE= 1 TARGET= 760.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2063.20 ELREA= 2066.50

61.073	6.51	2060.71	0.00	0.00	2061.99	1.28	0.51	0.21	2063.20
3324.0	0.0	3324.0	0.0	0.0	366.3	0.0	100.8	40.7	2066.50
0.27	0.00	9.07	0.00	0.000	0.025	0.000	0.000	2054.20	9962.17
0.003409	190.	200.	200.	0	0	0	0.00	85.19	10047.36

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	85.00	50.10	2.10	398.40	0.00	2054.20	2054.20

*SECNO 61.080

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.94

CLASS A LOW FLOW

3420 BRIDGE W.S.= 2060.34 BRIDGE VELOCITY= 11.27 CALCULATED CHANNEL AREA= 295.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2062.40	0.35	0.	3324.	398.	398.	2062.50	2064.30	0.

3470 ENCROACHMENT STATIONS= 9780.0 10545.0 TYPE= 1 TARGET= 765.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2065.00 ELREA= 2065.80

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
61.080	6.96	2061.06	0.00	0.00	2062.40	1.34	0.42	0.00	2065.00
3324.0	0.0	3324.0	0.0	0.0	357.3	0.0	101.1	40.7	2065.80
0.27	0.00	9.30	0.00	0.000	0.015	0.000	0.000	2054.10	9971.13
0.000909	65.	35.	35.	0	0	0	0.00	57.65	10028.77

*SECNO 61.095

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9535.0 10535.0 TYPE= 1 TARGET= 1000.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2067.50 ELREA= 2065.60

61.095	4.61	2063.81	2063.81	0.00	2065.96	2.15	0.11	0.40	2067.50
3324.0	0.0	3324.0	0.0	0.0	282.7	0.0	101.7	40.8	2065.60
0.27	0.00	11.76	0.00	0.000	0.015	0.000	0.000	2059.20	9970.06
0.002225	85.	78.	40.	20	14	0	0.00	66.62	10036.68

*SECNO 61.118
3280 CROSS SECTION 61.12 EXTENDED 0.69 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.24

3470 ENCROACHMENT STATIONS= 9760.0 10070.0 TYPE= 1 TARGET= 310.000

61.118	8.29	2066.19	0.00	0.00	2066.55	0.36	0.06	0.53	2065.30
3324.0	0.6	3321.2	2.3	4.6	685.9	12.0	103.0	41.1	2065.30
0.28	0.13	4.84	0.19	0.100	0.015	0.100	0.000	2057.90	9936.84
0.000211	155.	120.	78.	4	0	0	0.00	133.16	10070.00

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

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.60	80.00	62.50	2.50	246.00	0.00	2060.00	2057.90

*SECNO 61.142
3280 CROSS SECTION 61.14 EXTENDED 2.92 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2070.72	2066.58	0.03	911.	2413.	246.	246.	2064.10	2065.90	80.

3470 ENCROACHMENT STATIONS= 9860.0 10070.0 TYPE= 1 TARGET= 210.000

[redacted]1.142	8.42	2068.42	0.00	0.00	2068.58	0.15	2.03	0.00	2065.70
[redacted]24.0	13.8	3305.2	5.0	49.8	1047.8	17.5	105.8	41.6	2065.40
0.29	0.28	3.15	0.28	0.100	0.025	0.100	0.000	2060.00	9860.00
0.000216	150.	130.	165.	2	0	2	0.00	210.00	10070.00

CCHV= 0.100 CEHV= 0.300
*SECNO 61.166
3280 CROSS SECTION 61.17 EXTENDED 1.25 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9880.0 10140.0 TYPE= 1 TARGET= 260.000

61.166	7.25	2068.95	2068.95	0.00	2070.34	1.39	0.07	0.37	2065.70
3324.0	571.1	2071.2	681.7	283.5	174.0	330.5	108.3	42.2	2066.00
0.29	2.01	11.90	2.06	0.100	0.025	0.100	0.000	2061.70	9880.00
0.004657	60.	125.	140.	20	10	0	0.00	260.00	10140.00

*SECNO 61.237

[redacted]

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

3280 CROSS SECTION 61.24 EXTENDED 1.50 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9770.0 10334.9 TYPE= 1 TARGET= 564.900

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2079.60 ELREA= 2075.90

61.237	5.10	2074.20	2074.20	0.00	2075.76	1.56	2.87	0.05	2079.60
3324.0	0.0	3324.0	0.0	0.0	332.2	0.0	113.1	43.8	2075.90
0.30	0.00	10.01	0.00	0.000	0.038	0.000	0.000	2069.10	9933.64
0.014968	410.	375.	330.	20	19	0	0.00	109.02	10042.66

*SECNO 61.340

3470 ENCROACHMENT STATIONS= 9960.0 10100.0 TYPE= 1 TARGET= 140.000

[redacted]1.340	7.46	2081.86	2081.56	0.00	2083.54	1.68	7.74	0.04	2080.60
[redacted]324.0	31.1	3292.9	0.0	22.9	315.0	0.0	117.3	45.1	2084.60
0.32	1.36	10.45	0.00	0.125	0.043	0.000	0.000	2074.40	9960.00
0.013503	510.	545.	610.	6	14	0	0.00	95.92	10055.92

*SECNO 61.391

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.24

3470 ENCROACHMENT STATIONS= 9941.4 10335.0 TYPE= 1 TARGET= 393.600

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2083.30 ELREA= 2086.70

61.391	8.79	2084.49	0.00	0.00	2085.04	0.55	1.39	0.11	2083.30
3324.0	0.0	3324.0	0.0	0.0	556.3	0.0	120.0	45.6	2086.70
0.33	0.00	5.98	0.00	0.000	0.043	0.000	0.000	2075.70	9941.40
0.002699	265.	270.	275.	3	0	0	0.00	87.47	10028.87

T1 FLAMINGO WASH ENCROACHMENT CONDITIONS
T2 JOB NUMBER RDD33832.A2.60
T3 Flam-Enc.HC2 100 YEAR FLOOD CONDITIONS ENCROACHMENT

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	-10	3	0	0	0	0	0	0	2002.08	0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2	0	-1	0	0	0	0	0	0	15

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

*PROF 2

CCHV= 0.100 CEHV= 0.300
*SECNO 60.000

3470 ENCROACHMENT STATIONS= 9912.0 10024.0 TYPE= 1 TARGET= 112.000

60.000	11.78	2002.08	0.00	2001.08	2002.66	0.58	0.00	0.00	100000.00
4797.3	0.0	4797.3	0.0	0.0	786.3	0.0	0.0	0.0	100000.00
0.00	0.00	6.10	0.00	0.000	0.080	0.000	0.000	1990.30	9912.00
0.008502	0.	0.	0.	0	0	0	0.00	112.00	10024.00

FLOW DISTRIBUTION FOR SECNO= 60.00 CWSEL= 2002.08

STA= 9912. 10040.
PER Q= 100.0
AREA= 786.3
EL= 6.1
H= 7.0

*SECNO 60.080

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9919.2 10053.2 TYPE= 1 TARGET= 134.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2020.10 ELREA= 100000.00

60.080	7.93	2011.63	2011.63	2011.64	2013.95	2.32	8.23	0.52	2020.10
4797.3	0.0	4797.3	0.0	0.0	392.4	0.0	5.7	1.0	100000.00
0.01	0.00	12.23	0.00	0.000	0.095	0.000	0.000	2003.70	9943.49
0.084319	470.	420.	400.	20	19	0	0.00	86.88	10030.36

FLOW DISTRIBUTION FOR SECNO= 60.08 CWSEL= 2011.63

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

STA= 9943. 10053.
PER Q= 100.0
AREA= 392.4
VEL= 12.2
DEPTH= 4.5

CCHV= 0.300 CEHV= 0.500
*SECNO 60.135
3280 CROSS SECTION 60.13 EXTENDED 0.77 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.27

3470 ENCROACHMENT STATIONS= 9959.0 10042.0 TYPE= 1 TARGET= 83.000

[redacted]OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2022.80 ELREA= 2021.80

60.135	8.07	2021.97	0.00	2022.11	2023.49	1.52	9.29	0.24	2022.80
4797.3	0.0	4797.3	0.0	0.0	485.5	0.0	8.7	1.5	2021.80
0.02	0.00	9.88	0.09	0.000	0.062	0.020	0.000	2013.90	9961.09
0.016330	305.	295.	295.	6	0	0	0.00	80.91	10042.00

FLOW DISTRIBUTION FOR SECNO= 60.13 CWSEL= 2021.97

STA= 9961. 10042.
PER Q= 100.0
AREA= 485.5
VEL= 9.9
DEPTH= 6.0

SPECIAL BRIDGE

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

5227 DOWNSTREAM ELEV IS 2020.77 , NOT 2021.97 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.70	0.00	37.40	1.40	180.00	0.00	2014.30	2013.90

*SECNO 60.171
3280 CROSS SECTION 60.17 EXTENDED 2.92 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.70

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
[redacted]43.51	2025.77	0.00	3376.	1926.	180.	180.	2019.30	2022.80	550.

3470 ENCROACHMENT STATIONS= 9968.8 10047.6 TYPE= 1 TARGET= 78.800

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2022.40 ELREA= 100000.00

60.171	8.32	2022.62	0.00	2024.57	2024.81	2.20	1.33	0.00	2022.40
5300.0	0.0	5300.0	0.0	0.0	445.6	0.0	10.6	1.9	100000.00
0.02	0.00	11.89	0.00	0.000	0.032	0.000	0.000	2014.30	9968.80
0.006880	160.	185.	229.	5	0	6	0.00	78.80	10047.60

FLOW DISTRIBUTION FOR SECNO= 60.17 CWSEL= 2022.62

STA= 9969. 10048.
PER Q= 100.0
AREA= 445.6
VEL= 11.9
DEPTH= 5.7

*SECNO 60.219
3280 CROSS SECTION 60.22 EXTENDED 1.18 FEET

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

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9935.0 10055.0 TYPE= 1 TARGET= 120.000

60.219	8.08	2027.28	2027.28	2027.11	2029.23	1.95	1.59	0.07	2025.10
5300.0	725.3	4437.5	137.2	94.8	375.8	26.5	13.3	2.4	2026.30
0.03	7.65	11.81	5.18	0.025	0.032	0.025	0.000	2019.20	9935.00
0.005823	190.	255.	320.	20	8	0	0.00	120.00	10055.00

FLOW DISTRIBUTION FOR SECNO= 60.22 CWSEL= 2027.28

STA=	9935.	9976.	10035.	10050.	10055.
PER Q=	13.7	83.7	1.8	0.8	
AREA=	94.8	375.8	18.2	8.3	
VEL=	7.7	11.8	5.2	5.1	
DEPTH=	2.3	6.4	1.2	1.6	

[redacted]O 60.276

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.95

3470 ENCROACHMENT STATIONS= 9923.0 10066.0 TYPE= 1 TARGET= 143.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2029.20 ELREA= 2030.20

60.276	8.28	2029.88	0.00	2028.98	2030.44	0.57	0.80	0.41	2029.20
5300.0	0.0	5300.0	0.0	0.0	877.1	0.0	18.1	3.3	2030.20
0.04	0.00	6.04	0.00	0.000	0.032	0.000	0.000	2021.60	9923.00
0.001530	280.	300.	320.	2	0	0	0.00	141.58	10064.58

FLOW DISTRIBUTION FOR SECNO= 60.28 CWSEL= 2029.88

STA=	9923.	10065.
PER Q=	100.0	
AREA=	877.1	
VEL=	6.0	
DEPTH=	6.2	

[redacted]

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

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	74.50	2.50	295.20	0.00	2021.80	2021.60

*SECNO 60.301

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.83

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2037.89	2030.44	0.03	2637.	2686.	295.	295.	2025.90	2028.40	432.

3[redacted]ENCROACHMENT STATIONS= 9905.1 10076.9 TYPE= 1 TARGET= 171.801

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2029.30 ELREA= 100000.00

60.301	9.88	2031.68	0.00	2031.52	2031.93	0.25	1.49	0.00	2029.30
5300.0	0.0	5300.0	0.0	0.0	1320.8	0.0	21.5	3.8	100000.00
0.05	0.00	4.01	0.00	0.000	0.030	0.000	0.000	2021.80	9905.10
0.000456	130.	135.	160.	2	0	4	0.00	171.80	10076.90

FLOW DISTRIBUTION FOR SECNO= 60.30 CWSEL= 2031.68

STA= 9905. 10077.
PER Q= 100.0
AREA= 1320.8
VEL= 4.0
DEPTH= 7.7

*SECNO 60.345

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.37

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

3470 ENCROACHMENT STATIONS= 9922.9 10053.0 TYPE= 1 TARGET= 130.100

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2032.80 ELREA= 100000.00

60.345	7.28	2031.38	0.00	2031.08	2032.68	1.30	0.23	0.53	2032.80
5300.0	0.0	5300.0	0.0	0.0	579.0	0.0	26.5	4.5	100000.00
0.06	0.00	9.15	0.00	0.000	0.030	0.000	0.000	2024.10	9951.44
0.003416	260.	230.	200.	2	0	0	0.00	99.10	10050.54

FLOW DISTRIBUTION FOR SECNO= 60.35 CWSEL= 2031.38

STA= 9951. 10053.
PER Q= 100.0
AREA= 579.0
VEL= 9.2
DEPTH= 5.8

[redacted] 0.100 CEHV= 0.300
[redacted]0 60.397

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9958.9 10051.6 TYPE= 1 TARGET= 92.699

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2035.90 ELREA= 100000.00

60.397	8.24	2033.24	2033.24	2033.22	2035.89	2.64	1.93	0.40	2035.90
5300.0	0.0	5300.0	0.0	0.0	406.2	0.0	29.6	5.1	100000.00
0.06	0.00	13.05	0.00	0.000	0.050	0.000	0.000	2025.00	9968.91
0.021979	270.	275.	280.	20	8	0	0.00	77.35	10046.26

FLOW DISTRIBUTION FOR SECNO= 60.40 CWSEL= 2033.24

STA= 9969. 10052.
PER Q= 100.0
AREA= 406.2
VEL= 13.0
[redacted]EPTH= 5.3

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

*SECNO 60.446

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.60

3470 ENCROACHMENT STATIONS= 9949.6 10062.9 TYPE= 1 TARGET= 113.301

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2036.50 ELREA= 100000.00

60.446	10.12	2037.22	0.00	2037.12	2037.85	0.64	1.77	0.20	2036.50
5300.0	0.0	5300.0	0.0	0.0	828.3	0.0	33.3	5.6	100000.00
0.08	0.00	6.40	0.00	0.000	0.050	0.000	0.000	2027.10	9949.60
0.003258	270.	260.	255.	3	0	0	0.00	109.04	10058.64

FLOW DISTRIBUTION FOR SECNO= 60.45 CWSEL= 2037.22

[redacted] 9950. 10063.
PER Q= 100.0
AREA= 828.3
VEL= 6.4
DEPTH= 7.6

*SECNO 60.491
3280 CROSS SECTION 60.49 EXTENDED 1.79 FEET

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9937.6 10056.7 TYPE= 1 TARGET= 119.101

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2039.20 ELREA= 100000.00

60.491	6.19	2037.89	2037.89	2037.89	2040.04	2.16	1.66	0.46	2039.20
5300.0	0.0	5300.0	0.0	0.0	449.9	0.0	36.8	6.2	100000.00
0.08	0.00	11.78	0.00	0.000	0.050	0.000	0.000	2031.70	9943.15
0.023339	260.	240.	220.	4	14	0	0.00	106.36	10049.51

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 60.49 CWSEL= 2037.89

STA= 9943. 10057.
PER Q= 100.0
AREA= 449.9
VEL= 11.8
DEPTH= 4.2

1490 NH CARD USED
*SECNO 60.587
3280 CROSS SECTION 60.59 EXTENDED 0.84 FEET

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 9862.1 10053.6 TYPE= 1 TARGET= 191.500

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2043.80 ELREA= 100000.00

[redacted]0.587	2.34	2044.54	0.00	2043.83	2044.98	0.44	4.77	0.17	2043.80
1870.0	0.0	1870.0	0.0	0.0	352.9	0.0	41.4	8.0	100000.00
0.11	0.00	5.30	0.00	0.000	0.020	0.000	0.000	2042.20	9862.10
0.002286	515.	505.	500.	6	0	0	0.00	191.50	10053.60

FLOW DISTRIBUTION FOR SECNO= 60.59 CWSEL= 2044.54

STA= 9862. 10054.
PER Q= 100.0
AREA= 352.9
VEL= 5.3
DEPTH= 1.8

1490 NH CARD USED
*SECNO 60.667
3280 CROSS SECTION 60.67 EXTENDED 0.35 FEET

3470 ENCROACHMENT STATIONS= 9700.0 10062.7 TYPE= 1 TARGET= 362.700

60.667	2.45	2045.85	0.00	2044.82	2045.99	0.15	0.99	0.03	2045.30
1870.0	1728.2	141.8	0.0	560.6	44.0	0.0	45.8	10.5	100000.00
0.14	3.08	3.22	0.00	0.039	0.020	0.000	0.000	2043.40	9700.00
0.002612	385.	420.	425.	4	0	0	0.00	356.31	10056.31

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 60.67 CWSEL= 2045.85

STA=	9700.	9808.	9850.	9953.	10000.	10063.
PER Q=	67.8	23.5	1.0	0.2	7.6	
AREA=	256.9	92.3	169.0	42.5	44.0	
VEL=	4.9	4.8	0.1	0.1	3.2	
DEPTH=	2.4	2.2	1.6	0.9	0.8	

1490 NH CARD USED
*SECNO 60.705
WATER EL=X5 CARD= 2049.900

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.12

3470 ENCROACHMENT STATIONS= 9910.0 10200.0 TYPE= 1 TARGET= 290.000

60.705	7.20	2049.90	0.00	2048.90	2050.08	0.18	0.29	0.01	2044.20
5300.0	1367.9	1723.5	2208.7	376.1	458.2	726.1	51.3	12.0	2044.90
0.16	3.64	3.76	3.04	0.047	0.047	0.047	0.000	2042.70	9910.00
[redacted]01234	165.	200.	300.	0	0	0	0.00	290.00	10200.00

FLOW DISTRIBUTION FOR SECNO= 60.71 CWSEL= 2049.90

STA=	9910.	9920.	9953.	9970.	10044.	10097.	10200.
PER Q=	3.0	15.2	7.6	32.5	15.8	25.8	
AREA=	59.2	209.6	107.3	458.2	262.1	463.9	
VEL=	2.7	3.8	3.7	3.8	3.2	3.0	
DEPTH=	5.7	6.4	6.2	6.2	4.9	4.5	

1490 NH CARD USED
*SECNO 60.800

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9839.0 10036.0 TYPE= 1 TARGET= 197.000

60.800	3.88	2051.68	2051.68	2050.81	2053.16	1.48	1.24	0.39	2050.80
5300.0	4107.2	1192.8	0.0	385.4	208.2	0.1	62.8	14.6	2050.70
0.17	10.66	5.73	0.05	0.027	0.047	0.027	0.000	2047.80	9839.00
0.007785	535.	505.	355.	20	11	0	0.00	197.00	10036.00

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

FLOW DISTRIBUTION FOR SECNO= 60.80 CWSEL= 2051.68

STA=	9839.	9866.	9917.	9950.	9966.	10036.
PER Q=	22.5	42.5	11.4	1.1	22.5	
AREA=	107.9	191.1	73.3	13.1	208.2	
VEL=	11.1	11.8	8.3	4.3	5.7	
DEPTH=	4.0	3.8	2.2	0.8	3.0	

CCHV= 0.300 CEHV= 0.500
*SECNO 60.866
3280 CROSS SECTION 60.87 EXTENDED 4.40 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

[redacted]ENCROACHMENT STATIONS= 9951.0 10060.8 TYPE= 1 TARGET= 109.800

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2056.70 ELREA= 100000.00

60.866	6.20	2055.80	2055.80	2055.80	2057.97	2.16	2.05	0.34	2056.70
5300.0	0.0	5300.0	0.0	0.0	449.2	0.0	66.9	15.8	100000.00
0.18	0.00	11.80	0.00	0.000	0.022	0.000	0.000	2049.60	9955.03
0.004598	346.	350.	360.	20	14	0	0.00	105.77	10060.80

FLOW DISTRIBUTION FOR SECNO= 60.87 CWSEL= 2055.80

STA=	9955.	10061.
PER Q=	100.0	
AREA=	449.2	
VEL=	11.8	
DEPTH=	4.2	

*SECNO 60.887
3280 CROSS SECTION 60.89 EXTENDED 2.40 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

[redacted]

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

3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9945.5 10065.0 TYPE= 1 TARGET= 119.500

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2058.70 ELREA= 100000.00

60.887	7.20	2057.00	2057.00	2057.00	2059.35	2.35	0.49	0.09	2058.70
5300.0	0.0	5300.0	0.0	0.0	431.0	0.0	68.0	16.1	100000.00
0.19	0.00	12.30	0.00	0.000	0.022	0.000	0.000	2049.80	9952.85
0.004324	110.	110.	108.	20	8	0	0.00	91.92	10044.77

FLOW DISTRIBUTION FOR SECNO= 60.89 CWSEL= 2057.00

STA= 9953. 10065.
PER Q= 100.0
AREA= 431.0
VEL= 12.3
[redacted]TH= 4.7

*SECNO 60.903
3280 CROSS SECTION 60.90 EXTENDED 5.16 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.38

3470 ENCROACHMENT STATIONS= 9940.3 10044.8 TYPE= 1 TARGET= 104.500

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2058.60 ELREA= 100000.00

60.903	10.06	2059.76	0.00	2059.82	2060.05	0.29	0.09	0.62	2058.60
3324.0	0.0	3324.0	0.0	0.0	771.4	0.0	69.2	16.3	100000.00
0.19	0.00	4.31	0.00	0.000	0.022	0.000	0.000	2049.70	9940.30
0.000301	80.	85.	90.	3	0	0	0.00	104.50	10044.80

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

FLOW DISTRIBUTION FOR SECNO= 60.90 CWSEL= 2059.76

STA= 9940. 10045.
PER Q= 100.0
AREA= 771.4
VEL= 4.3
DEPTH= 7.4

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	0.00	50.00	2.00	366.80	0.00	2050.00	2049.70

*SECNO 60.912
3280 CROSS SECTION 60.91 EXTENDED 4.80 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

[redacted]S	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2060.37	2060.07	0.01	1529.	1812.	367.	365.	2057.60	2056.50	112.

3470 ENCROACHMENT STATIONS= 9934.0 10054.4 TYPE= 1 TARGET= 120.400

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2059.20 ELREA= 100000.00

60.912	10.10	2060.10	0.00	2060.21	2060.37	0.27	0.32	0.00	2059.20
3324.0	0.0	3324.0	0.0	0.0	801.6	0.0	70.0	16.4	100000.00
0.19	0.00	4.15	0.00	0.000	0.022	0.000	0.000	2050.00	9934.00
0.000314	45.	45.	45.	2	0	3	0.00	120.40	10054.40

FLOW DISTRIBUTION FOR SECNO= 60.91 CWSEL= 2060.10

STA= 9934. 10054.
PER Q= 100.0
AREA= 801.6
VEL= 4.1
DEPTH= 6.7

[redacted]

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

CCHV= 0.100 CEHV= 0.300
*SECNO 60.936
3280 CROSS SECTION 60.94 EXTENDED 0.72 FEET

3470 ENCROACHMENT STATIONS= 9934.1 10057.5 TYPE= 1 TARGET= 123.400

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2060.10 ELREA= 100000.00

60.936	9.22	2060.12	0.00	2060.18	2060.43	0.31	0.05	0.01	2060.10
3324.0	0.0	3324.0	0.0	0.0	744.3	0.0	72.3	16.7	100000.00
0.20	0.00	4.47	0.00	0.000	0.025	0.000	0.000	2050.90	9934.10
0.000521	70.	125.	230.	2	0	0	0.00	122.66	10056.76

FLOW DISTRIBUTION FOR SECNO= 60.94 CWSEL= 2060.12

STA= 9934. 10058.
PER Q= 100.0
[redacted]EA= 744.3
[redacted]EL= 4.5
DEPTH= 6.1

*SECNO 60.992

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.66

3470 ENCROACHMENT STATIONS= 9946.7 10053.5 TYPE= 1 TARGET= 106.800

60.992	7.87	2060.17	0.00	2060.23	2060.73	0.56	0.23	0.08	2059.40
3324.0	0.0	3324.0	0.0	0.0	553.1	0.0	76.7	17.5	100000.00
0.22	0.00	6.01	0.00	0.000	0.025	0.000	0.000	2052.30	9946.70
0.001182	320.	300.	255.	2	0	0	0.00	106.80	10053.50

FLOW DISTRIBUTION FOR SECNO= 60.99 CWSEL= 2060.17

STA= 9947. 10054.
PER Q= 100.0
AREA= 553.1
VEL= 6.0
DEPTH= 5.2

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

CCHV= 0.300 CEHV= 0.500
*SECNO 61.036

3470 ENCROACHMENT STATIONS= 9948.6 10047.0 TYPE= 1 TARGET= 98.400

61.036	6.77	2060.37	0.00	2060.41	2061.24	0.87	0.35	0.16	2059.90
3324.0	0.0	3324.0	0.0	0.0	443.8	0.0	79.3	18.1	100000.00
0.22	0.00	7.49	0.00	0.000	0.025	0.000	0.000	2053.60	9948.60
0.002092	215.	228.	235.	0	0	0	0.00	95.17	10043.77

FLOW DISTRIBUTION FOR SECNO= 61.04 CWSEL= 2060.37

STA= 9949. 10047.
PER Q= 100.0
AREA= 443.8
VEL= 7.5
DEPTH= 4.7

*SECNO 61.073

[redacted]ENCROACHMENT STATIONS= 9954.6 10078.3 TYPE= 1 TARGET= 123.700

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2063.20 ELREA= 100000.00

61.073	6.49	2060.69	0.00	2060.71	2061.98	1.29	0.53	0.21	2063.20
3324.0	0.0	3324.0	0.0	0.0	364.2	0.0	81.2	18.5	100000.00
0.23	0.00	9.13	0.00	0.000	0.025	0.000	0.000	2054.20	9962.25
0.003466	190.	200.	200.	0	0	0	0.00	85.03	10047.28

FLOW DISTRIBUTION FOR SECNO= 61.07 CWSEL= 2060.69

STA= 9962. 10078.
PER Q= 100.0
AREA= 364.2
VEL= 9.1
DEPTH= 4.3

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

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	85.00	50.10	2.10	398.40	0.00	2054.20	2054.20

*SECNO 61.080

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.95

CLASS A LOW FLOW

3420 BRIDGE W.S.= 2060.31 BRIDGE VELOCITY= 11.33 CALCULATED CHANNEL AREA= 293.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2062.40	0.36	0.	3324.	398.	398.	2062.50	2064.30	0.

[redacted]ENCROACHMENT STATIONS= 9968.5 10070.2 TYPE= 1 TARGET= 101.700

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2065.00 ELREA= 100000.00

61.080	6.95	2061.05	0.00	2061.06	2062.40	1.35	0.42	0.00	2065.00
3324.0	0.0	3324.0	0.0	0.0	356.5	0.0	81.5	18.5	100000.00
0.23	0.00	9.32	0.00	0.000	0.015	0.000	0.000	2054.10	9971.14
0.000915	65.	35.	35.	0	0	0	0.00	57.63	10028.77

FLOW DISTRIBUTION FOR SECNO= 61.08 CWSEL= 2061.05

STA=	9971.	10070.
PER Q=	100.0	
AREA=	356.5	
VEL=	9.3	
DEPTH=	6.2	

*SECNO 61.095

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY

[redacted]

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

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9956.2 10048.1 TYPE= 1 TARGET= 91.899

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2067.50 ELREA= 100000.00

61.095	4.62	2063.82	2063.82	2063.81	2065.96	2.14	0.11	0.40	2067.50
3324.0	0.0	3324.0	0.0	0.0	283.0	0.0	82.0	18.6	100000.00
0.23	0.00	11.75	0.00	0.000	0.015	0.000	0.000	2059.20	9970.05
0.002218	85.	78.	40.	20	14	0	0.00	66.63	10036.68

FLOW DISTRIBUTION FOR SECNO= 61.10 CWSEL= 2063.82

STA= 9970. 10048.
PER Q= 100.0
AREA= 283.0
VEL= 11.7
DEPTH= 4.2

[redacted]J 61.118
3280 CROSS SECTION 61.12 EXTENDED 0.69 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.20

3470 ENCROACHMENT STATIONS= 9947.2 10056.1 TYPE= 1 TARGET= 108.899

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2065.30 ELREA= 100000.00

61.118	8.29	2066.19	0.00	2066.19	2066.55	0.36	0.06	0.53	2065.30
3324.0	0.0	3324.0	0.0	0.0	685.7	0.0	83.4	18.9	100000.00
0.24	0.00	4.85	0.00	0.000	0.015	0.000	0.000	2057.90	9947.20
0.000217	155.	120.	78.	4	0	0	0.00	108.90	10056.10

FLOW DISTRIBUTION FOR SECNO= 61.12 CWSEL= 2066.19

[redacted]

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

STA= 9947. 10056.
PER Q= 100.0
AREA= 685.7
VEL= 4.8
DEPTH= 6.3

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.60	80.00	62.50	2.50	246.00	0.00	2060.00	2057.90

*SECNO 61.142
3280 CROSS SECTION 61.14 EXTENDED 2.92 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
[redacted]0.72	2066.58	0.03	911.	2413.	246.	246.	2064.10	2065.90	80.

3470 ENCROACHMENT STATIONS= 9904.7 10056.3 TYPE= 1 TARGET= 151.600

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2065.70 ELREA= 100000.00

61.142	8.42	2068.42	0.00	2068.42	2068.58	0.16	2.03	0.00	2065.70
3324.0	0.0	3324.0	0.0	0.0	1047.2	0.0	86.0	19.3	100000.00
0.25	0.00	3.17	0.00	0.000	0.025	0.000	0.000	2060.00	9904.70
0.000230	150.	130.	165.	2	0	2	0.00	151.60	10056.30

FLOW DISTRIBUTION FOR SECNO= 61.14 CWSEL= 2068.42

STA= 9905. 10056.
PER Q= 100.0
AREA= 1047.2
VEL= 3.2
DEPTH= 6.9

[redacted]

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

CCHV= 0.100 CEHV= 0.300
*SECNO 61.166
3280 CROSS SECTION 61.17 EXTENDED 2.14 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9951.0 10034.0 TYPE= 1 TARGET= 83.000

61.166	8.14	2069.84	2069.84	2068.95	2072.41	2.57	0.08	0.72	2065.70
3324.0	312.8	2835.8	175.3	119.5	204.1	75.4	88.0	19.6	2066.00
0.25	2.62	13.89	2.33	0.100	0.025	0.100	0.000	2061.70	9951.00
0.005134	60.	125.	140.	20	8	0	0.00	83.00	10034.00

FLOW DISTRIBUTION FOR SECNO= 61.17 CWSEL= 2069.84

[redacted]	9951.	9952.	9981.	10015.	10034.
PER Q=	0.1	9.3	85.3	5.3	
AREA=	4.2	115.3	204.1	75.4	
VEL=	1.0	2.7	13.9	2.3	
DEPTH=	3.8	4.0	6.1	3.9	

*SECNO 61.237
3280 CROSS SECTION 61.24 EXTENDED 1.50 FEET

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9866.0 10062.9 TYPE= 1 TARGET= 196.900

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2079.60 ELREA= 100000.00

61.237	5.10	2074.20	2074.20	2074.20	2075.76	1.56	3.07	0.10	2079.60
3324.0	0.0	3324.0	0.0	0.0	332.1	0.0	91.1	20.4	100000.00
0.26	0.00	10.01	0.00	0.000	0.038	0.000	0.000	2069.10	9933.64
0.014971	410.	375.	330.	10	14	0	0.00	109.01	10042.65

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 61.24 CWSEL= 2074.20

STA= 9934. 10063.
PER Q= 100.0
AREA= 332.1
VEL= 10.0
DEPTH= 3.0

*SECNO 61.340

3470 ENCROACHMENT STATIONS= 9982.8 10064.7 TYPE= 1 TARGET= 81.900

61.340	7.50	2081.90	0.00	2081.86	2083.59	1.70	7.79	0.04	2080.60
3324.0	0.0	3324.0	0.0	0.0	318.0	0.0	95.2	21.6	100000.00
0.28	0.00	10.45	0.00	0.000	0.043	0.000	0.000	2074.40	9982.80
0.013673	510.	545.	610.	3	0	0	0.00	73.25	10056.05

FLOW DISTRIBUTION FOR SECNO= 61.34 CWSEL= 2081.90

9983. 10065.
Q= 100.0
AREA= 318.0
VEL= 10.5
DEPTH= 4.3

*SECNO 61.391

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.28

3470 ENCROACHMENT STATIONS= 9941.4 10035.0 TYPE= 1 TARGET= 93.600

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2083.30 ELREA= 100000.00

61.391	8.84	2084.54	0.00	2084.49	2085.08	0.55	1.37	0.12	2083.30
3324.0	0.0	3324.0	0.0	0.0	560.8	0.0	97.9	22.1	100000.00
0.29	0.00	5.93	0.00	0.000	0.043	0.000	0.000	2075.70	9941.40
0.002635	265.	270.	275.	3	0	0	0.00	87.61	10029.01

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

FLOW DISTRIBUTION FOR SECNO= 61.39 CWSEL= 2084.54

STA= 9941. 10035.
PER Q= 100.0
AREA= 560.8
VEL= 5.9
DEPTH= 6.4

THIS RUN EXECUTED 30AUG93 16:59:21

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

Flam-Enc.HC2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
	60.000	2001.08	4797.30	10.78	0.00	7.09	0.00	0.00	4797.30	0.00	106.55	9915.79	10022.34
	60.000	2002.08	4797.30	11.78	0.00	6.10	0.00	0.00	4797.30	0.00	112.00	9912.00	10024.00
*	60.080	2011.64	4797.30	7.94	0.00	12.22	0.00	0.00	4797.30	0.00	86.89	9943.48	10030.37
*	60.080	2011.63	4797.30	7.93	0.00	12.23	0.00	0.00	4797.30	0.00	86.88	9943.49	10030.36
*	60.135	2022.11	4797.30	8.21	0.00	8.38	5.68	0.00	4157.53	639.77	266.79	9960.81	10227.60
*	60.135	2021.97	4797.30	8.07	0.00	9.88	0.09	0.00	4797.30	0.00	80.91	9961.09	10042.00
*	60.171	2024.57	5300.00	10.27	2.12	4.97	2.76	420.35	2978.29	1901.36	587.16	9792.54	10379.70
*	60.171	2022.62	5300.00	8.32	0.00	11.89	0.00	0.00	5300.00	0.00	78.80	9968.80	10047.60
*	60.219	2027.11	5300.00	7.91	6.97	10.54	5.01	1201.39	3854.72	243.89	170.00	9900.00	10070.00
*	60.219	2027.28	5300.00	8.08	7.65	11.81	5.18	725.27	4437.53	137.20	120.00	9935.00	10055.00
	60.276	2028.98	5300.00	7.38	0.00	7.06	0.00	0.00	5300.00	0.00	138.58	9924.24	10062.82
*	60.276	2029.88	5300.00	8.28	0.00	6.04	0.00	0.00	5300.00	0.00	141.58	9923.00	10064.58
*	60.301	2031.52	5300.00	9.72	1.31	3.56	1.11	365.71	4606.81	327.48	768.93	9677.60	10446.53
*	60.301	2031.68	5300.00	9.88	0.00	4.01	0.00	0.00	5300.00	0.00	171.80	9905.10	10076.90
*	60.345	2031.08	5300.00	6.98	0.00	9.65	0.00	0.00	5300.00	0.00	96.49	9953.51	10050.00
*	60.345	2031.38	5300.00	7.28	0.00	9.15	0.00	0.00	5300.00	0.00	99.10	9951.44	10050.54
*	60.397	2033.22	5300.00	8.22	0.00	13.10	0.00	0.00	5300.00	0.00	77.20	9969.00	10046.20
*	60.397	2033.24	5300.00	8.24	0.00	13.05	0.00	0.00	5300.00	0.00	77.35	9968.91	10046.26
*	60.446	2037.12	5300.00	10.02	2.82	5.46	0.00	832.12	4467.88	0.00	390.92	9667.49	10058.42
*	60.446	2037.22	5300.00	10.12	0.00	6.40	0.00	0.00	5300.00	0.00	109.04	9949.60	10058.64
*	60.491	2037.89	5300.00	6.19	0.00	11.78	0.00	0.00	5300.00	0.00	106.37	9943.15	10049.51
	60.491	2037.89	5300.00	6.19	0.00	11.78	0.00	0.00	5300.00	0.00	106.36	9943.15	10049.51

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	60.587	2043.83	1870.00	1.63	3.33	3.10	1.07	1131.61	675.18	63.20	732.92	9289.11	10187.30
	60.587	2044.54	1870.00	2.34	0.00	5.30	0.00	0.00	1870.00	0.00	191.50	9862.10	10053.60
*	60.667	2044.82	1870.00	1.42	4.30	1.79	0.00	1865.21	4.79	0.00	467.19	9517.02	10030.32
	60.667	2045.85	1870.00	2.45	3.08	3.22	0.00	1728.20	141.79	0.00	356.31	9700.00	10056.31
*	60.705	2048.90	5300.00	6.20	2.84	3.45	2.69	1431.59	1328.25	2540.16	687.39	9742.60	10430.00
*	60.705	2049.90	5300.00	7.20	3.64	3.76	3.04	1367.90	1723.45	2208.65	290.00	9910.00	10200.00
*	60.800	2050.81	5300.00	3.01	6.48	3.20	4.95	3662.76	472.21	1165.03	453.60	9715.48	10183.94
*	60.800	2051.68	5300.00	3.88	10.66	5.73	0.05	4107.17	1192.82	0.00	197.00	9839.00	10036.00
*	60.866	2055.80	5300.00	6.20	0.00	11.80	0.00	0.00	5300.00	0.00	105.76	9955.03	10060.80
*	60.866	2055.80	5300.00	6.20	0.00	11.80	0.00	0.00	5300.00	0.00	105.77	9955.03	10060.80
*	60.887	2057.00	5300.00	7.20	0.00	12.30	0.00	0.00	5300.00	0.00	91.92	9952.85	10044.77
*	60.887	2057.00	5300.00	7.20	0.00	12.30	0.00	0.00	5300.00	0.00	91.92	9952.85	10044.77
*	60.903	2059.82	3324.00	10.12	0.29	4.02	0.46	25.04	3123.72	175.24	370.00	9880.00	10250.00
*	60.903	2059.76	3324.00	10.06	0.00	4.31	0.00	0.00	3324.00	0.00	104.50	9940.30	10044.80
	60.912	2060.21	3324.00	10.21	0.17	3.77	0.46	6.34	3071.71	245.95	434.82	9870.00	10310.00
	60.912	2060.10	3324.00	10.10	0.00	4.15	0.00	0.00	3324.00	0.00	120.40	9934.00	10054.40
	60.936	2060.18	3324.00	9.28	0.04	4.42	0.00	0.01	3323.99	0.00	126.40	9930.60	10057.01
	60.936	2060.12	3324.00	9.22	0.00	4.47	0.00	0.00	3324.00	0.00	122.66	9934.10	10056.76
*	60.992	2060.23	3324.00	7.93	0.28	5.92	0.32	7.64	3310.14	6.22	211.53	9879.93	10091.46
*	60.992	2060.17	3324.00	7.87	0.00	6.01	0.00	0.00	3324.00	0.00	106.80	9946.70	10053.50
	61.036	2060.41	3324.00	6.81	0.27	7.41	0.00	2.59	3321.41	0.00	132.71	9911.22	10043.92
	61.036	2060.37	3324.00	6.77	0.00	7.49	0.00	0.00	3324.00	0.00	95.17	9948.60	10043.77
	61.073	2060.71	3324.00	6.51	0.00	9.07	0.00	0.00	3324.00	0.00	85.19	9962.17	10047.36
	61.073	2060.69	3324.00	6.49	0.00	9.13	0.00	0.00	3324.00	0.00	85.03	9962.25	10047.28
*	61.080	2061.06	3324.00	6.96	0.00	9.30	0.00	0.00	3324.00	0.00	57.65	9971.13	10028.77
*	61.080	2061.05	3324.00	6.95	0.00	9.32	0.00	0.00	3324.00	0.00	57.63	9971.14	10028.77
*	61.095	2063.81	3324.00	4.61	0.00	11.76	0.00	0.00	3324.00	0.00	66.62	9970.06	10036.68
*	61.095	2063.82	3324.00	4.62	0.00	11.75	0.00	0.00	3324.00	0.00	66.63	9970.05	10036.68
*	61.118	2066.19	3324.00	8.29	0.13	4.84	0.19	0.58	3321.16	2.26	133.16	9936.84	10070.00
*	61.118	2066.19	3324.00	8.29	0.00	4.85	0.00	0.00	3324.00	0.00	108.90	9947.20	10056.10
	61.142	2068.42	3324.00	8.42	0.28	3.15	0.28	13.84	3305.20	4.96	210.00	9860.00	10070.00
	61.142	2068.42	3324.00	8.42	0.00	3.17	0.00	0.00	3324.00	0.00	151.60	9904.70	10056.30
*	61.166	2068.95	3324.00	7.25	2.01	11.90	2.06	571.15	2071.17	681.68	260.00	9880.00	10140.00
*	61.166	2069.84	3324.00	8.14	2.62	13.89	2.33	312.83	2835.85	175.32	83.00	9951.00	10034.00

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	61.237	2074.20	3324.00	5.10	0.00	10.01	0.00	0.00	3324.00	0.00	109.02	9933.64	10042.66
*	61.237	2074.20	3324.00	5.10	0.00	10.01	0.00	0.00	3324.00	0.00	109.01	9933.64	10042.65
	61.340	2081.86	3324.00	7.46	1.36	10.45	0.00	31.06	3292.94	0.00	95.92	9960.00	10055.92
	61.340	2081.90	3324.00	7.50	0.00	10.45	0.00	0.00	3324.00	0.00	73.25	9982.80	10056.05
*	61.391	2084.49	3324.00	8.79	0.00	5.98	0.00	0.00	3324.00	0.00	87.47	9941.40	10028.87
*	61.391	2084.54	3324.00	8.84	0.00	5.93	0.00	0.00	3324.00	0.00	87.61	9941.40	10029.01

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SUMMARY PRINTOUT

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST
	60.000	2001.08	4797.30	0.00	106.55	9915.79	0.00	9878.20	10040.00	0.00	10022.34
	60.000	2002.08	4797.30	0.00	112.00	9912.00	9912.00	9878.20	10040.00	10024.00	10024.00
*	60.080	2011.64	4797.30	420.00	86.89	9943.48	0.00	9919.20	10053.20	0.00	10030.37
*	60.080	2011.63	4797.30	420.00	86.88	9943.49	9919.20	9919.20	10053.20	10053.20	10030.36
*	60.135	2022.11	4797.30	295.00	266.79	9960.81	0.00	9959.30	10041.90	0.00	10227.60
*	60.135	2021.97	4797.30	295.00	80.91	9961.09	9959.00	9959.30	10041.90	10042.00	10042.00
*	60.171	2024.57	5300.00	185.00	587.16	9792.54	9625.00	9968.80	10047.60	10379.70	10379.70
*	60.171	2022.62	5300.00	185.00	78.80	9968.80	9968.80	9968.80	10047.60	10047.60	10047.60
*	60.219	2027.11	5300.00	255.00	170.00	9900.00	9900.00	9975.80	10034.90	10070.00	10070.00
*	60.219	2027.28	5300.00	255.00	120.00	9935.00	9935.00	9975.80	10034.90	10055.00	10055.00
	60.276	2028.98	5300.00	300.00	138.58	9924.24	0.00	9923.00	10065.20	0.00	10062.82
*	60.276	2029.88	5300.00	300.00	141.58	9923.00	9923.00	9923.00	10065.20	10066.00	10064.58
[redacted]	60.301	2031.52	5300.00	135.00	768.93	9677.60	9677.60	9905.10	10076.90	10970.00	10446.53
	60.301	2031.68	5300.00	135.00	171.80	9905.10	9905.10	9905.10	10076.90	10076.90	10076.90
*	60.345	2031.08	5300.00	230.00	96.49	9953.51	9606.80	9922.90	10053.00	10234.50	10050.00
*	60.345	2031.38	5300.00	230.00	99.10	9951.44	9922.90	9922.90	10053.00	10053.00	10050.54
*	60.397	2033.22	5300.00	275.00	77.20	9969.00	9553.10	9958.90	10051.60	10568.00	10046.20
*	60.397	2033.24	5300.00	275.00	77.35	9968.91	9958.90	9958.90	10051.60	10051.60	10046.26
*	60.446	2037.12	5300.00	260.00	390.92	9667.49	9600.00	9949.60	10062.90	10180.00	10058.42
*	60.446	2037.22	5300.00	260.00	109.04	9949.60	9949.60	9949.60	10062.90	10062.90	10058.64
*	60.491	2037.89	5300.00	240.00	106.37	9943.15	9335.00	9937.60	10056.70	10205.30	10049.51
*	60.491	2037.89	5300.00	240.00	106.36	9943.15	9937.60	9937.60	10056.70	10056.70	10049.51
*	60.587	2043.83	1870.00	505.00	732.92	9289.11	9260.00	9862.10	10053.60	10187.30	10187.30
	60.587	2044.54	1870.00	505.00	191.50	9862.10	9862.10	9862.10	10053.60	10053.60	10053.60
*	60.667	2044.82	1870.00	420.00	467.19	9517.02	9220.00	10000.00	10062.70	10194.00	10030.32
	60.667	2045.85	1870.00	420.00	356.31	9700.00	9700.00	10000.00	10062.70	10062.70	10056.31
*	60.705	2048.90	5300.00	200.00	687.39	9742.60	0.00	9970.20	10043.60	0.00	10430.00
*	60.705	2049.90	5300.00	200.00	290.00	9910.00	9910.00	9970.20	10043.60	10200.00	10200.00
*	60.800	2050.81	5300.00	505.00	453.60	9715.48	0.00	9965.60	10035.90	0.00	10183.94
[redacted]	60.800	2051.68	5300.00	505.00	197.00	9839.00	9839.00	9965.60	10035.90	10036.00	10036.00
*	60.866	2055.80	5300.00	350.00	105.76	9955.03	9210.00	9951.00	10060.80	10060.80	10060.80
*	60.866	2055.80	5300.00	350.00	105.77	9955.03	9951.00	9951.00	10060.80	10060.80	10060.80

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST
*	60.887	2057.00	5300.00	110.00	91.92	9952.85	9300.00	9945.50	10065.00	10150.00	10044.77
*	60.887	2057.00	5300.00	110.00	91.92	9952.85	9945.50	9945.50	10065.00	10065.00	10044.77
*	60.903	2059.82	3324.00	85.00	370.00	9880.00	9880.00	9940.30	10044.80	10250.00	10250.00
*	60.903	2059.76	3324.00	85.00	104.50	9940.30	9940.30	9940.30	10044.80	10044.80	10044.80
	60.912	2060.21	3324.00	45.00	434.82	9870.00	9870.00	9934.00	10054.40	10310.00	10310.00
	60.912	2060.10	3324.00	45.00	120.40	9934.00	9934.00	9934.00	10054.40	10054.40	10054.40
	60.936	2060.18	3324.00	125.00	126.40	9930.60	9930.50	9934.10	10057.50	10219.40	10057.01
	60.936	2060.12	3324.00	125.00	122.66	9934.10	9934.10	9934.10	10057.50	10057.50	10056.76
*	60.992	2060.23	3324.00	300.00	211.53	9879.93	9780.00	9946.70	10053.50	10345.00	10091.46
*	60.992	2060.17	3324.00	300.00	106.80	9946.70	9946.70	9946.70	10053.50	10053.50	10053.50
	61.036	2060.41	3324.00	228.00	132.71	9911.22	9780.00	9948.60	10047.00	10530.00	10043.92
	61.036	2060.37	3324.00	228.00	95.17	9948.60	9948.60	9948.60	10047.00	10047.00	10043.77
	61.073	2060.71	3324.00	200.00	85.19	9962.17	9800.00	9954.60	10078.30	10560.00	10047.36
	61.073	2060.69	3324.00	200.00	85.03	9962.25	9954.60	9954.60	10078.30	10078.30	10047.28
*	61.080	2061.06	3324.00	35.00	57.65	9971.13	9780.00	9968.50	10070.20	10545.00	10028.77
*	61.080	2061.05	3324.00	35.00	57.63	9971.14	9968.50	9968.50	10070.20	10070.20	10028.77
*	61.095	2063.81	3324.00	78.00	66.62	9970.06	9535.00	9956.20	10048.10	10535.00	10036.68
*	61.095	2063.82	3324.00	78.00	66.63	9970.05	9956.20	9956.20	10048.10	10048.10	10036.68
*	61.118	2066.19	3324.00	120.00	133.16	9936.84	9760.00	9947.20	10056.10	10070.00	10070.00
*	61.118	2066.19	3324.00	120.00	108.90	9947.20	9947.20	9947.20	10056.10	10056.10	10056.10
	61.142	2068.42	3324.00	130.00	210.00	9860.00	9860.00	9904.70	10056.30	10070.00	10070.00
	61.142	2068.42	3324.00	130.00	151.60	9904.70	9904.70	9904.70	10056.30	10056.30	10056.30
*	61.166	2068.95	3324.00	125.00	260.00	9880.00	9880.00	9981.00	10014.60	10140.00	10140.00
*	61.166	2069.84	3324.00	125.00	83.00	9951.00	9951.00	9981.00	10014.60	10034.00	10034.00
*	61.237	2074.20	3324.00	375.00	109.02	9933.64	9770.00	9866.00	10062.90	10334.90	10042.66
*	61.237	2074.20	3324.00	375.00	109.01	9933.64	9866.00	9866.00	10062.90	10062.90	10042.65
	61.340	2081.86	3324.00	545.00	95.92	9960.00	9960.00	9982.80	10064.70	10100.00	10055.92
	61.340	2081.90	3324.00	545.00	73.25	9982.80	9982.80	9982.80	10064.70	10064.70	10056.05
*	61.391	2084.49	3324.00	270.00	87.47	9941.40	9941.40	9941.40	10035.00	10335.00	10028.87
*	61.391	2084.54	3324.00	270.00	87.61	9941.40	9941.40	9941.40	10035.00	10035.00	10029.01

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SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	60.171	2025.26	2019.30	2043.65	2022.80	1884.65	3417.20	30.00	0.00	10.27	2024.57	4.97	2024.83
*	60.171	2025.77	2019.30	2043.51	2022.80	1925.67	3376.48	30.00	0.00	8.32	2022.62	11.89	2024.81
*	60.301	2029.76	2025.90	2036.99	2028.40	3085.83	2219.01	30.00	0.06	9.72	2031.52	3.56	2031.70
*	60.301	2030.44	2025.90	2037.89	2028.40	2686.15	2637.26	30.00	0.03	9.88	2031.68	4.01	2031.93
	60.912	2060.12	2057.60	2060.41	2056.50	1787.97	1553.36	30.00	0.01	10.21	2060.21	3.77	2060.41
	60.912	2060.07	2057.60	2060.37	2056.50	1811.84	1528.54	30.00	0.01	10.10	2060.10	4.15	2060.37
*	61.080	2062.40	2062.50	0.00	2064.30	3324.00	0.00	1.00	0.35	6.96	2061.06	9.30	2062.40
*	61.080	2062.40	2062.50	0.00	2064.30	3324.00	0.00	1.00	0.36	6.95	2061.05	9.32	2062.40
	61.142	2066.58	2064.10	2070.72	2065.90	2412.60	911.41	30.00	0.03	8.42	2068.42	3.15	2068.58
	61.142	2066.58	2064.10	2070.72	2065.90	2413.09	911.04	30.00	0.03	8.42	2068.42	3.17	2068.58

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=     60.080  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.080  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.080  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.080  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.080  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     60.135  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.135  PROFILE=  1  MINIMUM SPECIFIC ENERGY
WARNING SECNO=     60.135  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     60.171  PROFILE=  1  HYDRAULIC JUMP D.S.
WARNING SECNO=     60.171  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=     60.171  PROFILE=  2  HYDRAULIC JUMP D.S.
WARNING SECNO=     60.171  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     60.219  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.219  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.219  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     60.219  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.219  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
[redacted]N SECNO=     60.219  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     60.276  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     60.301  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     60.301  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     60.345  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     60.345  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     60.397  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.397  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.397  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     60.397  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.397  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.397  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     60.446  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     60.446  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     60.491  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.491  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.491  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     60.491  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.491  PROFILE=  2  MINIMUM SPECIFIC ENERGY

[redacted]IG SECNO=     60.587  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     60.667  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE    SECNO=     60.705  PROFILE=  1  WSEL BASED ON X5 CARD
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[redacted]G SECNO= 60.705 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
NOTE SECNO= 60.705 PROFILE= 2 WSEL BASED ON X5 CARD
WARNING SECNO= 60.705 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 60.800 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.800 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.800 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 60.800 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.800 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.800 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 60.866 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.866 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.866 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 60.866 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.866 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.866 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 60.887 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.887 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.887 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 60.887 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.887 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.887 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

[redacted]G SECNO= 60.903 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
[redacted]NG SECNO= 60.903 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 60.992 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 60.992 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 61.080 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 61.080 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 61.095 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 61.095 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 61.095 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 61.095 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 61.095 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 61.095 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 61.118 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 61.118 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 61.166 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 61.166 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 61.166 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 61.166 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 61.166 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 61.166 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

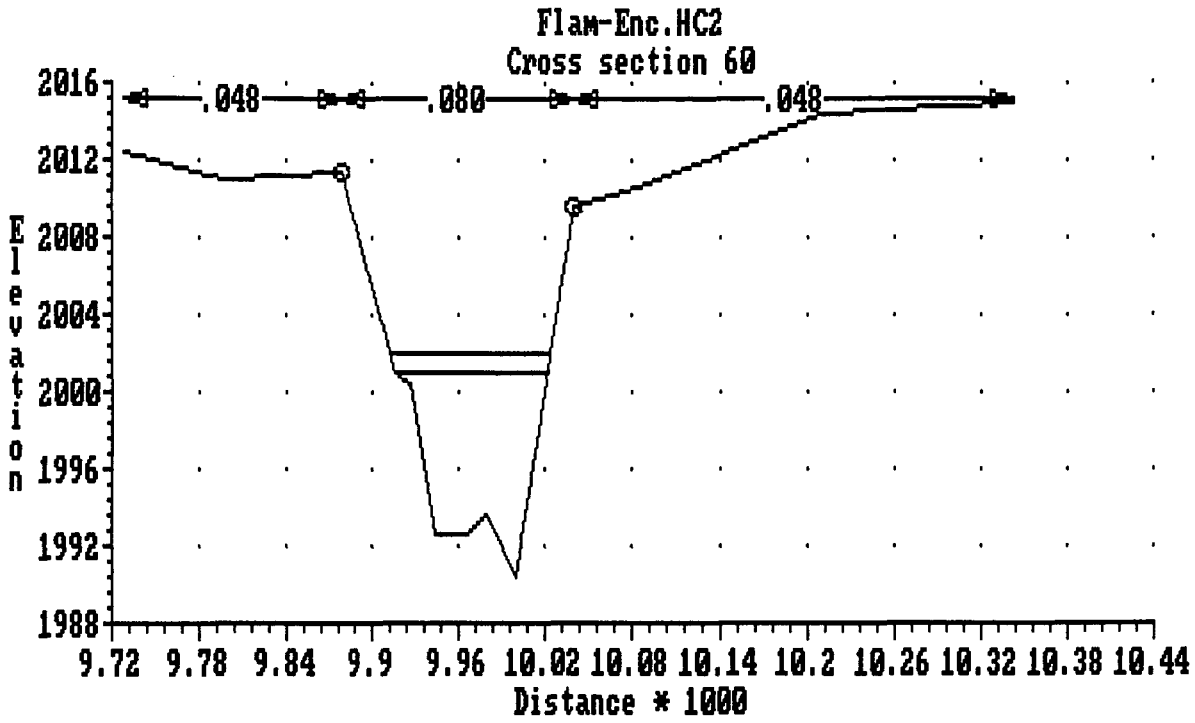
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[redacted]ON SECNO= 61.237 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 61.237 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

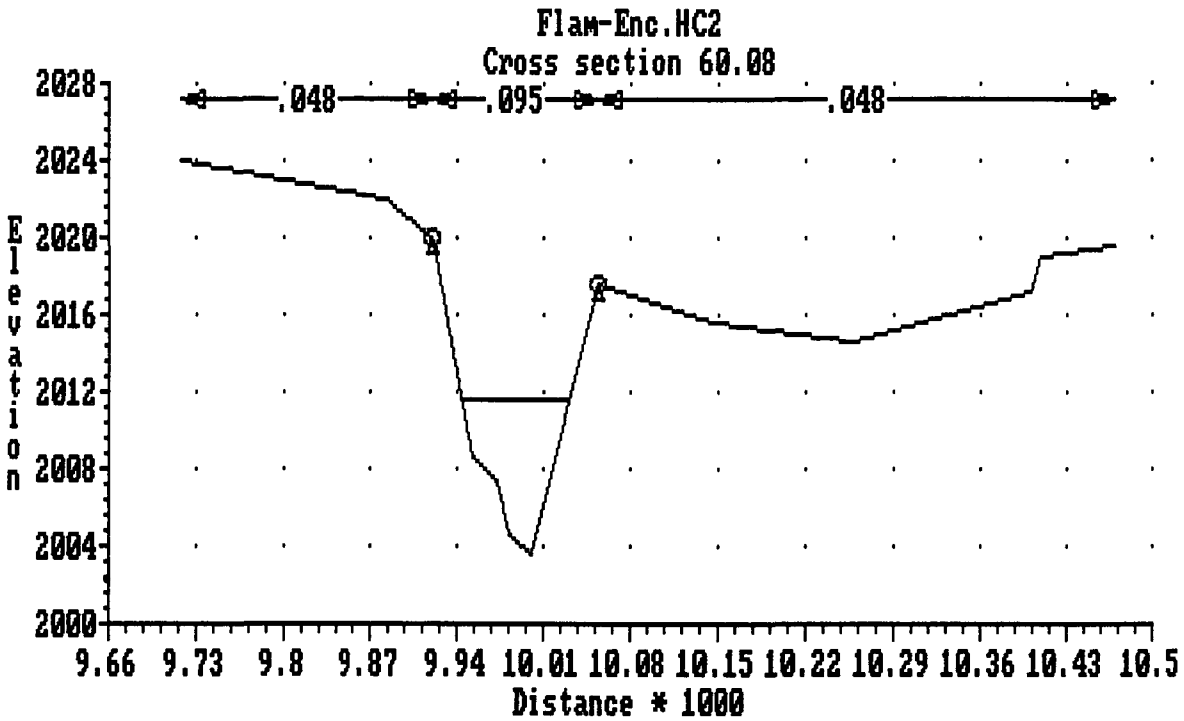
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CAUTION SECNO= 61.237 PROFILE= 2 MINIMUM SPECIFIC ENERGY

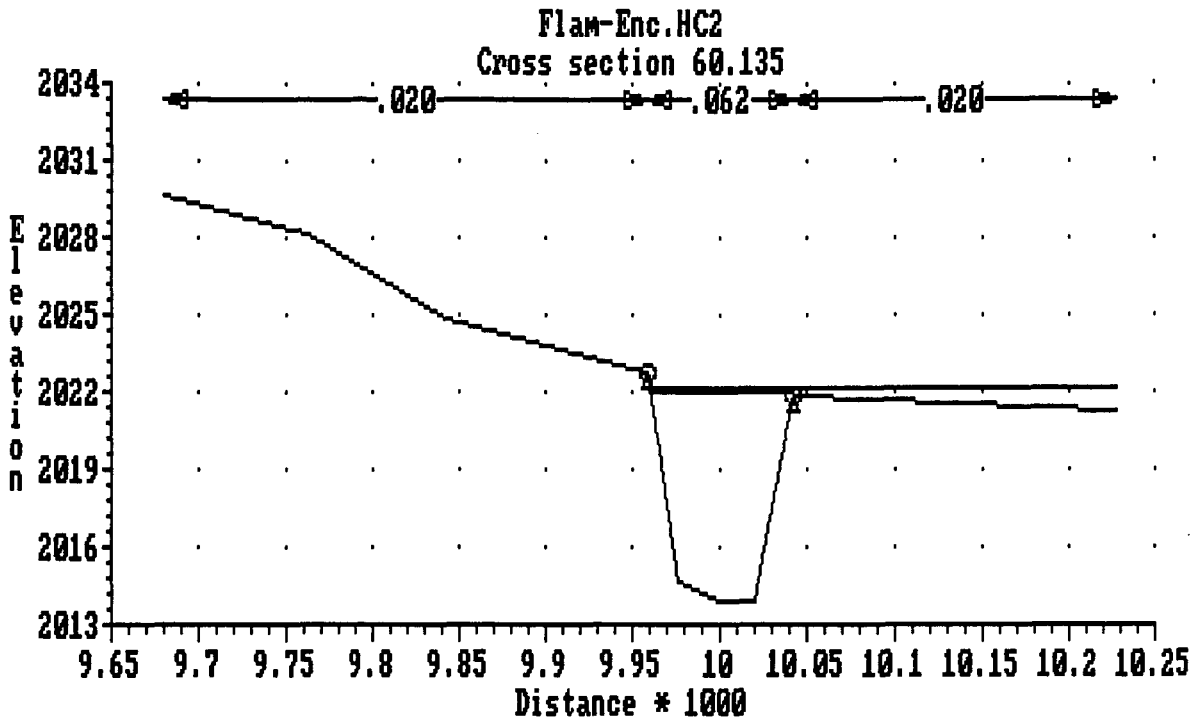
WARNING SECNO= 61.391 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 61.391 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

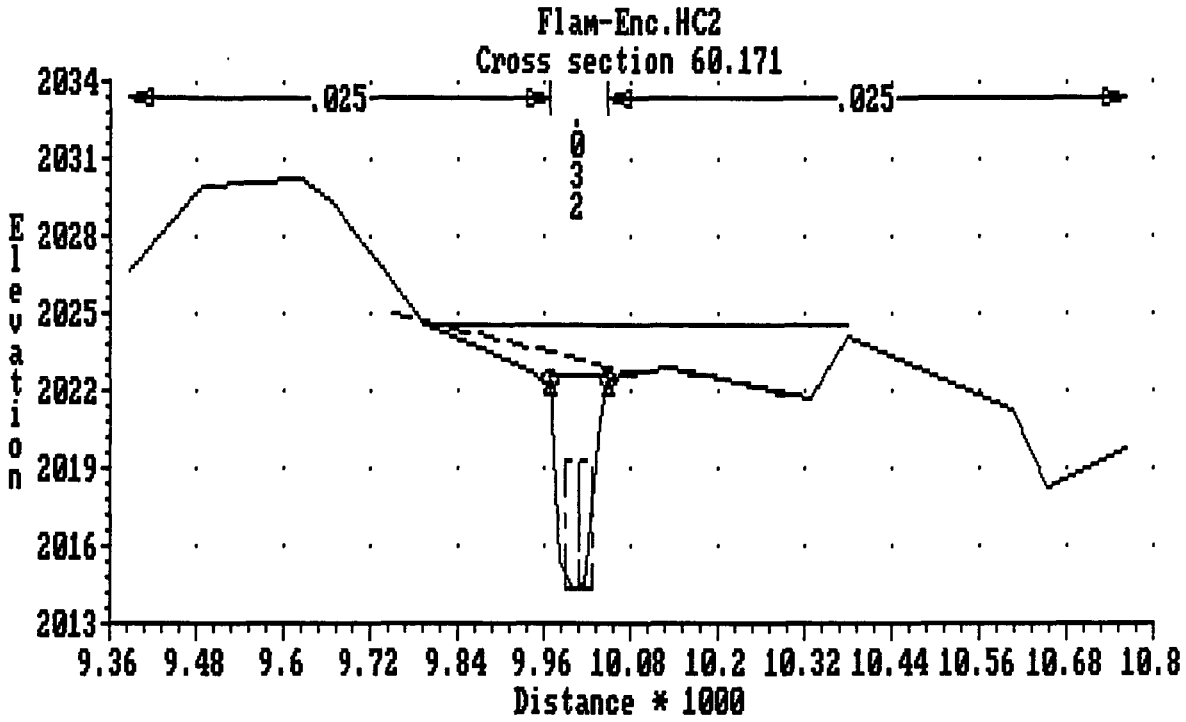
FLOODWAY DATA, Flam-Enc.HC2
PROFILE NO. 2

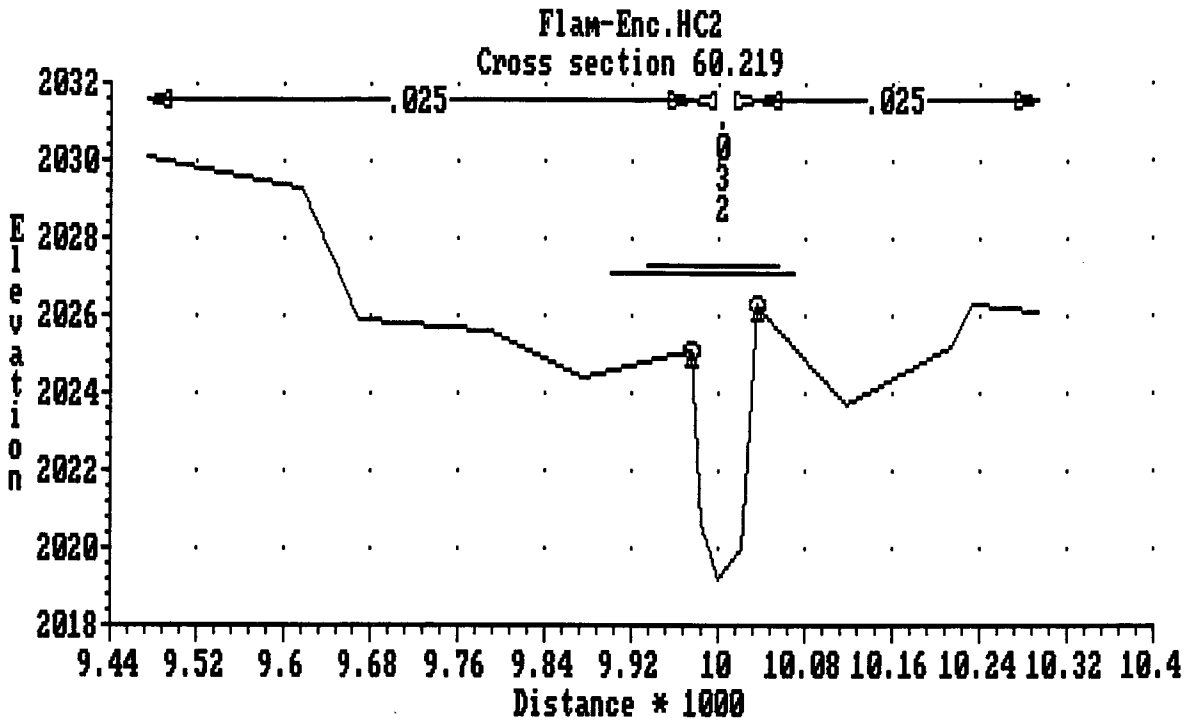
STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
60.000	112.	786.	6.1	2002.1	2001.1	1.0
60.080	87.	392.	12.2	2011.6	2011.6	0.0
60.135	81.	486.	9.9	2022.0	2022.1	-0.1
60.171	79.	446.	11.9	2022.7	2024.6	-1.9
60.219	120.	497.	10.7	2027.3	2027.1	0.2
60.276	142.	877.	6.0	2029.9	2029.0	0.9
60.301	172.	1321.	4.0	2031.7	2031.5	0.2
60.345	99.	579.	9.2	2031.4	2031.1	0.3
60.397	77.	406.	13.0	2033.2	2033.2	0.0
60.446	109.	828.	6.4	2037.2	2037.1	0.1
60.491	106.	450.	11.8	2037.9	2037.9	0.0
60.587	191.	353.	5.3	2044.5	2043.8	0.7
60.667	356.	605.	3.1	2045.8	2044.8	1.0
60.705	290.	1560.	3.4	2049.9	2048.9	1.0
60.800	197.	594.	8.9	2051.7	2050.8	0.9
0.866	106.	449.	11.8	2055.8	2055.8	0.0
0.887	92.	431.	12.3	2057.0	2057.0	0.0
60.903	104.	771.	4.3	2059.7	2059.8	-0.1
60.912	120.	802.	4.1	2060.1	2060.2	-0.1
60.936	123.	744.	4.5	2060.1	2060.2	-0.1
60.992	107.	553.	6.0	2060.1	2060.2	-0.1
61.036	95.	444.	7.5	2060.4	2060.4	0.0
61.073	85.	364.	9.1	2060.7	2060.7	0.0
61.080	58.	356.	9.3	2061.1	2061.1	0.0
61.095	67.	283.	11.7	2063.8	2063.8	0.0
61.118	109.	686.	4.8	2066.2	2066.2	0.0
61.142	152.	1047.	3.2	2068.4	2068.4	0.0
61.166	83.	399.	8.3	2069.8	2068.9	0.9
61.237	109.	332.	10.0	2074.2	2074.2	0.0
61.340	73.	318.	10.5	2081.9	2081.9	0.0
61.391	88.	561.	5.9	2084.6	2084.5	0.1

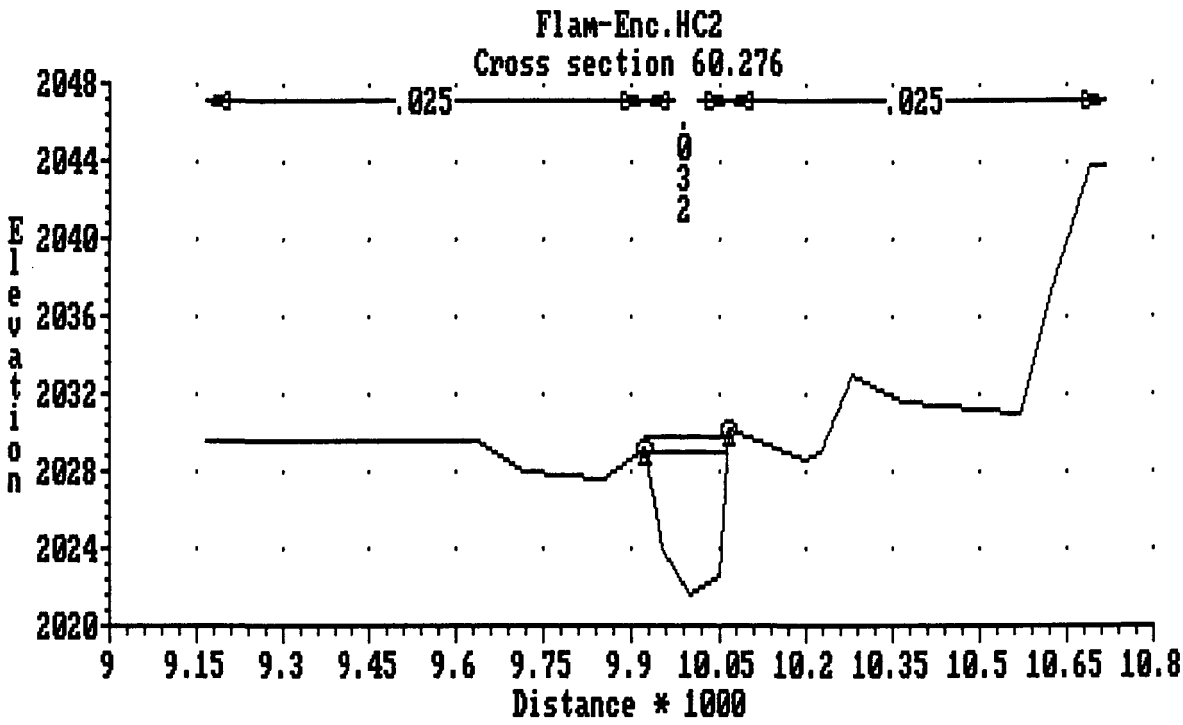

Flam-Enc.HC2
Cross section 60
.048
.080
.048
2016
2012
2008
2004
2000
1996
1992
1988
Elevation
9.72
9.78
9.84
9.9
9.96
10.02
10.08
10.14
10.2
10.26
10.32
10.38
10.44
Distance * 1000

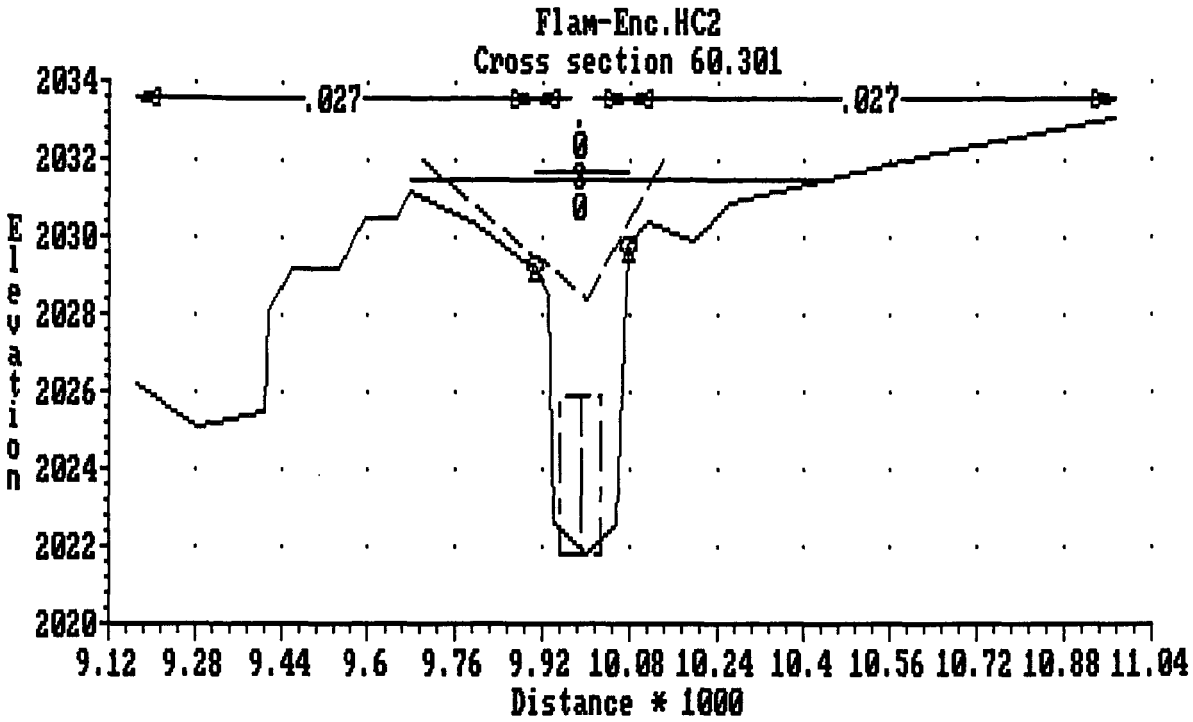

Flam-Enc.HC2
Cross section 60.08
.048
.095
.048
2028
2024
2020
2016
2012
2008
2004
2000
Elevation
9.66
9.73
9.8
9.87
9.94
10.01
10.08
10.15
10.22
10.29
10.36
10.43
10.5
Distance * 1000

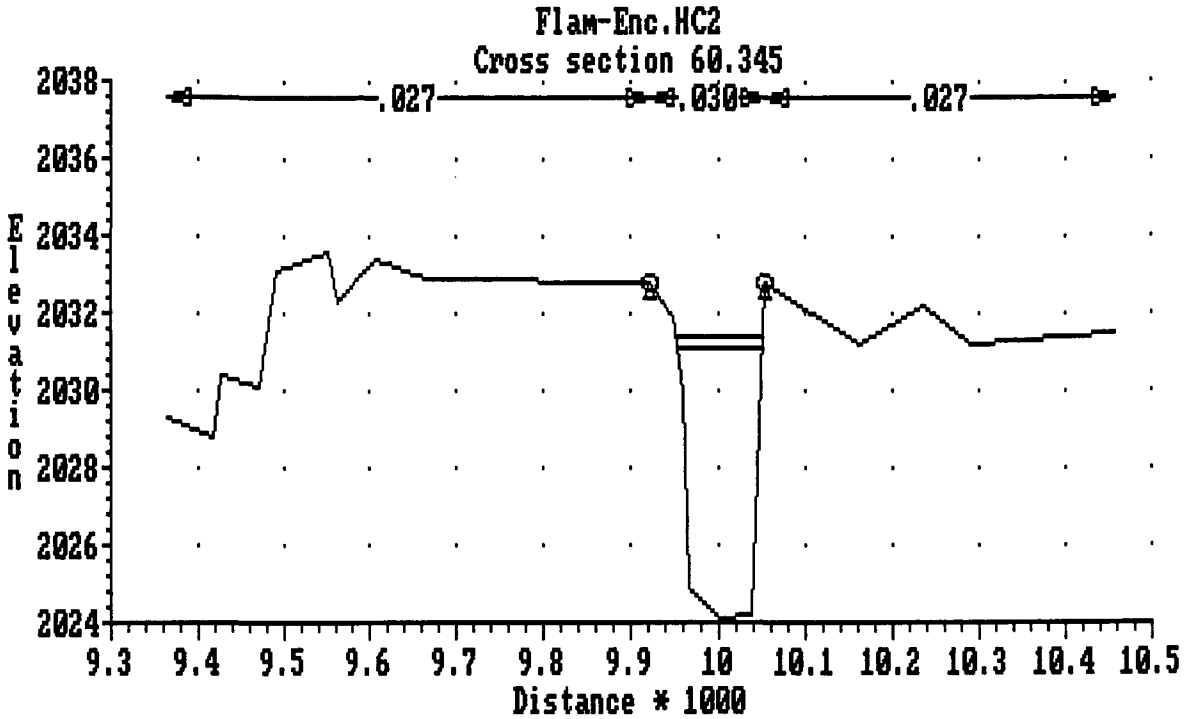

Flam-Enc.HC2
Cross section 60.135
.020
.062
.020
2034
2031
2028
2025
2022
2019
2016
2013
Elevation
9.65
9.7
9.75
9.8
9.85
9.9
9.95
10
10.05
10.1
10.15
10.2
10.25
Distance * 1000

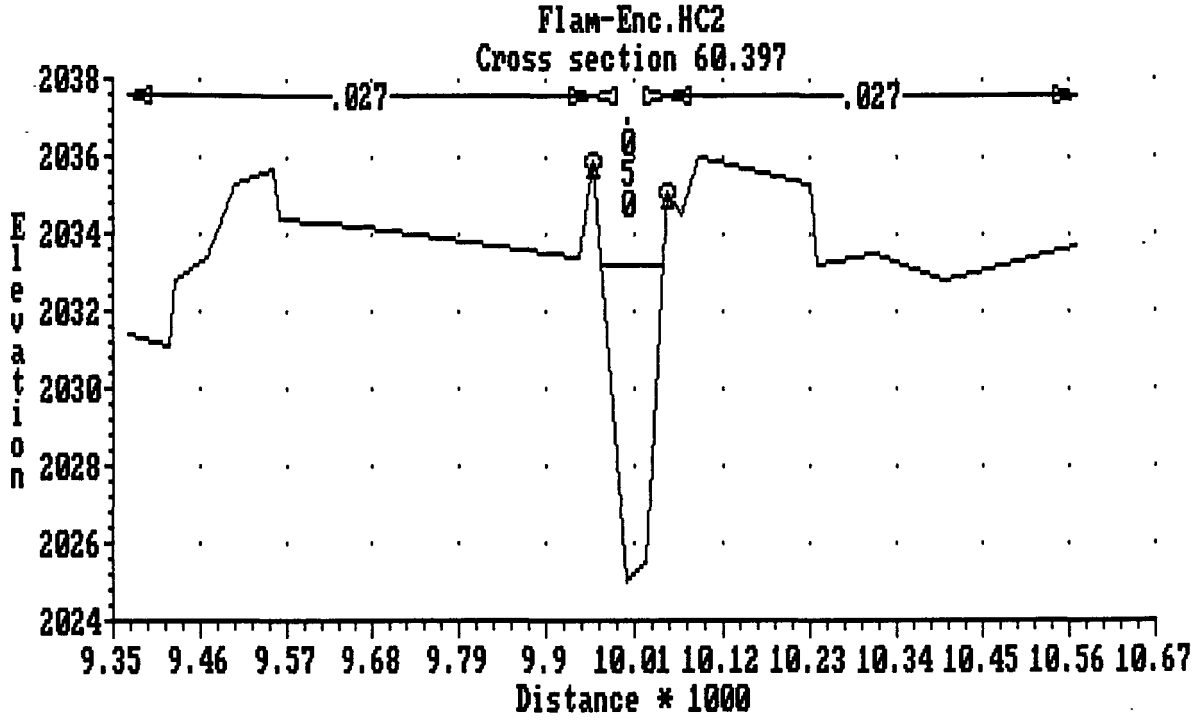

Flam-Enc.HC2
Cross section 60.171
.025
.025
.032
Elevation
2034
2031
2028
2025
2022
2019
2016
2013
9.36
9.48
9.6
9.72
9.84
9.96
10.08
10.2
10.32
10.44
10.56
10.68
10.8
Distance * 1000

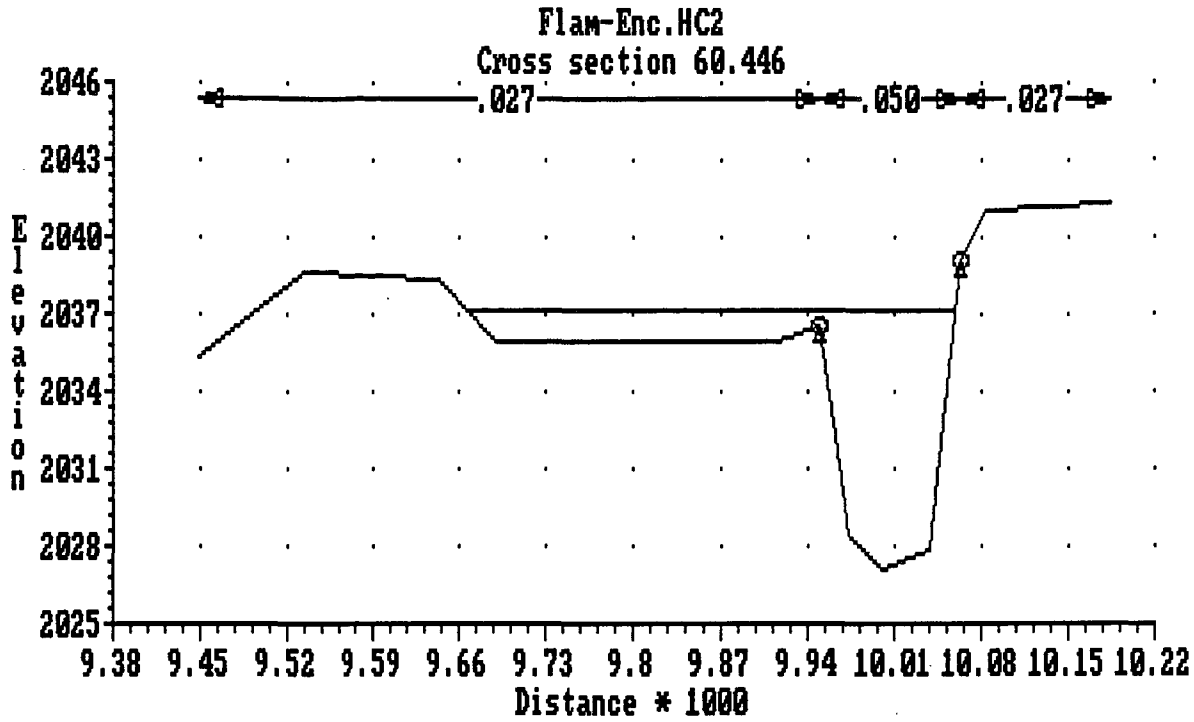

Flam-Enc.HC2
Cross section 60.219
.025
.025
.032
Elevation
2032
2030
2028
2026
2024
2022
2020
2018
9.44 9.52 9.6 9.68 9.76 9.84 9.92 10 10.08 10.16 10.24 10.32 10.4
Distance * 1000

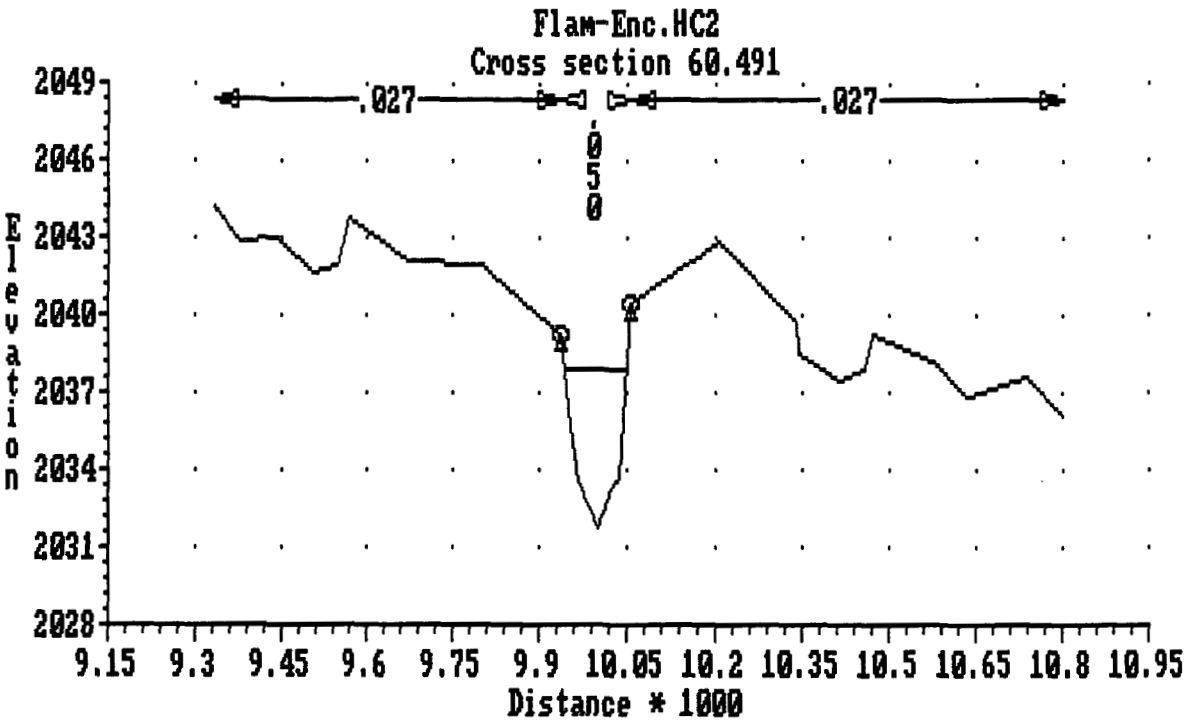

Flam-Enc.HC2
Cross section 60.276
.025
.032
.025
Elevation
2048
2044
2040
2036
2032
2028
2024
2020
9
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
Distance * 1000

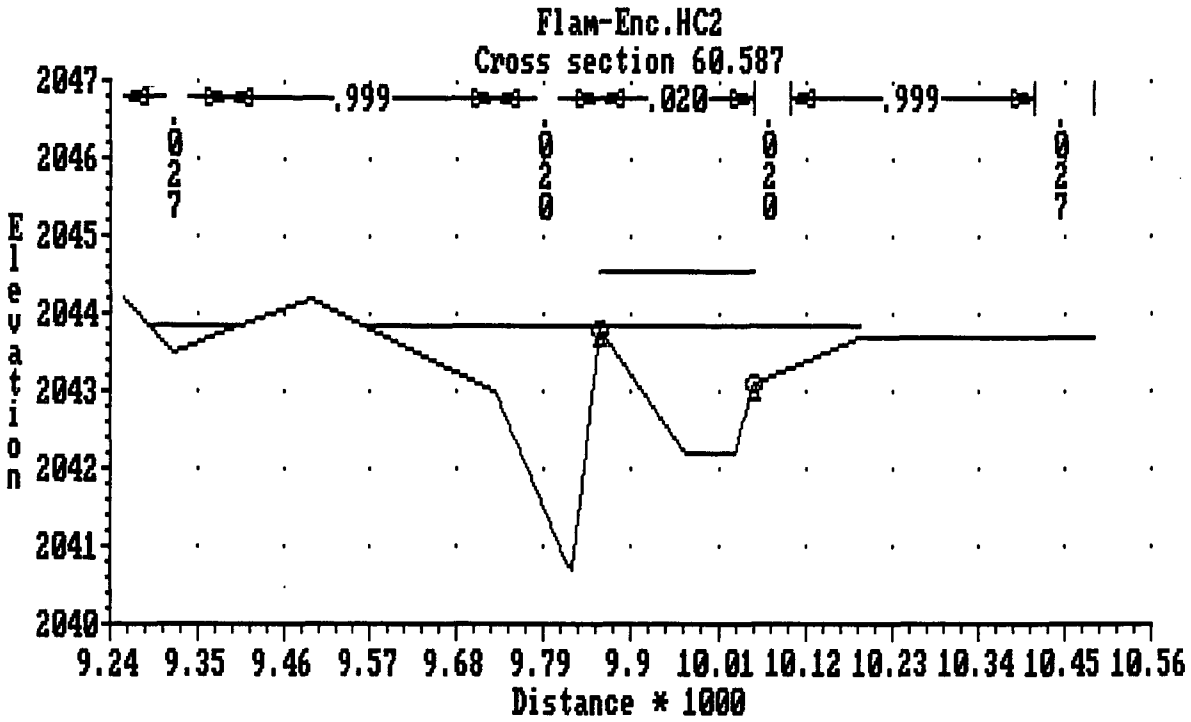

Flam-Enc.HC2
Cross section 60.301
.027
.027
0
0
Elevation
2034
2032
2030
2028
2026
2024
2022
2020
9.12 9.28 9.44 9.6 9.76 9.92 10.08 10.24 10.4 10.56 10.72 10.88 11.04
Distance * 1000

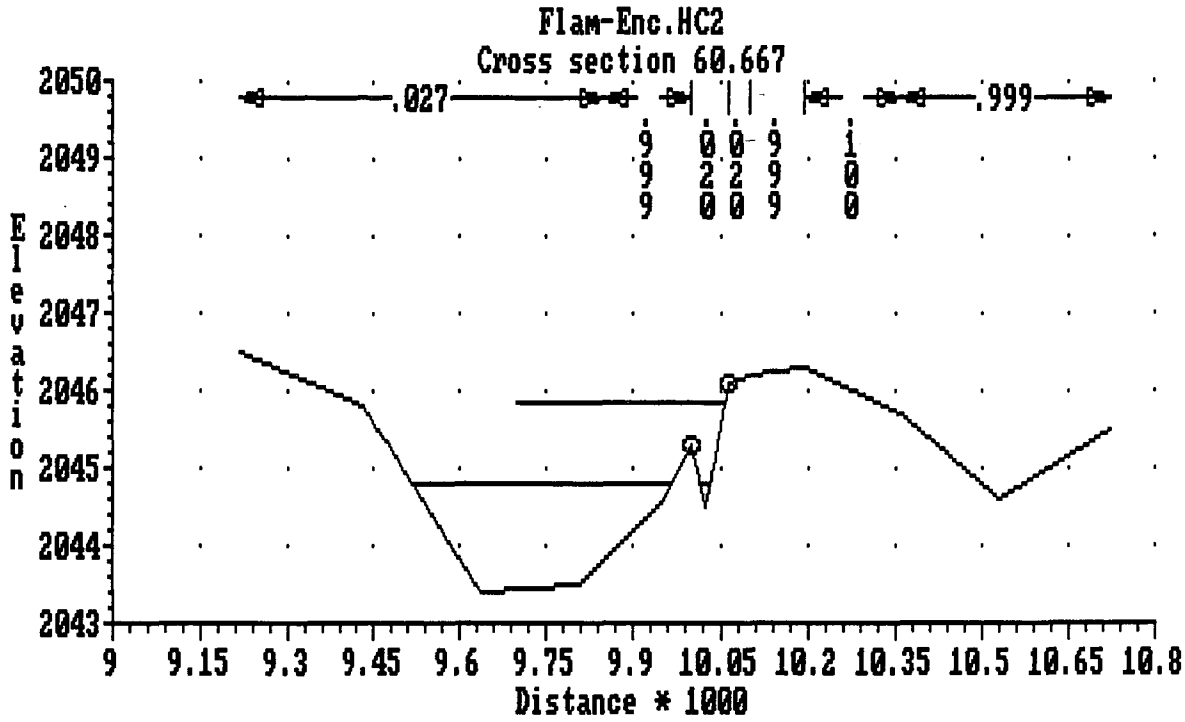

Flam-Enc.HC2
Cross section 60.345
.027
.030
.027
2038
2036
2034
2032
2030
2028
2026
2024
Elevation
9.3
9.4
9.5
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
Distance * 1000

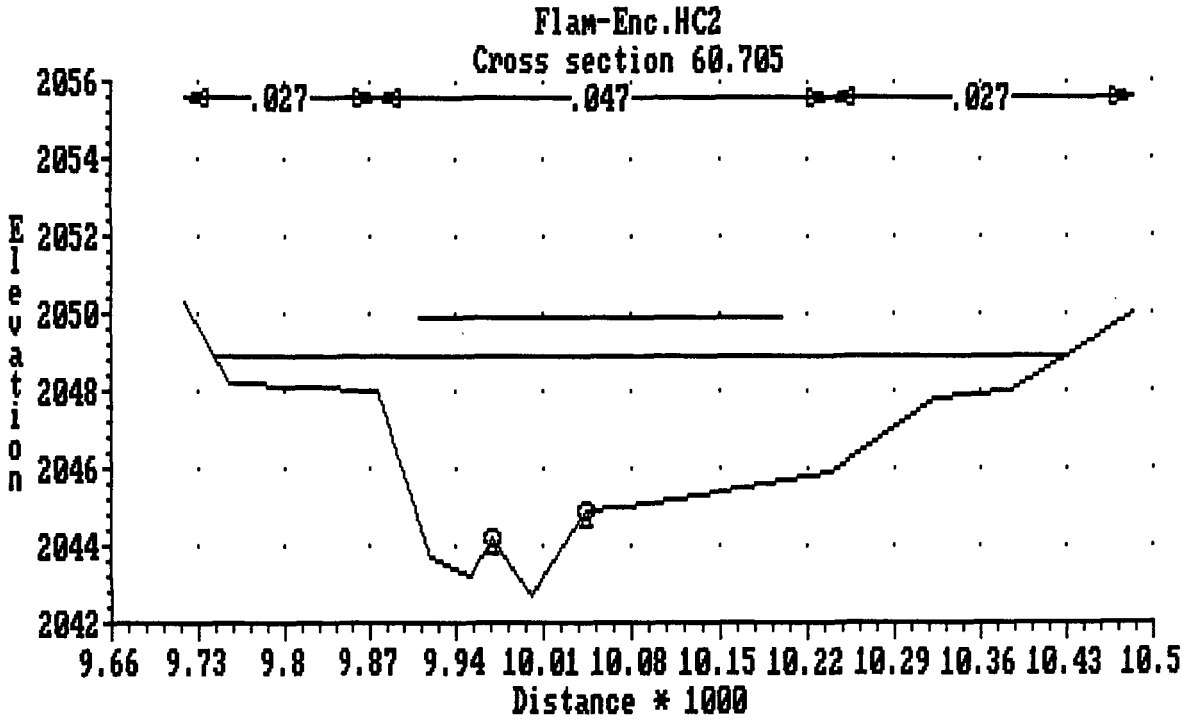

Flam-Enc.HC2
Cross section 60.397
.027
.027
.050
Elevation
2038
2036
2034
2032
2030
2028
2026
2024
9.35
9.46
9.57
9.68
9.79
9.9
10.01
10.12
10.23
10.34
10.45
10.56
10.67
Distance * 1000

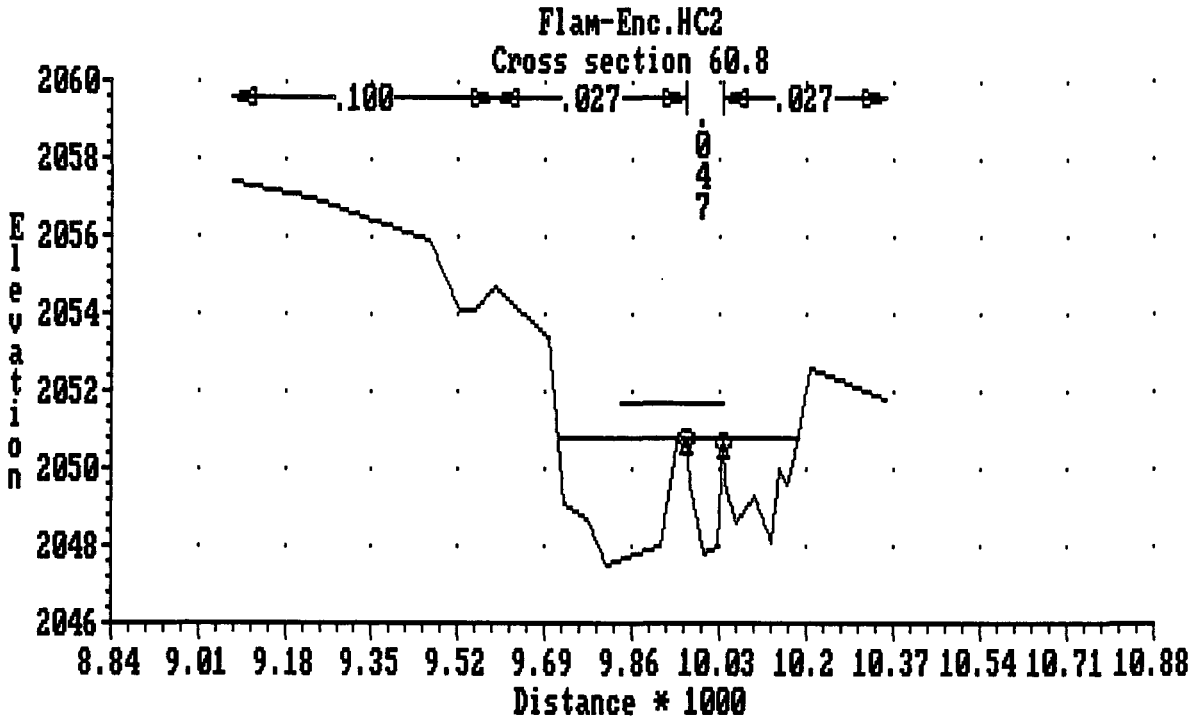

Flam-Enc.HC2
Cross section 60.446
.027
.050
.027
Elevation
2046
2043
2040
2037
2034
2031
2028
2025
9.38
9.45
9.52
9.59
9.66
9.73
9.8
9.87
9.94
10.01
10.08
10.15
10.22
Distance * 1000

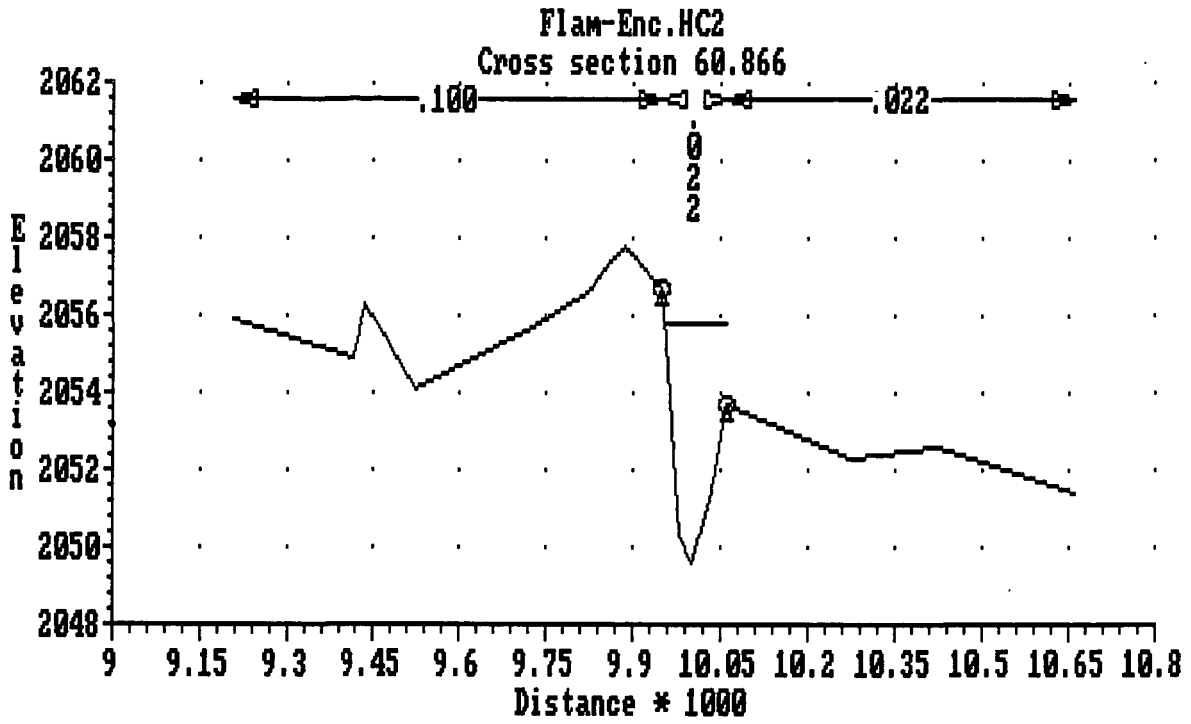

Flam-Enc.HC2
Cross section 60.491
.027
.050
.027
Elevation
2049
2046
2043
2040
2037
2034
2031
2028
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
10.95
Distance * 1000

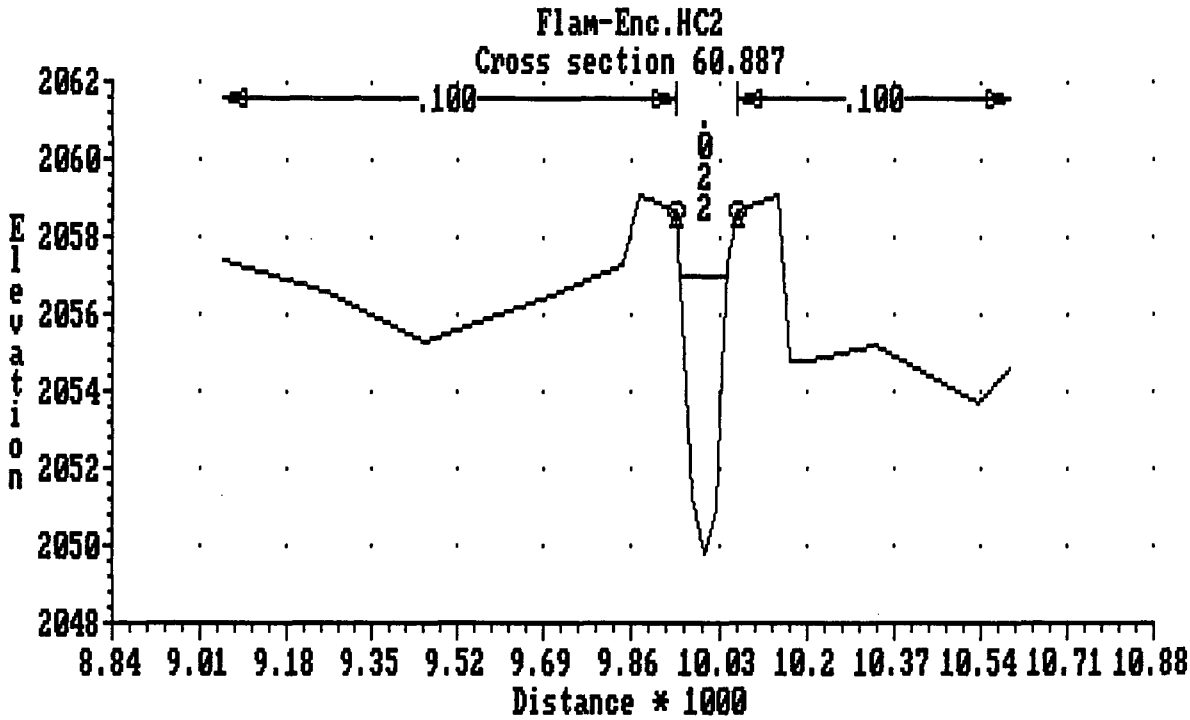

Flam-Enc.HC2
Cross section 60.587
.999
.020
.999
.027
.020
.020
.027
Elevation
2047
2046
2045
2044
2043
2042
2041
2040
9.24
9.35
9.46
9.57
9.68
9.79
9.9
10.01
10.12
10.23
10.34
10.45
10.56
Distance * 1000

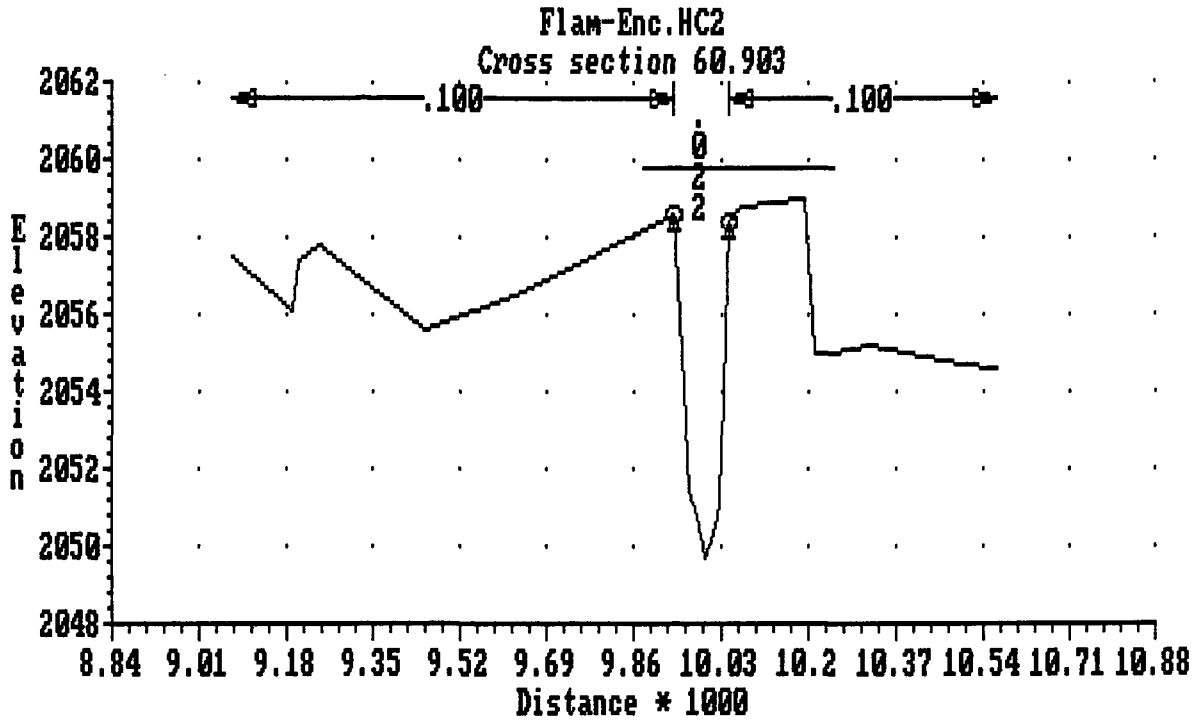

Flam-Enc.HC2
Cross section 60.667
.027
.999
Elevation
2050
2049
2048
2047
2046
2045
2044
2043
9
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
Distance * 1000

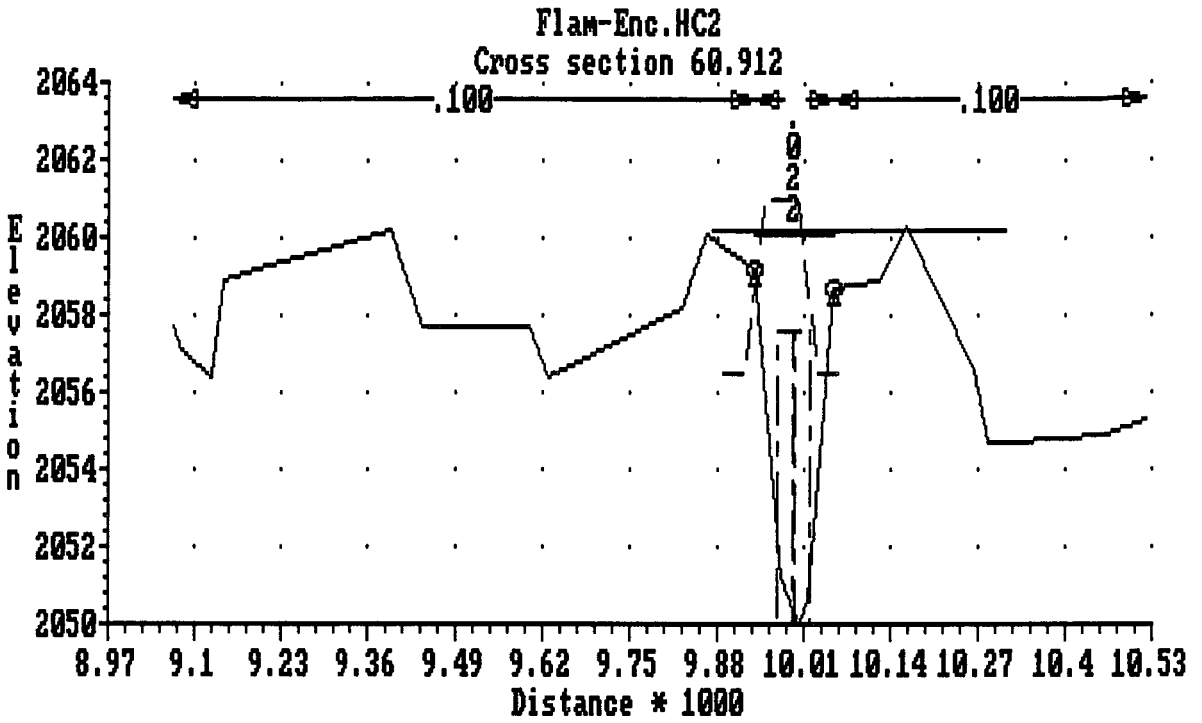

Flam-Enc.HC2
Cross section 60.705
.027
.047
.027
2056
2054
2052
2050
2048
2046
2044
2042
Elevation
9.66
9.73
9.8
9.87
9.94
10.01
10.08
10.15
10.22
10.29
10.36
10.43
10.5
Distance * 1000

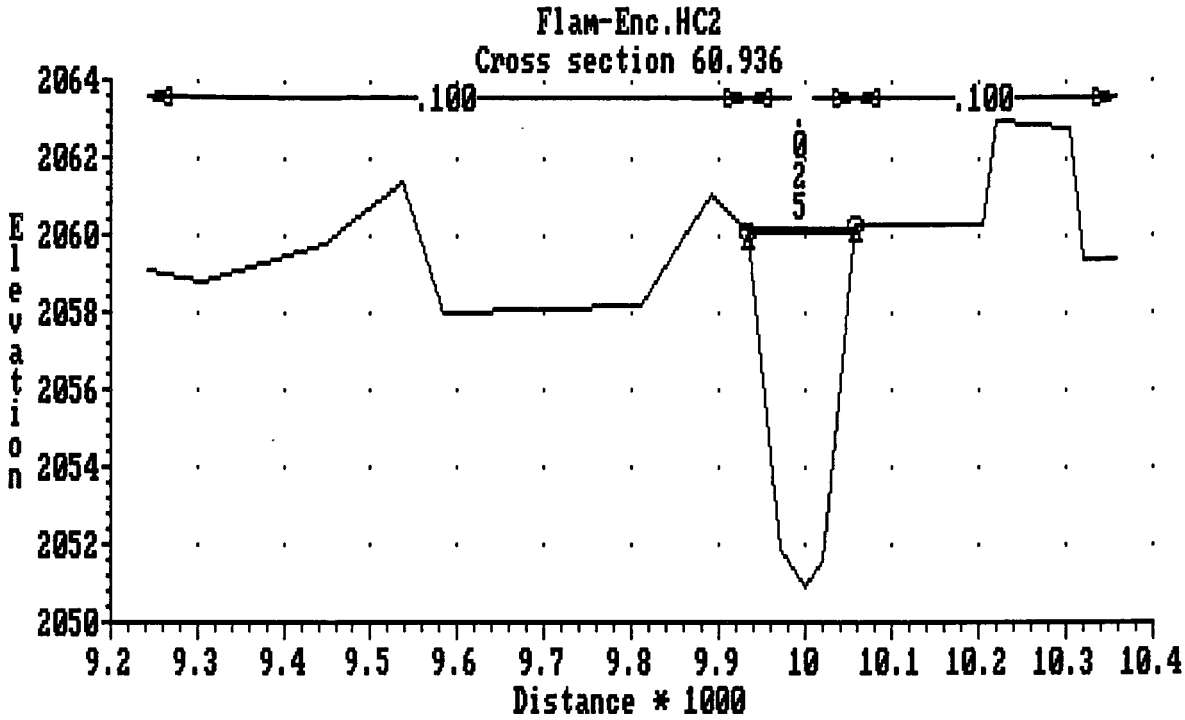

Flam-Enc.HC2
Cross section 60.8
.100
.027
.027
047
Elevation
2060
2058
2056
2054
2052
2050
2048
2046
8.84
9.01
9.18
9.35
9.52
9.69
9.86
10.03
10.2
10.37
10.54
10.71
10.88
Distance * 1000

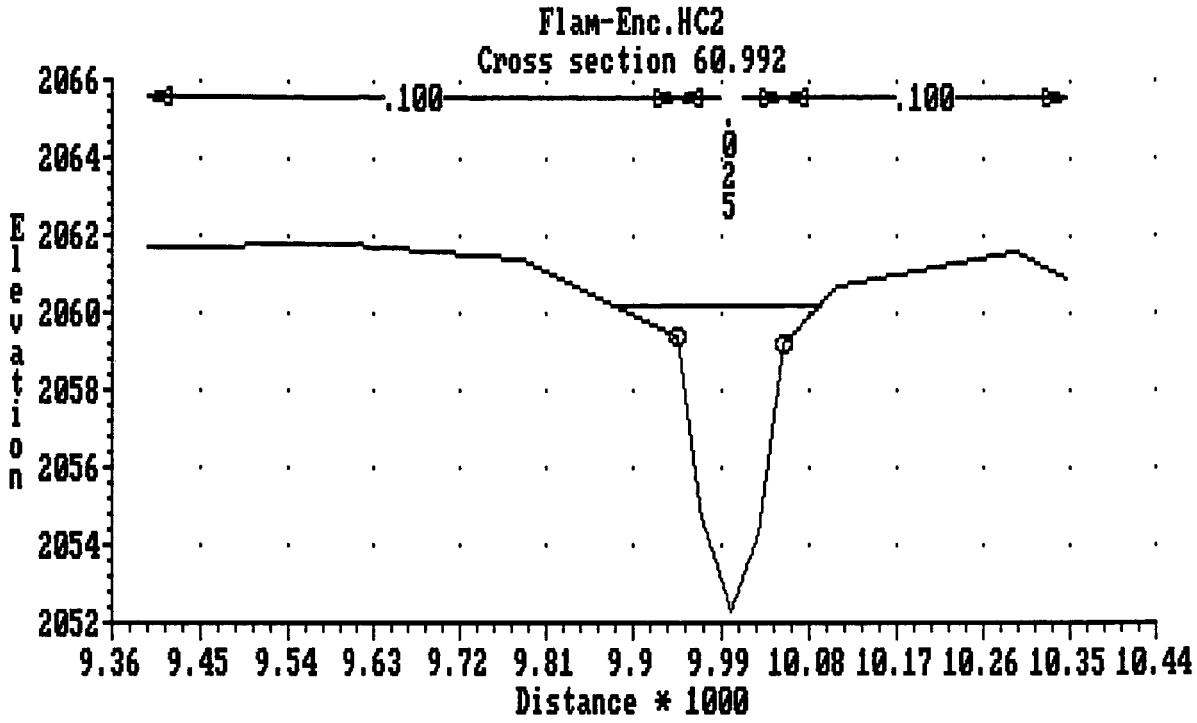

Flam-Enc.HC2
Cross section 60.866
.100
.022
.022
Elevation
2062
2060
2058
2056
2054
2052
2050
2048
9
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
Distance * 1000

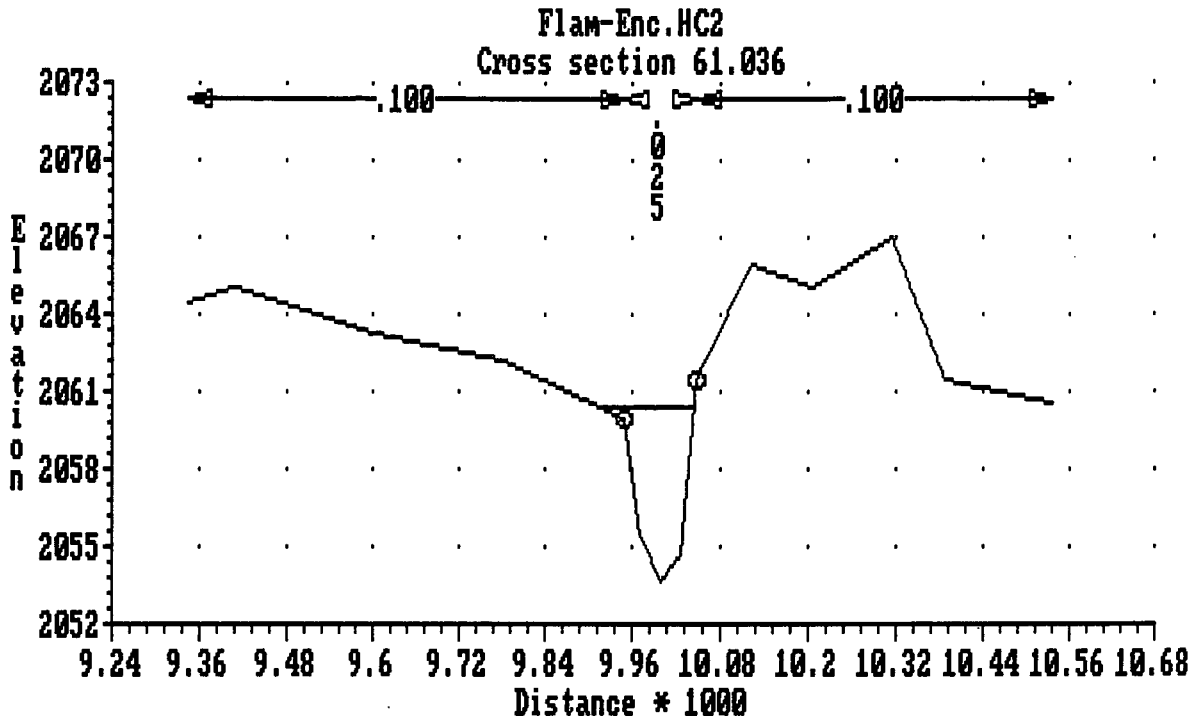

Flam-Enc.HC2
Cross section 60.887
.100
.100
.022
Elevation
2062
2060
2058
2056
2054
2052
2050
2048
8.84 9.01 9.18 9.35 9.52 9.69 9.86 10.03 10.2 10.37 10.54 10.71 10.88
Distance * 1000

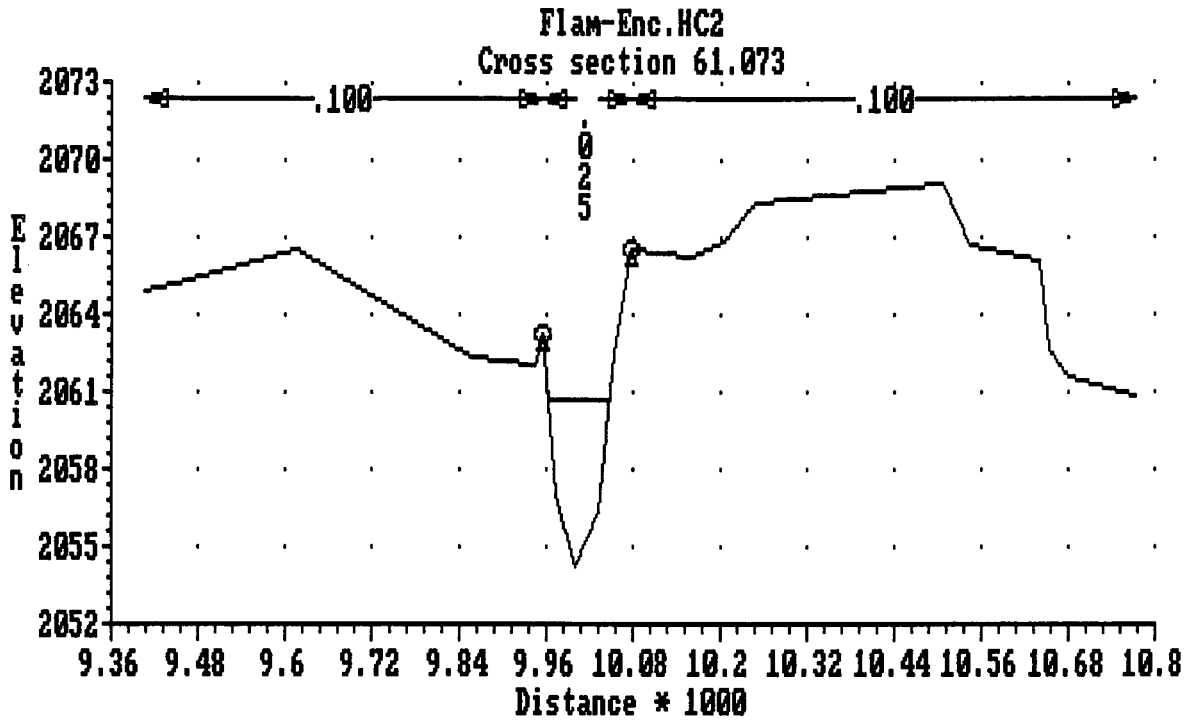

Flam-Enc.HC2
Cross section 60.903
.100
.100
0
2
2
Elevation
2062
2060
2058
2056
2054
2052
2050
2048
8.84
9.01
9.18
9.35
9.52
9.69
9.86
10.03
10.2
10.37
10.54
10.71
10.88
Distance * 1000

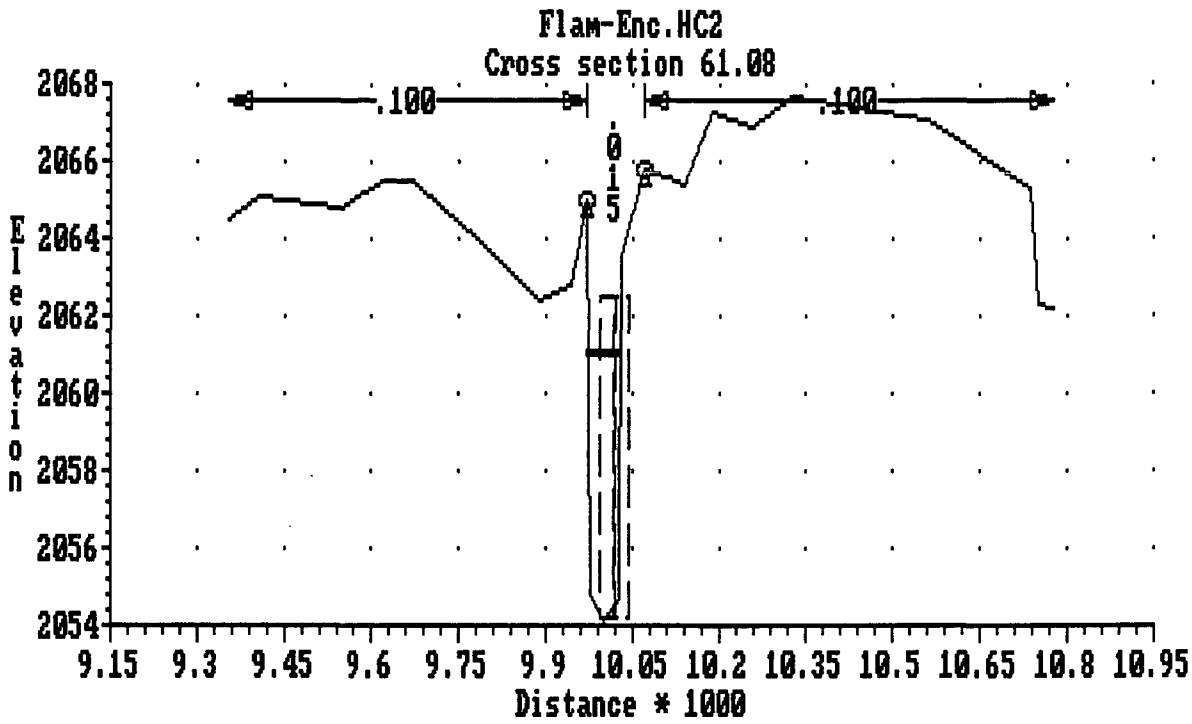

Flam-Enc.HC2
Cross section 60.912
.100
.100
0.2
Elevation
2064
2062
2060
2058
2056
2054
2052
2050
8.97
9.1
9.23
9.36
9.49
9.62
9.75
9.88
10.01
10.14
10.27
10.4
10.53
Distance * 1000

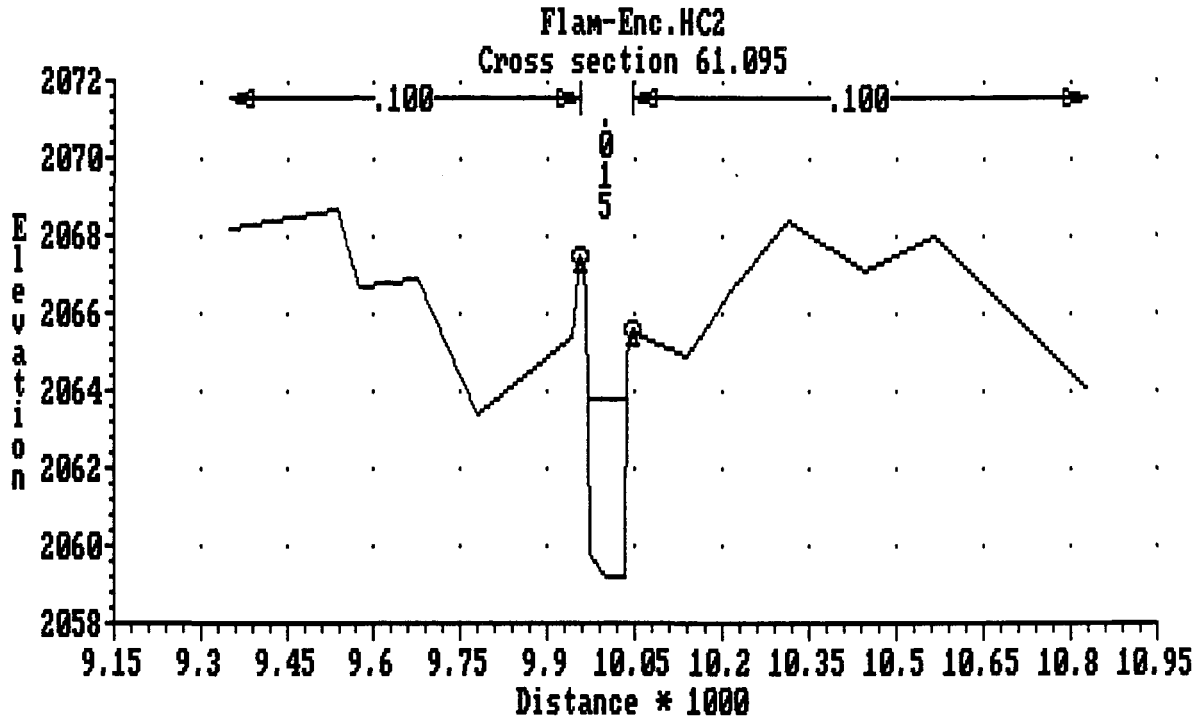

Flam-Enc.HC2
Cross section 60.936
.100
.025
.100
2064
2062
2060
2058
2056
2054
2052
2050
Elevation
9.2
9.3
9.4
9.5
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
Distance * 1000

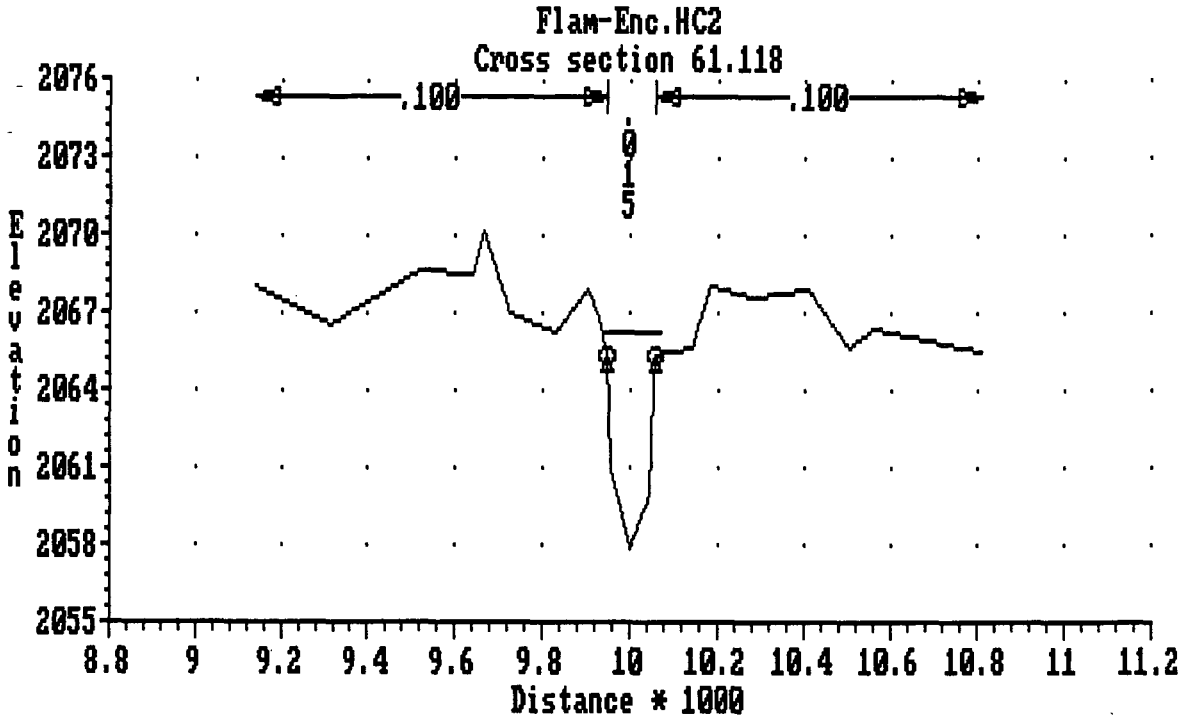

Flam-Enc.HC2
Cross section 60.992
.100
.100
0.52
2066
2064
2062
2060
2058
2056
2054
2052
Elevation
9.36
9.45
9.54
9.63
9.72
9.81
9.9
9.99
10.08
10.17
10.26
10.35
10.44
Distance * 1000

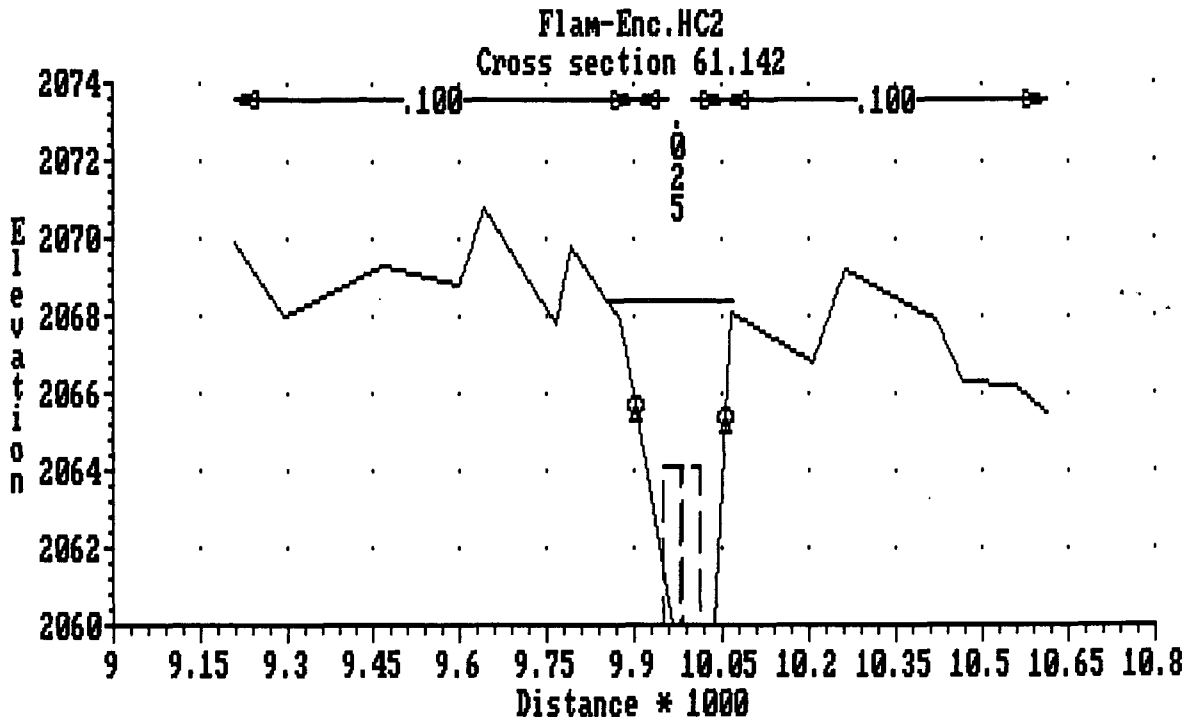

Flam-Enc.HC2
Cross section 61.036
.100
.100
.025
Elevation
2073
2070
2067
2064
2061
2058
2055
2052
9.24
9.36
9.48
9.6
9.72
9.84
9.96
10.08
10.2
10.32
10.44
10.56
10.68
Distance * 1000

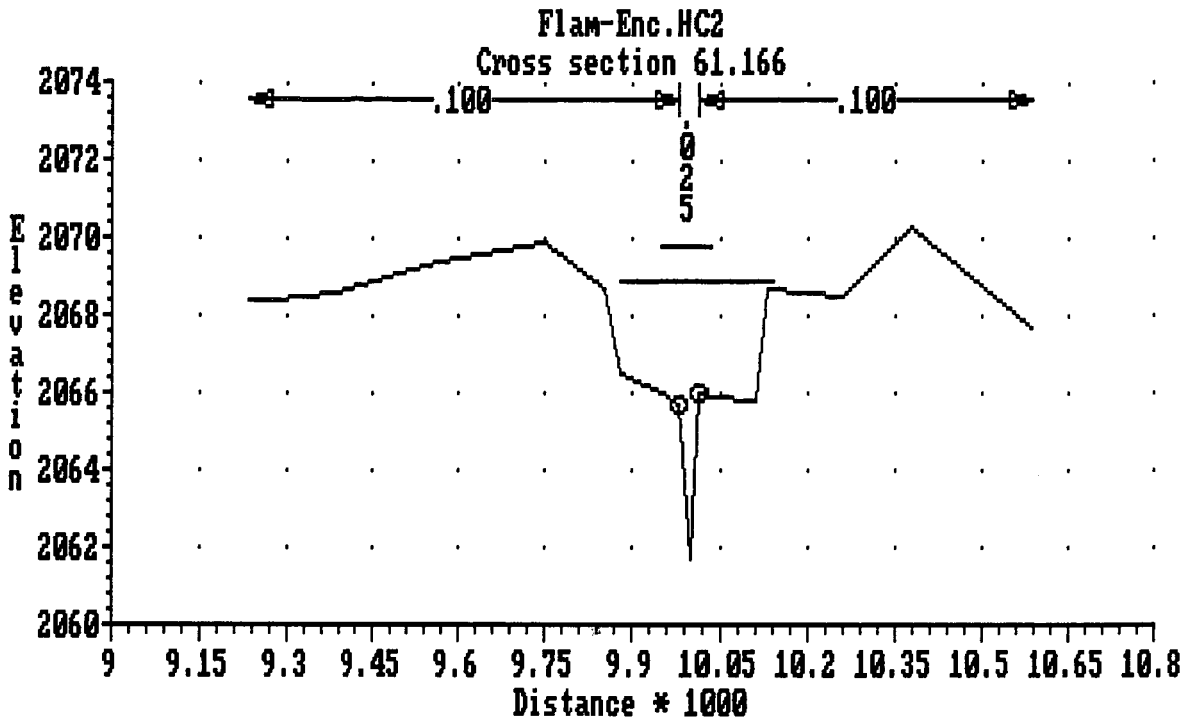

Flam-Enc.HC2
Cross section 61.073
.100
.100
.025
Elevation
2073
2070
2067
2064
2061
2058
2055
2052
9.36
9.48
9.6
9.72
9.84
9.96
10.08
10.2
10.32
10.44
10.56
10.68
10.8
Distance * 1000

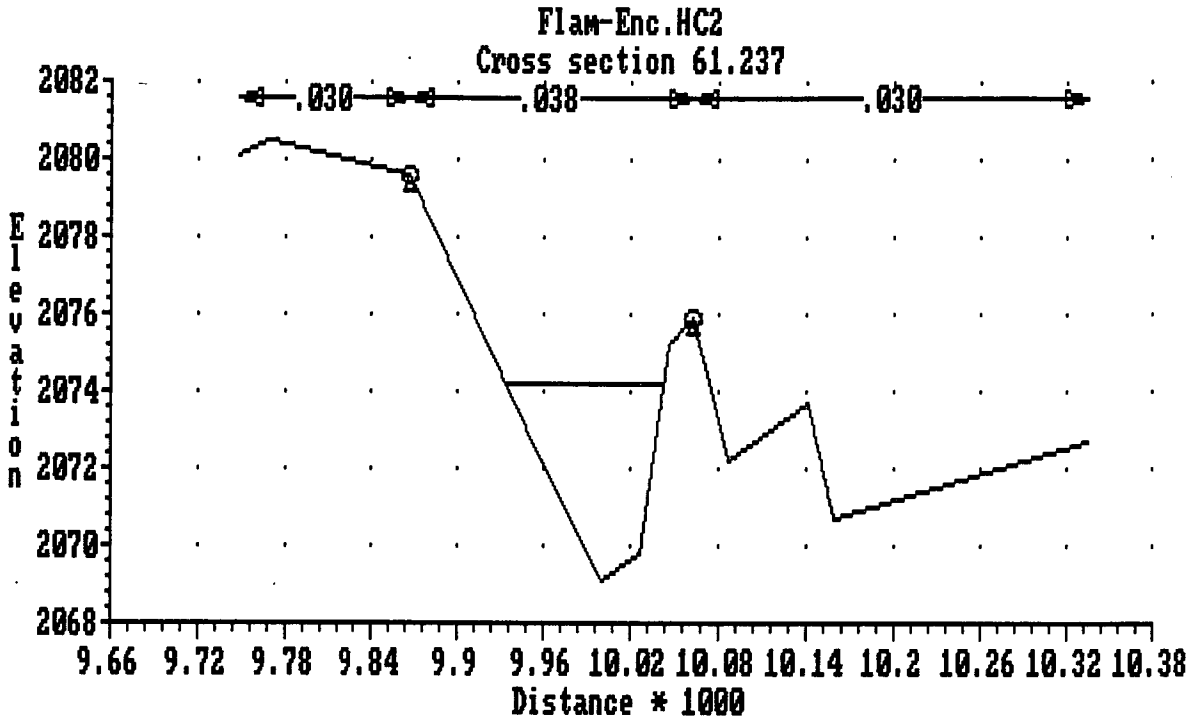

Flam-Enc.HC2
Cross section 61.08
.100
.100
0
.5
Elevation
2068
2066
2064
2062
2060
2058
2056
2054
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
10.95
Distance * 1000

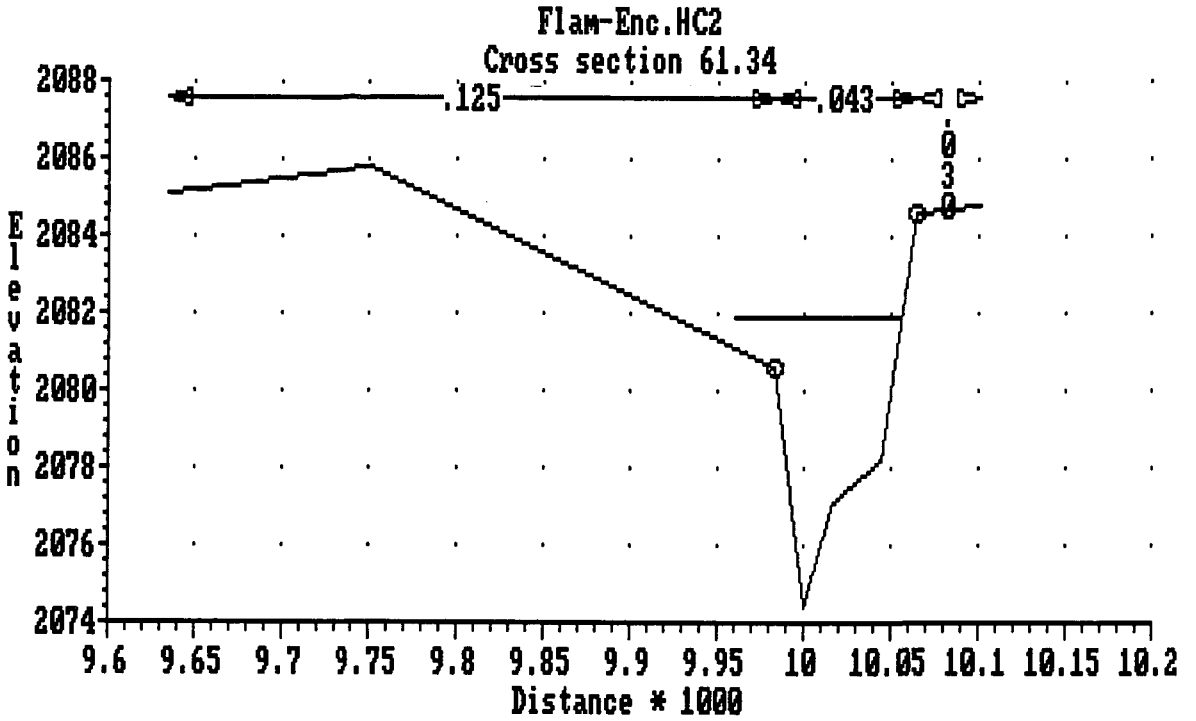

Flam-Enc.HC2
Cross section 61.095
.100
.100
.015
Elevation
2072
2070
2068
2066
2064
2062
2060
2058
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
10.95
Distance * 1000

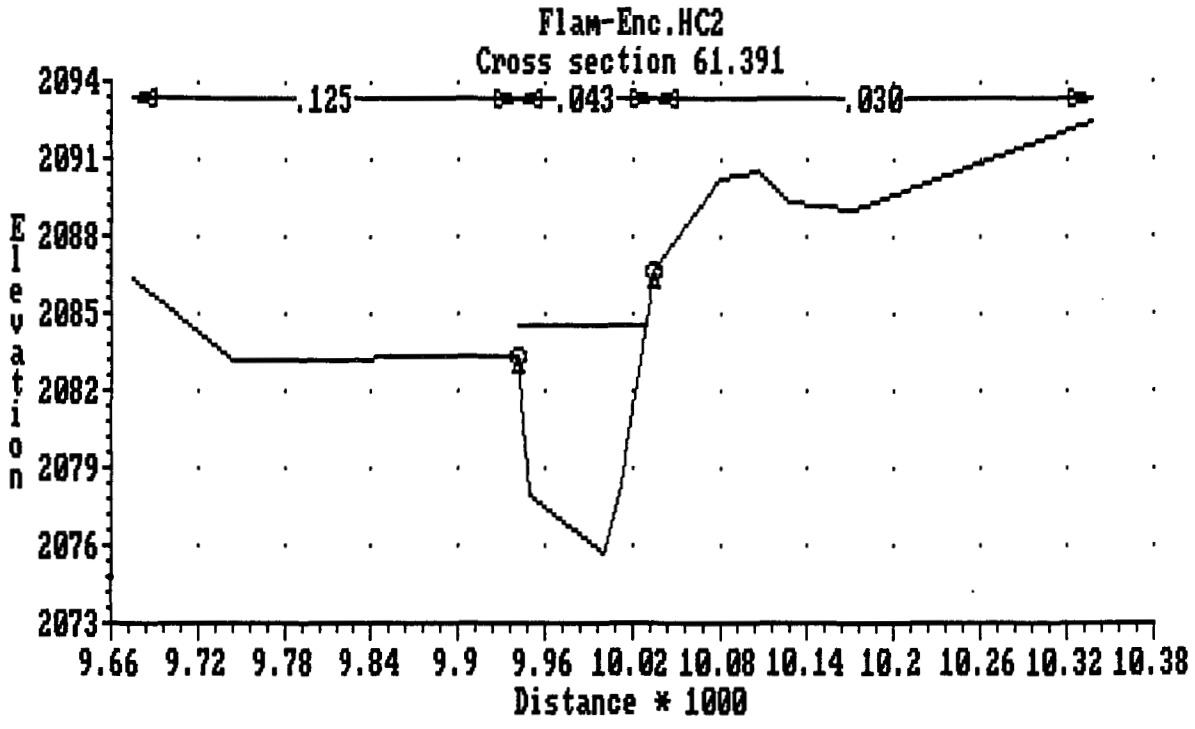

Flam-Enc.HC2
Cross section 61.118
.100
.100
.015
Elevation
2076
2073
2070
2067
2064
2061
2058
2055
8.8
9
9.2
9.4
9.6
9.8
10
10.2
10.4
10.6
10.8
11
11.2
Distance * 1000

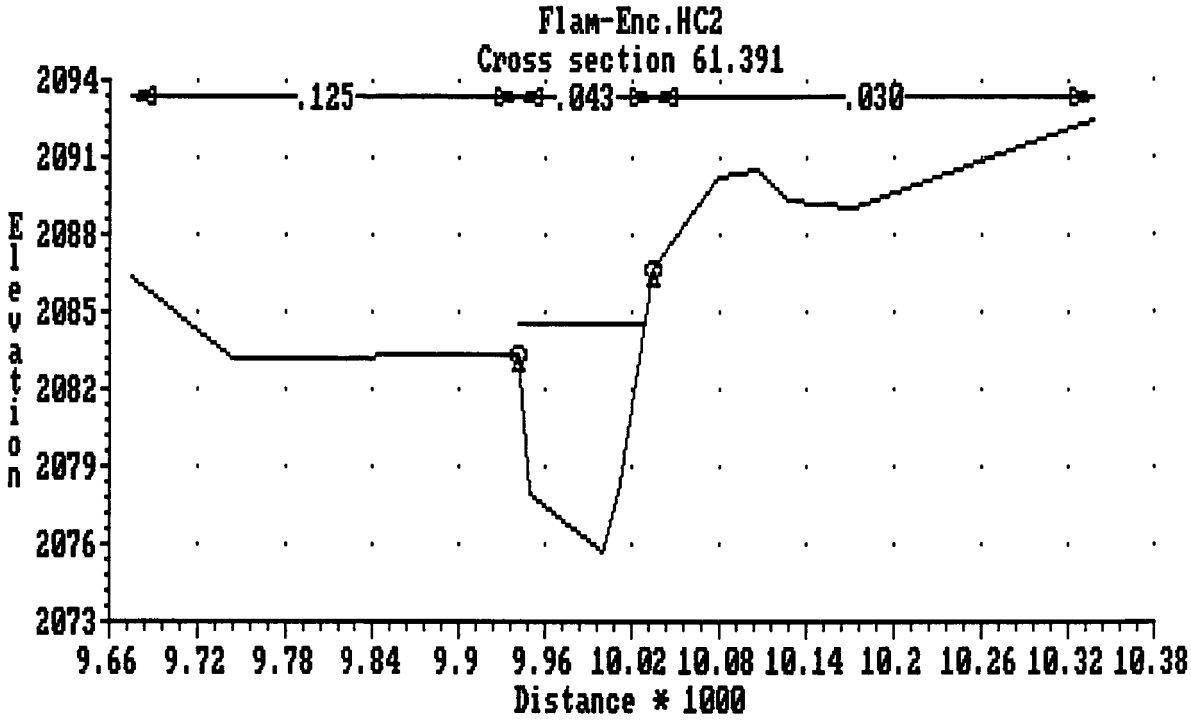

Flam-Enc.HC2
Cross section 61.142
.100
.100
.025
Elevation
2074
2072
2070
2068
2066
2064
2062
2060
9
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
Distance * 1000


Flam-Enc.HC2
Cross section 61.166
.100
.100
0.25
Elevation
2074
2072
2070
2068
2066
2064
2062
2060
9
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
Distance * 1000


Flam-Enc.HC2
Cross section 61.237
.030
.038
.030
Elevation
2082
2080
2078
2076
2074
2072
2070
2068
9.66
9.72
9.78
9.84
9.9
9.96
10.02
10.08
10.14
10.2
10.26
10.32
10.38
Distance * 1000


Flam-Enc.HC2
Cross section 61.34
.125
.043
0
3
0
Elevation
2088
2086
2084
2082
2080
2078
2076
2074
9.6
9.65
9.7
9.75
9.8
9.85
9.9
9.95
10
10.05
10.1
10.15
10.2
Distance * 1000


Flam-Enc.HC2
Cross section 61.391
.125
.043
.030
Elevation
2094
2091
2088
2085
2082
2079
2076
2073
9.66
9.72
9.78
9.84
9.9
9.96
10.02
10.08
10.14
10.2
10.26
10.32
10.38
Distance * 1000


Flam-Enc.HC2
Cross section 61.391
.125
.043
.030
Elevation
2094
2091
2088
2085
2082
2079
2076
2073
9.66
9.72
9.78
9.84
9.9
9.96
10.02
10.08
10.14
10.2
10.26
10.32
10.38
Distance * 1000

THIS RUN EXECUTED 12AUG93 15:25:45

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

TROPICANA WASH FLOOD INSURANCE STUDY

by CH2M Hill, 1992 RDD33832
*** Revised 6/15/93 per MBJ review comments
Notes:

-Manning's "n" values were estimated by field observations of channels and floodplains in conjunction with methods recommended in "Open Channel Hydraulics" by Chow, 1959

-stations and elevations obtained from 400 scale topo created by CH2M Hill from aerial photographs

-In this run, all of the discharge is kept in the channel for the floodway profile (at the railroad cars) instead of allowing it to break out.

/93
Changed discharges. Used just the flow that comes through the culverts under the UPRR, except at I15 where some of the flow coming down Tropicana is added.

T1 CCRFCD TROPICANA WASH F.I.S.; RDD33832
T2 Main Tropicana Wash, Detailed Methods FLOODWAY CALCULATION
T3 I15Q2-E1.hc2 From I-15 to the culvert at UPRR w/encroachments

Starting W.S.El. obtained by routing discharge at I-15 through the box culvert under the road using the F.H.W.A. culvert analysis program HY-8.

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2				0	0		2154.7	0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1	0	0	0	0	0	0	15

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	39	40	41	42	43	1	34	4	27
1	22	28		38	43	1	50	51	27
3	4	5	7	200		38	1	53	27

[redacted]21 22 28 54

```
QT       2      2243      2243
NC    .025      .025      .043       0.1       0.3
ET                         6.1                          9711.6    10324.5
X1   62.566        11    9845.7   10136.1         0         0          0
GR   2147.6    9634.7    2147.8    9704.9    2146.6    9792.0     2146.9    9845.7    2142.4    9933.3
GR   2139.8    9987.0    2139.1   10000.0    2138.1   10020.3     2147.3   10136.1    2149.1   10300.6
GR   2154.0   10580.2

ET                 4.1       6.1    9932.0   10415.0    9982.0    10029.7
X1   62.668        20      9982   10029.7       470       550        540
X3       10
GR   2156.0    9430.3    2155.8    9503.6    2155.2    9515.8     2155.0    9541.5    2155.0    9575.7
GR   2155.2    9685.6    2155.2    9735.4    2154.3    9891.8     2153.9    9982.0    2151.0    9992.4
GR   2151.0   10000.0    2151.0   10006.4    2156.6   10029.7     2157.6   10092.0    2156.9   10144.1
GR   2154.5   10166.4    2154.1   10184.5    2154.7   10261.9     2160.6   10348.3    2160.1   10419.7

NC    .025      .025      .046
[redacted]  2       800       800
ET                         6.1                          9943.5    10033.7
X1   62.763         9    9943.5   10033.7       505       495        500
GR   2166.4    9750.3    2167.3    9943.5    2159.0    9968.0     2158.3   10000.     2159.1   10016.
GR   2167.1   10033.7    2167.1   10075.0    2179.5   10102.0     2180.6   10555.

NC     .02       .07       .032       .3        .5
ET                         6.1                          9967.1    10027.2
X1   62.859         9    9967.1   10027.2       500       505        505
GR   2173.9    9820.3    2172.6    9967.1    2164.5   10000.0     2172.5   10027.2    2172.3   10064.
GR   2180.0   10087.5    2181.2   10114.5    2181.1   10533.0     2180.8   10551.2

ET                         6.1                          9979.8    10024.9
X1   62.906        15    9979.8   10024.9       240       180        250
X3       10
GR   2179.3    9942.9    2180.0    9957.2    2178.1    9979.8     2171.4    9989.3    2170.2   10000.0
GR   2171.1   10009.7    2179.1   10024.9    2179.3   10039.3     2181.1   10143.6    2180.5   10282.4
GR   2181.2   10307.2    2180.9   10433.6    2181.2   10489.5     2180.8   10515.7    2181.3   10705.5
```

Downstream-most of three railroad car bridges
-bridge is 9 ft. wide
[redacted]entered negligible pier width to force special bridge method

```
SB      .9      1.6      2.6                23       .01       191       1.7    2170.2    2170.2

ET                       6.1                        9979.8   10024.9
X1   62.908                                   9         9         9
X2                         1    2176.0    2177.6
X3      10
BT       6      9970    2177.6              9975    2177.6              9975.01     2190
BT   10015      2190              10015.01  2177.6              10030   2177.6
```

Begin cross section at effective flow boundary defined by LOB development
added station 9919 located @50 feet from left bank, based on field notes
elevation interpolated from survey data

```
ET                 4.1       6.1    9920.0   10100.0    9969.7   10021.9
X1   62.937          15    9969.7   10021.9       110       110       151
X3      10
GR    2179        9919    2179.9    9959.0    2180.0    9969.7    2171.7    9990.2    2171.1   10000.
GR  2172.0       10012.   2178.8   10021.9    2179.1    10031.    2179.4    10048.    2181.6   10063.
GR  2181.5       10185.   2180.2   10200.8    2182.4    10242.    2182.3    10366.    2181.9   10418.
```

Middle of three railroad car bridges
-bridge is 18 ft. wide (dual railroad cars)
-entered negligible pier width to force special bridge method

```
SB      .9      1.6      2.6                23.      .01       201      1.64    2171.1    2171.1

ET                 4.1       6.1      9919    10100.0    9969.7   10021.9
X1   62.940                                      18        18        18
X2                         1    2177.2    2178.7
X3      10
BT       6      9970    2178.7              9975    2178.7              9975.01     2190
BT   10015      2190              10015.01  2178.7              10030   2178.7
```

Begin section at effective flow boundary defined by 4:1 expansion and field
conditions, interpolate elevation and station from survey data

```
ET                 4.1       6.1      9910    10085.0    9968.5   10035.6
X1   62.967          12    9968.5   10035.6       120       160       142
X3      10
GR    2180        9910    2181.1    9968.5    2173.1    9987.4    2173.1    10000.    2173.1   10009.
GR  2179.5       10019.   2182.6   10035.6    2181.7    10172.    2183.5    10215.    2183.9   10341.
GR  2183.8       10392.   2185.4   10656.
```

Upstream-most of three railroad car bridges
-bridge is 9 ft. wide
-entered negligible pier width to force special bridge method

SB	.9	1.6	2.6		23.	.01	224	1.5	2173.1	2173.1
ET			4.1	6.1	9910	10085.0	9968.5	10035.6		
X1	62.969					9	9	9		
X2				1	2179.9	2181.4				
X3	10									
BT	6	9970	2181.4			9975	2181.4		9975.01	2190
BT	10015	2190			10015.01	2181.4		10030	2181.4	
NC	.036	.036	.043	.1	.3					
ET				6.1			9960.8	10020.2		
X1	63.061		13	9960.8	10020.2	530	430	486		
GR	2187.5	9779.4	2184.7	9960.8		2182.5	9982.3	2177.6	9991.3	2177.3
GR	2177.7	10007.9	2184.3	10020.2		2186.8	10034.6	2187.4	10167.6	2188.3
GR	2188.2	10384.4	2192.8	10416.4		2191.3	10606.0			
ET				6.1			9968.4	10040		
X1	63.157		20	9968.4	10040.0	555	465	510		
GR	2198.2	9629.1	2194.5	9717.6		2196.2	9784.2	2197.9	9828.5	2193.4
GR	2193.1	9924.6	2192.8	9968.4		2185.1	9983.7	2184.9	10000.	2185.5
GR	2192.1	10040.0	2191.8	10061.5		2193.7	10099.2	2193.2	10116.	2192.6
GR	2196.3	10233.5	2197.2	10252.1		2196.6	10314.6	2192.9	10357.	2198.2
NC	.058	.043	.053							
QT	2	710	710							
ET				6.1			9986.3	10045.2		
X1	63.260		13	9986.3	10025.7	485	565	545		
GR	2202.3	9709.9	2200.9	9748.6		2199.8	9904.0	2197.8	9986.3	2196.9
GR	2199.1	10025.7	2196.9	10085.8		2200.2	10144.1	2200.0	10173.4	2200.0
GR	2201.0	10344.0	2202.9	10386.2		2206.3	10450.2			
ET				6.1			9955.1	10045		
X1	63.353		21	9955.1	10045	490	510	490		
GR	2208.6	9587.2	2209.4	9684.5		2209.0	9756.6	2206.3	9784.0	2203.1
GR	2201.8	9864.5	2201.5	9865.4		2201.5	9940.5	2203.9	9955.1	2199.2
GR	2199.2	10000.0	2199.2	10012.2		2201.5	10045.0	2204.2	10093.2	2206.1
GR	2209.7	10193.5	2208.8	10221.9		2207.2	10282.1	2207.0	10346.3	2209.4
GR	2211.1	10550.7								

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

*PROF 1

CCHV= 0.100 CEHV= 0.300
*SECNO 62.566
3280 CROSS SECTION 62.57 EXTENDED 7.10 FEET

62.566	16.60	2154.70	0.00	2154.70	2154.70	0.00	0.00	0.00	2146.90
2243.0	592.0	1086.8	564.2	1571.5	3525.4	1949.9	0.0	0.0	2147.30
0.00	0.38	0.31	0.29	0.025	0.043	0.025	0.000	2138.10	9634.70
0.000003	0.	0.	0.	0	0	0	0.00	945.50	10580.20

FLOW DISTRIBUTION FOR SECNO= 62.57 CWSEL= 2154.70

STA=	9635.	9705.	9792.	9846.	10136.	10301.	10580.
PER Q=	7.6	11.2	7.6	48.5	16.7	8.5	
AREA=	491.4	653.2	426.9	3525.4	1069.2	880.7	
VEL=	0.3	0.4	0.4	0.3	0.4	0.2	
WH=	7.0	7.5	7.9	12.1	6.5	3.1	

*SECNO 62.668

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9932.0 10415.0 TYPE= 1 TARGET= 483.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2153.90 ELREA= 2156.60

62.668	4.79	2155.79	2155.79	0.00	2157.18	1.38	0.01	0.41	2153.90
2243.0	894.6	1348.4	0.0	89.0	149.6	0.0	44.0	6.3	2156.60
0.02	10.05	9.01	0.00	0.025	0.043	0.000	0.000	2151.00	9932.00
0.013833	470.	540.	550.	20	17	0	0.00	94.34	10026.34

FLOW DISTRIBUTION FOR SECNO= 62.67 CWSEL= 2155.79

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

STA= 9932. 9982. 10030.
PER Q= 39.9 60.1
AREA= 89.0 149.6
VEL= 10.0 9.0
DEPTH= 1.8 3.4

*SECNO 62.763

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.60

62.763	3.64	2161.94	0.00	0.00	2162.25	0.31	4.97	0.11	2167.30
800.0	0.0	800.0	0.0	0.0	179.1	0.0	46.4	7.2	2167.10
0.05	0.00	4.47	0.00	0.000	0.046	0.000	0.000	2158.30	9959.31
0.004859	505.	500.	495.	3	0	0	0.00	62.99	10022.29

DISTRIBUTION FOR SECNO= 62.76 CWSEL= 2161.94

STA= 9959. 10034.
PER Q= 100.0
AREA= 179.1
VEL= 4.5
DEPTH= 2.8

CCHV= 0.300 CEHV= 0.500
*SECNO 62.859

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

62.859	4.90	2169.40	2169.40	0.00	2170.64	1.24	3.63	0.46	2172.60
800.0	0.0	800.0	0.0	0.0	89.6	0.0	48.0	7.8	2172.50
0.06	0.00	8.93	0.00	0.000	0.032	0.000	0.000	2164.50	9980.10
0.011735	500.	505.	505.	20	11	0	0.00	36.56	10016.66

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

FLOW DISTRIBUTION FOR SECNO= 62.86 CWSEL= 2169.40

STA= 9980. 10027.
PER Q= 100.0
AREA= 89.6
VEL= 8.9
DEPTH= 2.4

*SECNO 62.906
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2178.10 ELREA= 2179.10

62.906	3.94	2174.14	2174.14	0.00	2175.56	1.42	2.92	0.09	2178.10
800.0	0.0	800.0	0.0	0.0	83.7	0.0	48.5	8.0	2179.10
0.07	0.00	9.56	0.00	0.000	0.032	0.000	0.000	2170.20	9985.42
0.011656	240.	250.	180.	4	15	0	0.00	30.06	10015.48

FLOW DISTRIBUTION FOR SECNO= 62.91 CWSEL= 2174.14

STA= 9985. 10025.
PER Q= 100.0
AREA= 83.7
VEL= 9.6
DEPTH= 2.8

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	191.00	1.70	2170.20	2170.20

*SECNO 62.908
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2174.14 BRIDGE VELOCITY= 6.84 CALCULATED CHANNEL AREA= 117.

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

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2175.56	0.00	0.	800.	191.	191.	2176.00	2177.60	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2178.10 ELREA= 2179.10

62.908	3.94	2174.14	0.00	0.00	2175.56	1.42	0.00	0.00	2178.10
800.0	0.0	800.0	0.0	0.0	83.7	0.0	48.5	8.0	2179.10
0.07	0.00	9.56	0.00	0.000	0.032	0.000	0.000	2170.20	9985.42
0.011656	9.	9.	9.	0	0	0	0.00	30.06	10015.48

FLOW DISTRIBUTION FOR SECNO= 62.91 CWSEL= 2174.14

STA= 9985. 10025.
PER Q= 100.0
[redacted]EA= 83.7
[redacted]L= 9.6
DEPTH= 2.8

*SECNO 62.937

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.94

3470 ENCROACHMENT STATIONS= 9920.0 10100.0 TYPE= 1 TARGET= 180.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2180.00 ELREA= 2178.80

62.937	5.02	2176.12	0.00	0.00	2176.64	0.52	0.82	0.27	2180.00
800.0	0.0	800.0	0.0	0.0	137.8	0.0	48.9	8.1	2178.80
0.08	0.00	5.81	0.00	0.000	0.032	0.000	0.000	2171.10	9979.27
0.003100	110.	151.	110.	2	0	0	0.00	38.73	10018.00

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

FLOW DISTRIBUTION FOR SECNO= 62.94 CWSEL= 2176.12

STA= 9979. 10022.
PER Q= 100.0
AREA= 137.8
VEL= 5.8
DEPTH= 3.6

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	201.00	1.64	2171.10	2171.10

*SECNO 62.940
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2176.12 BRIDGE VELOCITY= 5.11 CALCULATED CHANNEL AREA= 157.

S	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2176.64	0.00	0.	800.	201.	201.	2177.20	2178.70	0.

3470 ENCROACHMENT STATIONS= 9919.0 10100.0 TYPE= 1 TARGET= 181.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2180.00 ELREA= 2178.80

62.940	5.02	2176.12	0.00	0.00	2176.64	0.53	0.00	0.00	2180.00
800.0	0.0	800.0	0.0	0.0	137.6	0.0	49.0	8.1	2178.80
0.08	0.00	5.82	0.00	0.000	0.032	0.000	0.000	2171.10	9979.29
0.003113	18.	18.	18.	0	0	0	0.00	38.71	10018.00

FLOW DISTRIBUTION FOR SECNO= 62.94 CWSEL= 2176.12

STA= 9979. 10022.
PER Q= 100.0
AREA= 137.6
VEL= 5.8
DEPTH= 3.6

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

*SECNO 62.967

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.61

3470 ENCROACHMENT STATIONS= 9910.0 10085.0 TYPE= 1 TARGET= 175.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2181.10 ELREA= 2182.60

62.967	3.45	2176.55	0.00	0.00	2177.58	1.03	0.68	0.25	2181.10
800.0	0.0	800.0	0.0	0.0	98.1	0.0	49.3	8.2	2182.60
0.08	0.00	8.15	0.00	0.000	0.032	0.000	0.000	2173.10	9979.23
0.008367	120.	142.	160.	0	0	0	0.00	35.17	10014.40

FLOW DISTRIBUTION FOR SECNO= 62.97 CWSEL= 2176.55

9979. 10036.
PER Q= 100.0
AREA= 98.1
VEL= 8.2
DEPTH= 2.8

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	224.00	1.50	2173.10	2173.10

*SECNO 62.969
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2176.55 BRIDGE VELOCITY= 8.24 CALCULATED CHANNEL AREA= 97.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2177.59	0.00	0.	800.	224.	226.	2179.90	2181.40	0.

3470 ENCROACHMENT STATIONS= 9910.0 10085.0 TYPE= 1 TARGET= 175.000

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2181.10 ELREA= 2182.60

62.969	3.45	2176.55	0.00	0.00	2177.59	1.04	0.01	0.00	2181.10
800.0	0.0	800.0	0.0	0.0	97.9	0.0	49.4	8.2	2182.60
0.08	0.00	8.17	0.00	0.000	0.032	0.000	0.000	2173.10	9979.25
0.008424	9.	9.	9.	0	0	0	0.00	35.14	10014.39

FLOW DISTRIBUTION FOR SECNO= 62.97 CWSEL= 2176.55

STA= 9979. 10036.
PER Q= 100.0
AREA= 97.9
VEL= 8.2
DEPTH= 2.8

CCHV= 0.100 CEHV= 0.300
*SECNO 63.061

63.061	4.32	2181.62	0.00	0.00	2182.66	1.04	5.07	0.00	2184.70
800.0	0.0	800.0	0.0	0.0	98.0	0.0	50.5	8.6	2184.30
0.10	0.00	8.16	0.00	0.000	0.043	0.000	0.000	2177.30	9983.92
0.013244	530.	486.	430.	3	0	0	0.00	31.29	10015.21

FLOW DISTRIBUTION FOR SECNO= 63.06 CWSEL= 2181.62

STA= 9984. 10020.
PER Q= 100.0
AREA= 98.0
VEL= 8.2
DEPTH= 3.1

*SECNO 63.157

63.157	3.00	2187.90	0.00	0.00	2188.50	0.59	5.80	0.04	2192.80
800.0	0.0	800.0	0.0	0.0	129.4	0.0	51.8	9.1	2192.10
0.12	0.00	6.18	0.00	0.000	0.043	0.000	0.000	2184.90	9978.13
0.009867	555.	510.	465.	4	0	0	0.00	52.34	10030.47

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

FLOW DISTRIBUTION FOR SECNO= 63.16 CWSEL= 2187.90

STA= 9978. 10040.
PER Q= 100.0
AREA= 129.4
VEL= 6.2
DEPTH= 2.5

*SECNO 63.260

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

63.260	1.87	2198.77	2198.77	0.00	2199.22	0.45	8.43	0.01	2197.80
710.0	53.1	208.1	448.8	19.5	40.0	78.9	53.5	10.4	2199.10
0.15	2.73	5.20	5.68	0.058	0.053	0.043	0.000	2196.90	9946.25
0.029565	485.	545.	565.	4	14	0	0.00	159.92	10118.90

DISTRIBUTION FOR SECNO= 63.26 CWSEL= 2198.77

STA= 9946. 9986. 10026. 10086. 10119.
PER Q= 7.5 29.3 38.4 24.8
AREA= 19.5 40.0 47.9 31.0
VEL= 2.7 5.2 5.7 5.7
DEPTH= 0.5 1.1 0.8 0.9

*SECNO 63.353

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.11

63.353	3.44	2202.64	0.00	0.00	2202.74	0.10	3.48	0.03	2203.90
710.0	145.3	549.5	15.2	100.4	196.2	11.6	56.0	12.5	2201.50
0.21	1.45	2.80	1.31	0.058	0.053	0.043	0.000	2199.20	9840.69
0.003065	490.	490.	510.	6	0	0	0.00	207.72	10065.33

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

FLOW DISTRIBUTION FOR SECNO= 63.35 CWSEL= 2202.64

STA=	9841.	9865.	9865.	9941.	9947.	10045.	10065.
PER Q=	1.1	0.2	18.6	0.5	77.4	2.1	
AREA=	10.0	0.9	85.5	3.9	196.2	11.6	
VEL=	0.8	1.4	1.5	1.0	2.8	1.3	
DEPTH=	0.4	1.0	1.1	0.6	2.4	0.6	

T1 CCRFCD TROPICANA WASH F.I.S.; RDD33832
T2 Main Tropicana Wash, Detailed Methods
T3 I15Q2-E1.hc2 From I-15 to the culvert at UPRR w/encroachments

	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
J1	-10	3				0	0		2155.7	0

	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
J2	2	0	-1	0	0	0	0	0	0	15

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

*PROF 2

CCHV= 0.100 CEHV= 0.300
*SECNO 62.566
3280 CROSS SECTION 62.57 EXTENDED 1.70 FEET

3470 ENCROACHMENT STATIONS= 9711.6 10324.5 TYPE= 1 TARGET= 612.900

62.566	17.60	2155.70	0.00	2154.70	2155.70	0.00	0.00	0.00	2146.90
2243.0	479.9	1241.8	521.2	1167.7	3815.8	1386.5	0.0	0.0	2147.30
0.00	0.41	0.33	0.38	0.025	0.043	0.025	0.000	2138.10	9711.60
0.000003	0.	0.	0.	0	0	0	0.00	612.90	10324.50

FLOW DISTRIBUTION FOR SECNO= 62.57 CWSEL= 2155.70

STA=	9712.	9792.	9846.	10136.	10301.	10324.
[redacted]Q=	12.1	9.3	55.4	21.2	2.0	
[redacted]A=	687.1	480.6	3815.8	1233.7	152.7	
VEL=	0.4	0.4	0.3	0.4	0.3	
DEPTH=	8.5	8.9	13.1	7.5	6.4	

*SECNO 62.668

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9982.0 10029.7 TYPE= 1 TARGET= 47.700

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2153.90 ELREA= 100000.00

62.668	5.75	2156.75	2156.75	2155.79	2158.83	2.07	0.01	0.62	2153.90
2243.0	0.0	2243.0	0.0	0.0	194.1	0.0	39.9	4.0	100000.00
0.01	0.00	11.56	0.00	0.000	0.043	0.000	0.000	2151.00	9982.00
0.019192	470.	540.	550.	20	17	0	0.00	47.70	10029.70

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

FLOW DISTRIBUTION FOR SECNO= 62.67 CWSEL= 2156.75

STA= 9982. 10030.
PER Q= 100.0
AREA= 194.1
VEL= 11.6
DEPTH= 4.1

*SECNO 62.763

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 9943.5 10033.7 TYPE= 1 TARGET= 90.200

62.763	4.57	2162.87	0.00	2161.94	2163.04	0.17	4.03	0.19	2167.30
800.0	0.0	800.0	0.0	0.0	239.7	0.0	42.4	4.7	100000.00
0.05	0.00	3.34	0.00	0.000	0.046	0.000	0.000	2158.30	9956.57
0.002039	505.	500.	495.	4	0	0	0.00	67.77	10024.34

[redacted]ISTRIBUTION FOR SECNO= 62.76 CWSEL= 2162.87

STA= 9957. 10034.
PER Q= 100.0
AREA= 239.7
VEL= 3.3
DEPTH= 3.5

CCHV= 0.300 CEHV= 0.500
*SECNO 62.859

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9967.1 10027.2 TYPE= 1 TARGET= 60.101

62.859	4.88	2169.38	2169.38	2169.40	2170.64	1.26	2.06	0.54	2172.60
800.0	0.0	800.0	0.0	0.0	89.0	0.0	44.3	5.3	100000.00
0.07	0.00	8.99	0.00	0.000	0.032	0.000	0.000	2164.50	9980.16
0.011944	500.	505.	505.	20	8	0	0.00	36.44	10016.60

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

FLOW DISTRIBUTION FOR SECNO= 62.86 CWSEL= 2169.38

STA= 9980. 10027.
PER Q= 100.0
AREA= 89.0
VEL= 9.0
DEPTH= 2.4

*SECNO 62.906
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9979.8 10024.9 TYPE= 1 TARGET= 45.101

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2178.10 ELREA= 100000.00

62.906	3.94	2174.14	2174.14	2174.14	2175.56	1.42	2.95	0.08	2178.10
800.0	0.0	800.0	0.0	0.0	83.8	0.0	44.8	5.5	100000.00
0.08	0.00	9.55	0.00	0.000	0.032	0.000	0.000	2170.20	9985.41
[redacted]11632	240.	250.	180.	2	15	0	0.00	30.07	10015.48

FLOW DISTRIBUTION FOR SECNO= 62.91 CWSEL= 2174.14

STA= 9985. 10025.
PER Q= 100.0
AREA= 83.8
VEL= 9.6
DEPTH= 2.8

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	191.00	1.70	2170.20	2170.20

*SECNO 62.908
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2174.14 BRIDGE VELOCITY= 6.84 CALCULATED CHANNEL AREA= 117.

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

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2175.56	0.00	0.	800.	191.	191.	2176.00	2177.60	0.

3470 ENCROACHMENT STATIONS= 9979.8 10024.9 TYPE= 1 TARGET= 45.101

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2178.10 ELREA= 100000.00

62.908	3.95	2174.15	0.00	2174.14	2175.56	1.41	0.00	0.00	2178.10
800.0	0.0	800.0	0.0	0.0	83.9	0.0	44.8	5.5	100000.00
0.08	0.00	9.54	0.00	0.000	0.032	0.000	0.000	2170.20	9985.41
0.011591	9.	9.	9.	0	0	0	0.00	30.08	10015.49

FLOW DISTRIBUTION FOR SECNO= 62.91 CWSEL= 2174.15

9985. 10025.
Q= 100.0
AREA= 83.9
VEL= 9.5
DEPTH= 2.8

*SECNO 62.937

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.93

3470 ENCROACHMENT STATIONS= 9969.7 10021.9 TYPE= 1 TARGET= 52.200

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2180.00 ELREA= 100000.00

62.937	5.02	2176.12	0.00	2176.12	2176.64	0.52	0.82	0.27	2180.00
800.0	0.0	800.0	0.0	0.0	137.6	0.0	45.2	5.6	100000.00
0.08	0.00	5.81	0.00	0.000	0.032	0.000	0.000	2171.10	9979.28
0.003109	110.	151.	110.	2	0	0	0.00	38.72	10018.00

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

FLOW DISTRIBUTION FOR SECNO= 62.94 CWSEL= 2176.12

STA= 9979. 10022.
PER Q= 100.0
AREA= 137.6
VEL= 5.8
DEPTH= 3.6

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	201.00	1.64	2171.10	2171.10

*SECNO 62.940
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2176.12 BRIDGE VELOCITY= 5.11 CALCULATED CHANNEL AREA= 157.

S	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2176.64	0.00	0.	800.	201.	201.	2177.20	2178.70	0.

3470 ENCROACHMENT STATIONS= 9969.7 10021.9 TYPE= 1 TARGET= 52.200

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2180.00 ELREA= 100000.00

62.940	5.02	2176.12	0.00	2176.12	2176.64	0.53	0.00	0.00	2180.00
800.0	0.0	800.0	0.0	0.0	137.4	0.0	45.3	5.6	100000.00
0.09	0.00	5.82	0.00	0.000	0.032	0.000	0.000	2171.10	9979.29
0.003122	18.	18.	18.	0	0	0	0.00	38.70	10017.99

FLOW DISTRIBUTION FOR SECNO= 62.94 CWSEL= 2176.12

STA= 9979. 10022.
PER Q= 100.0
AREA= 137.4
VEL= 5.8
DEPTH= 3.6

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

*SECNO 62.967

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.61

3470 ENCROACHMENT STATIONS= 9968.5 10035.6 TYPE= 1 TARGET= 67.100

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2181.10 ELREA= 100000.00

62.967	3.45	2176.55	0.00	2176.55	2177.58	1.03	0.68	0.25	2181.10
800.0	0.0	800.0	0.0	0.0	98.0	0.0	45.6	5.7	100000.00
0.09	0.00	8.16	0.00	0.000	0.032	0.000	0.000	2173.10	9979.24
0.008386	120.	142.	160.	0	0	0	0.00	35.16	10014.40

FLOW DISTRIBUTION FOR SECNO= 62.97 CWSEL= 2176.55

[redacted] 9979. 10036.
PER Q= 100.0
AREA= 98.0
VEL= 8.2
DEPTH= 2.8

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	224.00	1.50	2173.10	2173.10

*SECNO 62.969
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2176.54 BRIDGE VELOCITY= 8.25 CALCULATED CHANNEL AREA= 97.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2177.59	0.00	0.	800.	224.	226.	2179.90	2181.40	0.

3470 ENCROACHMENT STATIONS= 9968.5 10035.6 TYPE= 1 TARGET= 67.100

[redacted]

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2181.10 ELREA= 100000.00

62.969	3.45	2176.55	0.00	2176.55	2177.59	1.04	0.01	0.00	2181.10
800.0	0.0	800.0	0.0	0.0	97.8	0.0	45.7	5.7	100000.00
0.09	0.00	8.18	0.00	0.000	0.032	0.000	0.000	2173.10	9979.25
0.008439	9.	9.	9.	0	0	0	0.00	35.13	10014.39

FLOW DISTRIBUTION FOR SECNO= 62.97 CWSEL= 2176.55

STA= 9979. 10036.
PER Q= 100.0
AREA= 97.8
VEL= 8.2
DEPTH= 2.8

CCHV= 0.100 CEHV= 0.300
*SECNO 63.061

[redacted]NCROACHMENT STATIONS= 9960.8 10020.2 TYPE= 1 TARGET= 59.400

63.061	4.32	2181.62	0.00	2181.62	2182.66	1.03	5.07	0.00	2184.70
800.0	0.0	800.0	0.0	0.0	98.0	0.0	46.8	6.1	100000.00
0.11	0.00	8.16	0.00	0.000	0.043	0.000	0.000	2177.30	9983.91
0.013221	530.	486.	430.	3	0	0	0.00	31.30	10015.21

FLOW DISTRIBUTION FOR SECNO= 63.06 CWSEL= 2181.62

STA= 9984. 10020.
PER Q= 100.0
AREA= 98.0
VEL= 8.2
DEPTH= 3.1

*SECNO 63.157

3470 ENCROACHMENT STATIONS= 9968.4 10040.0 TYPE= 1 TARGET= 71.600

63.157	3.00	2187.90	0.00	2187.90	2188.50	0.59	5.80	0.04	2192.80
800.0	0.0	800.0	0.0	0.0	129.3	0.0	48.1	6.6	100000.00
0.13	0.00	6.19	0.00	0.000	0.043	0.000	0.000	2184.90	9978.13
0.009879	555.	510.	465.	4	0	0	0.00	52.34	10030.46

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

FLOW DISTRIBUTION FOR SECNO= 63.16 CWSEL= 2187.90

STA= 9978. 10040.
PER Q= 100.0
AREA= 129.3
VEL= 6.2
DEPTH= 2.5

*SECNO 63.260
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9986.3 10045.2 TYPE= 1 TARGET= 58.900

63.260	2.86	2199.76	2199.76	2198.77	2200.59	0.83	8.57	0.07	2197.80
710.0	0.0	592.9	117.1	0.0	78.2	19.8	49.5	7.3	2199.10
0.15	0.00	7.58	5.91	0.000	0.053	0.043	0.000	2196.90	9986.30
0.031357	485.	545.	565.	12	11	0	0.00	58.90	10045.20

[redacted]ISTRIBUTION FOR SECNO= 63.26 CWSEL= 2199.76

STA= 9986. 10026. 10045.
PER Q= 83.5 16.5
AREA= 78.2 19.8
VEL= 7.6 5.9
DEPTH= 2.0 1.0

*SECNO 63.353

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.67

3470 ENCROACHMENT STATIONS= 9955.1 10045.0 TYPE= 1 TARGET= 89.900

63.353	4.17	2203.37	0.00	2202.64	2203.49	0.12	2.82	0.07	2203.90
710.0	0.0	710.0	0.0	0.0	257.4	0.0	51.5	8.1	100000.00
0.20	0.00	2.76	0.00	0.000	0.053	0.000	0.000	2199.20	9958.96
0.002323	490.	490.	510.	5	0	0	0.00	86.03	10045.00

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

FLOW DISTRIBUTION FOR SECNO= 63.35 CWSEL= 2203.37

STA= 9959. 10045.
PER Q= 100.0
AREA= 257.4
VEL= 2.8
DEPTH= 3.0

THIS RUN EXECUTED 12AUG93 15:25:53

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

I15Q2-E1.hc2

SUMMARY PRINTOUT

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	.01K	TOPWID	STENCL	STCHL	STCHR	STENCR
	62.566	0.00	0.00	0.00	2138.10	2243.00	2154.70	13264.51	945.50	0.00	9845.70	10136.10	0.00
	62.566	0.00	0.00	0.00	2138.10	2243.00	2155.70	13245.64	612.90	9711.60	9845.70	10136.10	10324.50
*	62.668	540.00	0.00	0.00	2151.00	2243.00	2155.79	190.71	94.34	9932.00	9982.00	10029.70	10415.00
*	62.668	540.00	0.00	0.00	2151.00	2243.00	2156.75	161.91	47.70	9982.00	9982.00	10029.70	10029.70
	62.763	500.00	0.00	0.00	2158.30	800.00	2161.94	114.77	62.99	0.00	9943.50	10033.70	0.00
	62.763	500.00	0.00	0.00	2158.30	800.00	2162.87	177.16	67.77	9943.50	9943.50	10033.70	10033.70
*	62.859	505.00	0.00	0.00	2164.50	800.00	2169.40	73.85	36.56	0.00	9967.10	10027.20	0.00
*	62.859	505.00	0.00	0.00	2164.50	800.00	2169.38	73.20	36.44	9967.10	9967.10	10027.20	10027.20
*	62.906	250.00	0.00	0.00	2170.20	800.00	2174.14	74.10	30.06	0.00	9979.80	10024.90	0.00
*	62.906	250.00	0.00	0.00	2170.20	800.00	2174.14	74.18	30.07	9979.80	9979.80	10024.90	10024.90
	62.908	9.00	2177.60	2176.00	2170.20	800.00	2174.14	74.10	30.06	0.00	9979.80	10024.90	0.00
	62.908	9.00	2177.60	2176.00	2170.20	800.00	2174.15	74.31	30.08	9979.80	9979.80	10024.90	10024.90
*	62.937	151.00	0.00	0.00	2171.10	800.00	2176.12	143.67	38.73	9920.00	9969.70	10021.90	10100.00
*	62.937	151.00	0.00	0.00	2171.10	800.00	2176.12	143.47	38.72	9969.70	9969.70	10021.90	10021.90
	62.940	18.00	2178.70	2177.20	2171.10	800.00	2176.12	143.38	38.71	9919.00	9969.70	10021.90	10100.00
	62.940	18.00	2178.70	2177.20	2171.10	800.00	2176.12	143.19	38.70	9969.70	9969.70	10021.90	10021.90
*	62.967	142.00	0.00	0.00	2173.10	800.00	2176.55	87.46	35.17	9910.00	9968.50	10035.60	10085.00
*	62.967	142.00	0.00	0.00	2173.10	800.00	2176.55	87.36	35.16	9968.50	9968.50	10035.60	10035.60
	62.969	9.00	2181.40	2179.90	2173.10	800.00	2176.55	87.16	35.14	9910.00	9968.50	10035.60	10085.00
	62.969	9.00	2181.40	2179.90	2173.10	800.00	2176.55	87.09	35.13	9968.50	9968.50	10035.60	10035.60
	63.061	486.00	0.00	0.00	2177.30	800.00	2181.62	69.52	31.29	0.00	9960.80	10020.20	0.00
	63.061	486.00	0.00	0.00	2177.30	800.00	2181.62	69.58	31.30	9960.80	9960.80	10020.20	10020.20

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	.01K	TOPWID	STENCL	STCHL	STCHR	STENCR
	63.157	510.00	0.00	0.00	2184.90	800.00	2187.90	80.54	52.34	0.00	9968.40	10040.00	0.00
	63.157	510.00	0.00	0.00	2184.90	800.00	2187.90	80.49	52.34	9968.40	9968.40	10040.00	10040.00
*	63.260	545.00	0.00	0.00	2196.90	710.00	2198.77	41.29	159.92	0.00	9986.30	10025.70	0.00
*	63.260	545.00	0.00	0.00	2196.90	710.00	2199.76	40.09	58.90	9986.30	9986.30	10025.70	10045.20
*	63.353	490.00	0.00	0.00	2199.20	710.00	2202.64	128.24	207.72	0.00	9955.10	10045.00	0.00
*	63.353	490.00	0.00	0.00	2199.20	710.00	2203.37	147.31	86.03	9955.10	9955.10	10045.00	10045.00

E1.hc2

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	STENCL	STENCR	TOPWID	10*KS	VOL
	62.566	2243.00	2154.70	0.00	0.00	0.00	0.00	945.50	0.03	0.00
	62.566	2243.00	2155.70	1.00	0.00	9711.60	10324.50	612.90	0.03	0.00
*	62.668	2243.00	2155.79	0.00	1.09	9932.00	10415.00	94.34	138.33	44.05
*	62.668	2243.00	2156.75	0.96	1.05	9982.00	10029.70	47.70	191.92	39.91
*	62.763	800.00	2161.94	0.00	6.15	0.00	0.00	62.99	48.59	46.45
	62.763	800.00	2162.87	0.93	6.12	9943.50	10033.70	67.77	20.39	42.40
*	62.859	800.00	2169.40	0.00	7.46	0.00	0.00	36.56	117.35	48.01
*	62.859	800.00	2169.38	-0.02	6.51	9967.10	10027.20	36.44	119.44	44.30
*	62.906	800.00	2174.14	0.00	4.74	0.00	0.00	30.06	116.56	48.50
*	62.906	800.00	2174.14	0.00	4.76	9979.80	10024.90	30.07	116.32	44.80
	62.908	800.00	2174.14	0.00	0.00	0.00	0.00	30.06	116.56	48.52
	62.908	800.00	2174.15	0.01	0.00	9979.80	10024.90	30.08	115.91	44.81
	62.937	800.00	2176.12	0.00	1.98	9920.00	10100.00	38.73	31.00	48.91
	62.937	800.00	2176.12	0.00	1.97	9969.70	10021.90	38.72	31.09	45.20
	62.940	800.00	2176.12	0.00	0.00	9919.00	10100.00	38.71	31.13	48.96
	62.940	800.00	2176.12	0.00	0.00	9969.70	10021.90	38.70	31.22	45.26
*	62.967	800.00	2176.55	0.00	0.43	9910.00	10085.00	35.17	83.67	49.35
*	62.967	800.00	2176.55	0.00	0.43	9968.50	10035.60	35.16	83.86	45.64
	62.969	800.00	2176.55	0.00	0.00	9910.00	10085.00	35.14	84.24	49.37
	62.969	800.00	2176.55	0.00	0.00	9968.50	10035.60	35.13	84.39	45.66
	63.061	800.00	2181.62	0.00	5.07	0.00	0.00	31.29	132.44	50.46
	63.061	800.00	2181.62	0.00	5.07	9960.80	10020.20	31.30	132.21	46.75
	63.157	800.00	2187.90	0.00	6.28	0.00	0.00	52.34	98.67	51.79
	63.157	800.00	2187.90	0.00	6.28	9968.40	10040.00	52.34	98.79	48.08
*	63.260	710.00	2198.77	0.00	10.87	0.00	0.00	159.92	295.65	53.47
*	63.260	710.00	2199.76	0.99	11.86	9986.30	10045.20	58.90	313.57	49.51
*	63.353	710.00	2202.64	0.00	3.87	0.00	0.00	207.72	30.65	56.00
*	63.353	710.00	2203.37	0.73	3.61	9955.10	10045.00	86.03	23.23	51.51

E1.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST
	62.566	2154.70	9634.70	0.00	9845.70	10136.10	0.00	10580.20
	62.566	2155.70	9711.60	9711.60	9845.70	10136.10	10324.50	10324.50
*	62.668	2155.79	9932.00	9932.00	9982.00	10029.70	10415.00	10026.34
*	62.668	2156.75	9982.00	9982.00	9982.00	10029.70	10029.70	10029.70
*	62.763	2161.94	9959.31	0.00	9943.50	10033.70	0.00	10022.29
	62.763	2162.87	9956.57	9943.50	9943.50	10033.70	10033.70	10024.34
*	62.859	2169.40	9980.10	0.00	9967.10	10027.20	0.00	10016.66
*	62.859	2169.38	9980.16	9967.10	9967.10	10027.20	10027.20	10016.60
*	62.906	2174.14	9985.42	0.00	9979.80	10024.90	0.00	10015.48
*	62.906	2174.14	9985.41	9979.80	9979.80	10024.90	10024.90	10015.48
	62.908	2174.14	9985.42	0.00	9979.80	10024.90	0.00	10015.48
	62.908	2174.15	9985.41	9979.80	9979.80	10024.90	10024.90	10015.49
	62.937	2176.12	9979.27	9920.00	9969.70	10021.90	10100.00	10018.00
	62.937	2176.12	9979.28	9969.70	9969.70	10021.90	10021.90	10018.00
	62.940	2176.12	9979.29	9919.00	9969.70	10021.90	10100.00	10018.00
	62.940	2176.12	9979.29	9969.70	9969.70	10021.90	10021.90	10017.99
*	62.967	2176.55	9979.23	9910.00	9968.50	10035.60	10085.00	10014.40
*	62.967	2176.55	9979.24	9968.50	9968.50	10035.60	10035.60	10014.40
	62.969	2176.55	9979.25	9910.00	9968.50	10035.60	10085.00	10014.39
	62.969	2176.55	9979.25	9968.50	9968.50	10035.60	10035.60	10014.39
	63.061	2181.62	9983.92	0.00	9960.80	10020.20	0.00	10015.21
	63.061	2181.62	9983.91	9960.80	9960.80	10020.20	10020.20	10015.21
	63.157	2187.90	9978.13	0.00	9968.40	10040.00	0.00	10030.47
	63.157	2187.90	9978.13	9968.40	9968.40	10040.00	10040.00	10030.46
*	63.260	2198.77	9946.25	0.00	9986.30	10025.70	0.00	10118.90
*	63.260	2199.76	9986.30	9986.30	9986.30	10025.70	10045.20	10045.20
*	63.353	2202.64	9840.69	0.00	9955.10	10045.00	0.00	10065.33
*	63.353	2203.37	9958.96	9955.10	9955.10	10045.00	10045.00	10045.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 62.668 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.668 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 62.668 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 62.668 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.668 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 62.668 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 62.763 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 62.859 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.859 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 62.859 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 62.859 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.859 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 62.859 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 62.906 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.906 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 62.906 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.906 PROFILE= 2 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 62.937 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 62.937 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 62.967 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 62.967 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 63.260 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 63.260 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 63.260 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 63.260 PROFILE= 2 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 63.353 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 63.353 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

FLOODWAY DATA, I15Q2-E1.hc2
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
62.566	613.	6370.	0.4	2155.7	2154.7	1.0
62.668	48.	194.	11.6	2156.8	2155.8	1.0
62.763	68.	240.	3.3	2162.8	2161.9	0.9
62.859	36.	89.	9.0	2169.4	2169.4	0.0
62.906	30.	84.	9.6	2174.1	2174.1	0.0
62.908	30.	84.	9.5	2174.1	2174.1	0.0
62.937	39.	138.	5.8	2176.1	2176.1	0.0
62.940	39.	137.	5.8	2176.1	2176.1	0.0
62.967	35.	98.	8.2	2176.5	2176.5	0.0
62.969	35.	98.	8.2	2176.5	2176.5	0.0
63.061	31.	98.	8.2	2181.6	2181.6	0.0
63.157	52.	129.	6.2	2187.9	2187.9	0.0
63.260	59.	98.	7.2	2199.8	2198.8	1.0
63.353	86.	257.	2.8	2203.3	2202.6	0.7

0.0

63.157	52.	129.	6.2	2187.9	2187.9	0.0
63.260	59.	98.	7.2	2199.8	2198.8	1.0
63.353	86.	257.	2.8	2203.3	2202.6	0.7

I15Q2-E1.HC2
· I15 to UPRR
· Floodway Encroachment

HEC2 S/N: 1916530021 HMVersion: 6.50 Data File: i15q2-e1.hc2

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*********************************************
*  :-2 WATER SURFACE PROFILES               *
*                                           *
*  Version   4.6.2;  May 1991               *
*                                           *
*  RUN DATE    12AUG93    TIME   15:25:45   *
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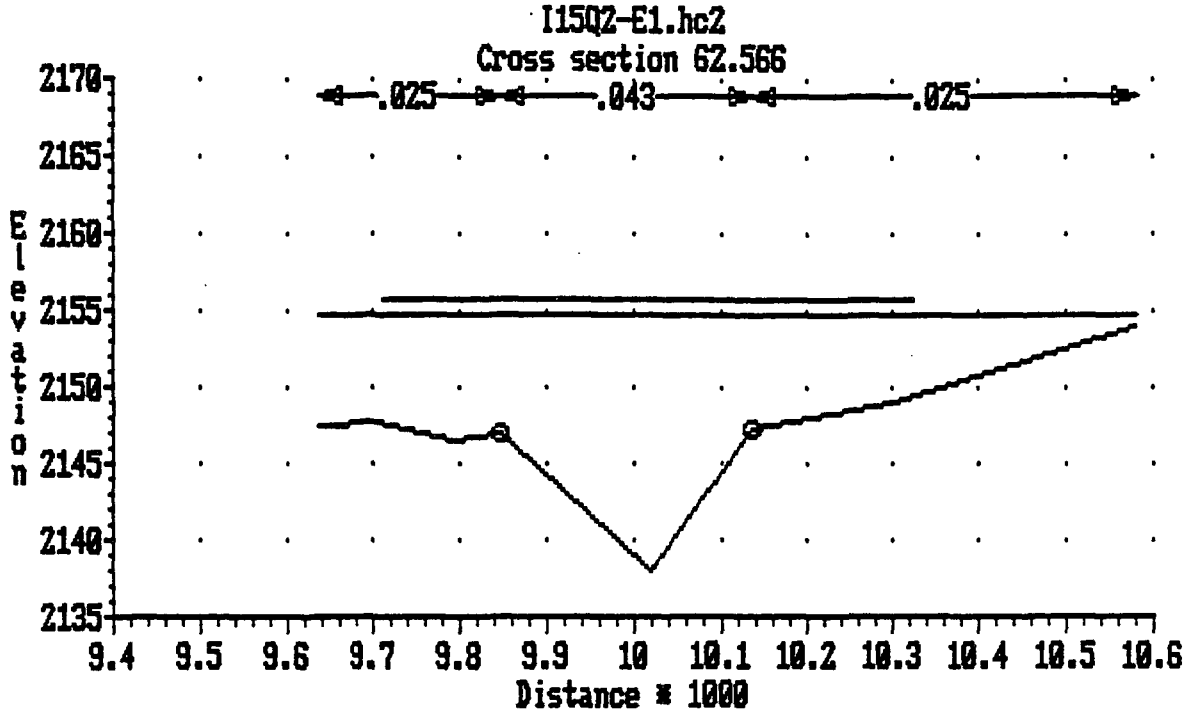
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*********************************************
*  U.S. ARMY CORPS OF ENGINEERS             *
*  HYDROLOGIC ENGINEERING CENTER            *
*  609 SECOND STREET, SUITE D               *
*  DAVIS, CALIFORNIA 95616-4687             *
*          (916) 756-1104                   *
*********************************************
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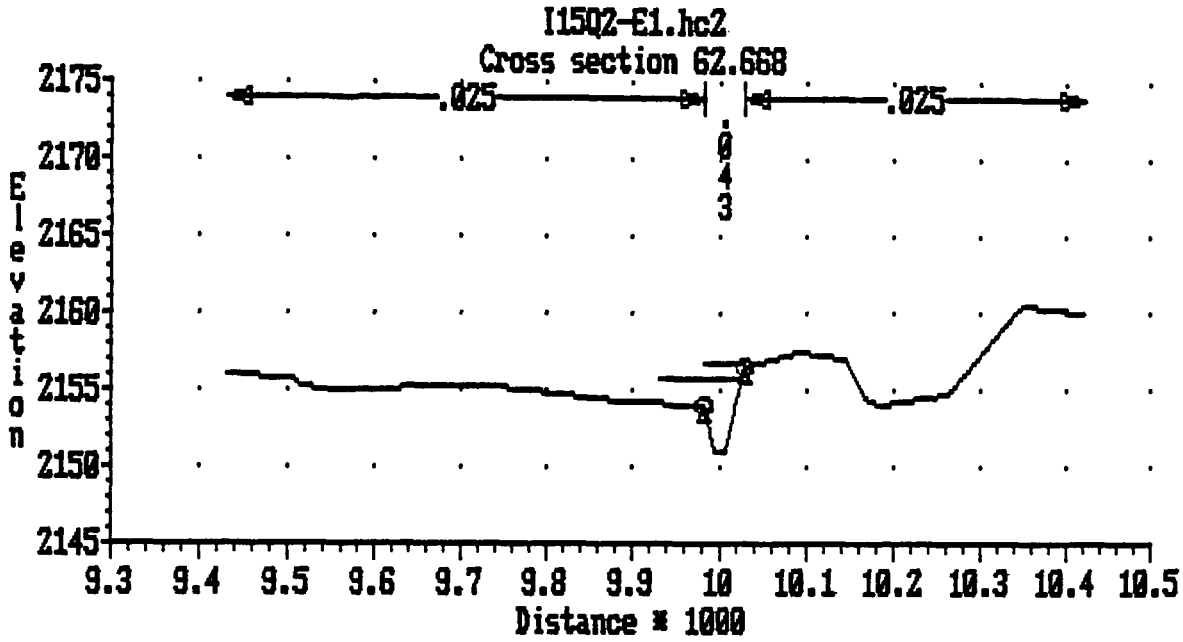
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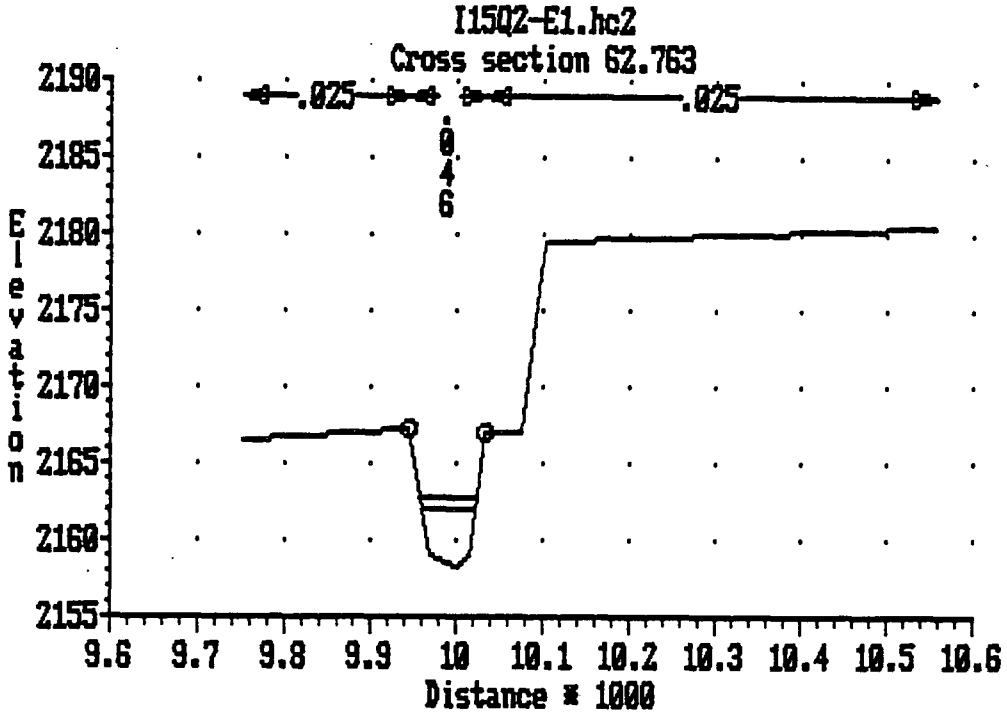
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:::                                        :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
:::                                        :::
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::::::::::::::::::::::::::::::::::::::::::::::
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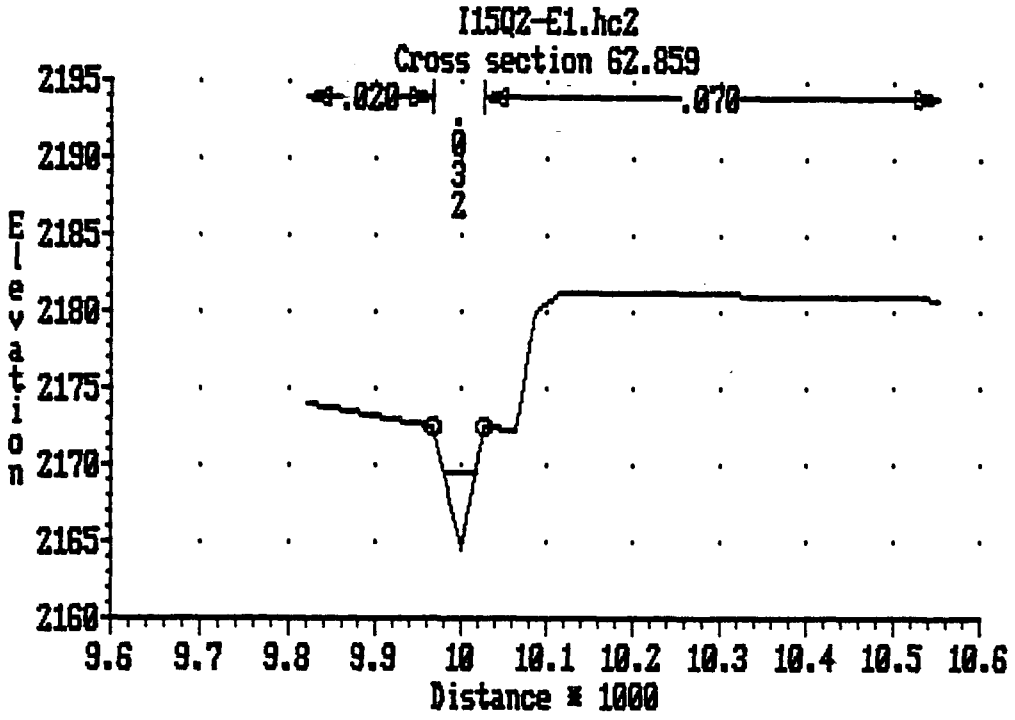
HAESTAD METHODS

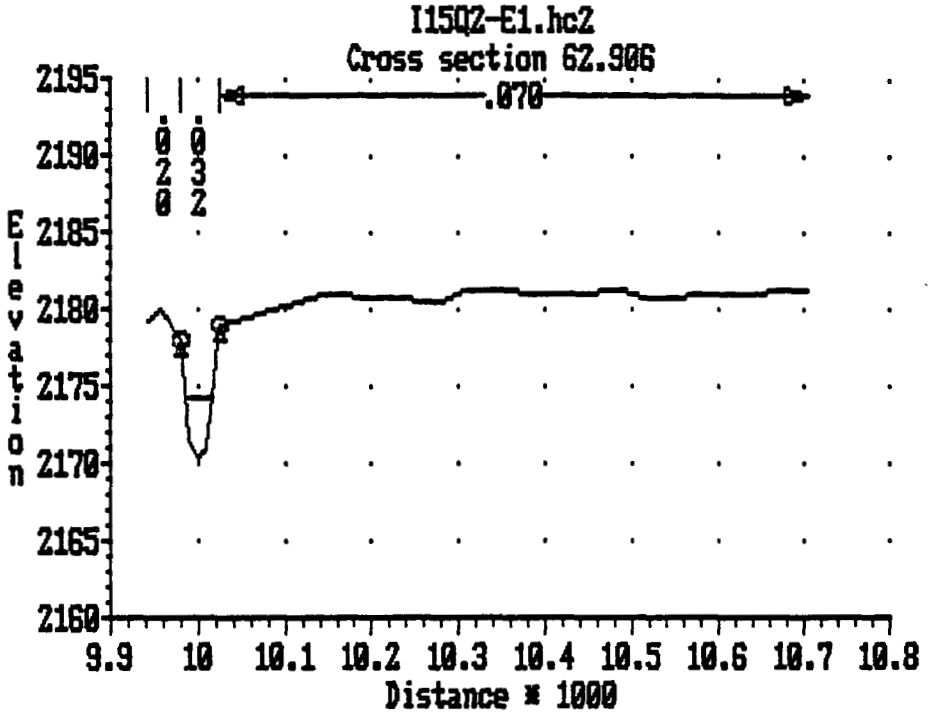
37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

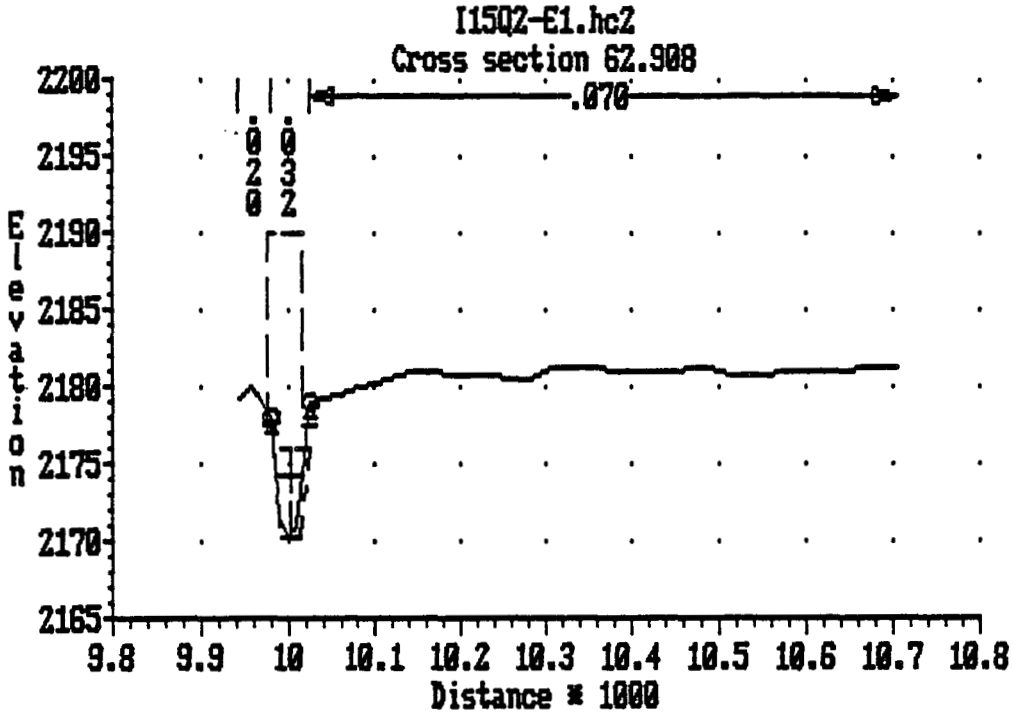

I15Q2-E1.hc2
Cross section 62.566
.025
.043
.025
Elevation
2170
2165
2160
2155
2150
2145
2140
2135
9.4
9.5
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
Distance * 1000

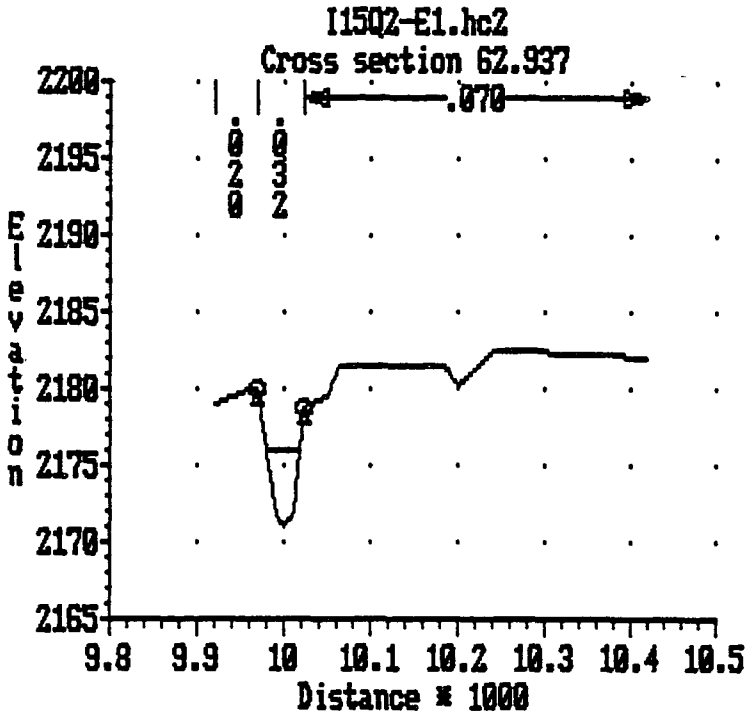

I15Q2-E1.hc2
Cross section 62.668
.025
.025
.043
Elevation
2175
2170
2165
2160
2155
2150
2145
9.3
9.4
9.5
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
Distance * 1000

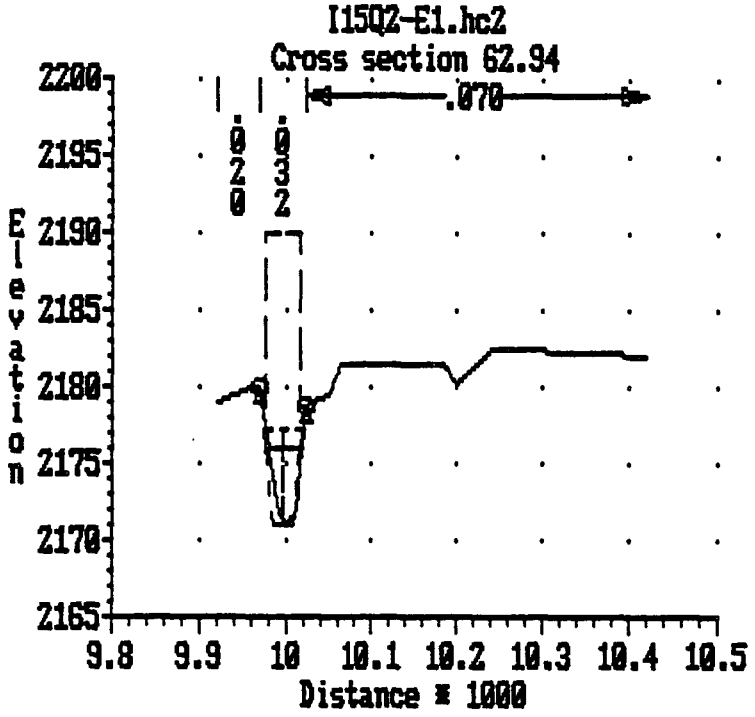

I15Q2-E1.hc2
Cross section 62.763
.025
.025
0.046
2190
2185
2180
2175
2170
2165
2160
2155
Elevation
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
Distance * 1000

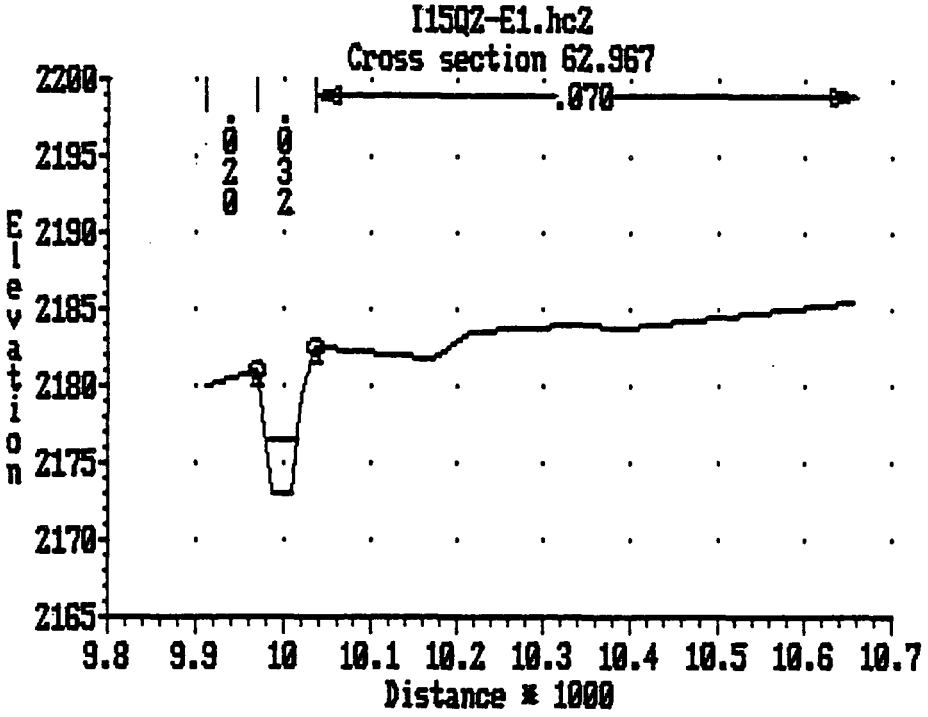

I15Q2-E1.hc2
Cross section 62.859
.020
.070
.032
Elevation
2195
2190
2185
2180
2175
2170
2165
2160
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
Distance x 1000

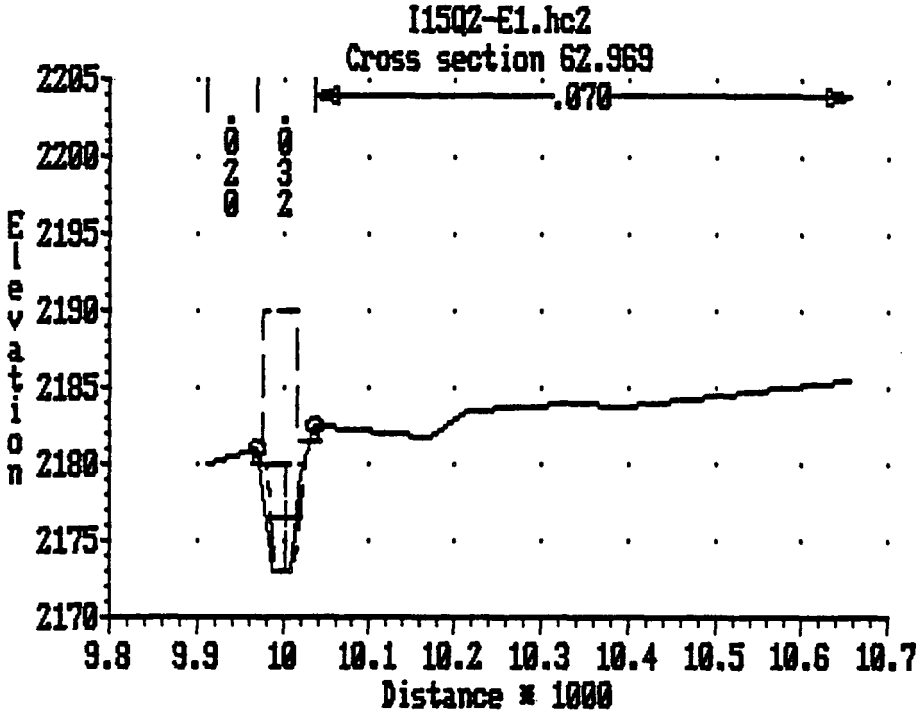

I15Q2-E1.hc2
Cross section 62.906
.070
.020
.032
Elevation
2195
2190
2185
2180
2175
2170
2165
2160
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
10.7
10.8
Distance * 1000

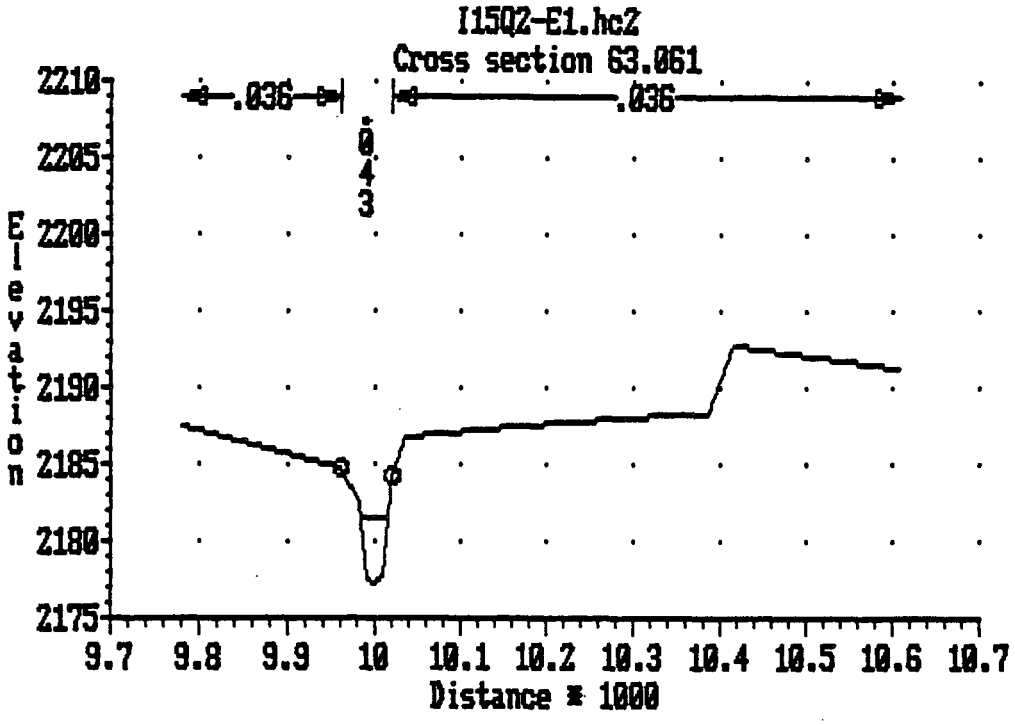

I15Q2-E1.hc2
Cross section 62.908
.070
.022
.032
Elevation
2200
2195
2190
2185
2180
2175
2170
2165
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
10.7
10.8
Distance * 1000

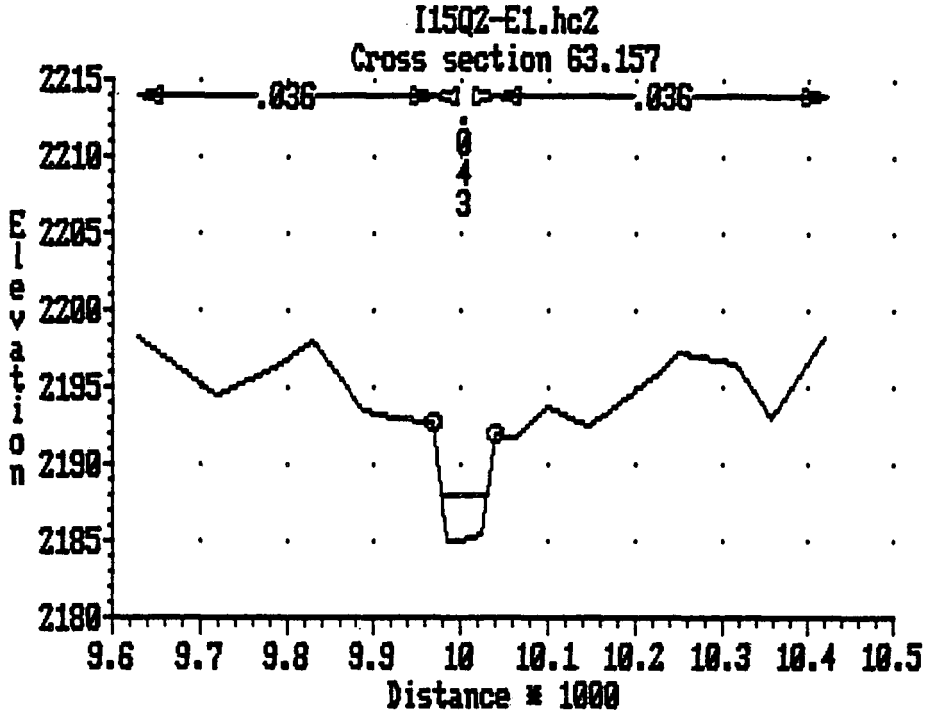

I15Q2-E1.hc2
Cross section 62.937
.070
.020
.032
Elevation
2200
2195
2190
2185
2180
2175
2170
2165
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
Distance * 1000

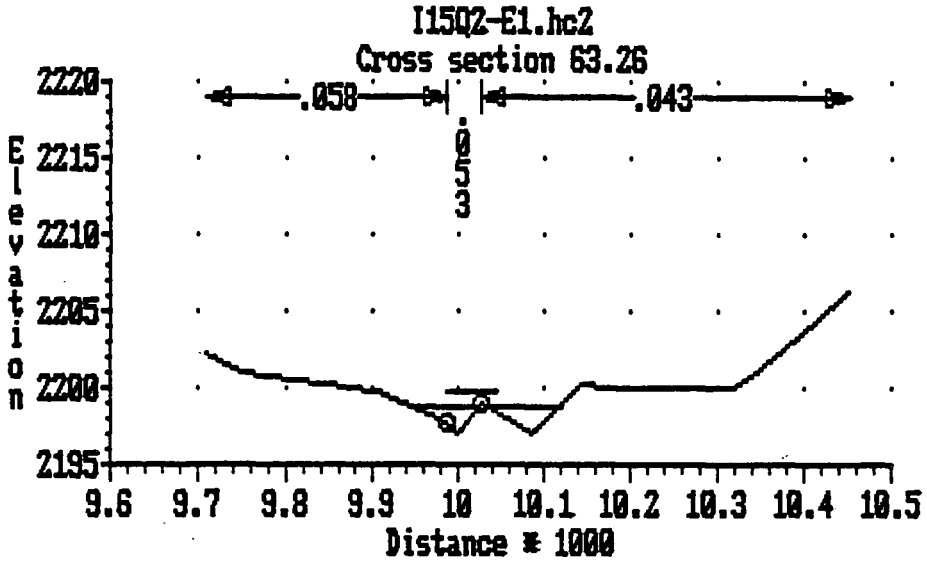

I15Q2-E1.hc2
Cross section 62.94
.070
.020
.330
Elevation
2200
2195
2190
2185
2180
2175
2170
2165
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
Distance x 1000

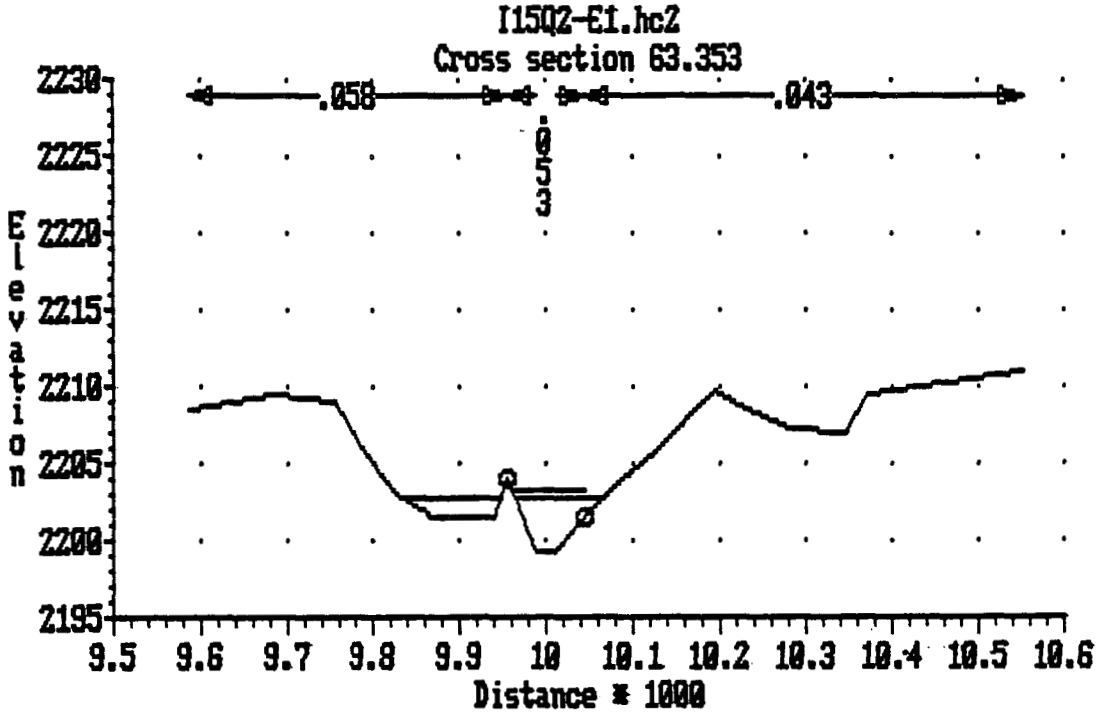

I15QZ-E1.hc2
Cross section 62.967
.070
.020
.032
2200
2195
2190
2185
2180
2175
2170
2165
Elevation
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
10.7
Distance x 1000


I150Z-E1.hc2
Cross section 62.969
.070
.020
.032
Elevation
2205
2200
2195
2190
2185
2180
2175
2170
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
10.7
Distance * 1000


I15Q2-E1.hc2
Cross section 63.061
.036
.043
.036
Elevation
2210
2205
2200
2195
2190
2185
2180
2175
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
10.7
Distance * 1000


I15QZ-E1.hc2
Cross section 63.157
.036
.036
0
4
3
Elevation
2215
2210
2205
2200
2195
2190
2185
2180
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
Distance * 1000


I15Q2-E1.hc2
Cross section 63.26
.058
.053
.043
Elevation
2220
2215
2210
2205
2200
2195
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
Distance * 1000


I15Q2-E1.hc2
Cross section 63.353
.058
.043
.050
Elevation
2230
2225
2220
2215
2210
2205
2200
2195
9.5
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
Distance * 1000

HEC2 S/N: 1916530021 HMVersion: 6.50 Data File: ctw-enc.hc2

CTW-ENC.hc2

- Central Branch upstream of UPRR
- Floodway Run

```
**********************************************
    :-2 WATER SURFACE PROFILES              *
                                            *
*  Version   4.6.2;  May 1991               *
*                                           *
*  RUN DATE    30AUG93    TIME    13:34:14  *
**********************************************
```

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

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

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

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

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

THIS RUN EXECUTED 30AUG93 13:34:14

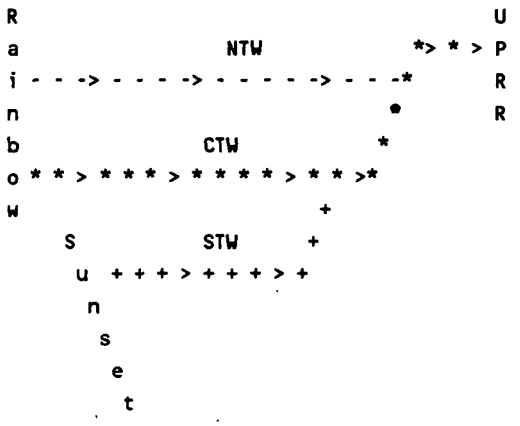
****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

TROPICANA WASH FLOOD INSURANCE STUDY

by CH2M Hill, 1992 RDD33832

Schematic:



Notes:
-discharges were based on those in the "Las Vegas Valley Flood Insurance Study Hydrology Report" by James M. Montgomery, Inc., September, 1991 (see CH2M Hill memo dated July 13, 1992)

-Manning's "n" values were estimated by field observations of channels and floodplains in conjunction with methods recommended in "Open Channel Hydraulics" by Chow, 1959

-stations and elevations obtained from 400 scale topo created by CH2M Hill from aerial photographs

Just downstream of section 64.366, a 66 inch RCP will be put in the Spear Channel. This pipe was estimated to remove 350 cfs from the storm discharge, reducing it from 3300 to 2950 cfs. Then, just downstream from the pipe inlet, at Cameron St., there is a flow split where a portion of the flow continues due east and the rest flows north up Cameron for about 600 feet before continuing east in the Tropicana Wash.

To calculate the amount of discharge in each channel, they were individually rated using the tailwater channel rating portion of the F.H.W.A. culvert analysis program HY-8. The rating curves were plotted and a common elevation found where the sums of the channel flows at that elevation = 2950 cfs. resulting discharge for Tropicana Wash of 2050 cfs was used in this run from section 64.366 to 64.179.

Just downstream of section 64.179, the pipe flow combines with the channel flow. This raises the discharge up to 2400 cfs which it continues to be

section 63.866.
section 63.682 a box culvert is proposed to go in under Arville St. with channel regrading upstream and downstream of the culvert. The GR input at sections 63.585 and 63.682 were modified to reflect the regrading and the channel "n" value was reduced to 0.025 at these sections. The discharge was routed through the culvert using the Special Bridge routine.
Also, at Arville St., some discharge leaves Tropicana Wash and flows north through the street. A split flow was performed (file = UPRR-WSF.HC2) and calculated that 281 cfs splits out but returns at section 63.411.

CCRFCD requested that there not be a floodway upstream of the confluence with the South TW, instead, this reach is to be an AE zone. Therefore the sections upstream of 64.56 were deleted.

```
T1   CCRFCD  TROPICANA WASH F.I.S.;   RDD33832
T2   Central Tropicana Wash, Detailed Methods   FLOODWAY CALCULATIONS
T3      CTW-Enc.hc2              UPRR to end of C. Trop. Wash, FLOODWAY CALCS
```

Starting W.S.El. obtained by routing discharge at UPRR through the culvert using the F.H.W.A. culvert analysis program HY-8

```
J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
                2                                       0         0                 2213.6        0

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

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1        43         8        55        26        56        13        14        15
      4        53        54
     38         1        43        39         4        53        27        21        22        28
     54        33
    100       200

QT        2       4100       4100

NC      .04       .042       .045       0.1        0.3
ET                           6.1                              9920      10045
```

```
[redacted]3.411        18      9951.2     10044.5           0           0           0
[redacted]  10
GR   2214.0      9546.2    2213.9      9626.7    2209.1      9748.7    2209.6      9817.4    2215.0      9908.6
GR   2212.7      9951.2    2203.9      9979.5    2203.5     10000.0    2210.7     10044.5    2213.8     10091.7
GR   2213.3     10276.9    2214.5     10426.3    2218.3     10564.6    2219.6     10700.4    2217.2     10792.7
GR   2220.5     10815.9    2225.3     10878.1    2221.3     10933.9
```

Sections 63.585 and 63.682 were modified (NC and GR) to reflect proposed channel grading

```
NH         3        .04      9808.8       .025     10169.9        .042     10777.7
```

Following reduced Q is due to the split at Arville St.

```
QT         2        3819       4100
```

```
ET                  4.1         6.1        9309       10488        9945       10080
X1    63.585         23      9983.3     10020.2         930         910         920
X3        10
GR   2224.4      9308.5    2222.9      9588.5    2223.4      9689.2    2220.0      9778.8    2221.5      9808.8
GR   2218.0      9983.3    2215.2      9995.0    2215.2     10000.0    2215.2     10005.0    2217.7     10006.8
GR   2219.2     10020.2    2216.9     10076.8    2222.3     10169.9    2221.7     10271.4    2223.8     10349.4
GR   2220.7     10418.6    2226.7     10488.0    2221.4     10584.4    2220.8     10653.8    2222.7     10683.3
GR   2220.3     10711.0    2226.5     10745.2    2228.5     10777.7
```

```
[redacted]         3        .055      9867.1       .025     10110.5        .055     10627.0
```

```
QT         2        4100       4100
```

Following left encroachment reflects 4:1 expansion

Following W.S.El. obtained by routing discharge through the proposed box culvert at Arville St. using the Special Culvert routine.

```
ET                  4.1         6.1        9850       11966        9930       10075
X1    63.682          18      9969.6     10035.4         450         500         510
X3        10
X5         1     2230.90     2231.90
GR   2228.1      9295.9    2227.5      9457.7    2226.2      9525.5    2226.2      9751.0    2226.8      9867.1
GR   2225.8      9969.6    2220.9      9985.0    2220.9     10000.0    2220.9     10015.0    2226.0     10035.4
GR   2224.7     10098.1    2228.5     10110.5    2227.2     10291.8    2229.3     10302.0    2230.5     10337.7
GR   2230.8     10503.5    2232.9     10543.4    2233.9     10627.0
```

```
NC       .04       .055       .028         .3         .5
```

Following section is at the confluence with the North TW. Q100 changes at the next section.

```
ET                  6.1                               9894       10044
```

[redacted]

```
X1     63.80        40      9894.9    10084.1         620         590         630
       10
GR   2241.3      8720.4    2242.1     8792.8      2241.0      8856.0      2239.5      9037.7      2238.5      9235.5
GR   2238.4      9411.5    2239.9     9475.0      2240.4      9584.1      2239.8      9646.2      2236.9      9727.9
GR   2233.1      9753.9    2233.1     9894.9      2231.5      9961.4      2229.1      9981.7      2228.4     10000.0
GR   2228.4     10015.1    2235.3    10052.4      2236.5     10084.1      2235.9     10096.0      2233.5     10123.2
GR   2232.8     10282.1    2231.7    10338.1      2232.1     10410.7      2235.1     10452.6      2235.0     10491.8
GR   2238.9     10541.6    2236.9    10911.1      2235.7     11107.0      2236.8     11165.7      2237.7     11327.0
GR   2237.8     11546.0    2237.0    11641.3      2239.6     11707.5      2238.8     11785.8      2236.6     11837.8
GR   2235.0     11877.1    2238.8    11896.1      2239.8     12139.6      2240.0     12429.9      2241.0     12442.3


NC      .025        .025       .032

   The following Q is the sum of the stormflow that remained in Tropicana Wash
  after the flow split that occured up at Cameron St. (near sect. 64.366) plus
  the flow from the 66" pipe.
    This section is just upstream of the confluence with the North TW

QT         2        2400       2400

ET                              6.1                             9979        10061
X1     63.866          10     9979.5    10016.3         355         340         345
X3         10
GR   2237.3      9744.2    2236.9     9833.1      2236.8      9973.3      2236.8      9973.3      2236.7      9979.5
GR   2230.8      9993.3    2230.8    10000.0      2230.8     10007.4      2235.7     10016.3      2233.4     10123.3

  Bridge at Hacienda
  Up & Downstream stream inverts have approximately 1 ft. of sediment deposition
  Culvert maintenance assumed

SB      1.25         1.6        2.6         67          16         0.7        80.0           0        2231      2230.8

ET                    4.1        6.1       9830       10117      9970.0     10050.0
X1     63.884           8     9986.5    10009.7          95          85          90
X2                       1       2236     2237.1
X3         10
GR   2237.0      9784.8    2236.9     9875.7      2236.4      9986.5        2231      9990.2        2231     10000.0
GR     2231     10005.9    2236.2    10009.7      2235.9     10117.1


ET                    4.1        6.1       9830      10070.0      9976.9     10035.0
X1     63.907           9     9976.9    10035.0         110         150         125
GR   2240.1      9738.1    2240.5     9851.0      2238.5      9873.9      2237.4      9976.9      2233.1      9993.4
GR   2231.9     10000.0    2231.9    10011.5      2238.1     10035.0      2238.0     10212.1

ET                    4.1        6.1       9910      10070.0      9970.6     10027.6
X1     63.945          12     9970.6    10027.6         190         210         200
X3         10
GR   2238.2      9811.3    2238.6     9890.4      2240.3      9921.7      2238.5      9932.9      2238.8      9970.6
GR   2233.0      9989.4    2233.0    10000.0      2233.0     10008.7      2238.2     10027.6      2239.6     10051.5
     2240.8     10069.8    2238.5    10202.1
  tbridge across Tropicana Wash
  -bridge is 5 ft. wide
```

```
X1    64.179        25      9982.8     10021.8       240        195        220
X3        10
GR    2249.7     9220.3     2248.8      9376.7    2248.4     9518.8     2249.9     9754.5     2249.6     9941.3
GR    2251.7     9982.8     2244.7     10000.0    2246.6    10011.4     2250.7    10021.8     2251.1    10034.5
GR    2249.7    10185.1     2250.7     10373.4    2254.0    10535.0     2253.0    10600.3     2250.0    10610.5
GR    2249.8    10627.8     2250.4     10650.8    2254.2    10708.0     2253.8    11001.2     2255.4    11021.7
GR    2256.3    11108.6     2253.9     11187.8    2255.7    11237.2     2261.8    11283.4     2267.0    11386.0

NC      .043       .098       .041
```

The following section is upstream of the flow split and the inlet to the 66" pipe.

```
QT         2       3300       3300

ET                  4.1        6.1     9961.4    10500.0     9961.4    10022.0
X1    64.366         15     9961.4    10022.0        735        950        990
X3        10
GR    2257.3     9394.0     2255.6     9574.6    2255.6     9574.6     2256.4     9683.3     2259.4     9961.4
GR    2254.3     9988.5     2251.8    10000.0    2253.0    10010.7     2257.2    10022.0     2257.5    10062.3
GR    2261.0    10089.      2265.0    10172.3    2266.1    10273.5     2267.5    10342.0     2269.5    10504.4

NC      .045       .078       .046
ET                             6.1                           9962      10044
X1    64.461         12     9962.0    10043.5        495        500        500
X3        10
GR    2267.8     9608.3     2268.7     9685.9    2267.1     9962.0     2265.4     9979.1     2257.9     9990.0
GR    2255.7    10000.0     2267.5    10043.5    2266.8    10114.7     2268.8    10227.6     2270.6    10424.5
GR    2273.4    10505.9     2271.4    10650.5

NC      .048       .048       .032
ET                             6.1                           9989      10070
```

Following section is at the confluence with the South TW.

```
X1    64.56          17     9979.0    10026.4        540        530        535
X3        10
GR    2277.4     9845.8     2274.3     9878.4    2274.2     9927.9     2274.2     9928.0     2276.0     9964.3
GR    2274.9     9979.0     2265.3    10000.0    2267.5    10015.9     2271.9    10026.4     2271.0    10078.4
GR    2273.1    10156.8     2276.0    10172.8    2277.6    10247.9     2274.6    10268.2     2275.3    10291.3
GR    2275.3    10424.8     2278.8    10588.5
```

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

*PROF 1

CCHV= 0.100 CEHV= 0.300
*SECNO 63.411

3265 DIVIDED FLOW

63.411	10.10	2213.60	0.00	2213.60	2213.76	0.16	0.00	0.00	2212.70
4100.0	1648.2	2354.7	97.1	691.9	642.2	86.3	0.0	0.0	2210.70
0.00	2.38	3.67	1.12	0.040	0.045	0.042	0.000	2203.50	9634.32
0.000967	0.	0.	0.	0	0	0	0.00	553.26	10314.26

1490 NH CARD USED
*SECNO 63.585

3265 DIVIDED FLOW

[redacted]

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9309.0 10488.0 TYPE= 1 TARGET= 1179.000

63.585	5.25	2220.45	2220.45	0.00	2221.42	0.97	1.71	0.24	2218.00
3819.0	753.7	1304.2	1761.1	154.1	131.5	244.3	20.7	9.0	2219.20
0.03	4.89	9.92	7.21	0.025	0.025	0.025	0.000	2215.20	9766.99
0.005432	930.	920.	910.	20	11	0	0.00	297.51	10137.97

1490 NH CARD USED
*SECNO 63.682
WATER EL=X5 CARD= 2230.900

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 6.35

3470 ENCROACHMENT STATIONS= 9850.0 11966.0 TYPE= 1 TARGET= 2116.000

63.682	10.00	2230.90	0.00	0.00	2230.98	0.08	0.21	0.09	2225.80
4100.0	1018.6	1746.5	1334.9	542.3	568.3	1058.5	35.8	14.3	2226.00
0.10	1.88	3.07	1.26	0.027	0.025	0.035	0.000	2220.90	9850.00
[redacted]0155	450.	510.	500.	0	0	0	0.00	655.40	10505.40

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

CCHV= 0.300 CEHV= 0.500
*SECNO 63.800

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2233.10 ELREA= 2236.50

63.800	5.55	2233.95	2233.95	0.00	2234.99	1.04	0.29	0.48	2233.10
4100.0	313.0	3787.0	0.0	121.9	445.6	0.0	55.1	21.0	2236.50
0.12	2.57	8.50	0.00	0.040	0.028	0.000	0.000	2228.40	9748.10
0.006050	620.	630.	590.	20	11	0	0.00	296.98	10045.09

*SECNO 63.866
3280 CROSS SECTION 63.87 EXTENDED 2.81 FEET

[redacted]
3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.56

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2236.70 ELREA= 2235.70

63.866	5.41	2236.21	0.00	0.00	2237.17	0.96	2.15	0.02	2236.70
2400.0	0.0	1215.5	1184.5	0.0	136.9	177.6	58.5	22.7	2235.70
0.13	0.00	8.88	6.67	0.000	0.032	0.025	0.000	2230.80	9980.65
0.006631	355.	345.	340.	3	0	0	0.00	142.65	10123.30

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	67.00	16.00	0.70	80.00	0.00	2231.00	2230.80

*SECNO 63.884
3280 CROSS SECTION 63.88 EXTENDED 4.98 FEET

3301 HV CHANGED MORE THAN HVINS

[redacted]

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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 7.47

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2258.57	2242.06	0.26	1304.	1103.	80.	77.	2236.00	2237.10	67.

3470 ENCROACHMENT STATIONS= 9830.0 10117.0 TYPE= 1 TARGET= 287.000

63.884	9.88	2240.88	0.00	0.00	2240.93	0.05	3.76	0.00	2236.40
2400.0	1071.0	398.5	930.5	649.4	209.3	518.2	60.3	23.2	2236.20
0.14	1.65	1.90	1.80	0.025	0.032	0.025	0.000	2231.00	9830.00
0.000119	95.	90.	85.	2	0	4	0.00	287.00	10117.00

*[redacted]O 63.907
[redacted]CROSS SECTION 63.91 EXTENDED 2.86 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.51

3470 ENCROACHMENT STATIONS= 9830.0 10070.0 TYPE= 1 TARGET= 240.000

63.907	8.96	2240.86	0.00	0.00	2241.00	0.14	0.03	0.05	2237.40
2400.0	827.7	1342.2	230.1	339.1	388.5	96.9	63.5	23.9	2238.10
0.16	2.44	3.46	2.37	0.025	0.032	0.025	0.000	2231.90	9830.00
0.000454	110.	125.	150.	2	0	0	0.00	240.00	10070.00

*SECNO 63.945
3280 CROSS SECTION 63.94 EXTENDED 2.38 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.60

3470 ENCROACHMENT STATIONS= 9910.0 10070.0 TYPE= 1 TARGET= 160.000

63.945	7.88	2240.88	0.00	0.00	2241.26	0.38	0.14	0.12	2238.80
2400.0	366.3	1856.6	177.1	111.1	345.4	59.7	66.5	24.8	2238.20
0.17	3.30	5.37	2.97	0.025	0.032	0.025	0.000	2233.00	9910.00
0.001257	190.	200.	210.	2	0	0	0.00	160.00	10070.00

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

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	58.00	22.00	0.01	185.00	3.06	2233.00	2233.00

*SECNO 63.946
3280 CROSS SECTION 63.95 EXTENDED 4.34 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.04

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2245.06	2241.26	0.00	661.	1740.	185.	186.	2238.00	2240.40	58.

3470 ENCROACHMENT STATIONS= 9910.0 10070.0 TYPE= 1 TARGET= 160.000

63.946	9.89	2242.94	0.00	0.00	2243.08	0.13	1.82	0.00	2238.85
2400.0	586.2	1467.5	346.3	233.2	460.3	145.2	66.6	24.8	2238.25
0.17	2.51	3.19	2.39	0.025	0.032	0.025	0.000	2233.05	9910.00
0.000302	5.	5.	5.	2	0	2	0.00	160.00	10070.00

CCHV= 0.100 CEHV= 0.300
*SECNO 63.979

3470 ENCROACHMENT STATIONS= 9880.0 10276.2 TYPE= 1 TARGET= 396.200

63.979	8.75	2243.05	0.00	0.00	2243.15	0.10	0.07	0.00	2240.80
2400.0	420.9	1333.0	646.1	217.6	433.9	577.7	71.2	26.1	2239.60
0.19	1.93	3.07	1.12	0.030	0.035	0.056	0.000	2234.30	9880.00
0.000498	145.	175.	250.	2	0	0	0.00	396.20	10276.20

*SECNO 64.084

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

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

3470 ENCROACHMENT STATIONS= 9925.0 11396.0 TYPE= 1 TARGET= 1471.000

64.084	7.16	2245.46	2245.46	0.00	2246.66	1.20	0.65	0.33	2243.50
2400.0	432.9	1921.1	46.0	81.8	202.2	42.4	81.0	29.9	2244.70
0.21	5.29	9.50	1.09	0.030	0.035	0.056	0.000	2238.30	9925.00
0.006050	460.	555.	590.	20	15	0	0.00	199.63	10124.63

CCHV= 0.300 CEHV= 0.500
*SECNO 64.113

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

3470 ENCROACHMENT STATIONS= 9925.0 10571.0 TYPE= 1 TARGET= 646.000

64.113	7.21	2247.01	0.00	0.00	2247.50	0.48	0.62	0.22	2244.20
2400.0	740.8	1634.6	24.6	142.6	283.1	38.7	82.4	30.7	2246.70
0.21	5.20	5.77	0.64	0.030	0.035	0.056	0.000	2239.80	9925.00
0.002980	150.	150.	145.	3	0	0	0.00	260.96	10185.96

*SECNO 64.137
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9930.0 10641.5 TYPE= 1 TARGET= 711.500

64.137	9.06	2250.36	2250.36	0.00	2250.96	0.60	0.57	0.06	2250.10
2400.0	10.0	1353.8	1036.2	13.2	169.8	407.8	84.0	31.8	2248.20
0.22	0.76	7.97	2.54	0.060	0.046	0.054	0.000	2241.30	9930.00
0.007331	125.	130.	130.	20	13	0	0.00	486.08	10416.08

CCHV= 0.100 CEHV= 0.300
*SECNO 64.179

3470 ENCROACHMENT STATIONS= 9225.0 10535.0 TYPE= 1 TARGET= 1310.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2251.70 ELREA= 2250.70

[redacted]CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
64.179	6.97	2251.67	0.00	0.00	2251.97	0.30	0.98	0.03	2251.70
2050.0	0.0	960.3	1089.7	0.0	159.7	501.1	86.9	33.9	2250.70
0.23	0.00	6.01	2.17	0.000	0.034	0.046	0.000	2244.70	9982.87
0.003108	240.	220.	195.	3	0	0	0.00	438.06	10420.93

*SECNO 64.366

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9961.4 10500.0 TYPE= 1 TARGET= 538.600

64.366	7.65	2259.45	2259.45	0.00	2261.27	1.82	6.65	0.46	2259.40
3300.0	0.0	3028.5	271.5	0.0	268.4	98.9	98.3	40.0	2257.20
0.26	0.00	11.28	2.75	0.000	0.041	0.098	0.000	2251.80	9961.40
0.013797	735.	990.	950.	4	8	0	0.00	115.75	10077.15

[redacted] 64.461

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2267.10 ELREA= 2267.50

64.461	10.28	2265.98	0.00	0.00	2267.48	1.50	6.18	0.03	2267.10
3300.0	0.0	3300.0	0.0	0.0	336.0	0.0	102.3	41.0	2267.50
0.27	0.00	9.82	0.00	0.000	0.046	0.000	0.000	2255.70	9973.19
0.011137	495.	500.	500.	2	0	0	0.00	64.74	10037.92

*SECNO 64.560
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2274.90 ELREA= 2271.90

64.560	8.31	2273.61	2273.61	0.00	2274.94	1.33	4.36	0.02	2274.90
3300.0	0.0	2437.7	862.3	0.0	231.3	235.5	107.2	42.5	2271.90
0.29	0.00	10.54	3.66	0.000	0.032	0.048	0.000	2265.30	9981.82
0.006228	540.	535.	530.	1	13	0	0.00	177.80	10159.62

[redacted]

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:CRFCD  TROPICANA WASH F.I.S.;  RDD33832     100 YEAR FLOOD DISCHARGE
Central Tropicana Wash, Detailed Methods   FLOODWAY CALCULATIONS
T3      CTW-Enc.hc2              UPRR to end of C. Trop. Wash, FLOODWAY CALCS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10        3                                      0         0                 2214.6      0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      2         0        -1         0         0         0         0         0         0         15
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[redacted]ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 2

CCHV= 0.100 CEHV= 0.300
*SECNO 63.411

3470 ENCROACHMENT STATIONS= 9920.0 10045.0 TYPE= 1 TARGET= 125.000

63.411	11.10	2214.60	0.00	2213.60	2215.06	0.46	0.00	0.00	2212.70
4100.0	53.9	4044.4	1.7	33.0	735.5	1.9	0.0	0.0	2210.70
0.00	1.63	5.50	0.88	0.040	0.045	0.042	0.000	2203.50	9920.00
0.001816	0.	0.	0.	0	0	0	0.00	125.00	10045.00

FLOW DISTRIBUTION FOR SECNO= 63.41 CWSEL= 2214.60

STA=	9920.	9951.	10045.	10045.
PER Q=	1.3	98.6	0.0	
AREA=	33.0	735.5	1.9	
[redacted]EL=	1.6	5.5	0.9	
[redacted]TH=	1.1	7.9	3.9	

1490 NH CARD USED
*SECNO 63.585

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9945.0 10080.0 TYPE= 1 TARGET= 135.000

63.585	5.71	2220.91	2220.91	2220.45	2222.47	1.56	2.80	0.33	2218.00
4100.0	803.8	1695.7	1600.5	96.6	148.4	174.2	12.6	2.7	2219.20
0.03	8.32	11.43	9.19	0.025	0.025	0.025	0.000	2215.20	9945.00
0.006133	930.	920.	910.	20	11	0	0.00	135.00	10080.00

FLOW DISTRIBUTION FOR SECNO= 63.58 CWSEL= 2220.91

STA=	9945.	9983.	10020.	10077.	10080.
PER Q=	19.6	41.4	36.9	2.1	
AREA=	96.6	148.4	161.7	12.5	
VEL=	8.3	11.4	9.4	6.8	
[redacted]DEPTH=	2.5	4.0	2.9	3.9	

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

1490 NH CARD USED
*SECNO 63.682
WATER EL=X5 CARD= 2231.900

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.88

3470 ENCROACHMENT STATIONS= 9930.0 10075.0 TYPE= 1 TARGET= 145.000

63.682	11.00	2231.90	0.00	2230.90	2232.13	0.23	0.35	0.13	2225.80
4100.0	666.3	2700.7	733.0	233.9	634.1	249.9	21.3	4.3	2226.00
0.06	2.85	4.26	2.93	0.025	0.025	0.025	0.000	2220.90	9930.00
0.000257	450.	510.	500.	0	0	0	0.00	145.00	10075.00

FLOW DISTRIBUTION FOR SECNO= 63.68 CWSEL= 2231.90

STA=	9930.	9970.	10035.	10075.
PER Q=		16.3	65.9	17.9
AREA=		233.9	634.1	249.9
[redacted]EL=		2.8	4.3	2.9
[redacted]TH=		5.9	9.6	6.3

CCHV= 0.300 CEHV= 0.500
*SECNO 63.800

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9894.0 10044.0 TYPE= 1 TARGET= 150.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2233.10 ELREA= 100000.00

63.800	5.45	2233.85	2233.85	2233.95	2235.25	1.40	0.46	0.58	2233.10
4100.0	1.2	4098.8	0.0	0.7	431.7	0.0	32.3	6.4	100000.00
0.08	1.81	9.49	0.00	0.040	0.028	0.000	0.000	2228.40	9894.00
0.007807	620.	630.	590.	20	9	0	0.00	150.00	10044.00

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

FLOW DISTRIBUTION FOR SECNO= 63.80 CWSEL= 2233.85

STA=	9894.	9895.	10084.
PER Q=	0.0	100.0	
AREA=	0.7	431.7	
VEL=	1.8	9.5	
DEPTH=	0.8	2.9	

*SECNO 63.866
3280 CROSS SECTION 63.87 EXTENDED 3.68 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9979.0 10061.0 TYPE= 1 TARGET= 82.000

63.866	6.28	2237.08	2237.08	2236.21	2238.58	1.51	2.64	0.05	2236.70
2400.0	0.3	1778.4	621.2	0.2	168.6	83.1	35.1	7.3	2235.70
0.09	1.84	10.55	7.47	0.025	0.032	0.025	0.000	2230.80	9979.00
0.007398	355.	345.	340.	2	11	0	0.00	82.00	10061.00

FLOW DISTRIBUTION FOR SECNO= 63.87 CWSEL= 2237.08

STA=	9979.	9980.	10016.	10061.
PER Q=	0.0	74.1	25.9	
AREA=	0.2	168.6	83.1	
VEL=	1.8	10.6	7.5	
DEPTH=	0.4	4.6	1.9	

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	67.00	16.00	0.70	80.00	0.00	2231.00	2230.80

*SECNO 63.884
3280 CROSS SECTION 63.88 EXTENDED 4.76 FEET

3301 HV CHANGED MORE THAN HVINS

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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.58

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2259.44	2239.09	0.50	1390.	1017.	80.	77.	2236.00	2237.10	67.

3470 ENCROACHMENT STATIONS= 9970.0 10050.0 TYPE= 1 TARGET= 80.000

63.884	9.65	2240.65	0.00	2240.88	2241.09	0.44	2.51	0.00	2236.40
2400.0	310.4	1171.7	917.8	69.6	204.2	181.9	35.8	7.5	2236.20
0.09	4.46	5.74	5.05	0.025	0.032	0.025	0.000	2231.00	9970.00
0.001116	95.	90.	85.	2	0	4	0.00	80.00	10050.00

[redacted]DISTRIBUTION FOR SECNO= 63.88 CWSEL= 2240.65

STA=	9970.	9987.	10010.	10050.
PER Q=		12.9	48.8	38.2
AREA=		69.6	204.2	181.9
VEL=		4.5	5.7	5.0
DEPTH=		4.2	8.8	4.5

*SECNO 63.907
3280 CROSS SECTION 63.91 EXTENDED 2.74 FEET

3470 ENCROACHMENT STATIONS= 9976.9 10035.0 TYPE= 1 TARGET= 58.100

63.907	8.84	2240.74	0.00	2240.86	2241.36	0.61	0.18	0.09	2237.40
2400.0	0.0	2400.0	0.0	0.0	381.8	0.0	37.0	7.7	100000.00
0.10	0.00	6.29	0.00	0.000	0.032	0.000	0.000	2231.90	9976.90
0.001749	110.	125.	150.	2	0	0	0.00	58.10	10035.00

FLOW DISTRIBUTION FOR SECNO= 63.91 CWSEL= 2240.74

STA=	9977.	10035.
PER Q=		100.0
AREA=		381.8
VEL=		6.3
DEPTH=		6.6

[redacted]

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

*SECNO 63.945
3280 CROSS SECTION 63.94 EXTENDED 2.58 FEET

3470 ENCROACHMENT STATIONS= 9970.6 10027.6 TYPE= 1 TARGET= 57.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2238.80 ELREA= 100000.00

63.945	8.08	2241.08	0.00	2240.88	2241.78	0.70	0.38	0.04	2238.80
2400.0	0.0	2400.0	0.0	0.0	357.0	0.0	38.7	8.0	100000.00
0.11	0.00	6.72	0.00	0.000	0.032	0.000	0.000	2233.00	9970.60
0.002107	190.	200.	210.	2	0	0	0.00	57.00	10027.60

FLOW DISTRIBUTION FOR SECNO= 63.94 CWSEL= 2241.08

STA= 9971. 10028.
PER Q= 100.0
AREA= 357.0
'EL= 6.7
'H= 6.3

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	58.00	22.00	0.01	185.00	3.06	2233.00	2233.00

*SECNO 63.946
3280 CROSS SECTION 63.95 EXTENDED 4.13 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.41

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2245.26	2241.78	0.00	696.	1697.	185.	186.	2238.00	2240.40	58.

3470 ENCROACHMENT STATIONS= 9970.6 10027.6 TYPE= 1 TARGET= 57.000

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2238.85 ELREA= 100000.00

	63.946	9.68	2242.73	0.00	2242.94	2243.17	0.45	1.39	0.00	2238.85
	2400.0	0.0	2400.0	0.0	0.0	448.0	0.0	38.8	8.0	100000.00
	0.11	0.00	5.36	0.00	0.000	0.032	0.000	0.000	2233.05	9970.60
	0.001055	5.	5.	5.	2	0	0	0.00	57.00	10027.60

FLOW DISTRIBUTION FOR SECNO= 63.95 CWSEL= 2242.73

STA= 9971. 10028.
PER Q= 100.0
AREA= 448.0
VEL= 5.4
DEPTH= 7.9

CCHV= 0.100 CEHV= 0.300
*SECNO 63.979

ENCROACHMENT STATIONS= 9971.6 10044.4 TYPE= 1 TARGET= 72.801

63.979	8.64	2242.94	0.00	2243.05	2243.43	0.49	0.24	0.01	2240.80
2400.0	0.0	2400.0	0.0	0.0	425.2	0.0	40.5	8.2	100000.00
0.12	0.00	5.64	0.00	0.000	0.035	0.000	0.000	2234.30	9971.60
0.001897	145.	175.	250.	2	0	0	0.00	72.80	10044.40

FLOW DISTRIBUTION FOR SECNO= 63.98 CWSEL= 2242.94

STA= 9972. 10044.
PER Q= 100.0
AREA= 425.2
VEL= 5.6
DEPTH= 5.8

*SECNO 64.084

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY

entered negligible pier width to use special bridge method

SB	.9	1.6	2.6	58	22	.01	185	3.06	2233.00	2233.00
ET		4.1	6.1	9910.0	10070.0	9970.6	10027.6			
X1	63.946	12	9970.6	10027.6	5	5	5		.05	
X2			1	2238	2240.4					
X3	10									
GR	2238.2	9811.3	2238.6	9890.4	2240.3	9921.7	2238.5	9932.9	2238.8	9970.6
GR	2233.0	9989.4	2233.0	10000.0	2233.0	10008.7	2238.2	10027.6	2239.6	10051.5
GR	2240.8	10069.8	2238.5	10202.1						
NC	.03	.056	.035	.1	.3					
ET		4.1	6.1	9880.0	10276.2	9971.6	10044.4			
X1	63.979	22	9971.6	10044.4	145	250	175			
GR	2241.6	9458.3	2240.8	9515.9	2237.6	9699.1	2240.4	9724.9	2240.7	9948.7
GR	2240.8	9971.6	2235.0	9990.9	2234.3	10000.0	2234.3	10008.9	2238.8	10025.2
GR	2239.6	10044.4	2240.0	10129.1	2242.0	10276.2	2238.8	10299.6	2240.4	10312.5
GR	2240.9	10489.0	2242.5	10744.8	2239.2	10790.3	2239.6	10860.5	2241.5	11051.7
GR	2243.4	11161.5	2243.9	11411.1						
ET		4.1	6.1	9925	11396	9955	10034			
X1	64.084	15	9974.5	10013.5	460	590	555			
GR	2243.8	9731.6	2244.5	9894.5	2243.5	9974.5	2238.9	9984.6	2238.3	10000.
GR	2244.7	10013.5	2246.8	10319.6	2247.5	10662.	2246.7	10678.	2248.3	10709.
GR	2249.8	10821.0	2249.2	11059.4	2248.0	11328.	2250.7	11348.	2251.0	11397.

lowing higher coefficients are due to buildings encroaching into channel

NC				.3	.5					
ET		4.1	6.1	9925.0	10571.0	9950.0	10047.0			
X1	64.113	21	9975.7	10046.1	150	145	150			
GR	2245.4	9678.3	2244.2	9900.4	2244.2	9975.7	2240.0	9989.7	2239.8	10000.0
GR	2239.8	10006.3	2244.7	10018.9	2246.7	10046.1	2246.7	10154.8	2248.2	10304.7
GR	2251.2	10571.0	2250.0	10602.5	2249.8	10661.6	2247.1	10667.6	2246.8	10693.7
GR	2251.6	10737.2	2252.3	10948.2	2250.1	11059.3	2251.0	11195.0	2253.6	11295.5
GR	2255.0	11401.6								
NC	.06	.054	.046							
ET		4.1	6.1	9930.0	10641.5	9950	10068.0			
X1	64.137	21	9991.4	10019.8	125	130	130			
GR	2250.2	9698.7	2250.2	9698.7	2250.5	9717.0	2250.1	9991.4	2243.1	9994.0
GR	2241.3	10000.0	2248.2	10019.8	2249.5	10118.4	2249.1	10284.7	2251.4	10524.6
GR	2251.9	10641.5	2249.4	10660.0	2248.7	10690.4	2252.5	10738.4	2253.4	10925.8
GR	2252.0	11023.3	2251.4	11119.0	2253.3	11200.5	2256.5	11297.0	2256.5	11351.1
GR	2259.2	11438.2								
NC	.046	.046	.034	.1	.3					
ET		4.1	6.1	9225.0	10535.0	9982	10055			

The following Q is portion of the stormflow that remained in Tropicana Wash
after the flow split that occured up at Cameron St. (near sect. 64.366)
This does not include the flow from the 66" pipe.

QT	2	2050	2050

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

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9955.0 10034.0 TYPE= 1 TARGET= 79.000

64.084	7.03	2245.33	2245.33	2245.46	2247.10	1.76	1.92	0.38	2243.50
2400.0	206.0	2175.2	18.8	33.3	197.1	11.5	44.7	9.2	2244.70
0.13	6.18	11.03	1.63	0.030	0.035	0.056	0.000	2238.30	9955.00
0.008444	460.	555.	590.	20	15	0	0.00	79.00	10034.00

FLOW DISTRIBUTION FOR SECNO= 64.08 CWSEL= 2245.33

STA=	9955.	9975.	10014.	10034.
PER Q=		8.6	90.6	0.8
AREA=		33.3	197.1	11.5
VEL=		6.2	11.0	1.6
DEPTH=		1.7	5.1	0.6

CCHV= 0.300 CEHV= 0.500
*SECNO 64.113

[redacted]V CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.78

3470 ENCROACHMENT STATIONS= 9950.0 10047.0 TYPE= 1 TARGET= 97.000

64.113	7.79	2247.59	0.00	2247.01	2248.12	0.53	0.66	0.37	2244.20
2400.0	463.4	1936.0	0.6	87.1	323.8	0.8	45.9	9.5	2246.70
0.14	5.32	5.98	0.80	0.030	0.035	0.056	0.000	2239.80	9950.00
0.002672	150.	150.	145.	3	0	0	0.00	97.00	10047.00

FLOW DISTRIBUTION FOR SECNO= 64.11 CWSEL= 2247.59

STA=	9950.	9976.	10046.	10047.
PER Q=		19.3	80.7	0.0
AREA=		87.1	323.8	0.8
VEL=		5.3	6.0	0.8
DEPTH=		3.4	4.6	0.9

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

*SECNO 64.137

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9950.0 10068.0 TYPE= 1 TARGET= 118.000

64.137	9.28	2250.58	2250.58	2250.36	2252.05	1.47	0.65	0.47	2250.10
2400.0	30.6	1883.0	486.4	18.8	176.2	99.6	46.9	9.8	2248.20
0.14	1.63	10.69	4.88	0.060	0.046	0.054	0.000	2241.30	9950.00
0.012541	125.	130.	130.	20	11	0	0.00	118.00	10068.00

FLOW DISTRIBUTION FOR SECNO= 64.14 CWSEL= 2250.58

STA=	9950.	9991.	10020.	10068.
PER Q=	1.3	78.5	20.3	
[redacted]EA=	18.8	176.2	99.6	
[redacted]EL=	1.6	10.7	4.9	
DEPTH=	0.5	6.2	2.1	

CCHV= 0.100 CEHV= 0.300
*SECNO 64.179

3470 ENCROACHMENT STATIONS= 9982.0 10055.0 TYPE= 1 TARGET= 73.000

64.179	7.93	2252.63	0.00	2251.67	2253.91	1.28	1.84	0.02	2251.70
2050.0	1.1	1863.3	185.6	0.8	197.2	55.3	48.2	10.3	2250.70
0.15	1.40	9.45	3.36	0.046	0.034	0.046	0.000	2244.70	9982.00
0.005814	240.	220.	195.	3	0	0	0.00	73.00	10055.00

FLOW DISTRIBUTION FOR SECNO= 64.18 CWSEL= 2252.63

STA=	9982.	9983.	10022.	10035.	10055.
PER Q=	0.1	90.9	3.8	5.2	
AREA=	0.8	197.2	22.0	33.3	
VEL=	1.4	9.4	3.5	3.2	
DEPTH=	1.0	5.1	1.7	1.6	

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

*SECNO 64.366

3470 ENCROACHMENT STATIONS= 9961.4 10022.0 TYPE= 1 TARGET= 60.600

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2259.40 ELREA= 100000.00

64.366	8.47	2260.27	0.00	2259.45	2261.94	1.67	7.91	0.12	2259.40
3300.0	0.0	3300.0	0.0	0.0	318.3	0.0	54.7	11.8	100000.00
0.18	0.00	10.37	0.00	0.000	0.041	0.000	0.000	2251.80	9961.40
0.010060	735.	990.	950.	3	0	0	0.00	60.60	10022.00

FLOW DISTRIBUTION FOR SECNO= 64.37 CWSEL= 2260.27

STA= 9961. 10022.
PER Q= 100.0
AREA= 318.3
VEL= 10.4
DEPTH= 5.3

[redacted]O 64.461

3470 ENCROACHMENT STATIONS= 9962.0 10044.0 TYPE= 1 TARGET= 82.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2267.10 ELREA= 2267.50

64.461	10.10	2265.80	0.00	2265.98	2267.42	1.61	5.47	0.01	2267.10
3300.0	0.0	3300.0	0.0	0.0	323.7	0.0	58.4	12.5	2267.50
0.19	0.00	10.19	0.00	0.000	0.046	0.000	0.000	2255.70	9975.13
0.011952	495.	500.	500.	3	0	0	0.00	62.08	10037.21

FLOW DISTRIBUTION FOR SECNO= 64.46 CWSEL= 2265.80

STA= 9975. 10044.
PER Q= 100.0
AREA= 323.7
VEL= 10.2
DEPTH= 5.2

[redacted]

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

*SECNO 64.560
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9989.0 10070.0 TYPE= 1 TARGET= 81.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 2271.90

64.560	8.55	2273.85	2273.85	2273.61	2275.95	2.10	5.07	0.14	100000.00
3300.0	0.0	2833.7	466.3	0.0	228.6	101.7	62.4	13.4	2271.90
0.20	0.00	12.40	4.59	0.000	0.032	0.048	0.000	2265.30	9989.00
0.007694	540.	535.	530.	4	15	0	0.00	81.00	10070.00

FLOW DISTRIBUTION FOR SECNO= 64.56 CWSEL= 2273.85

STA=	9989.	10026.	10070.
PER Q=	85.9	14.1	
AREA=	228.6	101.7	
[redacted]EL=	12.4	4.6	
[redacted]H=	6.1	2.3	

THIS RUN EXECUTED 30AUG93 13:34:48

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

CTW-Enc.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
	63.411	2213.60	4100.00	10.10	2.38	3.67	1.12	1648.20	2354.73	97.06	553.26	9634.32	10314.26
	63.411	2214.60	4100.00	11.10	1.63	5.50	0.88	53.94	4044.36	1.70	125.00	9920.00	10045.00
*	63.585	2220.45	3819.00	5.25	4.89	9.92	7.21	753.70	1304.23	1761.07	297.51	9766.99	10137.97
*	63.585	2220.91	4100.00	5.71	8.32	11.43	9.19	803.79	1695.69	1600.52	135.00	9945.00	10080.00
	63.682	2230.90	4100.00	10.00	1.88	3.07	1.26	1018.63	1746.50	1334.87	655.40	9850.00	10505.40
*	63.682	2231.90	4100.00	11.00	2.85	4.26	2.93	666.32	2700.65	733.02	145.00	9930.00	10075.00
*	63.800	2233.95	4100.00	5.55	2.57	8.50	0.00	313.00	3787.00	0.00	296.98	9748.10	10045.09
*	63.800	2233.85	4100.00	5.45	1.81	9.49	0.00	1.23	4098.77	0.00	150.00	9894.00	10044.00
*	63.866	2236.21	2400.00	5.41	0.00	8.88	6.67	0.00	1215.46	1184.54	142.65	9980.65	10123.30
*	63.866	2237.08	2400.00	6.28	1.84	10.55	7.47	0.34	1778.44	621.22	82.00	9979.00	10061.00
*	63.884	2240.88	2400.00	9.88	1.65	1.90	1.80	1071.01	398.54	930.46	287.00	9830.00	10117.00
*	63.884	2240.65	2400.00	9.65	4.46	5.74	5.05	310.44	1171.71	917.85	80.00	9970.00	10050.00
*	63.907	2240.86	2400.00	8.96	2.44	3.46	2.37	827.66	1342.22	230.12	240.00	9830.00	10070.00
	63.907	2240.74	2400.00	8.84	0.00	6.29	0.00	0.00	2400.00	0.00	58.10	9976.90	10035.00
*	63.945	2240.88	2400.00	7.88	3.30	5.37	2.97	366.28	1856.62	177.10	160.00	9910.00	10070.00
	63.945	2241.08	2400.00	8.08	0.00	6.72	0.00	0.00	2400.00	0.00	57.00	9970.60	10027.60
*	63.946	2242.94	2400.00	9.89	2.51	3.19	2.39	586.15	1467.50	346.35	160.00	9910.00	10070.00
*	63.946	2242.73	2400.00	9.68	0.00	5.36	0.00	0.00	2400.00	0.00	57.00	9970.60	10027.60
	63.979	2243.05	2400.00	8.75	1.93	3.07	1.12	420.92	1333.00	646.09	396.20	9880.00	10276.20
	63.979	2242.94	2400.00	8.64	0.00	5.64	0.00	0.00	2400.00	0.00	72.80	9971.60	10044.40
*	64.084	2245.46	2400.00	7.16	5.29	9.50	1.09	432.93	1921.10	45.97	199.63	9925.00	10124.63
	64.084	2245.33	2400.00	7.03	6.18	11.03	1.63	205.99	2175.21	18.80	79.00	9955.00	10034.00

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	64.113	2247.01	2400.00	7.21	5.20	5.77	0.64	740.76	1634.64	24.61	260.96	9925.00	10185.96
*	64.113	2247.59	2400.00	7.79	5.32	5.98	0.80	463.37	1935.99	0.64	97.00	9950.00	10047.00
*	64.137	2250.36	2400.00	9.06	0.76	7.97	2.54	10.01	1353.76	1036.23	486.08	9930.00	10416.08
*	64.137	2250.58	2400.00	9.28	1.63	10.69	4.88	30.61	1883.01	486.38	118.00	9950.00	10068.00
	64.179	2251.67	2050.00	6.97	0.00	6.01	2.17	0.00	960.26	1089.74	438.06	9982.87	10420.93
	64.179	2252.63	2050.00	7.93	1.40	9.45	3.36	1.07	1863.31	185.63	73.00	9982.00	10055.00
*	64.366	2259.45	3300.00	7.65	0.00	11.28	2.75	0.00	3028.47	271.53	115.75	9961.40	10077.15
	64.366	2260.27	3300.00	8.47	0.00	10.37	0.00	0.00	3300.00	0.00	60.60	9961.40	10022.00
	64.461	2265.98	3300.00	10.28	0.00	9.82	0.00	0.00	3300.00	0.00	64.74	9973.19	10037.92
	64.461	2265.80	3300.00	10.10	0.00	10.19	0.00	0.00	3300.00	0.00	62.08	9975.13	10037.21
*	64.560	2273.61	3300.00	8.31	0.00	10.54	3.66	0.00	2437.74	862.26	177.80	9981.82	10159.62
*	64.560	2273.85	3300.00	8.55	0.00	12.40	4.59	0.00	2833.74	466.26	81.00	9989.00	10070.00

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SUMMARY PRINTOUT

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	K*CHSL
	63.411	2213.60	4100.00	0.00	553.26	9634.32	0.00	9951.20	10044.50	0.00	10314.26	0.00
	63.411	2214.60	4100.00	0.00	125.00	9920.00	9920.00	9951.20	10044.50	10045.00	10045.00	0.00
*	63.585	2220.45	3819.00	920.00	297.51	9766.99	9309.00	9983.30	10020.20	10488.00	10137.97	12.72
*	63.585	2220.91	4100.00	920.00	135.00	9945.00	9945.00	9983.30	10020.20	10080.00	10080.00	12.72
*	63.682	2230.90	4100.00	510.00	655.40	9850.00	9850.00	9969.60	10035.40	11966.00	10505.40	11.18
*	63.682	2231.90	4100.00	510.00	145.00	9930.00	9930.00	9969.60	10035.40	10075.00	10075.00	11.18
*	63.800	2233.95	4100.00	630.00	296.98	9748.10	0.00	9894.90	10084.10	0.00	10045.09	11.90
*	63.800	2233.85	4100.00	630.00	150.00	9894.00	9894.00	9894.90	10084.10	10044.00	10044.00	11.90
*	63.866	2236.21	2400.00	345.00	142.65	9980.65	0.00	9979.50	10016.30	0.00	10123.30	6.96
*	63.866	2237.08	2400.00	345.00	82.00	9979.00	9979.00	9979.50	10016.30	10061.00	10061.00	6.96
*	63.884	2240.88	2400.00	90.00	287.00	9830.00	9830.00	9986.50	10009.70	10117.00	10117.00	2.22
*	63.884	2240.65	2400.00	90.00	80.00	9970.00	9970.00	9986.50	10009.70	10050.00	10050.00	2.22
*	63.907	2240.86	2400.00	125.00	240.00	9830.00	9830.00	9976.90	10035.00	10070.00	10070.00	7.20
	63.907	2240.74	2400.00	125.00	58.10	9976.90	9976.90	9976.90	10035.00	10035.00	10035.00	7.20
*	63.945	2240.88	2400.00	200.00	160.00	9910.00	9910.00	9970.60	10027.60	10070.00	10070.00	5.50
	63.945	2241.08	2400.00	200.00	57.00	9970.60	9970.60	9970.60	10027.60	10027.60	10027.60	5.50
*	63.946	2242.94	2400.00	5.00	160.00	9910.00	9910.00	9970.60	10027.60	10070.00	10070.00	10.01
*	63.946	2242.73	2400.00	5.00	57.00	9970.60	9970.60	9970.60	10027.60	10027.60	10027.60	10.01
	63.979	2243.05	2400.00	175.00	396.20	9880.00	9880.00	9971.60	10044.40	10276.20	10276.20	7.14
	63.979	2242.94	2400.00	175.00	72.80	9971.60	9971.60	9971.60	10044.40	10044.40	10044.40	7.14
*	64.084	2245.46	2400.00	555.00	199.63	9925.00	9925.00	9974.50	10013.50	11396.00	10124.63	7.21
*	64.084	2245.33	2400.00	555.00	79.00	9955.00	9955.00	9974.50	10013.50	10034.00	10034.00	7.21
*	64.113	2247.01	2400.00	150.00	260.96	9925.00	9925.00	9975.70	10046.10	10571.00	10185.96	10.00
*	64.113	2247.59	2400.00	150.00	97.00	9950.00	9950.00	9975.70	10046.10	10047.00	10047.00	10.00
*	64.137	2250.36	2400.00	130.00	486.08	9930.00	9930.00	9991.40	10019.80	10641.50	10416.08	11.54
*	64.137	2250.58	2400.00	130.00	118.00	9950.00	9950.00	9991.40	10019.80	10068.00	10068.00	11.54
	64.179	2251.67	2050.00	220.00	438.06	9982.87	9225.00	9982.80	10021.80	10535.00	10420.93	15.45
	64.179	2252.63	2050.00	220.00	73.00	9982.00	9982.00	9982.80	10021.80	10055.00	10055.00	15.45
*	64.366	2259.45	3300.00	990.00	115.75	9961.40	9961.40	9961.40	10022.00	10500.00	10077.15	7.17
	64.366	2260.27	3300.00	990.00	60.60	9961.40	9961.40	9961.40	10022.00	10022.00	10022.00	7.17
	64.461	2265.98	3300.00	500.00	64.74	9973.19	0.00	9962.00	10043.50	0.00	10037.92	7.80
	64.461	2265.80	3300.00	500.00	62.08	9975.13	9962.00	9962.00	10043.50	10044.00	10037.21	7.80

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST	K*CHSL
*	64.560	2273.61	3300.00	535.00	177.80	9981.82	0.00	9979.00	10026.40	0.00	10159.62	17.94
*	64.560	2273.85	3300.00	535.00	81.00	9989.00	9989.00	9979.00	10026.40	10070.00	10070.00	17.94

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SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	63.884	2242.06	2236.00	2258.57	2237.10	1102.69	1304.38	30.00	0.26	9.88	2240.88	1.90	2240.93
*	63.884	2239.09	2236.00	2259.44	2237.10	1016.82	1389.90	30.00	0.50	9.65	2240.65	5.74	2241.09
*	63.946	2241.26	2238.00	2245.06	2240.40	1740.08	660.50	30.00	0.00	9.89	2242.94	3.19	2243.08
*	63.946	2241.78	2238.00	2245.26	2240.40	1697.02	696.33	30.00	0.00	9.68	2242.73	5.36	2243.17

SUMMARY OF ERRORS AND SPECIAL NOTES

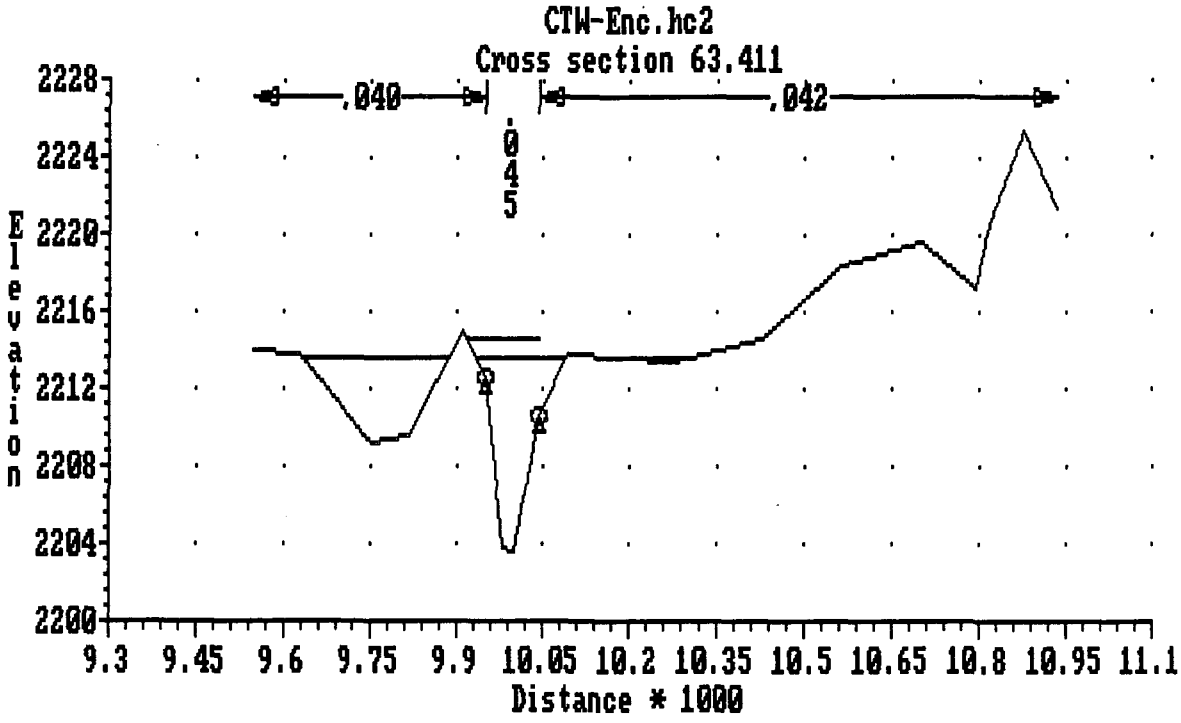
CAUTION	SECNO= 63.585	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 63.585	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 63.585	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO= 63.585	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 63.585	PROFILE= 2	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 63.585	PROFILE= 2	20 TRIALS ATTEMPTED TO BALANCE WSEL
NOTE	SECNO= 63.682	PROFILE= 1	WSEL BASED ON X5 CARD
WARNING	SECNO= 63.682	PROFILE= 1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
NOTE	SECNO= 63.682	PROFILE= 2	WSEL BASED ON X5 CARD
WARNING	SECNO= 63.682	PROFILE= 2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION	SECNO= 63.800	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 63.800	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 63.800	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO= 63.800	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 63.800	PROFILE= 2	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 63.800	PROFILE= 2	20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING	SECNO= 63.866	PROFILE= 1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
[illegible]ON	SECNO= 63.866	PROFILE= 2	CRITICAL DEPTH ASSUMED
[illegible]ON	SECNO= 63.866	PROFILE= 2	MINIMUM SPECIFIC ENERGY
WARNING	SECNO= 63.884	PROFILE= 1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO= 63.884	PROFILE= 2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO= 63.907	PROFILE= 1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO= 63.945	PROFILE= 1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO= 63.946	PROFILE= 1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO= 63.946	PROFILE= 2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION	SECNO= 64.084	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 64.084	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 64.084	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO= 64.084	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 64.084	PROFILE= 2	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 64.084	PROFILE= 2	20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING	SECNO= 64.113	PROFILE= 1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO= 64.113	PROFILE= 2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION	SECNO= 64.137	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 64.137	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 64.137	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
[illegible]ON	SECNO= 64.137	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 64.137	PROFILE= 2	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 64.137	PROFILE= 2	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO= 64.366	PROFILE= 1	CRITICAL DEPTH ASSUMED

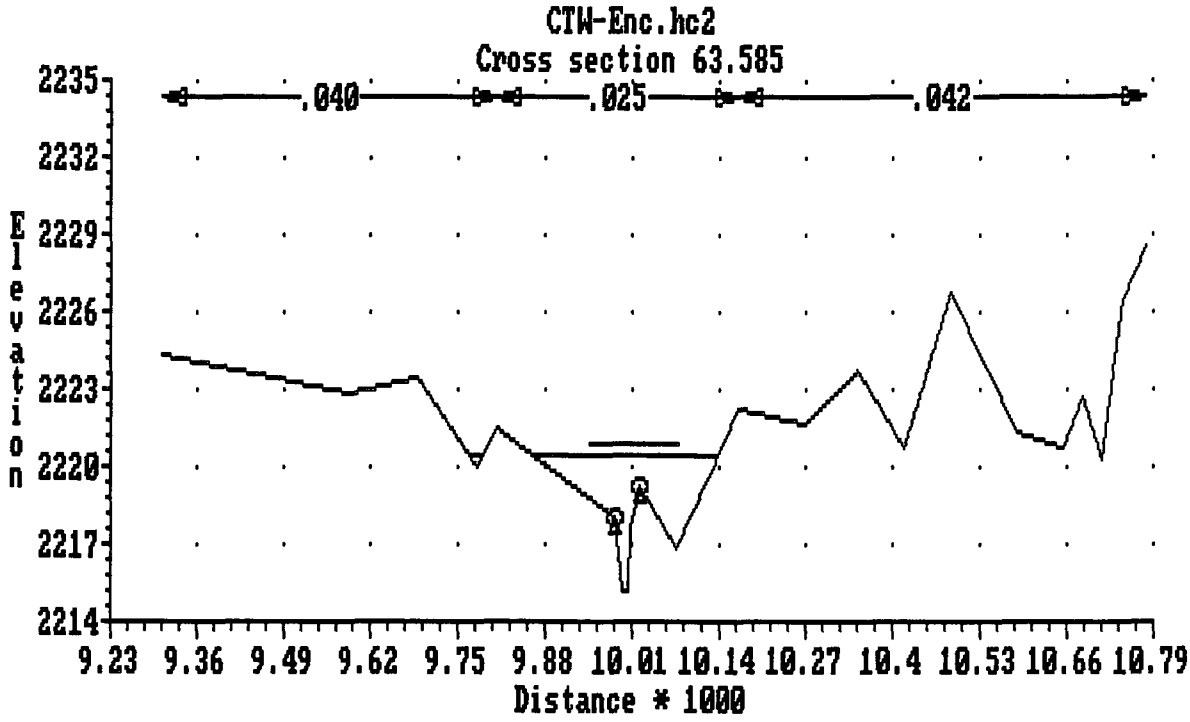
)N SECNO= 64.366 PROFILE= 1 MINIMUM SPECIFIC ENERGY

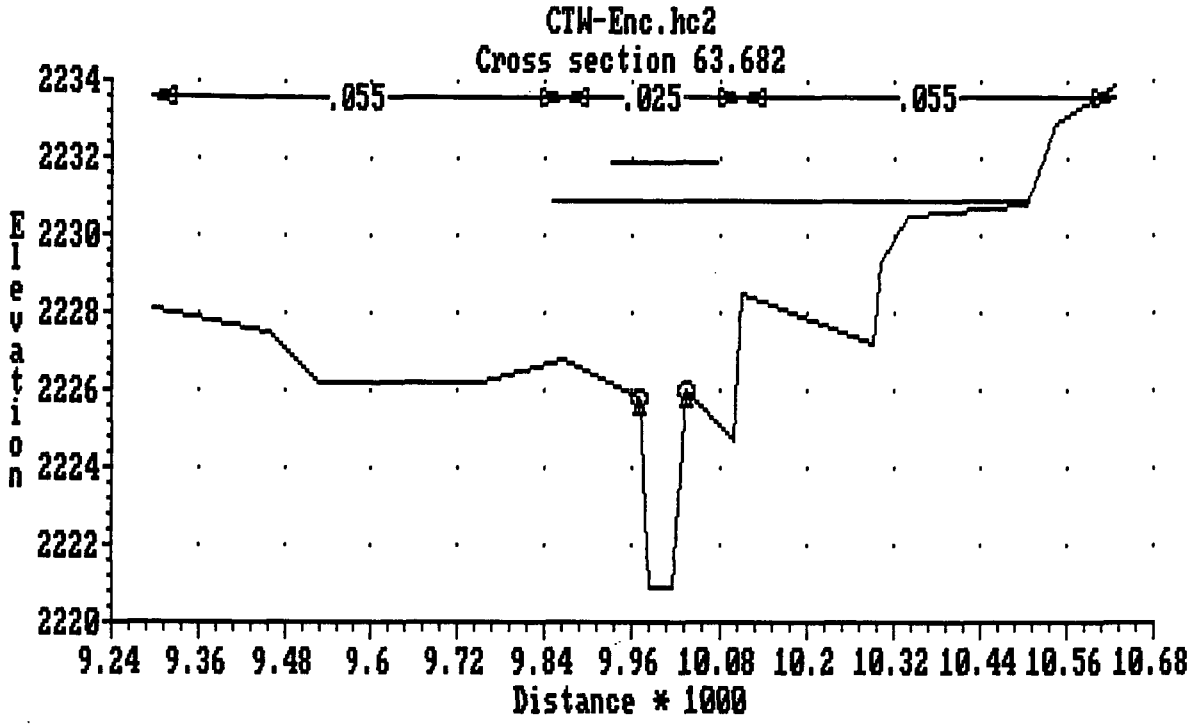
CAUTION SECNO= 64.560 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 64.560 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 64.560 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 64.560 PROFILE= 2 MINIMUM SPECIFIC ENERGY

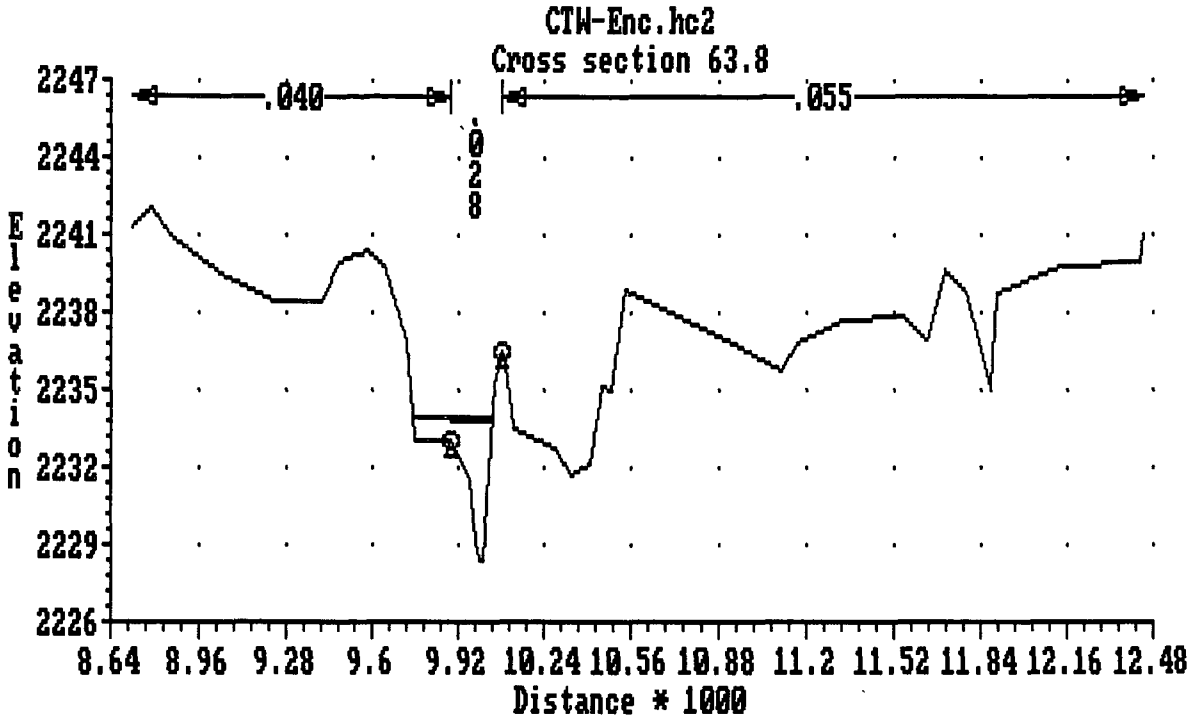
FLOODWAY DATA, CTW-Enc.hc2
PROFILE NO. 2

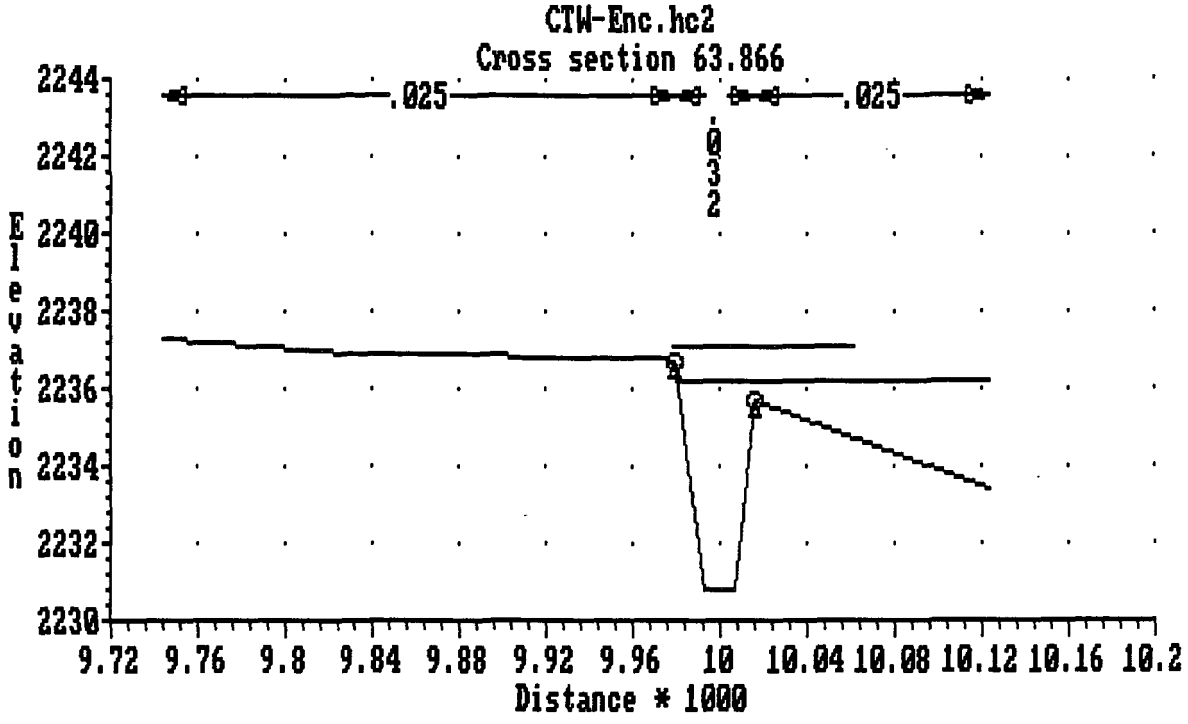
STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
63.411	125.	770.	5.3	2214.6	2213.6	1.0
63.585	135.	419.	9.8	2220.9	2220.4	0.5
63.682	145.	1118.	3.7	2231.9	2230.9	1.0
63.800	150.	432.	9.5	2233.8	2233.9	-0.1
63.866	82.	252.	9.5	2237.1	2236.2	0.9
63.884	80.	456.	5.3	2240.7	2240.9	-0.2
63.907	58.	382.	6.3	2240.8	2240.9	-0.1
63.945	57.	357.	6.7	2241.1	2240.9	0.2
63.946	57.	448.	5.4	2242.7	2242.9	-0.2
63.979	73.	425.	5.6	2243.0	2243.1	-0.1
64.084	79.	242.	9.9	2245.4	2245.5	-0.1
64.113	97.	412.	5.8	2247.6	2247.0	0.6
64.137	118.	295.	8.1	2250.6	2250.4	0.2
64.179	73.	253.	8.1	2252.7	2251.7	1.0
64.366	61.	318.	10.4	2260.2	2259.4	0.8
[illegible]4.461	62.	324.	10.2	2265.8	2266.0	-0.2
[illegible]4.560	81.	330.	10.0	2273.8	2273.6	0.2

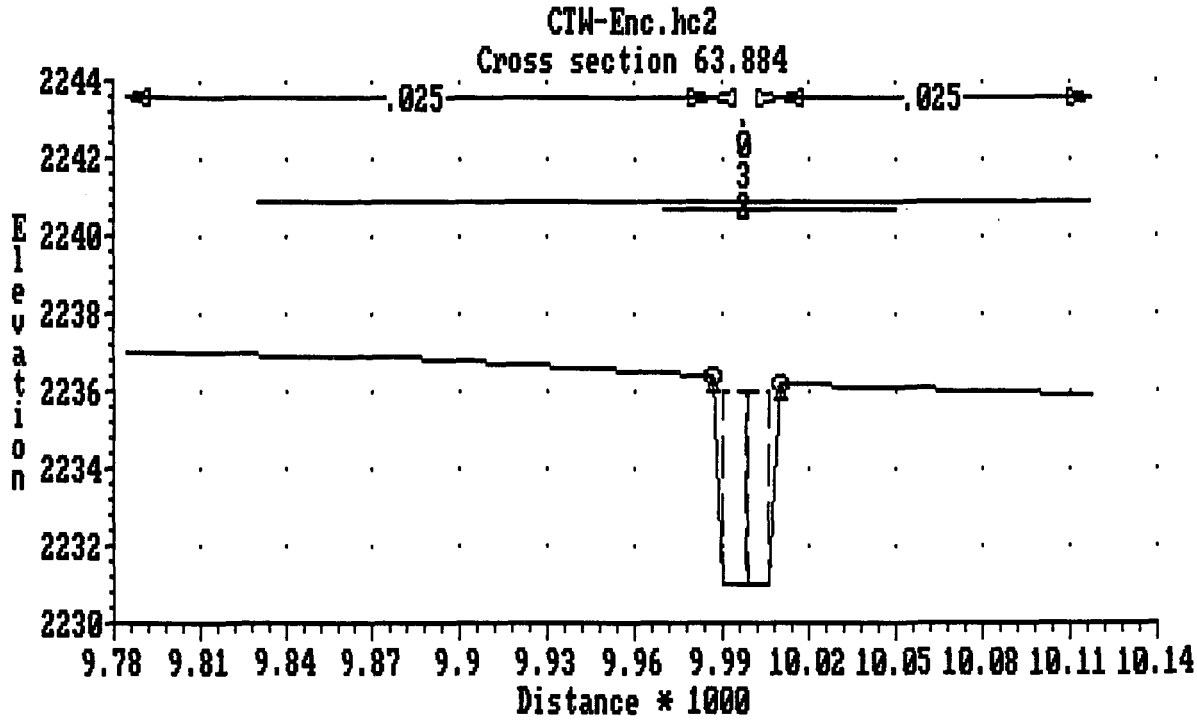

CTW-Enc.hc2
Cross section 63.411
.040
.045
.042
Elevation
2228
2224
2220
2216
2212
2208
2204
2200
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
10.95
11.1
Distance * 1000

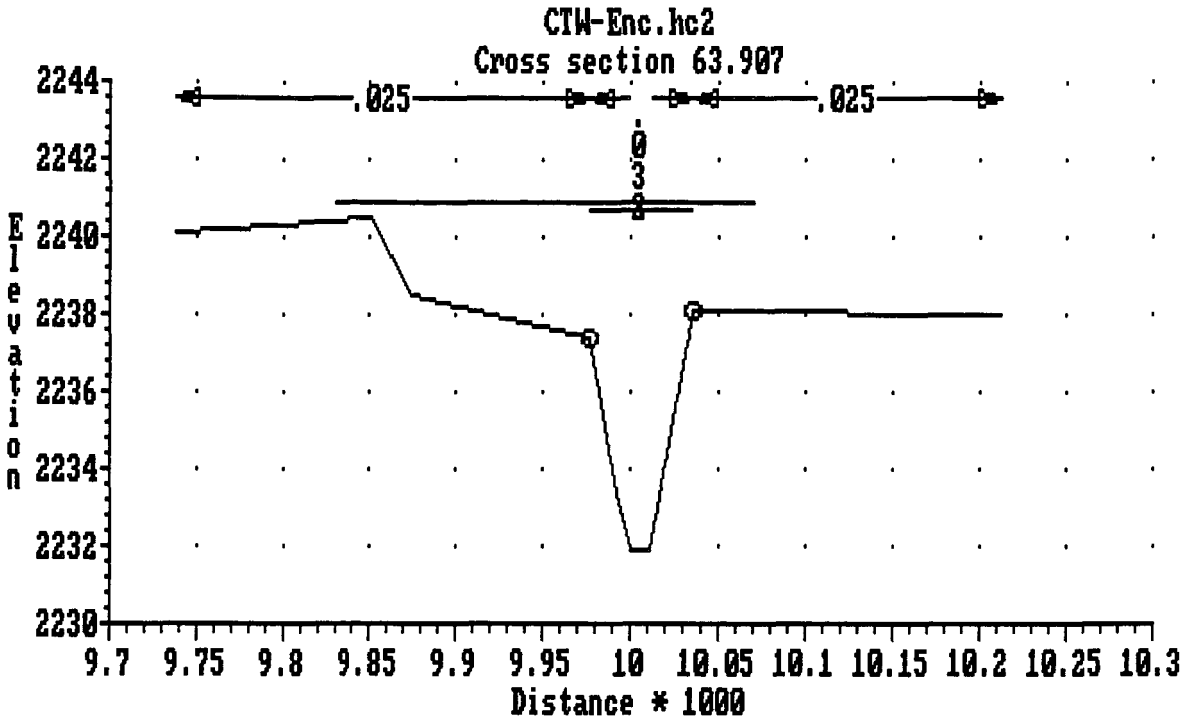

CTW-Enc.hc2
Cross section 63.585
.040
.025
.042
Elevation
2235
2232
2229
2226
2223
2220
2217
2214
9.23
9.36
9.49
9.62
9.75
9.88
10.01
10.14
10.27
10.4
10.53
10.66
10.79
Distance * 1000

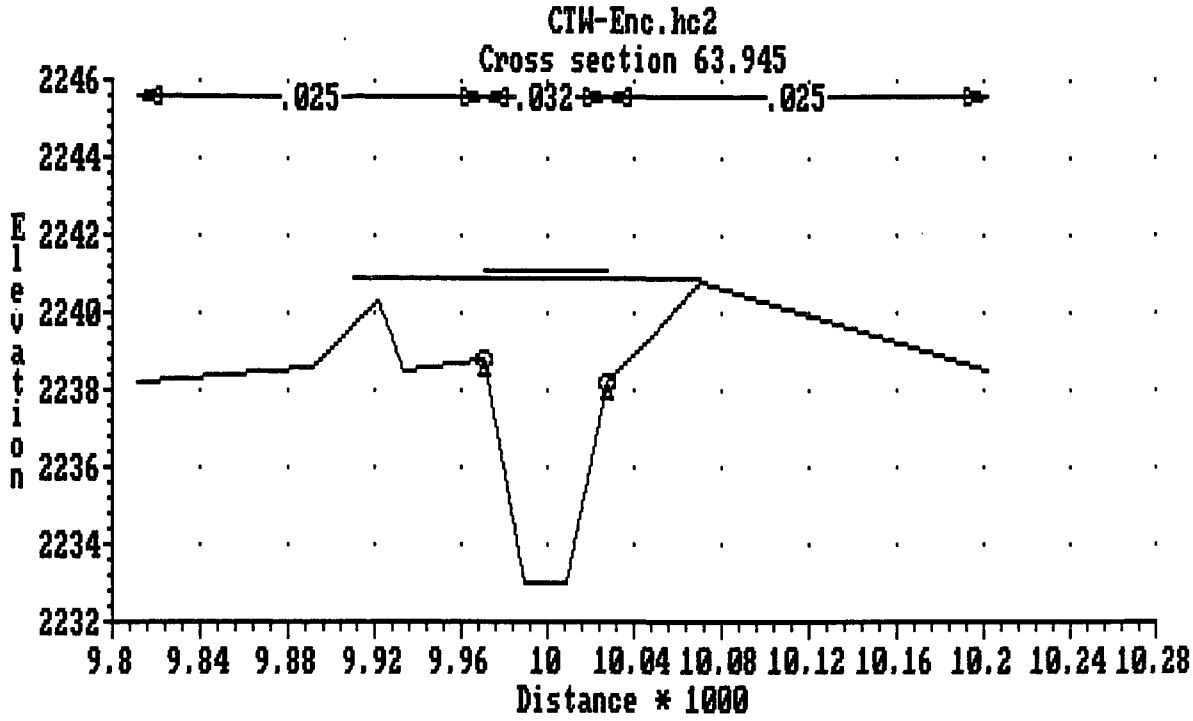

CTW-Enc.hc2
Cross section 63.682
.055
.025
.055
Elevation
2234
2232
2230
2228
2226
2224
2222
2220
9.24
9.36
9.48
9.6
9.72
9.84
9.96
10.08
10.2
10.32
10.44
10.56
10.68
Distance * 1000

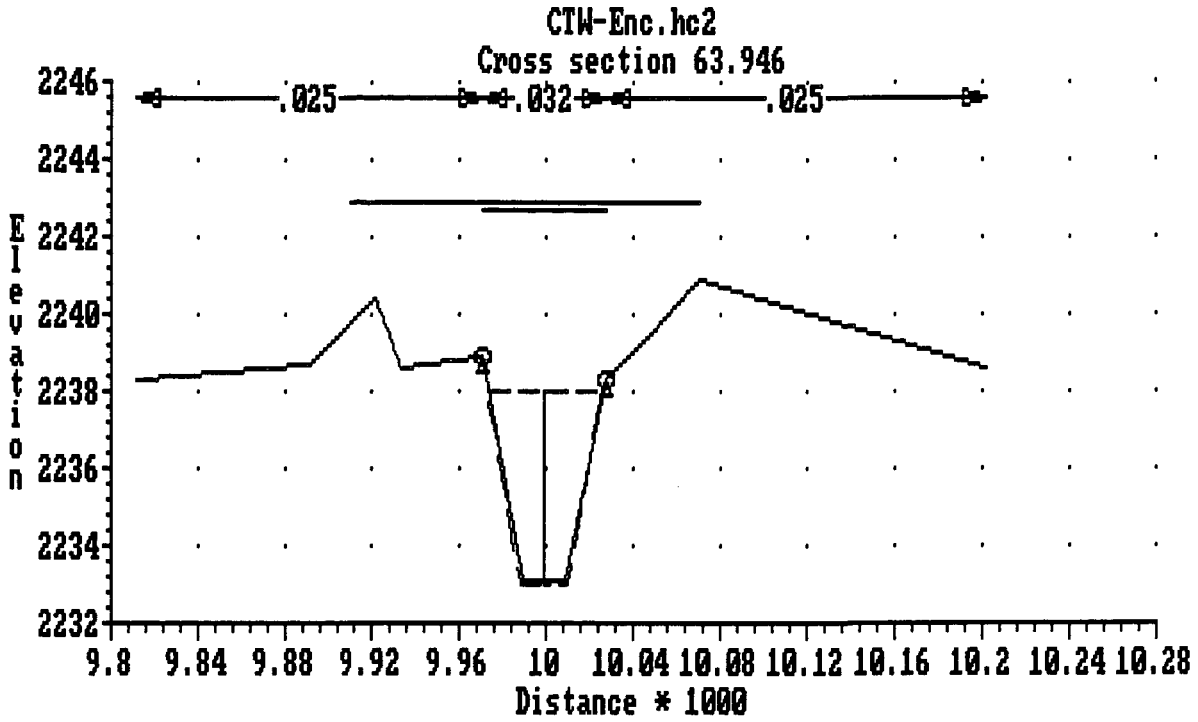

CTW-Enc.hc2
Cross section 63.8
.040
.028
.055
Elevation
2247
2244
2241
2238
2235
2232
2229
2226
8.64
8.96
9.28
9.6
9.92
10.24
10.56
10.88
11.2
11.52
11.84
12.16
12.48
Distance * 1000

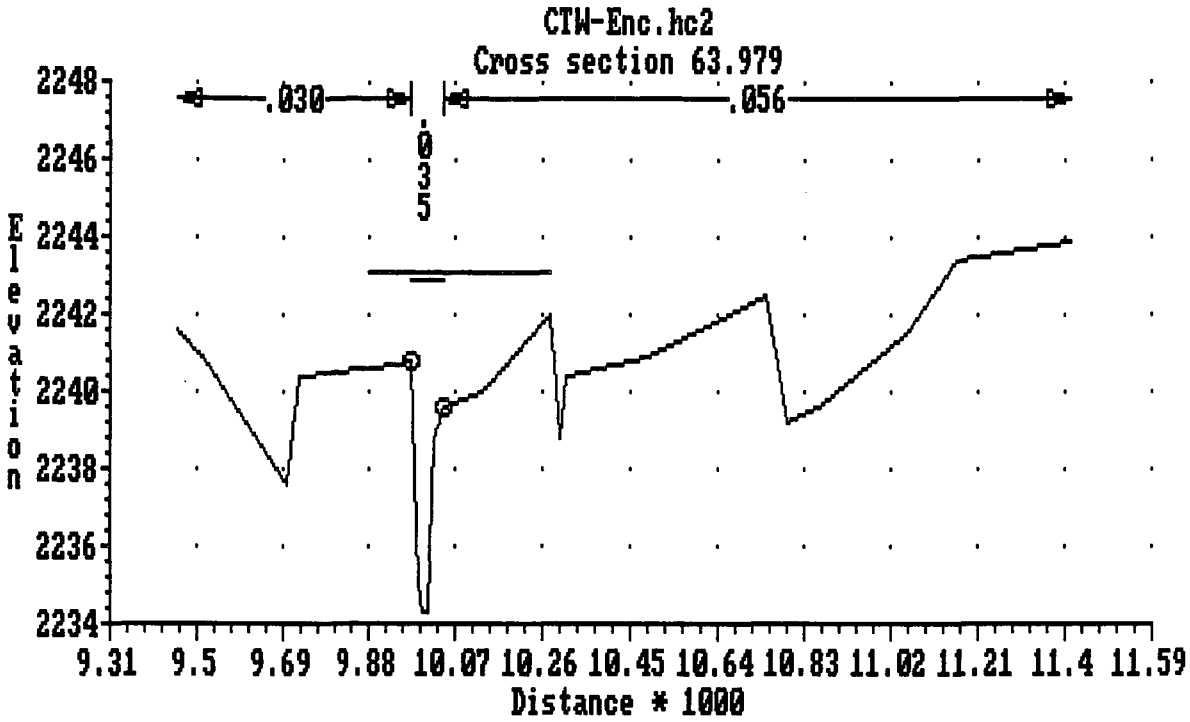

CTW-Enc.hc2
Cross section 63.866
.025
.025
.032
Elevation
2244
2242
2240
2238
2236
2234
2232
2230
9.72
9.76
9.8
9.84
9.88
9.92
9.96
10
10.04
10.08
10.12
10.16
10.2
Distance * 1000

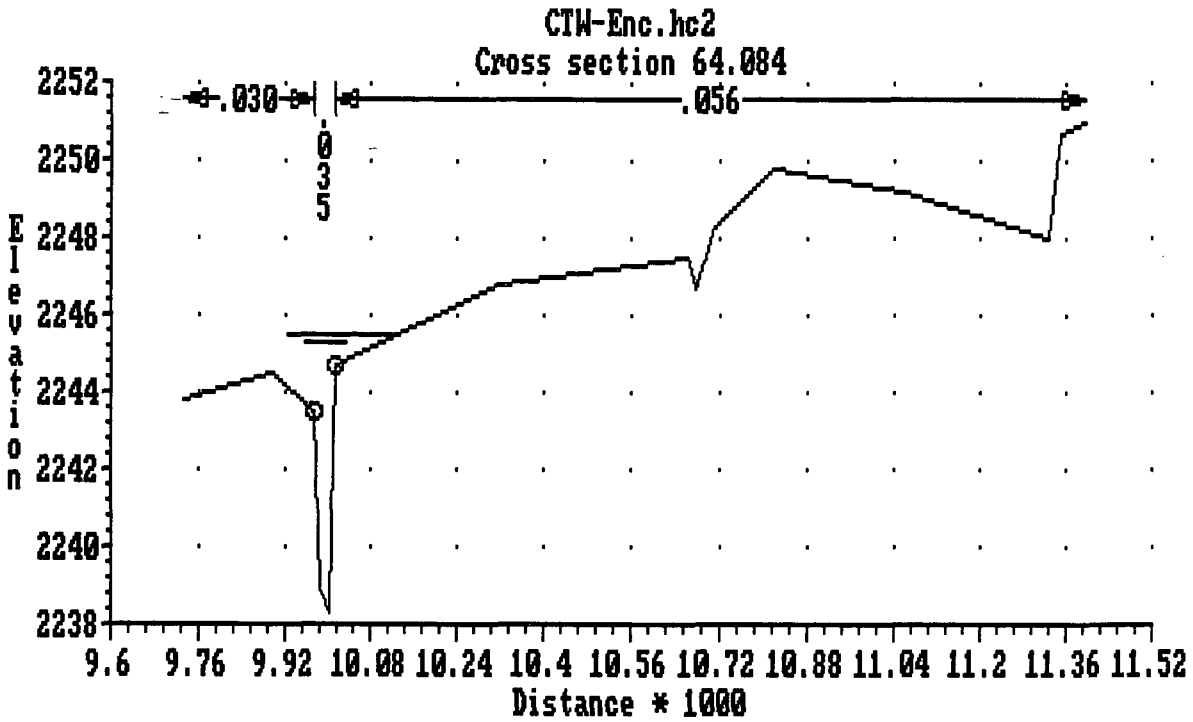

CTW-Enc.hc2
Cross section 63.884
.025
.025
.03
Elevation
2244
2242
2240
2238
2236
2234
2232
2230
9.78
9.81
9.84
9.87
9.9
9.93
9.96
9.99
10.02
10.05
10.08
10.11
10.14
Distance * 1000

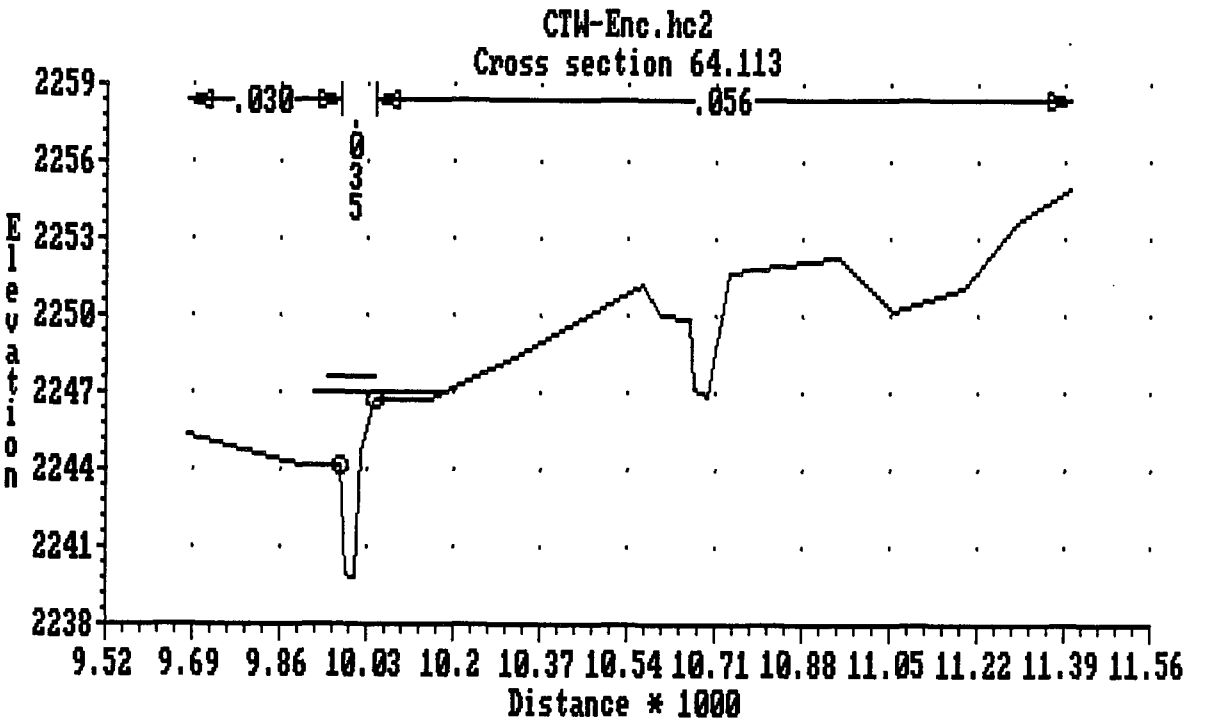

CTW-Enc.hc2
Cross section 63.907
.025
.025
.03
Elevation
2244
2242
2240
2238
2236
2234
2232
2230
9.7
9.75
9.8
9.85
9.9
9.95
10
10.05
10.1
10.15
10.2
10.25
10.3
Distance * 1000

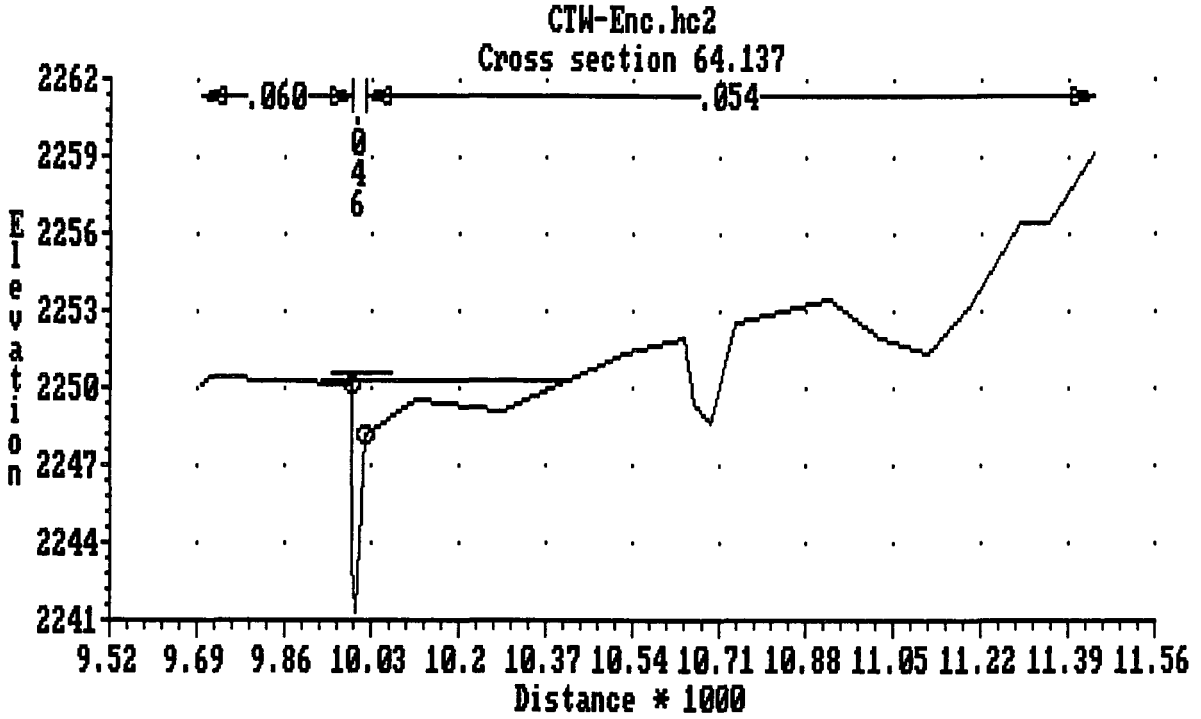

CTW-Enc.hc2
Cross section 63.945
.025
.032
.025
Elevation
2246
2244
2242
2240
2238
2236
2234
2232
9.8
9.84
9.88
9.92
9.96
10
10.04
10.08
10.12
10.16
10.2
10.24
10.28
Distance * 1000

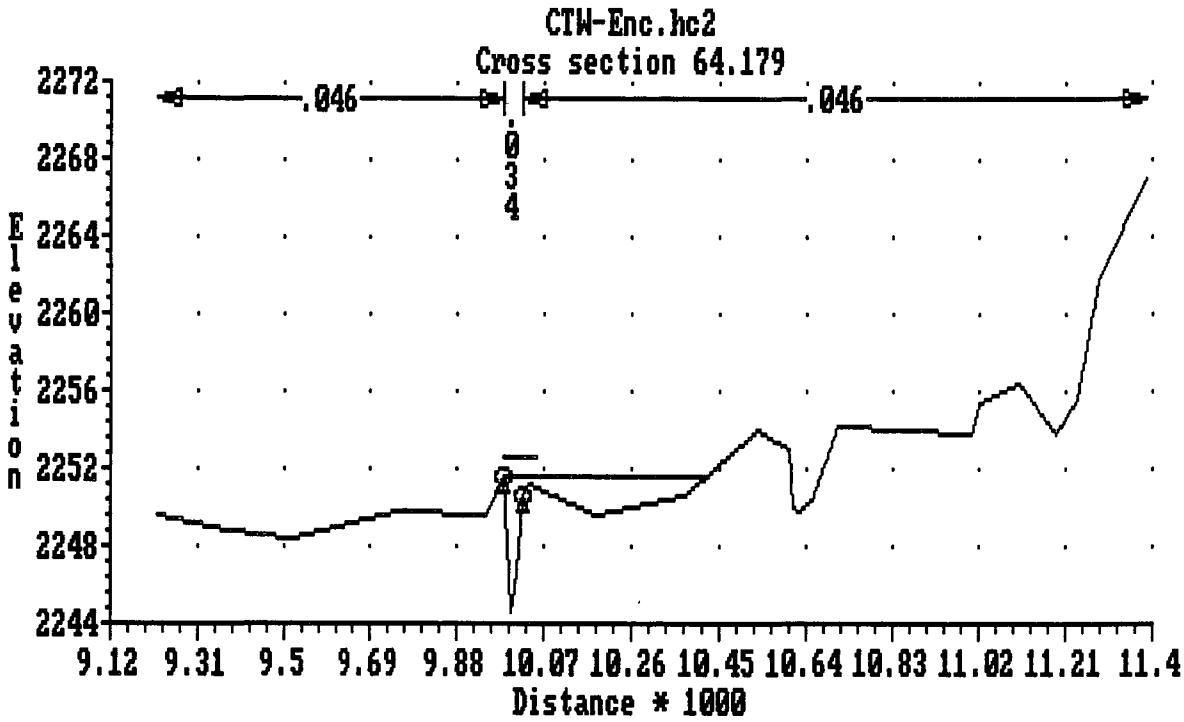

CTW-Enc.hc2
Cross section 63.946
.025
.032
.025
Elevation
2246
2244
2242
2240
2238
2236
2234
2232
9.8
9.84
9.88
9.92
9.96
10
10.04
10.08
10.12
10.16
10.2
10.24
10.28
Distance * 1000

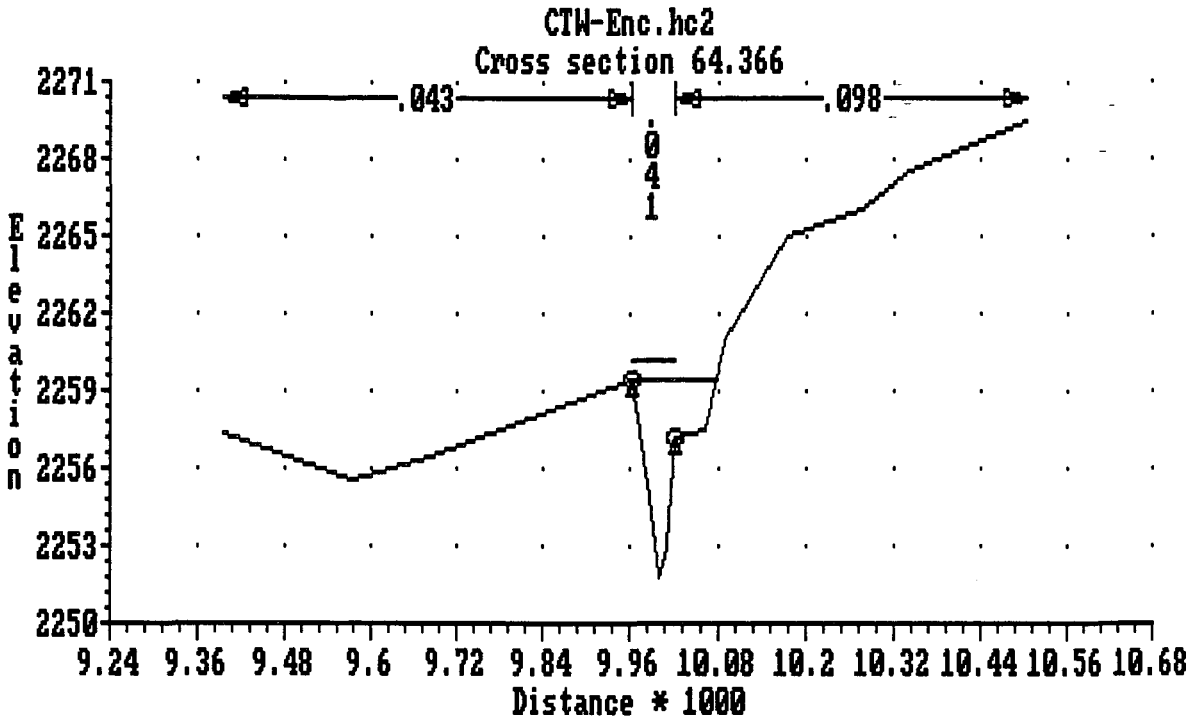

CTW-Enc.hc2
Cross section 63.979
.030
.035
.056
Elevation
2248
2246
2244
2242
2240
2238
2236
2234
9.31
9.5
9.69
9.88
10.07
10.26
10.45
10.64
10.83
11.02
11.21
11.4
11.59
Distance * 1000

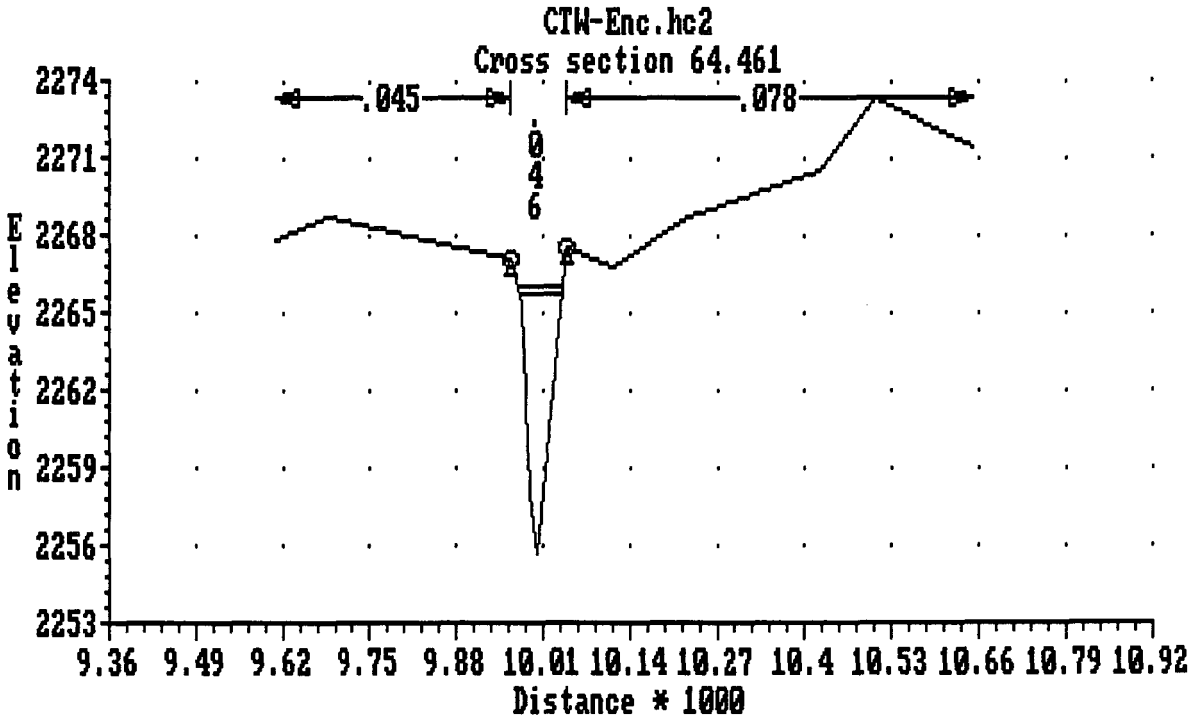

CTW-Enc.hc2
Cross section 64.084
.030
.035
.056
Elevation
2252
2250
2248
2246
2244
2242
2240
2238
9.6
9.76
9.92
10.08
10.24
10.4
10.56
10.72
10.88
11.04
11.2
11.36
11.52
Distance * 1000

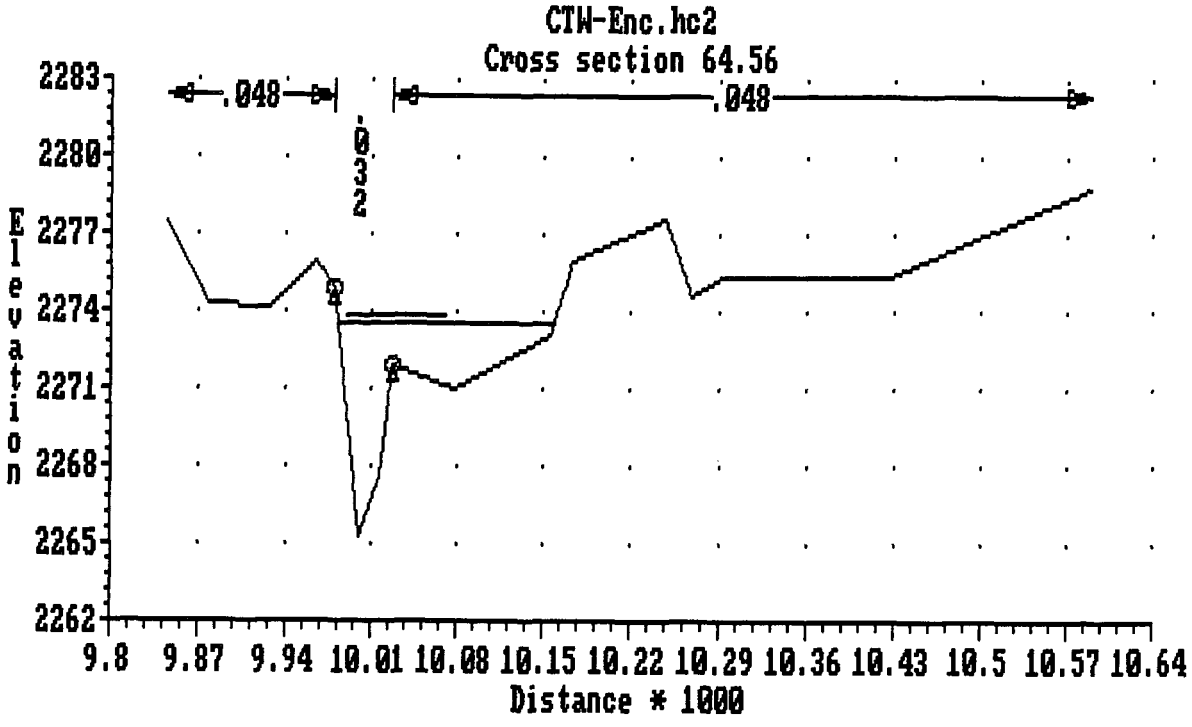

CTW-Enc.hc2
Cross section 64.113
.030
.035
.056
Elevation
2259
2256
2253
2250
2247
2244
2241
2238
9.52
9.69
9.86
10.03
10.2
10.37
10.54
10.71
10.88
11.05
11.22
11.39
11.56
Distance * 1000


CTW-Enc.hc2
Cross section 64.137
.060
.046
.054
Elevation
2262
2259
2256
2253
2250
2247
2244
2241
9.52
9.69
9.86
10.03
10.2
10.37
10.54
10.71
10.88
11.05
11.22
11.39
11.56
Distance * 1000


CTW-Enc.hc2
Cross section 64.179
.046
.046
034
Elevation
2272
2268
2264
2260
2256
2252
2248
2244
9.12
9.31
9.5
9.69
9.88
10.07
10.26
10.45
10.64
10.83
11.02
11.21
11.4
Distance * 1000


CTW-Enc.hc2
Cross section 64.366
.043
.098
041
Elevation
2271
2268
2265
2262
2259
2256
2253
2250
9.24
9.36
9.48
9.6
9.72
9.84
9.96
10.08
10.2
10.32
10.44
10.56
10.68
Distance * 1000


CTW-Enc.hc2
Cross section 64.461
.045
.078
046
Elevation
2274
2271
2268
2265
2262
2259
2256
2253
9.36 9.49 9.62 9.75 9.88 10.01 10.14 10.27 10.4 10.53 10.66 10.79 10.92
Distance * 1000


CTW-Enc.hc2
Cross section 64.56
.048
.032
.048
Elevation
2283
2280
2277
2274
2271
2268
2265
2262
9.8
9.87
9.94
10.01
10.08
10.15
10.22
10.29
10.36
10.43
10.5
10.57
10.64
Distance * 1000

NTW-ENC.hc2

- North branch upstream of confluence with CTW
- Floodway run

HEC2 S/N: 1916530021 HMVersion: 6.50 Data File: ntw-enc.hc2

```
*********************************************
*     -2 WATER SURFACE PROFILES             *
*                                           *
*  Version   4.6.2;  May 1991               *
*                                           *
*  RUN DATE    30AUG93    TIME   13:36:10   *
*********************************************
```

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

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

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

HAESTAD METHODS

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

THIS RUN EXECUTED 30AUG93 13:36:10

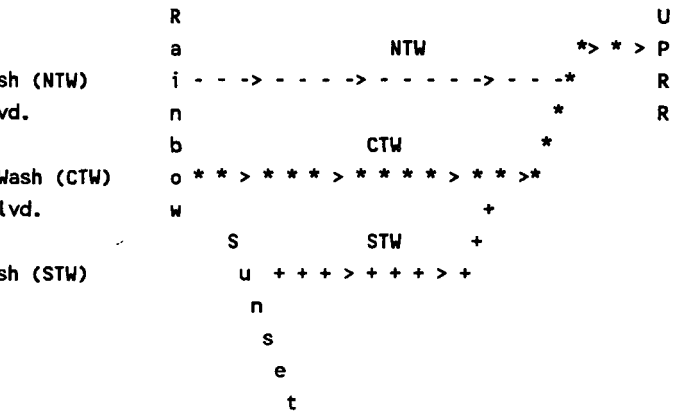
****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

TROPICANA WASH FLOOD INSURANCE STUDY

by CH2M Hill, 1992 RDD33832

Schematic:



Notes:
-discharges were based on those in the "Las Vegas Valley Flood Insurance Study Hydrology Report" by James M. Montgomery, Inc., September, 1991 (see CH2M Hill memo dated July 13, 1992)

-Manning's "n" values were estimated by field observations of channels and floodplains in conjunction with methods recommended in "Open Channel Hydraulics" by Chow, 1959

-stations and elevations obtained from 400 scale topo created by CH2M Hill from aerial photographs

T1 CCRFCD TROPICANA WASH F.I.S.; RDD33832
T2 North Tropicana Wash, Detailed Methods
T3 NTW-Enc.hc2 N. Trop. Wash FLOODWAY CALCULATIONS

The following channel slope and starting water surface elevation comes from the Central Tropicana Wash run, section 63.80, which is where this run is tributary.

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			0.0119	0	0		2233.95	0

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

VARIABLE CODES FOR SUMMARY PRINTOUT

```
     38        1        43        8        55        26        56        13        14        15
      4       53        54
     38        1        43       39         4        53        27        21        22        28
     54
    100      200

NC     .04      .055      .028       .1        .3

QT       2     4100      4100

   -this section is at the confluence of the North and Central Tropicana Washes

ET                       6.1                            9894     10044
X1   63.80       40    9894.9   10084.1         0         0         0
X3      10
GR  2241.3   8720.4    2242.1    8792.8    2241.0    8856.0    2239.5    9037.7    2238.5    9235.5
GR  2238.4   9411.5    2239.9    9475.0    2240.4    9584.1    2239.8    9646.2    2236.9    9727.9
GR  2233.1   9753.9    2233.1    9894.9    2231.5    9961.4    2229.1    9981.7    2228.4   10000.0
GR  2228.4  10015.1    2235.3   10052.4    2236.5   10084.1    2235.9   10096.0    2233.5   10123.2
GR  2232.8  10282.1    2231.7   10338.1    2232.1   10410.7    2235.1   10452.6    2235.0   10491.8
GR  2238.9  10541.6    2236.9   10911.1    2235.7   11107.0    2236.8   11165.7    2237.7   11327.0
GR  2237.8  11546.0    2237.0   11641.3    2239.6   11707.5    2238.8   11785.8    2236.6   11837.8
GR  2235.0  11877.1    2238.8   11896.1    2239.8   12139.6    2240.0   12429.9    2241.0   12442.3

NC     .034      .078      .053
   -this section above the confluence of the North and Central Tropicana Washes
QT       2     1450      1450
ET                       6.1                            9956     10060
X1   90.093      13    9955.1   10105.4       450       540       490
X3      10
GR  2241.2   9823.6    2241.2    9823.6    2240.8    9931.2    2235.8    9955.1    2234.8   10000.0
GR  2237.0  10105.4    2237.8   10255.9    2239.0   10340.3    2238.6   10423.3    2238.3   10491.1
GR  2239.2  10546.4    2244.5   10601.2    2242.4   10798.1

NC     .032      .032      .027       .3        .5
ET                4.1       6.1     9500  10147.8    9950.3     10060
X1   90.188       20    9980.3   10018.1       540       495       500
GR  2246.9   9499.1    2246.8    9566.9    2245.1    9752.5    2243.7    9925.9    2242.2    9941.0
GR  2241.4   9980.3    2238.1    9992.2    2238.1   10000.0    2238.1   10009.0    2242.0   10018.1
GR  2242.3  10066.1    2242.7   10147.8    2241.6   10366.7    2242.0   10631.7    2241.9   10673.2
GR  2244.2  10691.3    2245.8   10739.3    2246.1   10820.3    2244.4   10839.8    2248.3   10925.0
```

[redacted]ıt bank encroachment in sections 90.203 and 90.215 due to building

ET		4.1	6.1	2248	10285	9970	10120			
X1	90.203	12	9961.0	10025.0	80	75	80			
X3	10									
GR	2247.9	9456.4	2247.1	9706.9	2244.1	9961.0	2238.2	9987.1	2238.1	10000.0
GR	2238.1	10010.5	2243.2	10025.0	2242.1	10290.0	2242.9	10528.9	2242.8	10663.0
GR	2244.9	10819.5	2248.0	10918.0						

Culvert under Cameron St.

SB	1.25	1.6	2.6	50	27.6	3.6	96.0	0	2238.6	2238.1

Culverts are partially filled with silt, set sed. elev. in X3.2 to be at lowest GR elev.

NC	.085	.025	.031							
ET		4.1	6.1	2249	10270	9930	10109.0			
X1	90.215	13	9975.3	10028.7	65	65	65			
X2			1	2242.6	2244.5					
X3	10	2239.8								
GR	2248.3	9413.4	2246.5	9763.7	2244.9	9975.3	2242.0	9989.5	2240.8	10000.0
GR	2239.8	10010.7	2244.2	10028.7	2244.5	10279.0	2244.4	10543.0	2244.2	10656.2
GR	2245.8	10676.5	2246.4	10810.4	2248.9	10907.7				

NC	.085	.025	.033	.1	.3					
ET		4.1	6.1	9135	10289.7	9980	10160			
X1	90.284	18	9980.0	10016.3	370	375	365			
X3	10									
[redacted]	2251.3	9132.2	2250.4	9317.9	2252.1	9376.2	2252.0	9563.6	2248.2	9770.4
GR	2248.5	9980.0	2246.2	10000.0	2248.3	10016.3	2245.9	10216.0	2249.8	10289.7
GR	2249.1	10504.2	2247.4	10579.5	2246.9	10651.4	2251.6	10959.7	2252.6	11153.8
GR	2251.8	11301.9	2256.1	11314.1	2256.1	11336.4				

NC	.058	.058	.051							
ET		4.1	6.1	9805	10237.3	9915.9	10090			
X1	90.381	20	9990.9	10007.9	515	500	510			
GR	2259.0	9343.5	2258.9	9362.3	2256.4	9559.0	2253.4	9575.8	2254.9	9591.9
GR	2254.2	9617.3	2253.0	9631.6	2254.5	9641.7	2254.6	9717.5	2253.0	9747.3
GR	2254.7	9805.0	2253.2	9847.4	2253.4	9886.8	2252.1	9922.4	2253.1	9990.9
GR	2250.6	10000.0	2252.6	10007.9	2251.8	10026.2	2253.1	10058.2	2253.6	10237.3

NC	.045	.045	.04							
ET		4.1	6.1	8837	10537.5	9910	10097			
X1	90.476	29	9991.9	10012.1	510	500	505			
X3	10									
GR	2262.9	8835.5	2263.0	8996.0	2260.9	9150.9	2259.7	9279.7	2258.3	9306.5
GR	2257.6	9351.4	2259.8	9360.0	2258.6	9368.8	2258.1	9552.1	2258.6	9779.8
GR	2256.9	9972.0	2258.1	9991.9	2257.3	10000.0	2258.7	10012.1	2259.1	10037.0
GR	2258.0	10206.1	2256.6	10404.2	2258.3	10457.6	2257.6	10481.6	2258.9	10537.5
GR	2258.5	10641.2	2257.2	10657.7	2258.6	10685.9	2258.2	10724.9	2261.4	10739.2
GR	2262.8	10838.8	2269.5	10967.4	2264.3	11012.7	2267.0	11129.4		

			6.1			9890	10014.3			
X1	90.570	12	9991.3	10014.3	505	485	495			
X3	10									
GR	2265.5	9359.4	2265.3	9460.6	2264.1	9638.2	2262.0	9921.4	2261.7	9974.4
GR	2263.1	9991.3	2260.3	10000.0	2264.4	10014.3	2263.9	10070.7	2264.8	10200.4
GR	2266.8	10448.6	2267.1	10618.3						
NC	.045	.045	.035							
ET		4.1	6.1	9771	10708	9970.9	10040.5			
X1	90.667	30	9970.9	10037.5	520	500	510			
GR	2272.9	9102.9	2273.1	9108.9	2273.5	9211.7	2273.5	9329.5	2272.0	9370.2
GR	2273.0	9434.5	2270.0	9479.1	2270.4	9668.5	2268.4	9700.2	2268.2	9736.4
GR	2269.7	9771.0	2268.8	9871.5	2266.6	9955.7	2267.8	9970.9	2264.1	10000.0
GR	2266.0	10023.2	2268.6	10037.5	2266.7	10048.3	2267.6	10059.1	2270.3	10077.1
GR	2270.7	10105.6	2273.3	10150.4	2273.4	10202.1	2275.2	10279.1	2272.8	10321.3
GR	2277.0	10408.9	2278.6	10512.5	2278.0	10642.5	2276.4	10665.7	2279.3	10709.2
ET			6.1			9968	10036			
X1	90.760	26	9968.3	10035.3	465	515	495			
X3	10									
GR	2281.0	9083.7	2281.5	9282.3	2275.6	9357.6	2275.1	9419.0	2276.3	9522.8
GR	2274.1	9616.4	2278.1	9700.1	2274.9	9754.1	2274.3	9789.2	2271.1	9867.6
GR	2270.2	9955.5	2270.6	9968.3	2267.8	9987.4	2267.2	10000.0	2267.2	10014.9
GR	2271.6	10035.3	2272.3	10062.9	2274.8	10077.0	2275.2	10098.3	2272.7	10116.9
GR	2277.4	10150.1	2280.0	10229.6	2282.9	10398.2	2281.7	10496.8	2282.6	10733.6
GR	2286.4	10882.6								
NC				.3	.5					
ET			6.1			9980	10030			
X1	90.840	32	9958.8	10051.9	440	400	420			
X3	10									
GR	2289.2	8843.7	2291.4	8913.2	2289.7	8956.4	2285.2	9013.2	2286.8	9044.1
GR	2283.1	9066.9	2282.2	9171.5	2282.2	9307.0	2281.4	9488.0	2283.7	9520.4
GR	2281.9	9587.9	2279.6	9789.6	2277.7	9838.3	2277.5	9868.2	2279.3	9899.1
GR	2279.3	9952.4	2279.0	9958.8	2275.3	9977.7	2268.6	9992.8	2268.9	10000.0
GR	2269.9	10015.8	2274.3	10032.5	2277.2	10051.9	2277.5	10095.6	2277.5	10095.6
GR	2282.7	10289.3	2282.7	10352.5	2285.9	10389.4	2287.2	10536.8	2286.0	10666.4
GR	2287.9	10761.0	2288.8	10957.3						

Culvert under Hacienda Ave.
-entered negligible pier width to use special bridge method
-heavy silt deposits

SB	1.25	1.6	2.6	0	16	.01	78.8	0	2269.8	2268.6
ET		4.1	6.1	8843	10058.5	9974.8	10024.6			
X1	90.863	38	9974.8	10024.6	120	120	120			
X2			1	2274.7	2278.7					
X3	10									
BT	-9	9974	2277		9988	2278	2270	9991	2278	2274.1
BT		9994	2278	2274.5	9998	2278	2275.2	10002	2278	2274.9
BT		10005	2278	2274.5	10008	2278	2270	10027	2276	
GR	2288.8	8842.4	2285.6	8906.2	2283.8	9007.8	2283.3	9077.1	2286.4	9122.3
GR	2286.9	9197.9	2282.3	9220.0	2282.2	9276.2	2281.9	9330.0	2280.7	9364.0
GR	2280.6	9414.9	2282.0	9457.9	2280.2	9561.5	2281.7	9604.8	2279.5	9654.3

GR	2278.9	9723.1	2279.4	9766.3	2281.2	9830.8	2279.5	9846.8	2277.6	9877.3
GR	2277.4	9974.8	2269.8	9987.8	2269.8	10000.0	2269.8	10012.1	2276.1	10024.6
GR	2280.8	10058.5	2281.3	10078.9	2281.7	10093.2	2277.3	10111.4	2280.3	10135.6
GR	2281.2	10203.6	2284.9	10306.0	2284.5	10381.6	2286.0	10442.3	2287.3	10543.1
GR	2285.9	10634.9	2287.7	10700.3	2288.7	10770.8				
NC	.05	.05	.035	.1	.3					
ET			6.1			9974	10025			
X1	90.886	43	9898.3	10040.1	140	120	125			
X3	10									
GR	2289.1	8833.2	2289.1	8833.2	2288.2	8848.0	2290.3	8865.5	2286.9	8895.8
GR	2286.3	8941.5	2286.6	8973.9	2287.1	9042.9	2286.4	9055.1	2286.2	9105.1
GR	2287.7	9154.5	2289.4	9185.1	2289.1	9281.7	2287.4	9329.8	2281.1	9351.1
GR	2280.1	9551.6	2282.9	9570.2	2281.2	9659.2	2277.8	9689.5	2277.7	9752.6
GR	2280.1	9774.4	2286.8	9798.7	2286.8	9829.6	2284.3	9878.3	2285.6	9898.3
GR	2285.6	9898.3	2275.2	9935.6	2273.3	9969.4	2273.4	9981.8	2271.7	9993.5
GR	2271.7	10000.0	2271.7	10006.6	2284.3	10040.1	2284.3	10081.8	2283.8	10167.6
GR	2282.2	10183.7	2282.4	10201.8	2283.2	10255.4	2286.4	10316.8	2286.4	10381.0
GR	2287.7	10528.1	2289.6	10622.8	2289.3	10727.5				
ET			6.1			9960	10009			
X1	90.953	35	9917.4	10009.0	330	390	350			
X3	10									
GR	2286.7	8968.0	2286.2	8982.7	2289.0	9008.1	2289.5	9031.3	2291.8	9086.8
GR	2290.7	9132.0	2292.2	9283.3	2289.7	9342.4	2291.1	9436.3	2289.3	9540.6
GR	2281.1	9568.0	2281.4	9632.2	2290.5	9678.2	2294.5	9735.9	2295.2	9772.1
GR	2292.2	9850.8	2290.5	9888.4	2276.9	9917.4	2276.6	9991.1	2274.1	10000.0
GR	2276.6	10009.0	2277.8	10079.5	2279.7	10093.9	2289.9	10133.7	2290.1	10160.8
GR	2287.3	10230.6	2289.0	10290.3	2290.2	10389.2	2291.0	10425.1	2291.0	10425.1
GR	2289.9	10462.7	2288.3	10500.0	2289.6	10558.3	2290.4	10693.0	2290.4	10909.0
ET		4.1	6.1	9836.1	10567	9943.8	10062.3			
X1	91.045	28	9988.8	10017.3	460	510	490			
GR	2292.4	9173.8	2293.3	9242.2	2294.3	9311.6	2292.3	9347.3	2290.1	9396.4
GR	2292.3	9427.3	2291.6	9489.5	2287.0	9538.2	2288.3	9567.6	2285.1	9637.1
GR	2283.6	9707.4	2282.3	9765.1	2283.5	9836.1	2282.0	9862.7	2282.3	9887.7
GR	2281.6	9931.4	2281.4	9988.8	2278.7	10000.0	2283.4	10017.3	2284.6	10030.8
GR	2293.1	10038.0	2294.0	10061.0	2294.0	10120.5	2286.8	10164.5	2287.7	10205.4
GR	2291.3	10245.5	2292.0	10283.6	2293.6	10568.6				
ET		4.1	6.1	9845	10900	9960.2	10051.9			
X1	91.134	35	9990.2	10021.9	470	490	470			
GR	2295.5	9204.4	2296.0	9212.8	2293.7	9244.7	2296.2	9260.4	2295.5	9313.0
GR	2293.9	9417.5	2292.4	9494.2	2297.6	9556.0	2293.3	9581.7	2292.5	9605.1
GR	2292.0	9657.0	2289.4	9691.6	2288.6	9736.3	2292.8	9775.8	2287.8	9808.0
GR	2290.0	9845.0	2287.0	9990.2	2284.6	10000.0	2287.9	10021.9	2287.2	10106.3
GR	2289.2	10120.1	2288.3	10158.9	2288.7	10189.8	2288.3	10238.0	2290.1	10274.7
GR	2290.1	10346.7	2291.4	10398.5	2291.3	10460.2	2295.3	10538.3	2294.2	10597.8
GR	2296.4	10644.4	2294.7	10727.1	2296.2	10757.6	2297.8	10833.5	2300.1	10901.8

```
     .052      .052      .035
  North TW @ Confluence #1
QT      2      1250      1250
ET             4.1       6.1      9853     10304    9956.9   10038.4
X1  91.235       18    9986.9   10008.4       440       590       530
GR  2296.3    9350.3    2296.3    9350.3    2297.1    9426.5    2297.2    9467.4    2297.9    9604.5
GR  2296.0    9700.1    2294.9    9763.6    2293.1    9827.2    2295.1    9853.0    2293.3    9939.3
GR  2294.0    9951.1    2293.4    9986.9    2291.4   10000.0    2294.1   10008.4    2294.0   10048.3
GR  2294.2   10065.7    2295.3   10166.2    2296.4   10305.3

ET                       6.1                         9940   10022.6
X1  91.337       39    9974.8   10022.6       530       480       540
X3      10
GR  2313.0    9693.9    2313.0    9693.9    2313.8    9710.2    2311.9    9730.3    2302.4    9800.6
GR  2298.0    9837.6    2299.3    9862.8    2300.7    9915.2    2297.4    9962.8    2299.2    9974.8
GR  2296.3   10000.0    2302.8   10022.6    2303.5   10035.5    2302.8   10059.4    2303.9   10083.2
GR  2303.6   10119.5    2304.3   10144.8    2301.6   10178.0    2302.4   10201.0    2301.6   10230.1
GR  2301.7   10282.0    2303.0   10337.8    2306.3   10395.9    2306.5   10463.4    2305.9   10485.9
GR  2302.4   10547.1    2304.9   10581.7    2304.4   10635.3    2302.0   10645.3    2303.3   10656.6
GR  2302.9   10697.5    2306.0   10716.6    2307.8   10748.0    2311.4   10779.0    2317.9   10823.7
GR  2318.0   10861.6    2317.1   10895.6    2319.1   10929.4    2320.0   11001.9

NH      3       .052    9972.2      .035   10041.2      .052   10905.4
ET             4.1       6.1      9494     10280      9972     10029
X1  91.434       25    9972.2   10022.4       545       500       510
X3      10
GR  2321.1    9493.1    2321.2    9524.5    2318.5    9585.2    2310.7    9652.5    2306.0    9726.2
GR  2306.5    9896.7    2304.3    9912.4    2305.5    9933.1    2305.2    9972.2    2302.9    9992.8
GR  2302.1   10000.0    2304.3   10022.4    2309.2   10041.2    2309.5   10074.5    2314.6   10198.8
GR  2319.9   10280.7    2317.4   10360.0    2310.3   10450.0    2307.8   10503.4    2305.9   10536.7
GR  2306.3   10594.0    2320.2   10699.0    2320.7   10785.1    2322.2   10834.3    2321.9   10905.4
  North TW @ Jones Blvd.

QT      2      1200      1200
NC    .04       .04      .035
ET                       6.1                         9950   10016
X1  91.530       27    9924.9   10015.7       510       505       510
X3      10
GR  2328.5    9242.0    2328.1    9369.9    2323.7    9447.8    2315.4    9591.5    2315.8    9705.5
GR  2315.7    9819.4    2313.8    9924.9    2311.1    9938.1    2309.0    9971.4    2310.7    9979.6
GR  2309.3   10000.0    2313.2   10015.7    2318.6   10109.5    2325.8   10132.9    2328.3   10173.0
GR  2328.4   10263.3    2326.8   10328.2    2316.8   10473.1    2317.7   10489.3    2313.1   10509.5
GR  2312.7   10523.0    2314.2   10529.4    2313.4   10548.0    2319.7   10595.8    2321.6   10640.8
GR  2327.7   10700.5    2329.1   10812.2

NC    .04       .04      .03
ET                       6.1                         9968   10020
X1  91.630       34    9955.9   10019.7       500       550       525
X3      10
GR  2330.9    9316.8    2331.4    9364.1    2330.2    9458.5    2325.5    9540.5    2327.5    9579.4
GR  2329.5    9635.4    2330.0    9701.3    2327.6    9742.3    2324.8    9829.6    2324.2    9894.1
GR  2320.1    9955.9    2314.8    9993.2    2314.3   10000.0    2314.8   10006.3    2317.1   10019.7
GR  2316.5   10066.6    2318.8   10100.6    2316.5   10119.2    2316.5   10135.8    2318.2   10154.7
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GR	2316.8	10177.2	2318.9	10223.2	2333.1	10292.9	2334.6	10341.0	2336.5	10483.5
GR	2335.7	10553.2	2332.4	10586.5	2328.7	10622.7	2324.9	10670.4	2321.2	10693.5
GR	2325.3	10712.0	2334.0	10781.7	2336.2	10832.3	2336.8	10896.4		
ET			6.1			9969	10026			
X1	91.733	28	9963.4	10025.6	600	490	545			
GR	2338.8	9243.7	2339.0	9251.9	2339.1	9391.2	2337.8	9574.7	2339.1	9671.5
GR	2337.8	9739.1	2333.7	9775.6	2327.3	9836.3	2324.3	9894.2	2324.8	9963.4
GR	2321.1	9977.7	2319.7	10000.0	2319.7	10015.9	2323.1	10025.6	2323.7	10047.0
GR	2334.5	10148.2	2337.5	10176.9	2339.9	10226.6	2339.6	10281.1	2338.5	10315.6
GR	2339.4	10328.8	2338.6	10348.7	2339.9	10375.5	2340.8	10399.9	2339.1	10473.6
GR	2340.1	10502.4	2340.9	10533.2	2340.3	10622.4				
ET			6.1			9976	10020			
X1	91.831	20	9968.1	10042.2	500	510	520			
X3	10									
GR	2347.5	9384.3	2347.5	9384.3	2344.4	9454.9	2344.2	9485.9	2346.8	9538.4
GR	2344.6	9788.9	2335.5	9819.2	2328.0	9861.2	2326.8	9952.0	2328.5	9968.1
GR	2321.7	9991.0	2320.8	10000.0	2321.1	10012.0	2340.0	10042.2	2341.9	10071.4
GR	2346.5	10102.4	2346.8	10166.7	2347.3	10251.1	2347.5	10519.9	2348.2	10594.4
NC	.045	.045	.038							
ET			6.1			9970	10023			
X1	91.926	19	9912.6	10067.8	510	490	500			
GR	2351.8	9184.4	2353.6	9288.4	2354.9	9488.9	2353.0	9611.6	2351.1	9618.1
GR	2351.1	9638.8	2349.9	9658.8	2352.8	9686.1	2351.6	9817.3	2348.4	9912.6
GR	2328.4	9974.9	2327.3	10000.0	2326.3	10014.9	2350.6	10067.8	2353.1	10107.8
GR	2353.9	10159.5	2351.7	10194.1	2353.7	10349.4	2353.3	10546.9		
ET			6.1			9982	10014			
X1	92.026	19	9982.8	10044.2	530	520	525			
GR	2360.7	9148.5	2360.8	9155.2	2360.2	9341.8	2361.0	9423.7	2358.3	9451.5
GR	2358.3	9506.8	2356.5	9647.1	2355.0	9699.6	2355.0	9785.9	2355.8	9867.7
GR	2354.5	9884.9	2339.8	9909.5	2338.1	9934.1	2338.0	9982.8	2334.8	10000.0
GR	2336.1	10008.1	2354.0	10044.2	2359.1	10069.6	2360.0	10229.1		

North TW @ Confluence #2

QT	2	850	850							
ET		4.1	6.1	9505	10160.8	9976.0	10012.0			
X1	92.137	33	9976.0	10012.0	550	570	590			
GR	2365.1	9504.1	2365.3	9567.5	2363.5	9573.4	2363.0	9596.9	2364.1	9842.1
GR	2356.4	9879.6	2353.5	9928.4	2352.3	9976.0	2343.7	9996.2	2343.7	10000.0
GR	2344.2	10005.6	2347.9	10012.0	2347.4	10030.3	2348.3	10082.8	2351.8	10139.5
GR	2353.0	10160.8	2347.2	10189.0	2345.1	10204.0	2345.7	10213.2	2344.6	10228.4
GR	2344.6	10238.8	2346.1	10248.6	2349.3	10264.5	2350.5	10322.5	2361.7	10418.1
GR	2367.7	10439.1	2366.0	10509.9	2368.2	10667.6	2368.2	10752.6	2369.0	10800.1
GR	2372.6	10849.2	2372.9	10911.3	2370.2	10994.5				
ET			6.1			9988	10016			
X1	92.240	14	9988.8	10020.5	550	500	540			
GR	2370.4	9055.5	2369.7	9129.2	2370.3	9367.3	2371.9	9447.3	2370.2	9789.0
GR	2358.2	9905.8	2356.2	9942.5	2352.8	9969.4	2352.8	9988.8	2350.0	10000.0
GR	2350.0	10011.2	2357.8	10020.5	2369.2	10043.8	2371.5	10139.0		

fluence with minor tributary. No affect on Q100.

ET			6.1			9990	10059			
X1	92.348	26	9987.7	10058.8	560	580	570			
X3	10									
GR	2376.4	9243.2	2376.5	9321.1	2375.4	9408.9	2375.6	9505.5	2374.5	9526.9
GR	2376.4	9573.6	2377.2	9672.7	2377.1	9867.1	2368.1	9920.7	2363.7	9987.7
GR	2358.1	10000.0	2358.1	10004.0	2360.3	10019.7	2364.3	10058.8	2369.7	10115.3
GR	2370.1	10115.3	2367.7	10163.0	2358.5	10212.6	2358.5	10223.9	2367.2	10243.5
GR	2371.8	10272.8	2371.1	10301.1	2367.6	10326.2	2370.1	10347.3	2377.0	10386.9
GR	2377.5	10488.								
ET			6.1			9975	10010			
X1	92.446	16	9975.2	10025.6	520	520	520			
GR	2384.3	9327.5	2385.8	9493.3	2383.2	9592.8	2385.0	9887.8	2380.5	9926.5
GR	2371.9	9949.9	2369.0	9975.2	2368.5	9987.4	2366.7	9996.4	2366.1	10000.0
GR	2367.0	10005.9	2378.3	10025.6	2378.6	10065.3	2387.3	10110.3	2389.7	10189.0
GR	2388.9	10268.9								
ET			6.1			9982	10012			
X1	92.545	25	9960.8	10038.7	510	550	525			
GR	2390.6	9410.2	2391.7	9652.8	2391.5	9904.7	2386.4	9960.8	2377.1	9993.1
GR	2376.5	10000.0	2377.5	10008.7	2382.2	10017.2	2387.9	10038.7	2388.7	10058.3
GR	2391.8	10068.4	2392.7	10078.9	2392.7	10118.8	2393.6	10141.7	2394.7	10309.9
GR	2393.4	10334.8	2393.5	10355.6	2392.9	10401.9	2395.4	10428.6	2396.0	10476.5
	2397.1	10656.0	2395.5	10710.3	2395.8	10762.6	2397.3	10790.0	2398.1	10904.1

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

*PROF 1

CCHV= 0.100 CEHV= 0.300
*SECNO 63.800
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2233.10 ELREA= 2236.50

63.800	5.54	2233.94	2233.94	2233.95	2234.99	1.05	0.00	0.00	2233.10
4100.0	309.3	3790.7	0.0	120.6	444.3	0.0	0.0	0.0	2236.50
0.00	2.56	8.53	0.00	0.040	0.028	0.000	0.000	2228.40	9748.16
0.006119	0.	0.	0.	0	5	0	0.00	296.88	10045.04

*SECNO 90.093

3301 HV CHANGED MORE THAN HVINS

[redacted] WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.33

90.093	3.14	2237.94	0.00	0.00	2238.17	0.23	3.10	0.08	2235.80
1450.0	41.0	1324.5	84.6	10.9	332.7	81.1	5.6	3.5	2237.00
0.04	3.76	3.98	1.04	0.034	0.053	0.078	0.000	2234.80	9944.90
0.006988	450.	490.	540.	3	0	0	0.00	320.47	10265.36

CCHV= 0.300 CEHV= 0.500
*SECNO 90.188
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9500.0 10147.8 TYPE= 1 TARGET= 647.800

90.188	5.00	2243.10	2243.10	0.00	2243.74	0.64	2.13	0.20	2241.40
1450.0	156.3	1099.1	194.6	55.1	151.6	94.4	9.7	6.6	2242.00
0.06	2.84	7.25	2.06	0.032	0.027	0.032	0.000	2238.10	9931.96
0.002846	540.	500.	495.	2	16	0	0.00	215.84	10147.80

*SECNO 90.203

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.79

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

3470 ENCROACHMENT STATIONS= 2248.0 10285.0 TYPE= 1 TARGET= 8037.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2244.10 ELREA= 2243.20

90.203	5.71	2243.81	0.00	0.00	2243.99	0.19	0.12	0.14	2244.10
1450.0	0.0	1001.5	448.5	0.0	248.1	297.6	10.5	7.1	2243.20
0.07	0.00	4.04	1.51	0.000	0.027	0.032	0.000	2238.10	9962.30
0.000887	80.	80.	75.	4	0	0	0.00	322.69	10285.00

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2241.44 , NOT 2243.81 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	50.00	27.60	3.60	96.00	0.00	2238.60	2238.10

*SECNO 90.215

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.93

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2249.47	2245.46	0.00	422.	1035.	96.	96.	2242.60	2244.50	50.

3470 ENCROACHMENT STATIONS= 2249.0 10270.0 TYPE= 1 TARGET= 8021.000

90.215	6.84	2246.65	0.00	0.00	2246.69	0.05	2.70	0.00	2244.90
1450.0	52.0	517.4	880.6	202.0	251.9	555.1	11.7	7.7	2244.20
0.08	0.26	2.05	1.59	0.085	0.031	0.025	0.000	2239.80	9735.48
0.000237	65.	65.	65.	2	0	2	0.00	534.52	10270.00

CCHV= 0.100 CEHV= 0.300
*SECNO 90.284
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

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

3470 ENCROACHMENT STATIONS= 9135.0 10289.7 TYPE= 1 TARGET= 1154.700

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2248.50 ELREA= 2248.30

90.284	2.10	2248.30	2248.30	0.00	2248.61	0.31	0.23	0.08	2248.50
1450.0	0.0	113.8	1336.2	0.0	36.3	294.4	17.4	11.2	2248.30
0.10	0.00	3.13	4.54	0.000	0.033	0.025	0.000	2246.20	9981.73
0.004569	370.	365.	375.	20	26	0	0.00	279.65	10261.38

*SECNO 90.381

3280 CROSS SECTION 90.38 EXTENDED 0.14 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9805.0 10237.3 TYPE= 1 TARGET= 432.300

[redacted]0.381	3.14	2253.74	2253.74	0.00	2254.17	0.43	4.86	0.04	2253.10
[redacted]450.0	605.5	276.8	567.7	134.8	34.1	139.3	21.1	15.1	2252.60
0.13	4.49	8.12	4.08	0.058	0.051	0.058	0.000	2250.60	9832.13
0.032087	515.	510.	500.	20	17	0	0.00	405.16	10237.30

*SECNO 90.476

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3710 WSEL ASSUMED BASED ON MIN DIFF

3470 ENCROACHMENT STATIONS= 8837.0 10537.5 TYPE= 1 TARGET= 1700.500

90.476	1.41	2258.71	2258.62	0.00	2258.76	0.05	3.52	11.95	2258.10
1450.0	557.2	29.7	863.1	392.7	16.7	428.8	27.7	24.1	2258.70
0.21	1.42	1.78	2.01	0.045	0.040	0.045	0.000	2257.30	9298.71
0.002963	510.	505.	500.	20	20	0	0.00	1133.33	10529.20

*SECNO 90.570

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2263.10 ELREA= 2264.40

90.570	3.13	2263.43	2263.43	0.00	2263.91	0.48	3.19	0.13	2263.10
1450.0	1206.4	243.6	0.0	239.2	32.1	0.0	34.0	32.2	2264.40
0.23	5.04	7.58	0.00	0.045	0.040	0.000	0.000	2260.30	9728.47
0.022829	505.	495.	485.	20	17	0	0.00	282.45	10010.92

*SECNO 90.667

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.01

3470 ENCROACHMENT STATIONS= 9771.0 10708.0 TYPE= 1 TARGET= 937.000

90.667	4.52	2268.62	0.00	0.00	2269.10	0.47	5.19	0.00	2267.80
1450.0	263.6	1104.5	81.9	99.9	179.6	29.9	37.5	35.0	2268.60
0.26	2.64	6.15	2.74	0.045	0.035	0.045	0.000	2264.10	9878.27
0.005651	520.	510.	500.	6	0	0	0.00	187.64	10065.92

*SECNO 90.760

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2270.60 ELREA= 2271.60

90.760	4.17	2271.37	0.00	0.00	2272.00	0.62	2.85	0.04	2270.60
1450.0	163.1	1286.9	0.0	77.1	193.0	0.0	40.7	36.9	2271.60
0.28	2.12	6.67	0.00	0.045	0.035	0.000	0.000	2267.20	9860.87
0.005975	465.	495.	515.	4	0	0	0.00	173.38	10034.25

CCHV= 0.300 CEHV= 0.500
*SECNO 90.840

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2279.00 ELREA= 2277.20

90.840	5.39	2273.99	0.00	0.00	2275.06	1.07	2.84	0.22	2279.00
1450.0	0.0	1450.0	0.0	0.0	174.7	0.0	42.9	38.1	2277.20
0.29	0.00	8.30	0.00	0.000	0.035	0.000	0.000	2268.60	9980.65
0.007667	440.	420.	400.	2	0	0	0.00	50.67	10031.32

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

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	0.00	16.00	0.01	78.80	0.00	2269.80	2268.60

*SECNO 90.863

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.01

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

ESRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2282.40	2275.80	0.00	317.	1144.	79.	78.	2274.70	2278.70	53.

3470 ENCROACHMENT STATIONS= 8843.0 10058.5 TYPE= 1 TARGET= 1215.500

90.863	9.27	2279.07	0.00	0.00	2279.22	0.16	4.16	0.00	2277.40
1450.0	159.0	1261.4	29.6	172.9	372.7	31.8	43.9	38.4	2276.10
0.31	0.92	3.38	0.93	0.045	0.035	0.045	0.000	2269.80	9703.90
0.000476	120.	120.	120.	2	0	3	0.00	225.93	10046.00

CCHV= 0.100 CEHV= 0.300
*SECNO 90.886

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2285.60 ELREA= 2284.30

90.886	7.47	2279.17	0.00	0.00	2279.29	0.12	0.06	0.00	2285.60
1450.0	0.0	1450.0	0.0	0.0	516.2	0.0	45.5	38.9	2284.30
0.32	0.00	2.81	0.00	0.000	0.035	0.000	0.000	2271.70	9921.36
0.000538	140.	125.	120.	2	0	0	0.00	105.10	10026.46

*SECNO 90.953

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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.52

90.953	5.35	2279.45	0.00	0.00	2279.64	0.19	0.33	0.02	2276.90
1450.0	10.1	1065.5	374.3	6.9	272.3	168.9	49.5	40.1	2276.60
0.35	1.46	3.91	2.22	0.050	0.035	0.050	0.000	2274.10	9911.96
0.002007	330.	350.	390.	2	0	0	0.00	180.03	10092.00

*SECNO 91.045

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9836.1 10567.0 TYPE= 1 TARGET= 730.900

91.045	4.50	2283.20	2283.20	0.00	2283.90	0.71	2.00	0.15	2281.40
1450.0	802.1	647.9	0.0	190.9	72.5	0.0	53.4	42.1	2283.40
[redacted]0.37	4.20	8.94	0.00	0.050	0.035	0.000	0.000	2278.70	9841.46
0.012874	460.	490.	510.	20	9	0	0.00	175.09	10016.55

*SECNO 91.134

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9845.0 10900.0 TYPE= 1 TARGET= 1055.000

91.134	4.40	2289.00	2289.00	0.00	2289.46	0.46	4.60	0.02	2287.00
1450.0	251.2	680.1	518.7	97.0	91.6	189.1	56.9	45.0	2287.90
0.39	2.59	7.42	2.74	0.050	0.035	0.050	0.000	2284.60	9893.31
0.007586	470.	470.	490.	4	6	0	0.00	349.10	10252.31

*SECNO 91.235
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9853.0 10304.0 TYPE= 1 TARGET= 451.000

[redacted]CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
91.235	3.78	2295.18	2295.18	0.00	2295.65	0.46	4.52	0.00	2293.40
1250.0	511.4	459.7	278.9	155.9	56.9	108.1	61.1	48.9	2294.10
0.42	3.28	8.08	2.58	0.052	0.035	0.052	0.000	2291.40	9853.00
0.010256	440.	530.	590.	13	9	0	0.00	302.45	10155.45

*SECNO 91.337

3265 DIVIDED FLOW

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2299.20 ELREA= 2302.80

91.337	4.01	2300.31	0.00	0.00	2300.82	0.51	5.16	0.01	2299.20
1250.0	585.4	664.6	0.0	169.0	92.6	0.0	64.6	51.8	2302.80
0.45	3.46	7.18	0.00	0.052	0.035	0.000	0.000	2296.30	9818.15
0.009298	530.	540.	480.	3	0	0	0.00	175.75	10013.95

[redacted]NH CARD USED
[redacted]O 91.434

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9494.0 10280.0 TYPE= 1 TARGET= 786.000

91.434	4.06	2306.16	2306.16	0.00	2306.93	0.77	4.66	0.08	2305.20
1250.0	186.8	1038.8	24.4	74.7	136.1	6.6	67.5	54.0	2304.30
0.47	2.50	7.63	3.67	0.052	0.035	0.035	0.000	2302.10	9723.69
0.008606	545.	510.	500.	4	5	0	0.00	187.54	10029.54

*SECNO 91.530
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2313.80 ELREA= 2313.20

91.530	3.14	2312.14	2312.14	0.00	2313.12	0.98	5.62	0.06	2313.80
1200.0	0.0	1200.0	0.0	0.0	150.9	0.0	69.7	55.6	2313.20
0.49	0.00	7.95	0.00	0.000	0.035	0.000	0.000	2309.00	9933.01
0.014830	510.	510.	505.	4	15	0	0.00	78.42	10011.43

[redacted]

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

*SECNO 91.630

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2320.10 ELREA= 2317.10

91.630	3.66	2317.96	0.00	0.00	2318.51	0.55	5.35	0.04	2320.10
1200.0	0.0	759.1	440.9	0.0	106.8	140.7	72.1	57.3	2317.10
0.52	0.00	7.11	3.13	0.000	0.030	0.040	0.000	2314.30	9970.95
0.007321	500.	525.	550.	6	0	0	0.00	206.06	10202.65

*SECNO 91.733

3301 HV CHANGED MORE THAN HVINS

MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

91.733	3.32	2323.02	2323.02	0.00	2324.26	1.24	4.58	0.21	2324.80
1200.0	0.0	1200.0	0.0	0.0	134.3	0.0	74.4	58.9	2323.10
0.53	0.00	8.94	0.00	0.000	0.030	0.000	0.000	2319.70	9970.26
0.010135	600.	545.	490.	3	11	0	0.00	55.12	10025.38

*SECNO 91.831

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.71

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2328.50 ELREA= 2340.00

91.831	5.65	2326.45	0.00	0.00	2327.19	0.74	2.88	0.05	2328.50
1200.0	0.0	1200.0	0.0	0.0	173.8	0.0	76.3	59.5	2340.00
0.55	0.00	6.90	0.00	0.000	0.030	0.000	0.000	2320.80	9974.99
0.003478	500.	520.	510.	3	0	0	0.00	45.56	10020.55

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

*SECNO 91.926

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

91.926	3.94	2330.24	2330.24	0.00	2331.50	1.26	3.27	0.16	2348.40
1200.0	0.0	1200.0	0.0	0.0	133.3	0.0	78.0	60.0	2350.60
0.57	0.00	9.01	0.00	0.000	0.038	0.000	0.000	2326.30	9969.18
0.016493	510.	500.	490.	3	19	0	0.00	54.29	10023.47

*SECNO 92.026
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

92.026	4.68	2339.48	2339.48	0.00	2340.39	0.90	7.28	0.04	2338.00
1200.0	356.8	843.2	0.0	83.6	97.2	0.0	79.9	61.0	2354.00
0.59	4.27	8.67	0.00	0.045	0.038	0.000	0.000	2334.80	9914.08
0.011783	530.	525.	520.	5	11	0	0.00	100.84	10014.92

*SECNO 92.137
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9505.0 10160.8 TYPE= 1 TARGET= 655.800

92.137	4.93	2348.63	2348.63	0.00	2349.39	0.76	6.00	0.01	2352.30
850.0	0.0	689.0	161.0	0.0	89.9	59.6	82.1	62.3	2347.90
0.61	0.00	7.66	2.70	0.000	0.038	0.045	0.000	2343.70	9984.63
0.008637	550.	590.	570.	7	8	0	0.00	103.49	10088.12

*SECNO 92.240
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

92.240	4.04	2354.04	2354.04	0.00	2355.08	1.04	5.40	0.09	2352.80
850.0	115.6	734.4	0.0	30.1	84.5	0.0	83.7	63.3	2357.80
0.63	3.84	8.69	0.00	0.045	0.038	0.000	0.000	2350.00	9959.59
0.011864	550.	540.	500.	3	15	0	0.00	56.42	10016.02

*SECNO 92.348
7185 MINIMUM SPECIFIC ENERGY

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

3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2363.70 ELREA= 2364.30

92.348	4.14	2362.24	2362.24	0.00	2363.33	1.09	8.09	0.01	2363.70
850.0	0.0	850.0	0.0	0.0	101.5	0.0	85.1	63.9	2364.30
0.65	0.00	8.38	0.00	0.000	0.038	0.000	0.000	2358.10	9990.91
0.017326	560.	570.	580.	3	8	0	0.00	47.75	10038.66

*SECNO 92.446

92.446	4.35	2370.46	2370.44	0.00	2371.59	1.13	8.25	0.01	2369.00
850.0	29.7	820.3	0.0	9.2	94.6	0.0	86.4	64.5	2378.30
0.67	3.21	8.68	0.00	0.045	0.038	0.000	0.000	2366.10	9962.50
0.014569	520.	520.	520.	8	8	0	0.00	49.42	10011.92

*SECNO 92.545

7185 MINIMUM SPECIFIC ENERGY

[redacted] CRITICAL DEPTH ASSUMED

[redacted]2.545	4.21	2380.71	2380.71	0.00	2382.06	1.35	8.02	0.06	2386.40
850.0	0.0	850.0	0.0	0.0	91.2	0.0	87.5	65.0	2387.90
0.68	0.00	9.32	0.00	0.000	0.038	0.000	0.000	2376.50	9980.56
0.016039	510.	525.	550.	3	8	0	0.00	33.95	10014.51

T1 CCRFCD TROPICANA WASH F.I.S.; RDD33832
T2 North Tropicana Wash, Detailed Methods
T3 NTW-Enc.hc2 N. Trop. Wash FLOODWAY CALCULATIONS

The following starting water surface elevation is one foot above the CWSEL calculated in the natural run at this section.

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		3				0	0		2234.95	0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2	0	-1	0	0	0	0	0	0	15

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

*PROF 2

CCHV= 0.100 CEHV= 0.300
*SECNO 63.800

3470 ENCROACHMENT STATIONS= 9894.0 10044.0 TYPE= 1 TARGET= 150.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2233.10 ELREA= 100000.00

63.800	6.55	2234.95	0.00	2233.94	2235.69	0.74	0.00	0.00	2233.10
4100.0	2.3	4097.7	0.0	1.7	595.0	0.0	0.0	0.0	100000.00
0.00	1.38	6.89	0.00	0.040	0.028	0.000	0.000	2228.40	9894.00
0.002704	0.	0.	0.	0	0	0	0.00	150.00	10044.00

FLOW DISTRIBUTION FOR SECNO= 63.80 CWSEL= 2234.95

[redacted]	9894.	9895.	10084.
Q=	0.1	99.9	
AREA=	1.7	595.0	
VEL=	1.4	6.9	
DEPTH=	1.8	4.0	

*SECNO 90.093
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9956.0 10060.0 TYPE= 1 TARGET= 104.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 100000.00

90.093	2.38	2237.18	2237.18	2237.94	2238.10	0.92	2.02	0.06	100000.00
1450.0	0.0	1450.0	0.0	0.0	188.1	0.0	4.4	1.4	100000.00
0.02	0.00	7.71	0.00	0.000	0.053	0.000	0.000	2234.80	9956.00
0.035413	450.	490.	540.	20	22	0	0.00	104.00	10060.00

FLOW DISTRIBUTION FOR SECNO= 90.09 CWSEL= 2237.18

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

STA= 9956. 10105.
PER Q= 100.0
AREA= 188.1
VEL= 7.7
DEPTH= 1.8

CCHV= 0.300 CEHV= 0.500
*SECNO 90.188
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9950.3 10060.0 TYPE= 1 TARGET= 109.700

90.188	4.79	2242.89	2242.89	2243.10	2243.92	1.03	4.82	0.05	2241.40
1450.0	120.1	1249.3	80.6	35.5	143.7	31.8	6.7	2.7	2242.00
0.04	3.38	8.70	2.54	0.032	0.027	0.032	0.000	2238.10	9950.30
0.004394	540.	500.	495.	6	20	0	0.00	109.70	10060.00

FLOW DISTRIBUTION FOR SECNO= 90.19 CWSEL= 2242.89

[redacted] 9950. 9980. 10018. 10060.
PER Q= 8.3 86.2 5.6
AREA= 35.5 143.7 31.8
VEL= 3.4 8.7 2.5
DEPTH= 1.2 3.8 0.8

*SECNO 90.203

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.77

3470 ENCROACHMENT STATIONS= 9970.0 10120.0 TYPE= 1 TARGET= 150.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 2243.20

90.203	5.78	2243.88	0.00	2243.81	2244.29	0.41	0.18	0.19	100000.00
1450.0	0.0	1319.1	130.9	0.0	245.4	83.1	7.2	2.9	2243.20
0.04	0.00	5.38	1.58	0.000	0.027	0.032	0.000	2238.10	9970.00
0.001398	80.	80.	75.	4	0	0	0.00	150.00	10120.00

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 90.20 CWSEL= 2243.88

STA=	9970.	10025.	10120.
PER Q=	91.0	9.0	
AREA=	245.4	83.1	
VEL=	5.4	1.6	
DEPTH=	4.5	0.9	

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2241.44 , NOT 2243.88 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	50.00	27.60	3.60	96.00	0.00	2238.60	2238.10

*SECNO 90.215
PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2249.55	2245.69	0.00	430.	1027.	96.	96.	2242.60	2244.50	50.

3470 ENCROACHMENT STATIONS= 9930.0 10109.0 TYPE= 1 TARGET= 179.000

90.215	6.75	2246.55	0.00	2246.65	2246.72	0.17	2.43	0.00	2244.90
1450.0	41.1	891.8	517.1	67.1	247.0	185.1	7.8	3.1	2244.20
0.05	0.61	3.61	2.79	0.085	0.031	0.025	0.000	2239.80	9930.00
0.000753	65.	65.	65.	2	0	2	0.00	179.00	10109.00

FLOW DISTRIBUTION FOR SECNO= 90.21 CWSEL= 2246.55

STA=	9930.	9975.	10029.	10109.
PER Q=	2.8	61.5	35.7	
AREA=	67.1	247.0	185.1	
VEL=	0.6	3.6	2.8	
DEPTH=	1.5	4.6	2.3	

CCHV= 0.100 CEHV= 0.300

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

*SECNO 90.284
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9980.0 10160.0 TYPE= 1 TARGET= 180.000

90.284	2.46	2248.66	2248.66	2248.30	2249.32	0.66	0.69	0.15	2248.50
1450.0	0.0	268.6	1181.4	0.0	49.1	175.7	10.9	4.7	2248.30
0.06	0.00	5.46	6.73	0.000	0.033	0.025	0.000	2246.20	9980.00
0.009987	370.	365.	375.	20	22	0	0.00	180.00	10160.00

FLOW DISTRIBUTION FOR SECNO= 90.28 CWSEL= 2248.66

STA=	9980.	10016.	10160.
PER Q=	18.5	81.5	
AREA=	49.1	175.7	
VEL=	5.5	6.7	
DEPTH=	1.4	1.2	

*[redacted]J 90.381
3280 CROSS SECTION 90.38 EXTENDED 0.84 FEET

3470 ENCROACHMENT STATIONS= 9915.9 10090.0 TYPE= 1 TARGET= 174.100

90.381	3.84	2254.44	0.00	2253.74	2254.76	0.32	5.40	0.03	2253.10
1450.0	576.2	273.0	600.7	140.5	46.0	145.9	14.1	6.7	2252.60
0.09	4.10	5.93	4.12	0.058	0.051	0.058	0.000	2250.60	9915.90
0.011504	515.	510.	500.	5	0	0	0.00	174.10	10090.00

FLOW DISTRIBUTION FOR SECNO= 90.38 CWSEL= 2254.44

STA=	9916.	9922.	9991.	10008.	10026.	10058.	10090.
PER Q=	3.9	35.9	18.8	13.3	19.1	9.0	
AREA=	14.4	126.1	46.0	41.0	63.7	41.2	
VEL=	3.9	4.1	5.9	4.7	4.3	3.2	
DEPTH=	2.2	1.8	2.7	2.2	2.0	1.3	

*SECNO 90.476

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

3470 ENCROACHMENT STATIONS= 9910.0 10097.0 TYPE= 1 TARGET= 187.000

90.476	3.04	2259.64	0.00	2258.71	2260.08	0.44	5.29	0.04	2258.10
1450.0	1102.2	186.3	161.5	195.1	35.5	62.2	17.8	8.8	2258.70
0.12	5.65	5.25	2.60	0.045	0.040	0.045	0.000	2256.60	9910.00
0.009505	510.	505.	500.	4	0	0	0.00	187.00	10097.00

FLOW DISTRIBUTION FOR SECNO= 90.48 CWSEL= 2259.64

STA=	9910.	9972.	9992.	10012.	10037.	10097.
PER Q=	60.4	15.6	12.8	3.3	7.8	
AREA=	152.6	42.5	35.5	18.3	43.9	
VEL=	5.7	5.3	5.3	2.6	2.6	
DEPTH=	2.5	2.1	1.8	0.7	0.7	

*SECNO 90.570

3470 ENCROACHMENT STATIONS= 9890.0 10014.3 TYPE= 1 TARGET= 124.300

[redacted]OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2263.10 ELREA= 100000.00

90.570	3.94	2264.24	0.00	2263.43	2264.68	0.44	4.60	0.00	2263.10
1450.0	1169.9	280.1	0.0	223.9	49.1	0.0	21.0	10.6	100000.00
0.15	5.22	5.71	0.00	0.045	0.040	0.000	0.000	2260.30	9890.00
0.008817	505.	495.	485.	4	0	0	0.00	123.72	10013.72

FLOW DISTRIBUTION FOR SECNO= 90.57 CWSEL= 2264.24

STA=	9890.	9921.	9974.	9991.	10014.
PER Q=	22.5	48.2	9.9	19.3	
AREA=	66.5	126.4	31.0	49.1	
VEL=	4.9	5.5	4.6	5.7	
DEPTH=	2.1	2.4	1.8	2.2	

*SECNO 90.667

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS= 9970.9 10040.5 TYPE= 1 TARGET= 69.600

90.667	4.52	2268.62	0.00	2268.62	2269.63	1.01	4.78	0.17	2267.80
1450.0	0.0	1448.9	1.1	0.0	179.8	0.9	23.7	11.7	2268.60
0.16	0.00	8.06	1.27	0.000	0.035	0.045	0.000	2264.10	9970.90
0.009839	520.	510.	500.	2	0	0	0.00	69.60	10040.50

FLOW DISTRIBUTION FOR SECNO= 90.67 CWSEL= 2268.62

STA=	9971.	10038.	10040.
PER Q=	99.9	0.1	
AREA=	179.8	0.9	
VEL=	8.1	1.3	
DEPTH=	2.7	0.3	

*SECNO 90.760

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.58

[redacted]

3470 ENCROACHMENT STATIONS= 9968.0 10036.0 TYPE= 1 TARGET= 68.000

90.760	4.82	2272.02	0.00	2271.37	2272.60	0.59	2.93	0.04	2270.60
1450.0	0.3	1449.4	0.2	0.4	236.1	0.3	26.1	12.5	2271.60
0.19	0.82	6.14	0.85	0.045	0.035	0.045	0.000	2267.20	9968.00
0.003954	465.	495.	515.	3	0	0	0.00	68.00	10036.00

FLOW DISTRIBUTION FOR SECNO= 90.76 CWSEL= 2272.02

STA=	9968.	9968.	10035.	10036.
PER Q=	0.0	100.0	0.0	
AREA=	0.4	236.1	0.3	
VEL=	0.8	6.1	0.8	
DEPTH=	1.4	3.5	0.4	

CCHV= 0.300 CEHV= 0.500
*SECNO 90.840

3470 ENCROACHMENT STATIONS= 9980.0 10030.0 TYPE= 1 TARGET= 50.000

[redacted]

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 100000.00

90.840	5.40	2274.00	0.00	2273.99	2275.07	1.07	2.22	0.24	100000.00
1450.0	0.0	1450.0	0.0	0.0	174.8	0.0	28.1	13.1	100000.00
0.20	0.00	8.29	0.00	0.000	0.035	0.000	0.000	2268.60	9980.64
0.007455	440.	420.	400.	2	0	0	0.00	49.36	10030.00

FLOW DISTRIBUTION FOR SECNO= 90.84 CWSEL= 2274.00

STA= 9981. 10052.
PER Q= 100.0
AREA= 174.8
VEL= 8.3
DEPTH= 3.5

SPECIAL BRIDGE

[redacted]	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	1.60	2.60	0.00	16.00	0.01	78.80	0.00	2269.80	2268.60

*SECNO 90.863

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.21

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2282.41	2275.80	0.00	317.	1143.	79.	78.	2274.70	2278.70	53.

3470 ENCROACHMENT STATIONS= 9974.8 10024.6 TYPE= 1 TARGET= 49.800

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2277.40 ELREA= 100000.00

90.863	9.19	2278.99	0.00	2279.07	2279.23	0.24	4.16	0.00	2277.40
[redacted]450.0	0.0	1450.0	0.0	0.0	368.7	0.0	28.8	13.2	100000.00
[redacted] 0.21	0.00	3.93	0.00	0.000	0.035	0.000	0.000	2269.80	9974.80
[redacted]00725	120.	120.	120.	2	0	3	0.00	49.80	10024.60

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

FLOW DISTRIBUTION FOR SECNO= 90.86 CWSEL= 2278.99

STA= 9975. 10025.
PER Q= 100.0
AREA= 368.7
VEL= 3.9
DEPTH= 7.4

CCHV= 0.100 CEHV= 0.300
*SECNO 90.886

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.65

3470 ENCROACHMENT STATIONS= 9974.0 10025.0 TYPE= 1 TARGET= 51.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 100000.00

90.886	7.31	2279.01	0.00	2279.17	2279.41	0.40	0.13	0.05	100000.00
[redacted]450.0	0.0	1450.0	0.0	0.0	286.3	0.0	29.8	13.4	100000.00
0.22	0.00	5.07	0.00	0.000	0.035	0.000	0.000	2271.70	9974.00
0.001711	140.	125.	120.	2	0	0	0.00	51.00	10025.00

FLOW DISTRIBUTION FOR SECNO= 90.89 CWSEL= 2279.01

STA= 9974. 10040.
PER Q= 100.0
AREA= 286.3
VEL= 5.1
DEPTH= 5.6

*SECNO 90.953

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.44

3470 ENCROACHMENT STATIONS= 9960.0 10009.0 TYPE= 1 TARGET= 49.000

[redacted]

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 100000.00

90.953	5.57	2279.67	0.00	2279.45	2280.78	1.12	1.16	0.22	100000.00
1450.0	0.0	1450.0	0.0	0.0	170.9	0.0	31.6	13.8	100000.00
0.23	0.00	8.49	0.00	0.000	0.035	0.000	0.000	2274.10	9960.00
0.008959	330.	350.	390.	2	0	0	0.00	49.00	10009.00

FLOW DISTRIBUTION FOR SECNO= 90.95 CWSEL= 2279.67

STA= 9960. 10009.
PER Q= 100.0
AREA= 170.9
VEL= 8.5
DEPTH= 3.5

*SECNO 91.045

[redacted]ENCROACHMENT STATIONS= 9943.8 10062.3 TYPE= 1 TARGET= 118.500

[redacted]1.045	5.43	2284.13	0.00	2283.20	2284.96	0.84	4.15	0.03	2281.40
1450.0	592.3	853.6	4.1	119.1	98.9	3.0	33.8	14.5	2283.40
0.25	4.97	8.63	1.37	0.050	0.035	0.050	0.000	2278.70	9943.80
0.008226	460.	490.	510.	3	0	0	0.00	81.67	10025.47

FLOW DISTRIBUTION FOR SECNO= 91.04 CWSEL= 2284.13

STA= 9944. 9989. 10017. 10025.
PER Q= 40.8 58.9 0.3
AREA= 119.1 98.9 3.0
VEL= 5.0 8.6 1.4
DEPTH= 2.6 3.5 0.4

*SECNO 91.134
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9960.2 10051.9 TYPE= 1 TARGET= 91.700

91.134	4.68	2289.28	2289.28	2289.00	2290.38	1.10	4.56	0.08	2287.00
1450.0	286.9	979.7	183.4	59.2	100.6	45.2	36.1	15.4	2287.90
0.26	4.85	9.74	4.05	0.050	0.035	0.050	0.000	2284.60	9960.20
0.011551	470.	470.	490.	3	15	0	0.00	91.70	10051.90

[redacted]

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

FLOW DISTRIBUTION FOR SECNO= 91.13 CWSEL= 2289.28

STA=	9960.	9990.	10022.	10052.
PER Q=	19.8	67.6	12.6	
AREA=	59.2	100.6	45.2	
VEL=	4.8	9.7	4.1	
DEPTH=	2.0	3.2	1.5	

*SECNO 91.235
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9956.9 10038.4 TYPE= 1 TARGET= 81.500

91.235	4.39	2295.79	2295.79	2295.18	2296.83	1.04	6.11	0.01	2293.40
1250.0	320.9	703.7	225.4	64.2	69.9	51.8	38.4	16.5	2294.10
0.28	5.00	10.06	4.35	0.052	0.035	0.052	0.000	2291.40	9956.90
0.012066	440.	530.	590.	4	12	0	0.00	81.50	10038.40

F[redacted]ISTRIBUTION FOR SECNO= 91.24 CWSEL= 2295.79

STA=	9957.	9987.	10008.	10038.
PER Q=	25.7	56.3	18.0	
AREA=	64.2	69.9	51.8	
VEL=	5.0	10.1	4.4	
DEPTH=	2.1	3.3	1.7	

*SECNO 91.337

3470 ENCROACHMENT STATIONS= 9940.0 10022.6 TYPE= 1 TARGET= 82.600

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2299.20 ELREA= 100000.00

91.337	4.67	2300.97	0.00	2300.31	2301.57	0.60	4.70	0.04	2299.20
1250.0	421.5	828.5	0.0	95.4	119.0	0.0	40.8	17.4	100000.00
0.30	4.42	6.96	0.00	0.052	0.035	0.000	0.000	2296.30	9940.00
0.006755	530.	540.	480.	4	0	0	0.00	76.23	10016.23

FLOW DISTRIBUTION FOR SECNO= 91.34 CWSEL= 2300.97

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

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STA=    9940.    9963.    9975.   10023.
  PER Q=     22.2     11.5     66.3
   AREA=     63.4     32.0    119.0
    VEL=      4.4      4.5      7.0
  DEPTH=      2.8      2.7      2.9

1490 NH CARD USED
*SECNO 91.434

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9972.0   10029.0  TYPE=      1  TARGET=       57.000
    91.434      4.02   2306.12   2306.12   2306.16   2307.39      1.27      4.64      0.20   2305.20
    1250.0       0.2    1221.6      28.2       0.2     133.9       6.3      42.9      18.2   2304.30
      0.32      0.96      9.12      4.48     0.052     0.035     0.035     0.000   2302.10   9972.00
  0.012574      545.      510.      500.         2        15         0      0.00     57.00  10029.00

FLOW DISTRIBUTION FOR SECNO=     91.43          CWSEL=   2306.12

STA=    9972.    9972.   10022.   10029.
  PER Q=      0.0     97.7      2.3
   AREA=      0.2    133.9      6.3
    VEL=      1.0      9.1      4.5
  DEPTH=      0.9      2.7      1.0

*SECNO 91.530

3470 ENCROACHMENT STATIONS=     9950.0   10016.0  TYPE=      1  TARGET=       66.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=      2313.20

    91.530      3.48   2312.48      0.00   2312.14   2313.44      0.96      6.02      0.03 100000.00
    1200.0       0.0    1200.0       0.0       0.0     152.8       0.0      44.6      18.9   2313.20
      0.34      0.00      7.86      0.00     0.000     0.035     0.000     0.000   2309.00   9950.00
  0.011092      510.      510.      505.         2         0         0      0.00     62.82  10012.82
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[redacted]ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

FLOW DISTRIBUTION FOR SECNO= 91.53 CWSEL= 2312.48

STA= 9950. 10016.
PER Q= 100.0
AREA= 152.8
VEL= 7.9
DEPTH= 2.4

*SECNO 91.630
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9968.0 10020.0 TYPE= 1 TARGET= 52.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 2317.10

91.630	4.14	2318.44	2318.44	2317.96	2319.74	1.30	5.54	0.10	100000.00
1200.0	0.0	1199.4	0.6	0.0	131.0	0.4	46.3	19.6	2317.10
0.35	0.00	9.16	1.45	0.000	0.030	0.040	0.000	2314.30	9968.00
[redacted]10042	500.	525.	550.	3	11	0	0.00	52.00	10020.00

FLOW DISTRIBUTION FOR SECNO= 91.63 CWSEL= 2318.44

STA= 9968. 10020. 10020.
PER Q= 100.0 0.0
AREA= 131.0 0.4
VEL= 9.2 1.5
DEPTH= 2.5 1.3

*SECNO 91.733

3470 ENCROACHMENT STATIONS= 9969.0 10026.0 TYPE= 1 TARGET= 57.000

91.733	3.63	2323.33	0.00	2323.02	2324.30	0.97	4.53	0.03	100000.00
1200.0	0.0	1200.0	0.0	0.0	151.7	0.1	48.1	20.3	2323.10
0.37	0.00	7.91	0.03	0.000	0.030	0.040	0.000	2319.70	9969.06
0.006992	600.	545.	490.	3	0	0	0.00	56.94	10026.00

FLOW DISTRIBUTION FOR SECNO= 91.73 CWSEL= 2323.33

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

STA= 9969. 10026. 10026.
PER Q= 100.0 0.0
AREA= 151.7 0.1
VEL= 7.9 0.0
DEPTH= 2.7 0.2

*SECNO 91.831

3470 ENCROACHMENT STATIONS= 9976.0 10020.0 TYPE= 1 TARGET= 44.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 100000.00

91.831	5.42	2326.22	0.00	2326.45	2327.06	0.84	2.74	0.01	100000.00
1200.0	0.0	1200.0	0.0	0.0	163.2	0.0	50.0	20.9	100000.00
0.39	0.00	7.35	0.00	0.000	0.030	0.000	0.000	2320.80	9976.00
0.004106	500.	520.	510.	3	0	0	0.00	44.00	10020.00

FLOW DISTRIBUTION FOR SECNO= 91.83 CWSEL= 2326.22

[redacted] 9976. 10042.
PER Q= 100.0
AREA= 163.2
VEL= 7.4
DEPTH= 3.7

*SECNO 91.926
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9970.0 10023.0 TYPE= 1 TARGET= 53.000

91.926	3.92	2330.22	2330.22	2330.24	2331.50	1.28	3.67	0.13	100000.00
1200.0	0.0	1200.0	0.0	0.0	132.0	0.0	51.7	21.4	100000.00
0.41	0.00	9.09	0.00	0.000	0.038	0.000	0.000	2326.30	9970.00
0.016634	510.	500.	490.	9	19	0	0.00	53.00	10023.00

FLOW DISTRIBUTION FOR SECNO= 91.93 CWSEL= 2330.22

STA= 9970. 10068.
PER Q= 100.0
AREA= 132.0
VEL= 9.1
DEPTH= 2.5

[redacted]

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

*SECNO 92.026

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9982.0 10014.0 TYPE= 1 TARGET= 32.000

92.026	5.12	2339.92	2339.92	2339.48	2341.73	1.80	8.36	0.16	2338.00
1200.0	4.3	1195.7	0.0	1.5	110.8	0.0	53.2	22.0	100000.00
0.42	2.79	10.79	0.00	0.045	0.038	0.000	0.000	2334.80	9982.00
0.015256	530.	525.	520.	4	11	0	0.00	32.00	10014.00

FLOW DISTRIBUTION FOR SECNO= 92.03 CWSEL= 2339.92

STA=	9982.	9983.	10044.
PER Q=	0.4	99.6	
AREA=	1.5	110.8	
[redacted]EL=	2.8	10.8	
[redacted]TH=	1.9	3.6	

*SECNO 92.137

3470 ENCROACHMENT STATIONS= 9976.0 10012.0 TYPE= 1 TARGET= 36.000

92.137	5.03	2348.73	0.00	2348.63	2350.03	1.30	8.26	0.05	2352.30
850.0	0.0	850.0	0.0	0.0	92.7	0.0	54.6	22.4	100000.00
0.44	0.00	9.17	0.00	0.000	0.038	0.000	0.000	2343.70	9984.39
0.012464	550.	590.	570.	2	0	0	0.00	27.61	10012.00

FLOW DISTRIBUTION FOR SECNO= 92.14 CWSEL= 2348.73

STA=	9984.	10012.
PER Q=	100.0	
AREA=	92.7	
VEL=	9.2	
DEPTH=	3.4	

*SECNO 92.240

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

3470 ENCROACHMENT STATIONS= 9988.0 10016.0 TYPE= 1 TARGET= 28.000

92.240	4.64	2354.64	0.00	2354.04	2355.72	1.09	5.67	0.02	2352.80
850.0	3.1	846.9	0.0	1.5	101.0	0.0	55.8	22.7	100000.00
0.46	2.12	8.39	0.00	0.045	0.038	0.000	0.000	2350.00	9988.00
0.008962	550.	540.	500.	3	0	0	0.00	28.00	10016.00

FLOW DISTRIBUTION FOR SECNO= 92.24 CWSEL= 2354.64

STA=	9988.	9989. 10021.
PER Q=	0.4	99.6
AREA=	1.5	101.0
VEL=	2.1	8.4
DEPTH=	1.8	3.7

*SECNO 92.348
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3[redacted]ENCROACHMENT STATIONS= 9990.0 10059.0 TYPE= 1 TARGET= 69.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 2364.30

92.348	4.14	2362.24	2362.24	2362.24	2363.33	1.09	6.92	0.00	100000.00
850.0	0.0	850.0	0.0	0.0	101.4	0.0	57.1	23.2	2364.30
0.48	0.00	8.38	0.00	0.000	0.038	0.000	0.000	2358.10	9990.91
0.017369	560.	570.	580.	1	15	0	0.00	47.73	10038.64

FLOW DISTRIBUTION FOR SECNO= 92.35 CWSEL= 2362.24

STA=	9991.	10059.
PER Q=	100.0	
AREA=	101.4	
VEL=	8.4	
DEPTH=	2.1	

*SECNO 92.446

3470 ENCROACHMENT STATIONS= 9975.0 10010.0 TYPE= 1 TARGET= 35.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
92.446	4.39	2370.49	0.00	2370.46	2371.74	1.25	8.36	0.05	2369.00
850.0	0.4	849.6	0.0	0.3	94.8	0.0	58.3	23.7	100000.00
0.49	1.27	8.97	0.00	0.045	0.038	0.000	0.000	2366.10	9975.00
0.014936	520.	520.	520.	5	0	0	0.00	35.00	10010.00

FLOW DISTRIBUTION FOR SECNO= 92.45 CWSEL= 2370.49

STA= 9975. 9975. 10026.
PER Q= 0.0 100.0
AREA= 0.3 94.8
VEL= 1.3 9.0
DEPTH= 1.5 2.7

*SECNO 92.545
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9982.0 10012.0 TYPE= 1 TARGET= 30.000

92.545	4.14	2380.64	2380.64	2380.71	2382.12	1.48	8.34	0.07	100000.00
850.0	0.0	850.0	0.0	0.0	86.9	0.0	59.4	24.1	100000.00
0.51	0.00	9.78	0.00	0.000	0.038	0.000	0.000	2376.50	9982.00
0.016932	510.	525.	550.	2	11	0	0.00	30.00	10012.00

FLOW DISTRIBUTION FOR SECNO= 92.54 CWSEL= 2380.64

STA= 9982. 10039.
PER Q= 100.0
AREA= 86.9
VEL= 9.8
DEPTH= 2.9

THIS RUN EXECUTED 30AUG93 13:37:12

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

NTW-Enc.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	63.800	2233.94	4100.00	5.54	2.56	8.53	0.00	309.32	3790.68	0.00	296.88	9748.16	10045.04
	63.800	2234.95	4100.00	6.55	1.38	6.89	0.00	2.30	4097.70	0.00	150.00	9894.00	10044.00
*	90.093	2237.94	1450.00	3.14	3.76	3.98	1.04	40.96	1324.49	84.55	320.47	9944.90	10265.36
*	90.093	2237.18	1450.00	2.38	0.00	7.71	0.00	0.00	1450.00	0.00	104.00	9956.00	10060.00
*	90.188	2243.10	1450.00	5.00	2.84	7.25	2.06	156.33	1099.08	194.59	215.84	9931.96	10147.80
*	90.188	2242.89	1450.00	4.79	3.38	8.70	2.54	120.11	1249.26	80.63	109.70	9950.30	10060.00
*	90.203	2243.81	1450.00	5.71	0.00	4.04	1.51	0.00	1001.50	448.50	322.69	9962.30	10285.00
*	90.203	2243.88	1450.00	5.78	0.00	5.38	1.58	0.00	1319.05	130.95	150.00	9970.00	10120.00
*	90.215	2246.65	1450.00	6.84	0.26	2.05	1.59	51.97	517.41	880.63	534.52	9735.48	10270.00
*	90.215	2246.55	1450.00	6.75	0.61	3.61	2.79	41.07	891.79	517.14	179.00	9930.00	10109.00
*	90.284	2248.30	1450.00	2.10	0.00	3.13	4.54	0.00	113.76	1336.24	279.65	9981.73	10261.38
*	90.284	2248.66	1450.00	2.46	0.00	5.46	6.73	0.00	268.55	1181.44	180.00	9980.00	10160.00
*	90.381	2253.74	1450.00	3.14	4.49	8.12	4.08	605.54	276.80	567.66	405.16	9832.13	10237.30
	90.381	2254.44	1450.00	3.84	4.10	5.93	4.12	576.23	273.02	600.74	174.10	9915.90	10090.00
*	90.476	2258.71	1450.00	1.41	1.42	1.78	2.01	557.22	29.66	863.11	1133.33	9298.71	10529.20
	90.476	2259.64	1450.00	3.04	5.65	5.25	2.60	1102.18	186.29	161.52	187.00	9910.00	10097.00
*	90.570	2263.43	1450.00	3.13	5.04	7.58	0.00	1206.41	243.59	0.00	282.45	9728.47	10010.92
	90.570	2264.24	1450.00	3.94	5.22	5.71	0.00	1169.85	280.15	0.00	123.72	9890.00	10013.72
*	90.667	2268.62	1450.00	4.52	2.64	6.15	2.74	263.63	1104.51	81.86	187.64	9878.27	10065.92
	90.667	2268.62	1450.00	4.52	0.00	8.06	1.27	0.00	1448.89	1.11	69.60	9970.90	10040.50
	90.760	2271.37	1450.00	4.17	2.12	6.67	0.00	163.12	1286.88	0.00	173.38	9860.87	10034.25
	90.760	2272.02	1450.00	4.82	0.82	6.14	0.85	0.35	1449.41	0.24	68.00	9968.00	10036.00

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
	90.840	2273.99	1450.00	5.39	0.00	8.30	0.00	0.00	1450.00	0.00	50.67	9980.65	10031.32
	90.840	2274.00	1450.00	5.40	0.00	8.29	0.00	0.00	1450.00	0.00	49.36	9980.64	10030.00
*	90.863	2279.07	1450.00	9.27	0.92	3.38	0.93	159.02	1261.42	29.56	225.93	9703.90	10046.00
*	90.863	2278.99	1450.00	9.19	0.00	3.93	0.00	0.00	1450.00	0.00	49.80	9974.80	10024.60
	90.886	2279.17	1450.00	7.47	0.00	2.81	0.00	0.00	1450.00	0.00	105.10	9921.36	10026.46
*	90.886	2279.01	1450.00	7.31	0.00	5.07	0.00	0.00	1450.00	0.00	51.00	9974.00	10025.00
*	90.953	2279.45	1450.00	5.35	1.46	3.91	2.22	10.15	1065.50	374.35	180.03	9911.96	10092.00
*	90.953	2279.67	1450.00	5.57	0.00	8.49	0.00	0.00	1450.00	0.00	49.00	9960.00	10009.00
*	91.045	2283.20	1450.00	4.50	4.20	8.94	0.00	802.07	647.92	0.00	175.09	9841.46	10016.55
	91.045	2284.13	1450.00	5.43	4.97	8.63	1.37	592.29	853.65	4.06	81.67	9943.80	10025.47
*	91.134	2289.00	1450.00	4.40	2.59	7.42	2.74	251.19	680.14	518.68	349.10	9893.31	10252.31
*	91.134	2289.28	1450.00	4.68	4.85	9.74	4.05	286.93	979.71	183.36	91.70	9960.20	10051.90
*	91.235	2295.18	1250.00	3.78	3.28	8.08	2.58	511.38	459.70	278.92	302.45	9853.00	10155.45
*	91.235	2295.79	1250.00	4.39	5.00	10.06	4.35	320.91	703.68	225.41	81.50	9956.90	10038.40
	91.337	2300.31	1250.00	4.01	3.46	7.18	0.00	585.38	664.62	0.00	175.75	9818.15	10013.95
	91.337	2300.97	1250.00	4.67	4.42	6.96	0.00	421.54	828.46	0.00	76.23	9940.00	10016.23
	91.434	2306.16	1250.00	4.06	2.50	7.63	3.67	186.80	1038.83	24.37	187.54	9723.69	10029.54
*	91.434	2306.12	1250.00	4.02	0.96	9.12	4.48	0.18	1221.59	28.23	57.00	9972.00	10029.00
*	91.530	2312.14	1200.00	3.14	0.00	7.95	0.00	0.00	1200.00	0.00	78.42	9933.01	10011.43
	91.530	2312.48	1200.00	3.48	0.00	7.86	0.00	0.00	1200.00	0.00	62.82	9950.00	10012.82
*	91.630	2317.96	1200.00	3.66	0.00	7.11	3.13	0.00	759.14	440.86	206.06	9970.95	10202.65
*	91.630	2318.44	1200.00	4.14	0.00	9.16	1.45	0.00	1199.42	0.58	52.00	9968.00	10020.00
*	91.733	2323.02	1200.00	3.32	0.00	8.94	0.00	0.00	1200.00	0.00	55.12	9970.26	10025.38
	91.733	2323.33	1200.00	3.63	0.00	7.91	0.03	0.00	1200.00	0.00	56.94	9969.06	10026.00
*	91.831	2326.45	1200.00	5.65	0.00	6.90	0.00	0.00	1200.00	0.00	45.56	9974.99	10020.55
	91.831	2326.22	1200.00	5.42	0.00	7.35	0.00	0.00	1200.00	0.00	44.00	9976.00	10020.00
*	91.926	2330.24	1200.00	3.94	0.00	9.01	0.00	0.00	1200.00	0.00	54.29	9969.18	10023.47
*	91.926	2330.22	1200.00	3.92	0.00	9.09	0.00	0.00	1200.00	0.00	53.00	9970.00	10023.00
*	92.026	2339.48	1200.00	4.68	4.27	8.67	0.00	356.85	843.15	0.00	100.84	9914.08	10014.92
*	92.026	2339.92	1200.00	5.12	2.79	10.79	0.00	4.29	1195.71	0.00	32.00	9982.00	10014.00
*	92.137	2348.63	850.00	4.93	0.00	7.66	2.70	0.00	689.00	161.00	103.49	9984.63	10088.12
	92.137	2348.73	850.00	5.03	0.00	9.17	0.00	0.00	850.00	0.00	27.61	9984.39	10012.00
*	92.240	2354.04	850.00	4.04	3.84	8.69	0.00	115.65	734.35	0.00	56.42	9959.59	10016.02
	92.240	2354.64	850.00	4.64	2.12	8.39	0.00	3.13	846.87	0.00	28.00	9988.00	10016.00

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	92.348	2362.24	850.00	4.14	0.00	8.38	0.00	0.00	850.00	0.00	47.75	9990.91	10038.66
*	92.348	2362.24	850.00	4.14	0.00	8.38	0.00	0.00	850.00	0.00	47.73	9990.91	10038.64
	92.446	2370.46	850.00	4.35	3.21	8.68	0.00	29.68	820.32	0.00	49.42	9962.50	10011.92
	92.446	2370.49	850.00	4.39	1.27	8.97	0.00	0.38	849.62	0.00	35.00	9975.00	10010.00
*	92.545	2380.71	850.00	4.21	0.00	9.32	0.00	0.00	850.00	0.00	33.95	9980.56	10014.51
*	92.545	2380.64	850.00	4.14	0.00	9.78	0.00	0.00	850.00	0.00	30.00	9982.00	10012.00

[redacted]nc.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST
*	63.800	2233.94	4100.00	0.00	296.88	9748.16	0.00	9894.90	10084.10	0.00	10045.04
	63.800	2234.95	4100.00	0.00	150.00	9894.00	9894.00	9894.90	10084.10	10044.00	10044.00
*	90.093	2237.94	1450.00	490.00	320.47	9944.90	0.00	9955.10	10105.40	0.00	10265.36
*	90.093	2237.18	1450.00	490.00	104.00	9956.00	9956.00	9955.10	10105.40	10060.00	10060.00
*	90.188	2243.10	1450.00	500.00	215.84	9931.96	9500.00	9980.30	10018.10	10147.80	10147.80
*	90.188	2242.89	1450.00	500.00	109.70	9950.30	9950.30	9980.30	10018.10	10060.00	10060.00
*	90.203	2243.81	1450.00	80.00	322.69	9962.30	2248.00	9961.00	10025.00	10285.00	10285.00
*	90.203	2243.88	1450.00	80.00	150.00	9970.00	9970.00	9961.00	10025.00	10120.00	10120.00
*	90.215	2246.65	1450.00	65.00	534.52	9735.48	2249.00	9975.30	10028.70	10270.00	10270.00
*	90.215	2246.55	1450.00	65.00	179.00	9930.00	9930.00	9975.30	10028.70	10109.00	10109.00
*	90.284	2248.30	1450.00	365.00	279.65	9981.73	9135.00	9980.00	10016.30	10289.70	10261.38
*	90.284	2248.66	1450.00	365.00	180.00	9980.00	9980.00	9980.00	10016.30	10160.00	10160.00
[redacted]	90.381	2253.74	1450.00	510.00	405.16	9832.13	9805.00	9990.90	10007.90	10237.30	10237.30
	90.381	2254.44	1450.00	510.00	174.10	9915.90	9915.90	9990.90	10007.90	10090.00	10090.00
*	90.476	2258.71	1450.00	505.00	1133.33	9298.71	8837.00	9991.90	10012.10	10537.50	10529.20
	90.476	2259.64	1450.00	505.00	187.00	9910.00	9910.00	9991.90	10012.10	10097.00	10097.00
*	90.570	2263.43	1450.00	495.00	282.45	9728.47	0.00	9991.30	10014.30	0.00	10010.92
	90.570	2264.24	1450.00	495.00	123.72	9890.00	9890.00	9991.30	10014.30	10014.30	10013.72
*	90.667	2268.62	1450.00	510.00	187.64	9878.27	9771.00	9970.90	10037.50	10708.00	10065.92
	90.667	2268.62	1450.00	510.00	69.60	9970.90	9970.90	9970.90	10037.50	10040.50	10040.50
	90.760	2271.37	1450.00	495.00	173.38	9860.87	0.00	9968.30	10035.30	0.00	10034.25
*	90.760	2272.02	1450.00	495.00	68.00	9968.00	9968.00	9968.30	10035.30	10036.00	10036.00
	90.840	2273.99	1450.00	420.00	50.67	9980.65	0.00	9958.80	10051.90	0.00	10031.32
	90.840	2274.00	1450.00	420.00	49.36	9980.64	9980.00	9958.80	10051.90	10030.00	10030.00
*	90.863	2279.07	1450.00	120.00	225.93	9703.90	8843.00	9974.80	10024.60	10058.50	10046.00
*	90.863	2278.99	1450.00	120.00	49.80	9974.80	9974.80	9974.80	10024.60	10024.60	10024.60
	90.886	2279.17	1450.00	125.00	105.10	9921.36	0.00	9898.30	10040.10	0.00	10026.46
*	90.886	2279.01	1450.00	125.00	51.00	9974.00	9974.00	9898.30	10040.10	10025.00	10025.00
*	90.953	2279.45	1450.00	350.00	180.03	9911.96	0.00	9917.40	10009.00	0.00	10092.00
[redacted]	90.953	2279.67	1450.00	350.00	49.00	9960.00	9960.00	9917.40	10009.00	10009.00	10009.00
*	91.045	2283.20	1450.00	490.00	175.09	9841.46	9836.10	9988.80	10017.30	10567.00	10016.55
	91.045	2284.13	1450.00	490.00	81.67	9943.80	9943.80	9988.80	10017.30	10062.30	10025.47

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST
*	91.134	2289.00	1450.00	470.00	349.10	9893.31	9845.00	9990.20	10021.90	10900.00	10252.31
*	91.134	2289.28	1450.00	470.00	91.70	9960.20	9960.20	9990.20	10021.90	10051.90	10051.90
*	91.235	2295.18	1250.00	530.00	302.45	9853.00	9853.00	9986.90	10008.40	10304.00	10155.45
*	91.235	2295.79	1250.00	530.00	81.50	9956.90	9956.90	9986.90	10008.40	10038.40	10038.40
	91.337	2300.31	1250.00	540.00	175.75	9818.15	0.00	9974.80	10022.60	0.00	10013.95
	91.337	2300.97	1250.00	540.00	76.23	9940.00	9940.00	9974.80	10022.60	10022.60	10016.23
*	91.434	2306.16	1250.00	510.00	187.54	9723.69	9494.00	9972.20	10022.40	10280.00	10029.54
*	91.434	2306.12	1250.00	510.00	57.00	9972.00	9972.00	9972.20	10022.40	10029.00	10029.00
*	91.530	2312.14	1200.00	510.00	78.42	9933.01	0.00	9924.90	10015.70	0.00	10011.43
	91.530	2312.48	1200.00	510.00	62.82	9950.00	9950.00	9924.90	10015.70	10016.00	10012.82
*	91.630	2317.96	1200.00	525.00	206.06	9970.95	0.00	9955.90	10019.70	0.00	10202.65
*	91.630	2318.44	1200.00	525.00	52.00	9968.00	9968.00	9955.90	10019.70	10020.00	10020.00
*	91.733	2323.02	1200.00	545.00	55.12	9970.26	0.00	9963.40	10025.60	0.00	10025.38
	91.733	2323.33	1200.00	545.00	56.94	9969.06	9969.00	9963.40	10025.60	10026.00	10026.00
*	91.831	2326.45	1200.00	520.00	45.56	9974.99	0.00	9968.10	10042.20	0.00	10020.55
	91.831	2326.22	1200.00	520.00	44.00	9976.00	9976.00	9968.10	10042.20	10020.00	10020.00
*	91.926	2330.24	1200.00	500.00	54.29	9969.18	0.00	9912.60	10067.80	0.00	10023.47
*	91.926	2330.22	1200.00	500.00	53.00	9970.00	9970.00	9912.60	10067.80	10023.00	10023.00
*	92.026	2339.48	1200.00	525.00	100.84	9914.08	0.00	9982.80	10044.20	0.00	10014.92
*	92.026	2339.92	1200.00	525.00	32.00	9982.00	9982.00	9982.80	10044.20	10014.00	10014.00
*	92.137	2348.63	850.00	590.00	103.49	9984.63	9505.00	9976.00	10012.00	10160.80	10088.12
	92.137	2348.73	850.00	590.00	27.61	9984.39	9976.00	9976.00	10012.00	10012.00	10012.00
*	92.240	2354.04	850.00	540.00	56.42	9959.59	0.00	9988.80	10020.50	0.00	10016.02
	92.240	2354.64	850.00	540.00	28.00	9988.00	9988.00	9988.80	10020.50	10016.00	10016.00
*	92.348	2362.24	850.00	570.00	47.75	9990.91	0.00	9987.70	10058.80	0.00	10038.66
*	92.348	2362.24	850.00	570.00	47.73	9990.91	9990.00	9987.70	10058.80	10059.00	10038.64
	92.446	2370.46	850.00	520.00	49.42	9962.50	0.00	9975.20	10025.60	0.00	10011.92
	92.446	2370.49	850.00	520.00	35.00	9975.00	9975.00	9975.20	10025.60	10010.00	10010.00
*	92.545	2380.71	850.00	525.00	33.95	9980.56	0.00	9960.80	10038.70	0.00	10014.51
*	92.545	2380.64	850.00	525.00	30.00	9982.00	9982.00	9960.80	10038.70	10012.00	10012.00

nc.hc2

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	90.215	2245.46	2242.60	2249.47	2244.50	1034.71	421.93	30.00	0.00	6.84	2246.65	2.05	2246.69
*	90.215	2245.69	2242.60	2249.55	2244.50	1026.76	430.00	30.00	0.00	6.75	2246.55	3.61	2246.72
*	90.863	2275.80	2274.70	2282.40	2278.70	1143.72	316.56	30.00	0.00	9.27	2279.07	3.38	2279.22
*	90.863	2275.80	2274.70	2282.41	2278.70	1142.76	317.48	30.00	0.00	9.19	2278.99	3.93	2279.23

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 63.800 PROFILE= 1 CRITICAL DEPTH ASSUMED

WARNING SECNO= 90.093 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO= 90.093 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.093 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 90.093 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 90.188 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.188 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 90.188 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.188 PROFILE= 2 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 90.203 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 90.203 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 90.215 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 90.215 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO= 90.215 PROFILE= 2 HYDRAULIC JUMP D.S.

CAUTION SECNO= 90.284 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.284 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 90.284 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 90.284 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.284 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 90.284 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 90.381 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.381 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 90.381 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 90.476 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 90.476 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 90.570 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.570 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 90.570 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 90.667 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 90.760 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 90.863 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 90.863 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 90.886 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 90.953 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 90.953 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 91.045 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.045 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY

[redacted]N SECNO= 91.045 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION SECNO= 91.134 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 91.134 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.134 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 91.235 PROFILE= 1 CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 91.434 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 91.434 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.434 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 91.530 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.530 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 91.630 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO= 91.630 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.630 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 91.733 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted]N SECNO= 91.733 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 91.831 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 91.926 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.926 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 91.926 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 91.926 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 92.026 PROFILE= 1 CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 92.026 PROFILE= 2 CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 92.137 PROFILE= 1 CRITICAL DEPTH ASSUMED
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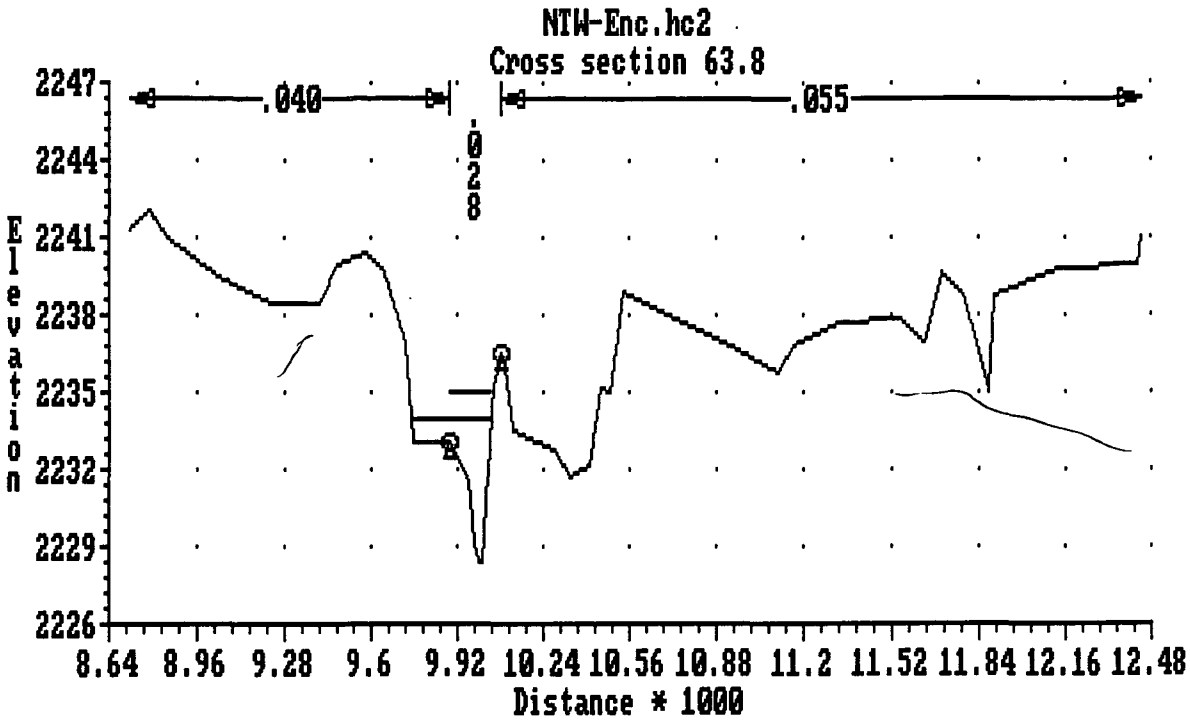
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CAUTION SECNO= 92.240 PROFILE= 1 MINIMUM SPECIFIC ENERGY

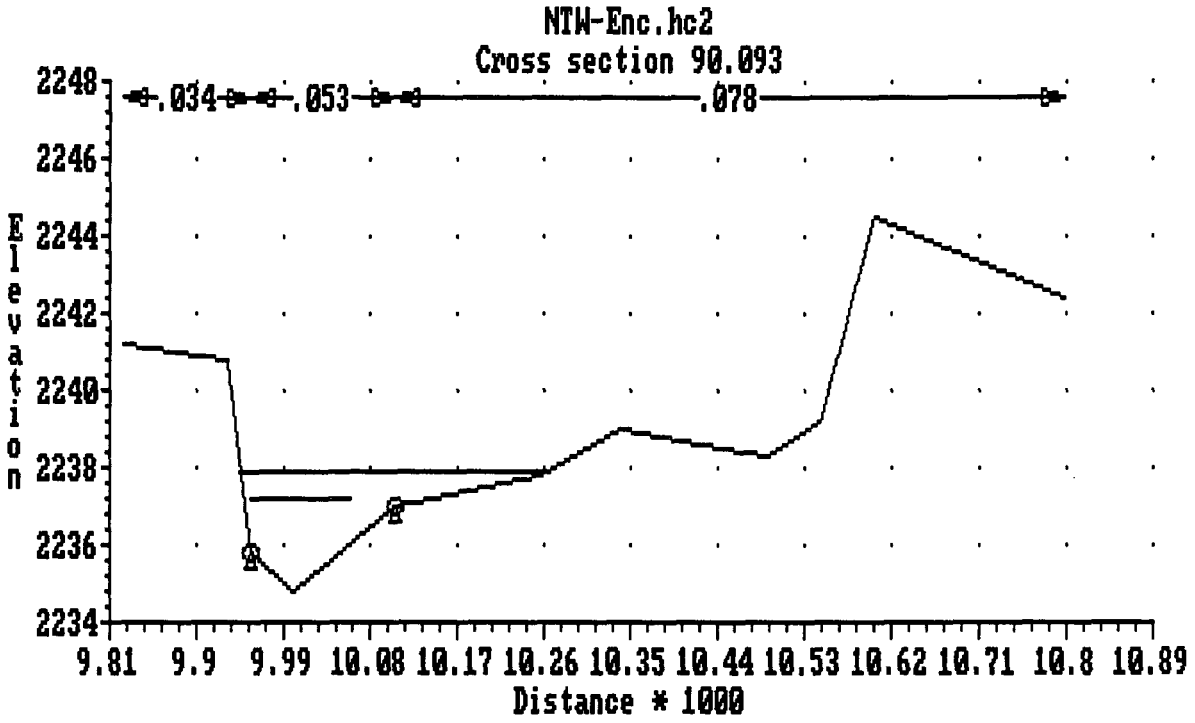
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CAUTION SECNO= 92.348 PROFILE= 1 MINIMUM SPECIFIC ENERGY
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CAUTION SECNO= 92.348 PROFILE= 2 MINIMUM SPECIFIC ENERGY

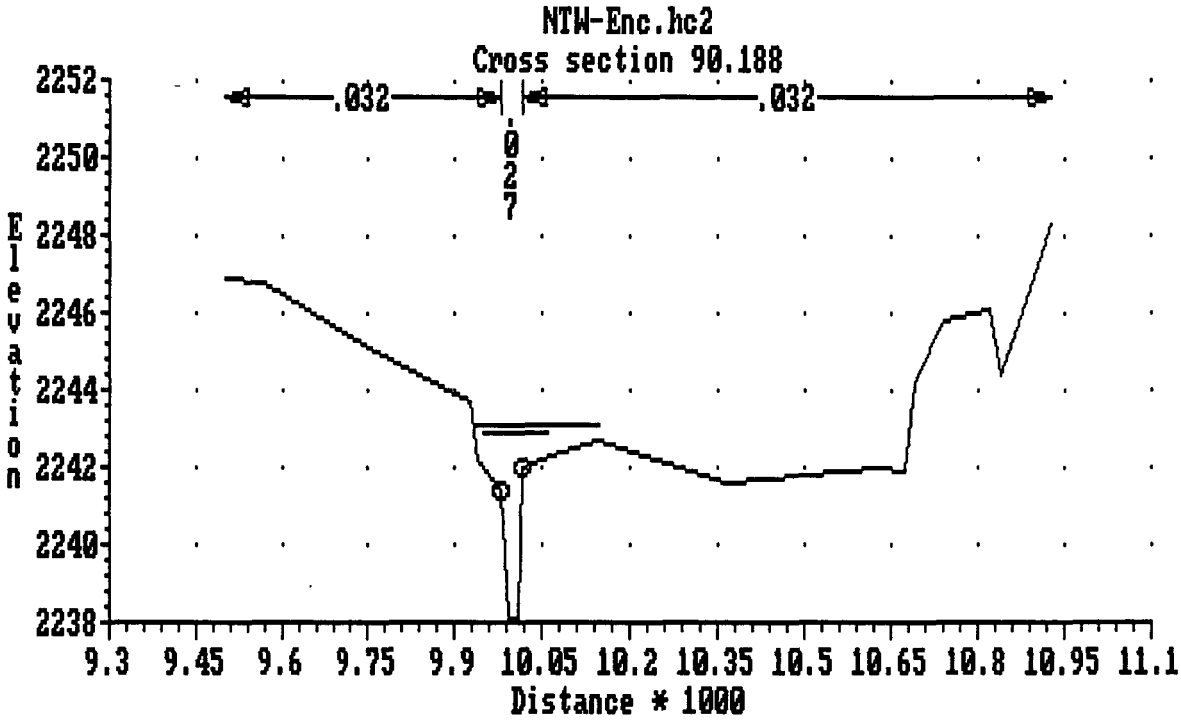
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[redacted]ON SECNO= 92.545 PROFILE= 1 MINIMUM SPECIFIC ENERGY
[redacted].ON SECNO= 92.545 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 92.545 PROFILE= 2 MINIMUM SPECIFIC ENERGY

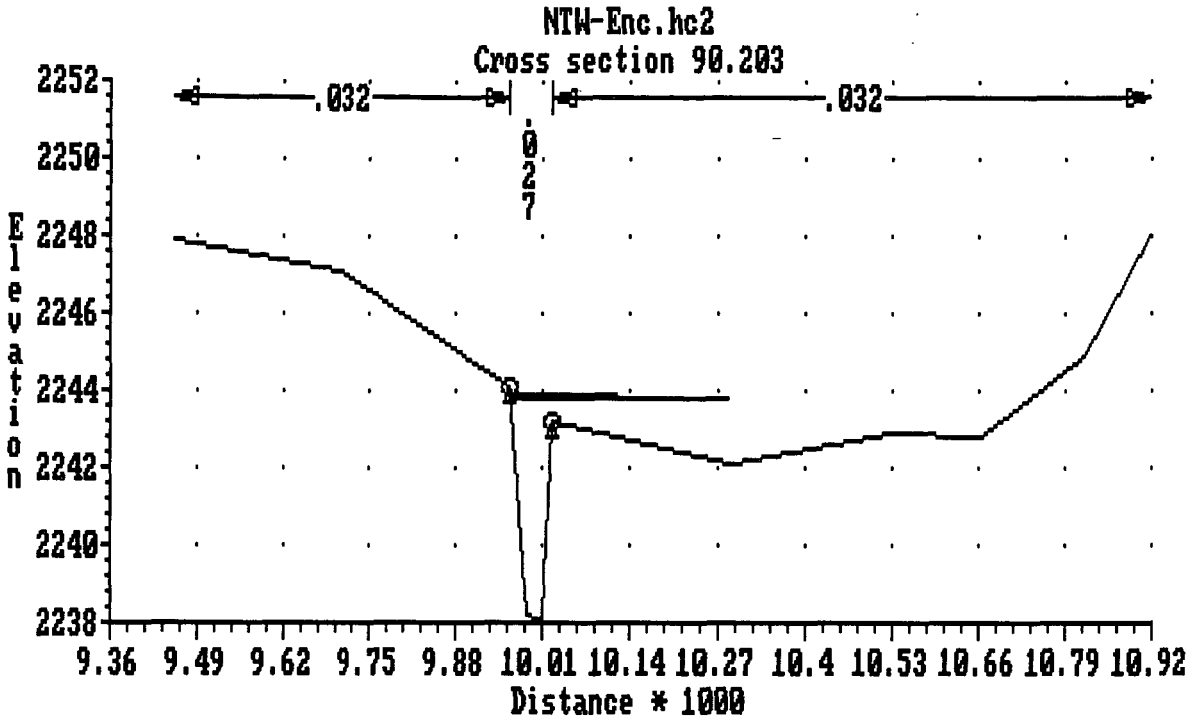
FLOODWAY DATA, NTW-Enc.hc2
PROFILE NO. 2

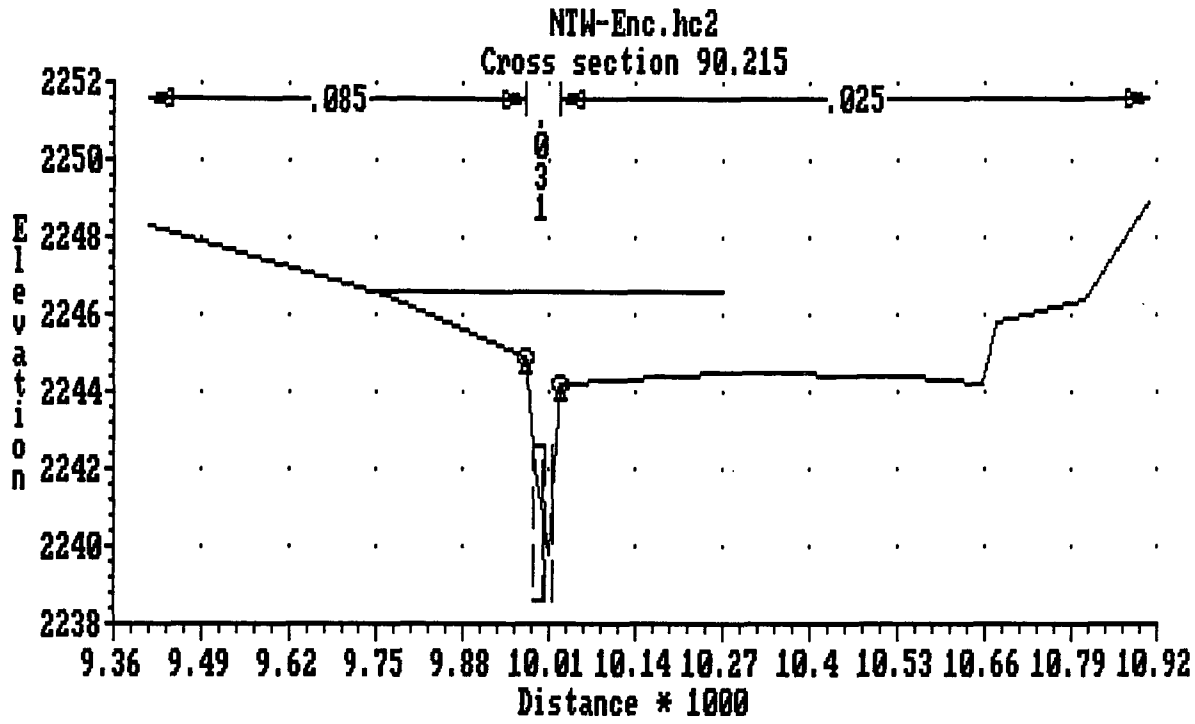
STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
63.800	150.	597.	6.9	2234.9	2233.9	1.0
90.093	104.	188.	7.7	2237.1	2237.9	-0.8
90.188	110.	211.	6.9	2242.9	2243.1	-0.2
90.203	150.	328.	4.4	2243.9	2243.8	0.1
90.215	179.	499.	2.9	2246.5	2246.6	-0.1
90.284	180.	225.	6.5	2248.7	2248.3	0.4
90.381	174.	332.	4.4	2254.4	2253.7	0.7
90.476	187.	293.	5.0	2259.6	2258.7	0.9
90.570	124.	273.	5.3	2264.2	2263.4	0.8
90.667	70.	181.	8.0	2268.6	2268.6	0.0
90.760	68.	237.	6.1	2272.0	2271.4	0.6
90.840	49.	175.	8.3	2274.0	2274.0	0.0
90.863	50.	369.	3.9	2279.0	2279.1	-0.1
90.886	51.	286.	5.1	2279.0	2279.2	-0.2
90.953	49.	171.	8.5	2279.6	2279.4	0.2
[illegible]045	82.	221.	6.6	2284.1	2283.2	0.9
[illegible]1.134	92.	205.	7.1	2289.3	2289.0	0.3
91.235	81.	186.	6.7	2295.8	2295.2	0.6
91.337	76.	214.	5.8	2301.0	2300.3	0.7
91.434	57.	140.	8.9	2306.2	2306.2	0.0
91.530	63.	153.	7.9	2312.4	2312.1	0.3
91.630	52.	131.	9.1	2318.5	2318.0	0.5
91.733	57.	152.	7.9	2323.3	2323.0	0.3
91.831	44.	163.	7.4	2326.3	2326.5	-0.2
91.926	53.	132.	9.1	2330.2	2330.2	0.0
92.026	32.	112.	10.7	2339.9	2339.5	0.4
92.137	28.	93.	9.2	2348.7	2348.6	0.1
92.240	28.	102.	8.3	2354.6	2354.0	0.6
92.348	48.	101.	8.4	2362.2	2362.2	0.0
92.446	35.	95.	8.9	2370.5	2370.5	0.0
92.545	30.	87.	9.8	2380.6	2380.7	-0.1

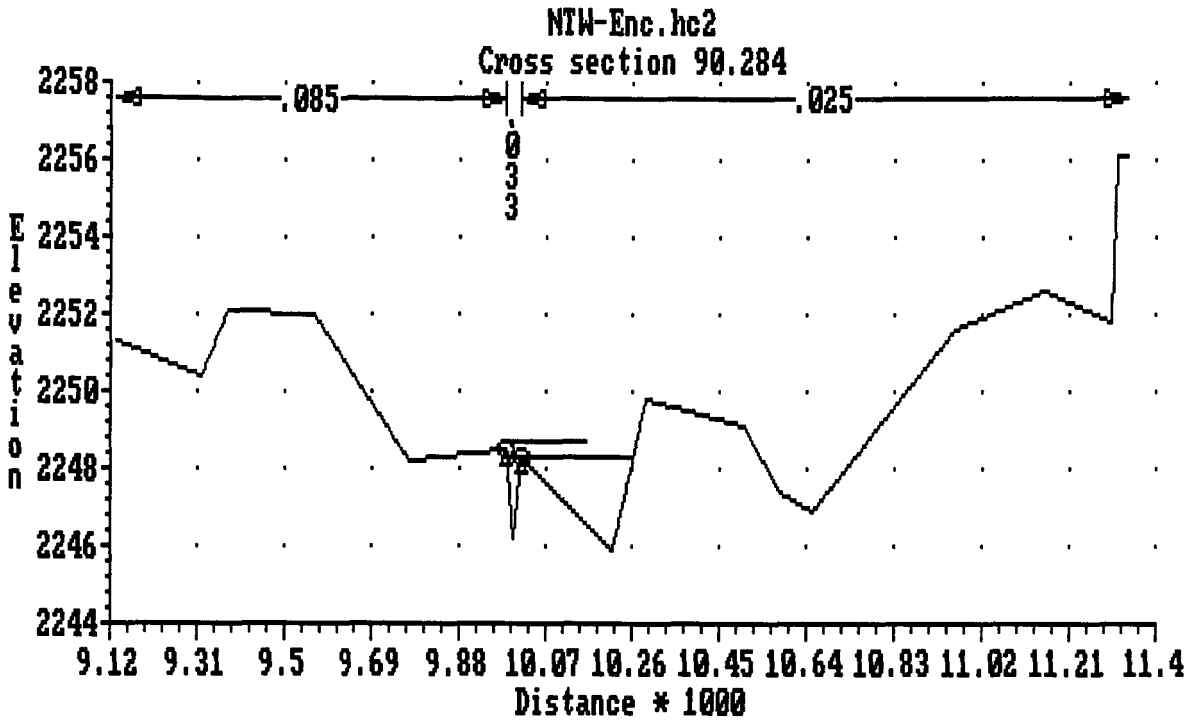

NTW-Enc.hc2
Cross section 63.8
.040
.028
.055
Elevation
2247
2244
2241
2238
2235
2232
2229
2226
8.64 8.96 9.28 9.6 9.92 10.24 10.56 10.88 11.2 11.52 11.84 12.16 12.48
Distance * 1000

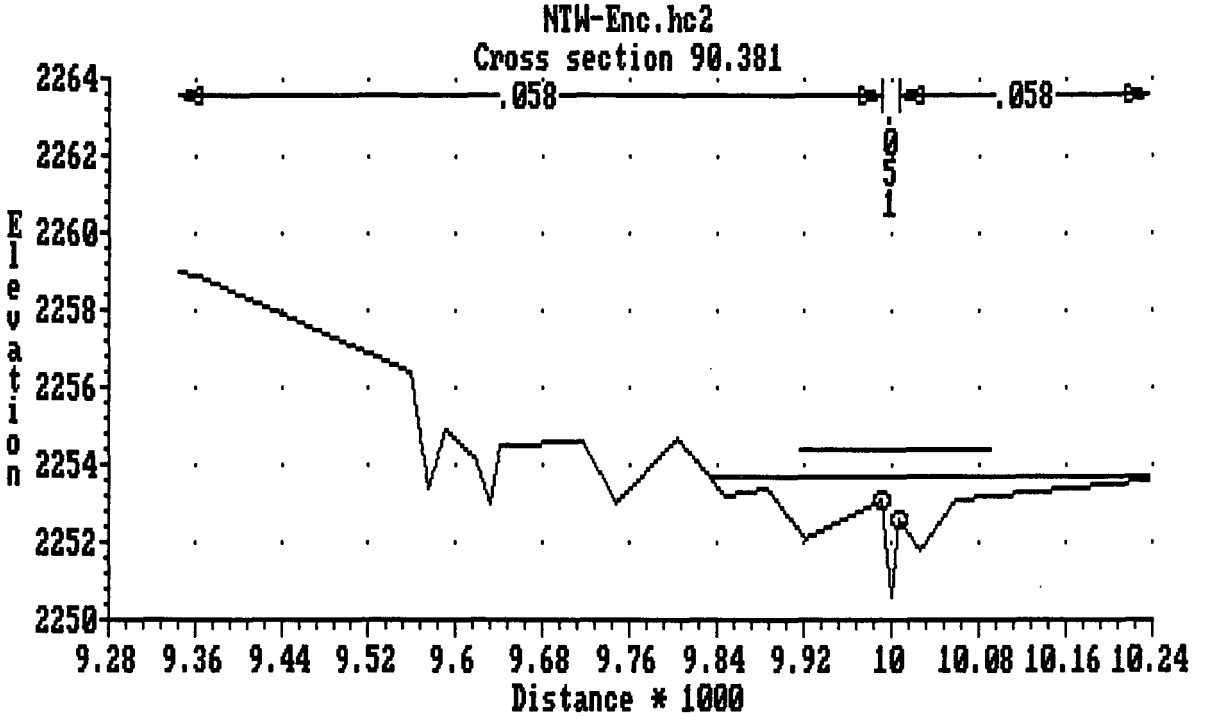

NTW-Enc.hc2
Cross section 90.093
.034
.053
.078
Elevation
2248
2246
2244
2242
2240
2238
2236
2234
9.81
9.9
9.99
10.08
10.17
10.26
10.35
10.44
10.53
10.62
10.71
10.8
10.89
Distance * 1000

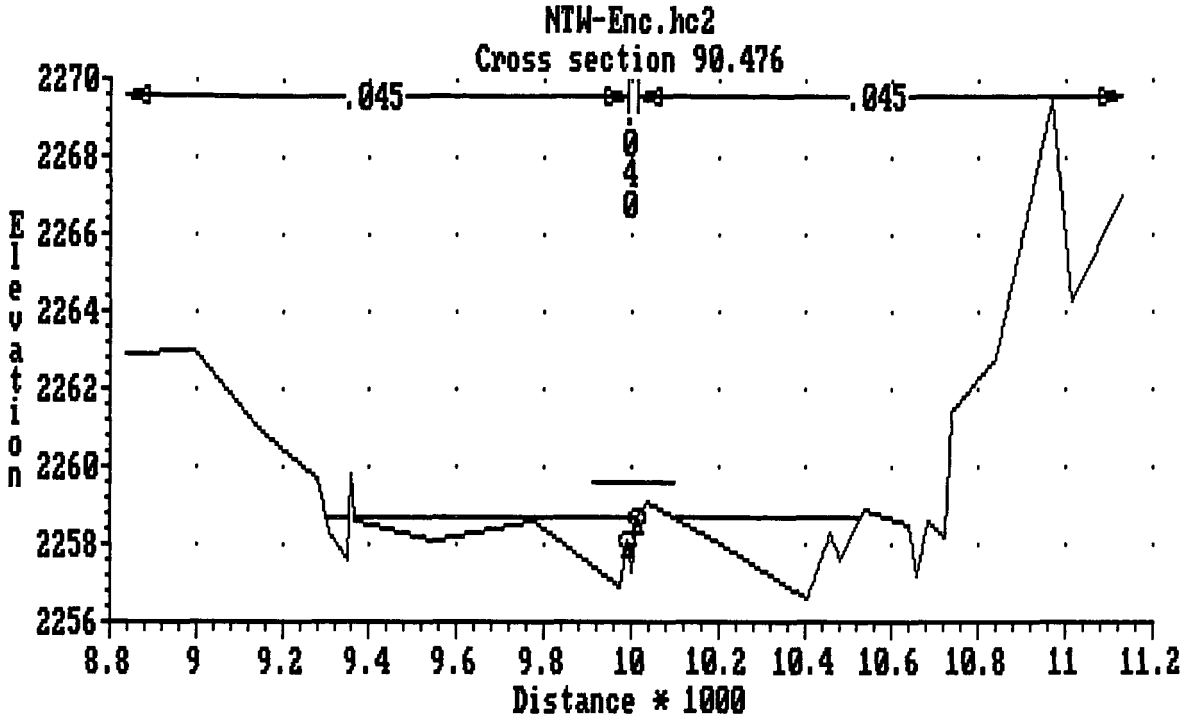

NTW-Enc.hc2
Cross section 90.188
.032
.027
.032
Elevation
2252
2250
2248
2246
2244
2242
2240
2238
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
10.95
11.1
Distance * 1000

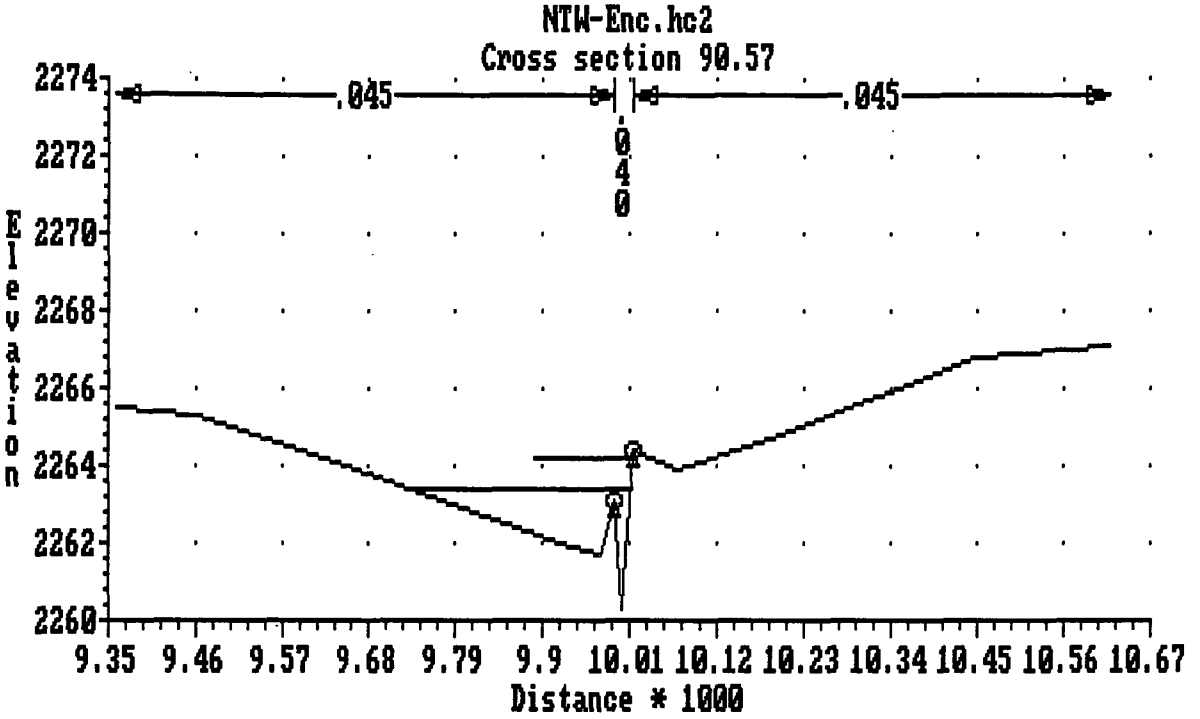

NTW-Enc.hc2
Cross section 90.203
.032
.027
.032
Elevation
2252
2250
2248
2246
2244
2242
2240
2238
9.36
9.49
9.62
9.75
9.88
10.01
10.14
10.27
10.4
10.53
10.66
10.79
10.92
Distance * 1000

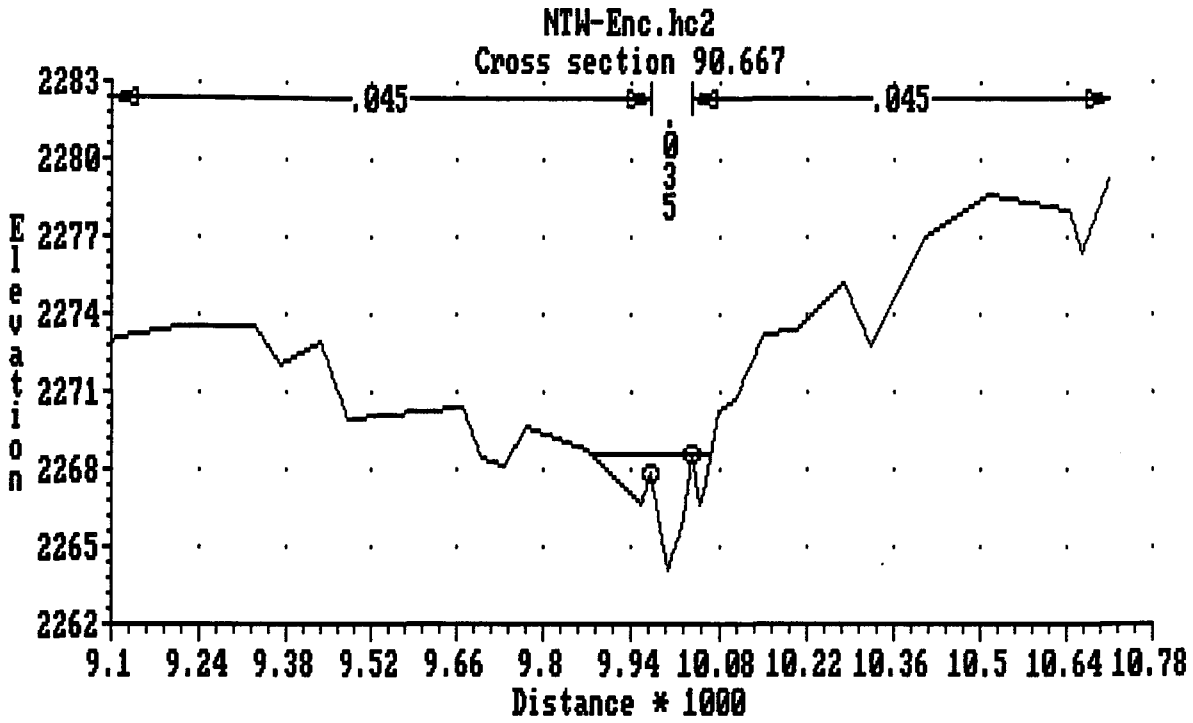

NTW-Enc.hc2
Cross section 90.215
.085
.025
0.31
Elevation
2252
2250
2248
2246
2244
2242
2240
2238
9.36
9.49
9.62
9.75
9.88
10.01
10.14
10.27
10.4
10.53
10.66
10.79
10.92
Distance * 1000

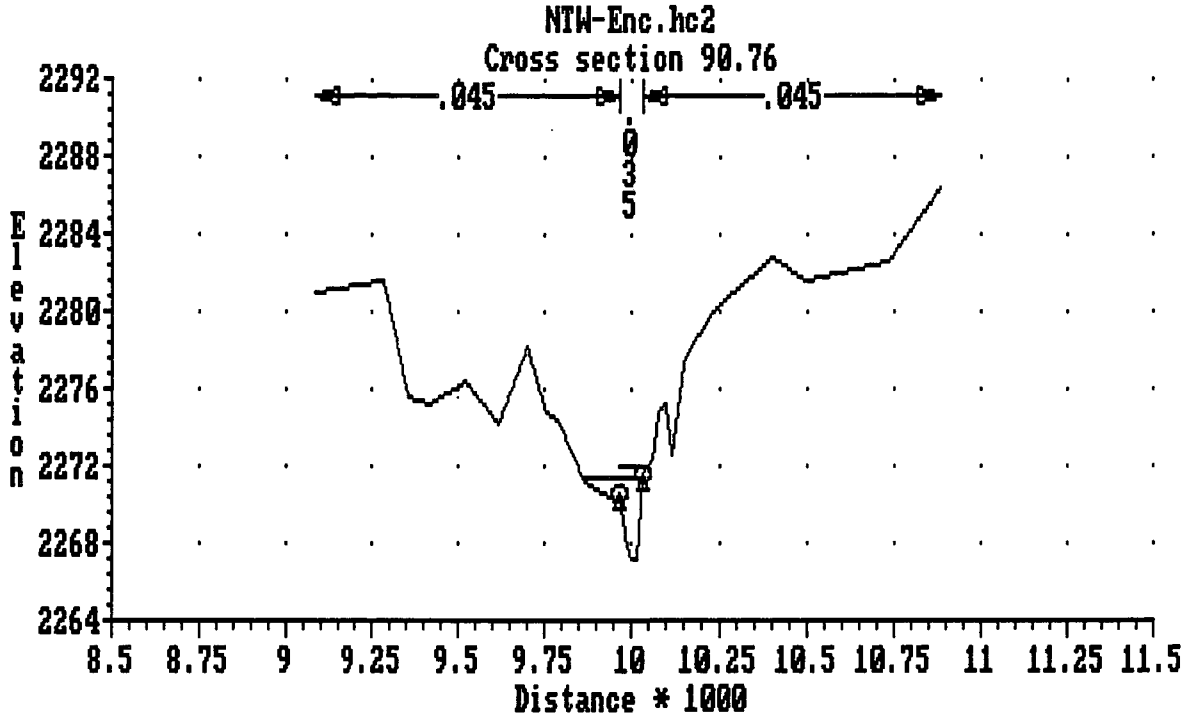

NTW-Enc.hc2
Cross section 90.284
.085
.033
.025
2258
2256
2254
2252
2250
2248
2246
2244
Elevation
9.12
9.31
9.5
9.69
9.88
10.07
10.26
10.45
10.64
10.83
11.02
11.21
11.4
Distance * 1000

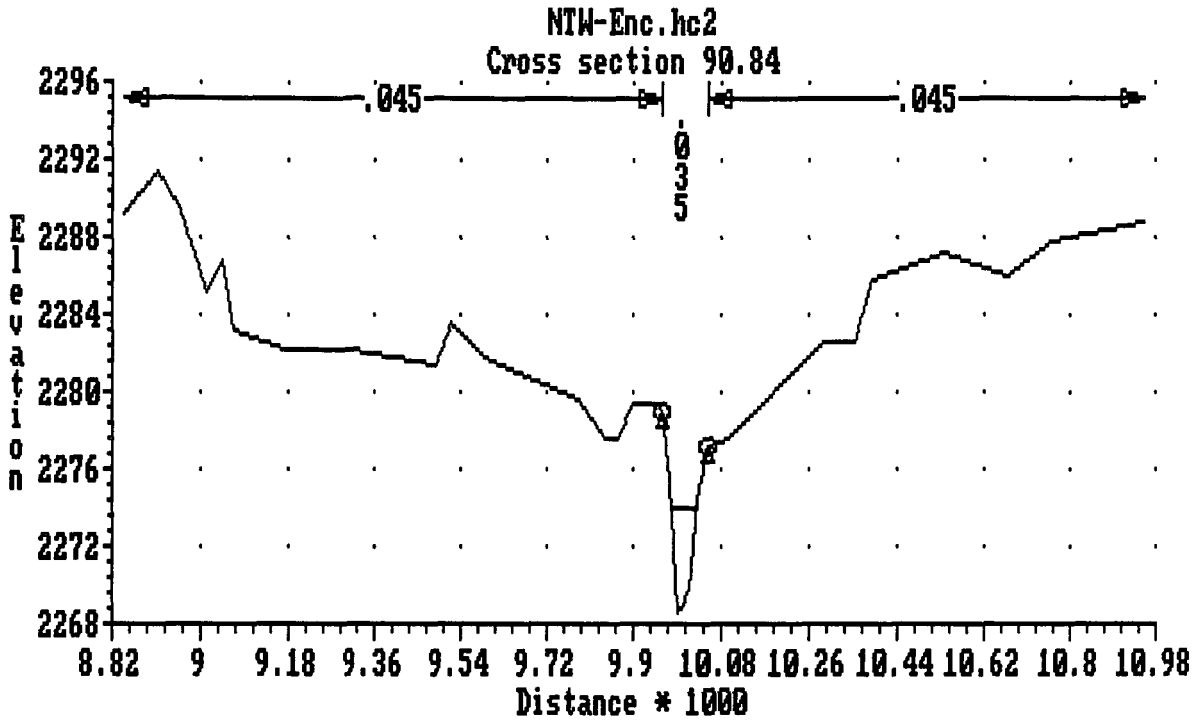

NTW-Enc.hc2
Cross section 90.381
.058
.058
.051
Elevation
2264
2262
2260
2258
2256
2254
2252
2250
9.28
9.36
9.44
9.52
9.6
9.68
9.76
9.84
9.92
10
10.08
10.16
10.24
Distance * 1000

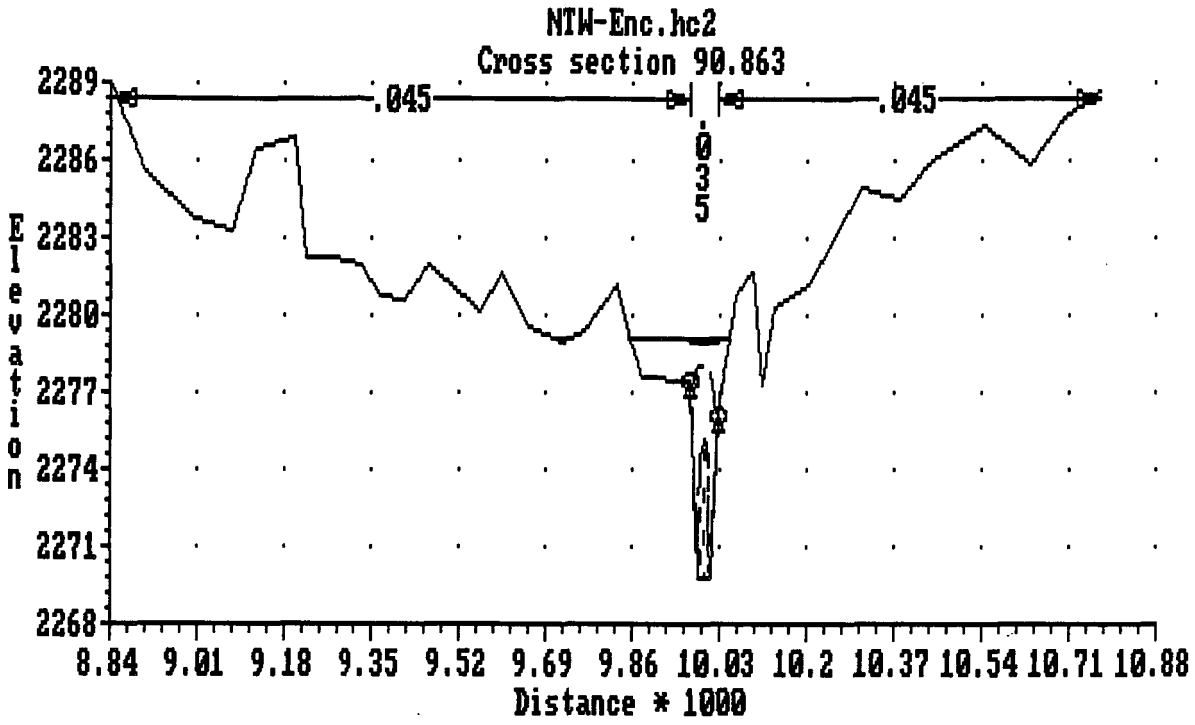

NTW-Enc.hc2
Cross section 90.476
.045
.045
040
Elevation
2270
2268
2266
2264
2262
2260
2258
2256
8.8
9
9.2
9.4
9.6
9.8
10
10.2
10.4
10.6
10.8
11
11.2
Distance * 1000

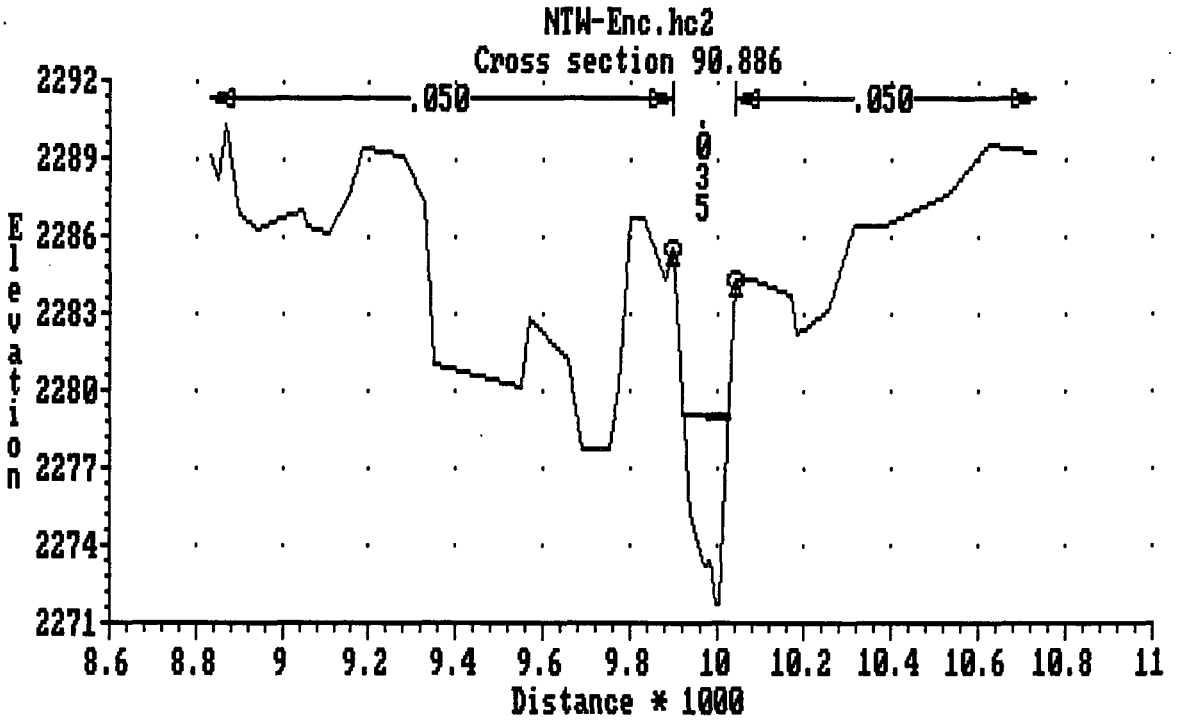

NTW-Enc.hc2
Cross section 90.57
.045
.040
.045
Elevation
2274
2272
2270
2268
2266
2264
2262
2260
9.35
9.46
9.57
9.68
9.79
9.9
10.01
10.12
10.23
10.34
10.45
10.56
10.67
Distance * 1000

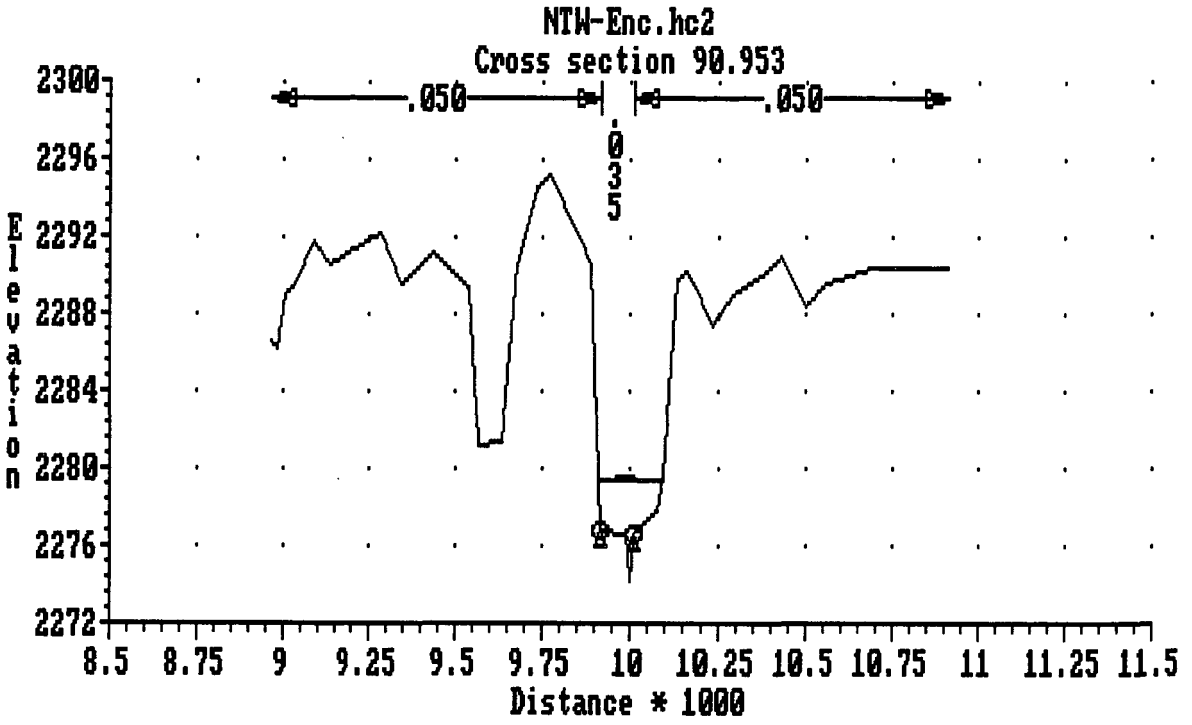

NTW-Enc.hc2
Cross section 90.667
.045
.045
0.53
Elevation
2283
2280
2277
2274
2271
2268
2265
2262
9.1
9.24
9.38
9.52
9.66
9.8
9.94
10.08
10.22
10.36
10.5
10.64
10.78
Distance * 1000

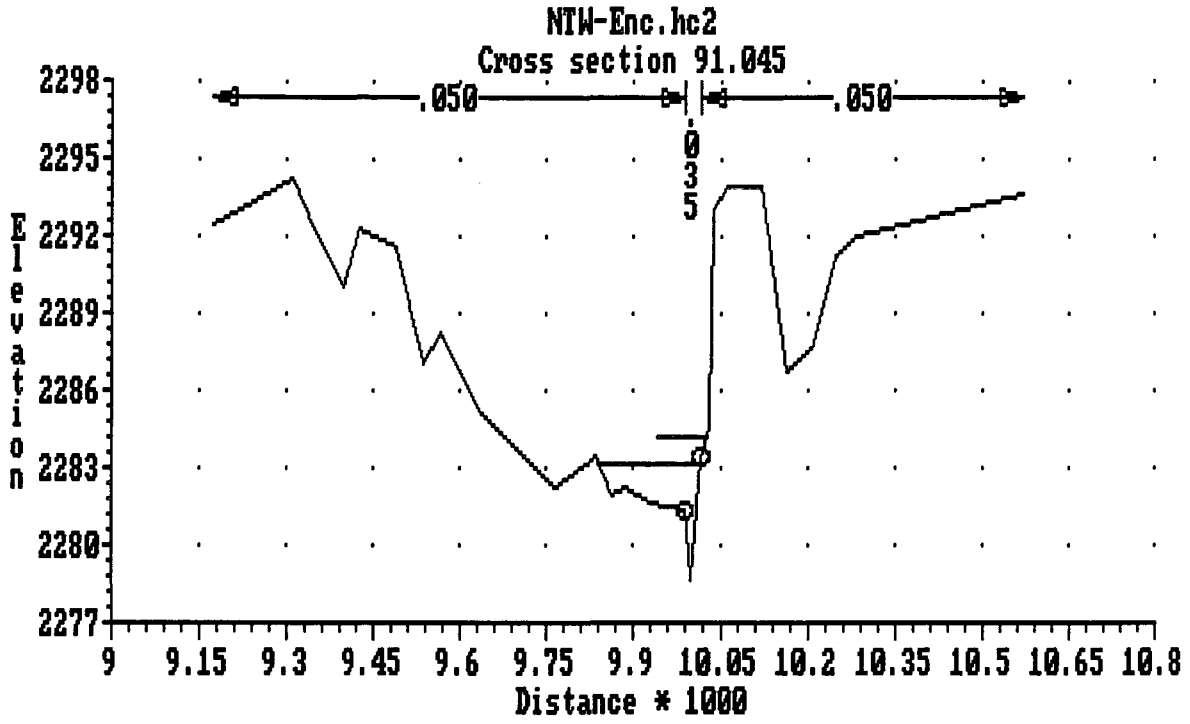

NTW-Enc.hc2
Cross section 90.76
.045
.045
.035
Elevation
2292
2288
2284
2280
2276
2272
2268
2264
8.5
8.75
9
9.25
9.5
9.75
10
10.25
10.5
10.75
11
11.25
11.5
Distance * 1000

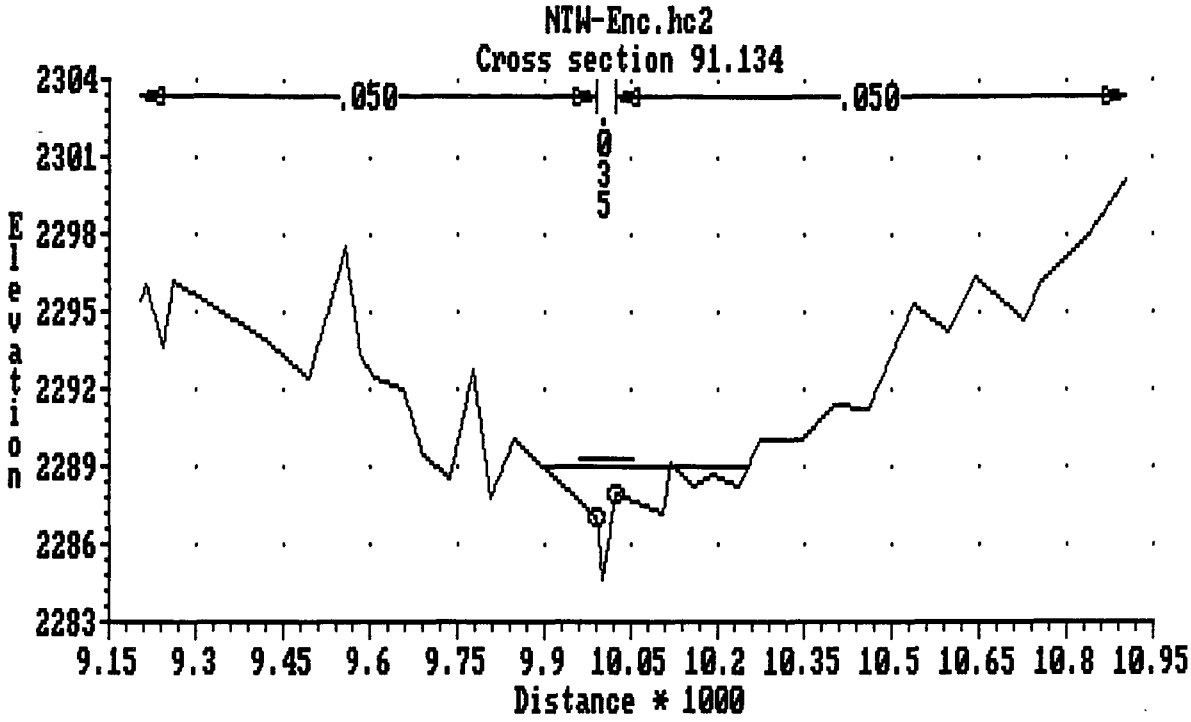

NTW-Enc.hc2
Cross section 90.84
.045
.045
0.538
Elevation
2296
2292
2288
2284
2280
2276
2272
2268
8.82
9
9.18
9.36
9.54
9.72
9.9
10.08
10.26
10.44
10.62
10.8
10.98
Distance * 1000

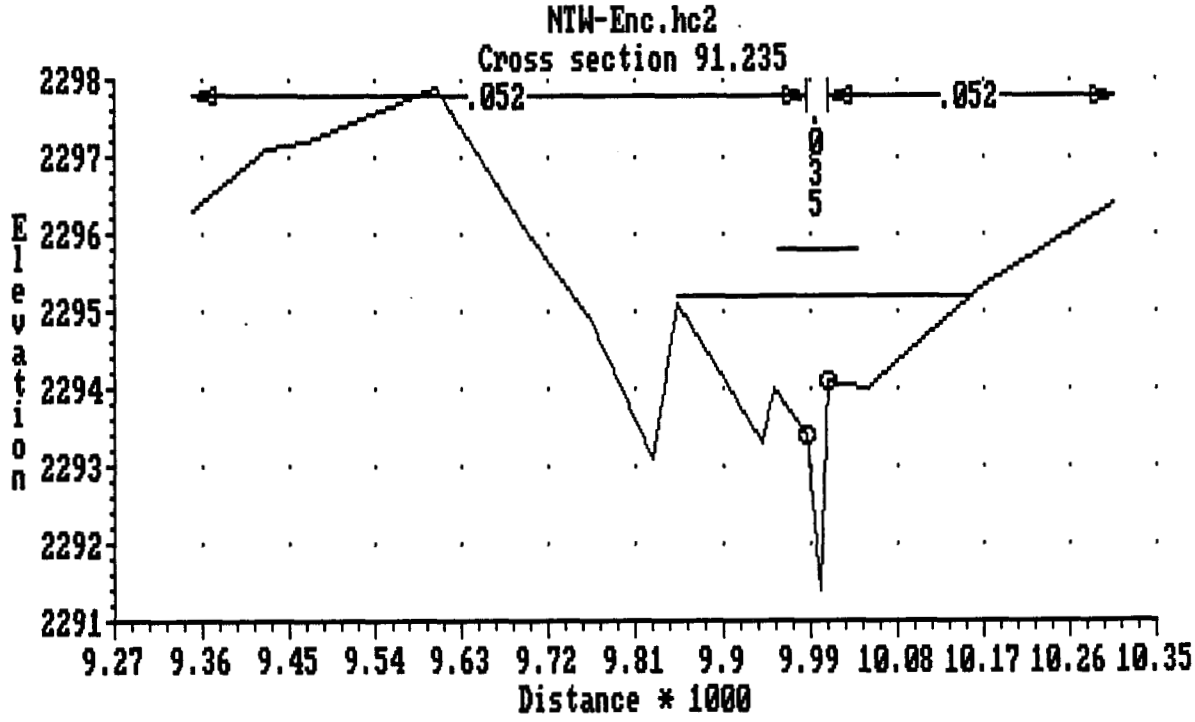

NTW-Enc.hc2
Cross section 90.863
.045
.035
.045
Elevation
2289
2286
2283
2280
2277
2274
2271
2268
8.84 9.01 9.18 9.35 9.52 9.69 9.86 10.03 10.2 10.37 10.54 10.71 10.88
Distance * 1000

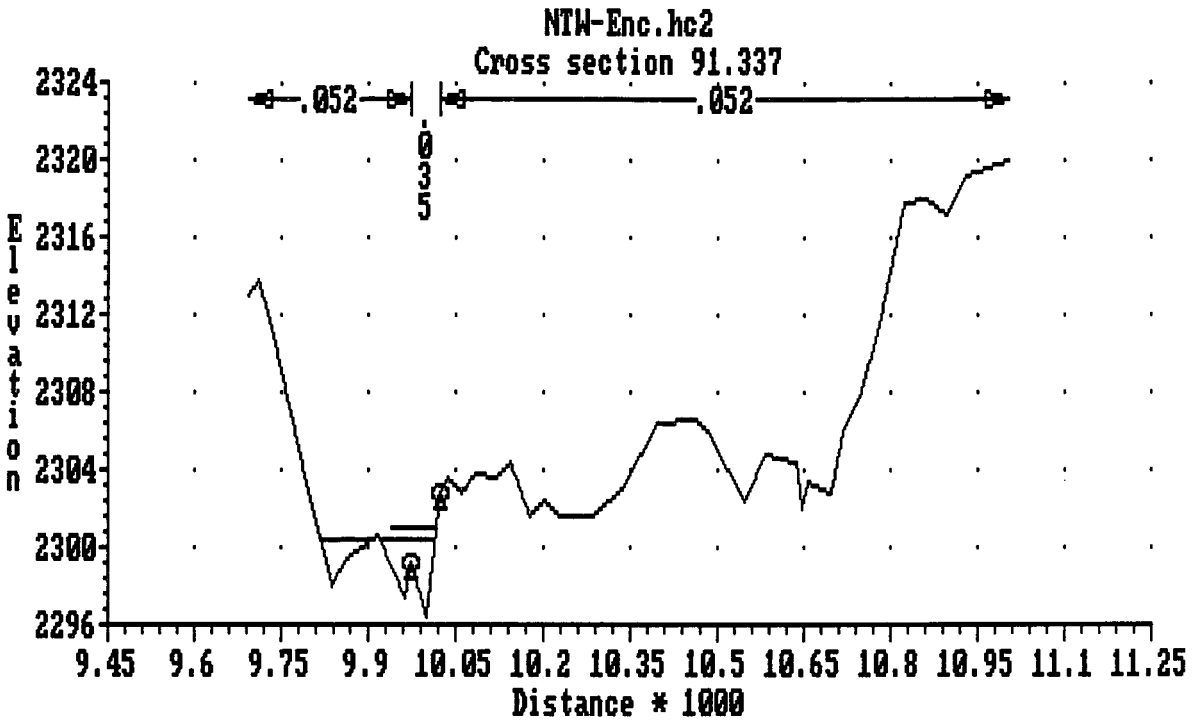

NTW-Enc.hc2
Cross section 90.886
.050
.035
.050
Elevation
2292
2289
2286
2283
2280
2277
2274
2271
8.6
8.8
9
9.2
9.4
9.6
9.8
10
10.2
10.4
10.6
10.8
11
Distance * 1000

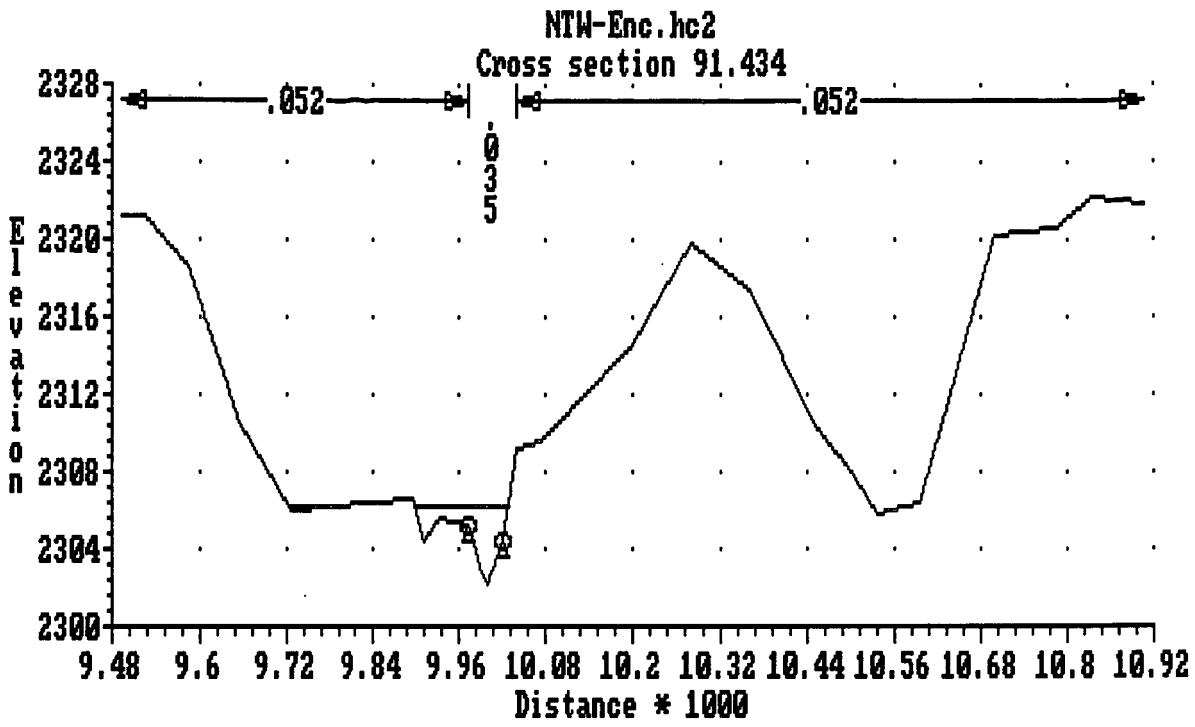

NTW-Enc.hc2
Cross section 90.953
.050
.050
.035
2300
2296
2292
2288
2284
2280
2276
2272
Elevation
8.5
8.75
9
9.25
9.5
9.75
10
10.25
10.5
10.75
11
11.25
11.5
Distance * 1000

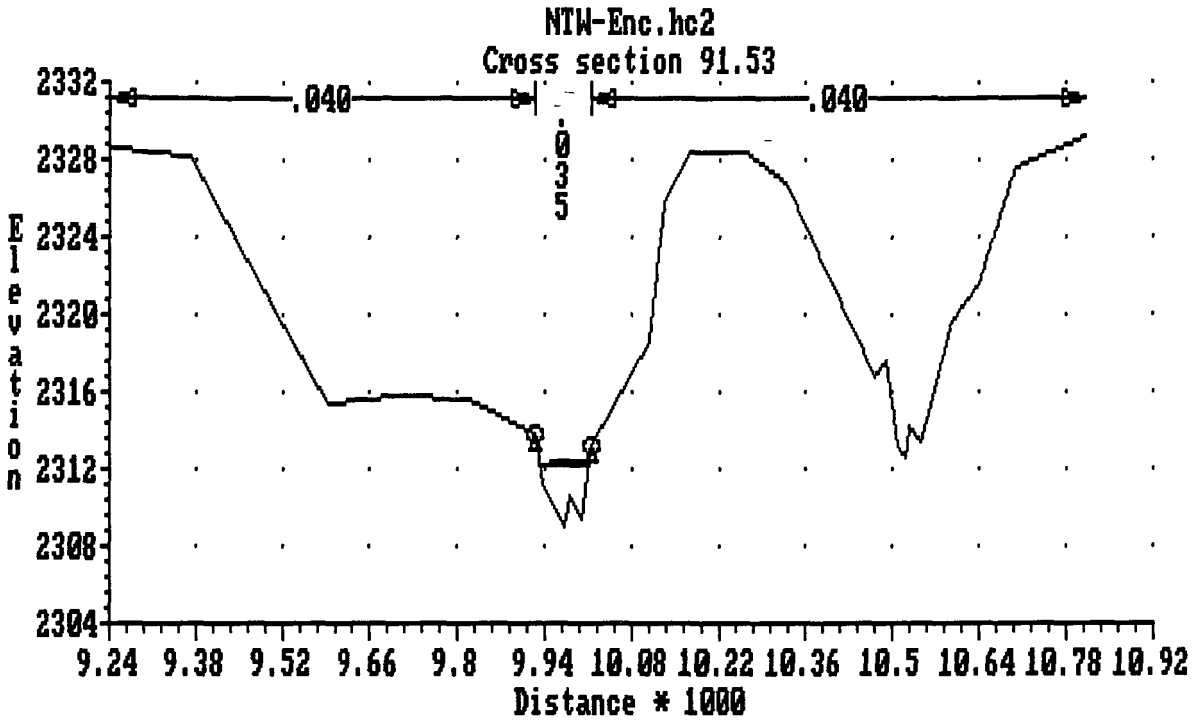

NTW-Enc.hc2
Cross section 91.045
.050
.050
.035
Elevation
2298
2295
2292
2289
2286
2283
2280
2277
9
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
Distance * 1000

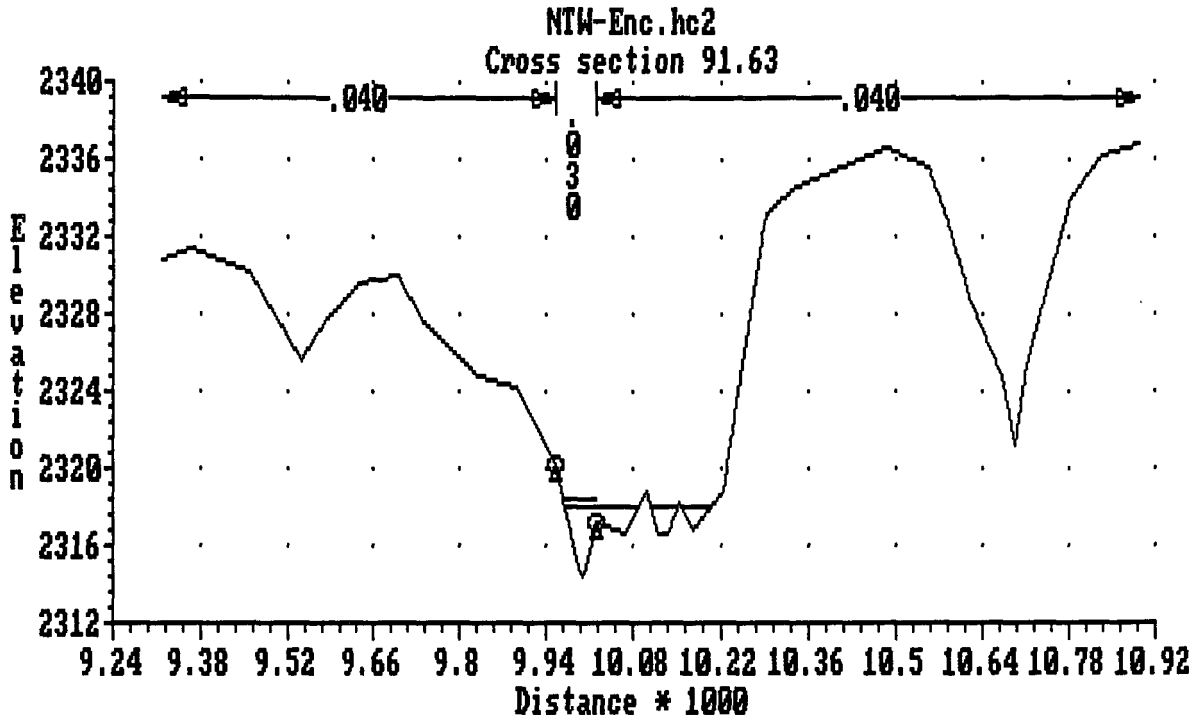

NTW-Enc.hc2
Cross section 91.134
.050
.035
.050
Elevation
2304
2301
2298
2295
2292
2289
2286
2283
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
10.95
Distance * 1000

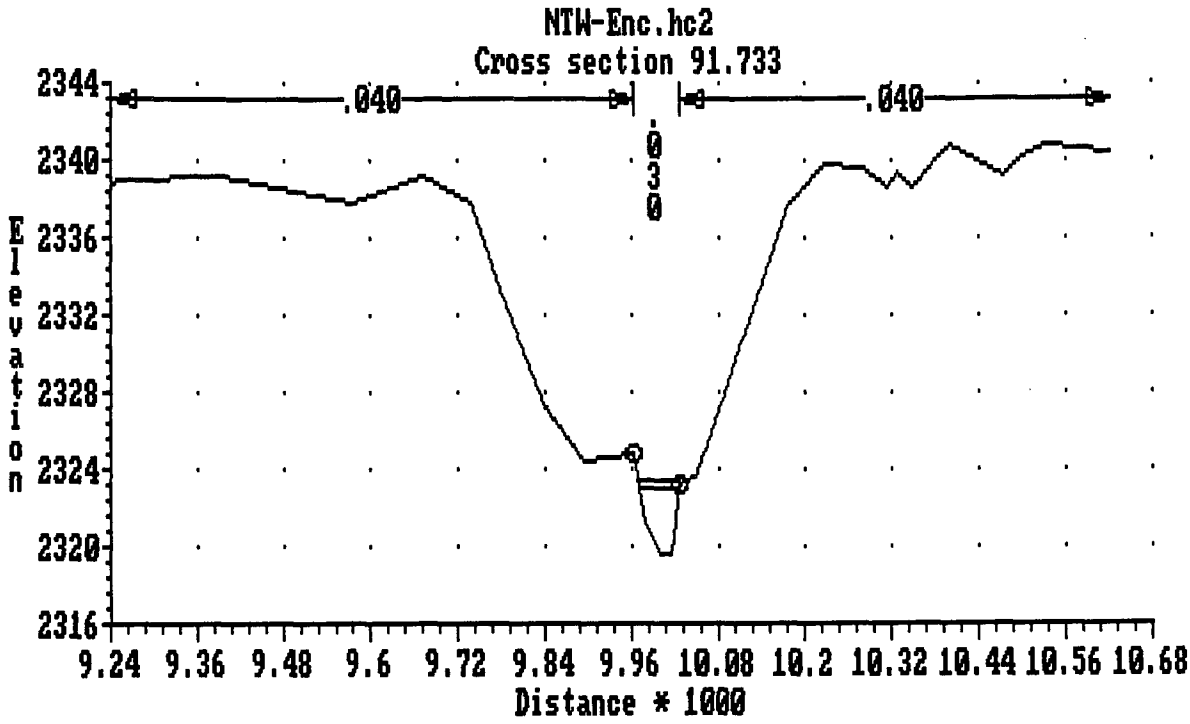

NTW-Enc.hc2
Cross section 91.235
.052
.052
Elevation
2298
2297
2296
2295
2294
2293
2292
2291
9.27
9.36
9.45
9.54
9.63
9.72
9.81
9.9
9.99
10.08
10.17
10.26
10.35
Distance * 1000

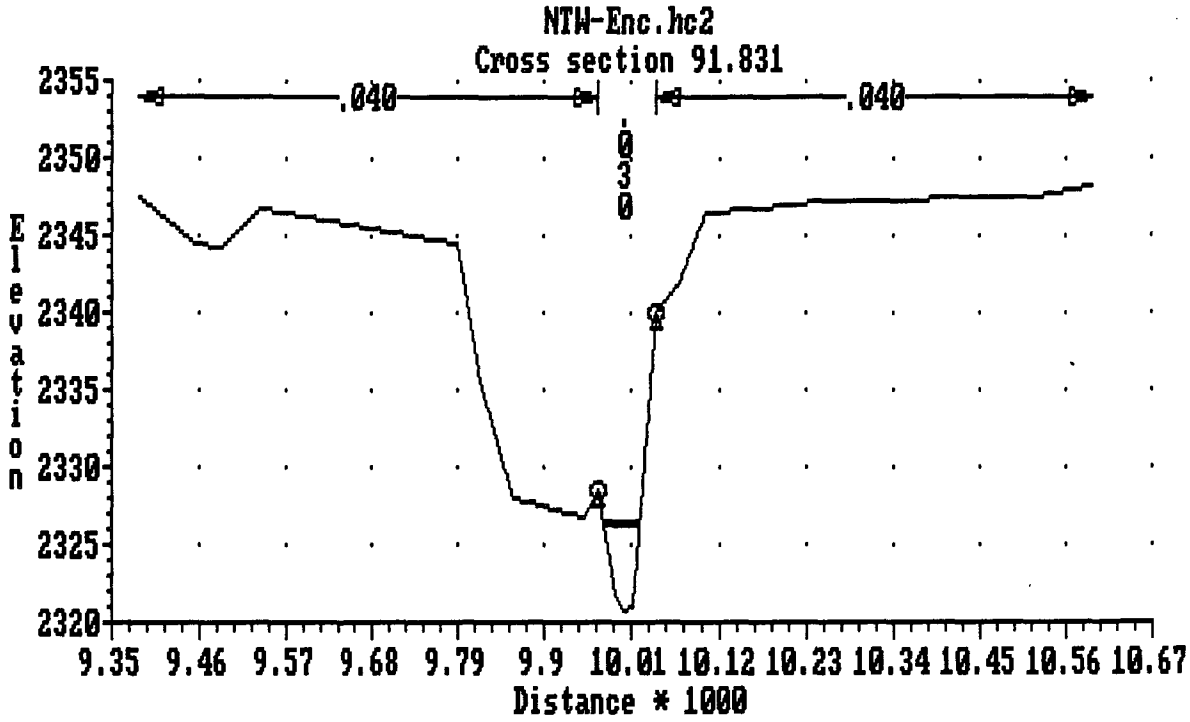

NTW-Enc.hc2
Cross section 91.337
.052
.052
.035
Elevation
2324
2320
2316
2312
2308
2304
2300
2296
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
10.95
11.1
11.25
Distance * 1000

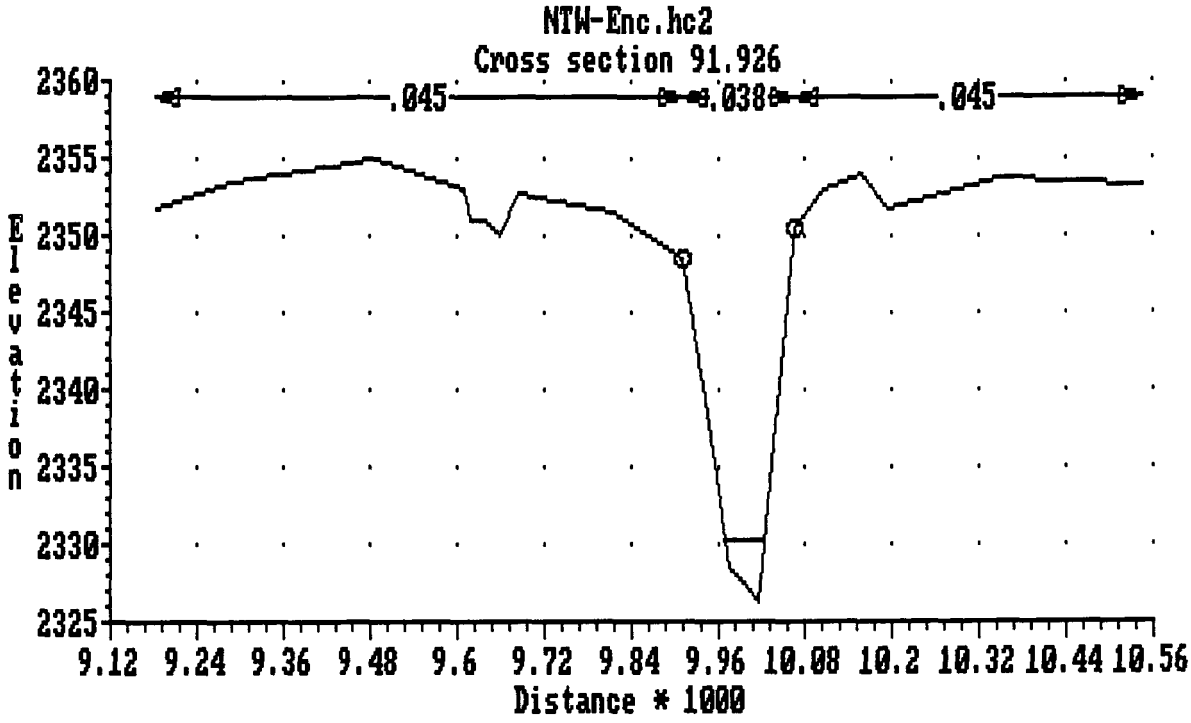

NTW-Enc.hc2
Cross section 91.434
.052
.035
.052
Elevation
2328
2324
2320
2316
2312
2308
2304
2300
9.48
9.6
9.72
9.84
9.96
10.08
10.2
10.32
10.44
10.56
10.68
10.8
10.92
Distance * 1000

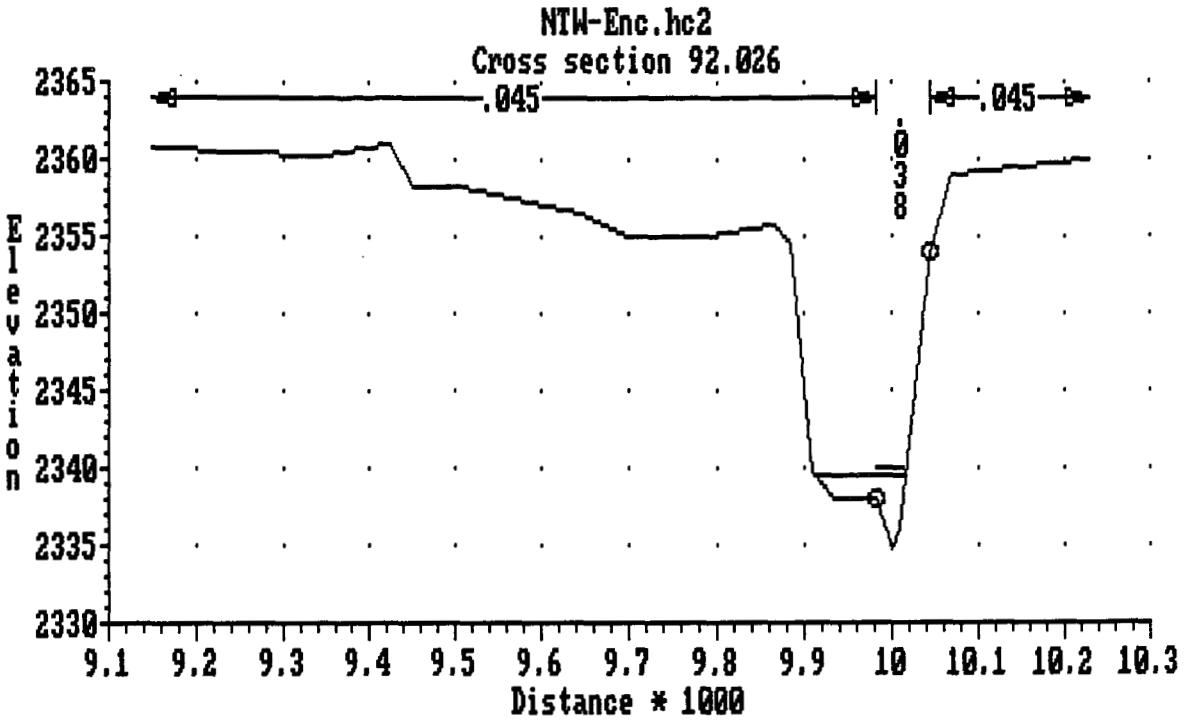

NTW-Enc.hc2
Cross section 91.53
.040
.040
0.035
Elevation
2332
2328
2324
2320
2316
2312
2308
2304
9.24
9.38
9.52
9.66
9.8
9.94
10.08
10.22
10.36
10.5
10.64
10.78
10.92
Distance * 1000

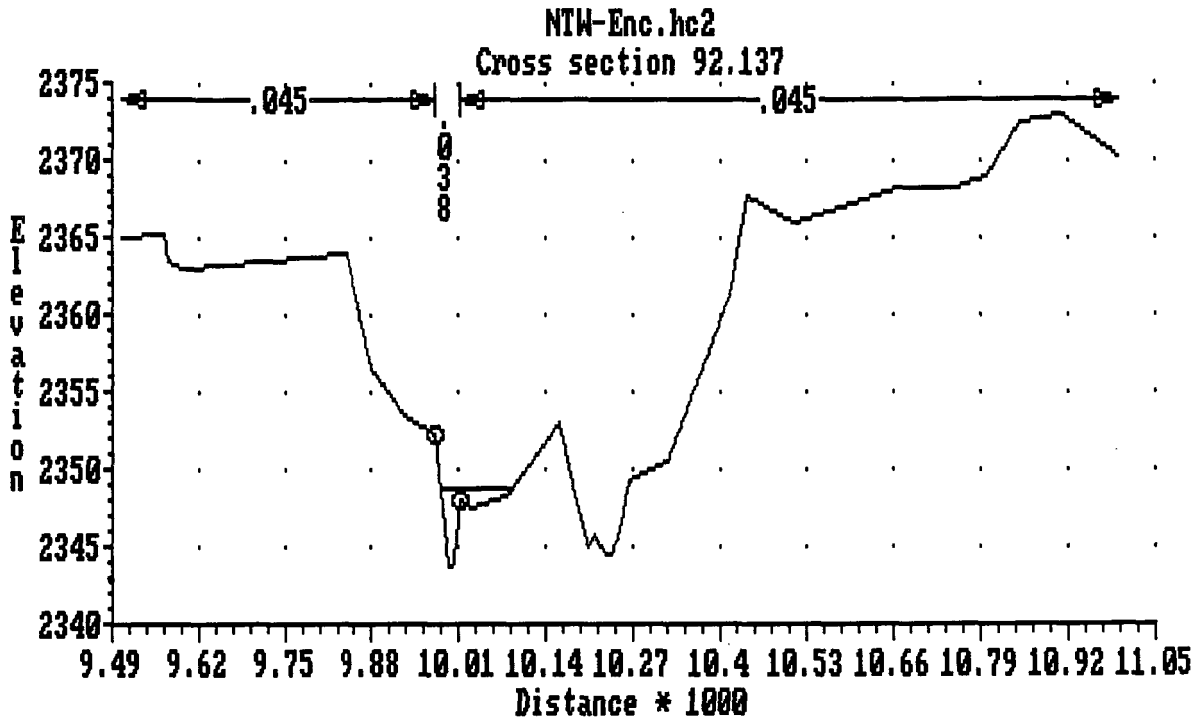

NTW-Enc.hc2
Cross section 91.63
.040
.040
.030
Elevation
2340
2336
2332
2328
2324
2320
2316
2312
9.24
9.38
9.52
9.66
9.8
9.94
10.08
10.22
10.36
10.5
10.64
10.78
10.92
Distance * 1000

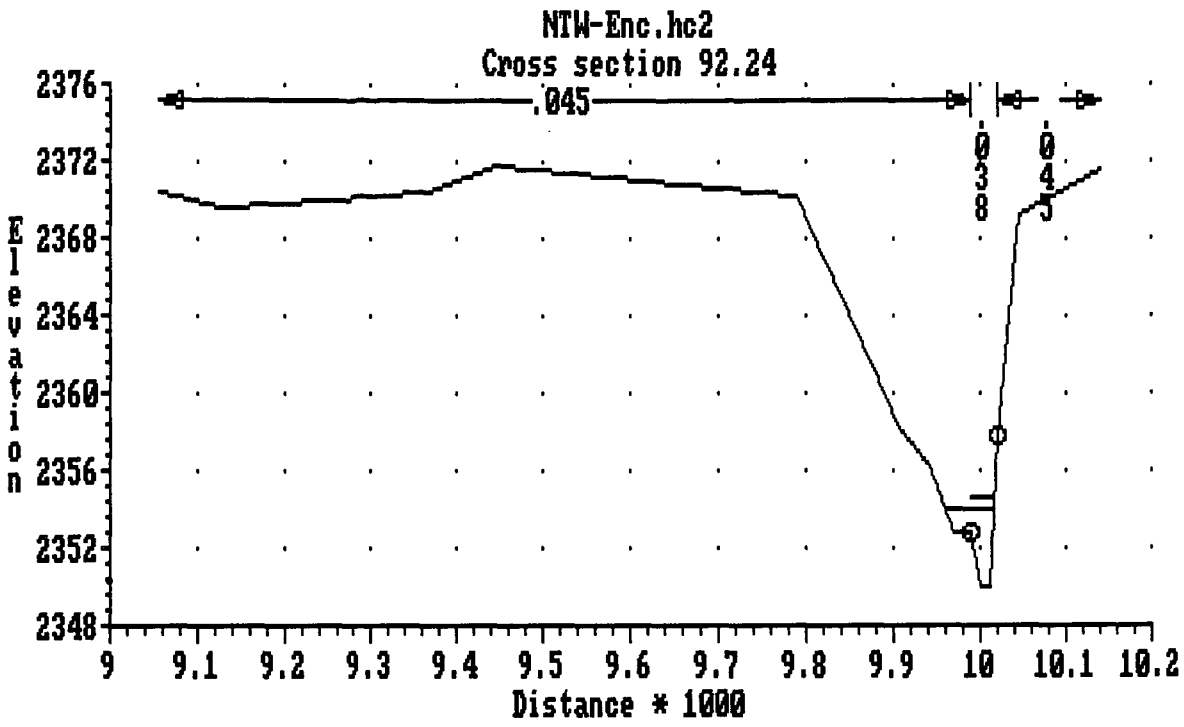

NTW-Enc.hc2
Cross section 91.733
.040
.040
.030
2344
2340
2336
2332
2328
2324
2320
2316
Elevation
9.24
9.36
9.48
9.6
9.72
9.84
9.96
10.08
10.2
10.32
10.44
10.56
10.68
Distance * 1000

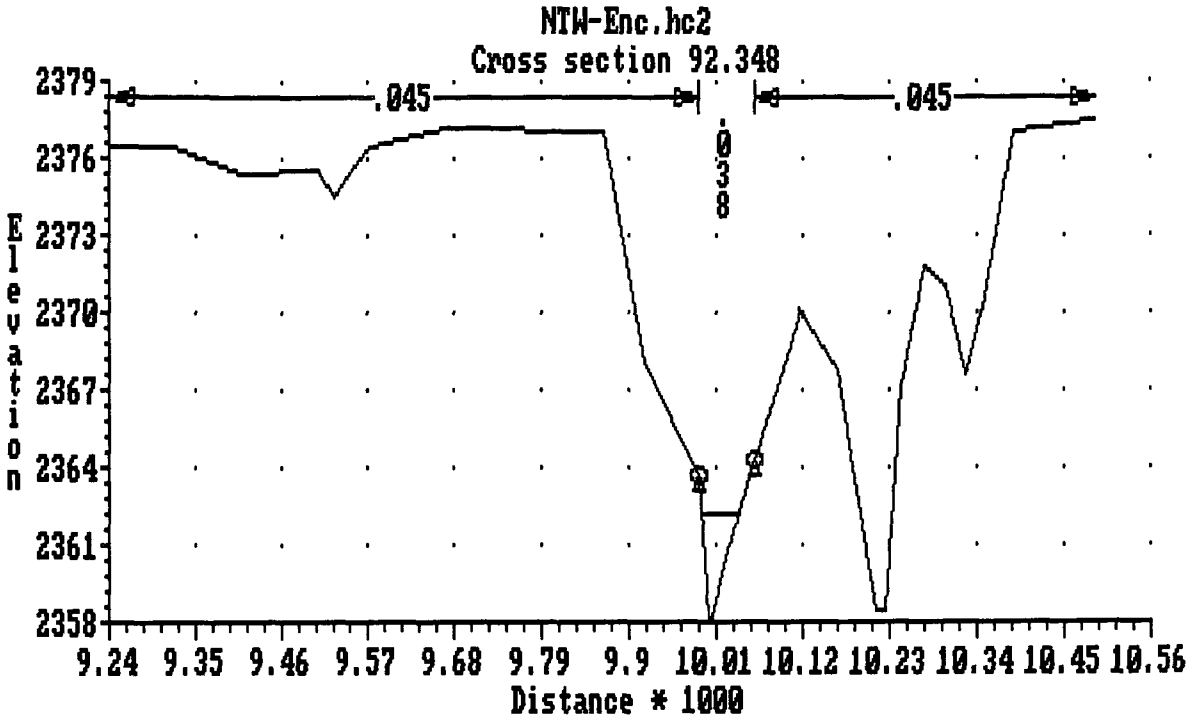

NTW-Enc.hc2
Cross section 91.831
.040
.040
.030
2355
2350
2345
2340
2335
2330
2325
2320
Elevation
9.35 9.46 9.57 9.68 9.79 9.9 10.01 10.12 10.23 10.34 10.45 10.56 10.67
Distance * 1000

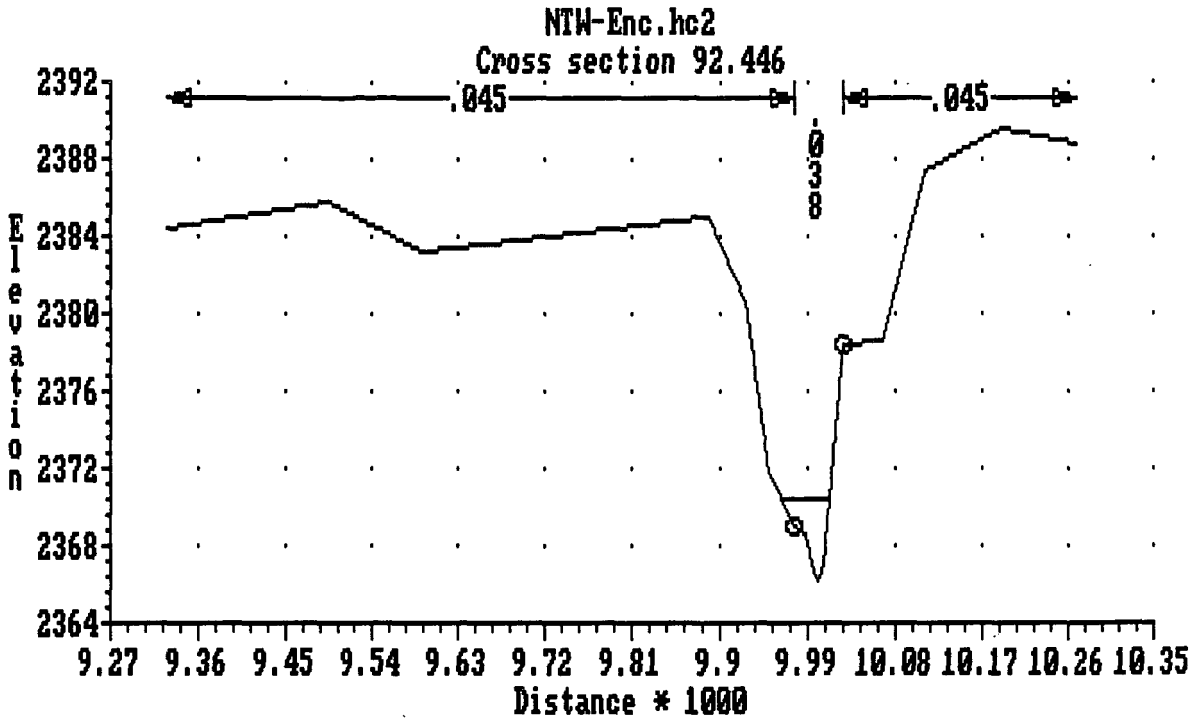

NTW-Enc.hc2
Cross section 91.926
.045
.038
.045
2360
2355
2350
2345
2340
2335
2330
2325
Elevation
9.12
9.24
9.36
9.48
9.6
9.72
9.84
9.96
10.08
10.2
10.32
10.44
10.56
Distance * 1000

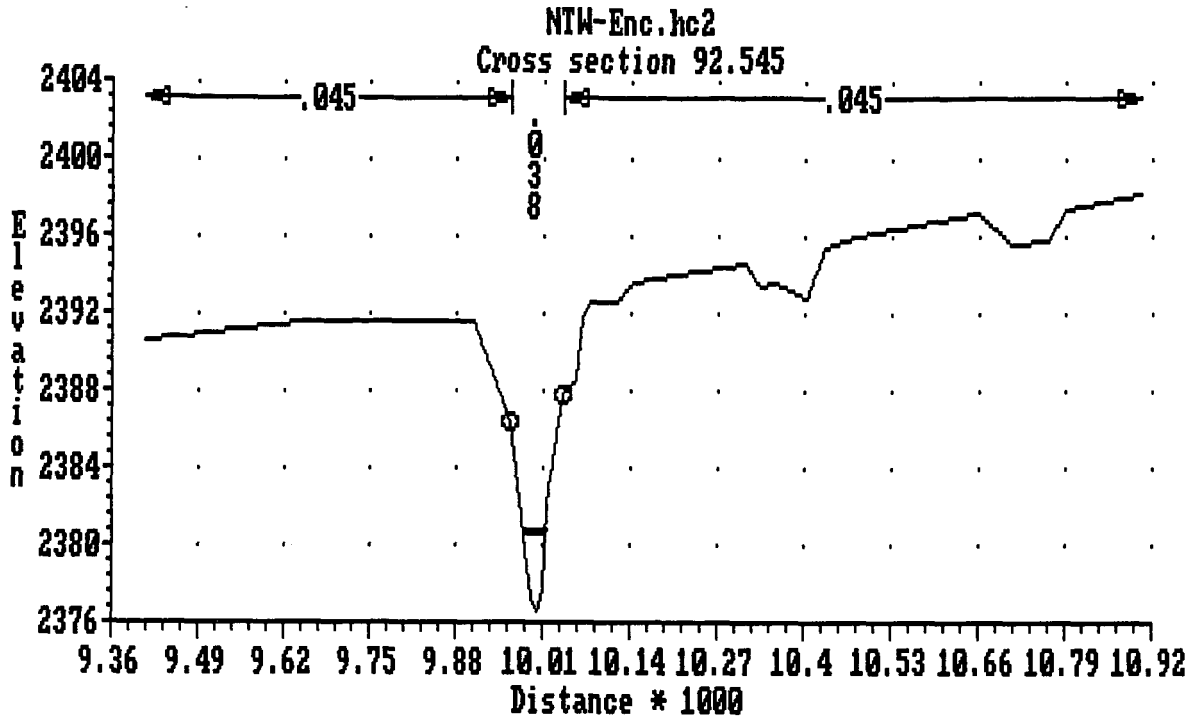

NTW-Enc.hc2
Cross section 92.026
.045
.045
.038
Elevation
2365
2360
2355
2350
2345
2340
2335
2330
9.1
9.2
9.3
9.4
9.5
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
Distance * 1000


NTW-Enc.hc2
Cross section 92.137
.045
.038
.045
Elevation
2375
2370
2365
2360
2355
2350
2345
2340
9.49
9.62
9.75
9.88
10.01
10.14
10.27
10.4
10.53
10.66
10.79
10.92
11.05
Distance * 1000


NTW-Enc.hc2
Cross section 92.24
.045
.038
.045
Elevation
2376
2372
2368
2364
2360
2356
2352
2348
9
9.1
9.2
9.3
9.4
9.5
9.6
9.7
9.8
9.9
10
10.1
10.2
Distance * 1000


NTW-Enc.hc2
Cross section 92.348
.045
.038
.045
Elevation
2379
2376
2373
2370
2367
2364
2361
2358
9.24 9.35 9.46 9.57 9.68 9.79 9.9 10.01 10.12 10.23 10.34 10.45 10.56
Distance * 1000


NTW-Enc.hc2
Cross section 92.446
.045
.038
.045
Elevation
2392
2388
2384
2380
2376
2372
2368
2364
9.27
9.36
9.45
9.54
9.63
9.72
9.81
9.9
9.99
10.08
10.17
10.26
10.35
Distance * 1000


NTW-Enc.hc2
Cross section 92.545
.045
.045
.038
Elevation
2404
2400
2396
2392
2388
2384
2380
2376
9.36
9.49
9.62
9.75
9.88
10.01
10.14
10.27
10.4
10.53
10.66
10.79
10.92
Distance * 1000

STW-ENC.hc2

- South Branch upstream of Confluence with Central Branch
- Floodway Encroachments

.C2 S/N: 1916530014 HMVersion: 6.50 Data File: stw-enc.hc2

```
**********************************************
*     WATER SURFACE PROFILES                 *
*                                            *
*  Version   4.6.2;  May 1991                *
*                                            *
*  RUN DATE    14JAN93    TIME    19:50:32   *
**********************************************
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**********************************************
*  U.S. ARMY CORPS OF ENGINEERS              *
*  HYDROLOGIC ENGINEERING CENTER             *
*  609 SECOND STREET, SUITE D                *
*  DAVIS, CALIFORNIA 95616-4687              *
*          (916) 756-1104                    *
**********************************************
```


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

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

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============================
H A E S T A D   M E T H O D S
============================
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37 Brookside Road • Waterbury, Connecticut 06708 * (203) 755-1666

THIS RUN EXECUTED 14JAN93 19:50:33

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

TROPICANA WASH FLOOD INSURANCE STUDY

by CH2M Hill, 1992 RDD33832

Notes:
-discharges were based on those in the "Las Vegas Valley Flood Insurance Study Hydrology Report" by James M. Montgomery, Inc., September, 1991 (see CH2M Hill memo dated July 13, 1992)

-Manning's "n" values were estimated by field observations of channels and floodplains in conjunction with methods recommended in "Open Channel Hydraulics" by Chow, 1959

-stations and elevations obtained from 400 scale topo created by CH2M Hill from aerial photographs

T1 FCD TROPICANA WASH F.I.S.; RDD33832
T2 South Tropicana Wash, Detailed Methods
T3 STW-Enc.hc2 South Trop. Wash FLOODWAY CALCULATIONS

The following channel slope and starting water surface elevation comes from the Central Tropicana Wash run, section 64.56, which is where this run is tributary.

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			0.01794	0	0		2273.61	0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1	0	0	0	0	0	0	15

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	1	43	8	55	26	56	13	14	15
4	53	54							
38	1	43	39	4	53	27	21	22	28
54									

[redacted] 200

T. section is at the confluence of the South and Central TW's

NC	.048	.048	.032	.1	.3					
QT	4	3300	3300	3300	3300					
ET			6.1			9846	10159			
X1	64.56	17	9979.0	10026.4	0	0	0			
X3	10									
GR	2277.4	9845.8	2274.3	9878.4	2274.2	9927.9	2274.2	9928.0	2276.0	9964.3
GR	2274.9	9979.0	2265.3	10000.0	2267.5	10015.9	2271.9	10026.4	2271.0	10078.4
GR	2273.1	10156.8	2276.0	10172.8	2277.6	10247.9	2274.6	10268.2	2275.3	10291.3
GR	2275.3	10424.8	2278.8	10588.5						

This section above the confluence with the Central TW

QT	4	1800	1800	1800	1800					
ET			6.1			9947	10042			
X1	30.093	13	9961.1	10041.7	480	500	490			
GR	2280.7	9787.9	2281.5	9796.8	2273.9	9859.9	2279.0	9887.4	2270.1	9934.5
GR	2268.5	9961.1	2268.1	10000.0	2268.5	10041.7	2268.0	10053.1	2275.5	10070.2
GR	2276.5	10184.7	2280.5	10251.0	2282.3	10362.1				
NC	.06	.06	.038							

West Russell Road

E[redacted]			6.1			9982	10050			
X1	191	25	9982.8	10049.5	520	480	520			
GR	2288.8	9671.4	2288.0	9684.6	2289.5	9713.8	2289.1	9731.4	2285.6	9768.2
GR	2286.4	9838.3	2277.8	9852.8	2276.5	9866.1	2276.6	9892.3	2275.8	9956.4
GR	2276.5	9982.8	2275.1	9993.4	2274.7	10000.0	2274.7	10006.3	2275.8	10017.5
GR	2276.3	10029.8	2278.1	10049.5	2277.1	10065.4	2278.6	10088.1	2283.2	10117.9
GR	2283.8	10211.4	2288.2	10267.0	2289.4	10285.7	2290.1	10353.2	2288.9	10409.8
NC	.045	.045	.035							
ET			6.1			9987	10046			
X1	30.292	27	9987.9	10018.4	500	510	530			
GR	2286.2	9802.0	2286.5	9814.7	2286.1	9870.3	2292.1	9894.3	2293.5	9908.6
GR	2288.4	9954.7	2283.3	9960.8	2283.7	9987.9	2282.1	10000.0	2284.0	10018.4
GR	2283.3	10032.9	2283.5	10045.7	2284.4	10055.6	2285.2	10074.2	2284.4	10128.1
GR	2284.0	10164.5	2285.9	10189.0	2286.1	10274.1	2290.5	10299.9	2289.2	10330.2
GR	2292.9	10370.8	2292.6	10385.9	2289.3	10412.6	2290.7	10420.9	2288.1	10451.1
GR	2293.4	10473.7	2293.2	10542.7						
ET			6.1			9978	10030			
X1	30.393	22	9978.7	10045.6	530	535	535			
GR	2298.6	9654.1	2296.5	9673.7	2296.9	9685.4	2299.1	9705.9	2294.1	9733.2
GR	2295.8	9811.8	2294.6	9856.7	2295.7	9898.7	2294.0	9921.7	2292.0	9958.5
GR	2292.0	9978.7	2289.7	9987.3	2289.5	10000.0	2289.7	10018.1	2299.2	10045.6
GR	2300.2	10087.1	2301.2	10125.1	2300.0	10232.2	2301.0	10268.1	2299.9	10299.4
GR	2300.9	10328.0	2299.8	10363.0						

[redacted]

ET			6.1			9962	10046			
X1	30.486	31	9953.1	10045.1	480	500	490			
GR	2303.1	9346.2	2302.0	9413.0	2302.4	9499.5	2300.5	9618.9	2299.6	9630.4
GR	2299.6	9677.4	2302.1	9690.1	2304.5	9715.6	2304.5	9778.3	2303.3	9795.2
GR	2305.1	9826.2	2304.9	9898.5	2300.5	9927.6	2301.2	9953.1	2296.5	9981.4
GR	2295.5	10000.0	2296.3	10021.7	2297.7	10027.8	2298.4	10045.1	2297.7	10063.2
GR	2299.6	10073.8	2300.8	10099.5	2305.8	10132.4	2305.6	10183.9	2305.8	10210.2
GR	2306.7	10373.0	2305.6	10408.3	2305.6	10433.4	2307.1	10457.9	2305.8	10525.2
GR	2307.2	10664.2								
NC	.043	.043	.033							
ET		4.1	6.1	9880.0	10090.6	9960.0	10064.3			
X1	30.584	28	9978.2	10044.3	530	510	520			
GR	2312.4	9333.2	2311.8	9360.8	2308.7	9412.4	2310.8	9429.2	2312.3	9474.6
GR	2312.2	9528.2	2310.7	9544.2	2312.4	9600.5	2313.1	9695.5	2309.8	9719.3
GR	2310.8	9752.0	2310.4	9784.0	2311.9	9798.4	2312.6	9814.1	2313.0	9880.0
GR	2312.2	9927.2	2309.7	9953.1	2309.2	9978.2	2306.6	10000.0	2306.3	10014.1
GR	2312.7	10044.3	2313.5	10090.6	2313.5	10124.1	2313.2	10198.2	2310.0	10270.6
GR	2312.7	10281.8	2313.6	10490.5	2313.8	10710.9				
ET			6.1			9981.3	10070			
X1	30.676	27	9976.6	10016.7	460	505	485			
GR	2318.0	9383.0	2317.2	9539.4	2317.2	9574.3	2318.0	9594.2	2319.2	9680.2
GR	2318.9	9763.0	2318.4	9829.6	2318.9	9922.6	2318.7	9964.1	2318.3	9976.6
GR	13.5	9991.5	2313.0	10000.0	2313.3	10008.9	2315.7	10016.7	2316.4	10046.2
GR	5.1	10070.9	2313.6	10109.8	2318.5	10125.1	2319.1	10206.0	2318.2	10234.1
GR	2319.2	10267.3	2319.4	10329.3	2317.0	10354.5	2319.4	10404.3	2318.9	10487.7
GR	2320.3	10580.3	2319.2	10690.4						
ET			6.1			9955	10040			
X1	30.779	24	9926.0	10071.8	490	555	545			
GR	2326.2	9588.7	2326.7	9591.8	2325.6	9655.4	2326.8	9697.6	2325.7	9753.4
GR	2325.9	9772.2	2327.4	9838.0	2327.0	9926.0	2323.7	9962.1	2320.7	9976.5
GR	2322.0	10000.0	2320.8	10023.3	2327.1	10053.3	2328.8	10071.8	2327.6	10130.5
GR	2327.4	10179.2	2326.2	10215.9	2327.9	10260.2	2327.6	10347.5	2328.1	10389.5
GR	2328.2	10497.3	2328.0	10546.0	2328.9	10597.3	2328.5	10676.3		
ET		4.1	6.1	9942.0	10540	9970.9	10054.1			
X1	30.872	22	9986.9	10024.1	505	470	490			
GR	2331.5	9372.1	2330.9	9568.9	2330.2	9667.9	2330.4	9790.7	2332.6	9839.9
GR	2329.7	9850.8	2329.6	9920.8	2332.0	9941.0	2327.2	9967.7	2328.4	9974.6
GR	2328.6	9986.9	2326.0	10000.0	2328.0	10024.1	2327.8	10056.0	2329.3	10067.4
GR	2332.9	10142.7	2330.5	10176.3	2331.5	10200.4	2332.1	10277.8	2332.1	10420.1
GR	2330.8	10454.4	2332.9	10541.0						
ET			6.1			9975	10040			
X1	30.967	28	9969.6	10018.7	505	490	500			
X3	10									
GR	2336.6	9308.2	2337.6	9336.2	2337.6	9421.7	2336.7	9434.6	2336.7	9482.0
GR	338.1	9510.2	2337.8	9572.3	2336.7	9590.9	2337.6	9620.7	2339.2	9761.4
GR	7.9	9777.2	2338.1	9799.1	2337.8	9901.0	2335.0	9916.4	2337.6	9923.7
GR	338.1	9969.6	2334.2	9985.5	2333.7	10000.0	2334.0	10008.8	2335.4	10018.7
GR	2335.4	10044.6	2334.0	10083.1	2338.0	10105.2	2338.8	10148.1	2338.3	10230.2

GR	8.7	10274.8	2338.7	10360.5	2339.1	10434.5				
NC	.046	.046	.038							
ET		4.1	6.1	9071	10087	9950.0	10035.9			
X1	31.079	32	9970.0	10015.9	560	580	590			
GR	2344.7	9069.5	2345.0	9123.4	2345.3	9202.1	2345.7	9271.2	2345.2	9382.6
GR	2347.1	9412.3	2345.2	9440.6	2345.6	9571.8	2344.7	9662.1	2346.3	9671.2
GR	2347.4	9737.3	2343.5	9764.1	2343.1	9810.7	2343.9	9838.1	2343.0	9861.3
GR	2344.6	9929.5	2344.7	9970.0	2341.7	9989.6	2341.4	10000.0	2342.0	10009.0
GR	2342.8	10015.9	2342.8	10040.4	2343.2	10072.2	2346.0	10087.0	2345.9	10155.8
GR	2345.7	10366.0	2344.2	10422.4	2344.2	10463.4	2345.3	10478.6	2344.9	10594.2
GR	2344.3	10635.3	2344.9	10775.4						
ET			6.1			9975	10031			
X1	31.173	35	9972.8	10031.1	515	530	500			
X3	10									
GR	2351.6	9211.8	2351.7	9266.7	2353.4	9341.2	2352.7	9372.8	2352.8	9442.6
GR	2354.0	9600.9	2352.7	9680.6	2352.4	9758.5	2350.4	9800.8	2351.3	9813.4
GR	2350.7	9851.1	2352.1	9890.1	2351.6	9959.0	2351.4	9972.8	2347.5	9987.1
GR	2347.1	10000.0	2347.3	10016.4	2348.6	10031.1	2348.9	10053.5	2351.5	10072.9
GR	2350.4	10116.2	2351.7	10171.9	2351.0	10204.1	2352.3	10218.4	2353.0	10411.7
GR	2353.6	10537.4	2352.7	10596.9	2353.0	10688.3	2353.9	10732.1	2353.7	10838.1
GR	2352.5	10910.5	2352.4	10974.0	2351.5	11021.5	2352.2	11046.6	2352.1	11046.6
ET			6.1			9958	10018			
NC	.044	.044	.035							
X1	272	35	9946.7	10029.7	520	520	520			
X3	10									
GR	2357.7	9396.4	2356.9	9407.6	2357.3	9476.7	2357.5	9613.2	2357.6	9747.5
GR	2356.8	9768.6	2356.7	9880.6	2353.1	9905.8	2352.6	9915.8	2352.6	9929.7
GR	2357.6	9942.1	2357.7	9946.7	2351.0	9990.9	2350.0	10000.0	2350.4	10007.5
GR	2354.4	10012.3	2358.9	10029.7	2359.8	10282.9	2358.1	10315.2	2359.8	10340.3
GR	2359.3	10355.1	2360.6	10425.1	2359.5	10479.6	2360.2	10516.9	2360.1	10551.4
GR	2358.3	10583.9	2359.2	10595.8	2359.6	10622.6	2358.9	10638.1	2359.2	10651.4
GR	2358.4	10682.1	2359.9	10753.5	2360.0	10796.0	2360.4	10828.0	2359.9	10864.7
ET			6.1			9951	10020			
X1	31.368	27	9941.0	10030.6	495	520	510			
X3	10									
GR	2366.1	9831.5	2363.9	9906.7	2364.2	9941.0	2359.4	9957.6	2357.1	9971.1
GR	2359.4	9983.9	2357.0	10000.0	2358.9	10011.2	2364.3	10030.6	2366.1	10049.4
GR	2365.7	10083.0	2364.5	10116.9	2365.8	10137.9	2365.2	10215.8	2363.9	10244.7
GR	2364.9	10255.3	2365.0	10327.9	2364.1	10331.4	2365.8	10365.0	2364.7	10421.8
GR	2365.5	10447.5	2365.2	10556.5	2364.9	10574.8	2366.2	10583.3	2365.8	10617.3
GR	2366.5	10732.6	2366.3	10857.3						

South TW above Jones Blvd.

QT	4	1500	1500	1500	1500					
ET			6.1			9951	10024			
X1	31.465	25	9937.6	10029.9	500	520	510			
X3	10									
GR	3.4	9308.4	2374.0	9486.0	2372.7	9505.8	2374.1	9534.2	2374.4	9617.9
GR	2372.5	9669.9	2373.7	9752.2	2373.3	9836.1	2371.4	9879.9	2372.6	9937.6
GR	2368.4	9963.2	2367.4	10000.0	2367.7	10017.6	2372.6	10029.9	2372.5	10074.4

[redacted]	3.4	10091.2	2372.3	10127.7	2372.8	10165.6	2372.2	10197.9	2371.8	10219.5
GR	3.7	10240.8	2374.1	10343.6	2375.3	10580.8	2375.9	10644.7	2375.9	10691.0
ET			6.1			9978	10028			
X1	31.565	18	9970.7	10027.2	530	540	530			
GR	2380.9	9534.3	2381.1	9536.5	2379.5	9662.5	2380.3	9676.9	2380.4	9805.7
GR	2378.5	9840.6	2378.3	9891.1	2378.3	9970.7	2373.3	9985.2	2372.4	10000.0
GR	2372.4	10012.6	2374.6	10027.2	2374.5	10054.9	2373.7	10100.6	2377.8	10107.1
GR	2376.3	10122.2	2378.7	10145.7	2379.1	10221.4				
ET			6.1			9971	10037			
X1	31.664	26	9971.6	10036.2	520	518	520			
GR	2388.1	9456.9	2389.1	9479.5	2386.5	9527.8	2388.0	9541.6	2388.6	9580.0
GR	2387.9	9627.4	2386.6	9641.9	2388.2	9670.8	2387.7	9883.6	2386.5	9921.6
GR	2382.5	9932.1	2381.6	9951.6	2382.5	9971.6	2380.6	9990.4	2380.6	10000.0
GR	2380.9	10005.6	2381.4	10011.9	2382.7	10036.2	2384.0	10065.8	2383.8	10097.4
GR	2386.2	10120.4	2386.7	10151.6	2385.6	10162.1	2386.6	10231.9	2386.9	10286.9
GR	2386.8	10398.0								
ET			6.1			9979	10045			
X1	31.761	20	9974.3	10044.8	520	505	515			
X3	10									
GR	2396.2	9606.9	2396.3	9621.4	2396.1	9692.4	2395.7	9755.4	2394.0	9789.3
GR	2395.5	9818.1	2395.3	9896.6	2392.4	9974.3	2388.7	9986.5	2386.9	10000.0
GR	2388.8	10014.5	2391.0	10044.8	2390.6	10101.4	2387.9	10111.8	2387.9	10128.3
[redacted]	94.1	10145.0	2395.2	10151.6	2395.7	10287.2	2395.2	10432.4	2395.5	10481.1
ET			6.1			9956	10048			
Sunset Blvd.										
X1	31.860	28	9956.2	10054.0	510	525	520			
X3	10									
GR	2403.3	9340.1	2403.3	9340.1	2401.4	9387.2	2403.0	9414.0	2403.2	9528.6
GR	2401.6	9542.1	2401.4	9569.4	2401.0	9599.0	2403.1	9611.5	2403.4	9674.8
GR	2402.3	9693.8	2404.0	9761.0	2401.8	9915.6	2396.3	9932.3	2397.7	9956.2
GR	2396.1	9989.3	2394.5	10000.0	2395.2	10009.5	2395.6	10038.1	2399.4	10054.0
GR	2403.3	10148.8	2403.4	10189.5	2404.0	10249.0	2400.7	10269.8	2404.2	10309.6
GR	2405.0	10414.0	2404.4	10428.9	2404.1	10512.2				
ET			6.1			9970	10030			
X1	31.963	21	9952.6	10033.5	510	510	545			
GR	2413.8	9151.1	2414.2	9190.6	2413.2	9323.3	2412.7	9423.6	2412.0	9594.9
GR	2410.8	9649.5	2411.9	9703.3	2411.7	9734.3	2411.6	9744.1	2413.0	9797.8
GR	2412.9	9879.4	2410.6	9952.6	2401.9	9983.0	2402.4	10000.0	2403.3	10025.0
GR	2406.9	10033.5	2408.1	10068.1	2408.0	10149.9	2410.0	10177.3	2413.0	10269.7
GR	2413.8	10358.4								

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

*PROF 1

CCHV= 0.100 CEHV= 0.300
*SECNO 64.560
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2274.90 ELREA= 2271.90

64.560	8.38	2273.68	2273.68	2273.61	2274.94	1.26	0.00	0.00	2274.90
3300.0	0.0	2412.6	887.4	0.0	234.2	244.1	0.0	0.0	2271.90
0.00	0.00	10.30	3.64	0.000	0.032	0.048	0.000	2265.30	9981.68
0.005881	0.	0.	0.	0	5	0	0.00	178.30	10159.97

FLOW DISTRIBUTION FOR SECNO= 64.56 CWSEL= 2273.68

STA=	9982.	10026.	10078.	10157.	10160.
PER Q=	73.1	14.2	12.7	0.0	
AREA=	234.2	115.7	127.4	0.9	
[redacted] =	10.3	4.0	3.3	1.0	
[redacted]	5.2	2.2	1.6	0.3	

*SECNO 30.093

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.10

30.093	7.40	2275.40	0.00	0.00	2275.47	0.07	0.41	0.12	2268.50
1800.0	290.1	1324.8	185.1	251.9	572.1	143.9	8.1	2.0	2268.50
0.07	1.15	2.32	1.29	0.048	0.032	0.048	0.000	2268.00	9847.46
0.000182	480.	490.	500.	3	0	0	0.00	184.03	10069.97

FLOW DISTRIBUTION FOR SECNO= 30.09 CWSEL= 2275.40

STA=	9847.	9860.	9868.	9935.	9961.	10042.	10053.	10070.
PER Q=	0.2	0.1	3.3	12.6	73.6	7.0	3.3	
AREA=	9.3	6.1	74.3	162.2	572.1	81.5	62.4	
VEL=	0.3	0.3	0.8	1.4	2.3	1.6	0.9	
[redacted]=	0.7	0.7	1.1	6.1	7.1	7.1	3.7	

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

*SECNO 30.191

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

30.191	3.08	2277.78	2277.78	0.00	2278.47	0.69	0.31	0.19	2276.50
1800.0	804.1	984.2	11.7	184.8	121.0	7.2	15.7	4.4	2278.10
0.09	4.35	8.14	1.63	0.060	0.038	0.060	0.000	2274.70	9853.01
0.018307	520.	520.	480.	20	15	0	0.00	214.06	10075.68

FLOW DISTRIBUTION FOR SECNO= 30.19 CWSEL= 2277.78

STA=	9853.	9866.	9892.	9956.	9983.	10050.	10065.	10076.
PER Q=	1.2	6.9	25.6	11.1	54.7	0.3	0.3	
AREA=	8.4	32.2	101.2	43.0	121.0	3.7	3.5	
VEL=	2.5	3.8	4.5	4.6	8.1	1.6	1.6	
DEPTH=	0.6	1.2	1.6	1.6	1.9	0.2	0.3	

*SECNO 30.292

30.292	3.42	2285.52	2285.51	0.00	2286.19	0.67	7.71	0.00	2283.70
1800.0	329.8	671.7	798.5	57.5	76.9	183.7	19.4	7.0	2284.00
0.11	5.74	8.73	4.35	0.045	0.035	0.045	0.000	2282.10	9958.15
0.012430	500.	530.	510.	6	8	0	0.00	225.85	10184.01

FLOW DISTRIBUTION FOR SECNO= 30.29 CWSEL= 2285.52

STA=	9958.	9961.	9988.	10018.	10033.	10046.	10056.	10074.	10128.	10165.	10184.
PER Q=	0.5	17.8	37.3	8.4	9.1	4.2	2.2	6.3	11.7	2.5	
AREA=	2.9	54.5	76.9	27.0	27.0	15.5	13.3	38.4	47.8	14.8	
VEL=	3.3	5.9	8.7	5.6	6.1	4.9	2.9	2.9	4.4	3.1	
DEPTH=	1.1	2.0	2.5	1.9	2.1	1.6	0.7	0.7	1.3	0.8	

*SECNO 30.393

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

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

30.393	4.12	2293.62	2293.62	0.00	2294.83	1.22	5.90	0.16	2292.00
1800.0	216.6	1583.4	0.0	56.8	169.8	0.0	22.8	9.0	2299.20
0.13	3.81	9.33	0.00	0.045	0.035	0.000	0.000	2289.50	9928.72
0.009883	530.	535.	535.	3	11	0	0.00	100.72	10029.44

FLOW DISTRIBUTION FOR SECNO= 30.39 CWSEL= 2293.62

STA=	9929.	9959.	9979.	10046.
PER Q=	3.8	8.2	88.0	
AREA=	24.1	32.7	169.8	
VEL=	2.8	4.5	9.3	
DEPTH=	0.8	1.6	3.3	

*SECNO 30.486

86	3.78	2299.28	2299.28	0.00	2300.39	1.11	5.55	0.01	2301.20
1800.0	0.0	1680.1	119.9	0.0	193.3	29.4	25.3	10.1	2298.40
0.15	0.00	8.69	4.08	0.000	0.035	0.045	0.000	2295.50	9964.63
0.013131	480.	490.	500.	4	11	0	0.00	107.42	10072.05

FLOW DISTRIBUTION FOR SECNO= 30.49 CWSEL= 2299.28

STA=	9965.	10045.	10063.	10072.
PER Q=	93.3	5.4	1.2	
AREA=	193.3	22.4	7.0	
VEL=	8.7	4.4	3.2	
DEPTH=	2.4	1.2	0.8	

*SECNO 30.584
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9880.0 10090.6 TYPE= 1 TARGET= 210.600

30.584	4.58	2310.88	2310.88	0.00	2312.10	1.21	5.77	0.03	2309.20
1800.0	170.5	1629.5	0.0	43.1	177.0	0.0	27.9	11.4	2312.70
0.16	3.95	9.21	0.00	0.043	0.033	0.000	0.000	2306.30	9940.87
0.009482	530.	520.	510.	13	11	0	0.00	94.85	10035.72

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

FLOW DISTRIBUTION FOR SECNO= 30.58 CWSEL= 2310.88

STA= 9941. 9953. 9978. 10044.
PER Q= 0.9 8.5 90.5
AREA= 7.2 35.9 177.0
VEL= 2.4 4.3 9.2
DEPTH= 0.6 1.4 3.1

*SECNO 30.676
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

30.676	3.78	2316.78	2316.78	0.00	2317.73	0.94	5.16	0.03	2318.30
1800.0	0.0	913.7	886.3	0.0	97.0	157.7	30.6	12.7	2315.70
0.18	0.00	9.42	5.62	0.000	0.033	0.043	0.000	2313.00	9981.30
0.011817	460.	485.	505.	3	13	0	0.00	138.44	10119.74

FLOW DISTRIBUTION FOR SECNO= 30.68 CWSEL= 2316.78

S 9981. 10017. 10046. 10071. 10110. 10120.
P 50.8 3.7 5.4 35.7 4.4
AREA= 97.0 21.7 25.6 94.7 15.8
VEL= 9.4 3.1 3.8 6.8 5.0
DEPTH= 2.7 0.7 1.0 2.4 1.6

*SECNO 30.779
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

30.779	3.68	2324.38	2324.38	0.00	2325.58	1.20	6.54	0.08	2327.00
1800.0	0.0	1800.0	0.0	0.0	204.7	0.0	33.5	14.1	2328.80
0.20	0.00	8.79	0.00	0.000	0.033	0.000	0.000	2320.70	9954.71
0.012074	490.	545.	555.	3	8	0	0.00	85.62	10040.33

FLOW DISTRIBUTION FOR SECNO= 30.78 CWSEL= 2324.38

STA= 9955. 10072.
PER Q= 100.0
AREA= 204.7
VEL= 8.8
DEPTH= 2.4

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

*SECNO 30.872

3470 ENCROACHMENT STATIONS= 9942.0 10540.0 TYPE= 1 TARGET= 598.000

30.872	4.06	2330.06	2330.02	0.00	2331.00	0.94	5.40	0.03	2328.60
1800.0	283.3	1023.9	492.8	57.7	110.1	92.4	36.1	15.3	2328.00
0.22	4.91	9.30	5.33	0.043	0.033	0.043	0.000	2326.00	9951.77
0.010166	505.	490.	470.	5	8	0	0.00	131.63	10083.39

FLOW DISTRIBUTION FOR SECNO= 30.87 CWSEL= 2330.06

STA=	9952.	9968.	9975.	9987.	10024.	10056.	10067.	10083.
PER Q=	5.6	5.2	5.0	56.9	22.4	4.4	0.6	
AREA=	22.8	15.6	19.2	110.1	69.1	17.3	6.1	
VEL=	4.4	5.9	4.7	9.3	5.8	4.6	1.8	
DEPTH=	1.4	2.3	1.6	3.0	2.2	1.5	0.4	

*SECNO 30.967

3280 CROSS SECTION 30.97 EXTENDED 0.24 FEET

3710 .IMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2338.10 ELREA= 2335.40

30.967	3.14	2336.84	2336.84	0.00	2337.79	0.96	5.79	0.00	2338.10
1800.0	0.0	951.3	848.7	0.0	103.4	141.6	39.0	16.7	2335.40
0.23	0.00	9.20	5.99	0.000	0.033	0.043	0.000	2333.70	9974.76
0.013506	505.	500.	490.	3	15	0	0.00	124.01	10098.77

FLOW DISTRIBUTION FOR SECNO= 30.97 CWSEL= 2336.84

STA=	9975.	10019.	10045.	10083.	10099.
PER Q=	52.8	10.6	30.4	6.2	
AREA=	103.4	37.2	82.2	22.2	
VEL=	9.2	5.1	6.7	5.0	
DEPTH=	2.4	1.4	2.1	1.4	

*SECNO 31.079

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

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 9071.0 10087.0 TYPE= 1 TARGET= 1016.000

31.079	3.18	2344.58	0.00	0.00	2345.04	0.46	7.20	0.05	2344.70
1800.0	621.1	705.6	473.3	174.0	99.9	99.4	43.1	19.4	2342.80
0.26	3.57	7.06	4.76	0.046	0.038	0.046	0.000	2341.40	9756.63
0.011409	560.	590.	580.	2	0	0	0.00	281.15	10079.53

FLOW DISTRIBUTION FOR SECNO= 31.08 CWSEL= 2344.58

STA=	9757.	9764.	9811.	9838.	9861.	9929.	10016.	10040.	10072.	10080.
PER Q=	0.5	13.6	6.0	5.5	8.8	39.2	12.4	13.2	0.8	
AREA=	4.1	60.0	29.8	26.4	53.7	99.9	43.8	50.5	5.1	
VEL=	2.3	4.1	3.6	3.8	3.0	7.1	5.1	4.7	2.7	
DEPTH=	0.5	1.3	1.1	1.1	0.8	2.2	1.8	1.6	0.7	

31.173

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2351.40 ELREA= 2348.60

31.173	3.71	2350.81	2350.81	0.00	2351.88	1.07	6.02	0.18	2351.40
1800.0	0.0	1478.4	321.6	0.0	166.4	66.4	46.6	21.8	2348.60
0.28	0.00	8.88	4.84	0.000	0.038	0.046	0.000	2347.10	9974.98
0.012260	515.	500.	530.	3	11	0	0.00	126.19	10133.63

FLOW DISTRIBUTION FOR SECNO= 31.17 CWSEL= 2350.81

STA=	9975.	10031.	10054.	10068.	10116.	10134.
PER Q=	82.1	14.8	2.6	0.2	0.2	
AREA=	166.4	46.1	13.6	3.3	3.5	
VEL=	8.9	5.8	3.4	1.2	1.2	
DEPTH=	3.0	2.1	1.0	0.1	0.2	

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

*SECNO 31.272

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2357.70 ELREA= 2358.90

31.272	6.13	2356.13	0.00	0.00	2357.31	1.18	5.40	0.03	2357.70
1800.0	0.0	1800.0	0.0	0.0	206.1	0.0	49.3	23.0	2358.90
0.30	0.00	8.73	0.00	0.000	0.035	0.000	0.000	2350.00	9957.07
0.008906	520.	520.	520.	3	0	0	0.00	61.91	10018.98

FLOW DISTRIBUTION FOR SECNO= 31.27 CWSEL= 2356.13

STA= 9957. 10030.
PER Q= 100.0
AREA= 206.1
VEL= 8.7
DEPTH= 3.3

*SECNO 31.368

3495 RBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2364.20 ELREA= 2364.30

31.368	4.42	2361.42	2361.38	0.00	2362.78	1.36	5.41	0.05	2364.20
1800.0	0.0	1800.0	0.0	0.0	192.4	0.0	51.6	23.7	2364.30
0.31	0.00	9.36	0.00	0.000	0.035	0.000	0.000	2357.00	9950.62
0.012859	495.	510.	520.	4	19	0	0.00	69.62	10020.24

FLOW DISTRIBUTION FOR SECNO= 31.37 CWSEL= 2361.42

STA= 9951. 10031.
PER Q= 100.0
AREA= 192.4
VEL= 9.4
DEPTH= 2.8

*SECNO 31.465
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2372.60 ELREA= 2372.60

31.465	3.12	2370.52	2370.52	0.00	2371.70	1.18	6.80	0.02	2372.60
1500.0	0.0	1500.0	0.0	0.0	172.2	0.0	53.7	24.6	2372.60
0.33	0.00	8.71	0.00	0.000	0.035	0.000	0.000	2367.40	9950.29
0.013930	500.	510.	520.	9	19	0	0.00	74.38	10024.67

FLOW DISTRIBUTION FOR SECNO= 31.47 CWSEL= 2370.52

STA= 9950. 10030.
PER Q= 100.0
AREA= 172.2
VEL= 8.7
DEPTH= 2.3

*SECNO 31.565

3[redacted]' CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.47

31.565	3.66	2376.06	0.00	0.00	2376.60	0.54	4.84	0.06	2378.30
1500.0	0.0	960.1	539.9	0.0	142.0	135.8	56.5	25.8	2374.60
0.36	0.00	6.76	3.98	0.000	0.035	0.044	0.000	2372.40	9977.20
0.006412	530.	530.	540.	5	0	0	0.00	127.14	10104.34

FLOW DISTRIBUTION FOR SECNO= 31.57 CWSEL= 2376.06

STA= 9977. 10027. 10055. 10101. 10104.
PER Q= 64.0 9.9 25.3 0.8
AREA= 142.0 41.8 89.6 4.4
VEL= 6.8 3.6 4.2 2.7
DEPTH= 2.8 1.5 2.0 1.2

*SECNO 31.664
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY

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

3720 CRITICAL DEPTH ASSUMED

31.664	3.04	2383.64	2383.64	0.00	2384.53	0.89	4.67	0.10	2382.50
1500.0	338.6	1137.8	23.6	64.3	138.7	10.0	59.4	27.3	2382.70
0.38	5.26	8.20	2.37	0.044	0.035	0.044	0.000	2380.60	9929.12
0.013519	520.	520.	518.	20	15	0	0.00	128.39	10057.51

FLOW DISTRIBUTION FOR SECNO= 31.66 CWSEL= 2383.64

STA=	9929.	9932.	9952.	9972.	10036.	10058.
PER Q=	0.3	11.0	11.3	75.9	1.6	
AREA=	1.7	30.9	31.7	138.7	10.0	
VEL=	2.6	5.3	5.3	8.2	2.4	
DEPTH=	0.6	1.6	1.6	2.1	0.5	

*SECNO 31.761
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
3[illegible] RBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2392.40 ELREA= 2391.00

31.761	4.12	2391.02	2391.02	0.00	2391.71	0.69	6.28	0.02	2392.40
1500.0	0.0	937.1	562.9	0.0	132.4	95.7	62.0	29.0	2391.00
0.40	0.00	7.08	5.88	0.000	0.035	0.044	0.000	2386.90	9978.84
0.011121	520.	515.	505.	20	26	0	0.00	157.87	10136.71

FLOW DISTRIBUTION FOR SECNO= 31.76 CWSEL= 2391.02

STA=	9979.	10045.	10101.	10112.	10128.	10137.
PER Q=	62.5	1.1	6.3	26.1	4.0	
AREA=	132.4	12.6	18.4	51.5	13.1	
VEL=	7.1	1.3	5.1	7.6	4.6	
DEPTH=	2.0	0.2	1.8	3.1	1.6	

*SECNO 31.860
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2397.70 ELREA= 2399.40

31.860	3.48	2397.98	2397.98	0.00	2398.86	0.89	6.42	0.06	2397.70
1500.0	105.8	1394.2	0.0	27.7	179.7	0.0	64.6	30.7	2399.40
0.42	3.82	7.76	0.00	0.044	0.035	0.000	0.000	2394.50	9927.20
0.013745	510.	520.	525.	3	15	0	0.00	120.85	10048.05

FLOW DISTRIBUTION FOR SECNO= 31.86 CWSEL= 2397.98

STA=	9927.	9932.	9956.	10054.
PER Q=	1.0	6.1	92.9	
AREA=	4.3	23.4	179.7	
VEL=	3.4	3.9	7.8	
DEPTH=	0.8	1.0	2.0	

*SECNO 31.963
7[illegible] MINIMUM SPECIFIC ENERGY
3[illegible] ITICAL DEPTH ASSUMED

63	3.76	2405.66	2405.66	0.00	2407.00	1.35	7.38	0.14	2410.60
1500.0	0.0	1500.0	0.0	0.0	161.0	0.0	66.9	31.8	2406.90
0.43	0.00	9.31	0.00	0.000	0.035	0.000	0.000	2401.90	9969.87
0.013398	510.	545.	510.	4	8	0	0.00	60.70	10030.57

FLOW DISTRIBUTION FOR SECNO= 31.96 CWSEL= 2405.66

STA=	9970.	10034.
PER Q=	100.0	
AREA=	161.0	
VEL=	9.3	
DEPTH=	2.7	

T1 FCD TROPICANA WASH F.I.S.; RDD33832
T2 South Tropicana Wash, Detailed Methods
T3 STW-Enc.hc2 South Trop. Wash FLOODWAY CALCULATIONS

The following starting water surface elevation is one foot above the CWSEL for the natural run at this section.

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		3			0	0	0		2274.68	0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2	0	-1	0	0	0	0	0	0	15

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

*PROF 2

CCHV= 0.100 CEHV= 0.300
*SECNO 64.560

3470 ENCROACHMENT STATIONS= 9846.0 10159.0 TYPE= 1 TARGET= 313.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2274.90 ELREA= 2271.90

64.560	9.38	2274.68	0.00	2273.68	2275.29	0.61	0.00	0.00	2274.90
3300.0	0.0	2095.1	1204.9	0.0	280.2	377.2	0.0	0.0	2271.90
0.00	0.00	7.48	3.19	0.000	0.032	0.048	0.000	2265.30	9979.48
0.002605	0.	0.	0.	0	0	0	0.00	179.52	10159.00

FLOW DISTRIBUTION FOR SECNO= 64.56 CWSEL= 2274.68

S[redacted]	9979.	10026.	10078.	10157. 10159.
	63.5	17.6	18.8	0.1
AREA=	280.2	168.0	206.2	3.0
VEL=	7.5	3.5	3.0	1.5
DEPTH=	6.0	3.2	2.6	1.4

*SECNO 30.093

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.73

3470 ENCROACHMENT STATIONS= 9947.0 10042.0 TYPE= 1 TARGET= 95.000

30.093	7.63	2275.63	0.00	2275.40	2275.75	0.12	0.41	0.05	2268.50
1800.0	131.1	1668.4	0.5	94.6	590.9	2.1	7.6	1.6	2268.50
0.05	1.39	2.82	0.22	0.048	0.032	0.048	0.000	2268.00	9947.00
0.000260	480.	490.	500.	2	0	0	0.00	95.00	10042.00

FLOW DISTRIBUTION FOR SECNO= 30.09 CWSEL= 2275.63

STA=	9947.	9961.	10042.	10042.
PER Q=	7.3	92.7	0.0	
AREA=	94.6	590.9	2.1	
VEL=	1.4	2.8	0.2	
DEPTH=	6.7	7.3	7.1	

[redacted]

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

*SECNO 30.191

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9982.0 10050.0 TYPE= 1 TARGET= 68.000

30.191	4.08	2278.78	2278.78	2277.78	2280.21	1.43	0.42	0.39	2276.50
1800.0	4.0	1795.6	0.5	1.8	186.8	0.3	12.8	2.5	2278.10
0.07	2.16	9.61	1.33	0.060	0.038	0.060	0.000	2274.70	9982.00
0.015377	520.	520.	480.	20	11	0	0.00	68.00	10050.00

FLOW DISTRIBUTION FOR SECNO= 30.19 CWSEL= 2278.78

STA=	9982.	9983.	10050.	10050.
PER Q=	0.2	99.8	0.0	
AREA=	1.8	186.8	0.3	
VEL=	2.2	9.6	1.3	
DEPTH=	2.3	2.8	0.7	

*SECNO 30.292
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9987.0 10046.0 TYPE= 1 TARGET= 59.000

30.292	4.33	2286.43	2286.43	2285.52	2288.02	1.59	7.59	0.05	2283.70
1800.0	7.3	1174.2	618.5	2.5	104.8	79.9	15.1	3.3	2284.00
0.08	2.96	11.20	7.74	0.045	0.035	0.045	0.000	2282.10	9987.00
0.013528	500.	530.	510.	3	8	0	0.00	59.00	10046.00

FLOW DISTRIBUTION FOR SECNO= 30.29 CWSEL= 2286.43

STA=	9987.	9988.	10018.	10033.	10046.	10046.
PER Q=	0.4	65.2	17.0	17.3	0.1	
AREA=	2.5	104.8	40.3	38.8	0.9	
VEL=	3.0	11.2	7.6	8.0	1.6	
DEPTH=	2.7	3.4	2.8	3.0	2.9	

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

*SECNO 30.393
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9978.0 10030.0 TYPE= 1 TARGET= 52.000

30.393	4.16	2293.66	2293.66	2293.62	2295.35	1.69	6.87	0.03	2292.00
1800.0	2.7	1797.3	0.0	1.2	172.1	0.0	17.3	4.0	100000.00
0.09	2.28	10.44	0.00	0.045	0.035	0.000	0.000	2289.50	9978.00
0.012214	530.	535.	535.	2	8	0	0.00	51.57	10029.57

FLOW DISTRIBUTION FOR SECNO= 30.39 CWSEL= 2293.66

STA=	9978.	9979.	10046.
PER Q=	0.1	99.9	
AREA=	1.2	172.1	
VEL=	2.3	10.4	
DEPTH=	1.7	3.4	

*SECNO 30.486

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 9962.0 10046.0 TYPE= 1 TARGET= 84.000

30.486	4.17	2299.67	0.00	2299.28	2300.66	0.99	5.24	0.07	100000.00
1800.0	0.0	1797.6	2.4	0.0	224.8	1.2	19.6	4.7	2298.40
0.11	0.00	8.00	2.09	0.000	0.035	0.045	0.000	2295.50	9962.30
0.009435	480.	490.	500.	2	0	0	0.00	83.70	10046.00

FLOW DISTRIBUTION FOR SECNO= 30.49 CWSEL= 2299.67

STA=	9962.	10045.	10046.
PER Q=	99.9	0.1	
AREA=	224.8	1.2	
VEL=	8.0	2.1	
DEPTH=	2.7	1.3	

*SECNO 30.584
3685 20 TRIALS ATTEMPTED WSEL,CWSEL

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

3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9960.0 10064.3 TYPE= 1 TARGET= 104.300

30.584	4.56	2310.86	2310.86	2310.88	2312.21	1.35	5.13	0.11	2309.20
1800.0	117.2	1682.8	0.0	26.9	175.9	0.0	22.1	5.7	2312.70
0.13	4.35	9.57	0.00	0.043	0.033	0.000	0.000	2306.30	9960.00
0.010304	530.	520.	510.	20	8	0	0.00	75.63	10035.63

FLOW DISTRIBUTION FOR SECNO= 30.58 CWSEL= 2310.86

STA=	9960.	9978.	10044.
PER Q=	6.5	93.5	
AREA=	26.9	175.9	
VEL=	4.4	9.6	
DEPTH=	1.5	3.1	

*SECNO 30.676
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9981.3 10070.0 TYPE= 1 TARGET= 88.700

30.676	4.77	2317.77	2317.77	2316.78	2319.02	1.25	4.74	0.01	100000.00
1800.0	0.0	1324.5	475.5	0.0	131.9	98.4	24.5	6.6	2315.70
0.14	0.00	10.04	4.83	0.000	0.033	0.043	0.000	2313.00	9981.30
0.009222	460.	485.	505.	5	8	0	0.00	88.70	10070.00

FLOW DISTRIBUTION FOR SECNO= 30.68 CWSEL= 2317.77

STA=	9981.	10017.	10046.	10070.
PER Q=	73.6	13.5	13.0	
AREA=	131.9	50.8	47.6	
VEL=	10.0	4.8	4.9	
DEPTH=	3.7	1.7	2.0	

*SECNO 30.779
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

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

3470 ENCROACHMENT STATIONS= 9955.0 10040.0 TYPE= 1 TARGET= 85.000

30.779	3.65	2324.35	2324.35	2324.38	2325.58	1.22	5.79	0.00	100000.00
1800.0	0.0	1800.0	0.0	0.0	202.9	0.0	27.3	7.7	100000.00
0.16	0.00	8.87	0.00	0.000	0.033	0.000	0.000	2320.70	9955.00
0.012329	490.	545.	555.	4	15	0	0.00	85.00	10040.00

FLOW DISTRIBUTION FOR SECNO= 30.78 CWSEL= 2324.35

STA= 9955. 10072.
PER Q= 100.0
AREA= 202.9
VEL= 8.9
DEPTH= 2.4

*SECNO 30.872
7185 MINIMUM SPECIFIC ENERGY
3[redacted]RITICAL DEPTH ASSUMED

34[redacted] ROACHMENT STATIONS= 9970.9 10054.1 TYPE= 1 TARGET= 83.199

30.872	4.25	2330.25	2330.25	2330.06	2331.55	1.30	5.82	0.02	2328.60
1800.0	151.8	1209.8	438.4	29.6	117.1	70.4	29.6	8.6	2328.00
0.17	5.13	10.33	6.23	0.043	0.033	0.043	0.000	2326.00	9970.90
0.011551	505.	490.	470.	3	11.	0	0.00	83.20	10054.10

FLOW DISTRIBUTION FOR SECNO= 30.87 CWSEL= 2330.25

STA= 9971. 9975. 9987. 10024. 10054.
PER Q= 2.0 6.5 67.2 24.4
AREA= 8.0 21.6 117.1 70.4
VEL= 4.4 5.4 10.3 6.2
DEPTH= 2.2 1.8 3.1 2.3

*SECNO 30.967
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9975.0 10040.0 TYPE= 1 TARGET= 65.000

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 2335.40

30.967	4.05	2337.75	2337.75	2336.84	2339.25	1.50	5.72	0.06	100000.00
1800.0	0.0	1494.5	305.5	0.0	143.5	50.1	32.0	9.5	2335.40
0.19	0.00	10.41	6.09	0.000	0.033	0.043	0.000	2333.70	9975.00
0.011427	505.	500.	490.	3	11	0	0.00	65.00	10040.00

FLOW DISTRIBUTION FOR SECNO= 30.97 CWSEL= 2337.75

STA=	9975.	10019.	10040.
PER Q=	83.0	17.0	
AREA=	143.5	50.1	
VEL=	10.4	6.1	
DEPTH=	3.3	2.4	

*SECNO 31.079

3[redacted]CROSS SECTION 31.08 EXTENDED 0.61 FEET

718[redacted]IMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9950.0 10035.9 TYPE= 1 TARGET= 85.900

31.079	4.11	2345.51	2345.51	2344.58	2346.78	1.27	7.37	0.02	2344.70
1800.0	54.1	1379.5	366.4	16.6	142.0	54.1	34.7	10.5	2342.80
0.21	3.26	9.72	6.77	0.046	0.038	0.046	0.000	2341.40	9950.00
0.013812	560.	590.	580.	4	5	0	0.00	85.90	10035.90

FLOW DISTRIBUTION FOR SECNO= 31.08 CWSEL= 2345.51

STA=	9950.	9970.	10016.	10036.
PER Q=	3.0	76.6	20.4	
AREA=	16.6	142.0	54.1	
VEL=	3.3	9.7	6.8	
DEPTH=	0.8	3.1	2.7	

*SECNO 31.173

3470 ENCROACHMENT STATIONS= 9975.0 10031.0 TYPE= 1 TARGET= 56.000

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 100000.00

31.173	4.37	2351.47	0.00	2350.81	2352.69	1.22	5.90	0.01	100000.00
1800.0	0.0	1800.0	0.0	0.0	203.3	0.0	37.1	11.3	100000.00
0.22	0.00	8.85	0.00	0.000	0.038	0.000	0.000	2347.10	9975.00
0.010083	515.	500.	530.	4	0	0	0.00	56.00	10031.00

FLOW DISTRIBUTION FOR SECNO= 31.17 CWSEL= 2351.47

STA= 9975. 10031.
PER Q= 100.0
AREA= 203.3
VEL= 8.9
DEPTH= 3.6

*SECNO 31.272

3[redacted]ROACHMENT STATIONS= 9958.0 10018.0 TYPE= 1 TARGET= 60.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 100000.00

31.272	6.22	2356.22	0.00	2356.13	2357.34	1.13	4.65	0.01	100000.00
1800.0	0.0	1800.0	0.0	0.0	211.1	0.0	39.6	12.0	100000.00
0.24	0.00	8.52	0.00	0.000	0.035	0.000	0.000	2350.00	9958.00
0.007977	520.	520.	520.	3	0	0	0.00	60.00	10018.00

FLOW DISTRIBUTION FOR SECNO= 31.27 CWSEL= 2356.22

STA= 9958. 10030.
PER Q= 100.0
AREA= 211.1
VEL= 8.5
DEPTH= 3.5

*SECNO 31.368
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

[redacted]

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

3470 ENCROACHMENT STATIONS= 9951.0 10020.0 TYPE= 1 TARGET= 69.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 100000.00

31.368	4.37	2361.37	2361.37	2361.42	2362.78	1.41	5.20	0.08	100000.00
1800.0	0.0	1800.0	0.0	0.0	189.0	0.0	41.9	12.8	100000.00
0.26	0.00	9.53	0.00	0.000	0.035	0.000	0.000	2357.00	9951.00
0.013497	495.	510.	520.	3	19	0	0.00	69.00	10020.00

FLOW DISTRIBUTION FOR SECNO= 31.37 CWSEL= 2361.37

STA= 9951. 10031.
PER Q= 100.0
AREA= 189.0
VEL= 9.5
DEPTH= 2.7

*S 31.465
718 IMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9951.0 10024.0 TYPE= 1 TARGET= 73.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 100000.00

31.465	3.10	2370.50	2370.50	2370.52	2371.70	1.20	7.00	0.02	100000.00
1500.0	0.0	1500.0	0.0	0.0	171.0	0.0	44.0	13.6	100000.00
0.27	0.00	8.77	0.00	0.000	0.035	0.000	0.000	2367.40	9951.00
0.013990	500.	510.	520.	10	19	0	0.00	73.00	10024.00

FLOW DISTRIBUTION FOR SECNO= 31.47 CWSEL= 2370.50

STA= 9951. 10030.
PER Q= 100.0
AREA= 171.0
VEL= 8.8
DEPTH= 2.3

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

*SECNO 31.565

3470 ENCROACHMENT STATIONS= 9978.0 10028.0 TYPE= 1 TARGET= 50.000

31.565	4.12	2376.52	0.00	2376.06	2377.80	1.29	6.08	0.03	100000.00
1500.0	0.0	1496.6	3.4	0.0	164.2	1.5	46.1	14.4	2374.60
0.29	0.00	9.11	2.25	0.000	0.035	0.044	0.000	2372.40	9978.00
0.009572	530.	530.	540.	4	0	0	0.00	50.00	10028.00

FLOW DISTRIBUTION FOR SECNO= 31.57 CWSEL= 2376.52

STA=	9978.	10027.	10028.
PER Q=	99.8	0.2	
AREA=	164.2	1.5	
VEL=	9.1	2.3	
DEPTH=	3.3	1.9	

*SECNO 31.664
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9971.0 10037.0 TYPE= 1 TARGET= 66.000

31.664	3.42	2384.02	2384.02	2383.64	2385.31	1.29	5.85	0.00	2382.50
1500.0	2.0	1495.4	2.6	0.9	163.8	1.0	48.1	15.0	2382.70
0.30	2.22	9.13	2.46	0.044	0.035	0.044	0.000	2380.60	9971.00
0.013427	520.	520.	518.	3	15	0	0.00	66.00	10037.00

FLOW DISTRIBUTION FOR SECNO= 31.66 CWSEL= 2384.02

STA=	9971.	9972.	10036.	10037.
PER Q=	0.1	99.7	0.2	
AREA=	0.9	163.8	1.0	
VEL=	2.2	9.1	2.5	
DEPTH=	1.5	2.5	1.3	

*SECNO 31.761
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9979.0 10045.0 TYPE= 1 TARGET= 66.000

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 2391.00

31.761	4.63	2391.53	2391.53	2391.02	2392.80	1.27	6.95	0.00	100000.00
1500.0	0.0	1499.9	0.1	0.0	165.8	0.1	50.0	15.8	2391.00
0.32	0.00	9.04	1.08	0.000	0.035	0.044	0.000	2386.90	9979.00
0.013557	520.	515.	505.	4	11	0	0.00	66.00	10045.00

FLOW DISTRIBUTION FOR SECNO= 31.76 CWSEL= 2391.53

STA=	9979.	10045.	10045.
PER Q=	100.0	0.0	
AREA=	165.8	0.1	
VEL=	9.0	1.1	
DEPTH=	2.5	0.5	

*SECNO 31.860

[redacted]ROACHMENT STATIONS= 9956.0 10048.0 TYPE= 1 TARGET= 92.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2397.70 ELREA= 100000.00

31.860	3.73	2398.23	0.00	2397.98	2399.08	0.85	6.24	0.04	2397.70
1500.0	0.1	1499.9	0.0	0.1	202.6	0.0	52.2	16.8	100000.00
0.34	0.96	7.40	0.00	0.044	0.035	0.000	0.000	2394.50	9956.00
0.010688	510.	520.	525.	4	0	0	0.00	92.00	10048.00

FLOW DISTRIBUTION FOR SECNO= 31.86 CWSEL= 2398.23

STA=	9956.	9956.	10054.
PER Q=	0.0	100.0	
AREA=	0.1	202.6	
VEL=	1.0	7.4	
DEPTH=	0.5	2.2	

*SECNO 31.963

3301 HV CHANGED MORE THAN HVINS

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

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9970.0 10030.0 TYPE= 1 TARGET= 60.000

31.963	3.75	2405.65	2405.65	2405.66	2407.01	1.35	6.50	0.15	100000.00
1500.0	0.0	1500.0	0.0	0.0	160.6	0.0	54.5	17.7	100000.00
0.35	0.00	9.34	0.00	0.000	0.035	0.000	0.000	2401.90	9970.00
0.013375	510.	545.	510.	3	5	0	0.00	60.00	10030.00

FLOW DISTRIBUTION FOR SECNO= 31.96 CWSEL= 2405.65

STA= 9970. 10034.
PER Q= 100.0
AREA= 160.6
VEL= 9.3
DEPTH= 2.7

THIS RUN EXECUTED 14JAN93 19:50:52

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

STW-Enc.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	64.560	2273.68	3300.00	8.38	0.00	10.30	3.64	0.00	2412.58	887.42	178.30	9981.68	10159.97
	64.560	2274.68	3300.00	9.38	0.00	7.48	3.19	0.00	2095.13	1204.87	179.52	9979.48	10159.00
•	30.093	2275.40	1800.00	7.40	1.15	2.32	1.29	290.05	1324.81	185.14	184.03	9847.46	10069.97
*	30.093	2275.63	1800.00	7.63	1.39	2.82	0.22	131.11	1668.43	0.46	95.00	9947.00	10042.00
•	.191	2277.78	1800.00	3.08	4.35	8.14	1.63	804.14	984.20	11.66	214.06	9853.01	10075.68
*	30.191	2278.78	1800.00	4.08	2.16	9.61	1.33	3.95	1795.59	0.46	68.00	9982.00	10050.00
	30.292	2285.52	1800.00	3.42	5.74	8.73	4.35	329.77	671.73	798.50	225.85	9958.15	10184.01
*	30.292	2286.43	1800.00	4.33	2.96	11.20	7.74	7.29	1174.18	618.53	59.00	9987.00	10046.00
*	30.393	2293.62	1800.00	4.12	3.81	9.33	0.00	216.56	1583.44	0.00	100.72	9928.72	10029.44
•	30.393	2293.66	1800.00	4.16	2.28	10.44	0.00	2.65	1797.35	0.00	51.57	9978.00	10029.57
	30.486	2299.28	1800.00	3.78	0.00	8.69	4.08	0.00	1680.09	119.91	107.42	9964.63	10072.05
	30.486	2299.67	1800.00	4.17	0.00	8.00	2.09	0.00	1797.58	2.42	83.70	9962.30	10046.00
•	30.584	2310.88	1800.00	4.58	3.95	9.21	0.00	170.51	1629.49	0.00	94.85	9940.87	10035.72
•	30.584	2310.86	1800.00	4.56	4.35	9.57	0.00	117.23	1682.77	0.00	75.63	9960.00	10035.63
*	30.676	2316.78	1800.00	3.78	0.00	9.42	5.62	0.00	913.73	886.27	138.44	9981.30	10119.74
•	30.676	2317.77	1800.00	4.77	0.00	10.04	4.83	0.00	1324.51	475.49	88.70	9981.30	10070.00
*	30.779	2324.38	1800.00	3.68	0.00	8.79	0.00	0.00	1800.00	0.00	85.62	9954.71	10040.33
•	30.779	2324.35	1800.00	3.65	0.00	8.87	0.00	0.00	1800.00	0.00	85.00	9955.00	10040.00
	30.872	2330.06	1800.00	4.06	4.91	9.30	5.33	283.34	1023.90	492.75	131.63	9951.77	10083.39
*	30.872	2330.25	1800.00	4.25	5.13	10.33	6.23	151.81	1209.76	438.43	83.20	9970.90	10054.10
•	30.967	2336.84	1800.00	3.14	0.00	9.20	5.99	0.00	951.27	848.73	124.01	9974.76	10098.77
*	.967	2337.75	1800.00	4.05	0.00	10.41	6.09	0.00	1494.51	305.49	65.00	9975.00	10040.00

	NO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
	31.079	2344.58	1800.00	3.18	3.57	7.06	4.76	621.14	705.59	473.27	281.15	9756.63	10079.53
*	31.079	2345.51	1800.00	4.11	3.26	9.72	6.77	54.11	1379.47	366.42	85.90	9950.00	10035.90
*	31.173	2350.81	1800.00	3.71	0.00	8.88	4.84	0.00	1478.39	321.61	126.19	9974.98	10133.63
	31.173	2351.47	1800.00	4.37	0.00	8.85	0.00	0.00	1800.00	0.00	56.00	9975.00	10031.00
	31.272	2356.13	1800.00	6.13	0.00	8.73	0.00	0.00	1800.00	0.00	61.91	9957.07	10018.98
	31.272	2356.22	1800.00	6.22	0.00	8.52	0.00	0.00	1800.00	0.00	60.00	9958.00	10018.00
	31.368	2361.42	1800.00	4.42	0.00	9.36	0.00	0.00	1800.00	0.00	69.62	9950.62	10020.24
*	31.368	2361.37	1800.00	4.37	0.00	9.53	0.00	0.00	1800.00	0.00	69.00	9951.00	10020.00
*	31.465	2370.52	1500.00	3.12	0.00	8.71	0.00	0.00	1500.00	0.00	74.38	9950.29	10024.67
•	31.465	2370.50	1500.00	3.10	0.00	8.77	0.00	0.00	1500.00	0.00	73.00	9951.00	10024.00
*	31.565	2376.06	1500.00	3.66	0.00	6.76	3.98	0.00	960.07	539.93	127.14	9977.20	10104.34
	31.565	2376.52	1500.00	4.12	0.00	9.11	2.25	0.00	1496.55	3.45	50.00	9978.00	10028.00
*	31.664	2383.64	1500.00	3.04	5.26	8.20	2.37	338.58	1137.84	23.58	128.39	9929.12	10057.51
*	31.664	2384.02	1500.00	3.42	2.22	9.13	2.46	2.05	1495.38	2.57	66.00	9971.00	10037.00
*	31.761	2391.02	1500.00	4.12	0.00	7.08	5.88	0.00	937.13	562.87	157.87	9978.84	10136.71
*	31.761	2391.53	1500.00	4.63	0.00	9.04	1.08	0.00	1499.88	0.11	66.00	9979.00	10045.00
*	860	2397.98	1500.00	3.48	3.82	7.76	0.00	105.77	1394.23	0.00	120.85	9927.20	10048.05
	31.860	2398.23	1500.00	3.73	0.96	7.40	0.00	0.10	1499.90	0.00	92.00	9956.00	10048.00
•	31.963	2405.66	1500.00	3.76	0.00	9.31	0.00	0.00	1500.00	0.00	60.70	9969.87	10030.57
•	31.963	2405.65	1500.00	3.75	0.00	9.34	0.00	0.00	1500.00	0.00	60.00	9970.00	10030.00

S[redacted]ic2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST
*	64.560	2273.68	3300.00	0.00	178.30	9981.68	0.00	9979.00	10026.40	0.00	10159.97
	64.560	2274.68	3300.00	0.00	179.52	9979.48	9846.00	9979.00	10026.40	10159.00	10159.00
*	30.093	2275.40	1800.00	490.00	184.03	9847.46	0.00	9961.10	10041.70	0.00	10069.97
*	30.093	2275.63	1800.00	490.00	95.00	9947.00	9947.00	9961.10	10041.70	10042.00	10042.00
*	30.191	2277.78	1800.00	520.00	214.06	9853.01	0.00	9982.80	10049.50	0.00	10075.68
*	30.191	2278.78	1800.00	520.00	68.00	9982.00	9982.00	9982.80	10049.50	10050.00	10050.00
	30.292	2285.52	1800.00	530.00	225.85	9958.15	0.00	9987.90	10018.40	0.00	10184.01
*	30.292	2286.43	1800.00	530.00	59.00	9987.00	9987.00	9987.90	10018.40	10046.00	10046.00
*	30.393	2293.62	1800.00	535.00	100.72	9928.72	0.00	9978.70	10045.60	0.00	10029.44
*	30.393	2293.66	1800.00	535.00	51.57	9978.00	9978.00	9978.70	10045.60	10030.00	10029.57
	30.486	2299.28	1800.00	490.00	107.42	9964.63	0.00	9953.10	10045.10	0.00	10072.05
	30.486	2299.67	1800.00	490.00	83.70	9962.30	9962.00	9953.10	10045.10	10046.00	10046.00
*	[redacted].584	2310.88	1800.00	520.00	94.85	9940.87	9880.00	9978.20	10044.30	10090.60	10035.72
*	.584	2310.86	1800.00	520.00	75.63	9960.00	9960.00	9978.20	10044.30	10064.30	10035.63
*	30.676	2316.78	1800.00	485.00	138.44	9981.30	0.00	9976.60	10016.70	0.00	10119.74
•	30.676	2317.77	1800.00	485.00	88.70	9981.30	9981.30	9976.60	10016.70	10070.00	10070.00
*	30.779	2324.38	1800.00	545.00	85.62	9954.71	0.00	9926.00	10071.80	0.00	10040.33
*	30.779	2324.35	1800.00	545.00	85.00	9955.00	9955.00	9926.00	10071.80	10040.00	10040.00
	30.872	2330.06	1800.00	490.00	131.63	9951.77	9942.00	9986.90	10024.10	10540.00	10083.39
*	30.872	2330.25	1800.00	490.00	83.20	9970.90	9970.90	9986.90	10024.10	10054.10	10054.10
*	30.967	2336.84	1800.00	500.00	124.01	9974.76	0.00	9969.60	10018.70	0.00	10098.77
*	30.967	2337.75	1800.00	500.00	65.00	9975.00	9975.00	9969.60	10018.70	10040.00	10040.00
	31.079	2344.58	1800.00	590.00	281.15	9756.63	9071.00	9970.00	10015.90	10087.00	10079.53
*	31.079	2345.51	1800.00	590.00	85.90	9950.00	9950.00	9970.00	10015.90	10035.90	10035.90
*	31.173	2350.81	1800.00	500.00	126.19	9974.98	0.00	9972.80	10031.10	0.00	10133.63
	31.173	2351.47	1800.00	500.00	56.00	9975.00	9975.00	9972.80	10031.10	10031.00	10031.00
	31.272	2356.13	1800.00	520.00	61.91	9957.07	0.00	9946.70	10029.70	0.00	10018.98
	31.272	2356.22	1800.00	520.00	60.00	9958.00	9958.00	9946.70	10029.70	10018.00	10018.00
	31.368	2361.42	1800.00	510.00	69.62	9950.62	0.00	9941.00	10030.60	0.00	10020.24
*	[redacted]1.368	2361.37	1800.00	510.00	69.00	9951.00	9951.00	9941.00	10030.60	10020.00	10020.00
•	[redacted].465	2370.52	1500.00	510.00	74.38	9950.29	0.00	9937.60	10029.90	0.00	10024.67
•	31.465	2370.50	1500.00	510.00	73.00	9951.00	9951.00	9937.60	10029.90	10024.00	10024.00

	CNO	CWSEL	Q	XLCH	TOPWID	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST
•	31.565	2376.06	1500.00	530.00	127.14	9977.20	0.00	9970.70	10027.20	0.00	10104.34
	31.565	2376.52	1500.00	530.00	50.00	9978.00	9978.00	9970.70	10027.20	10028.00	10028.00
*	31.664	2383.64	1500.00	520.00	128.39	9929.12	0.00	9971.60	10036.20	0.00	10057.51
*	31.664	2384.02	1500.00	520.00	66.00	9971.00	9971.00	9971.60	10036.20	10037.00	10037.00
*	31.761	2391.02	1500.00	515.00	157.87	9978.84	0.00	9974.30	10044.80	0.00	10136.71
*	31.761	2391.53	1500.00	515.00	66.00	9979.00	9979.00	9974.30	10044.80	10045.00	10045.00
*	31.860	2397.98	1500.00	520.00	120.85	9927.20	0.00	9956.20	10054.00	0.00	10048.05
	31.860	2398.23	1500.00	520.00	92.00	9956.00	9956.00	9956.20	10054.00	10048.00	10048.00
•	31.963	2405.66	1500.00	545.00	60.70	9969.87	0.00	9952.60	10033.50	0.00	10030.57
*	31.963	2405.65	1500.00	545.00	60.00	9970.00	9970.00	9952.60	10033.50	10030.00	10030.00

S[redacted]1c2

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 64.560 PROFILE= 1 CRITICAL DEPTH ASSUMED

WARNING SECNO= 30.093 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 30.093 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 30.191 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.191 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 30.191 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 30.191 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.191 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 30.191 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 30.292 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.292 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.393 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.393 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 30.393 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.393 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.584 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.584 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 30.584 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.584 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 30.584 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 30.676 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.676 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 30.676 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.676 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.779 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.779 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 30.779 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.779 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.872 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.872 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.967 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.967 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 30.967 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.967 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 31.079 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.079 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 31.173 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.173 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 31.368 PROFILE= 2 CRITICAL DEPTH ASSUMED

[redacted] SECNO= 31.368 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 31.465 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.465 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 31.465 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.465 PROFILE= 2 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 31.565 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 31.664 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.664 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 31.664 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 31.664 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.664 PROFILE= 2 MINIMUM SPECIFIC ENERGY

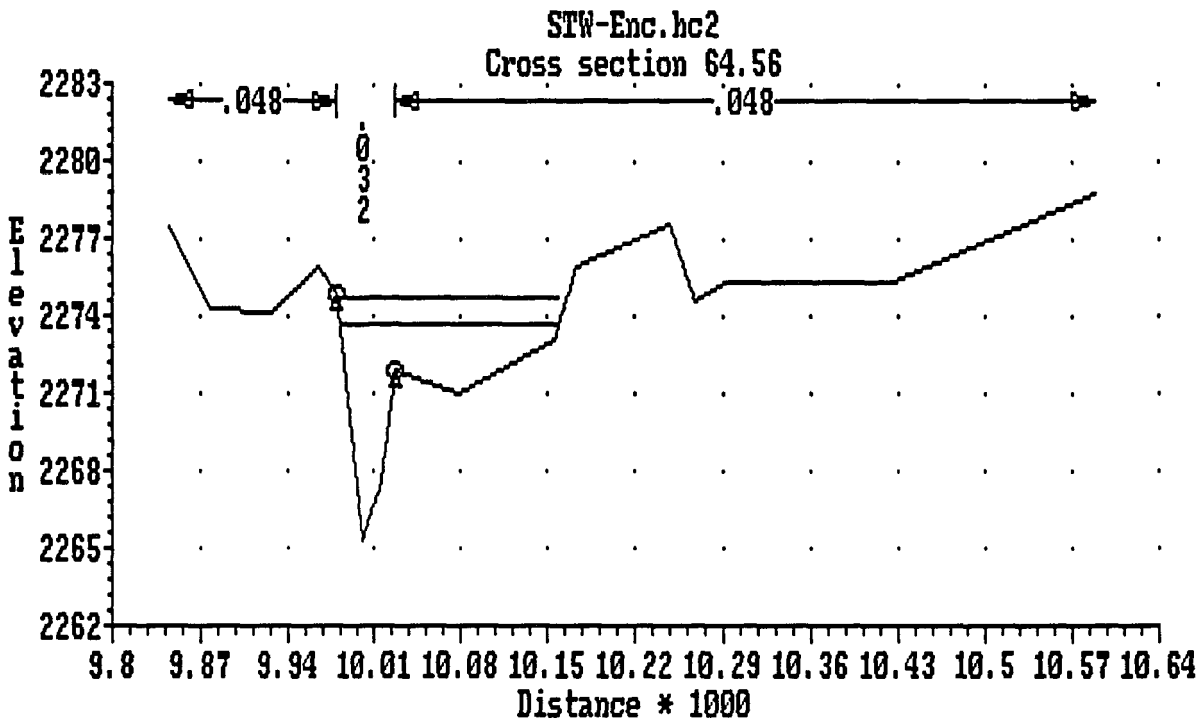
CAUTION SECNO= 31.761 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.761 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 31.761 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 31.761 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 31.761 PROFILE= 2 MINIMUM SPECIFIC ENERGY

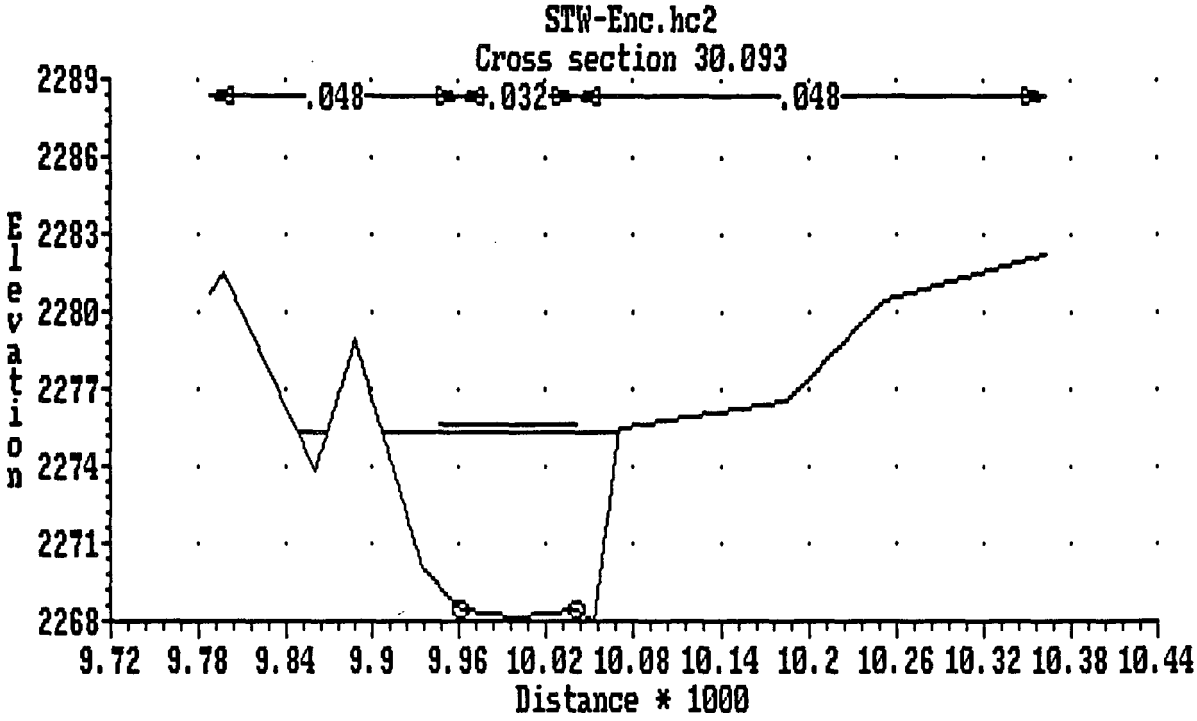
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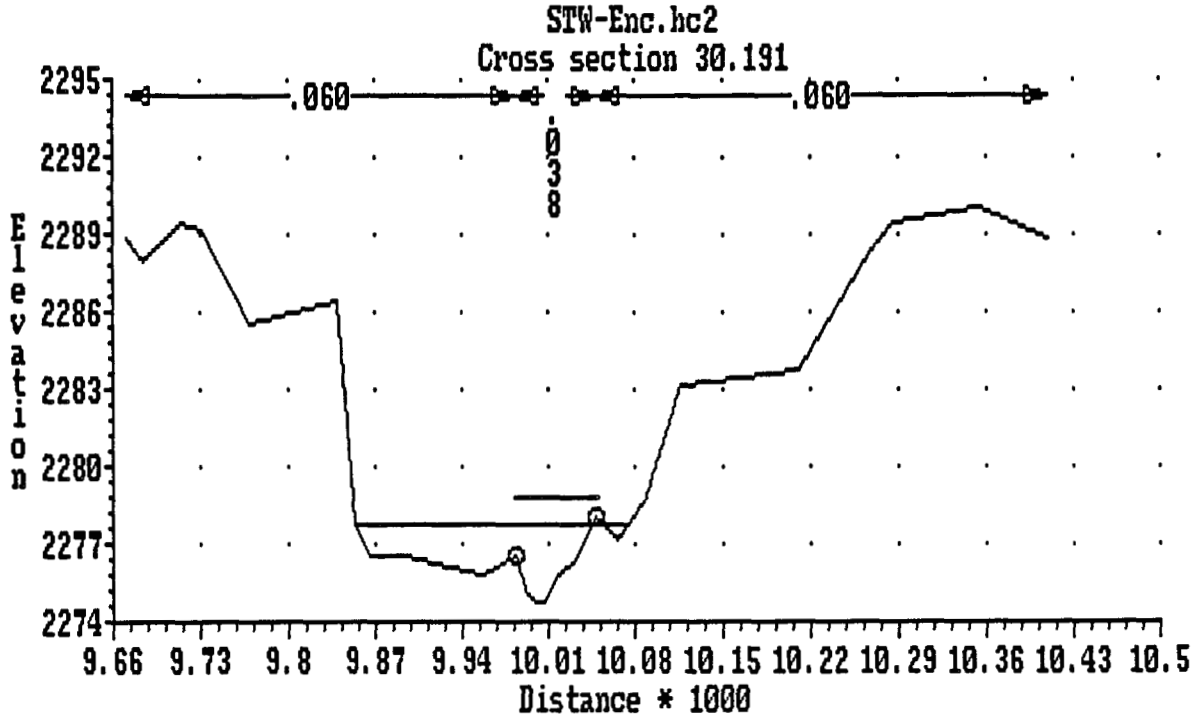
CAUTION SECNO= 31.963 PROFILE= 1 CRITICAL DEPTH ASSUMED
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[redacted] SECNO= 31.963 PROFILE= 2 MINIMUM SPECIFIC ENERGY

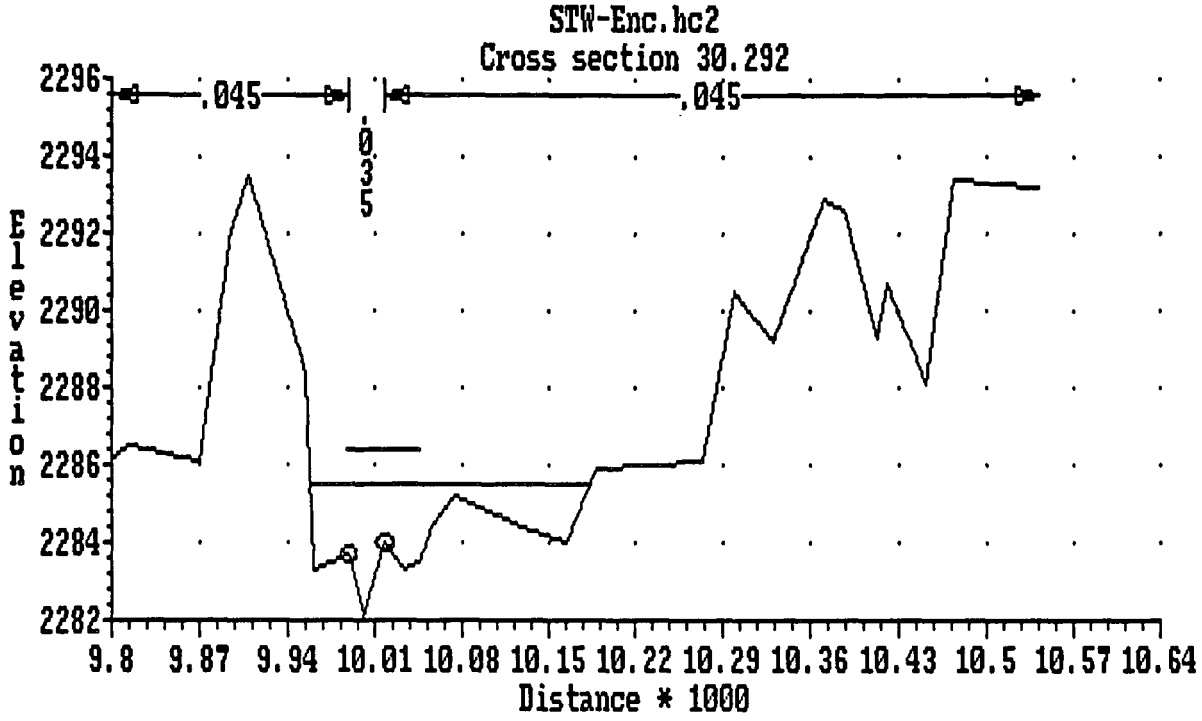
FLOODWAY DATA, STW-Enc.hc2
PROFILE NO. 2

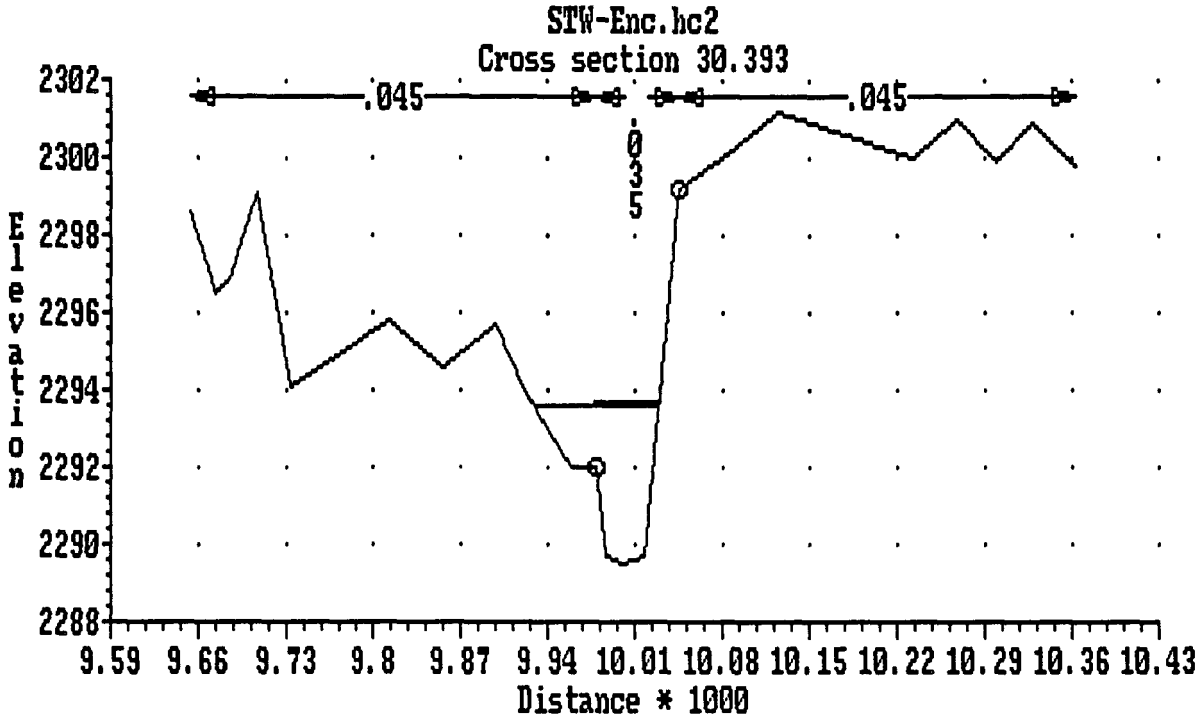
STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
64.560	180.	657.	5.0	2274.7	2273.7	1.0
30.093	95.	688.	2.6	2275.6	2275.4	0.2
30.191	68.	189.	9.5	2278.8	2277.8	1.0
30.292	59.	187.	9.6	2286.4	2285.5	0.9
30.393	52.	173.	10.4	2293.6	2293.6	0.0
30.486	84.	226.	8.0	2299.7	2299.3	0.4
30.584	76.	203.	8.9	2310.9	2310.9	0.0
30.676	89.	230.	7.8	2317.8	2316.8	1.0
30.779	85.	203.	8.9	2324.4	2324.4	0.0
30.872	83.	217.	8.3	2330.3	2330.1	0.2
30.967	65.	194.	9.3	2337.7	2336.8	0.9
31.079	86.	213.	8.5	2345.5	2344.6	0.9
31.173	56.	203.	8.9	2351.5	2350.8	0.7
31.272	60.	211.	8.5	2356.2	2356.1	0.1
[illegible].368	69.	189.	9.5	2361.4	2361.4	0.0
[illegible]465	73.	171.	8.8	2370.5	2370.5	0.0
[illegible]55	50.	166.	9.0	2376.6	2376.1	0.5
[illegible].664	66.	166.	9.1	2384.0	2383.6	0.4
31.761	66.	166.	9.0	2391.5	2391.0	0.5
31.860	92.	203.	7.4	2398.3	2398.0	0.3
31.963	60.	161.	9.3	2405.7	2405.7	0.0

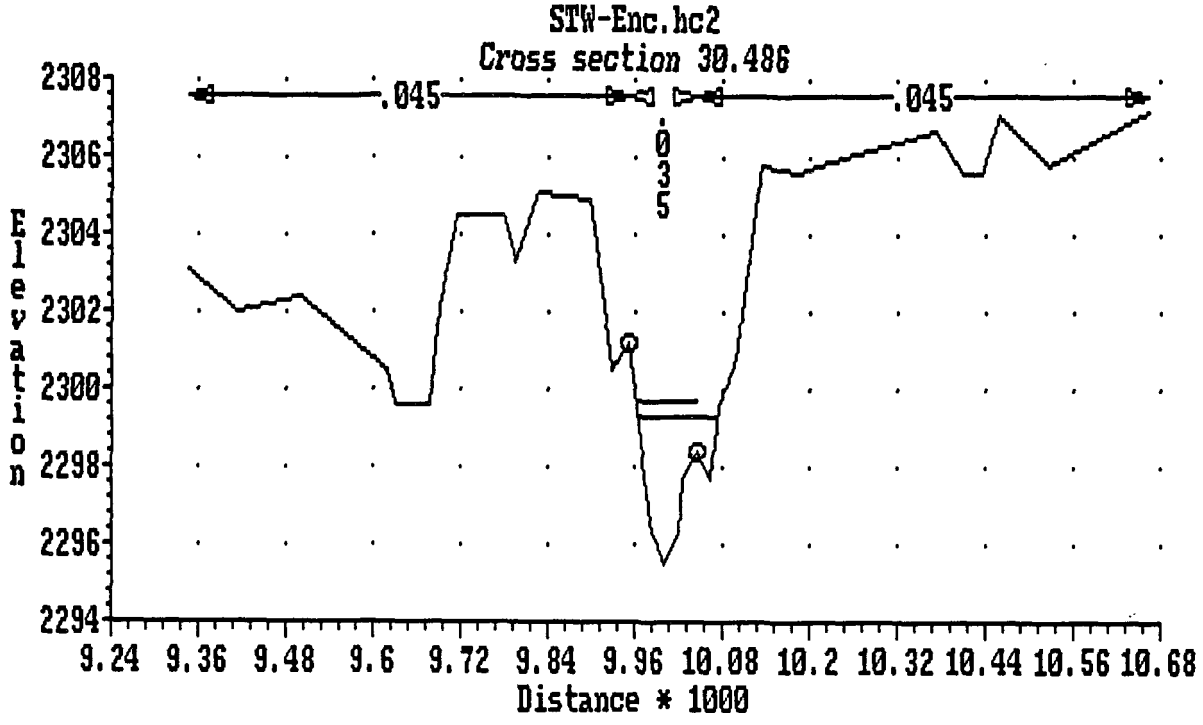

STW-Enc.hc2
Cross section 64.56
.048
.032
.048
Elevation
2283
2280
2277
2274
2271
2268
2265
2262
9.8
9.87
9.94
10.01
10.08
10.15
10.22
10.29
10.36
10.43
10.5
10.57
10.64
Distance * 1000

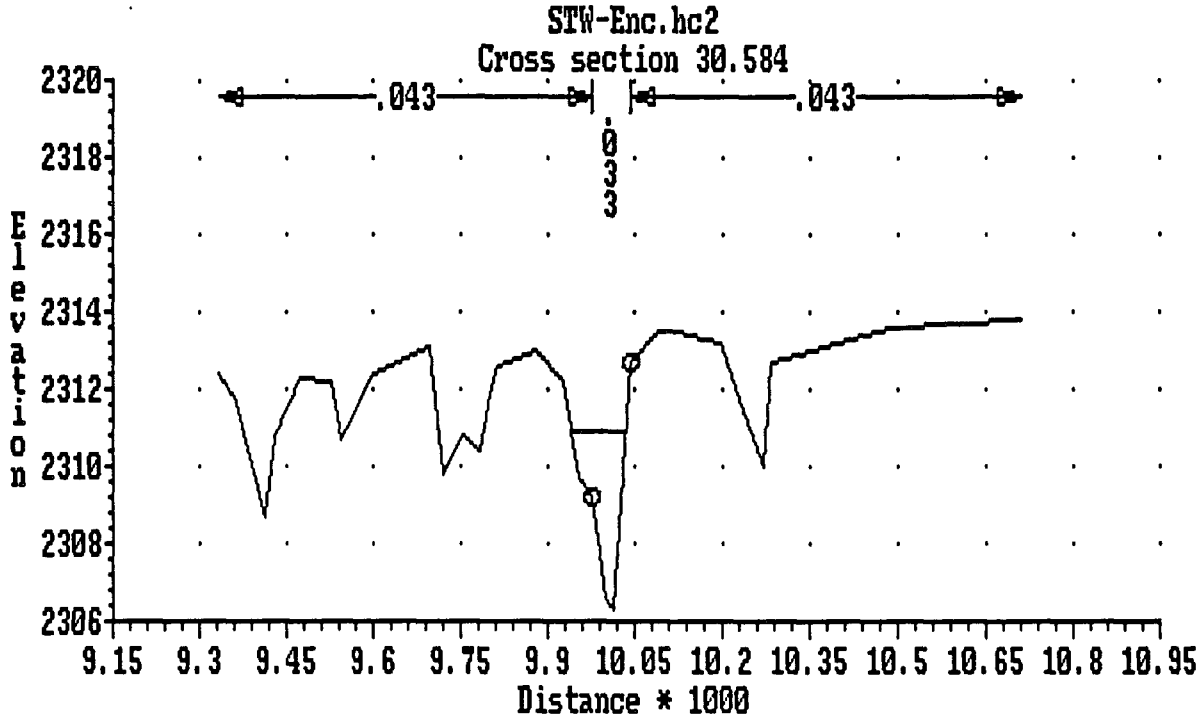

STW-Enc.hc2
Cross section 30.093
.048
.032
.048
Elevation
2289
2286
2283
2280
2277
2274
2271
2268
9.72
9.78
9.84
9.9
9.96
10.02
10.08
10.14
10.2
10.26
10.32
10.38
10.44
Distance * 1000

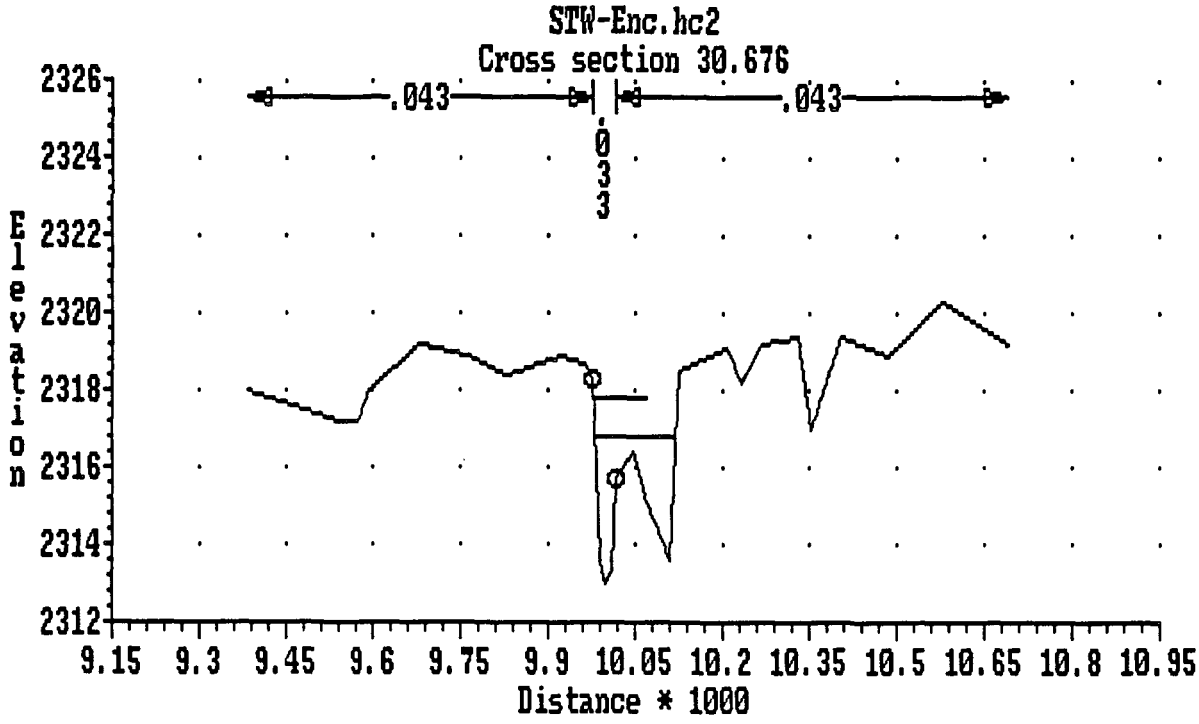

STW-Enc.hc2
Cross section 30.191
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.038
.060
Elevation
2295
2292
2289
2286
2283
2280
2277
2274
9.66
9.73
9.8
9.87
9.94
10.01
10.08
10.15
10.22
10.29
10.36
10.43
10.5
Distance * 1000

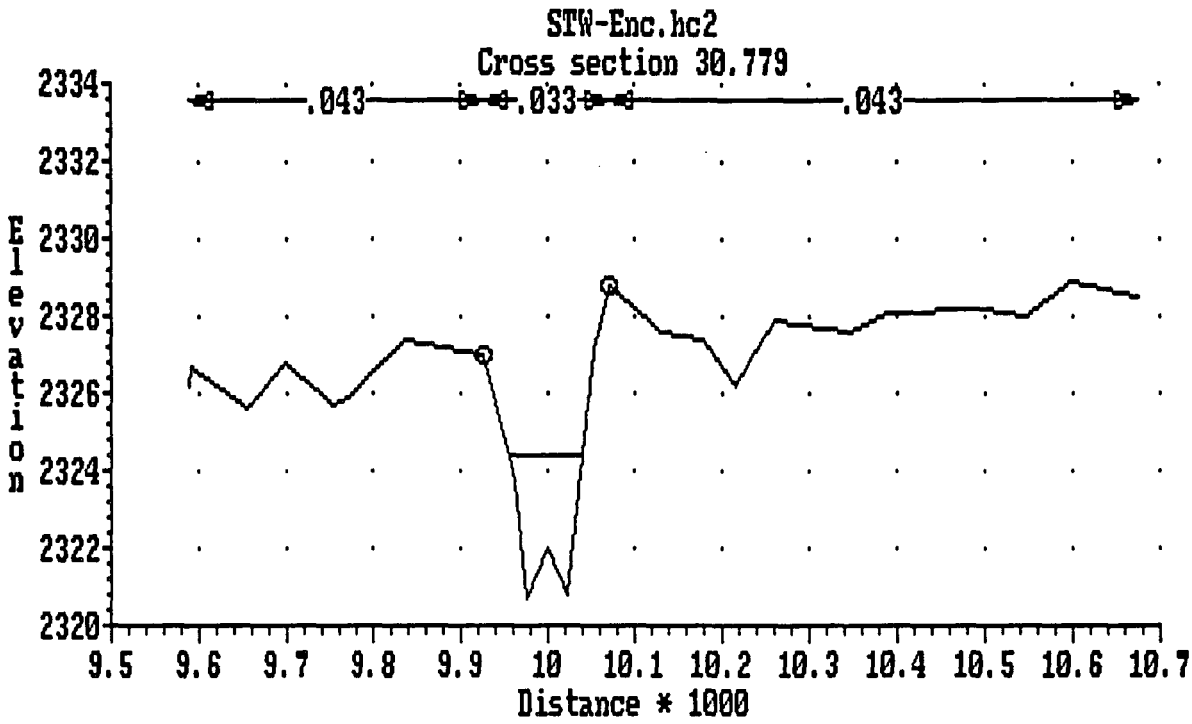

STW-Enc.hc2
Cross section 30.292
.045
.035
.045
Elevation
2296
2294
2292
2290
2288
2286
2284
2282
9.8
9.87
9.94
10.01
10.08
10.15
10.22
10.29
10.36
10.43
10.5
10.57
10.64
Distance * 1000

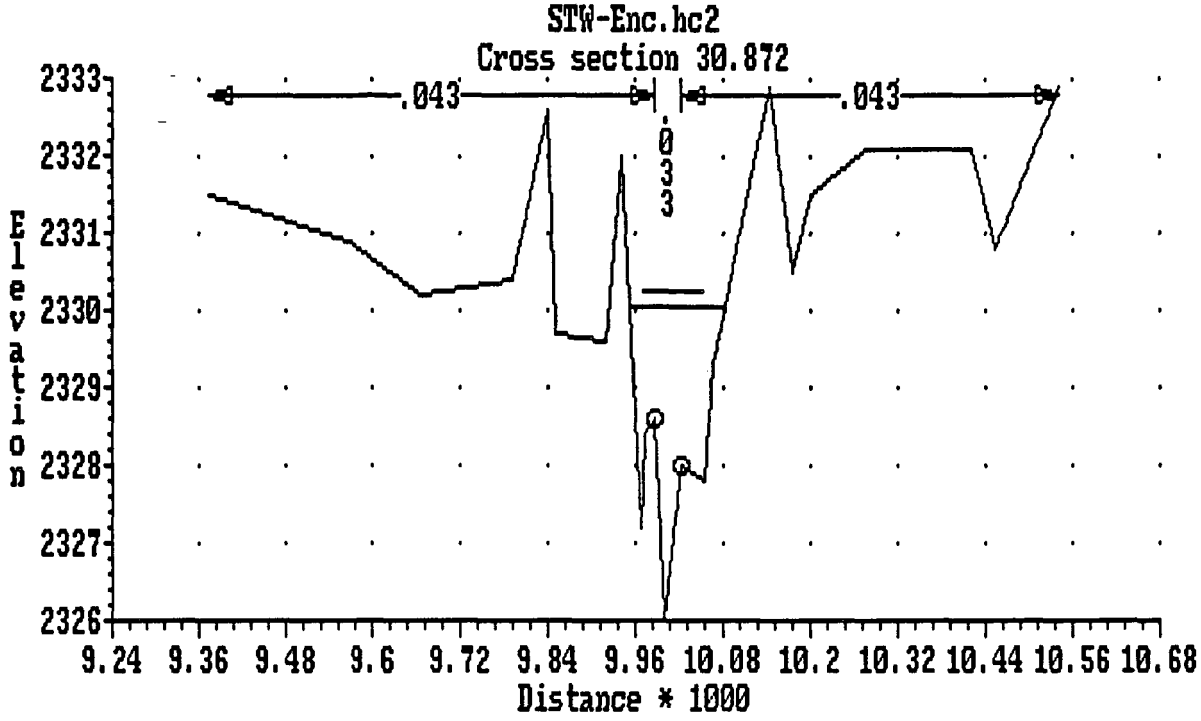

STW-Enc.hc2
Cross section 30.393
.045
.035
.045
Elevation
2302
2300
2298
2296
2294
2292
2290
2288
9.59
9.66
9.73
9.8
9.87
9.94
10.01
10.08
10.15
10.22
10.29
10.36
10.43
Distance * 1000

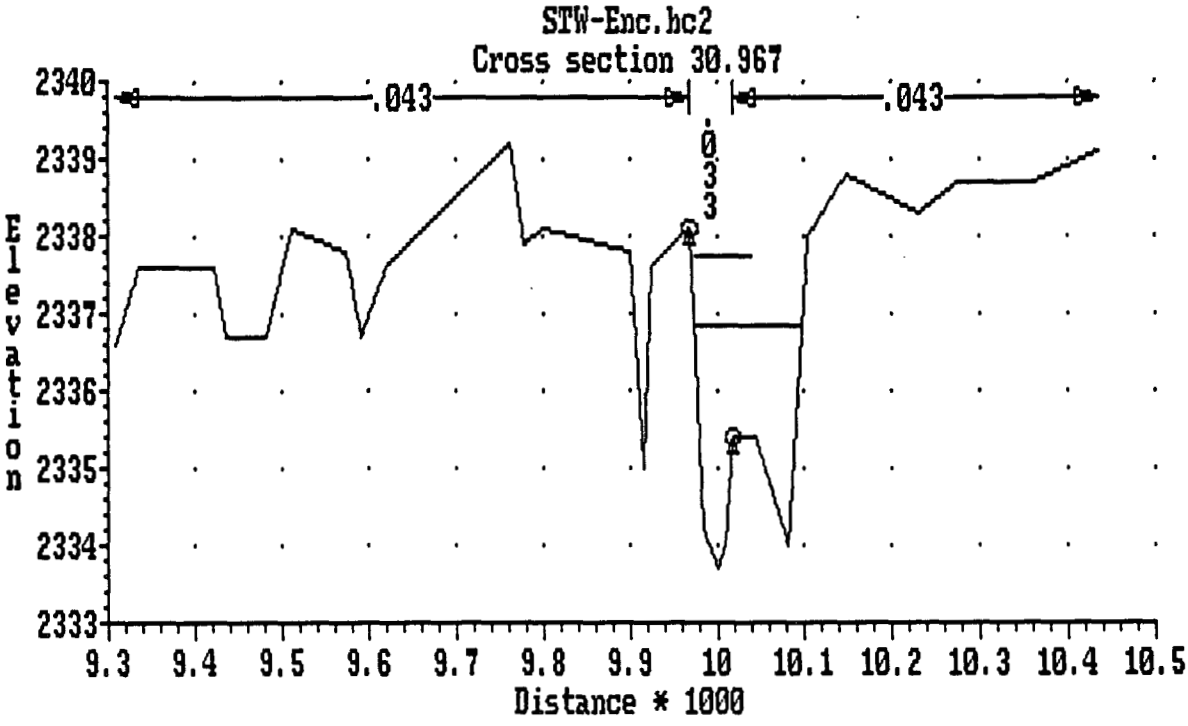

STW-Enc.hc2
Cross section 30.486
.045
.035
.045
Elevation
2308
2306
2304
2302
2300
2298
2296
2294
9.24
9.36
9.48
9.6
9.72
9.84
9.96
10.08
10.2
10.32
10.44
10.56
10.68
Distance * 1000

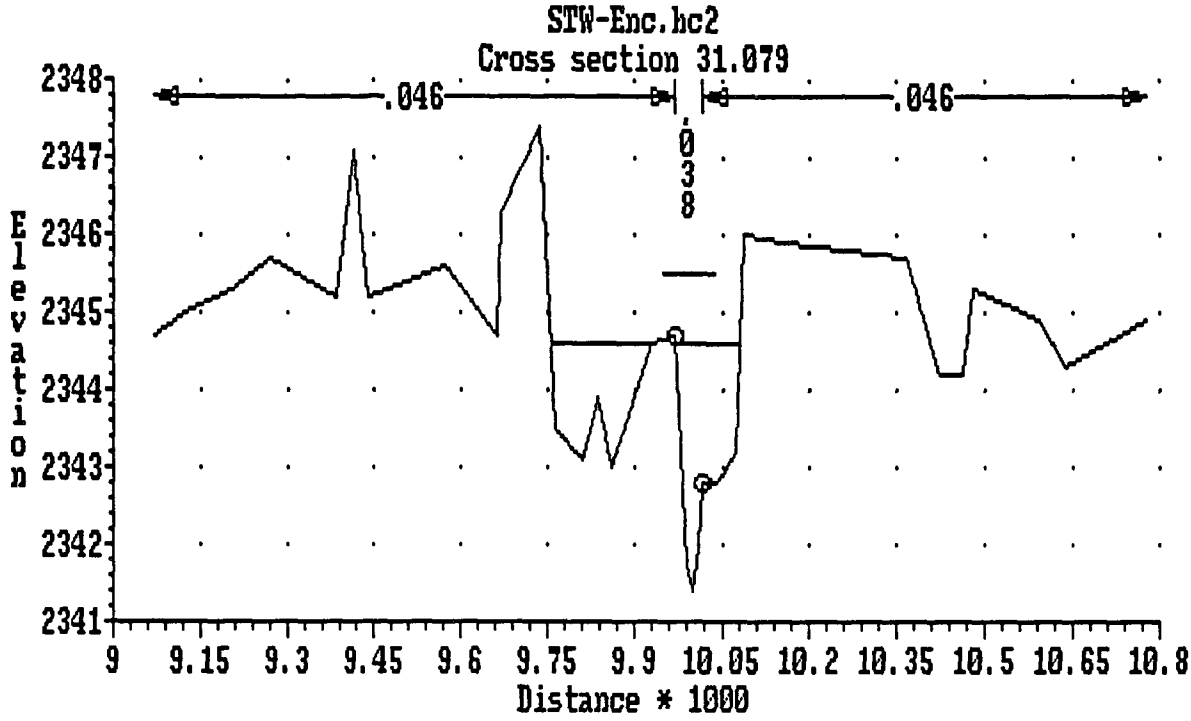

STW-Enc.hc2
Cross section 30.584
.043
.043
330.
Elevation
2320
2318
2316
2314
2312
2310
2308
2306
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
10.95
Distance * 1000

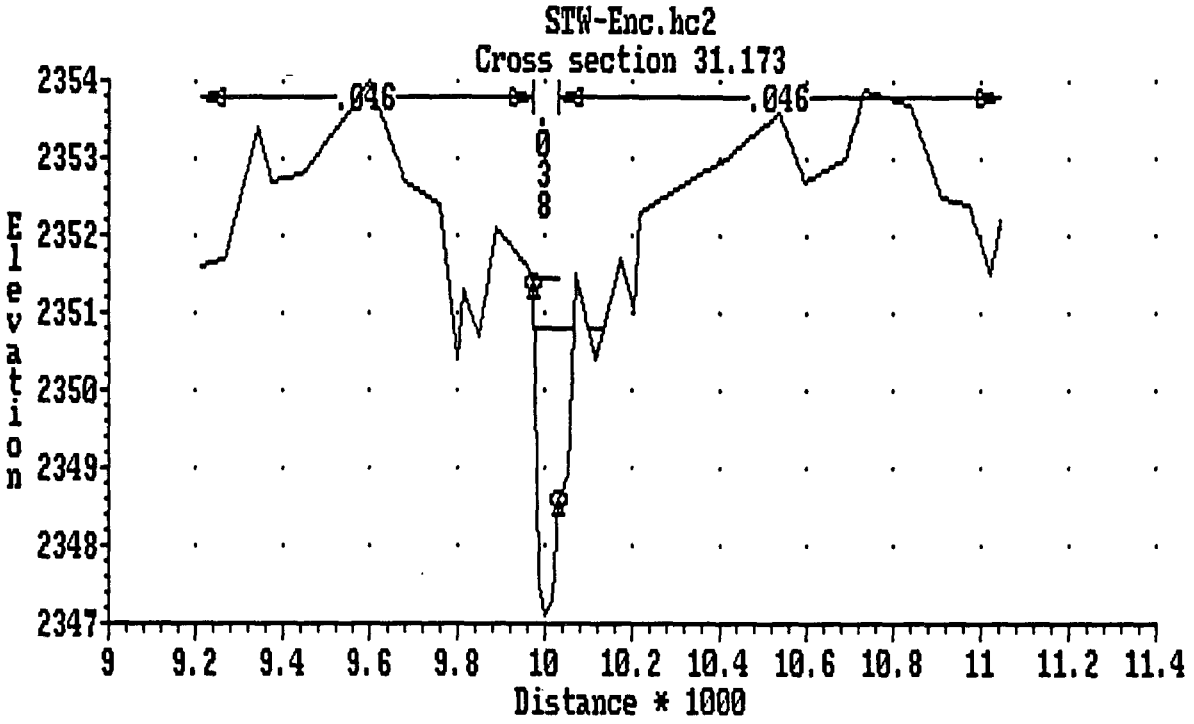

STW-Enc.hc2
Cross section 30.676
.043
.033
.043
Elevation
2326
2324
2322
2320
2318
2316
2314
2312
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
10.95
Distance * 1000

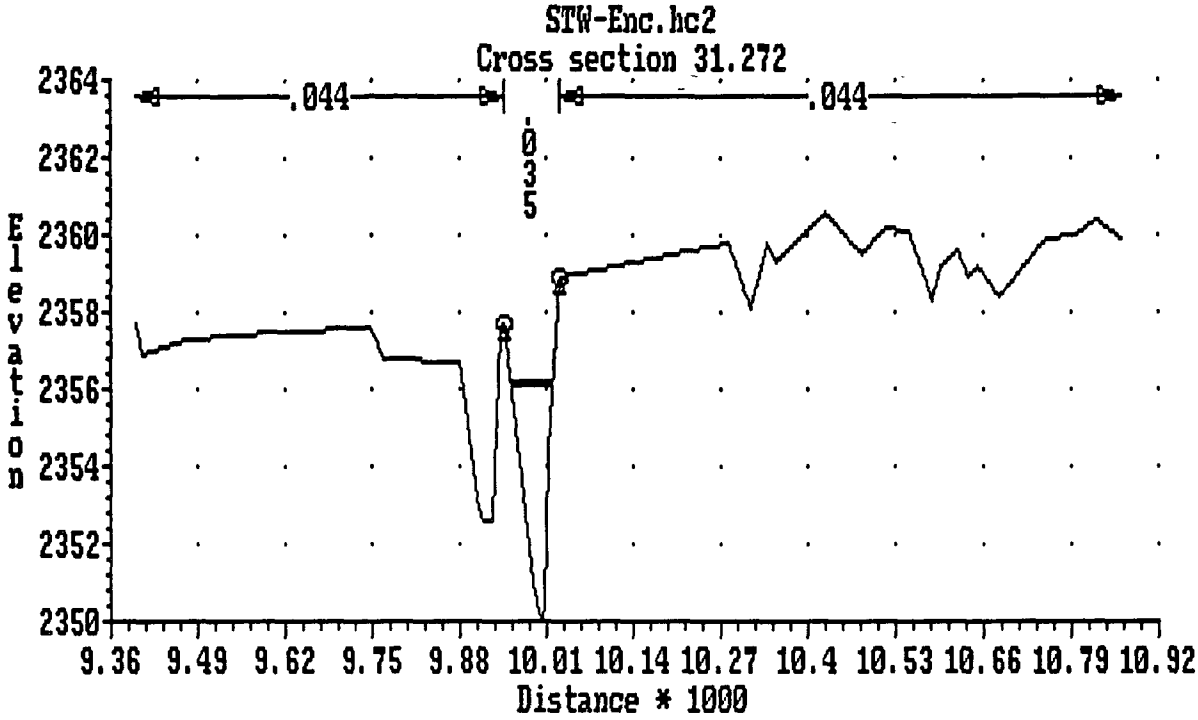

STW-Enc.hc2
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.043
.033
.043
Elevation
2334
2332
2330
2328
2326
2324
2322
2320
9.5
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
10.7
Distance * 1000

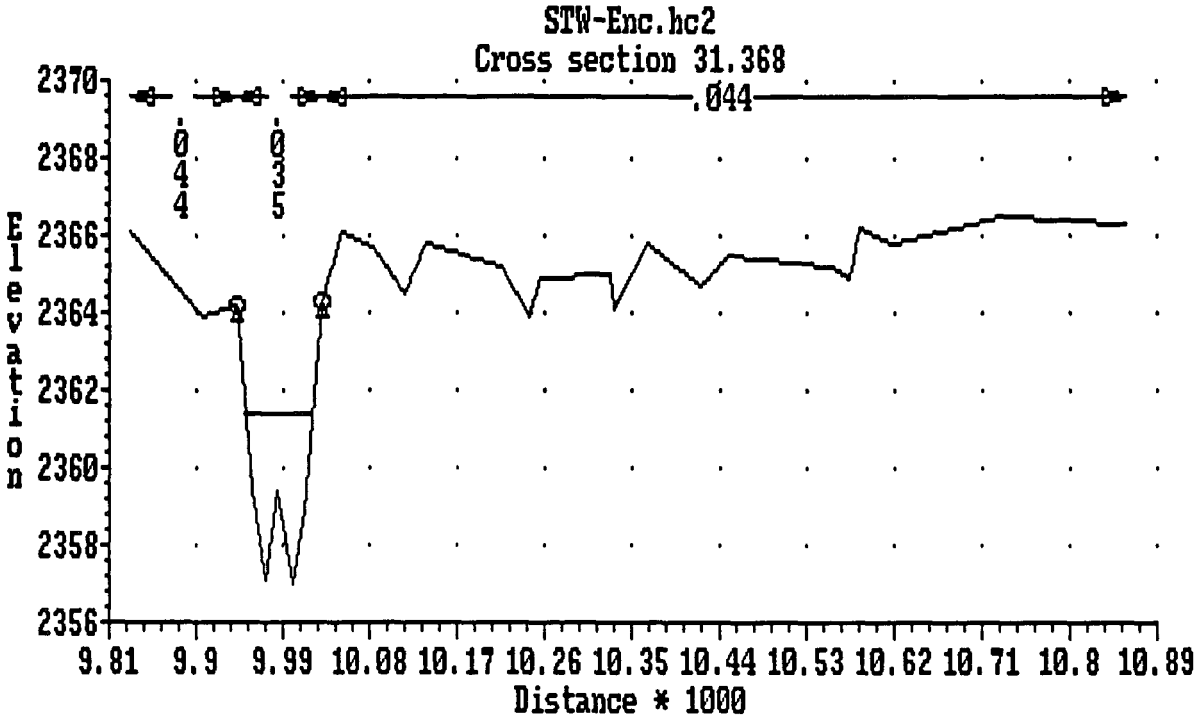

STW-Enc.hc2
Cross section 30.872
.043
.033
.043
Elevation
2333
2332
2331
2330
2329
2328
2327
2326
9.24 9.36 9.48 9.6 9.72 9.84 9.96 10.08 10.2 10.32 10.44 10.56 10.68
Distance * 1000

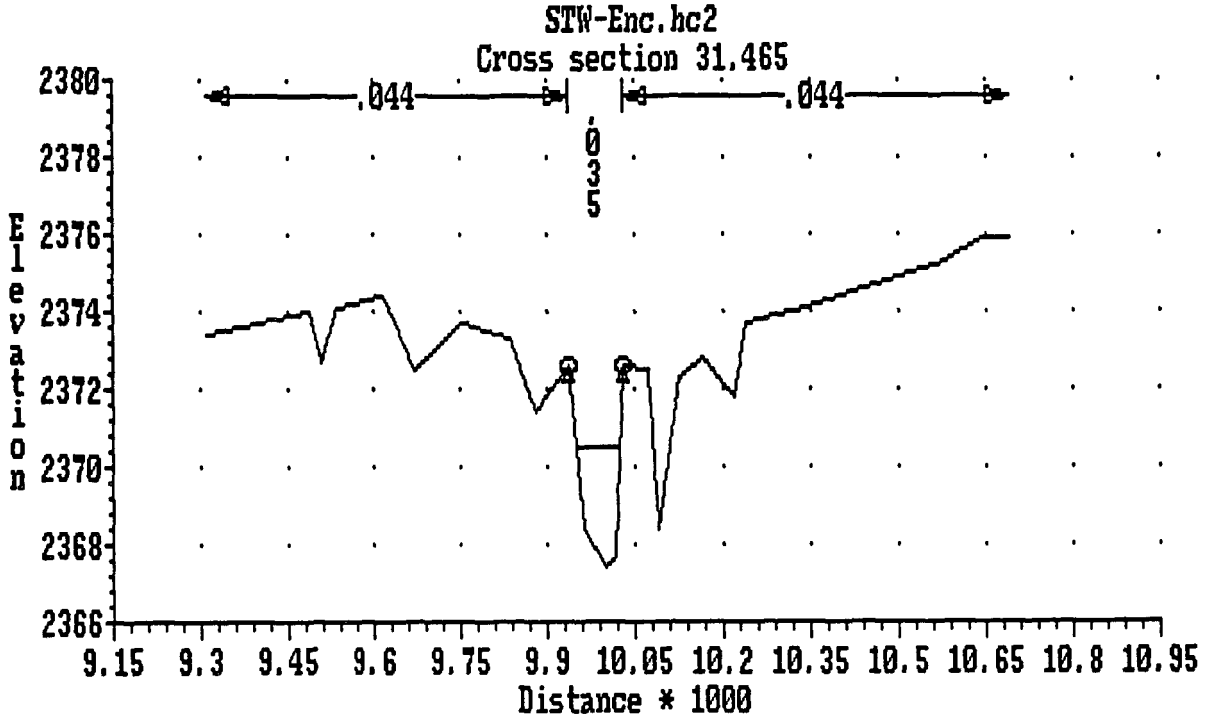

STW-Enc.hc2
Cross section 30.967
.043
.033
.043
Elevation
2340
2339
2338
2337
2336
2335
2334
2333
9.3
9.4
9.5
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
Distance * 1000

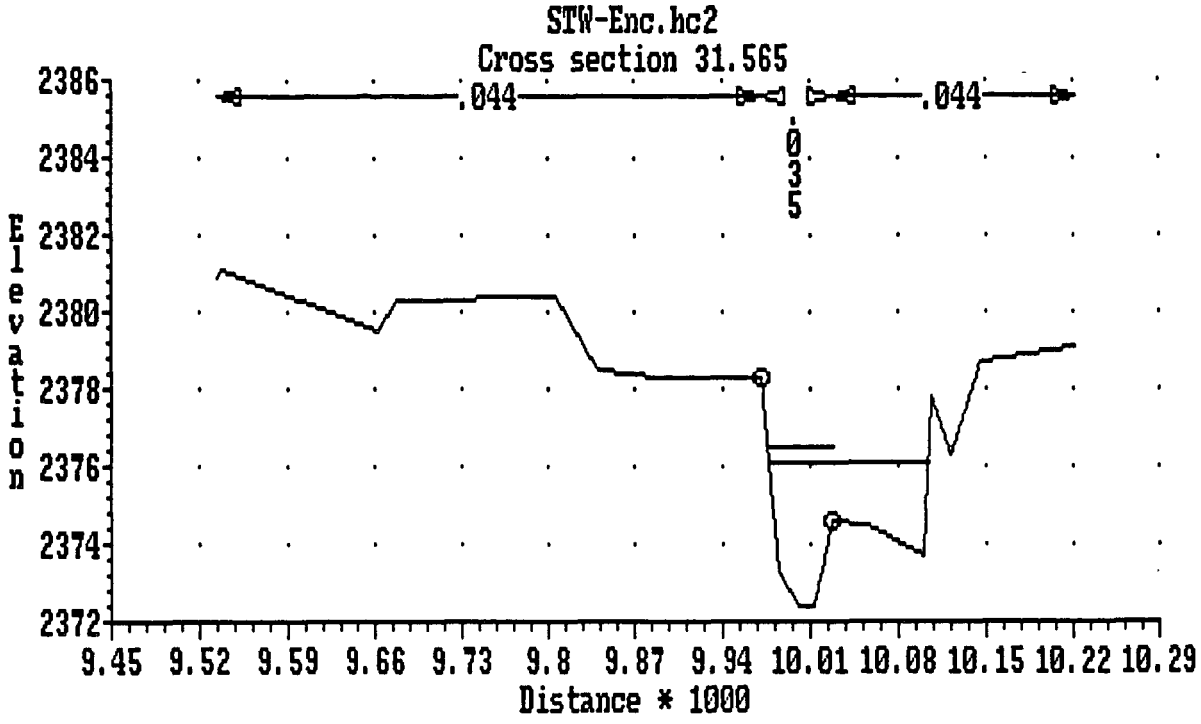

STW-Enc.hc2
Cross section 31.079
.046
.038
.046
Elevation
2348
2347
2346
2345
2344
2343
2342
2341
9
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
Distance * 1000

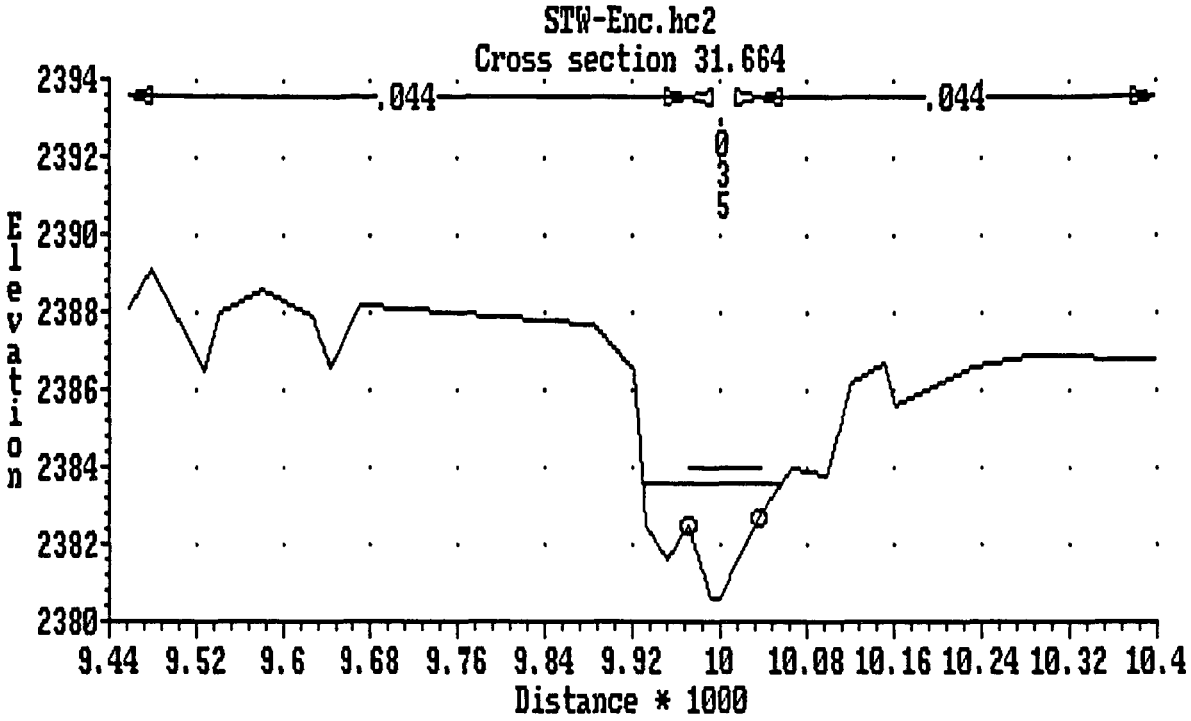

STW-Enc.hc2
Cross section 31.173
.046
.038
.046
Elevation
2354
2353
2352
2351
2350
2349
2348
2347
9
9.2
9.4
9.6
9.8
10
10.2
10.4
10.6
10.8
11
11.2
11.4
Distance * 1000

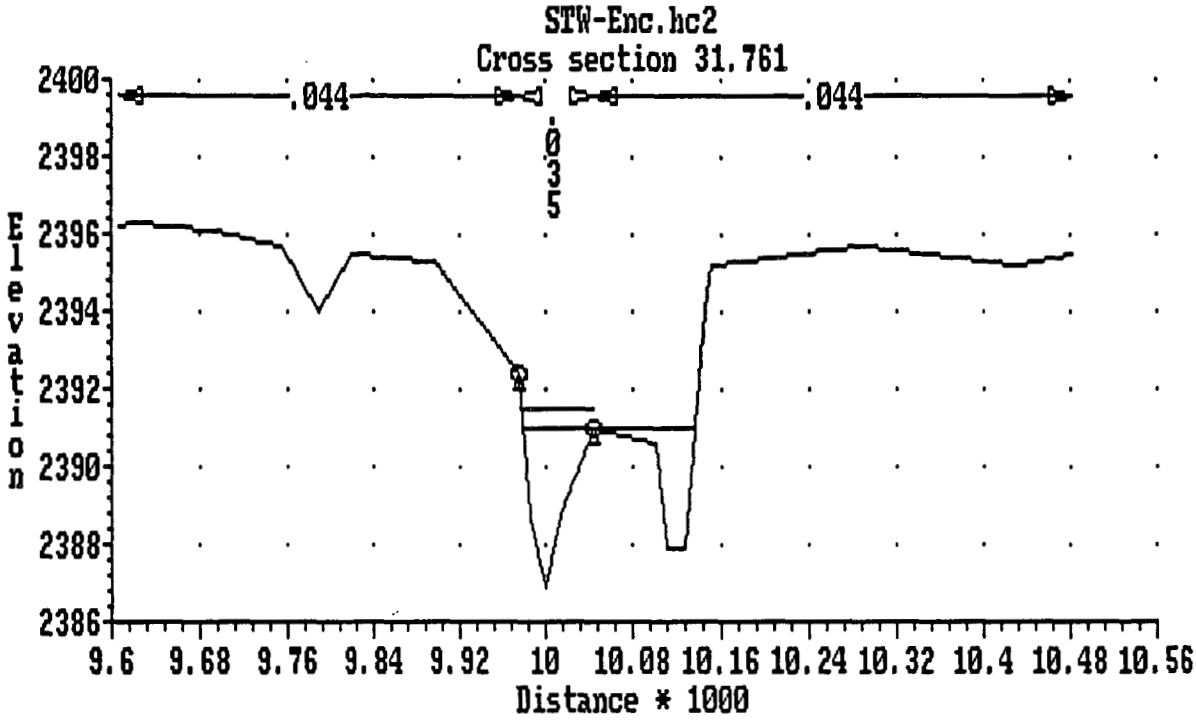

STW-Enc.hc2
Cross section 31.272
.044
.044
.035
Elevation
2364
2362
2360
2358
2356
2354
2352
2350
9.36
9.49
9.62
9.75
9.88
10.01
10.14
10.27
10.4
10.53
10.66
10.79
10.92
Distance * 1000

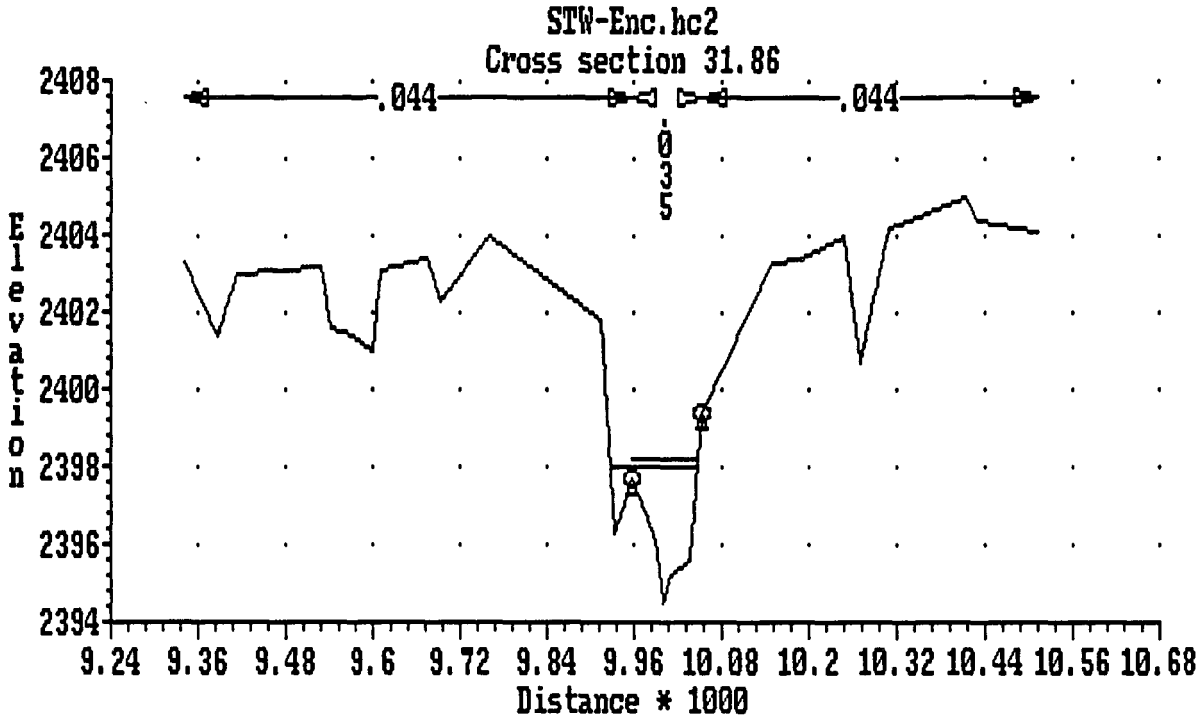

STW-Enc.hc2
Cross section 31.368
.044
.044
.035
Elevation
2370
2368
2366
2364
2362
2360
2358
2356
9.81
9.9
9.99
10.08
10.17
10.26
10.35
10.44
10.53
10.62
10.71
10.8
10.89
Distance * 1000

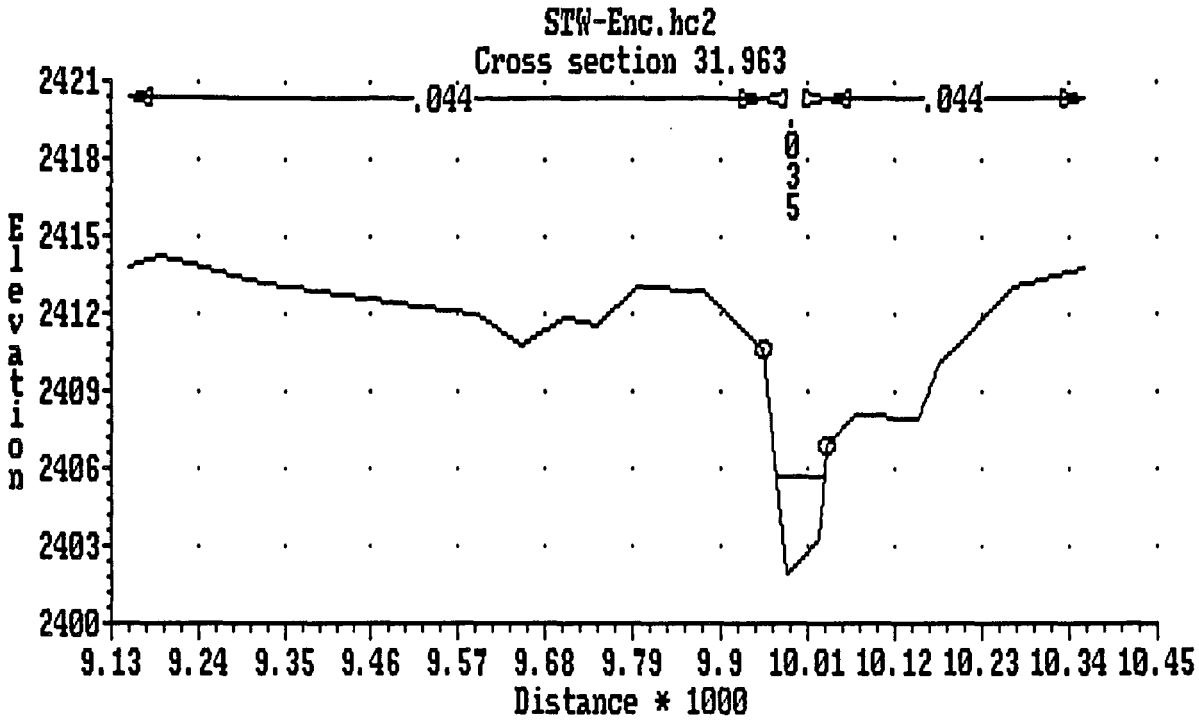

STW-Enc.hc2
Cross section 31.465
.044
.035
.044
Elevation
2380
2378
2376
2374
2372
2370
2368
2366
9.15
9.3
9.45
9.6
9.75
9.9
10.05
10.2
10.35
10.5
10.65
10.8
10.95
Distance * 1000


STW-Enc.hc2
Cross section 31.565
.044
.035
.044
Elevation
2386
2384
2382
2380
2378
2376
2374
2372
9.45
9.52
9.59
9.66
9.73
9.8
9.87
9.94
10.01
10.08
10.15
10.22
10.29
Distance * 1000


STW-Enc.hc2
Cross section 31.664
.044
.035
.044
Elevation
2394
2392
2390
2388
2386
2384
2382
2380
9.44
9.52
9.6
9.68
9.76
9.84
9.92
10
10.08
10.16
10.24
10.32
10.4
Distance * 1000


STW-Enc.hc2
Cross section 31.761
.044
.035
.044
2400
2398
2396
2394
2392
2390
2388
2386
Elevation
9.6
9.68
9.76
9.84
9.92
10
10.08
10.16
10.24
10.32
10.4
10.48
10.56
Distance * 1000


STW-Enc.hc2
Cross section 31.86
.044
.044
0.035
Elevation
2408
2406
2404
2402
2400
2398
2396
2394
9.24
9.36
9.48
9.6
9.72
9.84
9.96
10.08
10.2
10.32
10.44
10.56
10.68
Distance * 1000


STW-Enc.hc2
Cross section 31.963
.044
.044
.035
Elevation
2421
2418
2415
2412
2409
2406
2403
2400
9.13
9.24
9.35
9.46
9.57
9.68
9.79
9.9
10.01
10.12
10.23
10.34
10.45
Distance * 1000

SUBJECT Tropicana Wash FIS
Split flow over Flamingo Road

BY HMA DATE 8/21/92
SHEET NO. 1 OF 1
PROJECT NO. RDO 33832

Goal - model stormwater that is lost down Flamingo road as the road is overtopped

SF

TN Split flow at Flamingo Rd., road x-section is weir

NS: NWPL = 5

DSSNO = 60.135

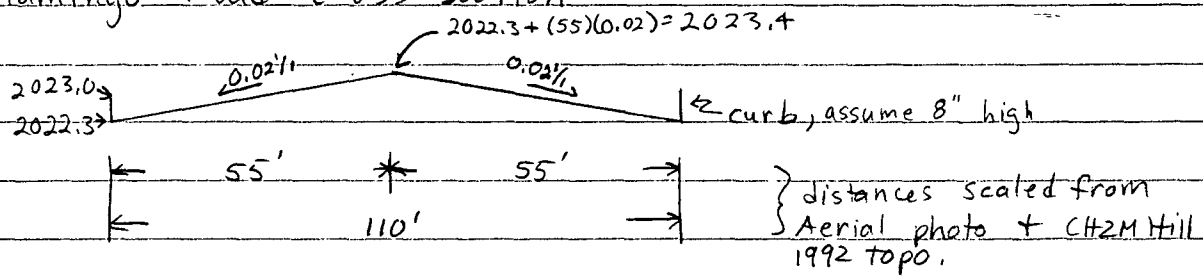
USSNO = 60.171

SNOFR = -1

XNVND = 0.015 for pavement

SLOPND = slope of road
= 4'/675'
= 0.00593 1/1

NG Flamingo Road cross-section:



STA., EL.; 0, 2023.0; 0.01, 2022.3; 55, 2023.4; 110, 2022.3; 110.01, 2023.0

CH2M HILL

SUBJECT Tropicana Wash F.I.S. Discharge through Culvert @ Paradise

BY HMA DATE 8/3/92

SHEET NO. 1 OF 4

PROJECT NO. RDD 33832

Calculate the amount of discharge that will go through the culvert and over paradise road.

- Culvert analysis will be performed using FHWA program HY-8, (file = Paradise.Inp)
- Discharge into culvert = 5300 cfs

- culvert = 10 - 10'w x 4.1' H boxes
  - length = (60.705* - 60.492*)(5280) = 1,125 ft (CH2M Hill topo, 1992)
  - slope = (2042.6 - 2032.1±)/1125 = 0.0094 ft/ft "
  - * section number
- inlet = conventional
  - headwall = 1:1 bevel
  - wingwall = 0° flare

tailwater channel
- width = 120' ±
- geom = rectangular
- slope = 8'/900' = 0.0082
- n = 0.025 (vegetation in concrete channel)

Roadway (From topo, assume railing doesn't affect flow)

x	y
150	2047.4
550	2048.0
1035.0	2049.4

- width = 80'

Results: @ 5300 cfs, 3430 cfs went through culvert and 1870 cfs went over the road. Water Surface Elev. = 2048.9

CURRENT DATE: 08-21-1992
CURRENT TIME: 15:25:18

FILE DATE: 08-03-1992
FILE NAME: PARADISE

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 3.2 **********
****

CULV #	SITE DATA: INLET ELEV. (FT)	SITE DATA: OUTLET ELEV. (FT)	SITE DATA: CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	2042.60	2032.10	1125.05	%10 RCB	10.00	4.10	.012	CONVENTIONA
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (CFS) FILE: PARADISE DATE: 08-03-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
2042.60	0	0	0	0	0	0	0	0	1
2044.21	530	530	0	0	0	0	0	0	1
2045.13	1060	1060	0	0	0	0	0	0	1
2045.91	1590	1590	0	0	0	0	0	0	1
2046.51	2000	2000	0	0	0	0	0	0	1
2047.49	2650	2648	0	0	0	0	0	2	2
2047.99	3180	2948	0	0	0	0	0	215	4
2048.29	3710	3115	0	0	0	0	0	583	4
2048.52	4240	3240	0	0	0	0	0	989	4
2048.70	4770	3341	0	0	0	0	0	1394	3
2048.87	5300	3429	0	0	0	0	0	1870 ~~1834~~*	3
2047.40	2587	2587	0	0	0	0	0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: PARADISE DATE: 08-03-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
2042.60	0.00	0	0	0.00
2044.21	0.00	530	0	0.00
2045.13	0.00	1060	0	0.00
2045.91	0.00	1590	0	0.00
2046.51	0.00	2000	0	0.00
2047.49	-0.00	2650	0	0.00
2047.99	-0.01	3180	17	0.52
2048.29	-0.00	3710	12	0.34
2048.52	-0.00	4240	11	0.26
2048.70	-0.01	4770	35	0.74
2048.87	-0.01	5300	37	0.69

****

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

****

for Q over road use 5300 - 3430 = 1870 cfs

CURRENT DATE: 08-21-1992 FILE DATE: 08-03-1992
CURRENT TIME: 15:25:18 FILE NAME: PARADISE

****
********** CULVERT # 1 **********
****

PERFORMANCE CURVE FOR 10 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2042.60	2032.10	0.00	-10.50	0-NF	0.00	2042.60	0.00	0.00
530	2044.21	2032.99	1.61	-7.85	6-FF	0.00	0.00	0.00	8.49
1060	2045.13	2033.46	2.53	-7.22	6-FF	0.00	0.00	0.00	10.72
1590	2045.91	2033.84	3.31	-6.39	6-FF	0.00	0.00	0.00	12.27
2000	2046.51	2034.10	3.91	-5.61	6-FF	0.00	0.00	0.00	13.29
2648	2047.49	2034.47	4.89	-4.10	6-FF	0.00	0.00	0.00	14.57
2948	2047.99	2034.75	5.39	-3.29	6-FF	0.00	0.00	0.00	15.08
3115	2048.28	2035.01	5.68	-2.81	6-FF	0.00	0.00	0.00	15.33
3240	2048.51	2035.26	5.91	-2.44	6-FF	0.00	0.00	0.00	15.53
3341	2048.70	2035.49	6.10	-2.12	6-FF	0.00	0.00	0.00	15.69
3429	2048.87	2035.72	6.27	-1.84	6-FF	0.00	0.00	0.00	15.49

El. inlet face invert 2042.60 ft El. outlet invert 2032.10 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)	2042.60
OUTLET STATION (FT)	1125.00
OUTLET ELEVATION (FT)	2032.10
NUMBER OF BARRELS	10.00
SLOPE (V-FT/H-FT)	0.0093
CULVERT LENGTH ALONG SLOPE (FT)	1125.05

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	4.10 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (0 DEG. FLARE)
INLET DEPRESSION	NONE

****

CURRENT DATE: 08-21-1992
CURRENT TIME: 15:25:18

FILE DATE: 08-03-1992
FILE NAME: PARADISE

****
********** TAILWATER **********
****

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	120.00
SIDE SLOPE H/V (X:1)	0.0
CHANNEL SLOPE V/H (FT/FT)	0.008
MANNING'S N (.01-0.1)	0.025
CHANNEL INVERT ELEVATION (FT)	2032.10
CULVERT NO.1 OUTLET INVERT ELEVATION	2032.10 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
0.00	2032.10	0.000	0.00	0.00
530.00	2032.99	0.922	4.94	0.46
1060.00	2033.46	0.983	6.50	0.69
1590.00	2033.84	1.020	7.63	0.89
2000.00	2034.10	1.041	8.35	1.02
2650.00	2034.47	1.067	9.32	1.21
3180.00	2034.75	1.084	10.01	1.36
3710.00	2035.01	1.098	10.63	1.49
4240.00	2035.26	1.110	11.19	1.62
4770.00	2035.49	1.121	11.72	1.74
5300.00	2035.72	1.130	12.20	1.85

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE		PAVED
EMBANKMENT TOP WIDTH (FT)		80.00

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	150.00	2047.40
2	550.00	2048.00
3	1035.00	2049.40

****

EXHIBIT 6-4

CULVERT RATINGS/SPLIT FLOW ANALYSES

CH2MHILL

SUBJECT Tropicana Wash
I-15 Box Culvert Rating

BY HMA DATE 7/16/92
SHEET NO. 1 OF 19
PROJECT NO. BOD33832

Goal: Find out how much flow goes through culvert and how much overtops road under existing conditions when total Q = 5100 cfs
- culvert analysis performed using F.H.W.A. program HY-8

Procedure:

1) Input culvert info derived from field notes and photos and CH2M Hill 1992 topo (see attached sheets)
e.g. culvert shape, size, material, inlet type

note:
- inlet invert elev. estimated from topo = 2139
- assume inlet control therefore culvert length set at 1000'
- assume culvert slope = 0.005 ft/ft, therefore outlet invert elev. = 2139 - (1000)(0.005) = 2134

2) Input tailwater channel
- assume inlet control so entered channel that was large enough to prevent backwater.

3) Input Roadway section (re: weir) that will be overtopped.
- stations and elevations derived from CH2M Hill 1992 topo.
- 2 roadway situations were analyzed:
  1) without Jersey Barrier at edge of road
  2) with " " " " " " (today)

4) With above info. entered, duplicate the culvert rating found from an earlier study*. In this study, when the Total Q = 5100 cfs, 2900 cfs was found to go through the culvert. Also, there was not a Jersey

*MGM Grand Culvert Hydraulics Study

FORM 38

barrier on the road when this study was done.

It was found that by treating the 4 barrel box culvert as 4 individual one-barrel box culverts, 2900 cfs went through the culverts when the total Q (Q through culvert + Q over road) = 5100 cfs and no barrier was in place. (see following report for file I15C-4B)

5) Then, using the same culvert set up, a 2½ foot high barrier was placed on the road thus raising the headwater elevation by 2½ ft. In this scenario, 3324 cfs went through the culverts when the total Q = 5100 cfs (see following report for file I15CJ-4B)

The water surface elevation for the above was 2154.7. This was used as the starting water surface elevation for the portion of Tropicana wash between I15 and UPRR.

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures: Just Downstream of Industrial Road

Field Data:

1. Structure Location: @ Inlet to Loooooooong Culvert
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet Not on this one page took 3 total
4. Survey structure yes TBM Nail in headwall 75' U.S. of Inlet
5. Culvert type Concrete Box length LONG
6. Inlet type square wing walls
7. Inlet conditions New Trash Racks @ Inlet
8. Signs of Erosion? NO
9. Signs of Deposition? Not yet ?
10. Obstructions which could cause backwater? Trash Racks
11. Skew angle ?
12. Pier description square nose
13. Comments _____

Date_____ by_____

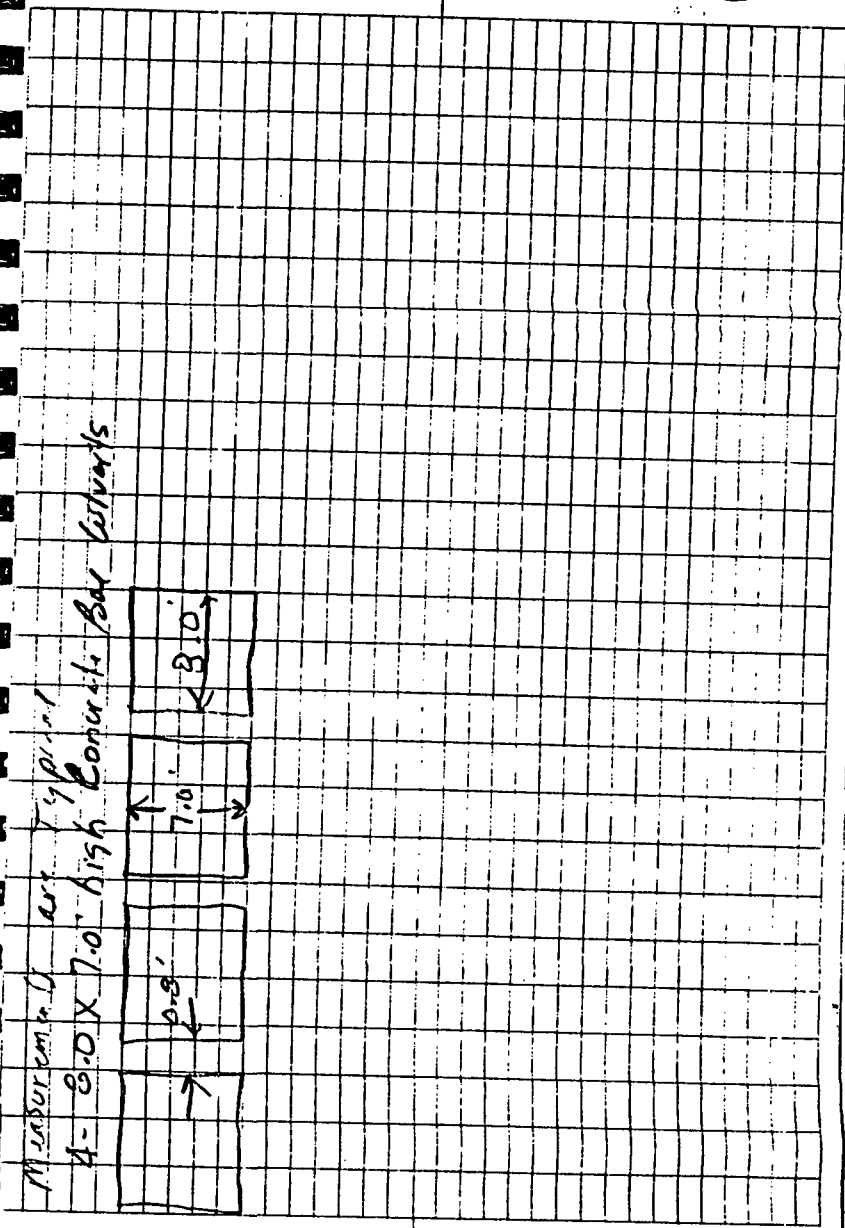
Tropicana wash @ U.S edge 3 m. l.c long
Culvert - @ Industrial

TBM - Nail in headwall of 3.0'
Culvert on D.S. side of Industrial
& in Tropicana wash.
elevation is Painted 2145.14

H.I. 3.41' above TBM

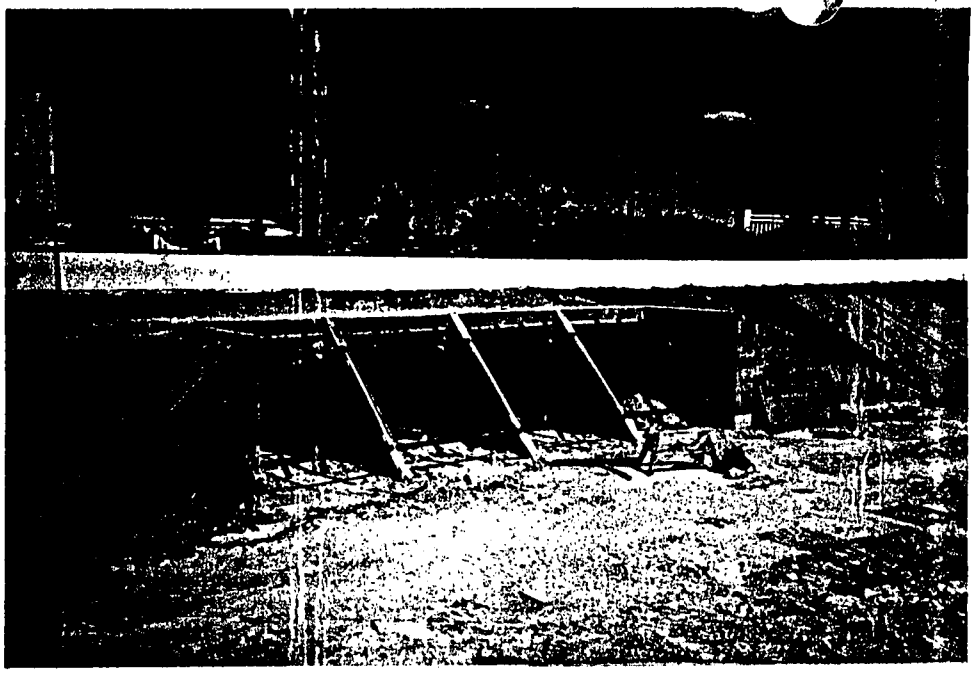
Invert U.S. Left side	9.0
Low Chord U.S. Left side	2.0
Invert U.S. Right side	9.0
Low Chord - Right side U.S	2.0

4 Concrete Box Culverts
8.0' wide x 7.0' high





INLET TO LONG CULVERT LOOKING SOUTH ALONG I-15



INLET TO LONG CULVERT.



LOOKING Upstream (WEST) ON the upstream side of long Culvert

Sheet 5 of 14

Box Culvert under I-15
- no Jersey barrier on road

CURRENT DATE: 07-15-1992
CURRENT TIME: 20:48:45

FILE DATE: 07-15-1992
FILE NAME: I15C-4B

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 3.2 **********
****

CULV #	SITE DATA: INLET ELEV. (FT)	SITE DATA: OUTLET ELEV. (FT)	SITE DATA: CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	2139.00	2134.00	1000.01	1 RCB	8.00	7.00	.012	IMPR SDT REC
2	2139.00	2134.00	1000.01	1 RCB	8.00	7.00	.012	IMPR SDT REC
3	2139.00	2134.00	1000.01	1 RCB	8.00	7.00	.012	IMPR SDT REC
4	2139.00	2134.00	1000.01	1 RCB	8.00	7.00	.012	IMPR SDT REC
5								
6								

****

SUMMARY OF CULVERT FLOWS (CFS) FILE: I15C-4B DATE: 07-15-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
2139.00	0	0	0	0	0	0	0	0	0
2142.54	510	127	127	127	127	0	0	0	6
2144.62	1020	255	255	255	255	0	0	0	4
2146.95	1530	383	383	383	383	0	0	0	4
2148.58	2040	510	510	510	510	0	0	0	4
2150.48	2550	627	627	627	627	0	0	39	4
2151.04	2900	658	658	658	658	0	0	265	4
2151.62	3570	688	688	688	688	0	0	814	4
2151.93	4080	704	704	704	704	0	0	1260	4
2152.18	4590	716	716	716	716	0	0	1706	3
2152.41	5100	727 +	727 +	727 +	727 = 2908	0	0	2172	3
2150.00	2398	600	600	600	600	0	0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: I15C-4B DATE: 07-15-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
2139.00	0.00	0	0	0.00
2142.54	-0.00	510	0	0.02
2144.62	-0.00	1020	1	0.08
2146.95	0.00	1530	-1	-0.07
2148.58	0.00	2040	-1	-0.05
2150.48	-0.00	2550	2	0.06
2151.04	-0.00	2900	5	0.17
2151.62	-0.00	3570	3	0.09
2151.93	-0.00	4080	4	0.10
2152.18	-0.01	4590	19	0.42
2152.41	-0.01	5100	19	0.38

****

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

****

CU NT DATE: 07-15-1992
NT TIME: 20:48:45

FILE DATE: 07-15-1992
FILE NAME: I15C-4B

****
********** CULVERT # 1 **********
****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2139.00	2133.00	0.00	-5.00	0-NF	0.00	2139.00	2139.00	0.00
127	2142.55	2135.18	3.55	-0.28	6-FF	0.00	2142.55	2141.98	9.57
255	2144.63	2136.30	5.63	0.99	6-FF	0.00	2144.63	2143.71	12.01
383	2146.96	2137.21	7.96	2.62	6-FF	0.00	2146.96	2145.20	13.40
510	2148.58	2138.00	9.58	4.65	6-FF	0.00	2148.58	2146.52	14.41
627	2150.48	2138.71	11.48	6.87	6-FF	0.00	2150.48	2147.67	15.11
658	2151.03	2139.17	12.03	7.51	6-FF	0.00	2151.03	2147.96	15.31
688	2151.62	2139.97	12.62	8.18	6-FF	0.00	2151.62	2148.26	15.30
704	2151.93	2140.54	12.93	8.53	6-FF	0.00	2151.93	2148.42	15.50
716	2152.18	2141.08	13.18	9.24	4-FF	0.00	2152.18	2148.54	12.79
727	2152.40	2141.60	13.40	9.98	4-FF	0.00	2152.40	2148.64	12.99

El. inlet face invert 2139.00 ft El. outlet invert 2134.00 ft
El. inlet throat invert 2139.00 ft El. inlet crest 0.00 ft

****

SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	2139.00
OUTLET STATION (FT)	1000.00
OUTLET ELEVATION (FT)	2134.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0050
CULVERT LENGTH ALONG SLOPE (FT)	1000.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	7.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	IMPR SDT RECT
INLET EDGE AND WALL	BEVELED EDGE TOP (15-26 DEG WINGWALL)
INLET DEPRESSION	NONE

***** SIDE-TAPERED RECTANGULAR IMPROVED INLET ***

FACE WIDTH	8.00 FT
SIDE TAPER (4:1 TO 6:1) (X:1)	6.00

****

CLIENT DATE: 07-15-1992
CLIENT TIME: 20:48:45

FILE DATE: 07-15-1992
FILE NAME: I15C-4B

****
********** CULVERT # 2 **********
****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2139.00	2133.00	0.00	-5.00	0-NF	0.00	2139.00	2139.00	0.00
127	2142.55	2135.18	3.55	-0.28	6-FF	0.00	2142.55	2141.98	9.57
255	2144.63	2136.30	5.63	0.99	6-FF	0.00	2144.63	2143.71	12.01
383	2146.96	2137.21	7.96	2.62	6-FF	0.00	2146.96	2145.20	13.40
510	2148.58	2138.00	9.58	4.65	6-FF	0.00	2148.58	2146.52	14.41
627	2150.48	2138.71	11.48	6.87	6-FF	0.00	2150.48	2147.67	15.11
658	2151.03	2139.17	12.03	7.51	6-FF	0.00	2151.03	2147.96	15.31
688	2151.62	2139.97	12.62	8.18	6-FF	0.00	2151.62	2148.26	15.30
704	2151.93	2140.54	12.93	8.53	6-FF	0.00	2151.93	2148.42	15.50
716	2152.18	2141.08	13.18	9.24	4-FF	0.00	2152.18	2148.54	12.79
727	2152.40	2141.60	13.40	9.98	4-FF	0.00	2152.40	2148.64	12.99

El. inlet face invert 2139.00 ft El. outlet invert 2134.00 ft
El. inlet throat invert 2139.00 ft El. inlet crest 0.00 ft

****

* SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	2139.00
OUTLET STATION (FT)	1000.00
OUTLET ELEVATION (FT)	2134.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0050
CULVERT LENGTH ALONG SLOPE (FT)	1000.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	7.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	IMPR SDT RECT
INLET EDGE AND WALL	BEVELED EDGE TOP (15-26 DEG WINGWALL)
INLET DEPRESSION	NONE

***** SIDE-TAPERED RECTANGULAR IMPROVED INLET ***

FACE WIDTH	8.00 FT
SIDE TAPER (4:1 TO 6:1) (X:1)	6.00

****

NT DATE: 07-15-1992 FILE DATE: 07-15-1992
NT TIME: 20:48:45 FILE NAME: I15C-4B

****
********** CULVERT # 3 **********
****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2139.00	2133.00	0.00	-5.00	0-NF	0.00	2139.00	2139.00	0.00
127	2142.55	2135.18	3.55	-0.28	6-FF	0.00	2142.55	2141.98	9.57
255	2144.63	2136.30	5.63	0.99	6-FF	0.00	2144.63	2143.71	12.01
383	2146.96	2137.21	7.96	2.62	6-FF	0.00	2146.96	2145.20	13.40
510	2148.58	2138.00	9.58	4.65	6-FF	0.00	2148.58	2146.52	14.41
627	2150.48	2138.71	11.48	6.87	6-FF	0.00	2150.48	2147.67	15.11
658	2151.03	2139.17	12.03	7.51	6-FF	0.00	2151.03	2147.96	15.31
688	2151.62	2139.97	12.62	8.18	6-FF	0.00	2151.62	2148.26	15.30
704	2151.93	2140.54	12.93	8.53	6-FF	0.00	2151.93	2148.42	15.50
716	2152.18	2141.08	13.18	9.24	4-FF	0.00	2152.18	2148.54	12.79
727	2152.40	2141.60	13.40	9.98	4-FF	0.00	2152.40	2148.64	12.99

El. inlet face invert 2139.00 ft El. outlet invert 2134.00 ft
El. inlet throat invert 2139.00 ft El. inlet crest 0.00 ft

****

SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	2139.00
OUTLET STATION (FT)	1000.00
OUTLET ELEVATION (FT)	2134.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0050
CULVERT LENGTH ALONG SLOPE (FT)	1000.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	7.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	IMPR SDT RECT
INLET EDGE AND WALL	BEVELED EDGE TOP (15-26 DEG WINGWALL)
INLET DEPRESSION	NONE

***** SIDE-TAPERED RECTANGULAR IMPROVED INLET ***

FACE WIDTH	8.00 FT
SIDE TAPER (4:1 TO 6:1) (X:1)	6.00

****

CURRENT DATE: 07-15-1992
CURRENT TIME: 20:48:45

FILE DATE: 07-15-1992
FILE NAME: I15C-4B

****
********** CULVERT # 4 **********
****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2139.00	2133.00	0.00	-5.00	0-NF	0.00	2139.00	2139.00	0.00
127	2142.55	2135.18	3.55	-0.28	6-FF	0.00	2142.55	2141.98	9.57
255	2144.63	2136.30	5.63	0.99	6-FF	0.00	2144.63	2143.71	12.01
383	2146.96	2137.21	7.96	2.62	6-FF	0.00	2146.96	2145.20	13.40
510	2148.58	2138.00	9.58	4.65	6-FF	0.00	2148.58	2146.52	14.41
627	2150.48	2138.71	11.48	6.87	6-FF	0.00	2150.48	2147.67	15.11
658	2151.03	2139.17	12.03	7.51	6-FF	0.00	2151.03	2147.96	15.31
688	2151.62	2139.97	12.62	8.18	6-FF	0.00	2151.62	2148.26	15.30
704	2151.93	2140.54	12.93	8.53	6-FF	0.00	2151.93	2148.42	15.50
716	2152.18	2141.08	13.18	9.24	4-FF	0.00	2152.18	2148.54	12.79
727	2152.40	2141.60	13.40	9.98	4-FF	0.00	2152.40	2148.64	12.99

El. inlet face invert 2139.00 ft El. outlet invert 2134.00 ft
El. inlet throat invert 2139.00 ft El. inlet crest 0.00 ft

****

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	2139.00
OUTLET STATION (FT)	1000.00
OUTLET ELEVATION (FT)	2134.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0050
CULVERT LENGTH ALONG SLOPE (FT)	1000.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	7.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	IMPR SDT RECT
INLET EDGE AND WALL	BEVELED EDGE TOP (15-26 DEG WINGWALL)
INLET DEPRESSION	NONE

***** SIDE-TAPERED RECTANGULAR IMPROVED INLET ***

FACE WIDTH	8.00 FT
SIDE TAPER (4:1 TO 6:1) (X:1)	6.00

****

CL NT DATE: 07-15-1992 FILE DATE: 07-15-1992
NT TIME: 20:48:45 FILE NAME: I15C-4B

****
********** TAILWATER **********
****

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	40.00
SIDE SLOPE H/V (X:1)	1.0
CHANNEL SLOPE V/H (FT/FT)	0.005
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	2133.00
CULVERT NO.1 OUTLET INVERT ELEVATION	2134.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
0.00	2133.00	0.000	0.00	0.00
510.00	2135.18	0.662	5.55	0.68
1020.00	2136.30	0.691	7.13	1.03
1530.00	2137.21	0.705	8.21	1.32
2040.00	2138.00	0.714	9.06	1.56
2550.00	2138.71	0.720	9.76	1.78
2900.00	2139.17	0.723	10.19	1.92
3570.00	2139.97	0.727	10.90	2.18
4080.00	2140.54	0.730	11.38	2.35
4590.00	2141.08	0.732	11.81	2.52
5100.00	2141.60	0.733	12.20	2.68

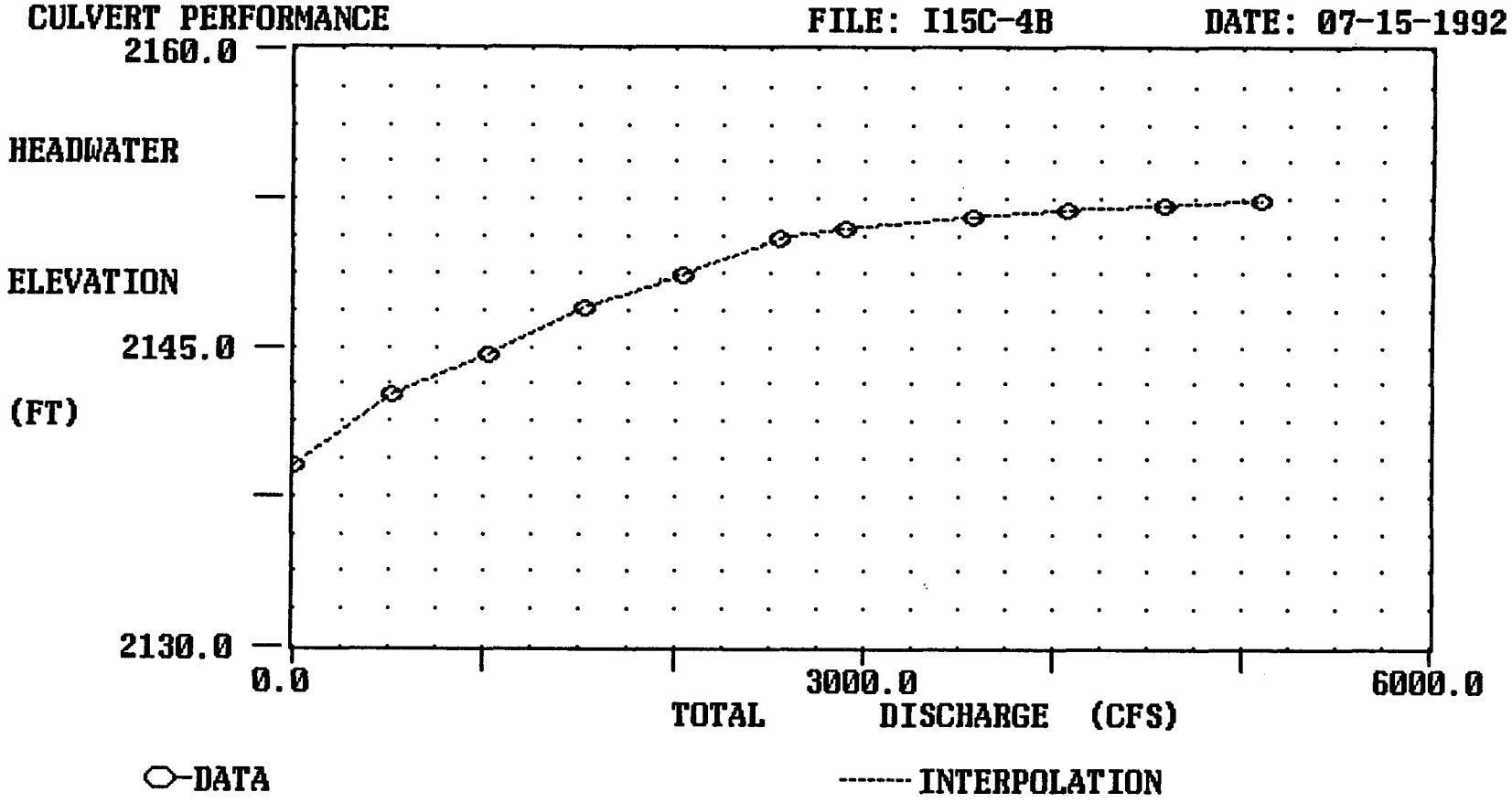
****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	100.00	2160.00
2	220.00	2156.00
3	390.00	2152.00
4	655.00	2150.00
5	790.00	2152.00
6	1000.00	2154.00
7	1160.00	2156.00

****


CULVERT PERFORMANCE
FILE: I15C-4B
DATE: 07-15-1992
2160.0
HEADWATER
ELEVATION
2145.0
(FT)
2130.0
0.0
3000.0
6000.0
TOTAL DISCHARGE (CFS)
DATA
INTERPOLATION

Box Culvert under I-15
- Jersey barrier on road

Sheet 13 of 14

CURRENT DATE: 07-15-1992
CURRENT TIME: 20:53:43

FILE DATE: 07-15-1992
FILE NAME: I15CJ-4B

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 3.2 **********
****

CULV #	SITE DATA: INLET ELEV. (FT)	SITE DATA: OUTLET ELEV. (FT)	SITE DATA: CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	2139.00	2134.00	1000.01	1 RCB	8.00	7.00	.012	IMPR SDT REC
2	2139.00	2134.00	1000.01	1 RCB	8.00	7.00	.012	IMPR SDT REC
3	2139.00	2134.00	1000.01	1 RCB	8.00	7.00	.012	IMPR SDT REC
4	2139.00	2134.00	1000.01	1 RCB	8.00	7.00	.012	IMPR SDT REC
5								
6								

****

SUMMARY OF CULVERT FLOWS (CFS) FILE: I15CJ-4B DATE: 07-15-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
2139.00	0	0	0	0	0	0	0	0	0
2142.54	510	127	127	127	127	0	0	0	6
2144.62	1020	255	255	255	255	0	0	0	4
2146.95	1530	383	383	383	383	0	0	0	4
2148.58	2040	510	510	510	510	0	0	0	4
2150.67	2550	638	638	638	638	0	0	0	4
2152.36	2900	725	725	725	725	0	0	0	3
2153.72	3570	788	788	788	788	0	0	409	5
2154.14	4080	807	807	807	807	0	0	848	4
2154.44	4590	820	820	820	820	0	0	1305	4
2154.69	5100	831 +	831 +	831 +	831 = 3324	0	0	1758	3
2152.50	2927	732	732	732	732	0	0	OVERTOPPING	

****

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: I15CJ-4B DATE: 07-15-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
2139.00	0.00	0	0	0.00
2142.54	-0.00	510	0	0.02
2144.62	-0.00	1020	1	0.08
2146.95	0.00	1530	-1	-0.07
2148.58	0.00	2040	-1	-0.05
2150.67	0.00	2550	-1	-0.03
2152.36	-0.00	2900	0	0.02
2153.72	-0.01	3570	7	0.20
2154.14	-0.00	4080	5	0.13
2154.44	-0.00	4590	5	0.10
2154.69	-0.01	5100	20	0.39

****

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

****

CURRENT DATE: 07-15-1992
CURRENT TIME: 20:53:43

FILE DATE: 07-15-1992
FILE NAME: I15CJ-4B

****
********** CULVERT # 1 **********
****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2139.00	2133.00	0.00	-5.00	0-NF	0.00	2139.00	2139.00	0.00
127	2142.55	2135.18	3.55	-0.28	6-FF	0.00	2142.55	2141.98	9.57
255	2144.63	2136.30	5.63	0.99	6-FF	0.00	2144.63	2143.71	12.01
383	2146.96	2137.21	7.96	2.62	6-FF	0.00	2146.96	2145.20	13.40
510	2148.58	2138.00	9.58	4.65	6-FF	0.00	2148.58	2146.52	14.41
638	2150.66	2138.71	11.66	7.09	6-FF	0.00	2150.66	2147.77	15.17
725	2152.35	2139.17	13.35	9.01	6-FF	0.00	2152.35	2148.62	15.60
788	2153.72	2139.97	14.72	10.53	6-FF	0.00	2153.72	2149.25	15.87
807	2154.14	2140.54	15.14	10.21	2-M2	0.00	2154.14	2149.43	14.78
820	2154.44	2141.08	15.44	11.46	4-FF	0.00	2154.44	2149.56	14.64
831	2154.69	2141.60	15.69	12.22	4-FF	0.00	2154.69	2149.67	14.83

El. inlet face invert 2139.00 ft El. outlet invert 2134.00 ft
El. inlet throat invert 2139.00 ft El. inlet crest 0.00 ft

****

* SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	2139.00
OUTLET STATION (FT)	1000.00
OUTLET ELEVATION (FT)	2134.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0050
CULVERT LENGTH ALONG SLOPE (FT)	1000.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	7.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	IMPR SDT RECT
INLET EDGE AND WALL	BEVELED EDGE TOP (15-26 DEG WINGWALL)
INLET DEPRESSION	NONE

***** SIDE-TAPERED RECTANGULAR IMPROVED INLET ***

FACE WIDTH	8.00 FT
SIDE TAPER (4:1 TO 6:1) (X:1)	6.00

****

CU NT DATE: 07-15-1992 FILE DATE: 07-15-1992
C NT TIME: 20:53:43 FILE NAME: I15CJ-4B

****
********** CULVERT # 2 **********
****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2139.00	2133.00	0.00	-5.00	0-NF	0.00	2139.00	2139.00	0.00
127	2142.55	2135.18	3.55	-0.28	6-FF	0.00	2142.55	2141.98	9.57
255	2144.63	2136.30	5.63	0.99	6-FF	0.00	2144.63	2143.71	12.01
383	2146.96	2137.21	7.96	2.62	6-FF	0.00	2146.96	2145.20	13.40
510	2148.58	2138.00	9.58	4.65	6-FF	0.00	2148.58	2146.52	14.41
638	2150.66	2138.71	11.66	7.09	6-FF	0.00	2150.66	2147.77	15.17
725	2152.35	2139.17	13.35	9.01	6-FF	0.00	2152.35	2148.62	15.60
788	2153.72	2139.97	14.72	10.53	6-FF	0.00	2153.72	2149.25	15.87
807	2154.14	2140.54	15.14	10.21	2-M2	0.00	2154.14	2149.43	14.78
820	2154.44	2141.08	15.44	11.46	4-FF	0.00	2154.44	2149.56	14.64
831	2154.69	2141.60	15.69	12.22	4-FF	0.00	2154.69	2149.67	14.83

El. inlet face invert 2139.00 ft El. outlet invert 2134.00 ft
El. inlet throat invert 2139.00 ft El. inlet crest 0.00 ft

****

* SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	2139.00
OUTLET STATION (FT)	1000.00
OUTLET ELEVATION (FT)	2134.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0050
CULVERT LENGTH ALONG SLOPE (FT)	1000.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	7.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	IMPR SDT RECT
INLET EDGE AND WALL	BEVELED EDGE TOP (15-26 DEG WINGWALL)
INLET DEPRESSION	NONE

***** SIDE-TAPERED RECTANGULAR IMPROVED INLET ***

FACE WIDTH	8.00 FT
SIDE TAPER (4:1 TO 6:1) (X:1)	6.00

****

CU NT DATE: 07-15-1992 FILE DATE: 07-15-1992
NT TIME: 20:53:43 FILE NAME: I15CJ-4B

****
********** CULVERT # 3 **********
****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2139.00	2133.00	0.00	-5.00	0-NF	0.00	2139.00	2139.00	0.00
127	2142.55	2135.18	3.55	-0.28	6-FF	0.00	2142.55	2141.98	9.57
255	2144.63	2136.30	5.63	0.99	6-FF	0.00	2144.63	2143.71	12.01
383	2146.96	2137.21	7.96	2.62	6-FF	0.00	2146.96	2145.20	13.40
510	2148.58	2138.00	9.58	4.65	6-FF	0.00	2148.58	2146.52	14.41
638	2150.66	2138.71	11.66	7.09	6-FF	0.00	2150.66	2147.77	15.17
725	2152.35	2139.17	13.35	9.01	6-FF	0.00	2152.35	2148.62	15.60
788	2153.72	2139.97	14.72	10.53	6-FF	0.00	2153.72	2149.25	15.87
807	2154.14	2140.54	15.14	10.21	2-M2	0.00	2154.14	2149.43	14.78
820	2154.44	2141.08	15.44	11.46	4-FF	0.00	2154.44	2149.56	14.64
831	2154.69	2141.60	15.69	12.22	4-FF	0.00	2154.69	2149.67	14.83

El. inlet face invert 2139.00 ft El. outlet invert 2134.00 ft
El. inlet throat invert 2139.00 ft El. inlet crest 0.00 ft

****

* SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	2139.00
OUTLET STATION (FT)	1000.00
OUTLET ELEVATION (FT)	2134.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0050
CULVERT LENGTH ALONG SLOPE (FT)	1000.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	7.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	IMPR SDT RECT
INLET EDGE AND WALL	BEVELED EDGE TOP (15-26 DEG WINGWALL)
INLET DEPRESSION	NONE

***** SIDE-TAPERED RECTANGULAR IMPROVED INLET ***

FACE WIDTH	8.00 FT
SIDE TAPER (4:1 TO 6:1) (X:1)	6.00

****

CU NT DATE: 07-15-1992 FILE DATE: 07-15-1992
NT TIME: 20:53:43 FILE NAME: I15CJ-4B

****
********** CULVERT # 4 **********
****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2139.00	2133.00	0.00	-5.00	0-NF	0.00	2139.00	2139.00	0.00
127	2142.55	2135.18	3.55	-0.28	6-FF	0.00	2142.55	2141.98	9.57
255	2144.63	2136.30	5.63	0.99	6-FF	0.00	2144.63	2143.71	12.01
383	2146.96	2137.21	7.96	2.62	6-FF	0.00	2146.96	2145.20	13.40
510	2148.58	2138.00	9.58	4.65	6-FF	0.00	2148.58	2146.52	14.41
638	2150.66	2138.71	11.66	7.09	6-FF	0.00	2150.66	2147.77	15.17
725	2152.35	2139.17	13.35	9.01	6-FF	0.00	2152.35	2148.62	15.60
788	2153.72	2139.97	14.72	10.53	6-FF	0.00	2153.72	2149.25	15.87
807	2154.14	2140.54	15.14	10.21	2-M2	0.00	2154.14	2149.43	14.78
820	2154.44	2141.08	15.44	11.46	4-FF	0.00	2154.44	2149.56	14.64
831	2154.69	2141.60	15.69	12.22	4-FF	0.00	2154.69	2149.67	14.83

El. inlet face invert 2139.00 ft El. outlet invert 2134.00 ft
El. inlet throat invert 2139.00 ft El. inlet crest 0.00 ft

****

* SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	2139.00
OUTLET STATION (FT)	1000.00
OUTLET ELEVATION (FT)	2134.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0050
CULVERT LENGTH ALONG SLOPE (FT)	1000.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	7.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	IMPR SDT RECT
INLET EDGE AND WALL	BEVELED EDGE TOP (15-26 DEG WINGWALL)
INLET DEPRESSION	NONE

***** SIDE-TAPERED RECTANGULAR IMPROVED INLET ***

FACE WIDTH	8.00 FT
SIDE TAPER (4:1 TO 6:1) (X:1)	6.00

****

CRT NT DATE: 07-15-1992 FILE DATE: 07-15-1992
CRT NT TIME: 20:53:43 FILE NAME: I15CJ-4B

****
********** TAILWATER **********
****

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	40.00
SIDE SLOPE H/V (X:1)	1.0
CHANNEL SLOPE V/H (FT/FT)	0.005
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	2133.00
CULVERT NO.1 OUTLET INVERT ELEVATION	2134.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
0.00	2133.00	0.000	0.00	0.00
510.00	2135.18	0.662	5.55	0.68
1020.00	2136.30	0.691	7.13	1.03
1530.00	2137.21	0.705	8.21	1.32
2040.00	2138.00	0.714	9.06	1.56
2550.00	2138.71	0.720	9.76	1.78
2900.00	2139.17	0.723	10.19	1.92
3570.00	2139.97	0.727	10.90	2.18
4080.00	2140.54	0.730	11.38	2.35
4590.00	2141.08	0.732	11.81	2.52
5100.00	2141.60	0.733	12.20	2.68

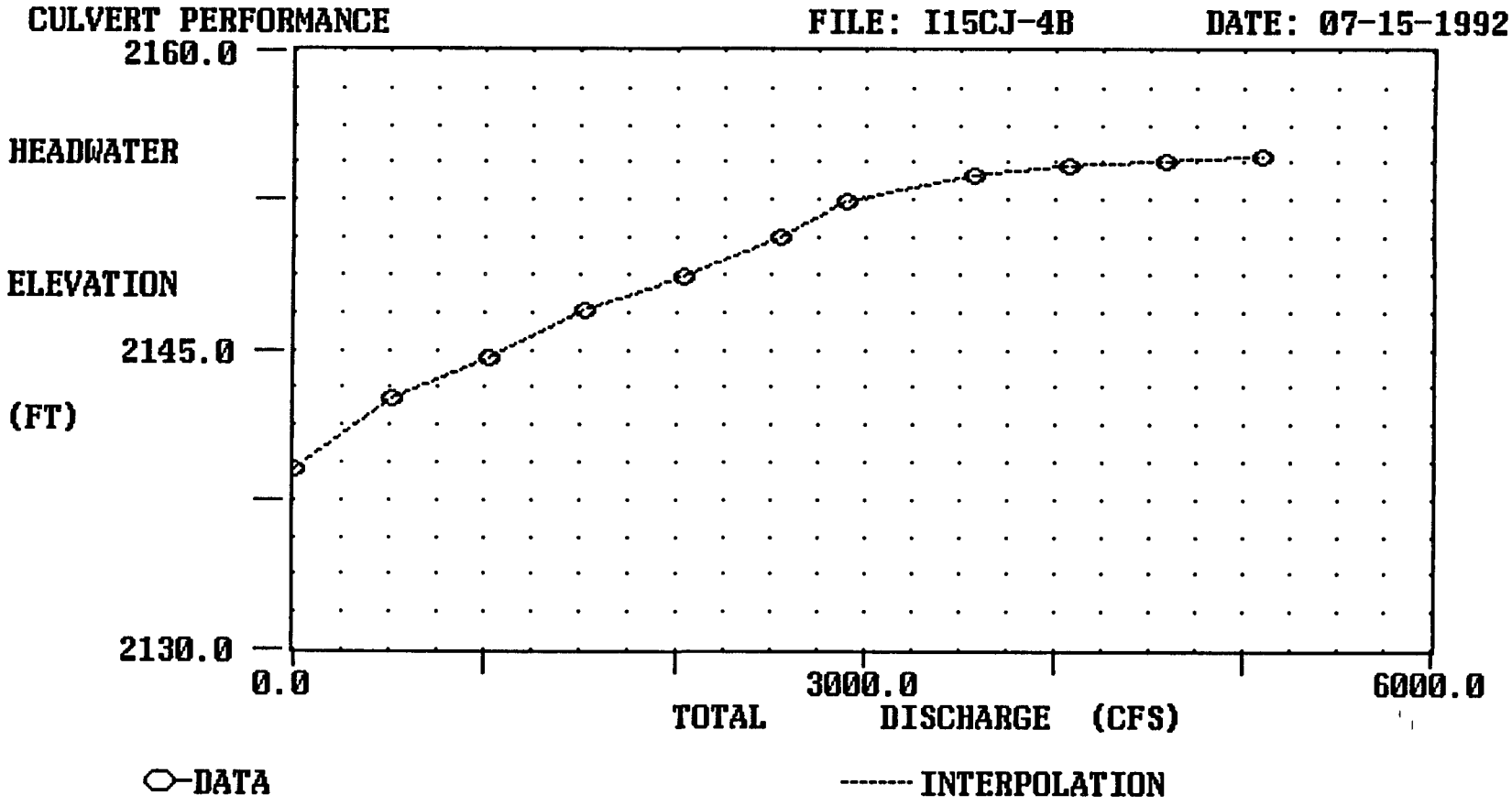
****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	1.00

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	100.00	2162.50
2	220.00	2158.50
3	390.00	2154.50
4	655.00	2152.50
5	790.00	2154.50
6	1000.00	2156.50
7	1160.00	2158.50

****


CULVERT PERFORMANCE
FILE: I15CJ-4B
DATE: 07-15-1992
2160.0
HEADWATER
ELEVATION
2145.0
(FT)
2130.0
0.0
3000.0
6000.0
TOTAL DISCHARGE (CFS)
DATA
INTERPOLATION

UPRR Culvert Rating

Procedure

1) From field notes + pictures (attached) determine culvert:
   - invert elevations
   - length
   - diameter
   - material
   - inlet type

2) From field notes, pictures and CH2M Hill 1992 topo, determine tailwater channel:
   - cross-section
   - slope
   - Manning's n

3) From CH2M Hill 1992 topo determine cross-section geometry of land (re: weir) that will be overtopped

4) Enter above info into FHWA Culvert Analysis Program HY-8 and find discharges over weir and through culvert when Q_{Total} = 4100 cfs. (file = UPRR-cul)

Results: 714 cfs through culvert
3380 cfs over weir
water surface elevation = 2213.6. This was used as the starting water surface elevation for HEC-2 run beginning at UPRR.

SUBJECT Tropicana Wash
UPRR Culvert rating
for HEC-2

BY HMA DATE 7/13/92
SHEET NO. 2 OF 11
PROJECT NO. RDD 3832

Notes:

Culvert data

1) Difference in elev. between upstream and downstream inverts = 18.6 (on rod) - 19.2 (on rod)
= -0.6 ft

invert elev. from topo = 2202.4 ±, ∴ outlet invert = 2202.4 - 0.6 = 2201.8

2) Tail water channel
assume bottom width is 20'
slope = 8/1040 = 0.0077 '/' (from topo)

Manning's n = 0.035

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: Railroad - UPRR
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes from S total 3 up 2 down
4. Survey structure yes TBM sign @ S.E. TOP Near Rails
5. Culvert type CMP - 9.75' Dia length 25'
6. Inlet type Square
7. Inlet conditions good
8. Signs of Erosion? Some @ Inlet but O.K.
9. Signs of Deposition? some silt in Culvert
10. Obstructions which could cause backwater? None -
11. Skew angle 0
12. Pier description None
13. Comments _____

Date_____ by_____

Upstream Wash @ Railroad bridge (UPRR)

TBM - Top of galvanized sign marked 32842 on S.E corner Top of Railroad

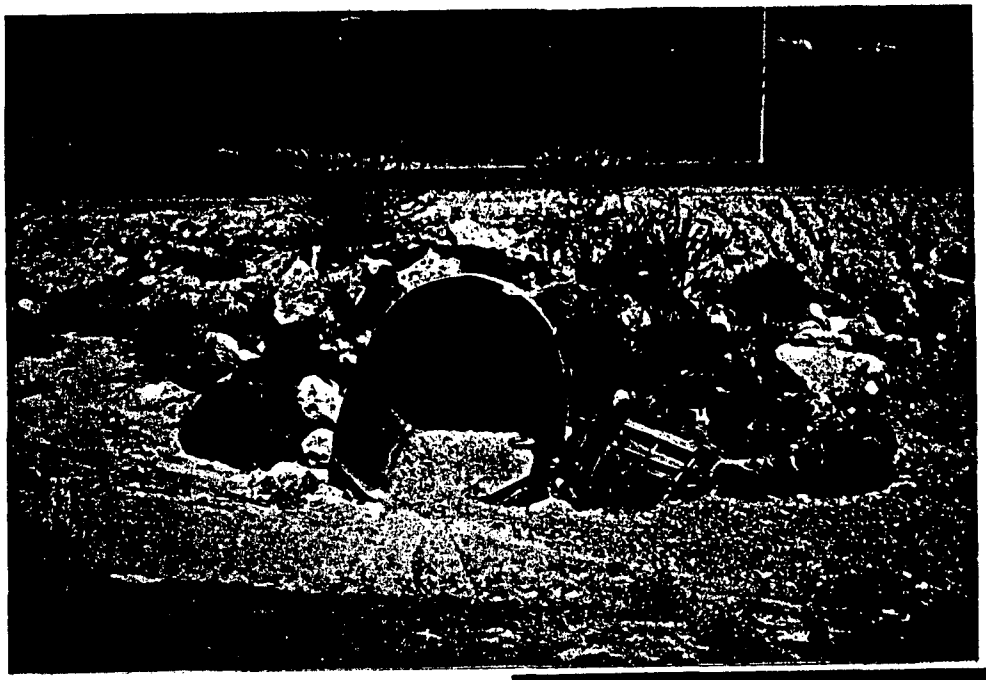
1.38 = H.I. is 1.35 above TBM

Invert D.S.	19.2
Low chord D.S.	9.8
℄ ℄	3.5
Low chord upstream	9.5
Invert upstream	18.6

Circular CMP. 9.75' Dia

95' long

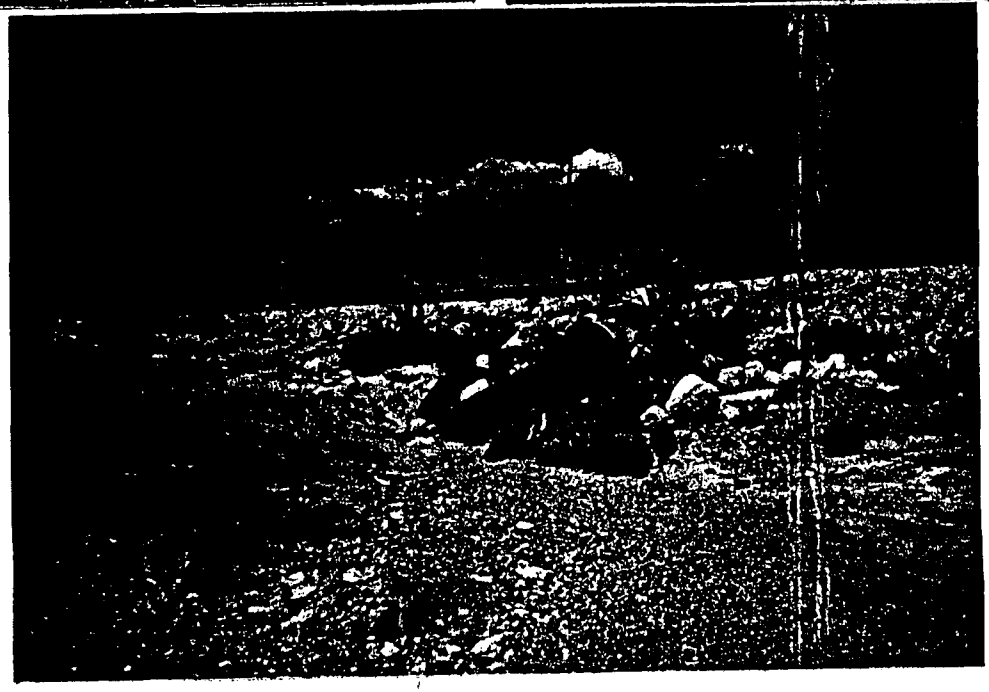
Sheet 4 of 11



Looking Downstream on the Upstream side of RR culvert



Looking Upstream on INLET side of RR culvert

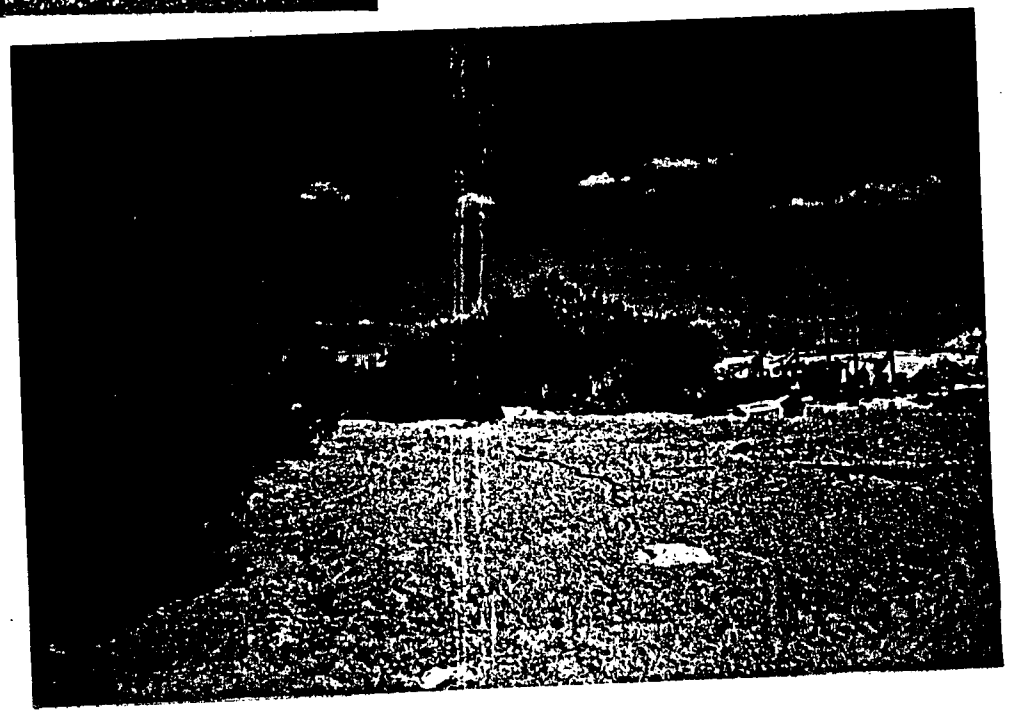


Looking Downstream on INLET to RR culvert

Sheet 5 of 11

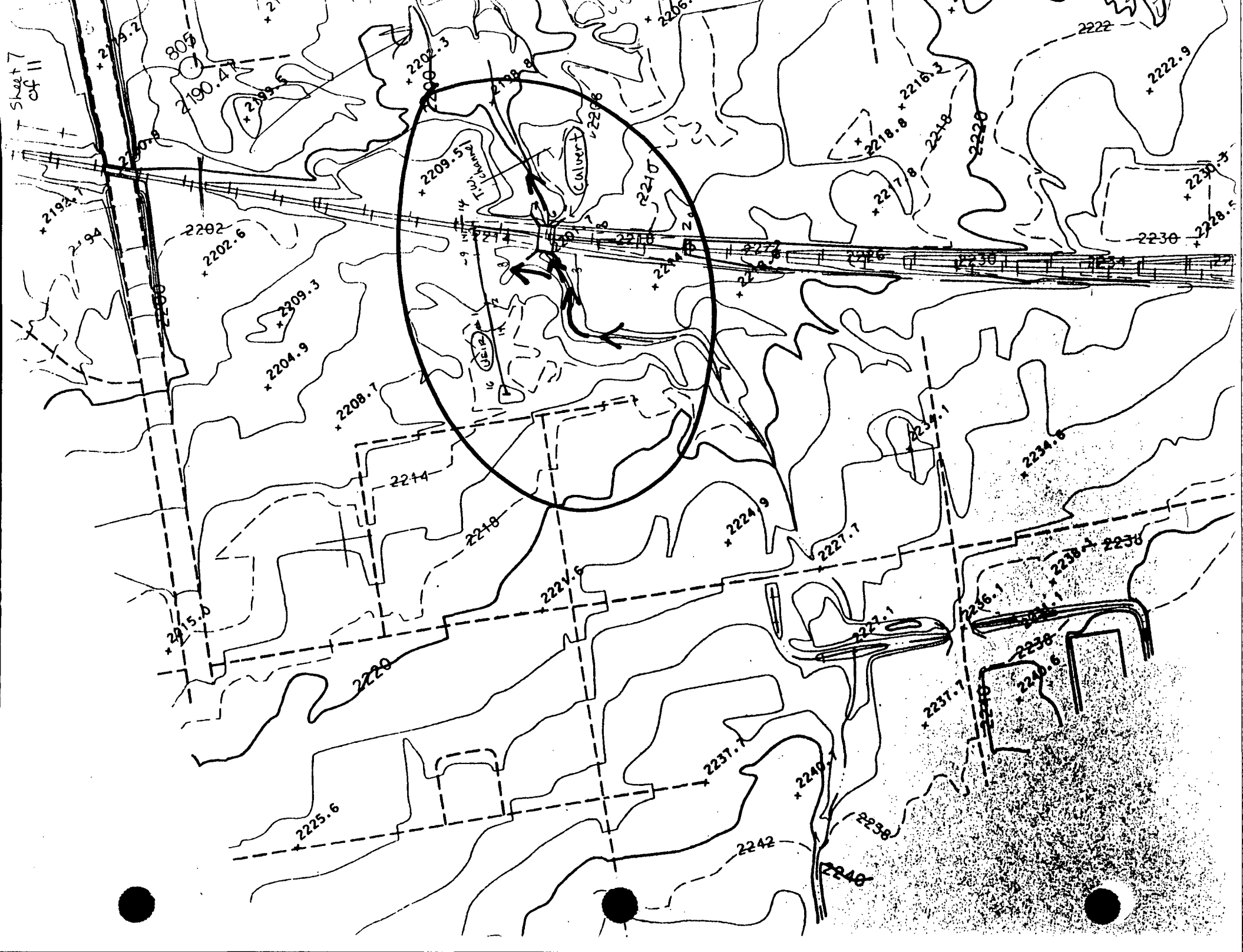


Looking Upstream on outlet end of RR culvert



Looking Downstream on outlet end of RR culvert

Sheet 6 of =


Sheet 7 of 11
805
2190.4
2199.2
2199.5
2200.3
2198.8
2206.
2222
2222.9
2216.2
2218.8
2220
2217.8
2230
2228.5
2192.1
2202
2202.6
2209.3
2204.9
2208.1
2209.5
Culvert
Weir
2210
2214
2218
2224.9
2227.7
2234.1
2234.6
2238
2236.1
2240.6
2237.7
2240.7
2238
2242
2240
2225.6
2220
2215.0
2221.1

CURRENT DATE: 07-15-1992
CURRENT TIME: 20:58:48

FILE DATE: 07-13-1992
FILE NAME: UPRR-CUL

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 3.2 **********
****

CULV #	SITE DATA: INLET ELEV. (FT)	SITE DATA: OUTLET ELEV. (FT)	SITE DATA: CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	2202.40	2201.80	95.00	1 CSP	9.75	9.75	.031	CONVENTIONAL
2								
3								
4								
5								
6								

****
SUMMARY OF CULVERT FLOWS (CFS) FILE: UPRR-CUL DATE: 07-13-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
2202.40	0	0	0	0	0	0	0	0	1
2209.79	410	367	0	0	0	0	0	41	11
2210.86	820	462	0	0	0	0	0	356	4
2211.46	1230	515	0	0	0	0	0	709	3
2211.90	1640	556	0	0	0	0	0	1077	3
2211.92	1660	557	0	0	0	0	0	1092	2
2212.60	2460	621	0	0	0	0	0	1836	3
2212.88	2870	647	0	0	0	0	0	2217	3
2213.14	3280	673	0	0	0	0	0	2602	3
2213.39	3690	693	0	0	0	0	0	2992	3
2213.61	4100	714	0	0	0	0	0	3380	3
2209.00	301	301	0	0	0	0	0	OVERTOPPING	

****
SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: UPRR-CUL DATE: 07-13-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
2202.40	0.00	0	0	0.00
2209.79	-0.01	410	2	0.51
2210.86	-0.00	820	2	0.25
2211.46	-0.01	1230	6	0.46
2211.90	-0.01	1640	7	0.44
2211.92	-0.01	1660	11	0.66
2212.60	-0.00	2460	3	0.13
2212.88	-0.00	2870	5	0.19
2213.14	-0.00	3280	6	0.17
2213.39	-0.00	3690	5	0.14
2213.61	-0.00	4100	5	0.12

****
<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000
****

NT DATE: 07-15-1992
NT TIME: 20:58:48

FILE DATE: 07-13-1992
FILE NAME: UPRR-CUL

****
********** CULVERT # 1 **********
****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2202.40	2200.00	0.00	-0.60	0-NF	0.00	2202.40	0.00	0.00
367	2209.79	2202.04	6.72	7.39	2-M2	0.00	0.00	0.00	10.78
462	2210.87	2202.80	7.69	8.47	2-M2	0.00	0.00	0.00	11.62
515	2211.45	2203.36	8.24	9.05	2-M2	0.00	0.00	0.00	12.06
556	2211.90	2203.82	8.67	9.50	2-M2	0.00	0.00	0.00	12.35
557	2211.92	2203.84	8.69	9.52	2-M2	0.00	0.00	0.00	12.36
621	2212.59	2204.56	9.39	10.19	2-M2	0.00	0.00	0.00	12.87
647	2212.88	2204.87	9.70	10.48	2-M2	0.00	0.00	0.00	13.10
673	2213.14	2205.16	10.01	10.74	2-M2	0.00	0.00	0.00	13.31
693	2213.39	2205.42	10.26	10.99	2-M2	0.00	0.00	0.00	13.47
714	2213.60	2205.67	10.53	11.20	2-M2	0.00	0.00	0.00	13.63

El. inlet face invert 2202.40 ft El. outlet invert 2201.80 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)	2202.40
OUTLET STATION (FT)	95.00
OUTLET ELEVATION (FT)	2201.80
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0063
CULVERT LENGTH ALONG SLOPE (FT)	95.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	9.75 FT
BARREL MATERIAL	CORRUGATED ALUMINUM
BARREL MANNING'S N	0.031
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	MITERED TO CONFORM TO SLOPE
INLET DEPRESSION	NONE

****

CUT NT DATE: 07-15-1992 FILE DATE: 07-13-1992
NT TIME: 20:58:48 FILE NAME: UPRR-CUL

****
********** TAILWATER **********
****

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: UPRRCHAN
MAIN CHANNEL ONLY FILE DATE: 07-13-1992
LEFT CHANNEL BOUNDARY 0
RIGHT CHANNEL BOUNDARY 0
MANNING N LEFT OVER BANK 0.000
MANNING N MAIN CHANNEL 0.035
MANNING N RIGHT OVER BAN 0.000
SLOPE OF CHANNEL (FT/FT) 0.0077

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	100.00	2208.00
2	130.00	2204.00
3	215.00	2200.00
4	235.00	2200.00
5	250.00	2204.00
6	290.00	2206.00

***** UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

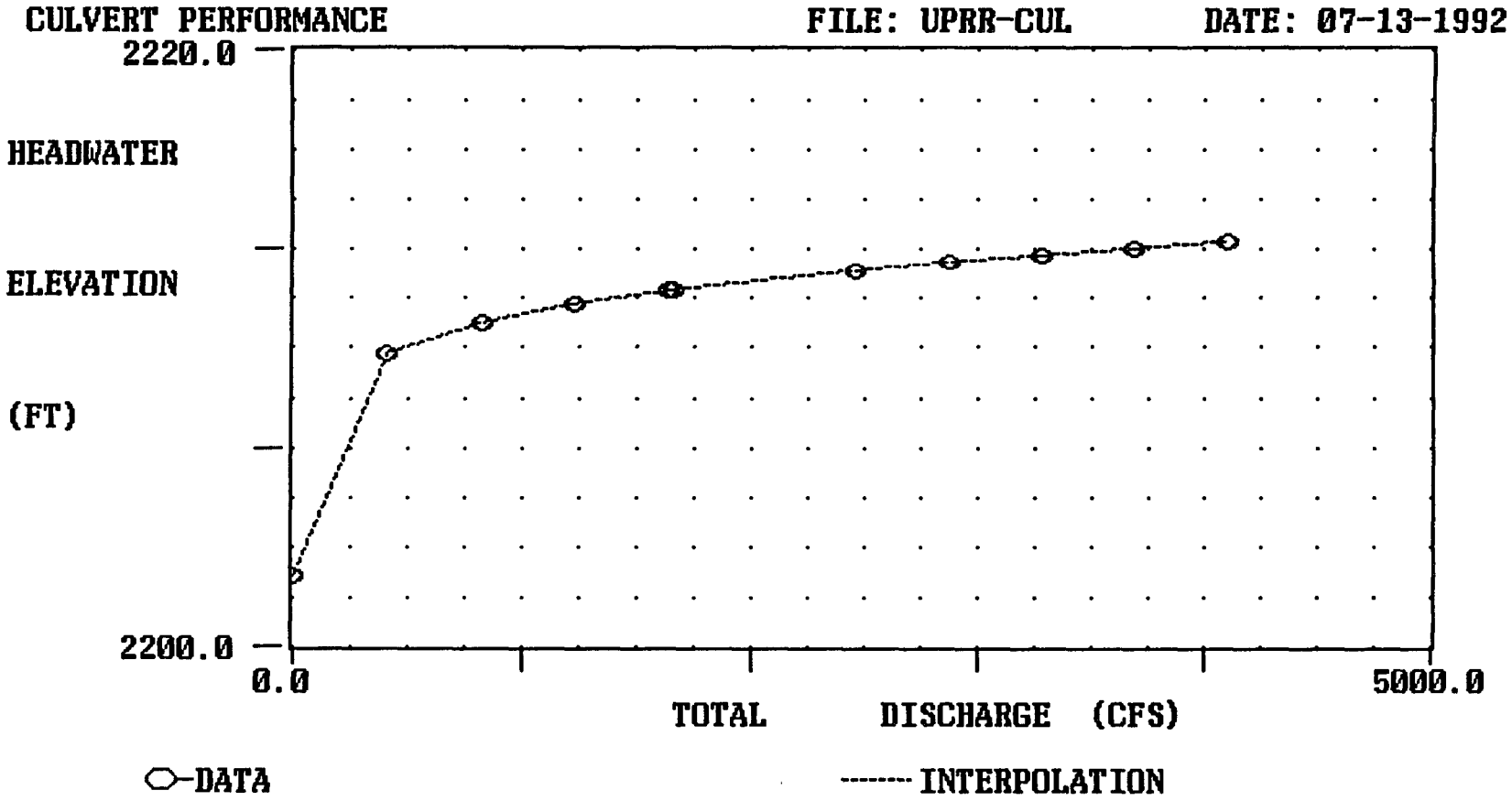
FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
0.00	2200.00	0.000	0.00	0.00
410.00	2202.04	0.684	4.44	0.63
820.00	2202.80	0.716	5.32	0.82
1230.00	2203.36	0.735	5.90	0.96
1640.00	2203.82	0.748	6.36	1.07
1660.00	2203.84	0.749	6.38	1.08
2460.00	2204.56	0.767	7.01	1.24
2870.00	2204.87	0.774	7.28	1.31
3280.00	2205.16	0.781	7.52	1.38
3690.00	2205.42	0.786	7.74	1.44
4100.00	2205.67	0.791	7.94	1.50

****
********** ROADWAY OVERTOPPING DATA **********
****

WEIR COEFFICIENT 2.50
EMBANKMENT TOP WIDTH (FT) 200.00
***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	100.00	2216.00
2	300.00	2214.00
3	390.00	2212.00
4	570.00	2209.00
5	645.00	2214.00

****


CULVERT PERFORMANCE
FILE: UPRR-CUL
DATE: 07-13-1992
2220.0
HEADWATER
ELEVATION
(FT)
2200.0
0.0
5000.0
TOTAL DISCHARGE (CFS)
DATA
INTERPOLATION

SUBJECT _____ BY _____ DATE _____

SHEET NO. _____ OF _____

PROJECT NO. _____

Steps

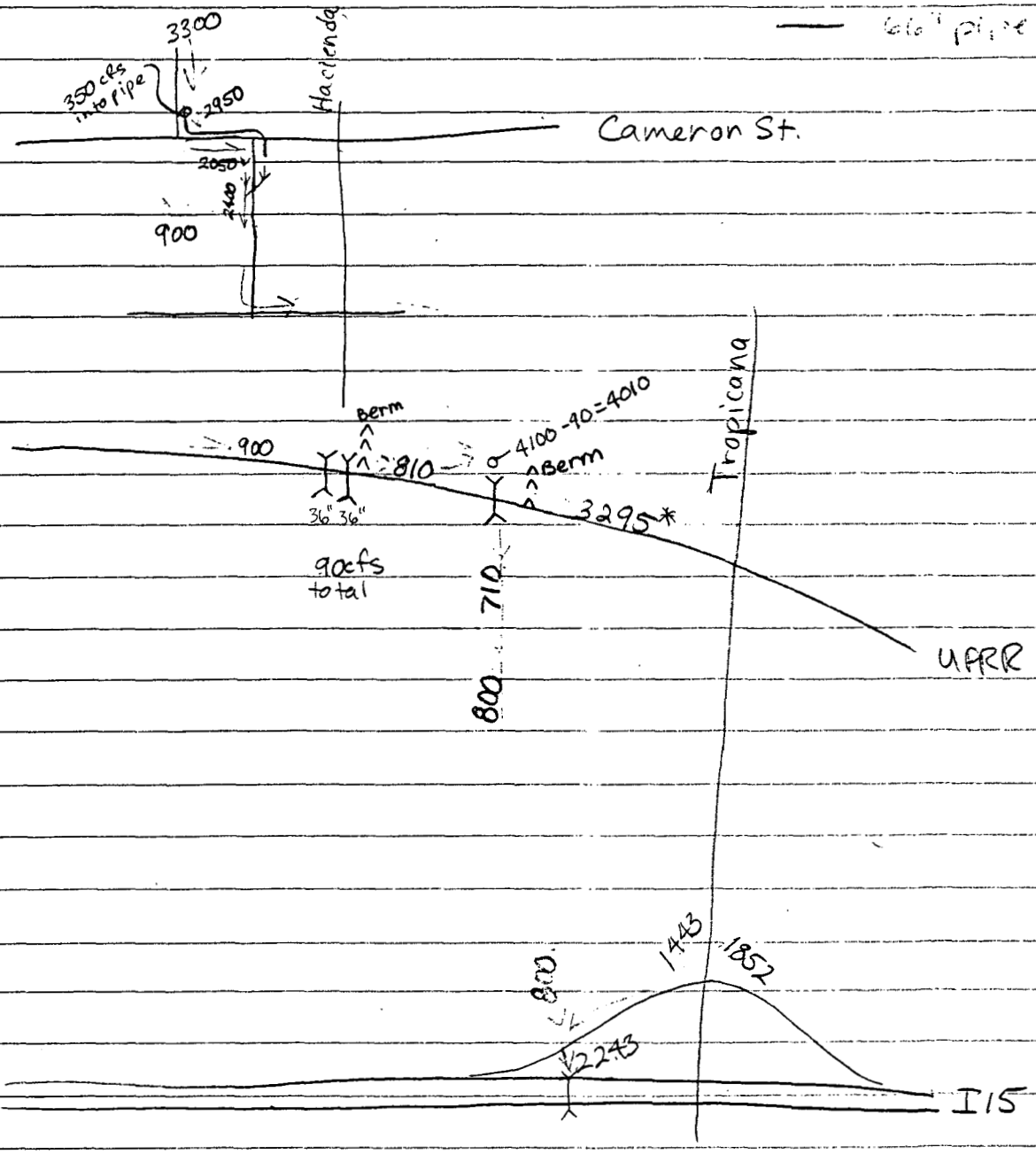
1) make new files (Original → Copy)

I15Q-ENC.HC2 → [redacted], I15Q2-E1.HC2

I15-NAT.HC2 → I15-2-N.HC2, [redacted]

I15Q-EN4.HC2 → I15Q2-E4.HC2

2) Change Q's per:



* 5 cfs lost in HY8 iterative calculations

SUBJECT Tropicana Wash
- Spear Channel flow split

BY HMA DATE 10/19/92
SHEET NO. 0 OF 26
PROJECT NO. RDD33832

Contents

1) Flow split for 3300 cfs - sheets 1-11
- original discharge
2) Flow split for 2950 cfs - sheets 12-26
- this is the amount left after some discharge was removed by the proposed 66" RCP.

SUBJECT Tropicana Wash
Spear Channel flow split
--original

BY HMA DATE 7/16/92
SHEET NO. 1 OF 26
PROJECT NO. RDD 33832

Estimate flow distribution of flow split.

Procedure

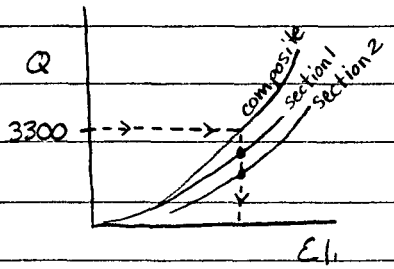
1) On topo (see following) locate cross-sections equi-distance downstream from node where flow divides.
   - draw cross-sections 1 + 2 (sheet 2)

2) Plot cross-sections, determine Manning's "n" and calculate the channel slope at the section (sheet 3)

3) Enter the info. from step 2 into the Tailwater section of the culvert analysis program, HY-8. HY8 calculates a rating curve of the channel. (sheets 6 and 9)

4) Enter rating curves into a spread sheet and calculate a composite Q (sheet 10)

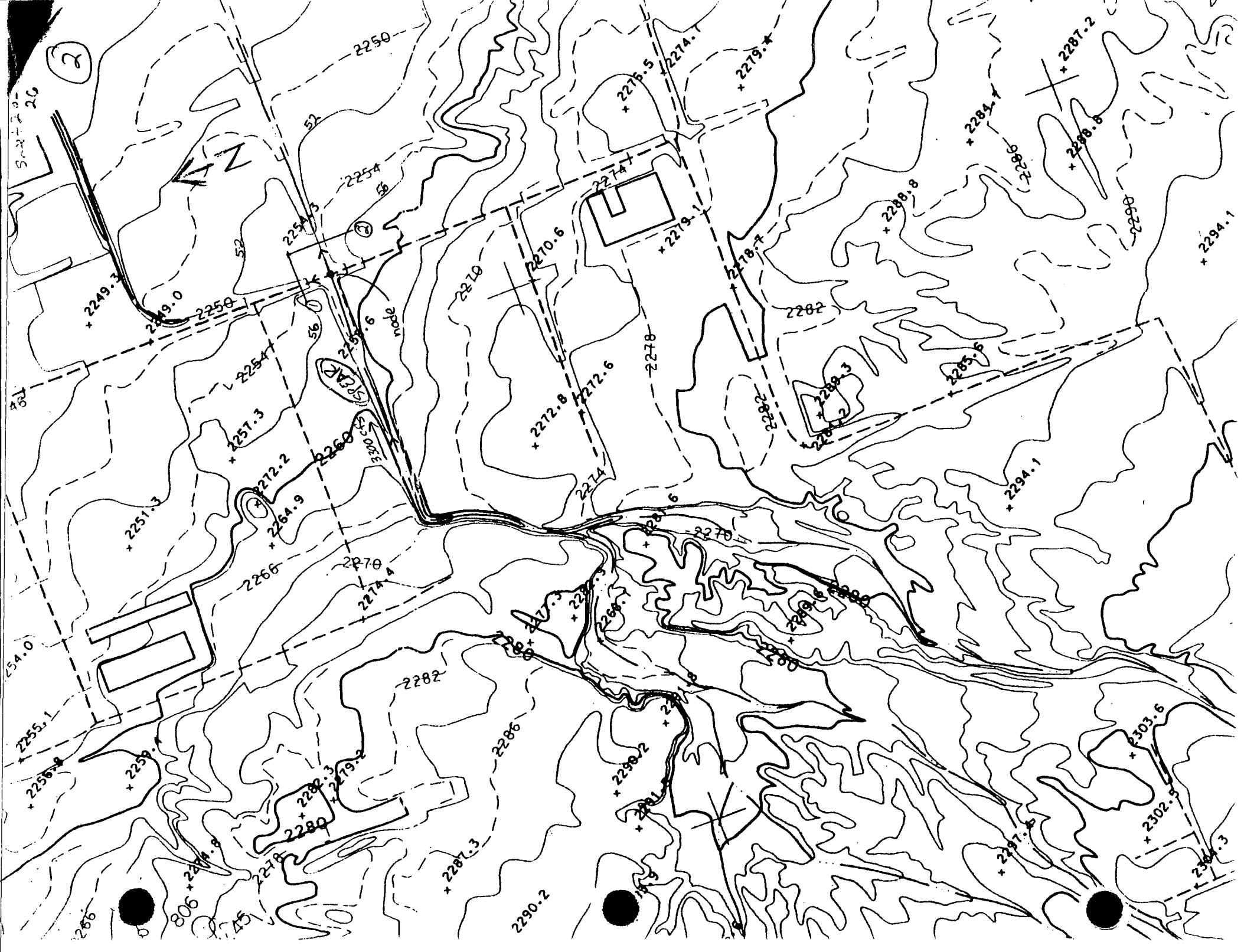
5) Plot Qcomposite, Qsect.1, Qsect.2 vs. Elevation (sheet 11)



6) where Q = 3300 cfs (discharge in Spear channel), find the point on the composite curve and then drop down to find the Q for each section.

7) resulting flow split is:

Section #1	2300	cfs	(70 % of total Q)
Section #2	1000	cfs	(30 % of total Q)


2250
2254
2274
2279.4
2284.4
2287.2
2288.8
2294.1
2249.3
2249.0
2254.3
2256.6
node
2270.6
2272.8
2272.6
2278.7
2282
2285.6
2289.3
2257.3
2260
2272.2
2264.9
2251.3
2266
2270
2274.4
2282
2286
2290.2
2303.6
2302.9
2254.0
2255.1
2256.4
2259.4
2279.2
2280
2287.3
2297.6
2304.3
806
45

SUBJECT Trop. Wash - Spear Channel

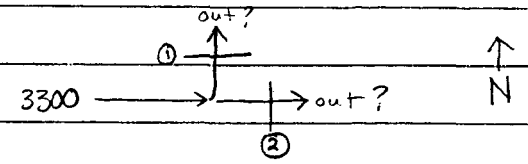
BY HMA DATE 7/15/92

SHEET NO. 3 OF 26

PROJECT NO. RDD 33832

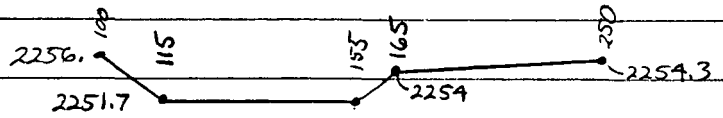
Input for HY8:

Q total = 3300 cfs



*Cross-section #1 (115' downstream from node)

a)

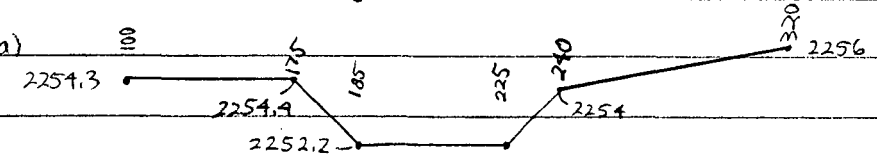


b) n = 0.015 (pavement)

c) slope = 4/370 = 0.0108 ft/ft

*Cross-section # 2 (115' downstream from node)

a)



b) n = 0.020 (packed gravel)

c) slope = 4/665 = 0.0060

*cross section info. from field data and new CH2M Hill 1992 topo.

[redacted]NT DATE: 07-31-1992
[redacted]IT TIME: 13:40:33

FILE DATE: 07-31-1992
FILE NAME: SPEAR1

****

********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 3.2 **********

****

CULV #	SITE DATA: INLET ELEV. (FT)	SITE DATA: OUTLET ELEV. (FT)	SITE DATA: CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	2252.50	2252.30	1.02	1 RCB	50.00	20.00	.012	IMPR SDT REC
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (CFS) FILE: SPEAR1 DATE: 07-31-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
[redacted]52.50	0	0	0	0	0	0	0	0	1
[redacted]2.85	330	330	0	0	0	0	0	0	1
[redacted]63.18	660	660	0	0	0	0	0	0	1
2263.46	990	990	0	0	0	0	0	0	1
2263.72	1320	1320	0	0	0	0	0	0	1
2263.96	1650	1650	0	0	0	0	0	0	1
2264.19	1980	1980	0	0	0	0	0	0	1
2264.41	2310	2310	0	0	0	0	0	0	1
2264.62	2640	2640	0	0	0	0	0	0	1
2264.83	2970	2970	0	0	0	0	0	0	1
2265.04	3300	3300	0	0	0	0	0	0	1
2280.00	15485	15485	0	0	0	0	0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: SPEAR1 DATE: 07-31-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
2252.50	0.00	0	0	0.00
2262.85	0.00	330	0	0.00
2263.18	0.00	660	0	0.00
2263.46	0.00	990	0	0.00
2263.72	0.00	1320	0	0.00
2263.96	0.00	1650	0	0.00
2264.19	0.00	1980	0	0.00
[redacted]2264.41	0.00	2310	0	0.00
2264.62	0.00	2640	0	0.00
2264.83	0.00	2970	0	0.00
2265.04	0.00	3300	0	0.00

****

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 07-31-1992
CURRENT TIME: 13:40:33

FILE DATE: 07-31-1992
FILE NAME: SPEAR1

****
********** CULVERT # 1 **********
****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2252.50	2251.70	0.00	-0.20	0-NF	0.00	2252.50	2252.50	0.00
330	2262.85	2252.56	3.14	10.35	6-FF	0.00	2254.47	2255.64	5.95
660	2263.18	2252.99	3.69	10.68	6-FF	0.00	2255.63	2256.19	7.50
990	2263.46	2253.34	4.23	10.96	6-FF	0.00	2256.60	2256.73	8.59
1320	2263.72	2253.63	4.97	11.22	6-FF	0.00	2257.47	2257.25	9.45
1650	2263.96	2254.04	5.76	11.46	6-FF	0.00	2258.26	2257.77	10.18
1980	2264.19	2254.50	6.51	11.69	6-FF	0.00	2259.01	2258.28	10.82
2310	2264.41	2254.62	7.21	11.91	6-FF	0.00	2259.71	2258.78	11.39
2640	2264.62	2254.73	7.88	12.12	6-FF	0.00	2260.38	2259.28	11.91
2970	2264.83	2254.83	8.53	12.33	6-FF	0.00	2261.03	2259.76	12.39
3300	2265.04	2254.94	9.15	12.54	6-FF	0.00	2261.65	2260.24	12.83

El. inlet face invert 2252.50 ft El. outlet invert 2252.30 ft
El. inlet throat invert 2252.50 ft El. inlet crest 0.00 ft

****

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	2252.50
OUTLET STATION (FT)	1.00
OUTLET ELEVATION (FT)	2252.30
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.2000
CULVERT LENGTH ALONG SLOPE (FT)	1.02

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	50.00 FT
BARREL RISE	20.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	IMPR SDT RECT
INLET EDGE AND WALL	BEVELED EDGE TOP (15-26 DEG WINGWALL)
INLET DEPRESSION	NONE

***** SIDE-TAPERED RECTANGULAR IMPROVED INLET ***

FACE WIDTH	50.00 FT
SIDE TAPER (4:1 TO 6:1) (X:1)	4.00

****

CURRENT DATE: 07-31-1992 FILE DATE: 07-31-1992
CURRENT TIME: 13:40:33 FILE NAME: SPEAR1

****
********** TAILWATER **********
****

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: SPEAR1
MAIN CHANNEL ONLY FILE DATE: 07-31-1992
LEFT CHANNEL BOUNDARY 0
RIGHT CHANNEL BOUNDARY 0
MANNING N LEFT OVER BANK 0.000
MANNING N MAIN CHANNEL 0.015
MANNING N RIGHT OVER BAN 0.000
SLOPE OF CHANNEL (FT/FT) 0.0108

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	100.00	2256.00
2	115.00	2251.70
3	155.00	2251.70
4	165.00	2254.00
5	250.00	2254.30
6	250.10	2256.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL → cross-section #1

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
0.00	2251.70	0.000	0.00	0.00
330.00	2252.56	1.743	8.85	0.54
660.00	2252.99	1.852	11.32	0.78
990.00	2253.34	1.918	13.05	0.96
1320.00	2253.63	1.964	14.39	1.11
1650.00	2254.04	1.961	14.29	1.10
1980.00	2254.50	1.860	11.51	0.80
2310.00	2254.62	1.888	12.22	0.87
2640.00	2254.73	1.912	12.88	0.94
2970.00	2254.83	1.933	13.48	1.01
3300.00	2254.94	1.952	14.04	1.07

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE PAVED
EMBANKMENT TOP WIDTH (FT) 10.00
CREST LENGTH (FT) 1000.00
OVERTOPPING CREST ELEVATION (FT) 2280.00

****

(7)

CURRENT DATE: 07-31-1992
CURRENT TIME: 13:41:43

FILE DATE: 07-31-1992
FILE NAME: SPEAR2

****

********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 3.2 **********

****

C	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
U								
L	INLET	OUTLET	CULVERT	BARRELS				
V	ELEV.	ELEV.	LENGTH	SHAPE	SPAN	RISE	MANNING	INLET
#	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)	n	TYPE
1	2252.50	2252.30	1.02	1 RCB	50.00	20.00	.012	IMPR SDT REC
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (CFS) FILE: SPEAR2 DATE: 07-31-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
2252.50	0	0	0	0	0	0	0	0	1
2262.85	330	330	0	0	0	0	0	0	1
2263.18	660	660	0	0	0	0	0	0	1
2263.46	990	990	0	0	0	0	0	0	1
2263.72	1320	1320	0	0	0	0	0	0	1
2263.96	1650	1650	0	0	0	0	0	0	1
2264.19	1980	1980	0	0	0	0	0	0	1
2264.41	2310	2310	0	0	0	0	0	0	1
2264.62	2640	2640	0	0	0	0	0	0	1
2264.83	2970	2970	0	0	0	0	0	0	1
2265.04	3300	3300	0	0	0	0	0	0	1
2280.00	15483	15483	0	0	0	0	0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: SPEAR2 DATE: 07-31-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
2252.50	0.00	0	0	0.00
2262.85	0.00	330	0	0.00
2263.18	0.00	660	0	0.00
2263.46	0.00	990	0	0.00
2263.72	0.00	1320	0	0.00
2263.96	0.00	1650	0	0.00
2264.19	0.00	1980	0	0.00
2264.41	0.00	2310	0	0.00
2264.62	0.00	2640	0	0.00
2264.83	0.00	2970	0	0.00
2265.04	0.00	3300	0	0.00

****

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

****

(8)

[redacted]NT DATE: 07-31-1992 FILE DATE: 07-31-1992
[redacted]T TIME: 13:41:43 FILE NAME: SPEAR2

****

********** CULVERT # 1 **********

****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2252.50	2252.20	0.00	-0.20	0-NF	0.00	2252.50	2252.50	0.00
330	2262.85	2253.39	3.14	10.35	6-FF	0.00	2254.47	2255.64	5.95
660	2263.18	2253.95	3.69	10.68	6-FF	0.00	2255.63	2256.19	7.50
990	2263.46	2254.63	4.23	10.96	6-FF	0.00	2256.60	2256.73	8.48
1320	2263.72	2254.85	4.97	11.22	6-FF	0.00	2257.47	2257.25	9.45
1650	2263.96	2255.04	5.76	11.46	6-FF	0.00	2258.26	2257.77	10.18
1980	2264.19	2255.21	6.51	11.69	6-FF	0.00	2259.01	2258.28	10.82
2310	2264.41	2255.37	7.21	11.91	6-FF	0.00	2259.71	2258.78	11.39
2640	2264.62	2255.51	7.88	12.12	6-FF	0.00	2260.38	2259.28	11.91
2970	2264.83	2255.65	8.53	12.33	6-FF	0.00	2261.03	2259.76	12.39
3300	2265.04	2255.79	9.15	12.54	6-FF	0.00	2261.65	2260.24	12.83

El. inlet face invert 2252.50 ft El. outlet invert 2252.30 ft
El. inlet throat invert 2252.50 ft El. inlet crest 0.00 ft

****

[redacted]

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	2252.50
OUTLET STATION (FT)	1.00
OUTLET ELEVATION (FT)	2252.30
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.2000
CULVERT LENGTH ALONG SLOPE (FT)	1.02

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	50.00 FT
BARREL RISE	20.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	IMPR SDT RECT
INLET EDGE AND WALL	BEVELED EDGE TOP (15-26 DEG WINGWALL)
INLET DEPRESSION	NONE

***** SIDE-TAPERED RECTANGULAR IMPROVED INLET ***

FACE WIDTH	50.00 FT
SIDE TAPER (4:1 TO 6:1) (X:1)	4.00

****

[redacted]

CURRENT DATE: 07-31-1992 FILE DATE: 07-31-1992
CURRENT TIME: 13:41:43 FILE NAME: SPEAR2

****
********** TAILWATER **********
****

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: SPEAR2
MAIN CHANNEL ONLY FILE DATE: 07-31-1992

LEFT CHANNEL BOUNDARY	0
RIGHT CHANNEL BOUNDARY	0
MANNING N LEFT OVER BANK	0.000
MANNING N MAIN CHANNEL	0.020
MANNING N RIGHT OVER BAN	0.000
SLOPE OF CHANNEL (FT/FT)	0.0060

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	99.90	2256.00
2	100.00	2254.30
3	175.00	2254.25
4	185.00	2252.20
5	225.00	2252.20
6	240.00	2254.00
7	320.00	2256.00

** UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL → Cross-Section #2

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
0.00	2252.20	0.000	0.00	0.00
330.00	2253.39	1.016	5.83	0.38
660.00	2253.95	1.074	7.29	0.53
990.00	2254.63	1.016	5.83	0.38
1320.00	2254.85	1.040	6.43	0.44
1650.00	2255.04	1.058	6.90	0.49
1980.00	2255.21	1.073	7.31	0.54
2310.00	2255.37	1.086	7.67	0.58
2640.00	2255.51	1.097	7.99	0.61
2970.00	2255.65	1.107	8.28	0.65
3300.00	2255.79	1.115	8.56	0.68

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	10.00
CREST LENGTH (FT)	1000.00
OVERTOPPING CREST ELEVATION (FT)	2280.00

****

(10)

SPEAR CHANNEL FLOW SPLIT CCRFCD RDD33832

Input rating curves generated from HY-8 program:

Q, cfs	W. S. El. Section 1, ft.	W. S. El. Section 2, ft.
0.0	2251.7	2252.2
330.0	2252.6	2253.4
660.0	2253.0	2254.0
990.0	2253.3	2254.6
1320.0	2253.6	2254.9
1650.0	2254.0	2255.0
1980.0	2254.5	2255.2
2310.0	2254.6	2255.4
2640.0	2254.7	2255.5
2970.0	2254.8	2255.7
3300.0	2254.9	2255.8

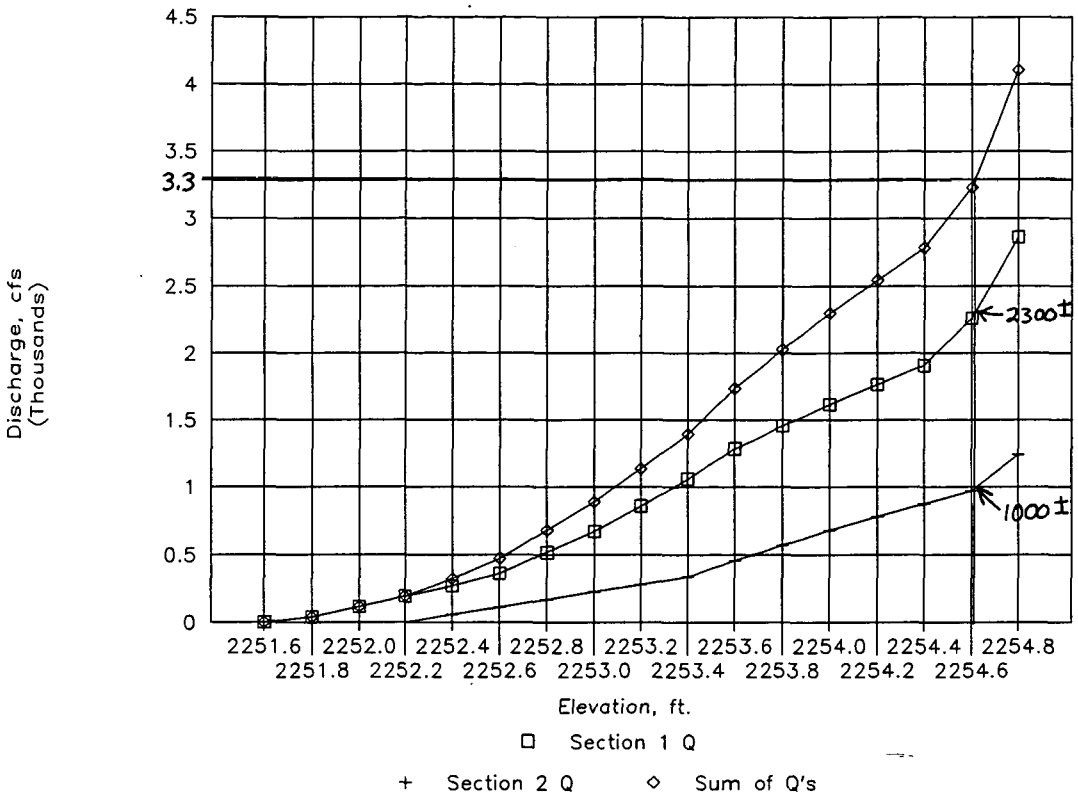
Above data rearranged to plot Q vs. Elevation:

Elevation, ft.	Q, Sect.1, cfs	Q, Sect.2, cfs	Composite Q, cfs
2251.6	0.0	0.0	0.0
2251.8	38.2	0.0	38.2
2252.0	114.7	0.0	114.7
2252.2	191.2	0.0	191.2
2252.4	267.7	55.4	323.1
2252.6	358.6	110.8	469.4
2252.8	513.2	166.2	679.4
2253.0	669.5	221.7	891.2
2253.2	859.7	277.1	1136.8
2253.4	1060.7	335.3	1396.0
2253.6	1285.2	452.5	1737.7
2253.8	1455.7	569.7	2025.4
2254.0	1616.3	682.3	2298.6
2254.2	1763.6	779.4	2543.0
2254.4	1907.4	876.4	2783.8
2254.6	2256.9	973.5	3230.4
2254.8	2863.1	1241.3	4104.4

File = SPEAR.WK1

SPEAR CHANNEL

Flow Distribution



SUBJECT Tropicana Wash - proposed 66" RCP in wash just upstream of Cameron St.

BY HMA DATE 10/19/92

SHEET NO. 12 OF 26

PROJECT NO. RDD 33832

Goal: To model effects of proposed 66" RCP in Tropicana Wash

Introduction

The proposed pipe will remove some discharge from the wash upstream of Cameron street and then outlet the flow back into the wash downstream from the street. At Cameron street there is a flow split where a portion of the flow, that was not picked up by the pipe, continues east while the remainder flows north up cameron St. and then empties back into the wash.

Procedure:

1) estimate Q into pipe
   - flow was based on HGL (shts 14-16) using a nomograph (sht 18)
   - HGL, assumed to be 100 year discharge, was 0.0113 ft/ft
   - assume n = 0.013
   - using sheet 18, the Q was estimated around 350 cfs

2) Subtract the pipe Q from the incoming Q:
   3300 - 350 = 2950 cfs

3) Estimate the portion of the 2950 cfs that remains in Tropicana Wash after the flow split:
   - this step is the same as the previous flow-split analysis for the 3300 cfs (see sheet 1)
   - new channel rating curves are on sheets 21 and 24.
   - new "Q vs. Elevation" plot is on sheet 26.

4) The resulting flow split is

Section #1	2050 cfs	(71 % of total)
Section #2	900 cfs	(29% of total)

PROFILE C
SCALE H 1"=40' V 1"=4'

PROFILE
SCALE H 1"=40'

42.11
INV CC"

SEE PROFILE C
THIS SHEET

FOUND NAIL & RLS 6005 TAG
0+00
DIABLO DR.

13+12 CAMERON

14+08 (5' R.T.) SMH No 2

14+56 8" PVC (S)

15+35 ℄ 22' COMM. DWY.

18+35 ℄ 22' COMM. DWY.

16+99 6" PVC (S)

17+40 ℄ 30' COMM. DWY.

17+90 ℄ END SIDEWALK

18+46 D.I. No 2 ℄ TYPE C D.I. (L=4')

18+68.16 (5' R.T.) SMH No 6

18+80 6" PVC (S)

19+50 ℄ 30' COMM. DWY.

N 00°10'11" W

0+44.82 P.C.

13+62.13 P.T.

SEE PROFILE 'A'
THIS SHEET

15+15 ℄ 32' COMM. DWY.

15+91 ℄ 32' COMM. DWY.

16+15 8" PVC (W)

16+93 6" PVC (S)

17+12 8" PVC (W)

17+50-MH-12'R.T. 66" REP TEE FLAT TOP M.H. 11+54 ℄ 32' COMM. DWY.

18+06 6" PVC (S)

18+37 D.I. No 1 ℄ TYPE C P.I. (L=4')

18+71 6" PVC (S)

18+92 8" PVC (W)

SEE PROFILE 'D'
THIS SHEET

SEE DETAIL SHEET 28
FOR CHANNEL GRADING

END CURB GUTTER

:H LINE
SHT. 15

DRIVE

CAMERON

STREET

CURVE DATA

NO.	BCR	Δ	L	T
①	20.00'	90°14'11"	31.50'	20.08'
②	20.00'	89°45'49"	31.33'	19.92'

14+55 G.P.
51.00 E.L.

EXIST. GRD 30' L.T.

FL. L.T.

1.41%

E

INV=0.19

Oct 23,1992 10:34AM FROM HILL Las Vegas TO CH2M PHX P.04

EXIST. GRD 30' L.T.

FL. L.T.

-0.57%

SEWER LINE

STORM

-1.41%

-1.84%

EXIST PAV'T AT ℄

HYDRAULIC GRADELOT

49.95 TMH

-0.60%

NEW 8" WATER LATERAL TO GO UNDER SANITARY AND STORM SEWER. SEE DETAIL 1 SHEET 25. (TYPE 3 POLICES)

D... FLAT TOP MANHOLE SEE DETAIL 2 SHT. 33

45.64 TUV T. 15"

45.72 TUV TU 15"

560 LF 66" RCP CLASS II @ 0.50%

450 LF 8" PVC @ 9.000 1/FT

16" PVC SEWER LATERAL AT 66" RCP STORM DRAIN

41.07 TUV

46.43 TUV

16" PVC SEWER LATERAL AT 66" RCP STORM DRAIN

-0.66%

EXIST GRD 30' R.T.

45.05 TUV

27 1/FT

The following requirements must be met in the event of a water-sewer/storm line crossing:

When p... ction of the waterline is considered, the minimum vertical ...tanc... 18 inches must be maintained when the waterline is installed

(2)

FL LJ

17+50 66" RCP TEE PIPE FOR MANHOLE

17+30 EVC 49.91 EC

18+27 45.79 P.C. 5=+1.4%

18+46 MVC 49.76 P.C. MH-6B

18+46 GIP 45.10 F.L.

16+71 49.75 P.C.

16+06 EVC 49.68 P.C.

12+21 49.51 F.C.

15+24.32 49.31 P.C. 66" RCP MH-6A

15+06 MVC 49.31 P.C. MH-6A

12+71 49.65 P.C.

13+96 EVC (49.20) F.C.

+0.67%

(-0.94%)

(+0.44%)

(-0.00%)

49.75 TMH

TOP T. 39

45.84 IUV @ 15"

45.72 IUV @ 15"

49.74 HYD GR.

49.76 IUV

APPROX. LOCATION OF EXIST. 10" WATER LINE

6" SEWER LATERAL @ WATER LINE CROSSING

S II @ 0.69 %

0.004'/FT

39± LF 8" PVC S=-0.004'/FT

50.43 IUV

6" PVC SEWER LATERAL AT 66" RCP STORM DRAIN

50.18 IUV 6" PVC LAT.

10+37 45.12 F.L.

18+00 45.00 F.L. PER SEC. 124-D-1

10+87 EVC 49.32 F.L.

10+21 49.50 F.C.

12+37 MVC 49.55 F.C. MH-6B

12+71 49.16 F.C.

12+87 EVC (49.24) F.L.

+0.40%

(-0.91%)

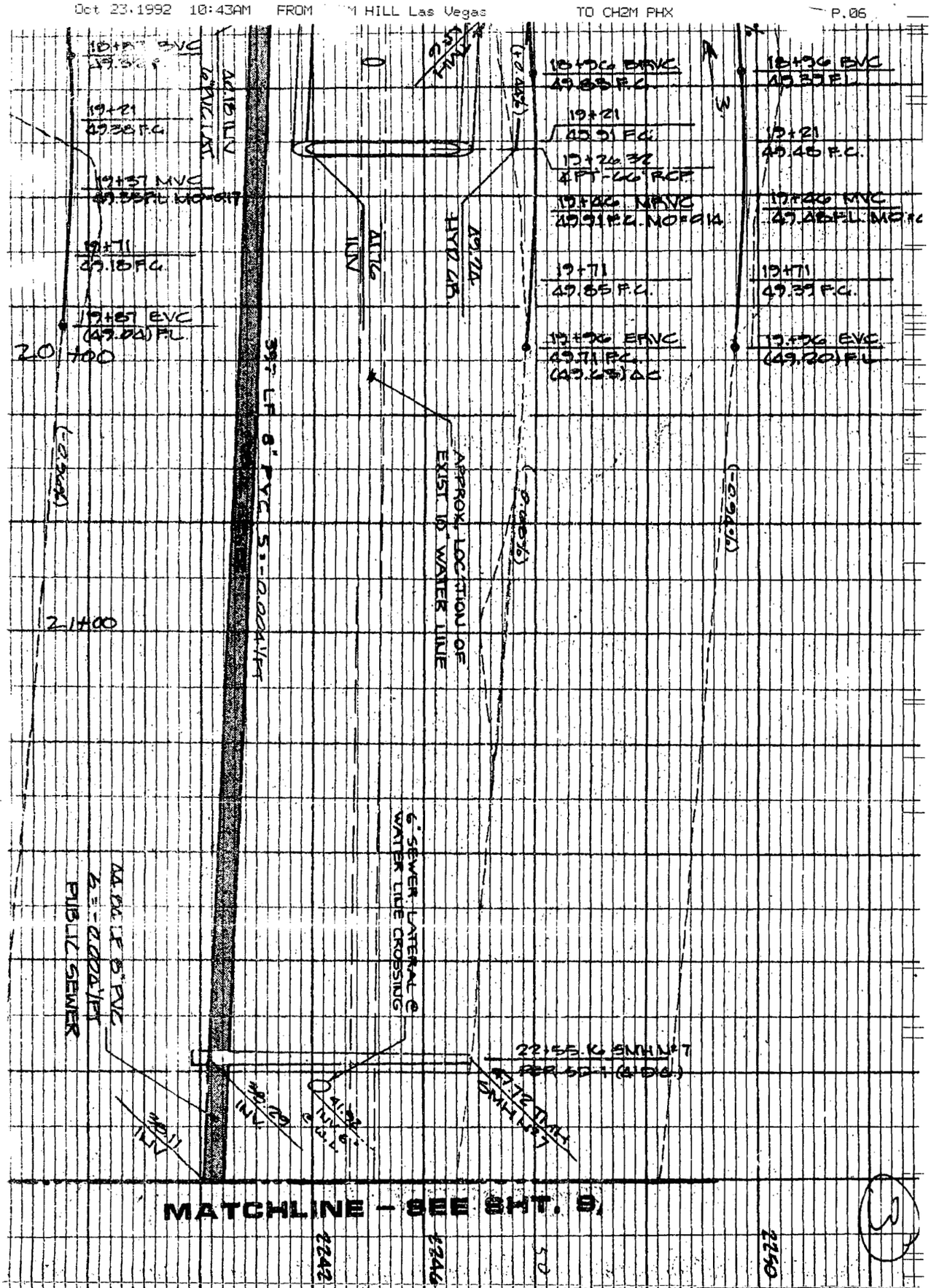
44.84 LF 8" PVC S=-0.004'/FT PUBLIC SEWER

32' B.T.

18+00

19+00

20+00



CAMERON STREET

STA. 11+00 TO STA. 23+00

BAUGH

CIVIL ENGINEERS

2325 WES[T] CH[URCH] ESTO[GA]

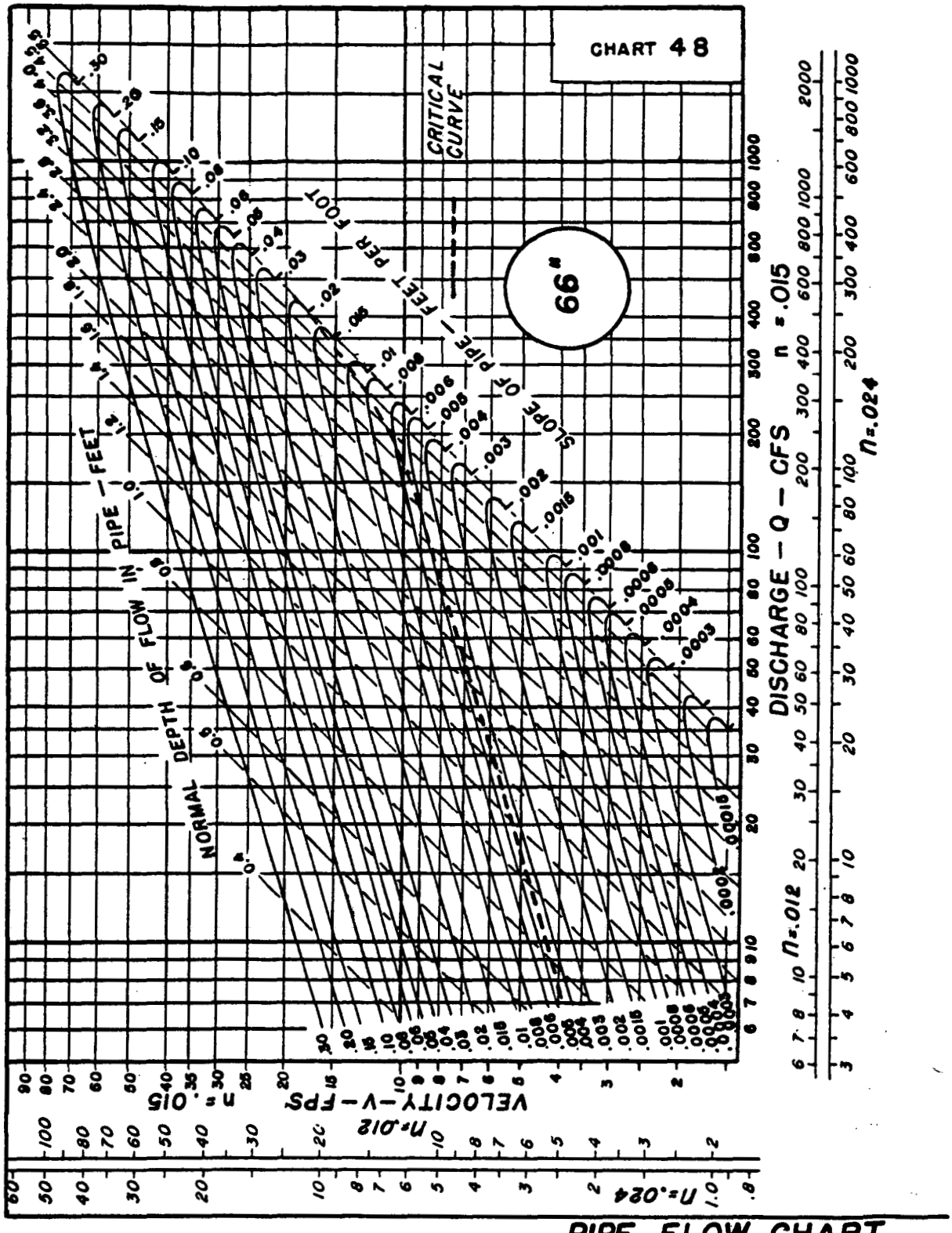
YO-87

DESIGN CHARTS FOR OPEN-CHANNEL FLOW

Hydraulic Design Series No. 3

U.S. Department of Transportation
Federal Highway Administration

August 1961



PIPE FLOW CHART
66 - INCH DIAMETER

CURRENT DATE: 10-15-1992
CURRENT TIME: 16:54:59

FILE DATE: 10-15-1992
FILE NAME: SP1-350

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 3.2 **********
****

C U L V #	SITE DATA: INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	2252.50	2252.30	1.02	1 RCB	50.00	20.00	.012	IMPR SDT REC
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (CFS) FILE: SP1-350 DATE: 10-15-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
2252.50	0	0	0	0	0	0	0	0	1
2262.81	295	295	0	0	0	0	0	0	1
2263.12	590	590	0	0	0	0	0	0	1
2263.38	885	885	0	0	0	0	0	0	1
2263.61	1180	1180	0	0	0	0	0	0	1
2263.83	1475	1475	0	0	0	0	0	0	1
2264.04	1770	1770	0	0	0	0	0	0	1
2264.24	2065	2065	0	0	0	0	0	0	1
2264.44	2360	2360	0	0	0	0	0	0	1
2264.63	2655	2655	0	0	0	0	0	0	1
2264.82	2950	2950	0	0	0	0	0	0	1
2280.00	15485	15485	0	0	0	0	0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: SP1-350 DATE: 10-15-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
2252.50	0.00	0	0	0.00
2262.81	0.00	295	0	0.00
2263.12	0.00	590	0	0.00
2263.38	0.00	885	0	0.00
2263.61	0.00	1180	0	0.00
2263.83	0.00	1475	0	0.00
2264.04	0.00	1770	0	0.00
2264.24	0.00	2065	0	0.00
2264.44	0.00	2360	0	0.00
2264.63	0.00	2655	0	0.00
2264.82	0.00	2950	0	0.00

****

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

****

NT DATE: 10-15-1992 FILE DATE: 10-15-1992
NT TIME: 16:54:59 FILE NAME: SP1-350

****
********** CULVERT # 1 **********
****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2252.50	2251.70	0.00	-0.20	0-NF	0.00	2252.50	2252.50	0.00
295	2262.81	2252.51	3.09	10.31	6-FF	0.00	2254.33	2255.59	5.74
590	2263.12	2252.91	3.57	10.62	6-FF	0.00	2255.40	2256.07	7.23
885	2263.38	2253.24	4.06	10.88	6-FF	0.00	2256.30	2256.56	8.27
1180	2263.61	2253.51	4.61	11.11	6-FF	0.00	2257.11	2257.03	9.11
1475	2263.83	2253.76	5.35	11.33	6-FF	0.00	2257.85	2257.50	9.81
1770	2264.04	2254.42	6.04	11.54	6-FF	0.00	2258.54	2257.96	10.42
2065	2264.24	2254.53	6.69	11.74	6-FF	0.00	2259.19	2258.41	10.97
2360	2264.44	2254.64	7.31	11.94	6-FF	0.00	2259.81	2258.86	11.47
2655	2264.63	2254.73	7.91	12.13	6-FF	0.00	2260.41	2259.30	11.93
2950	2264.82	2254.83	8.49	12.32	6-FF	0.00	2260.99	2259.73	12.36

El. inlet face invert 2252.50 ft El. outlet invert 2252.30 ft
El. inlet throat invert 2252.50 ft El. inlet crest 0.00 ft

****

* SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	2252.50
OUTLET STATION (FT)	1.00
OUTLET ELEVATION (FT)	2252.30
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.2000
CULVERT LENGTH ALONG SLOPE (FT)	1.02

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	50.00 FT
BARREL RISE	20.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	IMPR SDT RECT
INLET EDGE AND WALL	BEVELED EDGE TOP (15-26 DEG WINGWALL)
INLET DEPRESSION	NONE

***** SIDE-TAPERED RECTANGULAR IMPROVED INLET ***

FACE WIDTH	50.00 FT
SIDE TAPER (4:1 TO 6:1) (X:1)	4.00

****

[redacted]NT DATE: 10-15-1992 FILE DATE: 10-15-1992
[redacted]T TIME: 16:54:59 FILE NAME: SP1-350

****
********** TAILWATER **********
****

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: SP1-350
MAIN CHANNEL ONLY FILE DATE: 10-15-1992
LEFT CHANNEL BOUNDARY 0
RIGHT CHANNEL BOUNDARY 0
MANNING N LEFT OVER BANK 0.000
MANNING N MAIN CHANNEL 0.015
MANNING N RIGHT OVER BAN 0.000
SLOPE OF CHANNEL (FT/FT) 0.0108

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	100.00	2256.00
2	115.00	2251.70
3	155.00	2251.70
4	165.00	2254.00
5	250.00	2254.30
6	250.10	2256.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
0.00	2251.70	0.000	0.00	0.00
295.00	2252.51	1.725	8.49	0.50
590.00	2252.91	1.835	10.90	0.73
885.00	2253.24	1.900	12.56	0.91
1180.00	2253.51	1.946	13.85	1.05
1475.00	2253.76	1.982	14.94	1.18
1770.00	2254.42	1.840	11.02	0.75
2065.00	2254.53	1.868	11.70	0.82
2360.00	2254.64	1.891	12.33	0.88
2655.00	2254.73	1.913	12.91	0.95
2950.00	2254.83	1.932	13.45	1.01

channel #1 rating

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE PAVED
EMBANKMENT TOP WIDTH (FT) 10.00
CREST LENGTH (FT) 1000.00
OVERTOPPING CREST ELEVATION (FT) 2280.00

****

CURRENT DATE: 10-15-1992 FILE DATE: 10-15-1992
CURRENT TIME: 16:48:58 FILE NAME: SP2-350

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 3.2 **********
****

C U L V #	SITE DATA: INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	2252.50	2252.30	1.02	1 RCB	50.00	20.00	.012	IMPR SDT REC
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (CFS) FILE: SP2-350 DATE: 10-15-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
2252.50	0	0	0	0	0	0	0	0	1
2262.81	295	295	0	0	0	0	0	0	1
2263.12	590	590	0	0	0	0	0	0	1
2263.38	885	885	0	0	0	0	0	0	1
2263.61	1180	1180	0	0	0	0	0	0	1
2263.83	1475	1475	0	0	0	0	0	0	1
2264.04	1770	1770	0	0	0	0	0	0	1
2264.24	2065	2065	0	0	0	0	0	0	1
2264.44	2360	2360	0	0	0	0	0	0	1
2264.63	2655	2655	0	0	0	0	0	0	1
2264.82	2950	2950	0	0	0	0	0	0	1
2280.00	15484	15484	0	0	0	0	0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: SP2-350 DATE: 10-15-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
2252.50	0.00	0	0	0.00
2262.81	0.00	295	0	0.00
2263.12	0.00	590	0	0.00
2263.38	0.00	885	0	0.00
2263.61	0.00	1180	0	0.00
2263.83	0.00	1475	0	0.00
2264.04	0.00	1770	0	0.00
2264.24	0.00	2065	0	0.00
2264.44	0.00	2360	0	0.00
2264.63	0.00	2655	0	0.00
2264.82	0.00	2950	0	0.00

****

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

****

[redacted]T DATE: 10-15-1992
[redacted]T TIME: 16:48:58

FILE DATE: 10-15-1992
FILE NAME: SP2-350

****

********** CULVERT # 1 **********

****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2252.50	2252.20	0.00	-0.20	0-NF	0.00	2252.50	2252.50	0.00
295	2262.81	2253.31	3.09	10.31	6-FF	0.00	2254.33	2255.59	5.74
590	2263.12	2253.85	3.57	10.62	6-FF	0.00	2255.40	2256.07	7.23
885	2263.38	2254.56	4.06	10.88	6-FF	0.00	2256.30	2256.56	7.83
1180	2263.61	2254.76	4.61	11.11	6-FF	0.00	2257.11	2257.03	9.11
1475	2263.83	2254.94	5.35	11.33	6-FF	0.00	2257.85	2257.50	9.81
1770	2264.04	2255.10	6.04	11.54	6-FF	0.00	2258.54	2257.96	10.42
2065	2264.24	2255.25	6.69	11.74	6-FF	0.00	2259.19	2258.41	10.97
2360	2264.44	2255.39	7.31	11.94	6-FF	0.00	2259.81	2258.86	11.47
2655	2264.63	2255.52	7.91	12.13	6-FF	0.00	2260.41	2259.30	11.93
2950	2264.82	2255.65	8.49	12.32	6-FF	0.00	2260.99	2259.73	12.36

El. inlet face invert 2252.50 ft El. outlet invert 2252.30 ft
El. inlet throat invert 2252.50 ft El. inlet crest 0.00 ft

****

[redacted]

* SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	2252.50
OUTLET STATION (FT)	1.00
OUTLET ELEVATION (FT)	2252.30
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.2000
CULVERT LENGTH ALONG SLOPE (FT)	1.02

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	50.00 FT
BARREL RISE	20.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	IMPR SDT RECT
INLET EDGE AND WALL	BEVELED EDGE TOP (15-26 DEG WINGWALL)
INLET DEPRESSION	NONE

***** SIDE-TAPERED RECTANGULAR IMPROVED INLET ***

FACE WIDTH	50.00 FT
SIDE TAPER (4:1 TO 6:1) (X:1)	4.00

****

[redacted]

[redacted]NT DATE: 10-15-1992 FILE DATE: 10-15-1992
[redacted]IT TIME: 16:48:58 FILE NAME: SP2-350

****
********** TAILWATER **********
****

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: SP2-350
MAIN CHANNEL ONLY FILE DATE: 10-15-1992
LEFT CHANNEL BOUNDARY 0
RIGHT CHANNEL BOUNDARY 0
MANNING N LEFT OVER BANK 0.000
MANNING N MAIN CHANNEL 0.020
MANNING N RIGHT OVER BAN 0.000
SLOPE OF CHANNEL (FT/FT) 0.0060

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	99.90	2256.00
2	100.00	2254.30
3	175.00	2254.25
4	185.00	2252.20
5	225.00	2252.20
6	240.00	2254.00
7	320.00	2256.00

[redacted]* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
0.00	2252.20	0.000	0.00	0.00
295.00	2253.31	1.006	5.61	0.36
590.00	2253.85	1.064	7.04	0.51
885.00	2254.56	1.007	5.63	0.36
1180.00	2254.76	1.031	6.20	0.42
1475.00	2254.94	1.049	6.65	0.47
1770.00	2255.10	1.064	7.05	0.51
2065.00	2255.25	1.077	7.40	0.55
2360.00	2255.39	1.088	7.72	0.58
2655.00	2255.52	1.097	8.00	0.61
2950.00	2255.65	1.106	8.27	0.64

Channel #2 rating

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE PAVED
EMBANKMENT TOP WIDTH (FT) 10.00
CREST LENGTH (FT) 1000.00
OVERTOPPING CREST ELEVATION (FT) 2280.00

[redacted]**********

SPEAR CHANNEL FLOW SPLIT CCRFCD RDD33832

The peak discharge below of 2950 cfs is the difference between the initial channel flow of 3300 cfs minus 350 cfs that goes into a 66" RCP upstream of Spear Channel

Input rating curves generated from HY-8 program:

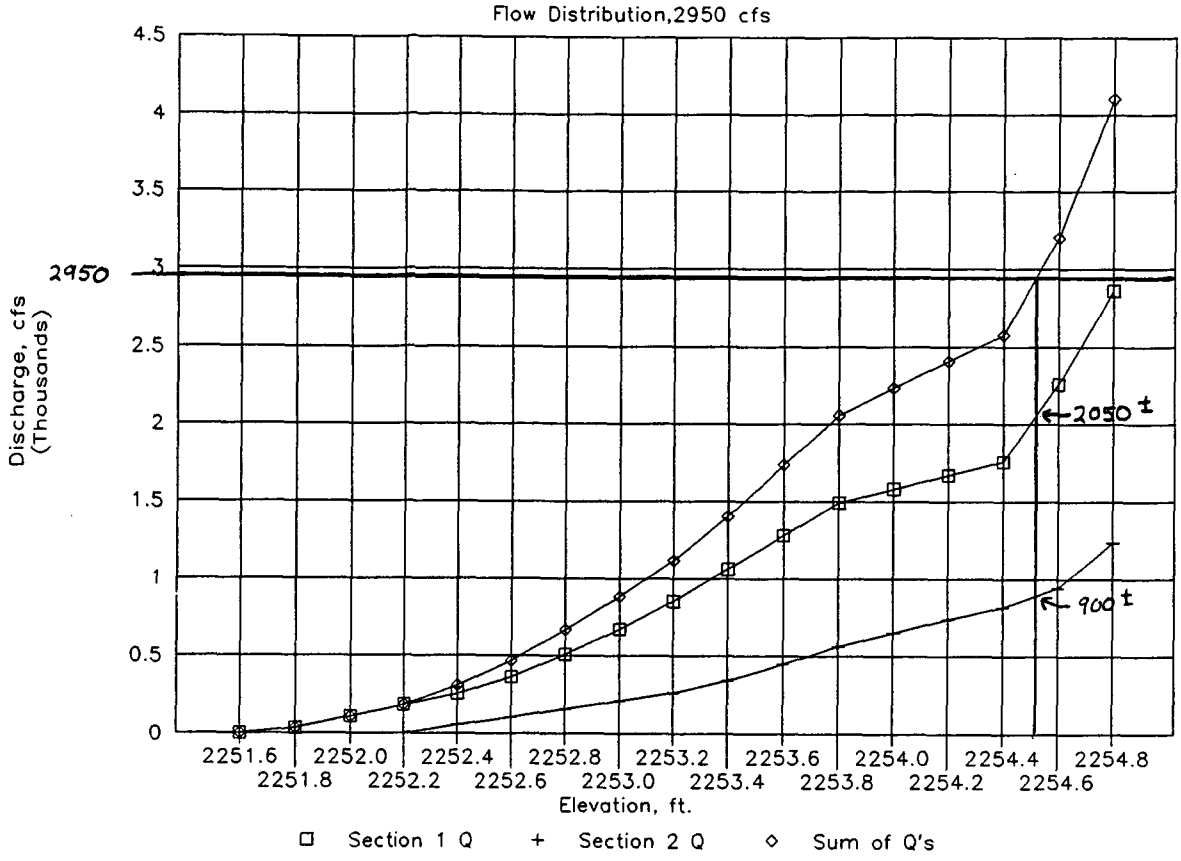
Q, cfs	W. S. El. Section 1, ft.	W. S. El. Section 2, ft.
0.0	2251.7	2252.2
295.0	2252.5	2253.3
590.0	2252.9	2253.8
885.0	2253.2	2254.6
1180.0	2253.5	2254.8
1475.0	2253.8	2254.9
1770.0	2254.4	2255.1
2065.0	2254.5	2255.3
2360.0	2254.6	2255.4
2655.0	2254.7	2255.5
2950.0	2254.8	2255.6

Above data rearranged to plot Q vs. Elevation:

Elevation, ft.	Q, Sect.1, cfs	Q, Sect.2, cfs	Composite Q, cfs
2251.6	0.0	0.0	0.0
2251.8	36.5	0.0	36.5
2252.0	109.5	0.0	109.5
2252.2	182.5	0.0	182.5
2252.4	255.6	52.9	308.5
2252.6	362.2	105.8	468.0
2252.8	508.2	158.7	667.0
2253.0	670.4	211.7	882.0
2253.2	853.0	264.6	1117.6
2253.4	1061.4	342.0	1403.3
2253.6	1285.4	452.4	1737.9
2253.8	1492.8	562.9	2055.7
2254.0	1581.8	652.6	2234.4
2254.2	1670.8	735.4	2406.2
2254.4	1759.8	818.3	2578.1
2254.6	2257.9	941.4	3199.3
2254.8	2862.1	1239.0	4101.1

File = SP-350.WK1

SPEAR CHANNEL



SUBJECT Tropicana Wash F.I.S.
HEC-2: Channel reach lengths & Stations for Central, North & South Washes

BY HMA DATE 7/27/92
SHEET NO. 1 OF 9
PROJECT NO. RDD 33832

Following sheets are a tabulation of channel (XCH) overbank (XLOB) and right overbank (XROB) distances

Sheets 6 through 9 were initial measurements but then sections were added and so the channel reaches were remeasured. The latter measurements are on sheets 2 through 5.

10/19/92
- after the runs were made and the floodplains plotted on the maps, the overbank lengths were reviewed and some were adjusted to reflect the new overbank flow limits.

Tropicana Wash F.I.S. CHELO 7/23
HEC-2 Channel reach lengths + stations 2 9
FLAMINGO/CENTRAL RDD33832

XCH (ft)	XCH (Mi)	XSXM	
0	0	00.000	
350	0.0663	00.0663	
90	0.0170	00.0833	
140	0.0265	00.1098	
180	0.0341	00.1439	= 60.000
420	0.0795	60.0795	
295	0.0559	60.1354	
185	0.0350	60.1705	
255	0.0483	60.2188	
300	0.0568	60.2756	
135	0.0256	60.3011	.3002
230	0.0436	60.3447	
275	0.0521	60.3968	
260	0.0492	60.4460	
240	0.0455	60.4915	
505	0.0956	60.5871	
420	0.0795	60.6667	
200	0.0379	60.7045	
505	0.0956	60.8002	
350	0.0663	60.8665	
110	0.0208	60.8873	
85	0.0161	60.9034	
45	0.0085	60.9119	
125	0.0237	60.9356	
300	0.0568	60.9924	
220	0.0417	61.0341	
200	0.0379	61.0720	
~~68~~ 35	~~0.0129~~ 0.0066	~~61.0848~~ 61.0786	
~~45~~ 78	~~0.0085~~ 0.0148	61.0934	
120	0.0227	61.1161	
130	0.0246	61.1407	
125	0.0237	1.1644	
375	0.0710	1.2354	
545	0.1032	1.3386	
270	0.0511	1.3898	
6211.29	1.1764	62.5662	
540	0.1023	2.6684	
~~500~~	0.0947	2.7631	
505	0.0956	2.8588	
~~MOVED 560~~	~~0.1061~~	~~2.9648~~	
~~505~~	~~0.0956~~	~~3.0605~~	
510	0.0966	3.1571	
545	0.1032	3.2603	
490	0.0928	3.3531	
305	0.0578	3.4109	
920	0.1742	3.5851	

LONG CULVERT, 5645.3

LONG CULVERT LENGTH 6067.29'
+ 144' to KOVAL BEFORE START

XCH(ft)	XSXM
250	62.9061
160	62.9365
160	62.9668
495	63.0605

Tropicana Wash F.I.S. CHELO 7/23/92
HEC-2 Channel Reach lengths & Stations 3 9
FLAMINGO CENTRAL CONT'D ROD 33832

XCH (ft)	XCH (mi)	XSXM		
✓ 630	0.1193	3.8010		
✓ 345	0.0653	3.8663		
✓ 90	0.0170	3.8834		
✓ 125	0.0237	3.9071	✓200	63.9450 ✓
			✓180	63.9791
~~380~~	~~0.0720~~	~~3.9790~~		
✓ 555	0.1051	6 4.0841	✓150	64.1125
			✓130	64.1371 ✓
~~500~~	~~0.0947~~	~~4.1788~~	✓220	64.1788
✓ 990	0.1875	4.3663		
✓ 500	0.0947	4.4610		
✓ 535	0.1013	4.5624		
✓ 605	0.1146	4.6769		
✓ 590	0.1117	4.7887		
✓ 530	0.1004	4.8891		
✓ 525	0.0994	4.9885		
✓ 530	0.1004	5.0889		
✓ 455	0.0862	5.1751		
✓ 535	0.1013	5.2764		
✓ 550	0.1042	5.3805		
✓ ✓ 540	0.1023	5.4828		
✓ ✓ 475	0.0900	5.5728		
✓520 500	0 0947 85	5. 6675 713		
✓525 ~~505~~	0.0956 94	5. 7631 707		
✓ ✓ 530	0.1004	~~5.8635~~	5.8711	
✓ ✓ 530	0.1004	~~5.9639~~	5.9715	
✓ ✓535	0.1013	~~6.0652~~	6.0728	
✓ ✓570	0.1080	~~6.1732~~	6.1808	
✓ ✓ 500	0.0947	~~6.2679~~	6.2755	
✓ ✓ 495	0.0938	~~6.3616~~	6.3692	
✓ ✓530	0.1004 75	~~6.4620~~	6.4696	
✓515 ~~508~~	0.0947	~~6.5567~~	6.5671	
✓ ✓ 500	0.0947 11	~~6.6514~~	6.6618	
✓550 ~~535~~	0.1013 43	~~6.7527~~	6.7660	
✓ ✓ 530	0.1004	~~6.8531~~	6.8664	
✓ ✓ 570	0.1080	~~6.9611~~	6.9743	

Tropicana Wash F.I.S. CHELO 7/23/92
HEC-2 Channel Reach Lengths + Stations 4 9
~~North~~ RDD 33832

XCH(ft)	XCH(mi)	XSXM
0	0	0
490	.0928	90.0928
500	.0947	90.1875
~~510~~	~~.0966~~	~~90.2841~~
510	.0966	90.3807
505	.0956	90.4763
495	.0938	90.5701
510	.0966	90.6667
495	.0938	90.7604
420	.0795	90.8400
120 ~~110~~	.0227 ~~.0208~~	90.8627 ~~90.8608~~
125 ~~135~~	.0237 ~~.0256~~	90.8864
350	.0663	90.953
490	.0928	91.0455
470	.0890	91.135
530	.1004	1.2348
540	.1023	1.3371
510	.0966	1.4337
510	.0966	1.5303
525	.0994	1.6297
~~545~~	.1032	1.7330
520	.0985	1.8314
500	0.0947	1.9261
525	0.0944	2.0256
590	0.1117	2.1373
540	0.1023	2.2396
570	0.1080	2.3475
520	0.0985	2.4460
525 ~~500~~	0.0994	2.5454 ~~2.5407~~

XCH	XSXM
80	90.2027
~~80~~65	~~90.2140~~ 90.2150
~~370~~365	90.2841

Tropicana Wash

HEC-2 Channel reach lengths & stations

~~SOUTH~~

CITELO 7/23/92

5 9

RDD 33832

XCH (Ft)	XCH (Mi)	XSXM	
0	0	0	
490	.0928	30.0928	
520	.0985	30.1913	
530	.1004	0.2917	
535	.1013	0.3930	
490	.0928	0.4858	
520	.0985	0.5843	
485	.0919	0.6761	
545	.1032	0.7794	
490	.0928	0.8722	
500	.0947	30.9669	
~~590~~	.1117	31.0786	
500	.0947	1.1733	
520	.0985	1.2718	
510 ~~485~~	.0968 ~~.0919~~	~~+.363~~	1.3684
510	.0966	~~+.4602~~	1.4650
530	.1004	~~+.5606~~	1.5654
520	.0985	~~+.6591~~	1.6638
515	.0975	~~+.7566~~	1.7614
520	.0985	~~+.8551~~	1.8599
545	0.1032	~~+.9583~~	1.9631

TROPICANA WASH
FLAMINGO / CENTRAL

CHELO 6 9

7/16/92

XSXN (sel prior sta)	CHSTL (ft)	CHSTR (ft)	XCH (ft)	ΣXCH (ft)	X LOB (ft)	X ROB (ft)
00.000	9920	10049	0	0	0	0
00.0663	9940	10060	350	350	265	450
FLAMINGO 00.083	9930	10060	90	440	80	80
00.110	9950	10045	140	580	223	78
00.135						
SAME STATION						
6 0.000	9963	10080	~~470~~ 133	700	160 92	~~145~~ 230
CENTRAL 6 0.089	9940	10049	~~420~~ OK	470	~~615~~ 470	320
6 0.137	9959	10035	295	765	305	195
6 0.172	9960	10025	185	950	~~260~~ 145	229
6 0.228	9960	10030	255	1105	110	390
60.306 → 6 0.294	9940	10050	300	1405	170	435
6 0.349	9945	10045	230	1635	270 ~~130~~ 130	150 160
6 0.407	9955	10034	275	1910	270	280
6 0.458	9955	10050	~~260~~ OK	2170	270	255
added sections 0.577 0.667 6 0.495	9935	10045	240	2410	350	160
6 0.709	9925	10070	200 ~~1130~~	3540	145 ~~1100~~	300 ~~1140~~
6 0.804	9860	10155	595 ~~440~~	3980	595 ~~685~~	355
6 0.871	9975	10035	350 ~~497~~	4477	346	360
6 0.897	9973	10030	110	4587	110	108
6 0.913	9962	10042	85	4672	80	90
6 0.919	9950	10050	45 ~~38~~	4710	45 ~~38~~	45 ~~38~~
6 0.953	9955	10053	125 ~~180~~	4890	70 ~~100~~	230
6 0.992						
~~6 1.005~~	9955	10055	300	5190	320	240 ~~260~~
6 1.044	9950	10060	228	5418	205	255
6 1.086	9950	10049	195 ~~49~~	5613	190	200
6 1.104	9965	10028	35 ~~68~~	5681	65	~~30~~ 35
6 1.112	9955	10045	78 ~~45~~	5726	85	~~30~~ 40
6 1.136	9940	10075	120 ~~130~~	5856	155	78
6 1.164	9975	10025	130 ~~120~~	5976	150 ~~195~~	165
6 1.185	9965	10025	125 ~~75~~	6049	60	140 ~~85~~
6 1.257	9925	10075	375 ~~370~~	6419	450	260 ~~280~~
RUN 2 6 1.363	9885	10040	600	7019	450 ~~490~~	650
6 1.415	9925	10040	290	7309	265	235 ~~260~~
? → 6 2.670	9970	10035	0 (6750)	0 (13759)	0	0
6 2.738	9975	10025	550	14309	470 520	550
NEED X3 CARD 6 2.814	9947	10045	500	14809	505	495
6 2.920	9965	10015	505	15314	500	505
6 3.042	9960	10052	160 ~~580~~	15894	140 ~~540~~	180 ~~530~~
6 3.080	9960	10015	500	16394	540	440
6 3.237	9965	10039	510 ~~550~~	16944	555	465
banks? → 6 3.340	9830	10130	570	17514	485	565
RUN 3 6 3.435	9925	10033	510	18024	490	510
6 3.489	9960	10020	0 (300)	0 (18324)	0 (755)	0 (410)
6 3.559	9945	10045	900	19224	1000 ~~1080~~	550 ~~330~~
6 3.607	9975	10030	530	19754	410	500
6 3.893	9975	10037	585	20339	620	400
6 3.952	9955	10038	385	20724	470	260 ~~80~~

TROPICANA WASH
CENTRAL

CHELO (M) 7 9

7/20/92

CENTRAL

XSXM	CHSTL	CHSTR	XCH	Σ XCH	X LOB	X ROB
6 3.966	9955	10010	90 ~~85~~	20809	95	85 ~~80~~
6 3.993	9975	10025	125	20934	110	150
6 4.065	9950	10030	~~380~~	21314	~~130~~	~~655~~ split
6 4.114	9975	10025	~~575~~	21889	~~345~~	~~680~~
6 4.269	9975	10022	~~505~~	22394	~~600~~	195 ~~457~~
6 4.447	9967	10050	990 ~~995~~	23389	735	950 ~~750~~
6 4.576	9965	10030	500	23889	495	500
6 4.636	9965	10015	535	24424	640	360
X3 → 6 4.763	9850	10150	~~640~~	25064	415	380
XST ? → 6 4.872	9850	10220	570 ~~575~~	25659	385	755
6 4.968	9955	10030	530 ~~525~~	26184	515	470 ~~455~~
6 5.074	9964	10040	525 ~~550~~	26734	~~635~~	425
6 5.176	9960	10034	530 ~~560~~	27284	505	570
6 5.223	9965	10020	470	27754	440	465
6 5.300	9970	10040	530	28284	520	470
6 5.477	9965	10025	565	28849	530 ~~430~~	510
6 5.574	9970	10030	540	29389	555 ~~585~~	465
6 5.629	9950	10030	520	29909	450	505
6 5.729	9970	10025	520	30429	498	505
6 5.880	9970	10015	525 ~~530~~	30959	520	510
6 5.985	9980	10012	530 ~~560~~	31519	505	500
6 6.069	9970	10020	550 ~~550~~	32069	525 ~~560~~	~~540~~
6 6.183	9975	10030	535 ~~530~~	32599	560	470
6 6.285	9980	10025	570	33169	590	545
6 6.383	9978	10020	500 ~~530~~	33699	430	490
6 6.489	9975	10035	495 ~~520~~	34219	450	550
6 6.541	9965	10025	530 ~~550~~	34769	480	525
6 6.695	9955	10025	515 ~~525~~	35294	500	505
6 6.787	9905	10020	500 ~~525~~	35819	560	440
6 6.895	9915	10015	550 ~~570~~	36389	515 ~~495~~	527
6 6.941	9930	10020	530 ~~520~~	36909	510 ~~552~~	490
and → 6 7.113	9975	10085	570 ~~620~~	37529	530 ~~515~~	515

7.1078 mi.

less than 1%

TROPICANA WASH
NORTH TRIBUTARY

CHELO 8 9

7/20/92

XSXM	CHSTL	CHSTR	XCH	ΣXCH	XLOB	XROB
9 0.00		—	(45)	-0	—	—
??? → 9 0.093	9945	10065	490 ~~(510)~~	555	472 ~~(475)~~	652 ~~(715)~~
9 0.189	9960	10015	520 ~~490~~	1045	510 ~~425~~	430
9 0.284	9975	10015	370 ~~530~~	1575	370 ~~510~~	375 ~~510~~
9 0.383	9950	10035	510 ~~520~~	2095	515	520 ~~495~~
9 0.484	9970	10035	505 ~~535~~	2630	510	465
9 0.576	9965	10025	495 ~~510~~	3140	562	390
9 0.676	9965	10030	510 ~~520~~	3660	520	500 ~~495~~
9 0.780	9975	10035	495 ~~520~~	4180	465	515
CHSTL? CHSTR? → 9 0.864	9970	10025	420 ~~430~~	4610	535 ~~490~~	350 ~~370~~
→ 9 0.897	9965	10020	120 ~~115~~	4725	0?? ~~120~~	??? ~~120~~
9 0.972	9955	10044	125 ~~140~~	4865	140	120
9 0.987	9890	10110	350 ~~380~~	5245	275	390
9 1.085	9970	10085	490 ~~500~~	5745	460 ~~445~~	510
9 1.183	9955	10030	470 ~~510~~	6255	470 ~~485~~	490 ~~505~~
9 1.285	9965	10020	✓ 530	6785	440	590
9 1.387	9950	10020	540 ~~510~~	7295	530 ~~550~~	480
9 1.459	9975	10035	510 ~~530~~	7825	545 ~~565~~	415
9 1.543	9945	10025	✓ 510	8335	510	505
9 1.699	9960	10065	525 ~~560~~	8895	450	590
9 1.774	9970	10010	545 ~~560~~	9455	600	490
9 1.878	9975	10025	520 ~~535~~	9990	500	510
9 2.040	9970	10030	500 ~~525~~	10515	545	455
9 2.142	9965	10025	525 ~~520~~	11035	555	485
9 2.261	9970	10020	590 ~~615~~	11650	405	570
9 2.306	9935	10050	510 ~~548~~	12198	550	500
9 2.476	9975	10035	✓ 570	12768	480 ~~580~~	450 ~~550~~
9 2.574	9930	10070	520 ~~530~~	13298	519 ~~570~~	610
end → 9 2.683	9925	10050	525 ~~530~~	13828	510	550
2.7				2.6189 mi.		
				2%		

TROPICANA WASH
SOUTH TRIBUTARY

CHELO 9 9

7/20/92

XS XM	CHSTL	CHSTR	XCH	Σ XCH	XLOB	XROB
3 0.000	9965	10045	(20) from 0	0	0	0
? → 3 0.102	9885	10080	520	540	(435)	(280)
3 0.210	9865	10085	550	1090	520	480
3 0.317	9950	10025	500	1650	500	510
3 0.423	9960	10025	550	2200	530	535
3 0.521	9955	10035	500	2700	460	550
3 0.628	9945	10028	540	3240	545	475
3 0.729	9960	10095	490	3730	460	505
3 0.844	9955	10020	555	4285	490	555
3 0.949	9980	10012	495	4780	505	470
3 1.040	9970	10030	520	5300	505	490
3 1.151	9975	10035	✓590	5890	560	580
3 1.267	9970	10020	510	6400	530	515
3 1.364	9885	10015	540	6940	460	505
3 1.470	9937	10030	525	7465	495	455
3 1.572	9955	10045	515	7980	480	545
3 1.675	9960	10090	✓530	8510	530	540
3 1.781	9930	10025	530	9040	520	518
3 1.880	9940	10030	520	9560	510	505
3 1.981	9965	10025	530	10090	510	525
end → 3 2.091	9965	10025	540	10630	510	510

2.013 mi

4%

SUBJECT: Tropicana Wash
New discharges from I15 to UPRR

BY: HMA DATE: 8/12/93
SHEET NO. 1 OF 1
PROJECT NO.: RDD33832

CH2M HILL

Goal: To rerun the portion of Tropicana Wash from I-15 to UPRR using the discharges that come through the culverts under the UPRR and at I-15 including the flow coming from Tropicana Blvd. A schematic of the Q's follows this text.

Results: With these decreased Q's, the flow is contained within the channel and also passes underneath the railroad-car bridges (i.e. no split flows).

Steps:

Create new files:

Old	New	Condition
I15-NAT.HC2	I15-2-N.HC2	Natural
I15Q-EN4.HC2	I15Q2-E4.HC2	Method 4
I15Q-ENC.HC2	I15Q2-E1.HC2	Method 1

Estimate the discharge coming through the culverts:

There was a set of two - 36 inch culverts* just south of the UPRR culvert that intercepted part of the 900 cfs from the Spear Channel flow split. These were evaluated using HY-8 (file = CULVERT3*) and it was found that 90 cfs flows through them. The remainder flows over a berm to the north and procedes to the 9.75 foot diameter culvert under the UPRR.

Estimate the discharge coming through the UPRR culvert:

The original discharge of 4100 cfs at this culvert was reduced by the 90 cfs removed above, leaving 4010 cfs. This flow was routed through the culvert using HY-8 (file = UPRR-C-2*), this was copied from the original on the master diskette). 710 cfs ends up going through the pipe and the remaining 3295 cfs (5 cfs was lost in the iterative calculation procedure used by HY-8) continues north and into Tropicana Blvd.

Estimate the discharge entering Tropicana Wash from the flow split where Tropicana Blvd. meets I-15:

Tropicana Blvd. goes over I-15. Where the road starts to climb, the flow splits with 56.2% , i.e. 1852 cfs, flowing north and 43.8%, i.e. 1443 cfs, flowing south (proportions from earlier analysis by Jon Fuller, 8/17/92*, see TDN section 4).

These discharges were put into the natural condition file* and run. Then the new discharges were put into the encroachment-method-4 and then the encroachment-method-1* runs. Cross-sections are also included.

* document follows text

I15 to UPRR
Natural Run with
Culvert Q5

HEC2 S/N: 1916530021 HMVersion: 6.50 Data File: i15-2-n.hc2

```
**********************************************
*  -2 WATER SURFACE PROFILES                 *
*                                            *
*  Version   4.6.2;  May 1991                *
*                                            *
*  RUN DATE    12AUG93    TIME    14:08:37   *
**********************************************
```


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


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

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


HAESTAD METHODS

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

THIS RUN EXECUTED 12AUG93 14:08:37

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

TROPICANA WASH FLOOD INSURANCE STUDY

by CH2M Hill, 1992 RDD33832

Notes:

-Manning's "n" values were estimated by field observations of channels and floodplains in conjunction with methods recommended in "Open Channel Hydraulics" by Chow, 1959

-stations and elevations obtained from 400 scale topo created by CH2M Hill from aerial photographs

8/11/93
-Changed discharges. Used just the flow that comes through the culverts [illegible]r the UPRR, except at I15 where some of the flow coming down Tropicana [illegible]dded.

```
T1   CCRFCD  TROPICANA WASH F.I.S.;   RDD33832
T2   Main Tropicana Wash, Detailed Methods
T3      I15-2-N.hc2              From I-15 up to the culvert at UPRR


J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                                       0         0              2154.7         0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1         0        -1         0         0         0         0         0         0         15


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1         43         8         55         26         56         13         14         15
      4         53        54         100       150


QT        1       2243
NC     .025       .025       .043       0.1        0.3
```

[illegible]arting W.S.El. in following X5 card obtained by routing discharge at I-15 [illegible]ough the box culvert under the road using the F.H.W.A. culvert analysis program HY-8.

X	2.566	11	9845.7	10136.1	0	0	0			
X5	1	2154.7								
GR	2147.6	9634.7	2147.8	9704.9	2146.6	9792.0	2146.9	9845.7	2142.4	9933.3
GR	2139.8	9987.0	2139.1	10000.0	2138.1	10020.3	2147.3	10136.1	2149.1	10300.6
GR	2154.0	10580.2								
X1	62.668	20	9982	10029.7	470	550	540			
X3	10			9932						
GR	2156.0	9430.3	2155.8	9503.6	2155.2	9515.8	2155.0	9541.5	2155.0	9575.7
GR	2155.2	9685.6	2155.2	9735.4	2154.3	9891.8	2153.9	9982.0	2151.0	9992.4
GR	2151.0	10000.0	2151.0	10006.4	2156.6	10029.7	2157.6	10092.0	2156.9	10144.1
GR	2154.5	10166.4	2154.1	10184.5	2154.7	10261.9	2160.6	10348.3	2160.1	10419.7
QT	1	800								
NC	.025	.025	.046							
X1	62.763	9	9943.5	10033.7	505	495	500			
GR	2166.4	9750.3	2167.3	9943.5	2159.0	9968.0	2158.3	10000.	2159.1	10016.
GR	2167.1	10033.7	2167.1	10075.0	2179.5	10102.0	2180.6	10555.		
N	.02	.07	.032	.3	.5					
X1	62.859	9	9967.1	10027.2	500	505	505			
GR	2173.9	9820.3	2172.6	9967.1	2164.5	10000.0	2172.5	10027.2	2172.3	10064.
GR	2180.0	10087.5	2181.2	10114.5	2181.1	10533.0	2180.8	10551.2		
X1	62.906	15	9979.8	10024.9	240	180	250			
X3	10									
GR	2179.3	9942.9	2180.0	9957.2	2178.1	9979.8	2171.4	9989.3	2170.2	10000.0
GR	2171.1	10009.7	2179.1	10024.9	2179.3	10039.3	2181.1	10143.6	2180.5	10282.4
GR	2181.2	10307.2	2180.9	10433.6	2181.2	10489.5	2180.8	10515.7	2181.3	10705.5

Downstream-most of three railroad car bridges
-bridge is 9 ft. wide
-entered negligible pier width to force special bridge method

SB	.9	1.6	2.6		23	.01	191	1.7	2170.2	2170.2
X1	62.908				9	9	9			
X2			1	2176.0	2177.6					
X3	10									
BT	6	9970	2177.6		9975	2177.6		9975.01	2190	
BT	10015	2190		10015.01	2177.6		10030	2177.6		

Begin cross section at effective flow boundary defined by LOB development
dded station 9919 located @50 feet from left bank, based on field notes
evation interpolated from survey data

```
X1   62.937       15    9969.7   10021.9       110       110       151
X3        10                                             10100
GR      2179     9919    2179.9    9959.0    2180.0    9969.7    2171.7    9990.2    2171.1   10000.
GR    2172.0    10012.   2178.8   10021.9    2179.1    10031.    2179.4    10048.    2181.6   10063.
GR    2181.5    10185.   2180.2   10200.8    2182.4    10242.    2182.3    10366.    2181.9   10418.

  Middle of three railroad car bridges
    -bridge is 18 ft. wide (dual railroad cars)
    -entered negligible pier width to force special bridge method

SB        .9       1.6       2.6                 23.       .01       201      1.64    2171.1    2171.1
X1   62.940                                       18        18        18
X2                              1    2177.2    2178.7
X3        10                                             10100
BT         6     9970    2178.7                9975    2178.7                9975.01      2190
BT     10015     2190              10015.01    2178.7                10030    2178.7

  Begin section at effective flow boundary defined by 4:1 expansion and field
    conditions, interpolate elevation and station from survey data

X1   62.967       12    9968.5   10035.6       120       160       142
X3        10                                             10085
GR      2180     9910    2181.1    9968.5    2173.1    9987.4    2173.1    10000.    2173.1   10009.
GR    2179.5    10019.   2182.6   10035.6    2181.7    10172.    2183.5    10215.    2183.9   10341.
      2183.8    10392.   2185.4   10656.

  Upstream-most of three railroad car bridges
    -bridge is 9 ft. wide
    -entered negligible pier width to force special bridge method

SB        .9       1.6       2.6                 23.       .01       224       1.5    2173.1    2173.1

X1   62.969                                        9         9         9
X2                              1    2179.9    2181.4
X3        10                                             10085
BT         6     9970    2181.4                9975    2181.4                9975.01      2190
BT     10015     2190              10015.01    2181.4                10030    2181.4


NC       .036      .036      .043        .1        .3

X1   63.061       13    9960.8   10020.2       530       430       486
GR    2187.5    9779.4   2184.7    9960.8    2182.5    9982.3    2177.6    9991.3    2177.3   10000.0
GR    2177.7   10007.9   2184.3   10020.2    2186.8    10034.6   2187.4    10167.6   2188.3   10347.0
GR    2188.2   10384.4   2192.8   10416.4    2191.3    10606.0


X1   63.157       20    9968.4   10040.0       555       465       510
GR    2198.2    9629.1   2194.5    9717.6    2196.2    9784.2    2197.9    9828.5    2193.4   9887.3
      2193.1    9924.6   2192.8    9968.4    2185.1    9983.7    2184.9    10000.    2185.5   10025.
      2192.1   10040.0   2191.8   10061.5    2193.7    10099.2   2193.2    10116.    2192.6   10147.
GR    2196.3   10233.5   2197.2   10252.1    2196.6    10314.6   2192.9    10357.    2198.2   10421.
```

NC	.058	.043	.053							
QT	1	710								
X1	63.260	13	9986.3	10025.7	485	565	545			
GR	2202.3	9709.9	2200.9	9748.6	2199.8	9904.0	2197.8	9986.3	2196.9	10000.
GR	2199.1	10025.7	2196.9	10085.8	2200.2	10144.1	2200.0	10173.4	2200.0	10317.
GR	2201.0	10344.0	2202.9	10386.2	2206.3	10450.2				
X1	63.353	21	9955.1	10045	490	510	490			
GR	2208.6	9587.2	2209.4	9684.5	2209.0	9756.6	2206.3	9784.0	2203.1	9827.6
GR	2201.8	9864.5	2201.5	9865.4	2201.5	9940.5	2203.9	9955.1	2199.2	9989.6
GR	2199.2	10000.0	2199.2	10012.2	2201.5	10045.0	2204.2	10093.2	2206.1	10132.2
GR	2209.7	10193.5	2208.8	10221.9	2207.2	10282.1	2207.0	10346.3	2209.4	10371.2
GR	2211.1	10550.7								

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

*PROF 1

CCHV= 0.100 CEHV= 0.300
*SECNO 62.566
WATER EL=X5 CARD= 2154.700
3280 CROSS SECTION 62.57 EXTENDED 7.10 FEET

62.566	16.60	2154.70	0.00	2154.70	2154.70	0.00	0.00	0.00	2146.90
2243.0	592.0	1086.8	564.2	1571.5	3525.4	1949.9	0.0	0.0	2147.30
0.00	0.38	0.31	0.29	0.025	0.043	0.025	0.000	2138.10	9634.70
0.000003	0.	0.	0.	0	0	0	0.00	945.50	10580.20

FLOW DISTRIBUTION FOR SECNO= 62.57 CWSEL= 2154.70

STA=	9635.	9705.	9792.	9846.	10136.	10301.	10580.
[redacted] Q=	7.6	11.2	7.6	48.5	16.7	8.5	
[redacted]A=	491.4	653.2	426.9	3525.4	1069.2	880.7	
[redacted]L=	0.3	0.4	0.4	0.3	0.4	0.2	
DEPTH=	7.0	7.5	7.9	12.1	6.5	3.1	

*SECNO 62.668

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9932.0 10419.7 TYPE= 1 TARGET= -9932.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2153.90 ELREA= 2156.60

62.668	4.79	2155.79	2155.79	0.00	2157.18	1.38	0.01	0.41	2153.90
2243.0	894.6	1348.4	0.0	89.0	149.6	0.0	44.0	6.3	2156.60
0.02	10.05	9.01	0.00	0.025	0.043	0.000	0.000	2151.00	9932.00
0.013833	470.	540.	550.	20	17	0	0.00	94.34	10026.34

FLOW DISTRIBUTION FOR SECNO= 62.67 CWSEL= 2155.79

[redacted]

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

STA= 9932. 9982. 10030.
PER Q= 39.9 60.1
AREA= 89.0 149.6
VEL= 10.0 9.0
DEPTH= 1.8 3.4

*SECNO 62.763

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.60

62.763	3.64	2161.94	0.00	0.00	2162.25	0.31	4.97	0.11	2167.30
800.0	0.0	800.0	0.0	0.0	179.1	0.0	46.4	7.2	2167.10
0.05	0.00	4.47	0.00	0.000	0.046	0.000	0.000	2158.30	9959.31
0.004859	505.	500.	495.	3	0	0	0.00	62.99	10022.29

DISTRIBUTION FOR SECNO= 62.76 CWSEL= 2161.94

STA= 9959. 10034.
PER Q= 100.0
AREA= 179.1
VEL= 4.5
DEPTH= 2.8

CCHV= 0.300 CEHV= 0.500
*SECNO 62.859

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

62.859	4.90	2169.40	2169.40	0.00	2170.64	1.24	3.63	0.46	2172.60
800.0	0.0	800.0	0.0	0.0	89.6	0.0	48.0	7.8	2172.50
0.06	0.00	8.93	0.00	0.000	0.032	0.000	0.000	2164.50	9980.10
0.011735	500.	505.	505.	20	11	0	0.00	36.56	10016.66

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

FLOW DISTRIBUTION FOR SECNO= 62.86 CWSEL= 2169.40

STA= 9980. 10027.
PER Q= 100.0
AREA= 89.6
VEL= 8.9
DEPTH= 2.4

*SECNO 62.906
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2178.10 ELREA= 2179.10

62.906	3.94	2174.14	2174.14	0.00	2175.56	1.42	2.92	0.09	2178.10
800.0	0.0	800.0	0.0	0.0	83.7	0.0	48.5	8.0	2179.10
0.07	0.00	9.56	0.00	0.000	0.032	0.000	0.000	2170.20	9985.42
0.011656	240.	250.	180.	4	15	0	0.00	30.06	10015.48

FLOW DISTRIBUTION FOR SECNO= 62.91 CWSEL= 2174.14

STA= 9985. 10025.
PER Q= 100.0
AREA= 83.7
VEL= 9.6
DEPTH= 2.8

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	191.00	1.70	2170.20	2170.20

*SECNO 62.908
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2174.14 BRIDGE VELOCITY= 6.84 CALCULATED CHANNEL AREA= 117.

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

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2175.56	0.00	0.	800.	191.	191.	2176.00	2177.60	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2178.10 ELREA= 2179.10

62.908	3.94	2174.14	0.00	0.00	2175.56	1.42	0.00	0.00	2178.10
800.0	0.0	800.0	0.0	0.0	83.7	0.0	48.5	8.0	2179.10
0.07	0.00	9.56	0.00	0.000	0.032	0.000	0.000	2170.20	9985.42
0.011656	9.	9.	9.	0	0	0	0.00	30.06	10015.48

FLOW DISTRIBUTION FOR SECNO= 62.91 CWSEL= 2174.14

STA= 9985. 10025.
Q= 100.0
A= 83.7
L= 9.6
DEPTH= 2.8

*SECNO 62.937

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.94

3470 ENCROACHMENT STATIONS= 0.0 10100.0 TYPE= 1 TARGET= 10099.999

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2180.00 ELREA= 2178.80

62.937	5.02	2176.12	0.00	0.00	2176.64	0.52	0.82	0.27	2180.00
800.0	0.0	800.0	0.0	0.0	137.8	0.0	48.9	8.1	2178.80
0.08	0.00	5.81	0.00	0.000	0.032	0.000	0.000	2171.10	9979.27
0.003100	110.	151.	110.	2	0	0	0.00	38.73	10018.00

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

FLOW DISTRIBUTION FOR SECNO= 62.94 CWSEL= 2176.12

STA= 9979. 10022.
PER Q= 100.0
AREA= 137.8
VEL= 5.8
DEPTH= 3.6

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	201.00	1.64	2171.10	2171.10

*SECNO 62.940
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2176.12 BRIDGE VELOCITY= 5.11 CALCULATED CHANNEL AREA= 157.

S	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2176.64	0.00	0.	800.	201.	201.	2177.20	2178.70	0.

3470 ENCROACHMENT STATIONS= 0.0 10100.0 TYPE= 1 TARGET= 10099.999

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2180.00 ELREA= 2178.80

62.940	5.02	2176.12	0.00	0.00	2176.64	0.53	0.00	0.00	2180.00
800.0	0.0	800.0	0.0	0.0	137.6	0.0	49.0	8.1	2178.80
0.08	0.00	5.82	0.00	0.000	0.032	0.000	0.000	2171.10	9979.29
0.003113	18.	18.	18.	0	0	0	0.00	38.71	10018.00

FLOW DISTRIBUTION FOR SECNO= 62.94 CWSEL= 2176.12

STA= 9979. 10022.
PER Q= 100.0
AREA= 137.6
VEL= 5.8
DEPTH= 3.6

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

*SECNO 62.967

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.61

3470 ENCROACHMENT STATIONS= 0.0 10085.0 TYPE= 1 TARGET= 10084.999

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2181.10 ELREA= 2182.60

62.967	3.45	2176.55	0.00	0.00	2177.58	1.03	0.68	0.25	2181.10
800.0	0.0	800.0	0.0	0.0	98.1	0.0	49.3	8.2	2182.60
0.08	0.00	8.15	0.00	0.000	0.032	0.000	0.000	2173.10	9979.23
0.008367	120.	142.	160.	0	0	0	0.00	35.17	10014.40

FLOW DISTRIBUTION FOR SECNO= 62.97 CWSEL= 2176.55

ST 9979. 10036.
PER Q= 100.0
AREA= 98.1
VEL= 8.2
DEPTH= 2.8

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
0.90	1.60	2.60	0.00	23.00	0.01	224.00	1.50	2173.10	2173.10

*SECNO 62.969
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2176.55 BRIDGE VELOCITY= 8.24 CALCULATED CHANNEL AREA= 97.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2177.59	0.00	0.	800.	224.	226.	2179.90	2181.40	0.

3470 ENCROACHMENT STATIONS= 0.0 10085.0 TYPE= 1 TARGET= 10084.999

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2181.10 ELREA= 2182.60

62.969	3.45	2176.55	0.00	0.00	2177.59	1.04	0.01	0.00	2181.10
800.0	0.0	800.0	0.0	0.0	97.9	0.0	49.4	8.2	2182.60
0.08	0.00	8.17	0.00	0.000	0.032	0.000	0.000	2173.10	9979.25
0.008424	9.	9.	9.	0	0	0	0.00	35.14	10014.39

FLOW DISTRIBUTION FOR SECNO= 62.97 CWSEL= 2176.55

STA= 9979. 10036.
PER Q= 100.0
AREA= 97.9
VEL= 8.2
DEPTH= 2.8

CCHV= 0.100 CEHV= 0.300

*[redacted]O 63.061

[redacted].061	4.32	2181.62	0.00	0.00	2182.66	1.04	5.07	0.00	2184.70
[redacted]00.0	0.0	800.0	0.0	0.0	98.0	0.0	50.5	8.6	2184.30
0.10	0.00	8.16	0.00	0.000	0.043	0.000	0.000	2177.30	9983.92
0.013244	530.	486.	430.	3	0	0	0.00	31.29	10015.21

FLOW DISTRIBUTION FOR SECNO= 63.06 CWSEL= 2181.62

STA= 9984. 10020.
PER Q= 100.0
AREA= 98.0
VEL= 8.2
DEPTH= 3.1

*SECNO 63.157

63.157	3.00	2187.90	0.00	0.00	2188.50	0.59	5.80	0.04	2192.80
800.0	0.0	800.0	0.0	0.0	129.4	0.0	51.8	9.1	2192.10
0.12	0.00	6.18	0.00	0.000	0.043	0.000	0.000	2184.90	9978.13
0.009867	555.	510.	465.	4	0	0	0.00	52.34	10030.47

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

FLOW DISTRIBUTION FOR SECNO= 63.16 CWSEL= 2187.90

STA= 9978. 10040.
PER Q= 100.0
AREA= 129.4
VEL= 6.2
DEPTH= 2.5

*SECNO 63.260

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

63.260	1.87	2198.77	2198.77	0.00	2199.22	0.45	8.43	0.01	2197.80
710.0	53.1	208.1	448.8	19.5	40.0	78.9	53.5	10.4	2199.10
0.15	2.73	5.20	5.68	0.058	0.053	0.043	0.000	2196.90	9946.25
0.029565	485.	545.	565.	4	14	0	0.00	159.92	10118.90

FLOW DISTRIBUTION FOR SECNO= 63.26 CWSEL= 2198.77

STA= 9946. 9986. 10026. 10086. 10119.
PER Q= 7.5 29.3 38.4 24.8
AREA= 19.5 40.0 47.9 31.0
VEL= 2.7 5.2 5.7 5.7
DEPTH= 0.5 1.1 0.8 0.9

*SECNO 63.353

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.11

63.353	3.44	2202.64	0.00	0.00	2202.74	0.10	3.48	0.03	2203.90
710.0	145.3	549.5	15.2	100.4	196.2	11.6	56.0	12.5	2201.50
0.21	1.45	2.80	1.31	0.058	0.053	0.043	0.000	2199.20	9840.69
0.003065	490.	490.	510.	6	0	0	0.00	207.72	10065.33

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

FLOW DISTRIBUTION FOR SECNO= 63.35 CWSEL= 2202.64

STA=	9841.	9865.	9865.	9941.	9947.	10045.	10065.
PER Q=	1.1	0.2	18.6	0.5	77.4	2.1	
AREA=	10.0	0.9	85.5	3.9	196.2	11.6	
VEL=	0.8	1.4	1.5	1.0	2.8	1.3	
DEPTH=	0.4	1.0	1.1	0.6	2.4	0.6	

THIS RUN EXECUTED 12AUG93 14:08:41

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

I15-2-N.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	62.566	2154.70	2243.00	16.60	0.38	0.31	0.29	592.00	1086.80	564.20	945.50	9634.70	10580.20
*	62.668	2155.79	2243.00	4.79	10.05	9.01	0.00	894.60	1348.40	0.00	94.34	9932.00	10026.34
	62.763	2161.94	800.00	3.64	0.00	4.47	0.00	0.00	800.00	0.00	62.99	9959.31	10022.29
*	62.859	2169.40	800.00	4.90	0.00	8.93	0.00	0.00	800.00	0.00	36.56	9980.10	10016.66
*	62.906	2174.14	800.00	3.94	0.00	9.56	0.00	0.00	800.00	0.00	30.06	9985.42	10015.48
	62.908	2174.14	800.00	3.94	0.00	9.56	0.00	0.00	800.00	0.00	30.06	9985.42	10015.48
*	62.937	2176.12	800.00	5.02	0.00	5.81	0.00	0.00	800.00	0.00	38.73	9979.27	10018.00
	62.940	2176.12	800.00	5.02	0.00	5.82	0.00	0.00	800.00	0.00	38.71	9979.29	10018.00
*	62.967	2176.55	800.00	3.45	0.00	8.15	0.00	0.00	800.00	0.00	35.17	9979.23	10014.40
	62.969	2176.55	800.00	3.45	0.00	8.17	0.00	0.00	800.00	0.00	35.14	9979.25	10014.39
	63.061	2181.62	800.00	4.32	0.00	8.16	0.00	0.00	800.00	0.00	31.29	9983.92	10015.21
	63.157	2187.90	800.00	3.00	0.00	6.18	0.00	0.00	800.00	0.00	52.34	9978.13	10030.47
*	63.260	2198.77	710.00	1.87	2.73	5.20	5.68	53.12	208.07	448.80	159.92	9946.25	10118.90
*	63.353	2202.64	710.00	3.44	1.45	2.80	1.31	145.27	549.53	15.20	207.72	9840.69	10065.33

N.hc2

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
62.908	2175.56	2176.00	0.00	2177.60	800.00	0.00	1.00	0.00	3.94	2174.14	9.56	2175.56
62.940	2176.64	2177.20	0.00	2178.70	800.00	0.00	1.00	0.00	5.02	2176.12	5.82	2176.64
62.969	2177.59	2179.90	0.00	2181.40	800.00	0.00	1.00	0.00	3.45	2176.55	8.17	2177.59

[redacted]N.hc2

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	62.566	0.00	0.00	0.00	2138.10	2243.00	2154.70	0.00	2154.70	0.03	0.31	7046.85	13264.51
*	62.668	540.00	0.00	0.00	2151.00	2243.00	2155.79	2155.79	2157.18	138.33	9.01	238.63	190.71
*	62.763	500.00	0.00	0.00	2158.30	800.00	2161.94	0.00	2162.25	48.59	4.47	179.10	114.77
*	62.859	505.00	0.00	0.00	2164.50	800.00	2169.40	2169.40	2170.64	117.35	8.93	89.57	73.85
*	62.906	250.00	0.00	0.00	2170.20	800.00	2174.14	2174.14	2175.56	116.56	9.56	83.69	74.10
	62.908	9.00	2177.60	2176.00	2170.20	800.00	2174.14	0.00	2175.56	116.56	9.56	83.69	74.10
*	62.937	151.00	0.00	0.00	2171.10	800.00	2176.12	0.00	2176.64	31.00	5.81	137.75	143.67
	62.940	18.00	2178.70	2177.20	2171.10	800.00	2176.12	0.00	2176.64	31.13	5.82	137.55	143.38
*	62.967	142.00	0.00	0.00	2173.10	800.00	2176.55	0.00	2177.58	83.67	8.15	98.10	87.46
	62.969	9.00	2181.40	2179.90	2173.10	800.00	2176.55	0.00	2177.59	84.24	8.17	97.87	87.16
	63.061	486.00	0.00	0.00	2177.30	800.00	2181.62	0.00	2182.66	132.44	8.16	97.98	69.52
	63.157	510.00	0.00	0.00	2184.90	800.00	2187.90	0.00	2188.50	98.67	6.18	129.38	80.54
*	63.260	545.00	0.00	0.00	2196.90	710.00	2198.77	2198.77	2199.22	295.65	5.20	138.44	41.29
*	63.353	490.00	0.00	0.00	2199.20	710.00	2202.64	0.00	2202.74	30.65	2.80	308.14	128.24

[redacted]N.hc2

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	62.566	2243.00	2154.70	0.00	0.00	0.00	945.50	0.00
*	62.668	2243.00	2155.79	0.00	1.09	0.00	94.34	540.00
*	62.763	800.00	2161.94	0.00	6.15	0.00	62.99	500.00
*	62.859	800.00	2169.40	0.00	7.46	0.00	36.56	505.00
*	62.906	800.00	2174.14	0.00	4.74	0.00	30.06	250.00
	62.908	800.00	2174.14	0.00	0.00	0.00	30.06	9.00
*	62.937	800.00	2176.12	0.00	1.98	0.00	38.73	151.00
	62.940	800.00	2176.12	0.00	0.00	0.00	38.71	18.00
*	62.967	800.00	2176.55	0.00	0.43	0.00	35.17	142.00
	62.969	800.00	2176.55	0.00	0.00	0.00	35.14	9.00
	63.061	800.00	2181.62	0.00	5.07	0.00	31.29	486.00
	63.157	800.00	2187.90	0.00	6.28	0.00	52.34	510.00
*	63.260	710.00	2198.77	0.00	10.87	0.00	159.92	545.00
*	63.353	710.00	2202.64	0.00	3.87	0.00	207.72	490.00

SUMMARY OF ERRORS AND SPECIAL NOTES

NOTE	SECNO=	62.566	PROFILE=	1	WSEL BASED ON X5 CARD
CAUTION	SECNO=	62.668	PROFILE=	1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	62.668	PROFILE=	1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	62.668	PROFILE=	1	20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING	SECNO=	62.763	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION	SECNO=	62.859	PROFILE=	1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	62.859	PROFILE=	1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	62.859	PROFILE=	1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	62.906	PROFILE=	1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	62.906	PROFILE=	1	MINIMUM SPECIFIC ENERGY
WARNING	SECNO=	62.937	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	62.967	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION	SECNO=	63.260	PROFILE=	1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	63.260	PROFILE=	1	MINIMUM SPECIFIC ENERGY
WARNING	SECNO=	63.353	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

I15 to UPRR
Encroachment method #1
with culvert Q's

HEC2 S/N: 1916530021 HMVersion: 6.50 Data File: i15q2-e1.hc2

```
**********************************************
*  :-2 WATER SURFACE PROFILES                *
*                                            *
*  Version   4.6.2;  May 1991                *
*                                            *
*  RUN DATE    12AUG93    TIME    15:25:45   *
**********************************************
```

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

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

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

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

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

THIS RUN EXECUTED 12AUG93 15:25:45

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

TROPICANA WASH FLOOD INSURANCE STUDY

by CH2M Hill, 1992 RDD33832
*** Revised 6/15/93 per MBJ review comments
Notes:

-Manning's "n" values were estimated by field observations of channels and floodplains in conjunction with methods recommended in "Open Channel Hydraulics" by Chow, 1959

-stations and elevations obtained from 400 scale topo created by CH2M Hill from aerial photographs

-In this run, all of the discharge is kept in the channel for the floodway profile (at the railroad cars) instead of allowing it to break out.

/93
Changed discharges. Used just the flow that comes through the culverts under the UPRR, except at I15 where some of the flow coming down Tropicana is added.

T1 CCRFCD TROPICANA WASH F.I.S.; RDD33832
T2 Main Tropicana Wash, Detailed Methods FLOODWAY CALCULATION
T3 I15Q2-E1.hc2 From I-15 to the culvert at UPRR w/encroachments

Starting W.S.El. obtained by routing discharge at I-15 through the box culvert under the road using the F.H.W.A. culvert analysis program HY-8.

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2				0	0		2154.7	0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1	0	0	0	0	0	0	15

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	39	40	41	42	43	1	34	4	27
21	22	28		38	43	1	50	51	27
28	4	5	7	200		38	1	53	27

[redacted]?1 22 28 54

QT 2 2243 2243

NC .025 .025 .043 0.1 0.3

ET 6.1 9711.6 10324.5
X1 62.566 11 9845.7 10136.1 0 0 0
GR 2147.6 9634.7 2147.8 9704.9 2146.6 9792.0 2146.9 9845.7 2142.4 9933.3
GR 2139.8 9987.0 2139.1 10000.0 2138.1 10020.3 2147.3 10136.1 2149.1 10300.6
GR 2154.0 10580.2

ET 4.1 6.1 9932.0 10415.0 9982.0 10029.7
X1 62.668 20 9982 10029.7 470 550 540
X3 10
GR 2156.0 9430.3 2155.8 9503.6 2155.2 9515.8 2155.0 9541.5 2155.0 9575.7
GR 2155.2 9685.6 2155.2 9735.4 2154.3 9891.8 2153.9 9982.0 2151.0 9992.4
GR 2151.0 10000.0 2151.0 10006.4 2156.6 10029.7 2157.6 10092.0 2156.9 10144.1
GR 2154.5 10166.4 2154.1 10184.5 2154.7 10261.9 2160.6 10348.3 2160.1 10419.7

NC .025 .025 .046

[redacted] 2 800 800

ET 6.1 9943.5 10033.7
X1 62.763 9 9943.5 10033.7 505 495 500
GR 2166.4 9750.3 2167.3 9943.5 2159.0 9968.0 2158.3 10000. 2159.1 10016.
GR 2167.1 10033.7 2167.1 10075.0 2179.5 10102.0 2180.6 10555.

NC .02 .07 .032 .3 .5

ET 6.1 9967.1 10027.2
X1 62.859 9 9967.1 10027.2 500 505 505
GR 2173.9 9820.3 2172.6 9967.1 2164.5 10000.0 2172.5 10027.2 2172.3 10064.
GR 2180.0 10087.5 2181.2 10114.5 2181.1 10533.0 2180.8 10551.2

ET 6.1 9979.8 10024.9
X1 62.906 15 9979.8 10024.9 240 180 250
X3 10
GR 2179.3 9942.9 2180.0 9957.2 2178.1 9979.8 2171.4 9989.3 2170.2 10000.0
GR 2171.1 10009.7 2179.1 10024.9 2179.3 10039.3 2181.1 10143.6 2180.5 10282.4
GR 2181.2 10307.2 2180.9 10433.6 2181.2 10489.5 2180.8 10515.7 2181.3 10705.5

Downstream-most of three railroad car bridges
-bridge is 9 ft. wide
[redacted]ntered negligible pier width to force special bridge method

```
SB      .9      1.6      2.6                23      .01      191      1.7     2170.2     2170.2

ET                       6.1                        9979.8   10024.9
X1   62.908                                    9         9         9
X2                         1     2176.0     2177.6
X3       10
BT        6     9970     2177.6               9975     2177.6              9975.01      2190
BT    10015     2190               10015.01   2177.6               10030   2177.6
```

Begin cross section at effective flow boundary defined by LOB development
added station 9919 located @50 feet from left bank, based on field notes
elevation interpolated from survey data

```
ET                 4.1      6.1     9920.0    10100.0   9969.7   10021.9
X1   62.937          15   9969.7   10021.9        110      110       151
X3       10
GR     2179       9919     2179.9   9959.0    2180.0   9969.7   2171.7   9990.2   2171.1   10000.
GR   2172.0      10012.    2178.8   10021.9   2179.1   10031.   2179.4   10048.   2181.6   10063.
GR   2181.5      10185.    2180.2   10200.8   2182.4   10242.   2182.3   10366.   2181.9   10418.
```

Middle of three railroad car bridges
-bridge is 18 ft. wide (dual railroad cars)
-entered negligible pier width to force special bridge method

```
SB      .9      1.6      2.6                23.     .01      201      1.64    2171.1     2171.1

ET                 4.1      6.1      9919     10100.0   9969.7   10021.9
X1   62.940                                          18        18        18
X2                         1     2177.2     2178.7
X3       10
BT        6     9970     2178.7               9975     2178.7              9975.01      2190
BT    10015     2190               10015.01   2178.7               10030   2178.7
```

Begin section at effective flow boundary defined by 4:1 expansion and field
conditions, interpolate elevation and station from survey data

```
ET                 4.1      6.1      9910     10085.0   9968.5   10035.6
X1   62.967          12   9968.5   10035.6        120      160       142
X3       10
GR     2180       9910     2181.1   9968.5    2173.1   9987.4   2173.1   10000.   2173.1   10009.
GR   2179.5      10019.    2182.6   10035.6   2181.7   10172.   2183.5   10215.   2183.9   10341.
GR   2183.8      10392.    2185.4   10656.
```

Upstream-most of three railroad car bridges
-bridge is 9 ft. wide
-entered negligible pier width to force special bridge method

SB .9 1.6 2.6 23. .01 224 1.5 2173.1 2173.1

ET 4.1 6.1 9910 10085.0 9968.5 10035.6
X1 62.969 9 9 9
X2 1 2179.9 2181.4
X3 10
BT 6 9970 2181.4 9975 2181.4 9975.01 2190
BT 10015 2190 10015.01 2181.4 10030 2181.4

NC .036 .036 .043 .1 .3

ET 6.1 9960.8 10020.2
X1 63.061 13 9960.8 10020.2 530 430 486
GR 2187.5 9779.4 2184.7 9960.8 2182.5 9982.3 2177.6 9991.3 2177.3 10000.0
GR 2177.7 10007.9 2184.3 10020.2 2186.8 10034.6 2187.4 10167.6 2188.3 10347.0
GR 2188.2 10384.4 2192.8 10416.4 2191.3 10606.0

ET 6.1 9968.4 10040
X1 63.157 20 9968.4 10040.0 555 465 510
GR 2198.2 9629.1 2194.5 9717.6 2196.2 9784.2 2197.9 9828.5 2193.4 9887.3
GR 2193.1 9924.6 2192.8 9968.4 2185.1 9983.7 2184.9 10000. 2185.5 10025.
GR 2192.1 10040.0 2191.8 10061.5 2193.7 10099.2 2193.2 10116. 2192.6 10147.
GR 2196.3 10233.5 2197.2 10252.1 2196.6 10314.6 2192.9 10357. 2198.2 10421.

NC .058 .043 .053

QT 2 710 710

ET 6.1 9986.3 10045.2
X1 63.260 13 9986.3 10025.7 485 565 545
GR 2202.3 9709.9 2200.9 9748.6 2199.8 9904.0 2197.8 9986.3 2196.9 10000.
GR 2199.1 10025.7 2196.9 10085.8 2200.2 10144.1 2200.0 10173.4 2200.0 10317.
GR 2201.0 10344.0 2202.9 10386.2 2206.3 10450.2

ET 6.1 9955.1 10045
X1 63.353 21 9955.1 10045 490 510 490
GR 2208.6 9587.2 2209.4 9684.5 2209.0 9756.6 2206.3 9784.0 2203.1 9827.6
GR 2201.8 9864.5 2201.5 9865.4 2201.5 9940.5 2203.9 9955.1 2199.2 9989.6
GR 2199.2 10000.0 2199.2 10012.2 2201.5 10045.0 2204.2 10093.2 2206.1 10132.2
GR 2209.7 10193.5 2208.8 10221.9 2207.2 10282.1 2207.0 10346.3 2209.4 10371.2
GR 2211.1 10550.7

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

*PROF 1

CCHV= 0.100 CEHV= 0.300
*SECNO 62.566
3280 CROSS SECTION 62.57 EXTENDED 7.10 FEET

62.566	16.60	2154.70	0.00	2154.70	2154.70	0.00	0.00	0.00	2146.90
2243.0	592.0	1086.8	564.2	1571.5	3525.4	1949.9	0.0	0.0	2147.30
0.00	0.38	0.31	0.29	0.025	0.043	0.025	0.000	2138.10	9634.70
0.000003	0.	0.	0.	0	0	0	0.00	945.50	10580.20

FLOW DISTRIBUTION FOR SECNO= 62.57 CWSEL= 2154.70

STA=	9635.	9705.	9792.	9846.	10136.	10301.	10580.
PER Q=	7.6	11.2	7.6	48.5	16.7	8.5	
[redacted]EA=	491.4	653.2	426.9	3525.4	1069.2	880.7	
[redacted]EL=	0.3	0.4	0.4	0.3	0.4	0.2	
[redacted]H=	7.0	7.5	7.9	12.1	6.5	3.1	

*SECNO 62.668

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9932.0 10415.0 TYPE= 1 TARGET= 483.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2153.90 ELREA= 2156.60

62.668	4.79	2155.79	2155.79	0.00	2157.18	1.38	0.01	0.41	2153.90
2243.0	894.6	1348.4	0.0	89.0	149.6	0.0	44.0	6.3	2156.60
0.02	10.05	9.01	0.00	0.025	0.043	0.000	0.000	2151.00	9932.00
0.013833	470.	540.	550.	20	17	0	0.00	94.34	10026.34

FLOW DISTRIBUTION FOR SECNO= 62.67 CWSEL= 2155.79

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

STA= 9932. 9982. 10030.
PER Q= 39.9 60.1
AREA= 89.0 149.6
VEL= 10.0 9.0
DEPTH= 1.8 3.4

*SECNO 62.763

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.60

62.763	3.64	2161.94	0.00	0.00	2162.25	0.31	4.97	0.11	2167.30
800.0	0.0	800.0	0.0	0.0	179.1	0.0	46.4	7.2	2167.10
0.05	0.00	4.47	0.00	0.000	0.046	0.000	0.000	2158.30	9959.31
0.004859	505.	500.	495.	3	0	0	0.00	62.99	10022.29

DISTRIBUTION FOR SECNO= 62.76 CWSEL= 2161.94

STA= 9959. 10034.
PER Q= 100.0
AREA= 179.1
VEL= 4.5
DEPTH= 2.8

CCHV= 0.300 CEHV= 0.500
*SECNO 62.859

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

62.859	4.90	2169.40	2169.40	0.00	2170.64	1.24	3.63	0.46	2172.60
800.0	0.0	800.0	0.0	0.0	89.6	0.0	48.0	7.8	2172.50
0.06	0.00	8.93	0.00	0.000	0.032	0.000	0.000	2164.50	9980.10
0.011735	500.	505.	505.	20	11	0	0.00	36.56	10016.66

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

FLOW DISTRIBUTION FOR SECNO= 62.86 CWSEL= 2169.40

STA= 9980. 10027.
PER Q= 100.0
AREA= 89.6
VEL= 8.9
DEPTH= 2.4

*SECNO 62.906
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2178.10 ELREA= 2179.10

62.906	3.94	2174.14	2174.14	0.00	2175.56	1.42	2.92	0.09	2178.10
800.0	0.0	800.0	0.0	0.0	83.7	0.0	48.5	8.0	2179.10
0.07	0.00	9.56	0.00	0.000	0.032	0.000	0.000	2170.20	9985.42
0.011656	240.	250.	180.	4	15	0	0.00	30.06	10015.48

FLOW DISTRIBUTION FOR SECNO= 62.91 CWSEL= 2174.14

STA= 9985. 10025.
PER Q= 100.0
AREA= 83.7
VEL= 9.6
DEPTH= 2.8

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	191.00	1.70	2170.20	2170.20

*SECNO 62.908
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2174.14 BRIDGE VELOCITY= 6.84 CALCULATED CHANNEL AREA= 117.

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

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2175.56	0.00	0.	800.	191.	191.	2176.00	2177.60	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2178.10 ELREA= 2179.10

62.908	3.94	2174.14	0.00	0.00	2175.56	1.42	0.00	0.00	2178.10
800.0	0.0	800.0	0.0	0.0	83.7	0.0	48.5	8.0	2179.10
0.07	0.00	9.56	0.00	0.000	0.032	0.000	0.000	2170.20	9985.42
0.011656	9.	9.	9.	0	0	0	0.00	30.06	10015.48

FLOW DISTRIBUTION FOR SECNO= 62.91 CWSEL= 2174.14

STA= 9985. 10025.
Q= 100.0
EA= 83.7
EL= 9.6
DEPTH= 2.8

*SECNO 62.937

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.94

3470 ENCROACHMENT STATIONS= 9920.0 10100.0 TYPE= 1 TARGET= 180.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2180.00 ELREA= 2178.80

62.937	5.02	2176.12	0.00	0.00	2176.64	0.52	0.82	0.27	2180.00
800.0	0.0	800.0	0.0	0.0	137.8	0.0	48.9	8.1	2178.80
0.08	0.00	5.81	0.00	0.000	0.032	0.000	0.000	2171.10	9979.27
0.003100	110.	151.	110.	2	0	0	0.00	38.73	10018.00

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

FLOW DISTRIBUTION FOR SECNO= 62.94 CWSEL= 2176.12

STA= 9979. 10022.
PER Q= 100.0
AREA= 137.8
VEL= 5.8
DEPTH= 3.6

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	201.00	1.64	2171.10	2171.10

*SECNO 62.940
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2176.12 BRIDGE VELOCITY= 5.11 CALCULATED CHANNEL AREA= 157.

S	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2176.64	0.00	0.	800.	201.	201.	2177.20	2178.70	0.

3470 ENCROACHMENT STATIONS= 9919.0 10100.0 TYPE= 1 TARGET= 181.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2180.00 ELREA= 2178.80

62.940	5.02	2176.12	0.00	0.00	2176.64	0.53	0.00	0.00	2180.00
800.0	0.0	800.0	0.0	0.0	137.6	0.0	49.0	8.1	2178.80
0.08	0.00	5.82	0.00	0.000	0.032	0.000	0.000	2171.10	9979.29
0.003113	18.	18.	18.	0	0	0	0.00	38.71	10018.00

FLOW DISTRIBUTION FOR SECNO= 62.94 CWSEL= 2176.12

STA= 9979. 10022.
PER Q= 100.0
AREA= 137.6
VEL= 5.8
DEPTH= 3.6

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

*SECNO 62.967

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.61

3470 ENCROACHMENT STATIONS= 9910.0 10085.0 TYPE= 1 TARGET= 175.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2181.10 ELREA= 2182.60

62.967	3.45	2176.55	0.00	0.00	2177.58	1.03	0.68	0.25	2181.10
800.0	0.0	800.0	0.0	0.0	98.1	0.0	49.3	8.2	2182.60
0.08	0.00	8.15	0.00	0.000	0.032	0.000	0.000	2173.10	9979.23
0.008367	120.	142.	160.	0	0	0	0.00	35.17	10014.40

FLOW DISTRIBUTION FOR SECNO= 62.97 CWSEL= 2176.55

ST 9979. 10036.
PER Q= 100.0
AREA= 98.1
VEL= 8.2
DEPTH= 2.8

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	224.00	1.50	2173.10	2173.10

*SECNO 62.969
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2176.55 BRIDGE VELOCITY= 8.24 CALCULATED CHANNEL AREA= 97.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2177.59	0.00	0.	800.	224.	226.	2179.90	2181.40	0.

3470 ENCROACHMENT STATIONS= 9910.0 10085.0 TYPE= 1 TARGET= 175.000

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2181.10 ELREA= 2182.60

62.969	3.45	2176.55	0.00	0.00	2177.59	1.04	0.01	0.00	2181.10
800.0	0.0	800.0	0.0	0.0	97.9	0.0	49.4	8.2	2182.60
0.08	0.00	8.17	0.00	0.000	0.032	0.000	0.000	2173.10	9979.25
0.008424	9.	9.	9.	0	0	0	0.00	35.14	10014.39

FLOW DISTRIBUTION FOR SECNO= 62.97 CWSEL= 2176.55

STA= 9979. 10036.
PER Q= 100.0
AREA= 97.9
VEL= 8.2
DEPTH= 2.8

CCHV= 0.100 CEHV= 0.300

*[redacted]O 63.061

[redacted]3.061	4.32	2181.62	0.00	0.00	2182.66	1.04	5.07	0.00	2184.70
800.0	0.0	800.0	0.0	0.0	98.0	0.0	50.5	8.6	2184.30
0.10	0.00	8.16	0.00	0.000	0.043	0.000	0.000	2177.30	9983.92
0.013244	530.	486.	430.	3	0	0	0.00	31.29	10015.21

FLOW DISTRIBUTION FOR SECNO= 63.06 CWSEL= 2181.62

STA= 9984. 10020.
PER Q= 100.0
AREA= 98.0
VEL= 8.2
DEPTH= 3.1

*SECNO 63.157

63.157	3.00	2187.90	0.00	0.00	2188.50	0.59	5.80	0.04	2192.80
800.0	0.0	800.0	0.0	0.0	129.4	0.0	51.8	9.1	2192.10
0.12	0.00	6.18	0.00	0.000	0.043	0.000	0.000	2184.90	9978.13
0.009867	555.	510.	465.	4	0	0	0.00	52.34	10030.47

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

FLOW DISTRIBUTION FOR SECNO= 63.16 CWSEL= 2187.90

STA= 9978. 10040.
PER Q= 100.0
AREA= 129.4
VEL= 6.2
DEPTH= 2.5

*SECNO 63.260

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

63.260	1.87	2198.77	2198.77	0.00	2199.22	0.45	8.43	0.01	2197.80
710.0	53.1	208.1	448.8	19.5	40.0	78.9	53.5	10.4	2199.10
0.15	2.73	5.20	5.68	0.058	0.053	0.043	0.000	2196.90	9946.25
0.029565	485.	545.	565.	4	14	0	0.00	159.92	10118.90

FLOW DISTRIBUTION FOR SECNO= 63.26 CWSEL= 2198.77

STA= 9946. 9986. 10026. 10086. 10119.
PER Q= 7.5 29.3 38.4 24.8
AREA= 19.5 40.0 47.9 31.0
VEL= 2.7 5.2 5.7 5.7
DEPTH= 0.5 1.1 0.8 0.9

*SECNO 63.353

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.11

63.353	3.44	2202.64	0.00	0.00	2202.74	0.10	3.48	0.03	2203.90
710.0	145.3	549.5	15.2	100.4	196.2	11.6	56.0	12.5	2201.50
0.21	1.45	2.80	1.31	0.058	0.053	0.043	0.000	2199.20	9840.69
0.003065	490.	490.	510.	6	0	0	0.00	207.72	10065.33

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

FLOW DISTRIBUTION FOR SECNO= 63.35 CWSEL= 2202.64

STA=	9841.	9865.	9865.	9941.	9947.	10045.	10065.
PER Q=	1.1	0.2	18.6	0.5	77.4	2.1	
AREA=	10.0	0.9	85.5	3.9	196.2	11.6	
VEL=	0.8	1.4	1.5	1.0	2.8	1.3	
DEPTH=	0.4	1.0	1.1	0.6	2.4	0.6	

T1 :CRFCD TROPICANA WASH F.I.S.; RDD33832
T2 Main Tropicana Wash, Detailed Methods
T3 I15Q2-E1.hc2 From I-15 to the culvert at UPRR w/encroachments

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	-10	3				0	0		2155.7	0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2	0	-1	0	0	0	0	0	0	15

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

*PROF 2

CCHV= 0.100 CEHV= 0.300
*SECNO 62.566
3280 CROSS SECTION 62.57 EXTENDED 1.70 FEET

3470 ENCROACHMENT STATIONS= 9711.6 10324.5 TYPE= 1 TARGET= 612.900

62.566	17.60	2155.70	0.00	2154.70	2155.70	0.00	0.00	0.00	2146.90
2243.0	479.9	1241.8	521.2	1167.7	3815.8	1386.5	0.0	0.0	2147.30
0.00	0.41	0.33	0.38	0.025	0.043	0.025	0.000	2138.10	9711.60
0.000003	0.	0.	0.	0	0	0	0.00	612.90	10324.50

FLOW DISTRIBUTION FOR SECNO= 62.57 CWSEL= 2155.70

[redacted]	9712.	9792.	9846.	10136.	10301.	10324.
[redacted]Q=	12.1	9.3	55.4	21.2	2.0	
[redacted]A=	687.1	480.6	3815.8	1233.7	152.7	
VEL=	0.4	0.4	0.3	0.4	0.3	
DEPTH=	8.5	8.9	13.1	7.5	6.4	

*SECNO 62.668

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9982.0 10029.7 TYPE= 1 TARGET= 47.700

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2153.90 ELREA= 100000.00

62.668	5.75	2156.75	2156.75	2155.79	2158.83	2.07	0.01	0.62	2153.90
2243.0	0.0	2243.0	0.0	0.0	194.1	0.0	39.9	4.0	100000.00
0.01	0.00	11.56	0.00	0.000	0.043	0.000	0.000	2151.00	9982.00
0.019192	470.	540.	550.	20	17	0	0.00	47.70	10029.70

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

FLOW DISTRIBUTION FOR SECNO= 62.67 CWSEL= 2156.75

STA= 9982. 10030.
PER Q= 100.0
AREA= 194.1
VEL= 11.6
DEPTH= 4.1

*SECNO 62.763

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 9943.5 10033.7 TYPE= 1 TARGET= 90.200

62.763	4.57	2162.87	0.00	2161.94	2163.04	0.17	4.03	0.19	2167.30
800.0	0.0	800.0	0.0	0.0	239.7	0.0	42.4	4.7	100000.00
0.05	0.00	3.34	0.00	0.000	0.046	0.000	0.000	2158.30	9956.57
0.002039	505.	500.	495.	4	0	0	0.00	67.77	10024.34

FLOW DISTRIBUTION FOR SECNO= 62.76 CWSEL= 2162.87

STA= 9957. 10034.
PER Q= 100.0
AREA= 239.7
VEL= 3.3
DEPTH= 3.5

CCHV= 0.300 CEHV= 0.500
*SECNO 62.859

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9967.1 10027.2 TYPE= 1 TARGET= 60.101

62.859	4.88	2169.38	2169.38	2169.40	2170.64	1.26	2.06	0.54	2172.60
800.0	0.0	800.0	0.0	0.0	89.0	0.0	44.3	5.3	100000.00
0.07	0.00	8.99	0.00	0.000	0.032	0.000	0.000	2164.50	9980.16
0.011944	500.	505.	505.	20	8	0	0.00	36.44	10016.60

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

FLOW DISTRIBUTION FOR SECNO= 62.86 CWSEL= 2169.38

STA= 9980. 10027.
PER Q= 100.0
AREA= 89.0
VEL= 9.0
DEPTH= 2.4

*SECNO 62.906
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9979.8 10024.9 TYPE= 1 TARGET= 45.101

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2178.10 ELREA= 100000.00

62.906	3.94	2174.14	2174.14	2174.14	2175.56	1.42	2.95	0.08	2178.10
800.0	0.0	800.0	0.0	0.0	83.8	0.0	44.8	5.5	100000.00
0.08	0.00	9.55	0.00	0.000	0.032	0.000	0.000	2170.20	9985.41
11632	240.	250.	180.	2	15	0	0.00	30.07	10015.48

FLOW DISTRIBUTION FOR SECNO= 62.91 CWSEL= 2174.14

STA= 9985. 10025.
PER Q= 100.0
AREA= 83.8
VEL= 9.6
DEPTH= 2.8

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	191.00	1.70	2170.20	2170.20

*SECNO 62.908
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2174.14 BRIDGE VELOCITY= 6.84 CALCULATED CHANNEL AREA= 117.

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

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2175.56	0.00	0.	800.	191.	191.	2176.00	2177.60	0.

3470 ENCROACHMENT STATIONS= 9979.8 10024.9 TYPE= 1 TARGET= 45.101

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2178.10 ELREA= 100000.00

62.908	3.95	2174.15	0.00	2174.14	2175.56	1.41	0.00	0.00	2178.10
800.0	0.0	800.0	0.0	0.0	83.9	0.0	44.8	5.5	100000.00
0.08	0.00	9.54	0.00	0.000	0.032	0.000	0.000	2170.20	9985.41
0.011591	9.	9.	9.	0	0	0	0.00	30.08	10015.49

FLOW DISTRIBUTION FOR SECNO= 62.91 CWSEL= 2174.15

9985. 10025.
Q= 100.0
AREA= 83.9
VEL= 9.5
DEPTH= 2.8

*SECNO 62.937

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.93

3470 ENCROACHMENT STATIONS= 9969.7 10021.9 TYPE= 1 TARGET= 52.200

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2180.00 ELREA= 100000.00

62.937	5.02	2176.12	0.00	2176.12	2176.64	0.52	0.82	0.27	2180.00
800.0	0.0	800.0	0.0	0.0	137.6	0.0	45.2	5.6	100000.00
0.08	0.00	5.81	0.00	0.000	0.032	0.000	0.000	2171.10	9979.28
0.003109	110.	151.	110.	2	0	0	0.00	38.72	10018.00

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

FLOW DISTRIBUTION FOR SECNO= 62.94 CWSEL= 2176.12

STA= 9979. 10022.
PER Q= 100.0
AREA= 137.6
VEL= 5.8
DEPTH= 3.6

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	201.00	1.64	2171.10	2171.10

*SECNO 62.940
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2176.12 BRIDGE VELOCITY= 5.11 CALCULATED CHANNEL AREA= 157.

S	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2176.64	0.00	0.	800.	201.	201.	2177.20	2178.70	0.

3470 ENCROACHMENT STATIONS= 9969.7 10021.9 TYPE= 1 TARGET= 52.200

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2180.00 ELREA= 100000.00

62.940	5.02	2176.12	0.00	2176.12	2176.64	0.53	0.00	0.00	2180.00
800.0	0.0	800.0	0.0	0.0	137.4	0.0	45.3	5.6	100000.00
0.09	0.00	5.82	0.00	0.000	0.032	0.000	0.000	2171.10	9979.29
0.003122	18.	18.	18.	0	0	0	0.00	38.70	10017.99

FLOW DISTRIBUTION FOR SECNO= 62.94 CWSEL= 2176.12

STA= 9979. 10022.
PER Q= 100.0
AREA= 137.4
VEL= 5.8
DEPTH= 3.6

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

*SECNO 62.967

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.61

3470 ENCROACHMENT STATIONS= 9968.5 10035.6 TYPE= 1 TARGET= 67.100

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2181.10 ELREA= 100000.00

62.967	3.45	2176.55	0.00	2176.55	2177.58	1.03	0.68	0.25	2181.10
800.0	0.0	800.0	0.0	0.0	98.0	0.0	45.6	5.7	100000.00
0.09	0.00	8.16	0.00	0.000	0.032	0.000	0.000	2173.10	9979.24
0.008386	120.	142.	160.	0	0	0	0.00	35.16	10014.40

F[redacted]DISTRIBUTION FOR SECNO= 62.97 CWSEL= 2176.55

S[redacted] 9979. 10036.
PER Q= 100.0
AREA= 98.0
VEL= 8.2
DEPTH= 2.8

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.60	2.60	0.00	23.00	0.01	224.00	1.50	2173.10	2173.10

*SECNO 62.969
CLASS A LOW FLOW

3420 BRIDGE W.S.= 2176.54 BRIDGE VELOCITY= 8.25 CALCULATED CHANNEL AREA= 97.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
0.00	2177.59	0.00	0.	800.	224.	226.	2179.90	2181.40	0.

3470 ENCROACHMENT STATIONS= 9968.5 10035.6 TYPE= 1 TARGET= 67.100

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2181.10 ELREA= 100000.00

62.969	3.45	2176.55	0.00	2176.55	2177.59	1.04	0.01	0.00	2181.10
800.0	0.0	800.0	0.0	0.0	97.8	0.0	45.7	5.7	100000.00
0.09	0.00	8.18	0.00	0.000	0.032	0.000	0.000	2173.10	9979.25
0.008439	9.	9.	9.	0	0	0	0.00	35.13	10014.39

FLOW DISTRIBUTION FOR SECNO= 62.97 CWSEL= 2176.55

STA= 9979. 10036.
PER Q= 100.0
AREA= 97.8
VEL= 8.2
DEPTH= 2.8

CCHV= 0.100 CEHV= 0.300
*SECNO 63.061

3470 ENCROACHMENT STATIONS= 9960.8 10020.2 TYPE= 1 TARGET= 59.400

63.061	4.32	2181.62	0.00	2181.62	2182.66	1.03	5.07	0.00	2184.70
800.0	0.0	800.0	0.0	0.0	98.0	0.0	46.8	6.1	100000.00
0.11	0.00	8.16	0.00	0.000	0.043	0.000	0.000	2177.30	9983.91
0.013221	530.	486.	430.	3	0	0	0.00	31.30	10015.21

FLOW DISTRIBUTION FOR SECNO= 63.06 CWSEL= 2181.62

STA= 9984. 10020.
PER Q= 100.0
AREA= 98.0
VEL= 8.2
DEPTH= 3.1

*SECNO 63.157

3470 ENCROACHMENT STATIONS= 9968.4 10040.0 TYPE= 1 TARGET= 71.600

63.157	3.00	2187.90	0.00	2187.90	2188.50	0.59	5.80	0.04	2192.80
800.0	0.0	800.0	0.0	0.0	129.3	0.0	48.1	6.6	100000.00
0.13	0.00	6.19	0.00	0.000	0.043	0.000	0.000	2184.90	9978.13
0.009879	555.	510.	465.	4	0	0	0.00	52.34	10030.46

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

FLOW DISTRIBUTION FOR SECNO= 63.16 CWSEL= 2187.90

STA= 9978. 10040.
PER Q= 100.0
AREA= 129.3
VEL= 6.2
DEPTH= 2.5

*SECNO 63.260
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9986.3 10045.2 TYPE= 1 TARGET= 58.900

63.260	2.86	2199.76	2199.76	2198.77	2200.59	0.83	8.57	0.07	2197.80
710.0	0.0	592.9	117.1	0.0	78.2	19.8	49.5	7.3	2199.10
0.15	0.00	7.58	5.91	0.000	0.053	0.043	0.000	2196.90	9986.30
0.031357	485.	545.	565.	12	11	0	0.00	58.90	10045.20

DISTRIBUTION FOR SECNO= 63.26 CWSEL= 2199.76

STA= 9986. 10026. 10045.
PER Q= 83.5 16.5
AREA= 78.2 19.8
VEL= 7.6 5.9
DEPTH= 2.0 1.0

*SECNO 63.353

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.67

3470 ENCROACHMENT STATIONS= 9955.1 10045.0 TYPE= 1 TARGET= 89.900

63.353	4.17	2203.37	0.00	2202.64	2203.49	0.12	2.82	0.07	2203.90
710.0	0.0	710.0	0.0	0.0	257.4	0.0	51.5	8.1	100000.00
0.20	0.00	2.76	0.00	0.000	0.053	0.000	0.000	2199.20	9958.96
0.002323	490.	490.	510.	5	0	0	0.00	86.03	10045.00

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

FLOW DISTRIBUTION FOR SECNO= 63.35 CWSEL= 2203.37

STA= 9959. 10045.
PER Q= 100.0
AREA= 257.4
VEL= 2.8
DEPTH= 3.0

THIS RUN EXECUTED 12AUG93 15:25:53

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

I15Q2-E1.hc2

SUMMARY PRINTOUT

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	.01K	TOPWID	STENCL	STCHL	STCHR	STENCR
	62.566	0.00	0.00	0.00	2138.10	2243.00	2154.70	13264.51	945.50	0.00	9845.70	10136.10	0.00
	62.566	0.00	0.00	0.00	2138.10	2243.00	2155.70	13245.64	612.90	9711.60	9845.70	10136.10	10324.50
*	62.668	540.00	0.00	0.00	2151.00	2243.00	2155.79	190.71	94.34	9932.00	9982.00	10029.70	10415.00
*	62.668	540.00	0.00	0.00	2151.00	2243.00	2156.75	161.91	47.70	9982.00	9982.00	10029.70	10029.70
*	62.763	500.00	0.00	0.00	2158.30	800.00	2161.94	114.77	62.99	0.00	9943.50	10033.70	0.00
	62.763	500.00	0.00	0.00	2158.30	800.00	2162.87	177.16	67.77	9943.50	9943.50	10033.70	10033.70
*	62.859	505.00	0.00	0.00	2164.50	800.00	2169.40	73.85	36.56	0.00	9967.10	10027.20	0.00
*	62.859	505.00	0.00	0.00	2164.50	800.00	2169.38	73.20	36.44	9967.10	9967.10	10027.20	10027.20
*	62.906	250.00	0.00	0.00	2170.20	800.00	2174.14	74.10	30.06	0.00	9979.80	10024.90	0.00
*	62.906	250.00	0.00	0.00	2170.20	800.00	2174.14	74.18	30.07	9979.80	9979.80	10024.90	10024.90
	62.908	9.00	2177.60	2176.00	2170.20	800.00	2174.14	74.10	30.06	0.00	9979.80	10024.90	0.00
	62.908	9.00	2177.60	2176.00	2170.20	800.00	2174.15	74.31	30.08	9979.80	9979.80	10024.90	10024.90
*	62.937	151.00	0.00	0.00	2171.10	800.00	2176.12	143.67	38.73	9920.00	9969.70	10021.90	10100.00
*	62.937	151.00	0.00	0.00	2171.10	800.00	2176.12	143.47	38.72	9969.70	9969.70	10021.90	10021.90
	62.940	18.00	2178.70	2177.20	2171.10	800.00	2176.12	143.38	38.71	9919.00	9969.70	10021.90	10100.00
	62.940	18.00	2178.70	2177.20	2171.10	800.00	2176.12	143.19	38.70	9969.70	9969.70	10021.90	10021.90
*	62.967	142.00	0.00	0.00	2173.10	800.00	2176.55	87.46	35.17	9910.00	9968.50	10035.60	10085.00
*	62.967	142.00	0.00	0.00	2173.10	800.00	2176.55	87.36	35.16	9968.50	9968.50	10035.60	10035.60
	62.969	9.00	2181.40	2179.90	2173.10	800.00	2176.55	87.16	35.14	9910.00	9968.50	10035.60	10085.00
	62.969	9.00	2181.40	2179.90	2173.10	800.00	2176.55	87.09	35.13	9968.50	9968.50	10035.60	10035.60
	63.061	486.00	0.00	0.00	2177.30	800.00	2181.62	69.52	31.29	0.00	9960.80	10020.20	0.00
	63.061	486.00	0.00	0.00	2177.30	800.00	2181.62	69.58	31.30	9960.80	9960.80	10020.20	10020.20

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	.01K	TOPWID	STENCL	STCHL	STCHR	STENCR
	63.157	510.00	0.00	0.00	2184.90	800.00	2187.90	80.54	52.34	0.00	9968.40	10040.00	0.00
	63.157	510.00	0.00	0.00	2184.90	800.00	2187.90	80.49	52.34	9968.40	9968.40	10040.00	10040.00
*	63.260	545.00	0.00	0.00	2196.90	710.00	2198.77	41.29	159.92	0.00	9986.30	10025.70	0.00
*	63.260	545.00	0.00	0.00	2196.90	710.00	2199.76	40.09	58.90	9986.30	9986.30	10025.70	10045.20
*	63.353	490.00	0.00	0.00	2199.20	710.00	2202.64	128.24	207.72	0.00	9955.10	10045.00	0.00
*	63.353	490.00	0.00	0.00	2199.20	710.00	2203.37	147.31	86.03	9955.10	9955.10	10045.00	10045.00

[redacted]E1.hc2

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	STENCL	STENCR	TOPWID	10*KS	VOL
	62.566	2243.00	2154.70	0.00	0.00	0.00	0.00	945.50	0.03	0.00
	62.566	2243.00	2155.70	1.00	0.00	9711.60	10324.50	612.90	0.03	0.00
*	62.668	2243.00	2155.79	0.00	1.09	9932.00	10415.00	94.34	138.33	44.05
*	62.668	2243.00	2156.75	0.96	1.05	9982.00	10029.70	47.70	191.92	39.91
*	62.763	800.00	2161.94	0.00	6.15	0.00	0.00	62.99	48.59	46.45
	62.763	800.00	2162.87	0.93	6.12	9943.50	10033.70	67.77	20.39	42.40
*	62.859	800.00	2169.40	0.00	7.46	0.00	0.00	36.56	117.35	48.01
*	62.859	800.00	2169.38	-0.02	6.51	9967.10	10027.20	36.44	119.44	44.30
*	62.906	800.00	2174.14	0.00	4.74	0.00	0.00	30.06	116.56	48.50
*	62.906	800.00	2174.14	0.00	4.76	9979.80	10024.90	30.07	116.32	44.80
	62.908	800.00	2174.14	0.00	0.00	0.00	0.00	30.06	116.56	48.52
	62.908	800.00	2174.15	0.01	0.00	9979.80	10024.90	30.08	115.91	44.81
[redacted]	62.937	800.00	2176.12	0.00	1.98	9920.00	10100.00	38.73	31.00	48.91
*	62.937	800.00	2176.12	0.00	1.97	9969.70	10021.90	38.72	31.09	45.20
	62.940	800.00	2176.12	0.00	0.00	9919.00	10100.00	38.71	31.13	48.96
	62.940	800.00	2176.12	0.00	0.00	9969.70	10021.90	38.70	31.22	45.26
*	62.967	800.00	2176.55	0.00	0.43	9910.00	10085.00	35.17	83.67	49.35
*	62.967	800.00	2176.55	0.00	0.43	9968.50	10035.60	35.16	83.86	45.64
	62.969	800.00	2176.55	0.00	0.00	9910.00	10085.00	35.14	84.24	49.37
	62.969	800.00	2176.55	0.00	0.00	9968.50	10035.60	35.13	84.39	45.66
	63.061	800.00	2181.62	0.00	5.07	0.00	0.00	31.29	132.44	50.46
	63.061	800.00	2181.62	0.00	5.07	9960.80	10020.20	31.30	132.21	46.75
	63.157	800.00	2187.90	0.00	6.28	0.00	0.00	52.34	98.67	51.79
	63.157	800.00	2187.90	0.00	6.28	9968.40	10040.00	52.34	98.79	48.08
*	63.260	710.00	2198.77	0.00	10.87	0.00	0.00	159.92	295.65	53.47
*	63.260	710.00	2199.76	0.99	11.86	9986.30	10045.20	58.90	313.57	49.51
*	63.353	710.00	2202.64	0.00	3.87	0.00	0.00	207.72	30.65	56.00
*	63.353	710.00	2203.37	0.73	3.61	9955.10	10045.00	86.03	23.23	51.51

[redacted]

E1.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST
	62.566	2154.70	9634.70	0.00	9845.70	10136.10	0.00	10580.20
	62.566	2155.70	9711.60	9711.60	9845.70	10136.10	10324.50	10324.50
*	62.668	2155.79	9932.00	9932.00	9982.00	10029.70	10415.00	10026.34
*	62.668	2156.75	9982.00	9982.00	9982.00	10029.70	10029.70	10029.70
*	62.763	2161.94	9959.31	0.00	9943.50	10033.70	0.00	10022.29
	62.763	2162.87	9956.57	9943.50	9943.50	10033.70	10033.70	10024.34
*	62.859	2169.40	9980.10	0.00	9967.10	10027.20	0.00	10016.66
*	62.859	2169.38	9980.16	9967.10	9967.10	10027.20	10027.20	10016.60
*	62.906	2174.14	9985.42	0.00	9979.80	10024.90	0.00	10015.48
*	62.906	2174.14	9985.41	9979.80	9979.80	10024.90	10024.90	10015.48
	62.908	2174.14	9985.42	0.00	9979.80	10024.90	0.00	10015.48
	62.908	2174.15	9985.41	9979.80	9979.80	10024.90	10024.90	10015.49
	62.937	2176.12	9979.27	9920.00	9969.70	10021.90	10100.00	10018.00
*	62.937	2176.12	9979.28	9969.70	9969.70	10021.90	10021.90	10018.00
	62.940	2176.12	9979.29	9919.00	9969.70	10021.90	10100.00	10018.00
	62.940	2176.12	9979.29	9969.70	9969.70	10021.90	10021.90	10017.99
*	62.967	2176.55	9979.23	9910.00	9968.50	10035.60	10085.00	10014.40
*	62.967	2176.55	9979.24	9968.50	9968.50	10035.60	10035.60	10014.40
	62.969	2176.55	9979.25	9910.00	9968.50	10035.60	10085.00	10014.39
	62.969	2176.55	9979.25	9968.50	9968.50	10035.60	10035.60	10014.39
	63.061	2181.62	9983.92	0.00	9960.80	10020.20	0.00	10015.21
	63.061	2181.62	9983.91	9960.80	9960.80	10020.20	10020.20	10015.21
	63.157	2187.90	9978.13	0.00	9968.40	10040.00	0.00	10030.47
	63.157	2187.90	9978.13	9968.40	9968.40	10040.00	10040.00	10030.46
*	63.260	2198.77	9946.25	0.00	9986.30	10025.70	0.00	10118.90
*	63.260	2199.76	9986.30	9986.30	9986.30	10025.70	10045.20	10045.20
*	63.353	2202.64	9840.69	0.00	9955.10	10045.00	0.00	10065.33
*	63.353	2203.37	9958.96	9955.10	9955.10	10045.00	10045.00	10045.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 62.668 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.668 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 62.668 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 62.668 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.668 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 62.668 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 62.763 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 62.859 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.859 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 62.859 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 62.859 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.859 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 62.859 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 62.906 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.906 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 62.906 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 62.906 PROFILE= 2 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 62.937 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 62.937 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

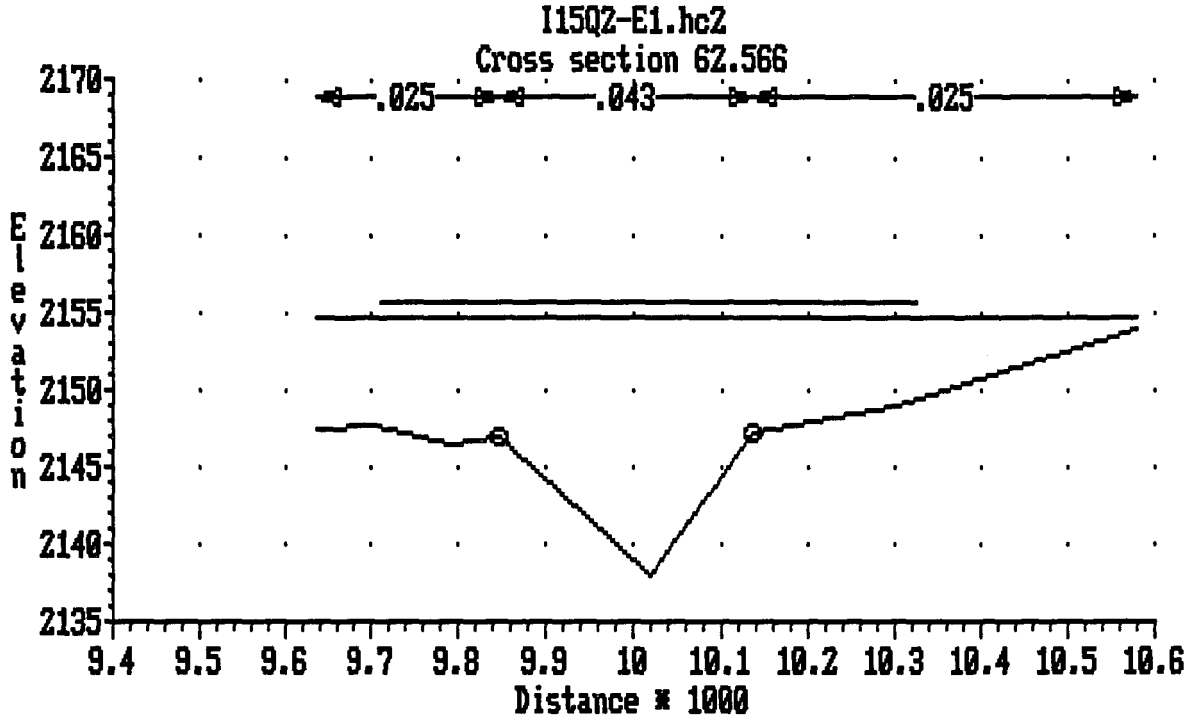
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WARNING SECNO= 62.967 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

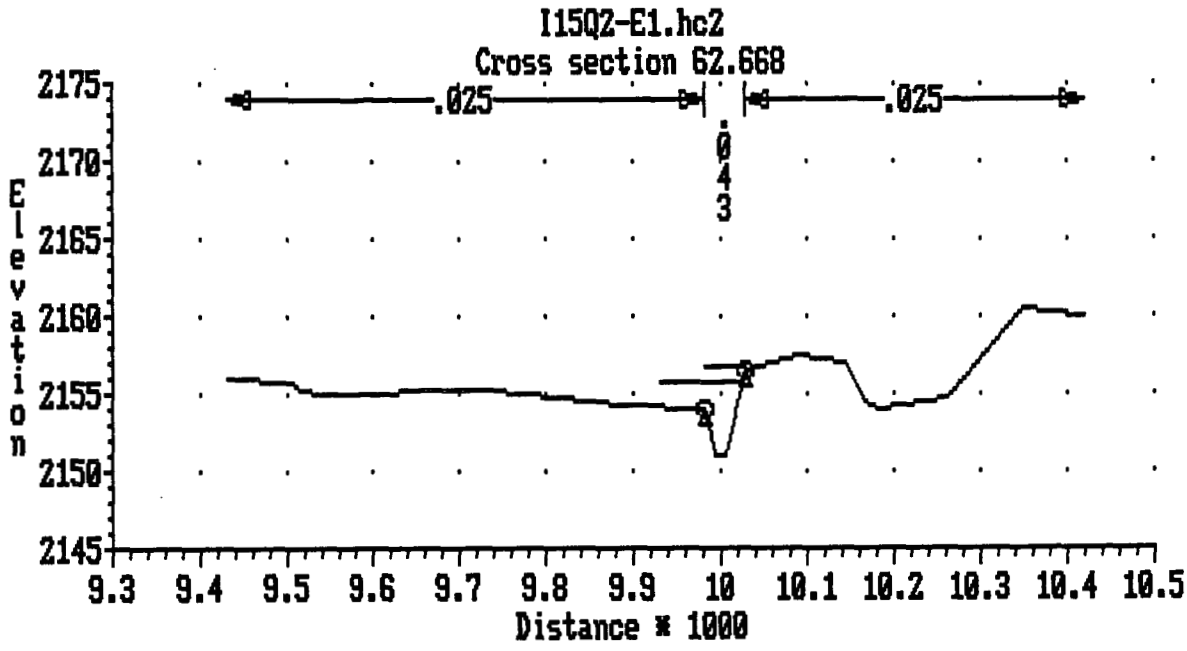
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CAUTION SECNO= 63.260 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 63.260 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 63.260 PROFILE= 2 MINIMUM SPECIFIC ENERGY

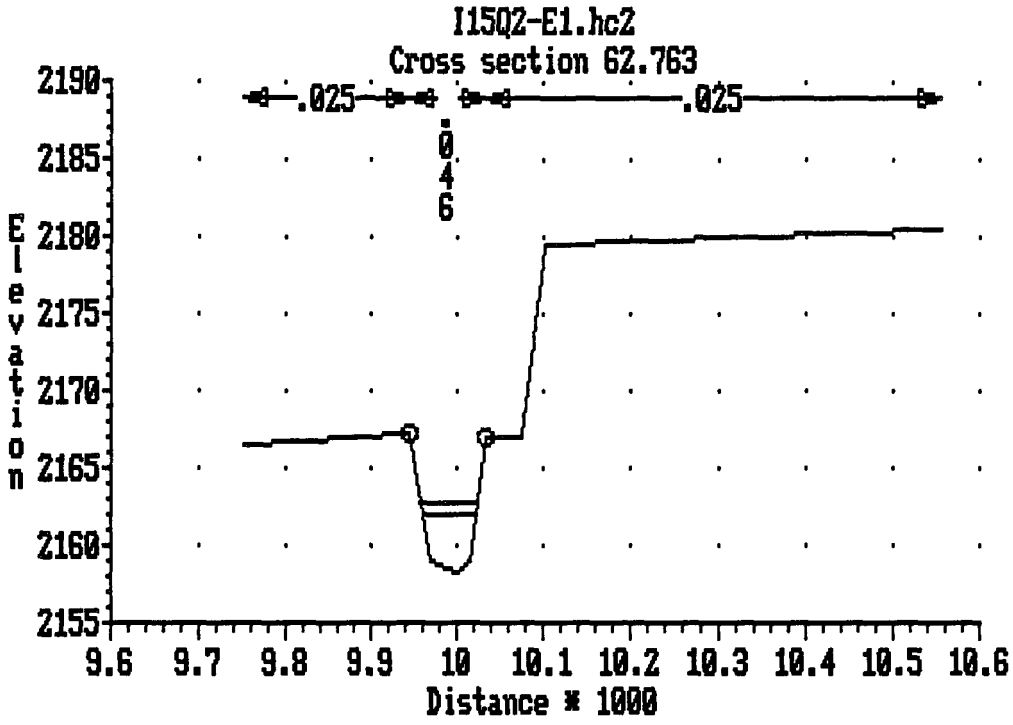
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WARNING SECNO= 63.353 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

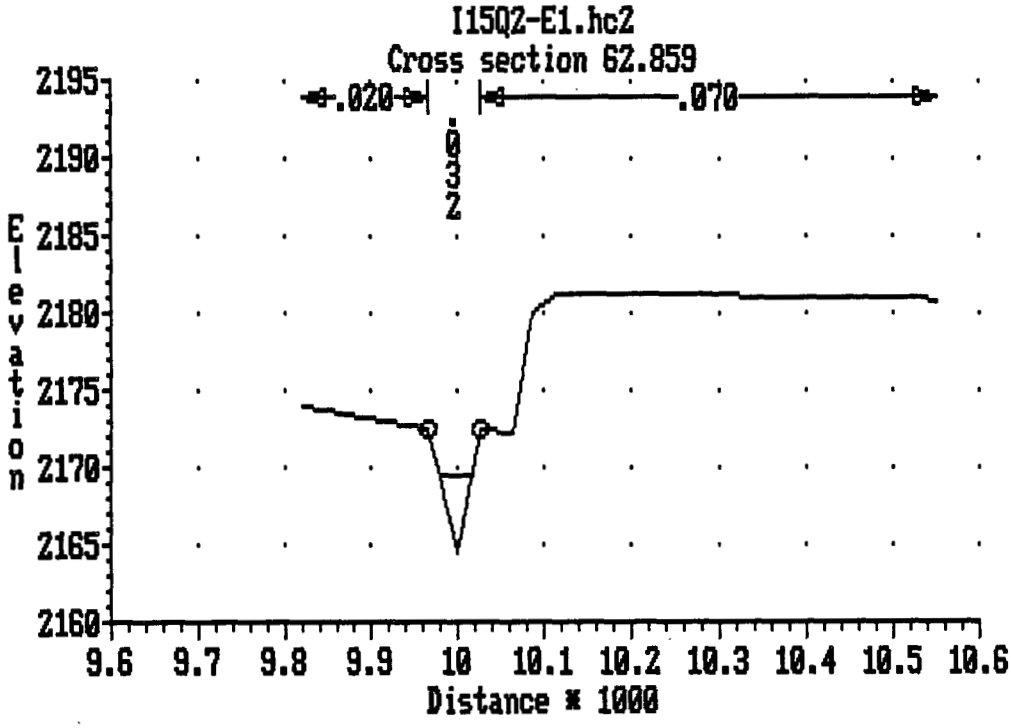
FLOODWAY DATA, I15Q2-E1.hc2
PROFILE NO. 2

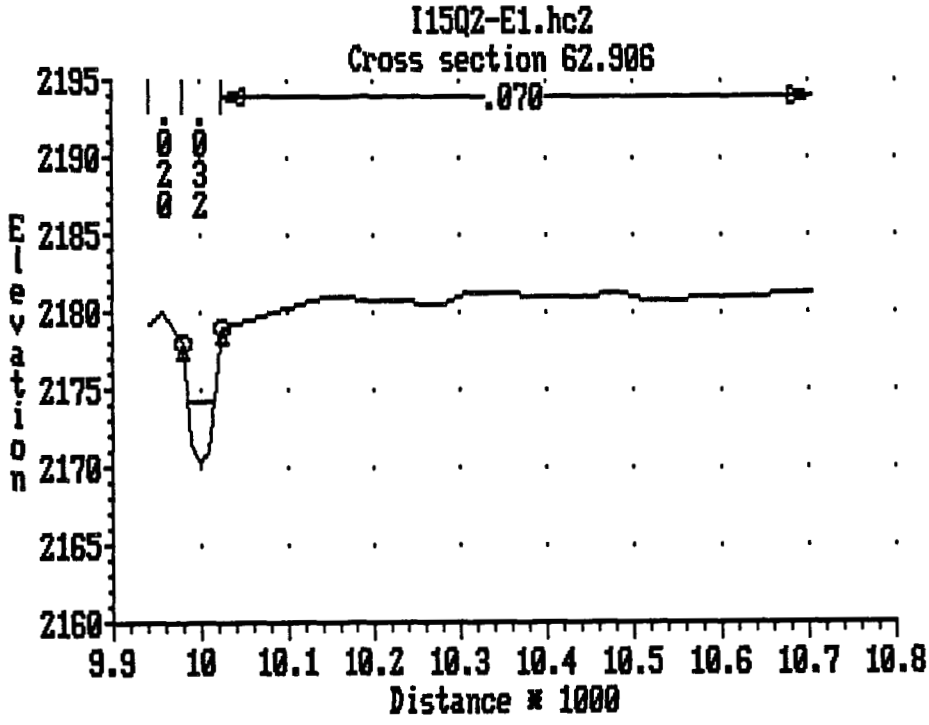
STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
62.566	613.	6370.	0.4	2155.7	2154.7	1.0
62.668	48.	194.	11.6	2156.8	2155.8	1.0
62.763	68.	240.	3.3	2162.8	2161.9	0.9
62.859	36.	89.	9.0	2169.4	2169.4	0.0
62.906	30.	84.	9.6	2174.1	2174.1	0.0
62.908	30.	84.	9.5	2174.1	2174.1	0.0
62.937	39.	138.	5.8	2176.1	2176.1	0.0
62.940	39.	137.	5.8	2176.1	2176.1	0.0
62.967	35.	98.	8.2	2176.5	2176.5	0.0
62.969	35.	98.	8.2	2176.5	2176.5	0.0
63.061	31.	98.	8.2	2181.6	2181.6	0.0
63.157	52.	129.	6.2	2187.9	2187.9	0.0
63.260	59.	98.	7.2	2199.8	2198.8	1.0
63.353	86.	257.	2.8	2203.3	2202.6	0.7
63.157	52.	129.	6.2	2187.9	2187.9	0.0
63.260	59.	98.	7.2	2199.8	2198.8	1.0
63.353	86.	257.	2.8	2203.3	2202.6	0.7

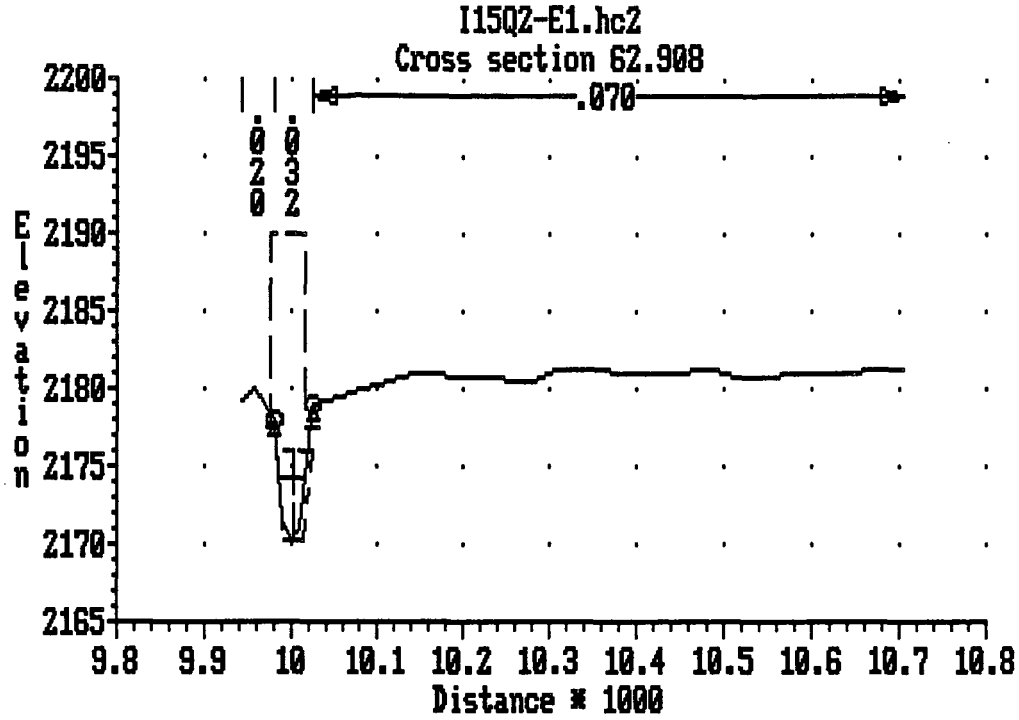

I15Q2-E1.hc2
Cross section 62.566
.025
.043
.025
Elevation
2170
2165
2160
2155
2150
2145
2140
2135
9.4
9.5
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
Distance * 1000

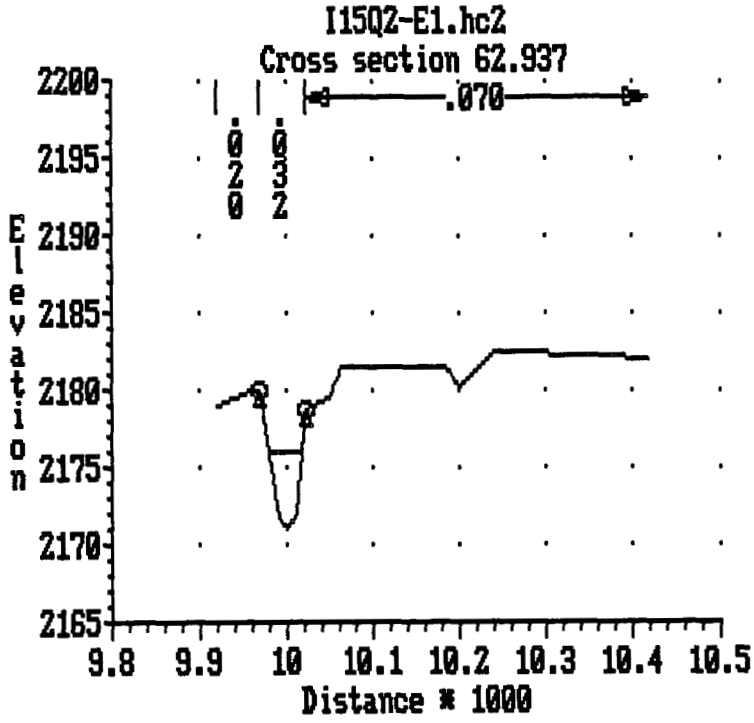

I15Q2-E1.hc2
Cross section 62.668
.025
.025
043
Elevation
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2170
2165
2160
2155
2150
2145
9.3
9.4
9.5
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
Distance * 1000

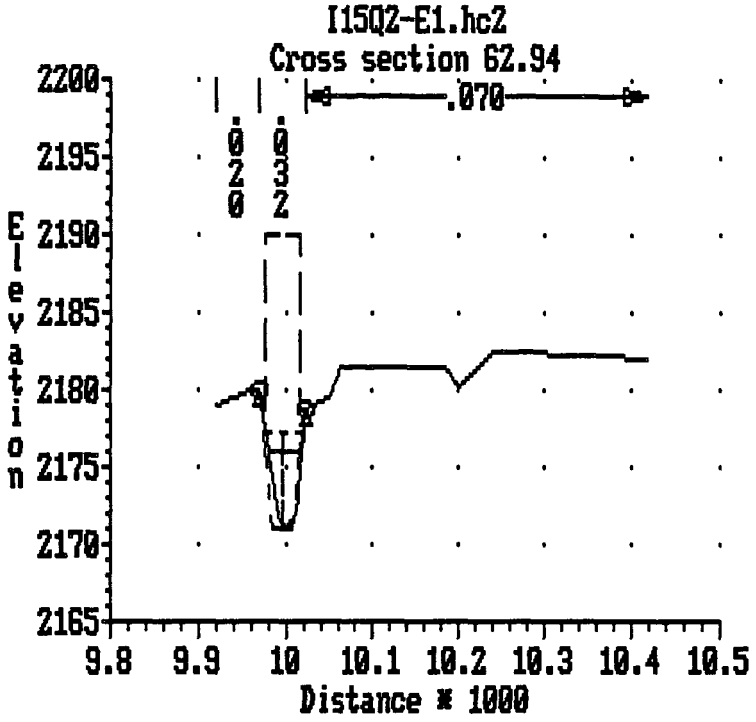

I15Q2-E1.hc2
Cross section 62.763
.025
.025
.046
Elevation
2190
2185
2180
2175
2170
2165
2160
2155
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
Distance * 1000

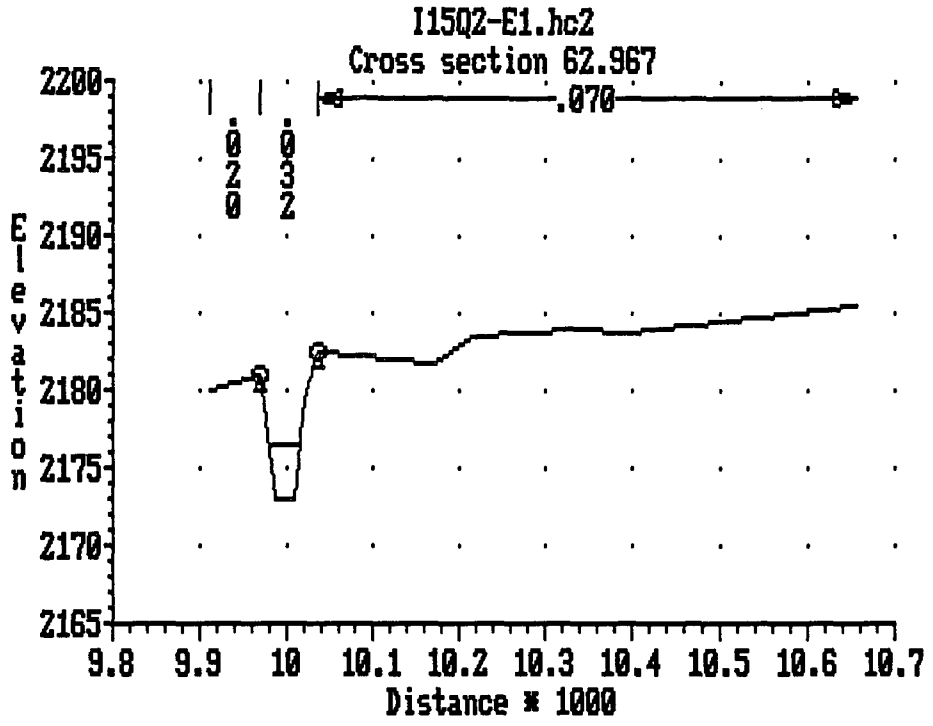

I15Q2-E1.hc2
Cross section 62.859
.020
.070
.030
Elevation
2195
2190
2185
2180
2175
2170
2165
2160
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
Distance * 1000

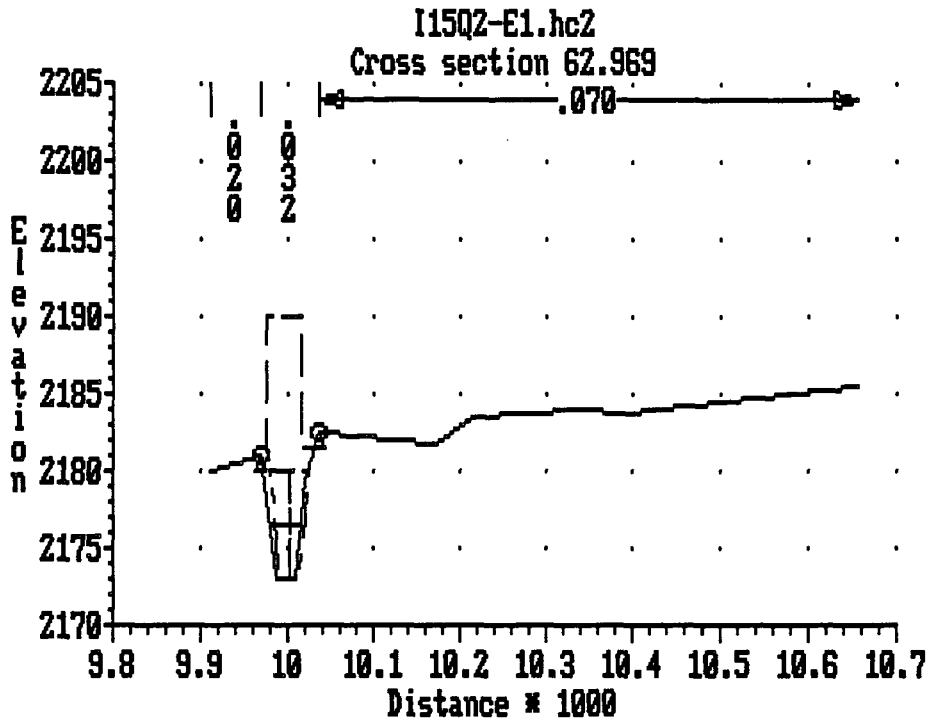

I15Q2-E1.hc2
Cross section 62.906
.070
.032
.032
Elevation
2195
2190
2185
2180
2175
2170
2165
2160
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
10.7
10.8
Distance * 1000

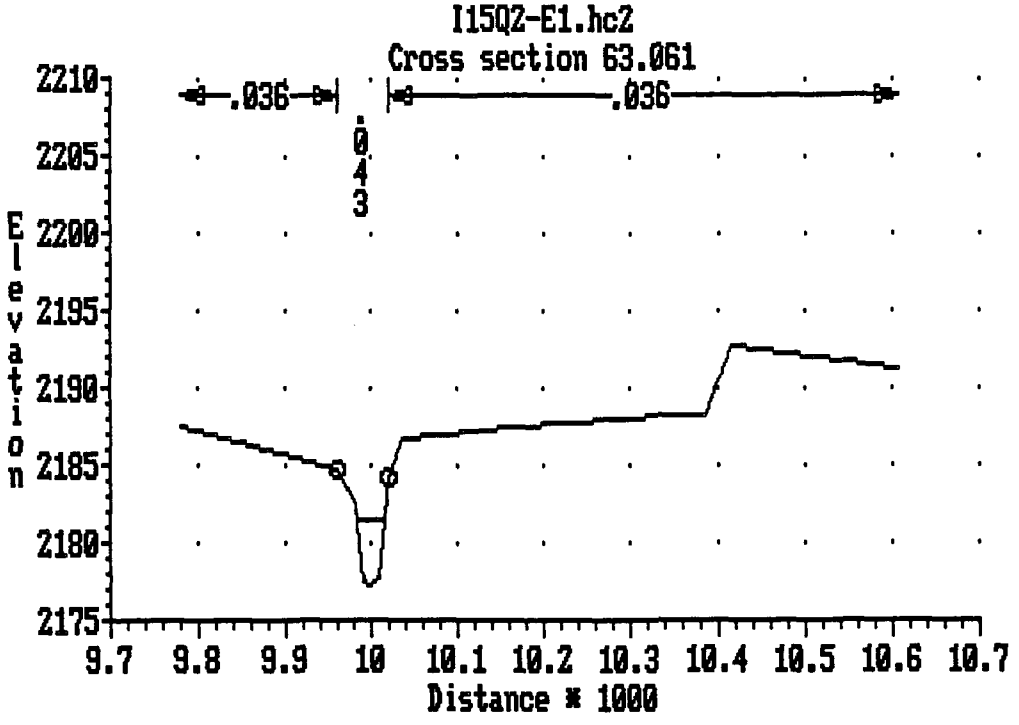

I15Q2-E1.hc2
Cross section 62.908
.070
.0202
.0302
Elevation
2200
2195
2190
2185
2180
2175
2170
2165
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
10.7
10.8
Distance * 1000

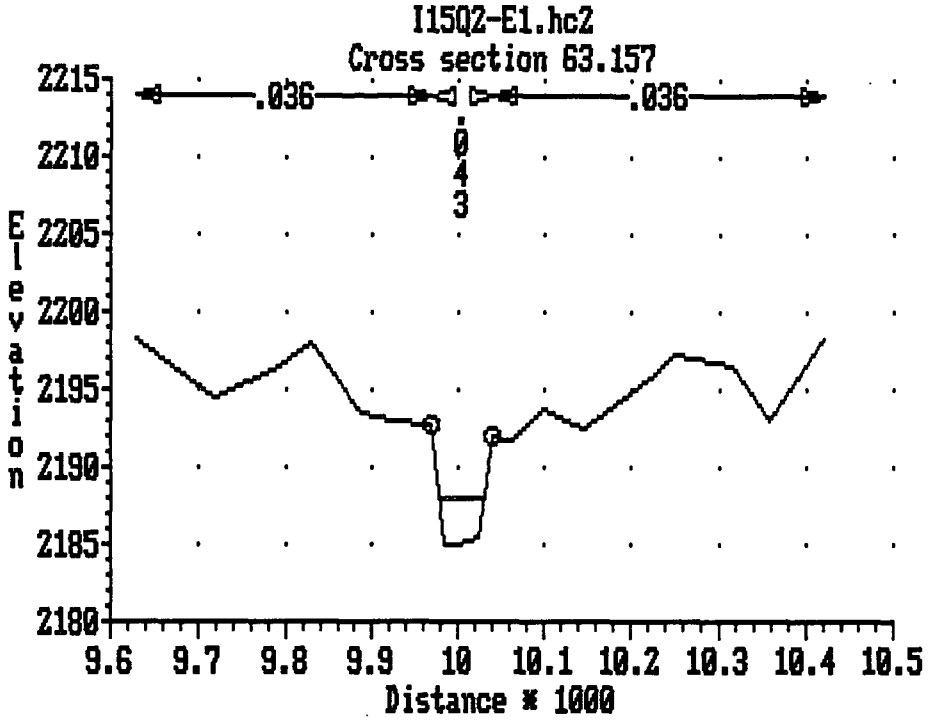

I15Q2-E1.hc2
Cross section 62.937
.070
.020
.032
Elevation
2200
2195
2190
2185
2180
2175
2170
2165
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
Distance * 1000

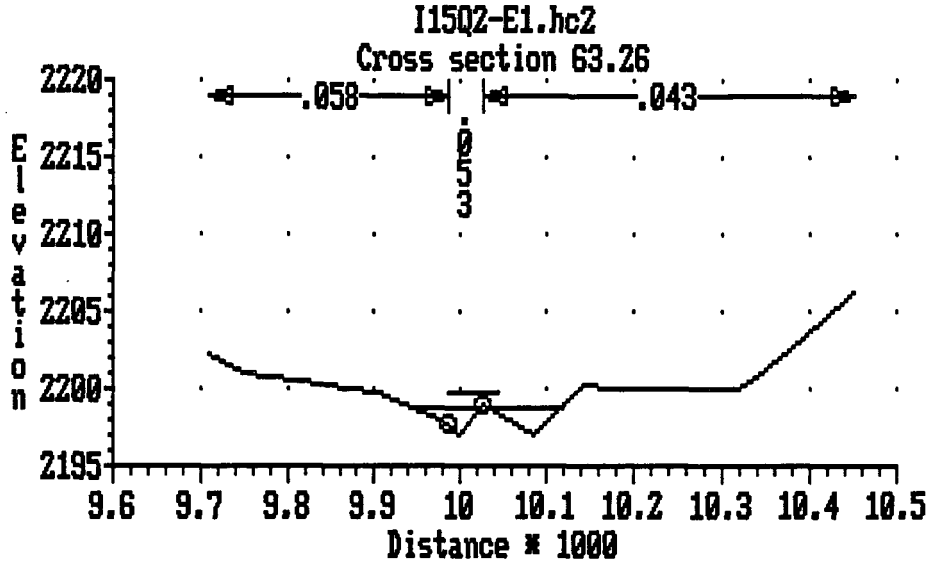

I15Q2-E1.hc2
Cross section 62.94
.070
.020
.032
Elevation
2200
2195
2190
2185
2180
2175
2170
2165
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
Distance * 1000

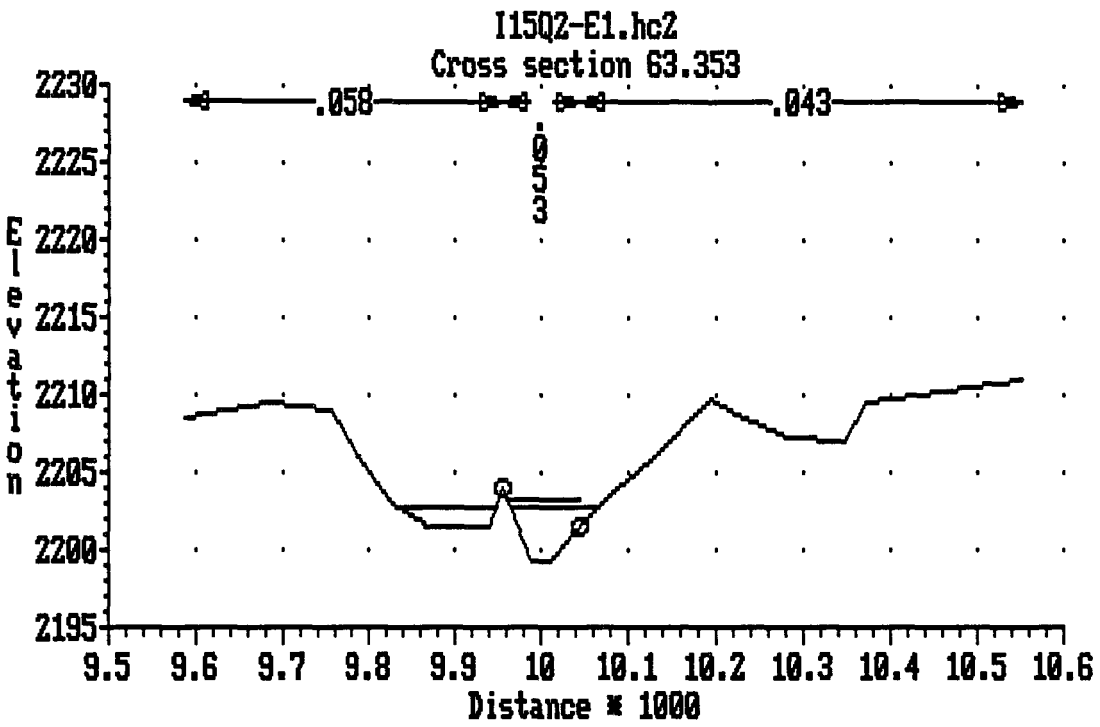

I15Q2-E1.hc2
Cross section 62.967
.070
.020
.032
Elevation
2200
2195
2190
2185
2180
2175
2170
2165
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
10.7
Distance * 1000


I15Q2-E1.hc2
Cross section 62.969
.070
.020
.032
Elevation
2205
2200
2195
2190
2185
2180
2175
2170
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
10.7
Distance * 1000


I15Q2-E1.hc2
Cross section 63.061
.036
.043
.036
Elevation
2210
2205
2200
2195
2190
2185
2180
2175
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
10.7
Distance * 1000


I15Q2-E1.hc2
Cross section 63.157
.036
.036
.043
Elevation
2215
2210
2205
2200
2195
2190
2185
2180
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
Distance * 1000


I15Q2-E1.hc2
Cross section 63.26
.058
.053
.043
Elevation
2220
2215
2210
2205
2200
2195
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
Distance * 1000


I15Q2-E1.hc2
Cross section 63.353
.058
.043
.350
Elevation
2230
2225
2220
2215
2210
2205
2200
2195
9.5
9.6
9.7
9.8
9.9
10
10.1
10.2
10.3
10.4
10.5
10.6
Distance * 1000

CURRENT DATE: 10-16-1992 FILE DATE: 10-16-1992
CURRENT TIME: 15:27:16 FILE NAME: ARV-BC

****
********** TAILWATER **********
****

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	30.00
SIDE SLOPE H/V (X:1)	1.5
CHANNEL SLOPE V/H (FT/FT)	0.010
MANNING'S N (.01-0.1)	0.025
CHANNEL INVERT ELEVATION (FT)	21.48
CULVERT NO.1 OUTLET INVERT ELEVATION	21.48 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
0.00	21.48	0.000	0.00	0.00
410.00	23.12	1.063	7.72	1.02
820.00	23.95	1.107	9.86	1.54
1230.00	24.61	1.128	11.33	1.95
1640.00	25.18	1.142	12.46	2.31
2050.00	25.69	1.151	13.40	2.63
2460.00	26.16	1.157	14.20	2.92
2870.00	26.59	1.162	14.91	3.19
3280.00	26.99	1.167	15.55	3.44
3690.00	27.37	1.171	16.13	3.68
4100.00	27.73	1.174	16.65	3.90

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	80.00

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	0.00	30.70
2	150.00	29.60
3	300.00	28.00

****

CULVERT DATE: 10-16-1992 FILE DATE: 10-16-1992
CULVERT TIME: 15:27:16 FILE NAME: ARV-BC

****

********** CULVERT # 1 **********

****

PERFORMANCE CURVE FOR 3 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	21.82	21.48	0.00	-0.34	0-NF	0.00	21.82	0.00	0.00
410	25.49	23.12	2.86	3.67	6-FF	0.00	0.00	0.00	7.59
820	26.35	23.95	4.44	4.53	6-FF	0.00	0.00	0.00	9.56
1230	27.67	24.61	5.85	5.51	6-FF	0.00	0.00	0.00	11.98
1561	28.83	25.18	7.01	6.44	6-FF	0.00	0.00	0.00	12.84
1230	27.67	25.69	5.85	5.51	6-FF	0.00	0.00	0.00	11.98
1640	29.12	26.16	7.30	6.67	6-FF	0.00	0.00	0.00	13.02
1640	29.12	26.59	7.30	6.67	6-FF	0.00	0.00	0.00	13.02
1640	29.12	26.99	7.30	6.40	5-S2	0.00	0.00	0.00	13.02
1640	29.13	27.37	7.30	7.31	5-S2	0.00	0.00	0.00	9.28
1230	28.71	27.73	5.85	6.89	4-FF	0.00	0.00	0.00	6.83

El. inlet face invert 21.82 ft El. outlet invert 21.48 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)	21.82
OUTLET STATION (FT)	85.00
OUTLET ELEVATION (FT)	21.48
NUMBER OF BARRELS	3.00
SLOPE (V-FT/H-FT)	0.0040
CULVERT LENGTH ALONG SLOPE (FT)	85.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	6.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL
INLET DEPRESSION	NONE

****

CURRENT DATE: 10-16-1992 FILE DATE: 10-16-1992
CURRENT TIME: 15:27:16 FILE NAME: ARV-BC

****

********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 3.2 **********

****

C	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
U	INLET	OUTLET	CULVERT	BARRELS				
L	ELEV.	ELEV.	LENGTH	SHAPE	SPAN	RISE	MANNING	INLET
V #	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)	n	TYPE
1	21.82	21.48	85.00	3 RCB	10.00	6.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (CFS) FILE: ARV-BC DATE: 10-16-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
21.82	0	0	0	0	0	0	0	0	1
25.49	410	410	0	0	0	0	0	0	1
26.35	820	820	0	0	0	0	0	0	1
27.67	1230	1230	0	0	0	0	0	0	1
28.84	1640	1561	0	0	0	0	0	73	4
30.17	2050	1230	0	0	0	0	0	805	6
30.21	2460	1640	0	0	0	0	0	844	13
30.54	2870	1640	0	0	0	0	0	1219	3
30.84	3280	1640	0	0	0	0	0	1631	3
31.12	3690	1640	0	0	0	0	0	2084	9
31.46	4100	1230	0	0	0	0	0	2694	13
28.00	1323	1323	0	0	0	0	0	OVERTOPPING	

****

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: ARV-BC DATE: 10-16-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
21.82	0.00	0	0	0.00
25.49	0.00	410	0	0.00
26.35	0.00	820	0	0.00
27.67	0.00	1230	0	0.00
28.84	-0.01	1640	7	0.41
30.17	-0.01	2050	15	0.75
30.21	0.00	2460	-24	-0.96
30.54	-0.01	2870	11	0.40
30.84	-0.01	3280	9	0.28
31.12	0.00	3690	-34	-0.92
31.46	-0.00	4100	176	4.29

****

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

****

SUBJECT Trop. Wash - Proposed box culvert at Arville St.

BY HMA DATE 10/19/92

SHEET NO. 3 OF 49

PROJECT NO. RDD 33832

HY-8 input

- summary follows this write-up
- copies of portions of plans follow the summary

- culvert length was measured along culvert axis
- although the inlet of the box culvert is lower than the existing channel elevation, an inlet depression was not entered since the depression occurs about 100 ft. upstream so it was assumed that its effect would be minimal.

- road stations and elevations were based on the upstream gutter profile plus 0.5' for curb.
- a 300' road length was used because that was the effective flow width at this section

CH2M HILL

SUBJECT Tropicana Wash - Proposed Box Culvert at Arville St. / using HY8

BY HMA DATE 10/6/92

SHEET NO. 2 OF 49

PROJECT NO. RD033832

Goal - to route the 4100 cfs through the box culvert using the FHWA culvert analysis program HY-8 (file = ARV-BC.INP) and then input the resulting water surface elevation into the run via an XS card at section 63.682.

The culvert goes under Arville St. 650 ft north of the intersection of Arville and Hacienda.

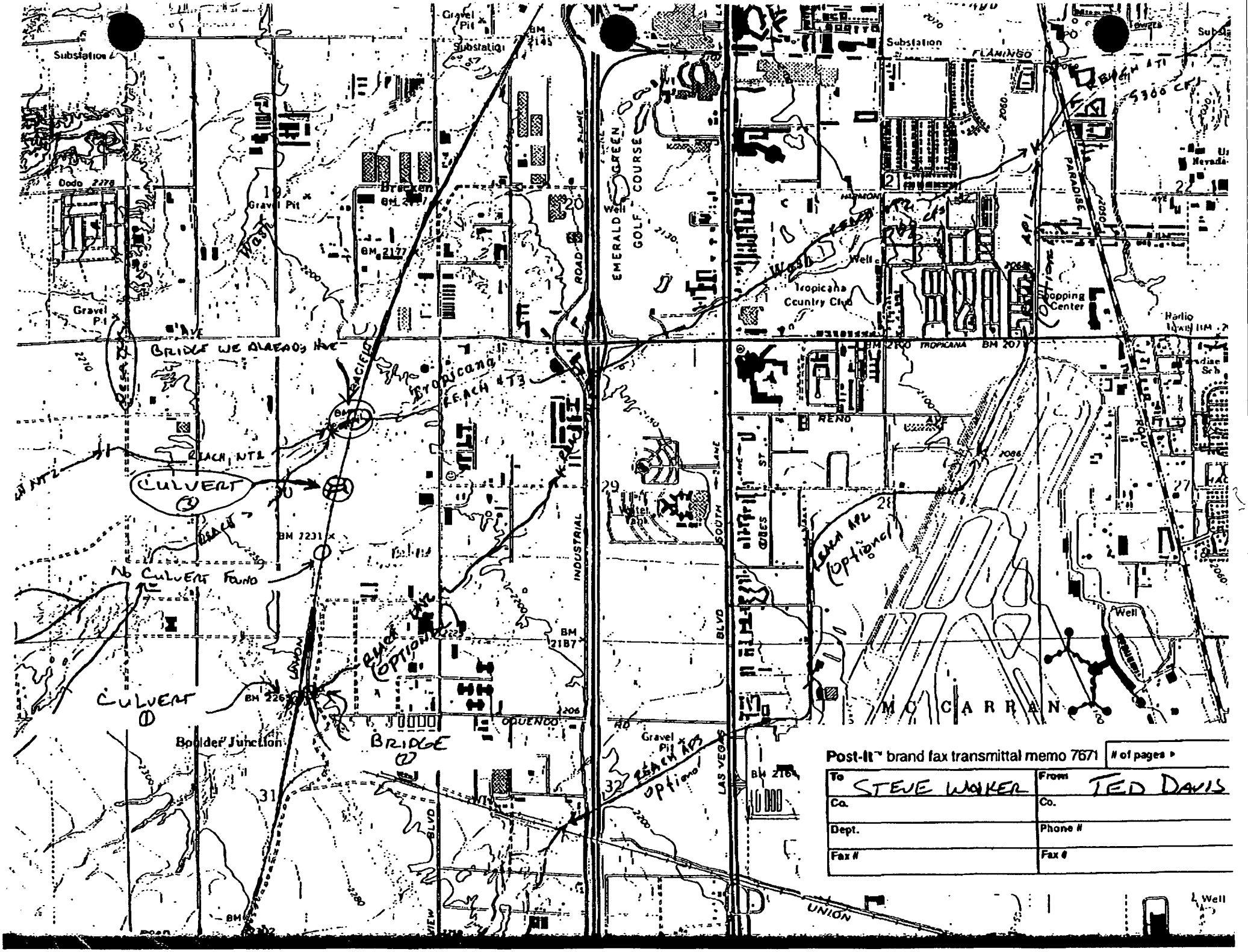
The channel is regraded for 165 ft upstream and 600 ft downstream of the center of the box culvert. This channel reshaping affects sections 63.682 and 63.585 so these sections were modified per the plans

Culvert and road information from following plans.

Clark County Dept. of Public Works
Special Improvement District No. 67, 1992
Contract L-1337

Results

From the HY-8 analysis (following), the water surface elevation to be entered into the run was 2231.46.



JUL 21,1995 12:48PM FROM UNLV FILL LAS VEGAS P.01
TO UNLV FMA

CH2M HILL

SUBJECT: Tropicana Wash
Arville Street Proposed Box Culvert

BY: HMA DATE: 8/23/93
SHEET NO. 1 OF 4
PROJECT NO.: RDD33832

GOAL: To model the proposed box culvert at Arville Street and and enter the results into the HEC-2 runs.

BACKGROUND and PROCEDURE:

In October, 1992, the proposed culvert was evaluated using HY-8 for passing the Q100 discharge of 4100 cfs. 1230 cfs ended up going through the culvert, the remainder flowed over the road and the resulting W.S.EL. of 2231.46 was entered into the HEC-2 runs with an X5 record. The write-up for this analysis follows this text.

In August, 1993, a new analysis for this culvert was done because it was determined that some of the stormflow does not flow over Arville but splits off and flows down the street. For this situation, the special culvert routine was used (the culvert design information can be found in the HY-8 analysis) and split flow analyses were run to estimate the amount of water lost down the street. The "lost" discharges were then subtracted from the Q100. Two split flows were performed:

1) A cross section of the street was used as the overflow channel and the flow was estimated using normal depth. This resulted in supercritical flow so a second run was done only using a weir instead of a channel.
2) A cross section of the street was used to define the weir. Results below.

RESULTS from second analysis:

(Q down Arville = 281 cfs.)
Q in channel downstream from Arville St. = 3819 cfs.
Natural Q100 W.S.EL. at Arville St. = 2230.90

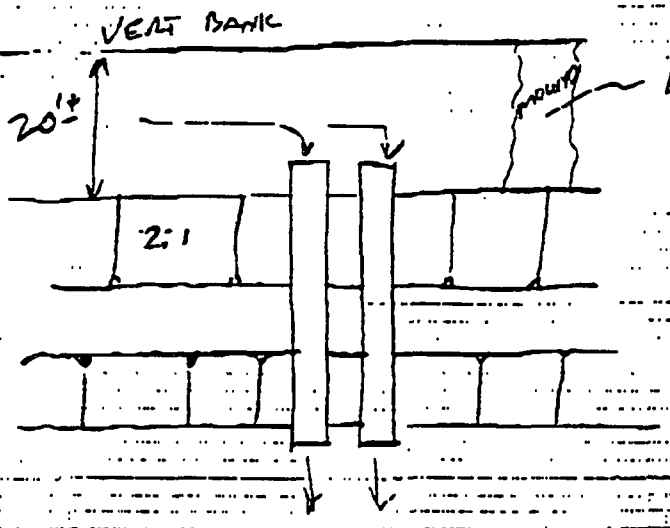
These results were put into HEC-2 runs: UPRR-NAT.hc2 and CTW-ENC.hc2.

SUBJECT _____ BY _____ DATE _____

SHEET ____ OF ____

PROJECT NO. _____

Culvert 3

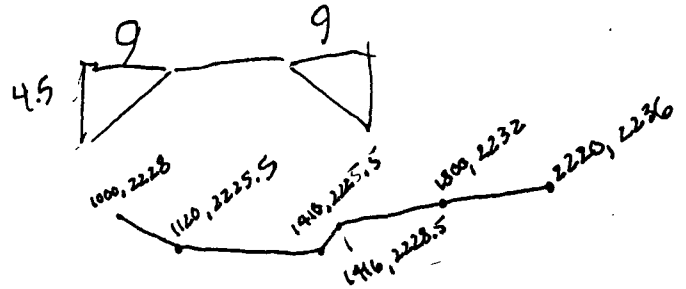


NOTE — MOUND APPROX 4½' EL ABOVE CULVERT INVERTS THEN OVERFLOWS

TWIN 36 ϕ C-P 90' ± LONG

PROJECTING INLET

NOTE: AREA AROUND OUTLET APPEARS TO POND WATER AT LEAST 6' DEEP BEFORE SPILLING ON DOWNSTREAM. THERE IS NO WELL DEFINED CHANNEL DOWNSTREAM.



TOTAL P.04

- 2-36" diameter culverts @ UP 1250' South of large culvert
- intercepts some flow from 900 cfs coming from Spear channel flow split

CURRENT DATE: 08-10-1993
CURRENT TIME: 10:37:13

FILE DATE: 08-09-1993
FILE NAME: CULVERT3

****

********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 3.2 **********

****

CULV #	SITE DATA: INLET ELEV. (FT)	SITE DATA: OUTLET ELEV. (FT)	SITE DATA: CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	2221.00	2218.00	90.05	2 CSP	3.00	3.00	.031	CONVENTIONAL
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (CFS) FILE: CULVERT3 DATE: 08-09-1993

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
2221.00	0	0	0	0	0	0	0	0	1
2225.15	90	90	0	0	0	0	0	0	1
[illegible].72	180	103	0	0	0	0	0	77	8
[illegible].75	200	103	0	0	0	0	0	96	5
2225.98	360	90	0	0	0	0	0	267	5
2226.07	450	90	0	0	0	0	0	356	4
2226.16	540	90	0	0	0	0	0	447	4
2226.24	630	90	0	0	0	0	0	538	4
2226.32	720	90	0	0	0	0	0	628	4
2226.38	810	90	0	0	0	0	0	713	3
2226.45	900	90	0	0	0	0	0	802	3
2225.50	98	98	0	0	0	0	0	OVERTOPPING	

use 810 cfs

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: CULVERT3 DATE: 08-09-1993

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
2221.00	0.00	0	0	0.00
2225.15	0.00	90	0	0.00
2225.72	-0.00	180	1	0.33
2225.75	-0.00	200	1	0.58
2225.98	-0.01	360	3	0.85
2226.07	-0.01	450	4	0.88
2226.16	-0.01	540	3	0.59
2226.24	-0.01	630	2	0.37
2226.32	-0.00	720	2	0.29
2226.38	-0.00	810	7	0.82
2226.45	-0.00	900	8	0.84

****

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

****

CURRENT DATE: 08-10-1993
CURRENT TIME: 10:37:13

FILE DATE: 08-09-1993
FILE NAME: CULVERT3

****

********** CULVERT # 1 **********

****

PERFORMANCE CURVE FOR 2 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2221.00	2220.00	0.00	-1.00	0-NF	0.00	2221.00	0.00	0.00
90	2225.15	2220.69	4.08	4.15	3-M1	0.00	0.00	0.00	6.73
103	2225.71	2221.04	4.71	4.56	3-M1	0.00	0.00	0.00	7.26
103	2225.74	2221.10	4.74	4.57	3-M1	0.00	0.00	0.00	7.31
90	2225.15	2221.54	4.08	4.15	3-M1	0.00	0.00	0.00	7.31
90	2225.15	2221.74	4.08	4.15	3-M1	0.00	0.00	0.00	7.31
90	2225.15	2221.93	4.08	4.15	3-M1	0.00	0.00	0.00	7.31
90	2225.15	2222.10	4.08	4.15	3-M1	0.00	0.00	0.00	7.31
90	2225.15	2222.26	4.08	4.15	3-M1	0.00	0.00	0.00	7.31
90	2225.15	2222.41	4.08	4.15	3-M1	0.00	0.00	0.00	7.31
90	2225.15	2222.56	4.08	4.15	3-M1	0.00	0.00	0.00	7.31

El. inlet face invert 2221.00 ft El. outlet invert 2218.00 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)	2221.00
OUTLET STATION (FT)	90.00
OUTLET ELEVATION (FT)	2218.00
NUMBER OF BARRELS	2.00
SLOPE (V-FT/H-FT)	0.0333
CULVERT LENGTH ALONG SLOPE (FT)	90.05

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	3.00 FT
BARREL MATERIAL	CORRUGATED ALUMINUM
BARREL MANNING'S N	0.031
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	THIN EDGE PROJECTING
INLET DEPRESSION	NONE

****

CURRENT DATE: 08-10-1993
CURRENT TIME: 10:37:13

FILE DATE: 08-09-1993
FILE NAME: CULVERT3

****

********** TAILWATER **********

****

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	25.00
SIDE SLOPE H/V (X:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.017
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	2220.00
CULVERT NO.1 OUTLET INVERT ELEVATION	2218.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
0.00	2220.00	0.000	0.00	0.00
90.00	2220.69	0.991	4.68	0.72
180.00	2221.04	1.031	5.96	1.08
200.00	2221.10	1.037	6.18	1.15
360.00	2221.54	1.067	7.51	1.60
450.00	2221.74	1.076	8.07	1.81
540.00	2221.93	1.084	8.55	2.01
630.00	2222.10	1.090	8.97	2.19
720.00	2222.26	1.094	9.34	2.35
810.00	2222.41	1.098	9.68	2.51
900.00	2222.56	1.102	10.00	2.66

****

********** ROADWAY OVERTOPPING DATA **********

****

ROADWAY SURFACE	GRAVEL
EMBANKMENT TOP WIDTH (FT)	50.00

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	1000.00	2228.00
2	1120.00	2225.50
3	1410.00	2225.50
4	1416.00	2228.50
5	1800.00	2232.00
6	2220.00	2236.00

****

9.75' diam. culvert under UPR
HY-8 analysis
4010 cfs in, 710 cfs out
3295 cfs flows north

CURRENT DATE: 08-11-1993 FILE DATE: 08-11-1993
CURRENT TIME: 17:23:50 FILE NAME: UPRR-C-2

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 3.2 **********
****

CULV #	SITE DATA: INLET ELEV. (FT)	SITE DATA: OUTLET ELEV. (FT)	SITE DATA: CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS	SHAPE	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE	MATERIAL
1	2202.40	2201.80	95.00	1	CSP	9.75	9.75	.031	CONVENTIONAL	
2										
3										
4										
5										
6										

****
SUMMARY OF CULVERT FLOWS (CFS) FILE: UPRR-C-2 DATE: 08-11-1993

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
2202.40	0	0	0	0	0	0	0	0	1
2209.74	401	363	0	0	0	0	0	36	11
2210.83	802	458	0	0	0	0	0	341	4
2211.42	1203	512	0	0	0	0	0	685	3
2211.87	1604	553	0	0	0	0	0	1044	3
2211.93	1660	558	0	0	0	0	0	1099	3
2212.56	2406	617	0	0	0	0	0	1785	3
2212.84	2807	643	0	0	0	0	0	2159	3
2213.10	3208	669	0	0	0	0	0	2534	3
2213.34	3609	689	0	0	0	0	0	2915	3
2213.57	4010	710	0	0	0	0	0	3295	3
2209.00	301	301	0	0	0	0	0	OVERTOPPING	

****
SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: UPRR-C-2 DATE: 08-11-1993

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
2202.40	0.00	0	0	0.00
2209.74	-0.01	401	2	0.56
2210.83	-0.00	802	3	0.42
2211.42	-0.01	1203	6	0.48
2211.87	-0.01	1604	7	0.45
2211.93	-0.00	1660	3	0.19
2212.56	-0.00	2406	4	0.15
2212.84	-0.00	2807	5	0.19
2213.10	-0.00	3208	5	0.16
2213.34	-0.00	3609	5	0.14
2213.57	-0.00	4010	5	0.12

****
<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000
****

CURRENT DATE: 08-11-1993
CURRENT TIME: 17:23:50

FILE DATE: 08-11-1993
FILE NAME: UPRR-C-2

****

********** CULVERT # 1 **********

****

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	2202.40	2200.00	0.00	-0.60	0-NF	0.00	2202.40	0.00	0.00
363	2209.75	2202.02	6.68	7.35	2-M2	0.00	0.00	0.00	10.75
458	2210.83	2202.78	7.65	8.43	2-M2	0.00	0.00	0.00	11.59
512	2211.42	2203.33	8.21	9.02	2-M2	0.00	0.00	0.00	12.03
553	2211.87	2203.78	8.63	9.47	2-M2	0.00	0.00	0.00	12.33
558	2211.93	2203.84	8.69	9.53	2-M2	0.00	0.00	0.00	12.36
617	2212.55	2204.51	9.35	10.15	2-M2	0.00	0.00	0.00	12.83
643	2212.84	2204.82	9.65	10.44	2-M2	0.00	0.00	0.00	13.06
669	2213.09	2205.11	9.96	10.69	2-M2	0.00	0.00	0.00	13.28
689	2213.34	2205.37	10.21	10.94	2-M2	0.00	0.00	0.00	13.44
710	2213.56	2205.62	10.48	11.16	2-M2	0.00	0.00	0.00	13.60

El. inlet face invert 2202.40 ft El. outlet invert 2201.80 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)	2202.40
OUTLET STATION (FT)	95.00
OUTLET ELEVATION (FT)	2201.80
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0063
CULVERT LENGTH ALONG SLOPE (FT)	95.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	9.75 FT
BARREL MATERIAL	CORRUGATED ALUMINUM
BARREL MANNING'S N	0.031
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	MITERED TO CONFORM TO SLOPE
INLET DEPRESSION	NONE

****

CURRENT DATE: 08-11-1993 FILE DATE: 08-11-1993
CURRENT TIME: 17:23:50 FILE NAME: UPRR-C-2

****
********** TAILWATER **********
****

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: UPRRCHAN
MAIN CHANNEL ONLY FILE DATE: 07-13-1992
LEFT CHANNEL BOUNDARY 0
RIGHT CHANNEL BOUNDARY 0
MANNING N LEFT OVER BANK 0.000
MANNING N MAIN CHANNEL 0.035
MANNING N RIGHT OVER BAN 0.000
SLOPE OF CHANNEL (FT/FT) 0.0077

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	100.00	2208.00
2	130.00	2204.00
3	215.00	2200.00
4	235.00	2200.00
5	250.00	2204.00
6	290.00	2206.00
7	290.00	2208.00

** UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
0.00	2200.00	0.000	0.00	0.00
401.00	2202.02	0.683	4.41	0.62
802.00	2202.78	0.715	5.29	0.81
1203.00	2203.33	0.734	5.87	0.95
1604.00	2203.78	0.747	6.32	1.06
1660.00	2203.84	0.749	6.38	1.08
2406.00	2204.51	0.766	6.97	1.23
2807.00	2204.82	0.773	7.24	1.30
3208.00	2205.11	0.780	7.48	1.37
3609.00	2205.37	0.785	7.69	1.43
4010.00	2205.62	0.790	7.90	1.48

****
********** ROADWAY OVERTOPPING DATA **********
****

WEIR COEFFICIENT 2.50
EMBANKMENT TOP WIDTH (FT) 200.00
***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	100.00	2216.00
2	300.00	2214.00
3	390.00	2212.00
4	570.00	2209.00
5	645.00	2214.00

****

Copy of sheet from TDN, Sec. 4
Showing proportions

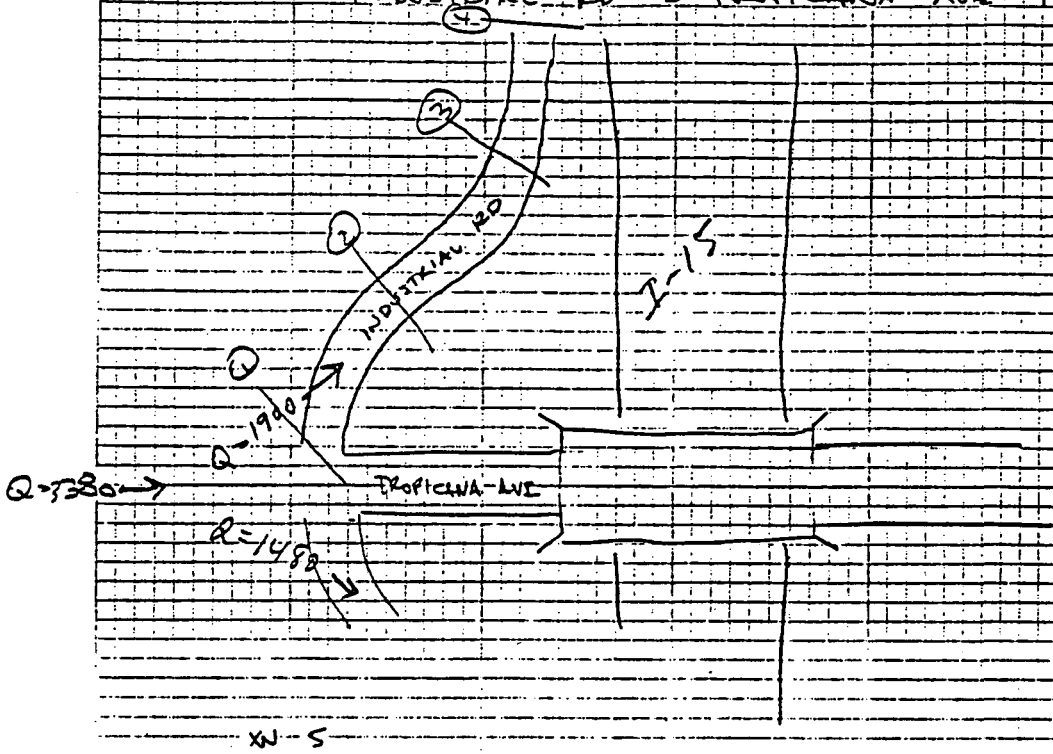
SUBJECT TROPICANA FIS BY JEE DATE 8-17-92

SHEET 8 OF

PROJECT NO. RD033832.A2.50

REACH 4 Q = 1900 CFS

INDUSTRIAL RD - TROPICANA AVE TO I-15



XN 5

ELEV	2134	2132	2130	2129.3	2130	2131.8
STN	0	95	205	300	315	355

XN 4

ELEV	2136	2134.4	2134	2133.1	2134	2133.8	2134
STN	0	100	180	190	205	230	275

XN 3

ELEV	2144	2140	2140	2139.1	2140	2143.4	2144
STN	0	130	395	420	440	510	550

.04 .02 .04

XN 2

ELEV	2156	2152	2148	2146.2	2146.4	2146	2160
STN	0	25	100	200	290	495	540

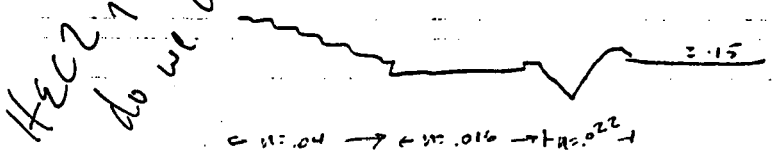
.04 .016 .024

XN 1

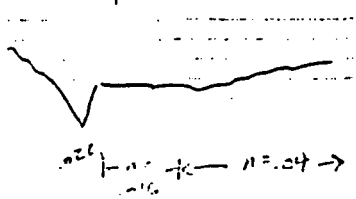
SEE REACH - SPLIT SECTION

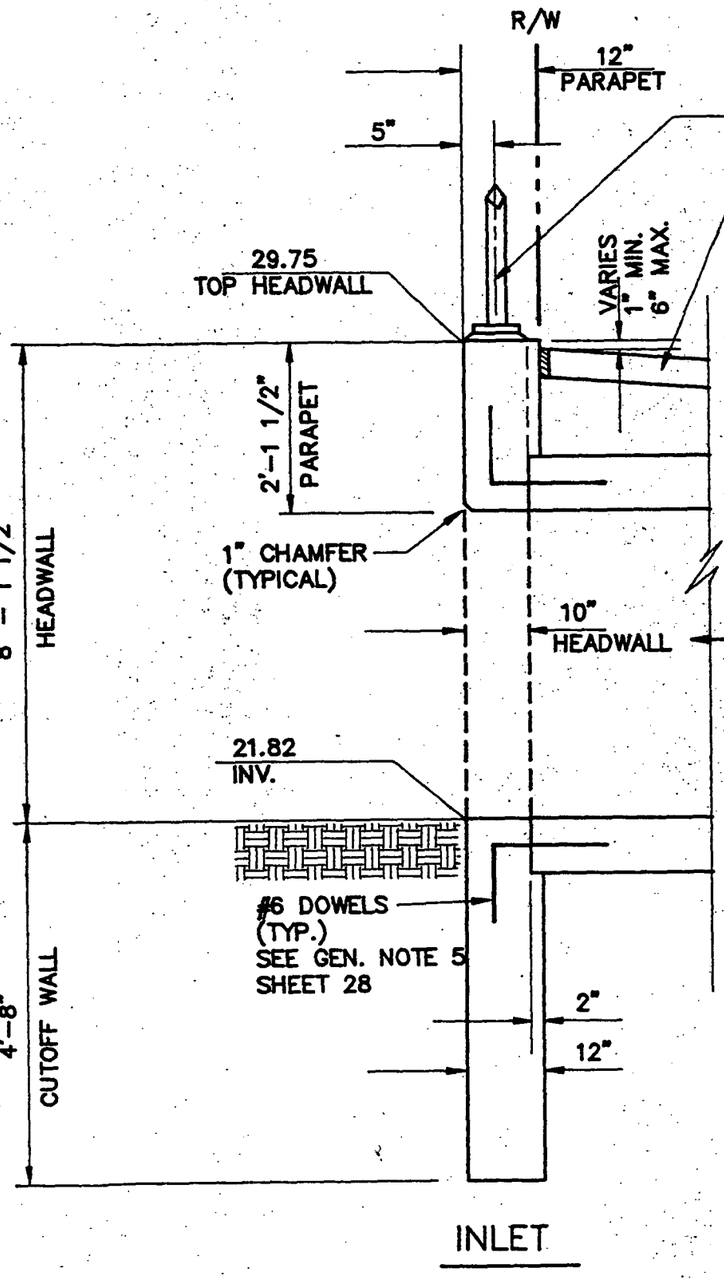
Reach split do we want?

XN 5 & 4

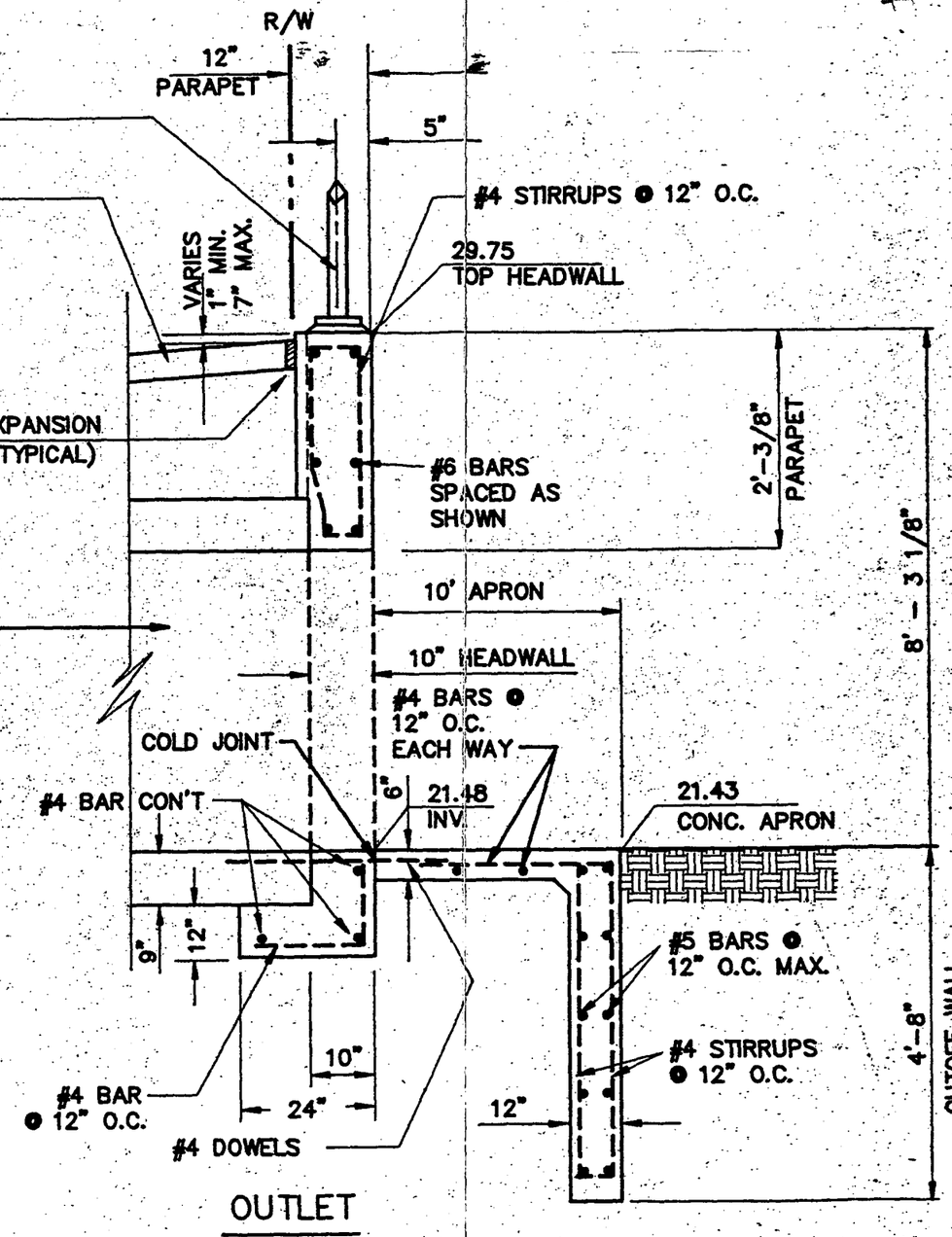


XN 3 & 2





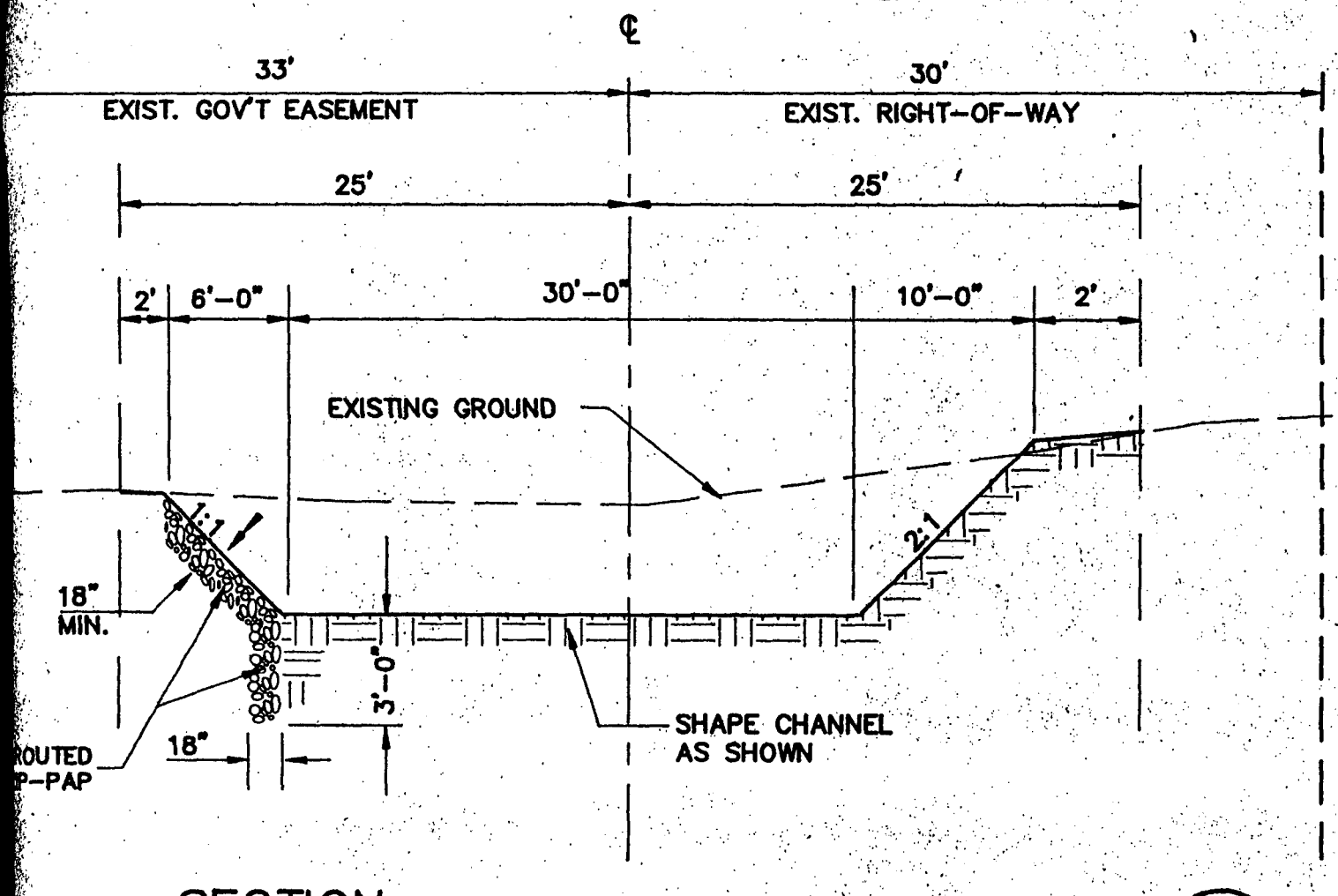
INLET



OUTLET

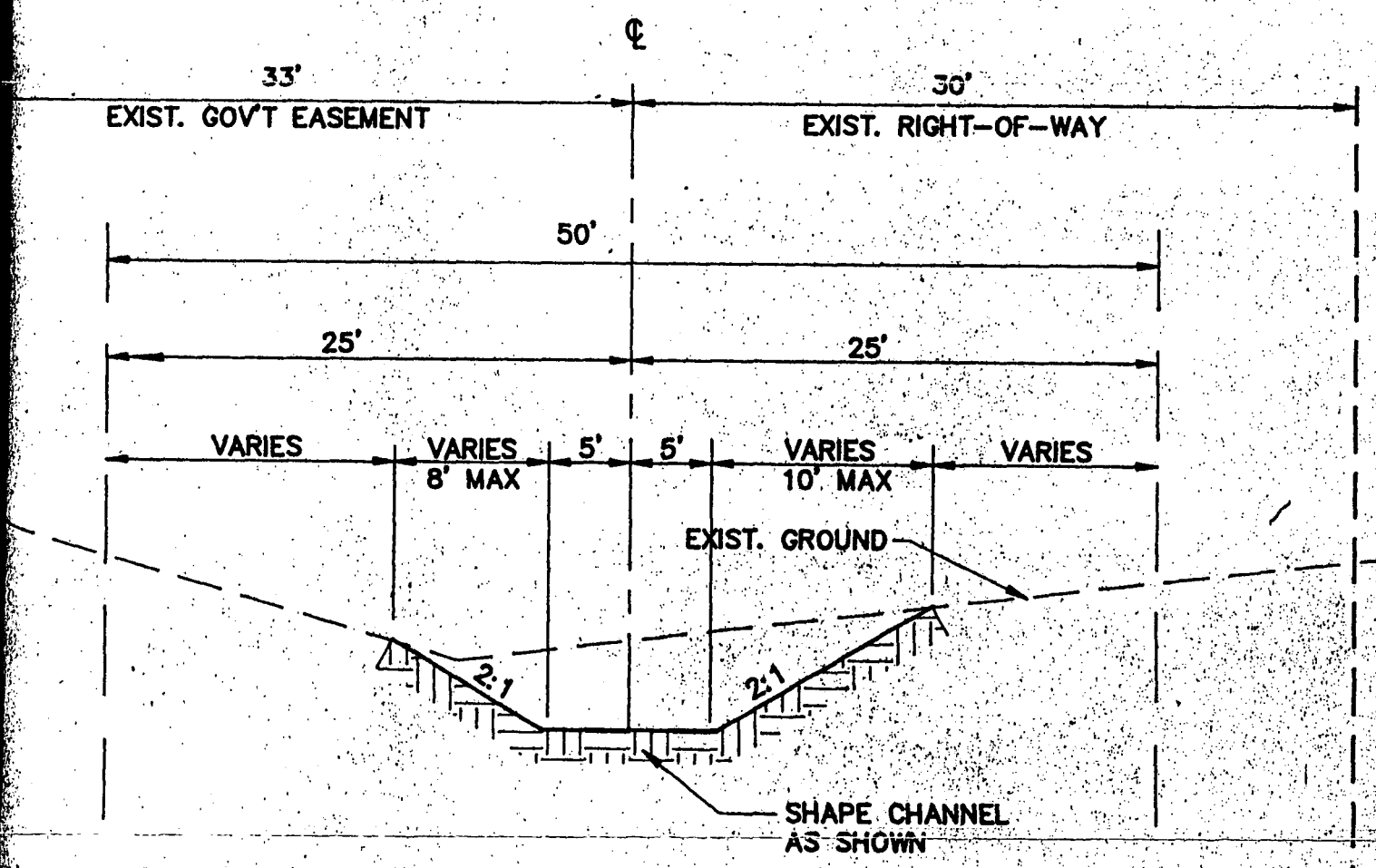
SECTION D

NO SCALE



SECTION B

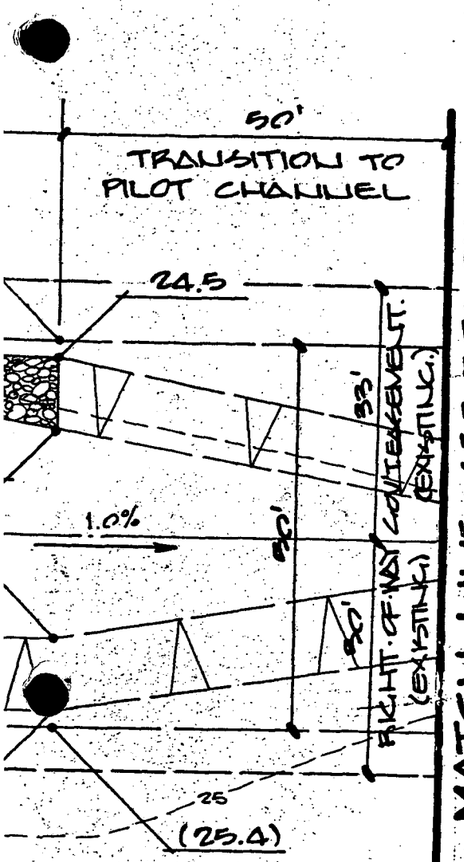
NO SCALE

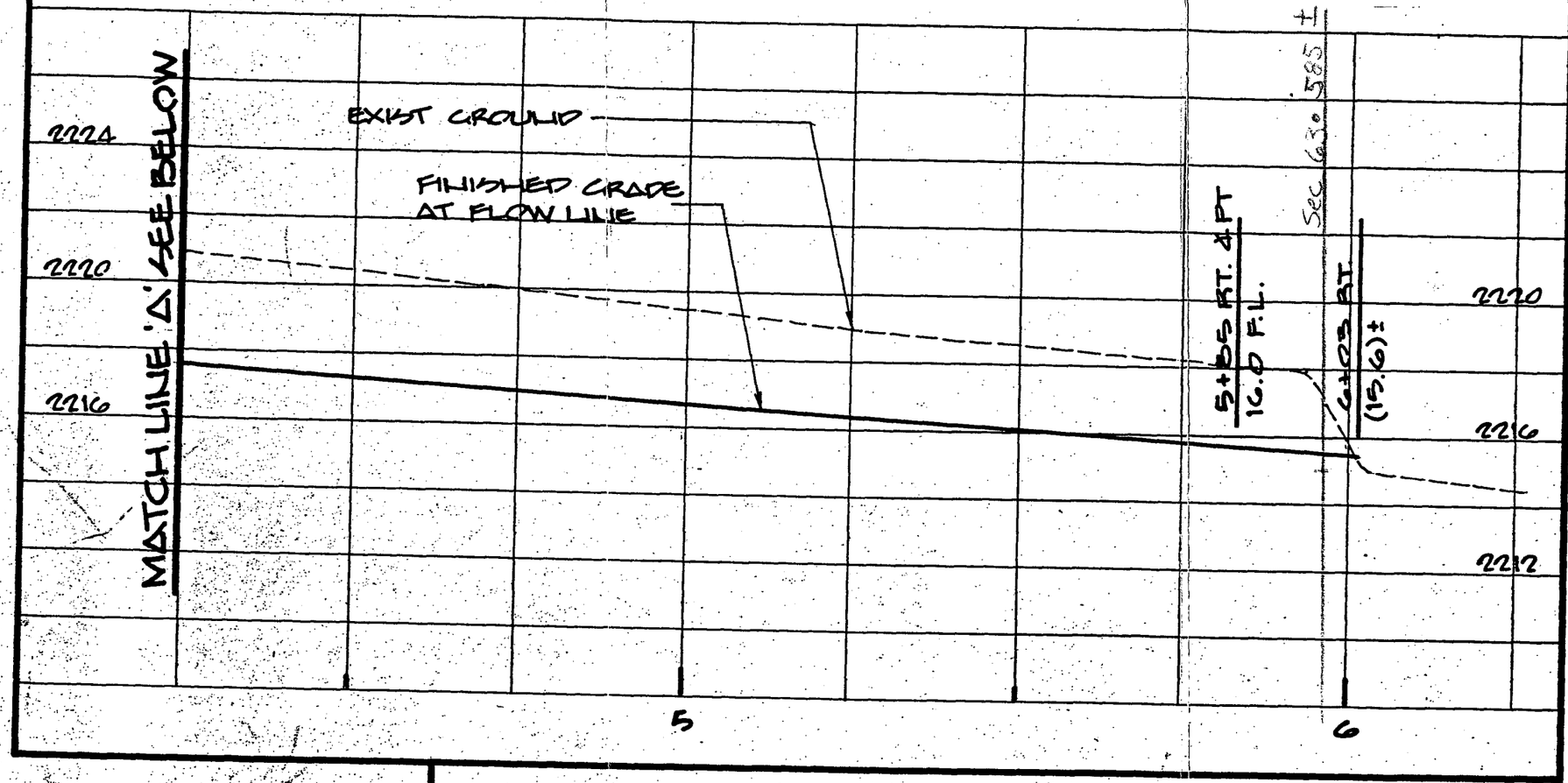


SECTION C

NO SCALE

Sheet 13 of 15





CONSTRUCTION NOTES (THIS SHT.)

1. SHAPE MAIN DRAINAGE CHANNEL AS SHOWN
2. INSTALL PRE-CAST 10' X 6' RCB PER N.D.O.T. STD. B-20.1.8-(502)
3. CONSTRUCT CUTOFF WALL, HEADWALL, PARAPET & PED. RAIL (REF SECTION "D" SHEET 31).
4. CONSTRUCT HEADWALL, PARAPET & PED. RAIL (REF DETAIL 1 SHEET 31).
5. CONSTRUCT CONC. APRON & CUTOFF WALL (REF SECTION "D" SHEET 31).
6. PLACE GROUTED RIPRAP (REF DETAIL 1 SHEET 32 SIMILAR).
7. CONSTRUCT MODIFIED TYPE 3 DROP INLET PER N.D.O.T. STD. R-4.3.1(609) W/FRAME AND GRATE PER STD. DWG. 312. CONNECT TO OPENINGS IN TOP OF RCB (PER MANUFACTURER). COORDINATE LOCATION WITH MANUFACTURER OF RCB.
8. INSTALL 18" RCP INTO SIDE OF RCB AND TRIM FLUSH.
9. INSTALL (2) 2" DIA. PVC CONDUIT (SCH. ...

DATE NO	REVISIONS	APP'D

PREPARED FOR:
CLARK COUNTY NEVADA
DEPARTMENT OF PUBLIC WORKS

DATE JULY 1992
DESIGN AWM
DRAWN AWM
CHECK
SCALE AS NOTED

ENGINEER INC.
LAND PLANNERS
LAS VEGAS, NEVADA
89102

(14) SHAPE PILOT CHANNEL AS SHOWN.

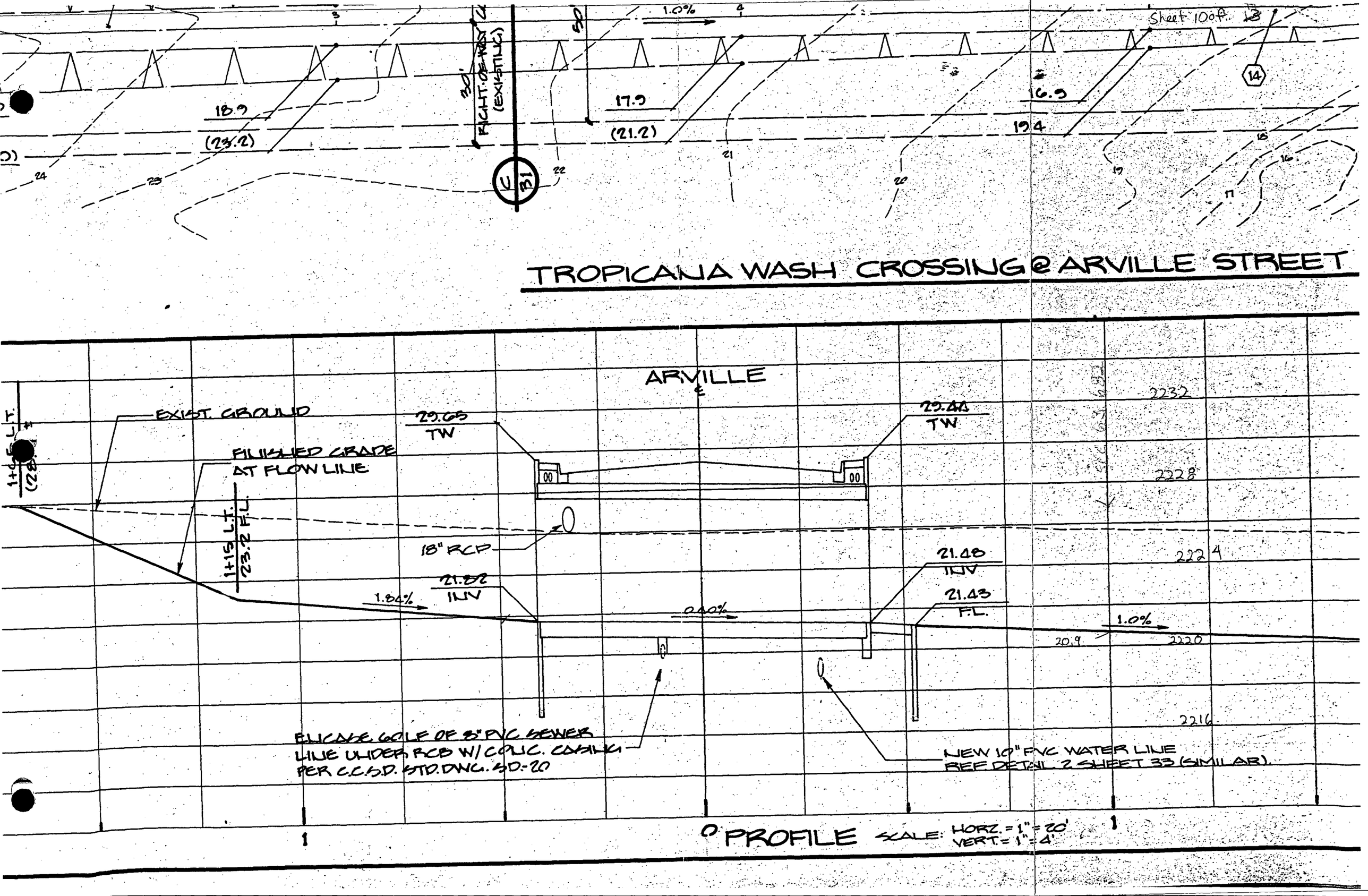
TREET

BAUGHM
CIVIL ENGINEERS
1210 HINSON STREET

ARVILLE ST./TROPICANA BRANCH WASH
PLAN AND PROFILE
(3) 10 X 6 PRECAST RCB & CHANNEL GRADING

SHEET 12 OF 12
PROJ. NO
F-1337

TROPICANA WASH CROSSING @ ARVILLE STREET



PROFILE SCALE: HORZ. = 1" = 20'
VERT. = 1" = 4'

65' 10' 40' 40' 10' 65' 25' 50'

TRANSITION TO PILOT CHANNEL

MATCH LINE SEE BELOW

29.95 TOP WALL (28.0)

29.44 TW (29.34) TC

29.17 TW

29.07 TC

29.75 TOP WALL (26.0)

72°38'46"

N89°59'21"E

1.0%

1.34%

STREET

ARVILLE

RIGHT-OF-WAY (EXISTING)

CURB EASEMENT (EXISTING)

33'

50'

(24.7)

24.5

20.7

20.5

21.3

25.2

(25.4)

23.2

21.92

21.82 INV

26.8

(27.0)

29.75 TC

29.85 TW

29.55 TC

29.65 TW

25.8 (26.0)

26.0

29.75 TOP WALL

21.43

21.48 INV

21.48 INV

21.43

10' 20'

T.O.N. 93.68

PLAN

SCALE: 1" = 20'

395'

(23.1)

18.9

(21.4)

17.2

(19.7)

16.9

16.0

1.0%

Sheet 9 of 13
49

MATCH

D 31

ARVILLE

TC 25.85
(25.65)
TW

29.75
TC

29.85
TW

29.75
TOP WALL

25.8
(26.0)
25.8
26.0

25.2
(25.4)

10' 20'

PLAN
SCALE: 1"=20'

395'

33'
LOOP EASEMENT
(EXISTING)

30'
RIGHT-OF-WAY
(EXISTING)

50'

1.0%

(21.4)
17.2
17.9
(21.2)

(19.7)
16.9
16.9
19.4

16.0
16.0

15.6
15.6

18'

C 31

TROPICANA WASH CROSSING @ ARVILLE STREET

28+42.41 PC

28+69
8"PVC(W)
28+82.37
℄ PRIVATE DR. ACCESS
6"PVC(S)

29+22.41 PT

28+21.36 D.I. N°6
℄ U.D.O.T. TYPE 3 D.I.

28+52±
EXIST. 6" SEWER LAT.

29+10
℄ H.C. RAMP

28+82.54
ARVILLE

29+87±
EXIST. 6" SEWER LAT.

PRIVATE DR.

Arville St.

30+65.44
℄ 16' COMM. DWY.

30+86
8"PVC(W)
31+62.27 (10' L.T.)
EXIST. SMH N°2

31+03
8"PVC(W)
31+34.31
END SIDEWALK

32+02
EXIST. 6" SEWER LAT.

32+45
8"PVC(W)

32+70
8"PVC(W)

32+77.36
℄ TYPE 'B' D.I.
32+90.10
℄ RCB & R/W

33+01.23
℄ TYPE 'B' D.I.
33+15.10
℄ RCB & R/W

33+16
END S.W. C & G.
MATCH EXIST.
33+36
SAWCUT & MATCH

STEEL ENCASE WATER LATERAL PER LVVWD STDS. UNDER 18" STORM DRAIN. LOWER IF REQUIRED PER DETAIL 1 SHT. 25 REFER TO WATER PLAN SHT. 27

EXISTING 30' R.O.W.

85.10
IN SIDEWALK

EXISTING 33' CONT. EASEMENT

INSTALL 3-10'x6' RCB (SEE DETAIL ON SHT. 19)

60" SEWER LINE CONC. PROTECTION PER C.C.S.D. STD DWG. SD-20

EXISTING 50' WIDE DRAINAGE EASEMENT

25'

Hacienda at Arville Station
26+51.77

MATCHLINE - SEE SHT. 16

ER NGINEERS / EGAS NEVADA	DATE JULY 1992 DESIGN D.S.T./A.W.M. DRAWN D.S.T./A.W.M. CHECK J.W.L.	PREPARED FOR: CLARK COUNTY NEVADA DEPARTMENT OF PUBLIC WORKS	DATE NO	REVISIONS	APP'D

Sheet 7 of 16

CH2M HILL

SUBJECT: Tropicana Wash
Arville Street Proposed Box Culvert
Split flow using Normal Depth

BY: HMA DATE: 8/23/93
SHEET NO. 15 OF 49
PROJECT NO.: RDD33832

GOAL: To model the proposed culvert under Arville St. using the Special Culvert routine in conjunction with a **normal-depth** option split flow down Arville Street.

PROCEDURE:

(details follow)

1) Copy section 63.682 (downstream of Arville) and put the duplicate (section 63.698) in just upstream of Arville into edited HEC-2 file (filename = UPRR-NSC.hc2).
2) Input split flow channel between the two above sections.
3) Put in the Special Culvert between sections 63.682 and 63.698.
   - culvert information found in HY-8 analysis.
4) put in BT records to define Arville St. at 63.698.

RESULTS:

Q down Arville = 716 cfs.
Average flow velocity = 9.57 ft./s.
Average depth = 1.46 ft.

Results not put into HEC-2, see next analysis.

Procedure Details

1) Split flow channel:

(0, 2228.5) (60.01, 2228.5)
(0.01, 2228.0) (70.0, 2228.0)

n = 0.020 - pavement
slope = 0.01 - calculated from topo.

2) SC Input

CUNO = 3
CUNV = 0.012
ENTLC = 0.3 Culvert has a headwall and edges have a 1" chamfer so $0.2 < ENTLC < 0.5$. Used 0.3 as a compromise.

COFQ = 2.63
RDLEN = 0 use BT record
RISE = 6'
SPAN = 10'
CULVLN = 85'
CITRT = 10 Box Culvert, 90° headwall, Beveled Inlet edges
Scale = 2 bevel = 1/2" / ft of fall height @ 45°
ELCHU = 2221.24 } Culvert is 100' upstream of section
ELCHD = 2220.9 } 63.682. For the actual culvert, ELCHU = 2221.82 & ELCHD = 2221.48, the difference being 0.34'. So, the downstream section (63.682) was kept as is but the upstream section is a copy of 63.682 that has been raised 0.34' and located 85' upstream of original section.

HEC2 S/N: 1916530021 HMVersion: 6.50 Data File: uprr-nsc.hc2

```
*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    23AUG93    TIME    14:37:28 *
*******************************************
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*******************************************
*  U.S. ARMY CORPS OF ENGINEERS           *
*  HYDROLOGIC ENGINEERING CENTER          *
*  609 SECOND STREET, SUITE D             *
*  DAVIS, CALIFORNIA 95616-4687           *
*           (916) 756-1104                *
*******************************************
```


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

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

HAESTAD METHODS

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

THIS RUN EXECUTED 23AUG93 14:37:28

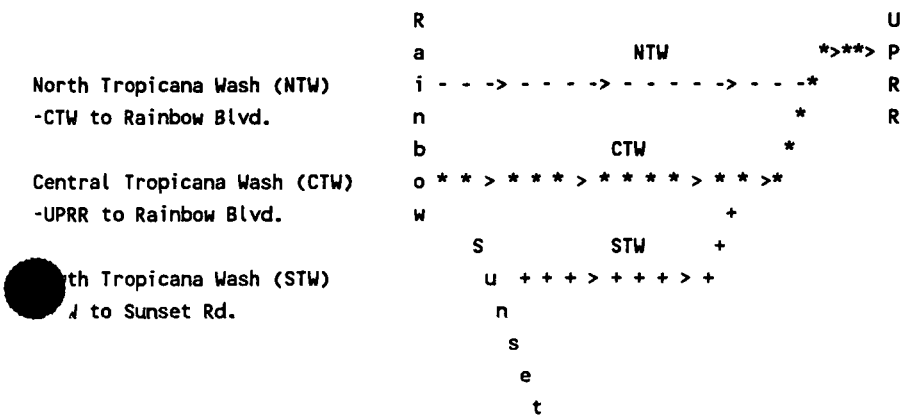
****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

TROPICANA WASH FLOOD INSURANCE STUDY

by CH2M Hill, 1992 RDD33832

Schematic:



Notes:
-discharges were based on those in the "Las Vegas Valley Flood Insurance Study Hydrology Report" by James M. Montgomery, Inc., September, 1991 (see CH2M Hill memo dated July 13, 1992)

-Manning's "n" values were estimated by field observations of channels and floodplains in conjunction with methods recommended in "Open Channel Hydraulics" by Chow, 1959

-stations and elevations obtained from 400 scale topo created by CH2M Hill from aerial photographs

At section 63.682 a box culvert is proposed to go in under Arville St. with channel regrading upstream and downstream of the culvert. The GR input at sections 63.585 and 63.682 were modified to reflect the regrading and the channel "n" value was reduced to 0.025 at these sections. The discharge was routed through the culvert using the Special Culvert routine. Also, a split flow w/normal depth option was performed to calculate the amount of flow going down Arville St.

new section # is $63.682 + \frac{85}{5280} = 63.698$

3) BT input

- left & right ends of road are limits of effective flow on latest map.
- elevation of road @ culvert = 2221.24 + 8.13 = 2229.37

use 2229.4

(8.13 = 8' 1 1/2" on culvert design plan)

SPLIT FLOW BEING PERFORMED

SF

TN Split flow: modelling discharge down Arville Street
NS 4 63.682 63.698 63.411 0.020 0.01
NG 0 2228.5 0.01 2228.0 70 2228.0 70.01 2228.5

```
T1   CCRFCD  TROPICANA WASH F.I.S.;   RDD33832
T2   Central, North and South Tropicana Wash, Detailed Methods
T3      UPRR-NSC.hc2            Special culvert + normal depth split flow

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                                       0         0              2213.6         0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    -1        0         -1        0         0         0         0         0         0         15


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1         43         8         55         26         56         13         14         15
      4         53        54         100       150

QT        1       4100

NC      .04       .042       .045       0.1        0.3
X1   63.411         18      9951.2    10044.5         0          0          0
X3       10

Starting W.S.El. obtained by routing discharge at UPRR through the culvert
ing the F.H.W.A. culvert analysis program HY-8

X5        1     2213.6
GR   2214.0     9546.2    2213.9     9626.7    2209.1     9748.7    2209.6     9817.4    2215.0     9908.6
GR   2212.7     9951.2    2203.9     9979.5    2203.5    10000.0    2210.7    10044.5    2213.8    10091.7
GR   2213.3    10276.9    2214.5    10426.3    2218.3    10564.6    2219.6    10700.4    2217.2    10792.7
GR   2220.5    10815.9    2225.3    10878.1    2221.3    10933.9

  Sections 63.585 and 63.682 were modified (NC and GR) to reflect proposed
  channel grading


NH        3       .04      9808.8       .025     10169.9       .042    10777.7

X1   63.585         23      9983.3    10020.2         930         910         920
X3       10
GR   2224.4     9308.5    2222.9     9588.5    2223.4     9689.2    2220.0     9778.8    2221.5     9808.8
GR   2218.0     9983.3    2215.2     9995.0    2215.2    10000.0    2215.2    10005.0    2217.7    10006.8
GR   2219.2    10020.2    2216.9    10076.8    2222.3    10169.9    2221.7    10271.4    2223.8    10349.4
GR   2220.7    10418.6    2226.7    10488.0    2221.4    10584.4    2220.8    10653.8    2222.7    10683.3
GR   2220.3    10711.0    2226.5    10745.2    2228.5    10777.7

  Following NC was put in for the culvert.
```

```
NC                                    .3        .5

NH       3       .055      9867.1      .025     10110.5       .055     11967.9

  Following left encroachment reflects 4:1 expansion

X1    63.682         32      9969.6   10035.4       450        500        510
X3        10                            9850
GR    2228.1     9295.9     2227.5    9457.7    2226.2     9525.5     2226.2     9751.0     2226.8     9867.1
GR    2225.8     9969.6     2220.9    9985.0    2220.9    10000.0     2220.9    10015.0     2226.0    10035.4
GR    2224.7    10098.1     2228.5   10110.5    2227.2    10291.8     2229.3    10302.0     2230.5    10337.7
GR    2230.8    10503.5     2232.9   10543.4    2233.9    10627.0     2229.4    10659.3     2229.4    10680.7
GR    2232.2    10816.2     2230.8   10991.8    2233.4    11047.6     2230.7    11135.0     2229.2    11211.7
GR    2230.3    11276.3     2228.5   11364.1    2229.1    11488.7     2229.4    11688.6     2231.0    11903.4
GR    2238.4    11949.5     2238.4   11967.9

SC     3.012          .3        2.63         0          6         10         85       10.2    2221.24     2220.9

X1    63.698                                             85         85         85                 0.34
X2                                  2
X3        10                            9850
BT         3     9867.1     2228.0                10000     2229.4                10337.7     2231.0

NC       .04        .055       .028         .3         .5

  Following station is 63.801 but is abbreviated to allow room for "-" sign for
  beginning the North Tropicana Wash tributary run
   -this section is at the confluence of the North and Central Tropicana Washes
X1     63.80         40      9894.9   10084.1       535        505        545
X3        10
GR    2241.3     8720.4     2242.1    8792.8    2241.0     8856.0     2239.5     9037.7     2238.5     9235.5
GR    2238.4     9411.5     2239.9    9475.0    2240.4     9584.1     2239.8     9646.2     2236.9     9727.9
GR    2233.1     9753.9     2233.1    9894.9    2231.5     9961.4     2229.1     9981.7     2228.4    10000.0
GR    2228.4    10015.1     2235.3   10052.4    2236.5    10084.1     2235.9    10096.0     2233.5    10123.2
GR    2232.8    10282.1     2231.7   10338.1    2232.1    10410.7     2235.1    10452.6     2235.0    10491.8
GR    2238.9    10541.6     2236.9   10911.1    2235.7    11107.0     2236.8    11165.7     2237.7    11327.0
GR    2237.8    11546.0     2237.0   11641.3    2239.6    11707.5     2238.8    11785.8     2236.6    11837.8
GR    2235.0    11877.1     2238.8   11896.1    2239.8    12139.6     2240.0    12429.9     2241.0    12442.3
```

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

*PROF 1

CCHV= 0.100 CEHV= 0.300
*SECNO 63.411
WATER EL=X5 CARD= 2213.600

3265 DIVIDED FLOW

63.411	10.10	2213.60	0.00	2213.60	2213.76	0.16	0.00	0.00	2212.70
4100.0	1648.2	2354.7	97.1	691.9	642.2	86.3	0.0	0.0	2210.70
0.00	2.38	3.67	1.12	0.040	0.045	0.042	0.000	2203.50	9634.32
0.000967	0.	0.	0.	0	0	0	0.00	553.26	10314.26

FLOW DISTRIBUTION FOR SECNO= 63.41 CWSEL= 2213.60

STA=	9634.	9749.	9817.	9885.	9951.	10045.	10089.	10277.	10314.
[redacted]Q=	12.4	21.6	6.0	0.1	57.4	2.2	0.1	0.0	
[redacted]EA=	257.4	292.0	135.1	7.5	642.2	64.0	16.7	5.6	
VEL=	2.0	3.0	1.8	0.7	3.7	1.4	0.3	0.3	
DEPTH=	2.3	4.3	2.0	0.1	6.9	1.5	0.1	0.2	

1490 NH CARD USED
*SECNO 63.585

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

63.585	5.11	2220.31	2220.31	0.00	2221.19	0.88	1.61	0.22	2218.00
3377.3	628.7	1193.6	1555.0	135.2	126.4	228.1	20.2	8.8	2219.20
0.03	4.65	9.45	6.82	0.025	0.025	0.025	0.000	2215.20	9770.63
0.005193	930.	920.	910.	20	8	0	0.00	281.98	10711.05

FLOW DISTRIBUTION FOR SECNO= 63.58 CWSEL= 2220.31

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

STA=	9771.	9779.	9785.	9983.	10020.	10077.	10136.
PER Q=	0.0	0.0	18.6	35.3	27.9	18.1	
AREA=	1.3	1.0	133.0	126.4	127.9	100.2	
VEL=	0.8	0.8	4.7	9.4	7.4	6.1	
DEPTH=	0.2	0.2	0.7	3.4	2.3	1.7	

CCHV= 0.300 CEHV= 0.500
1490 NH CARD USED
*SECNO 63.682
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9850.0 11967.9 TYPE= 1 TARGET= -9850.000

63.682	6.02	2226.92	2226.92	0.00	2228.00	1.08	1.95	0.10	2225.80
3377.3	152.3	2762.1	463.0	66.2	306.3	106.4	25.7	11.8	2226.00
0.05	2.30	9.02	4.35	0.025	0.025	0.025	0.000	2220.90	9850.00
0.003044	450.	510.	500.	20	11	0	0.00	255.34	10105.34

[redacted]ISTRIBUTION FOR SECNO= 63.68 CWSEL= 2226.92

STA=	9850.	9867.	9970.	10035.	10098.	10105.
PER Q=	0.0	4.5	81.8	12.9	0.8	
AREA=	2.8	63.4	306.3	98.4	8.0	
VEL=	0.4	2.4	9.0	4.4	3.4	
DEPTH=	0.2	0.6	4.7	1.6	1.1	

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	3	0.012	0.30	2.63	0.00	6.00	10.00	85.00	10	2	2221.24	2220.90

CHART 10 - BOX CULVERT; 90-DEGREE HEADWALL; CHAMFERED OR BEVELED INLET EDGES
SCALE 2 - INLET EDGES BEVELED 1/2-IN/FT AT 45 DEGREES (1:1)

5130, EGIC= 2237.20..MAY BE TOO LARGE IF INLET CONTROLS.
*SECNO 63.698

SPECIAL CULVERT INLET CONTROL + WEIR FLOW, EG = 2231.00

3265 DIVIDED FLOW

[redacted]HV CHANGED MORE THAN HVINS

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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.31

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
2237.20	2234.87	3.01	1856.	2238.	3.038	180.0	2228.00	471.

3470 ENCROACHMENT STATIONS= 9850.0 11967.9 TYPE= 1 TARGET= -9850.000

63.698	9.69	2230.93	0.00	0.00	2231.00	0.07	3.01	0.00	2226.14
4100.0	917.5	1663.9	1518.6	504.9	547.7	1781.2	29.0	13.3	2226.34
0.06	1.82	3.04	0.85	0.027	0.025	0.039	0.000	2221.24	9850.00
0.000159	85.	85.	85.	2	0	0	0.00	1330.45	11847.98

FLOW DISTRIBUTION FOR SECNO= 63.70 CWSEL= 2230.93

	9850.	9970.	10035.	10098.	10292.	11489.	11848.
Q=	22.4	40.6	18.1	10.3	5.4	3.3	
AREA=	504.9	547.7	328.4	545.7	545.2	361.9	
VEL=	1.8	3.0	2.3	0.8	0.4	0.4	
DEPTH=	4.2	8.3	5.2	2.8	0.5	1.0	

CCHV= 0.300 CEHV= 0.500
*SECNO 63.800

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2233.10 ELREA= 2236.50

63.800	5.56	2233.96	2233.96	0.00	2234.99	1.03	0.25	0.48	2233.10
4100.0	319.0	3781.0	0.0	124.0	447.8	0.0	49.4	23.0	2236.50
0.08	2.57	8.44	0.00	0.040	0.028	0.000	0.000	2228.40	9748.00
0.005938	535.	545.	505.	20	11	0	0.00	297.16	10045.17

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

FLOW DISTRIBUTION FOR SECNO= 63.80 CWSEL= 2233.96

STA=	9748.	9754.	9895.	10084.
PER Q=	0.1	7.7	92.2	
AREA=	2.5	121.5	447.8	
VEL=	1.6	2.6	8.4	
DEPTH=	0.4	0.9	3.0	

In Split flow: modelling discharge down Arville Street

TOTAL AREA	AVG VELOCITY	MAX DEPTH	AVG DEPTH	TOF WIDTH	TOP WIDTH
74.8	9.57	2.93	1.46	70.0	51.1

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
722.65	716.41	0.87	722.65	716.41	0.87	5	2226.919	2230.927	63.682	63.698

THIS RUN EXECUTED 23AUG93 14:38:23

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

UPRR-NSC.hc2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	63.411	2213.60	4100.00	10.10	2.38	3.67	1.12	1648.20	2354.73	97.06	553.26	9634.32	10314.26
*	63.585	2220.31	3377.35	5.11	4.65	9.45	6.82	628.72	1193.62	1555.01	281.98	9770.63	10711.05
*	63.682	2226.92	3377.35	6.02	2.30	9.02	4.35	152.32	2762.06	462.97	255.34	9850.00	10105.34
*	63.698	2230.93	4100.00	9.69	1.82	3.04	0.85	917.53	1663.85	1518.62	1330.45	9850.00	11847.98
*	63.800	2233.96	4100.00	5.56	2.57	8.44	0.00	319.00	3780.99	0.00	297.16	9748.00	10045.17

ISC.hc2

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG

[redacted]ISC.hc2

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	63.411	0.00	0.00	0.00	2203.50	4100.00	2213.60	0.00	2213.76	9.67	3.67	1420.46	1318.19
*	63.585	920.00	0.00	0.00	2215.20	3377.35	2220.31	2220.31	2221.19	51.93	9.45	489.74	468.69
*	63.682	510.00	0.00	0.00	2220.90	3377.35	2226.92	2226.92	2228.00	30.44	9.02	478.94	612.11
*	63.698	85.00	2228.00	0.00	2221.24	4100.00	2230.93	0.00	2231.00	1.59	3.04	2833.81	3249.24
*	63.800	545.00	0.00	0.00	2228.40	4100.00	2233.96	2233.96	2234.99	59.38	8.44	571.81	532.06

[redacted]SC.hc2

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	63.411	4100.00	2213.60	0.00	0.00	0.00	553.26	0.00
*	63.585	3377.35	2220.31	0.00	6.71	0.00	281.98	920.00
*	63.682	3377.35	2226.92	0.00	6.61	0.00	255.34	510.00
*	63.698	4100.00	2230.93	0.00	4.01	0.00	1330.45	85.00
*	63.800	4100.00	2233.96	0.00	3.03	0.00	297.16	545.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
NOTE    SECNO=     63.411  PROFILE=  1  WSEL BASED ON X5 CARD

CAUTION SECNO=     63.585  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     63.585  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     63.585  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     63.682  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     63.682  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     63.682  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     63.698  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     63.800  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     63.800  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     63.800  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
```

CH2M HILL

SUBJECT: Tropicana Wash
Arville Street Proposed Box Culvert
Split flow using Weir Flow

BY: HMA DATE: 8/23/93
SHEET NO. 33 OF 49
PROJECT NO.: RDD33832

GOAL: To model the proposed culvert under Arville St. using the Special Culvert routine in conjunction with a **weir-flow** option split flow down Arville Street.

PROCEDURE:
(details follow)

1) Copy section 63.682 (downstream of Arville) and put the duplicate (section 63.698) in just upstream of Arville into edited HEC-2 file (filename = UPRR-WSF.hc2).
2) Input split flow weir between the two above sections.
3) Put in the Special Culvert between sections 63.682 and 63.698.
 - culvert information found in HY-8 analysis.
4) put in BT records to define Arville St. at 63.698.

RESULTS:

(Q down Arville = 281 cfs.)
Q in channel downstream from Arville St. = 3819 cfs.
Natural Q100 W.S.EL. at Arville St. = 2230.90

These results were put into HEC-2 runs: UPRR-NAT.hc2 and CTW-ENC.hc2.

SUBJECT Tropicana Wash
Arville Bc. : Special Culvert
± Weir split flow

BY HMA DATE 8/23/93
SHEET NO. 34 OF 49
PROJECT NO. EOD33332

Procedure details

1) weir for split flow

(0, 2228.0) ——————— (70, 2228.0)

C coefficient = 2.63

2) SC input
- see normal depth split flow analysis

3) BT input
- see normal depth split flow analysis

HEC2 S/N: 1916530021 HMVersion: 6.50 Data File: uprr-wsf.hc2

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**********************************************
*  C-2 WATER SURFACE PROFILES                *
*                                            *
*  Version   4.6.2;  May 1991                *
*                                            *
*  RUN DATE    23AUG93    TIME    14:53:13   *
**********************************************
```


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


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

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

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

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

THIS RUN EXECUTED 23AUG93 14:53:13

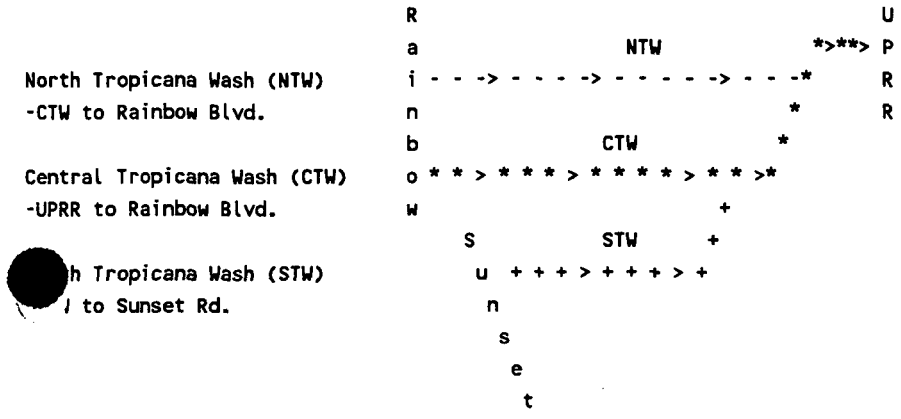
****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

TROPICANA WASH FLOOD INSURANCE STUDY

by CH2M Hill, 1992 RDD33832

Schematic:



Notes:

-discharges were based on those in the "Las Vegas Valley Flood Insurance Study Hydrology Report" by James M. Montgomery, Inc., September, 1991 (see CH2M Hill memo dated July 13, 1992)

-Manning's "n" values were estimated by field observations of channels and floodplains in conjunction with methods recommended in "Open Channel Hydraulics" by Chow, 1959

-stations and elevations obtained from 400 scale topo created by CH2M Hill from aerial photographs

At section 63.682 a box culvert is proposed to go in under Arville St. with channel regrading upstream and downstream of the culvert. The GR input at sections 63.585 and 63.682 were modified to reflect the regrading and the channel "n" value was reduced to 0.025 at these sections. The discharge was routed through the culvert using the Special Culvert routine. Also, a weir-option split flow was performed to calculate the amount of going down Arville St.

SPLIT FLOW BEING PERFORMED

SF

TW

WS	2	63.682	63.698	63.411	2.63
WC	0	2228	70	2228	

```
T1   CCRFCD  TROPICANA WASH F.I.S.;   RDD33832
T2   Central, North and South Tropicana Wash, Detailed Methods
T3      UPRR-WSF.HC2            Special culvert + weir split flow option

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                                       0         0              2213.6         0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1         0        -1         0         0         0         0         0         0         15


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         1        43         8        55        26        56        13        14        15
      4        53        54       100       150

QT        1       4100

NC      .04      .042      .045       0.1       0.3
X1   63.411        18    9951.2   10044.5         0         0         0
X3       10

tarting W.S.El. obtained by routing discharge at UPRR through the culvert
ıg the F.H.W.A. culvert analysis program HY-8

X5        1    2213.6
GR   2214.0    9546.2    2213.9    9626.7    2209.1    9748.7    2209.6    9817.4    2215.0    9908.6
GR   2212.7    9951.2    2203.9    9979.5    2203.5   10000.0    2210.7   10044.5    2213.8   10091.7
GR   2213.3   10276.9    2214.5   10426.3    2218.3   10564.6    2219.6   10700.4    2217.2   10792.7
GR   2220.5   10815.9    2225.3   10878.1    2221.3   10933.9

  Sections 63.585 and 63.682 were modified (NC and GR) to reflect proposed
  channel grading


NH        3      .04    9808.8      .025   10169.9      .042   10777.7

X1   63.585        23    9983.3   10020.2       930       910       920
X3       10
GR   2224.4    9308.5    2222.9    9588.5    2223.4    9689.2    2220.0    9778.8    2221.5    9808.8
GR   2218.0    9983.3    2215.2    9995.0    2215.2   10000.0    2215.2   10005.0    2217.7   10006.8
GR   2219.2   10020.2    2216.9   10076.8    2222.3   10169.9    2221.7   10271.4    2223.8   10349.4
GR   2220.7   10418.6    2226.7   10488.0    2221.4   10584.4    2220.8   10653.8    2222.7   10683.3
GR   2220.3   10711.0    2226.5   10745.2    2228.5   10777.7

  Following NC was put in for the culvert.
```

NC				.3	.5					
NH	3	.055	9867.1	.025	10110.5	.055	10627.0			

Following left encroachment reflects 4:1 expansion

X1	63.682	18	9969.6	10035.4	450	500	510			
X3	10			9850						
GR	2228.1	9295.9	2227.5	9457.7	2226.2	9525.5	2226.2	9751.0	2226.8	9867.1
GR	2225.8	9969.6	2220.9	9985.0	2220.9	10000.0	2220.9	10015.0	2226.0	10035.4
GR	2224.7	10098.1	2228.5	10110.5	2227.2	10291.8	2229.3	10302.0	2230.5	10337.7
GR	2230.8	10503.5	2232.9	10543.4	2233.9	10627.0				
SC	3.012	.3	2.63	0	6	10	85	10.2	2221.24	2220.9
X1	63.698				85	85	85		0.34	
X2			2							
X3	10			9850						
BT	3	9867.1	2228.0		10000	2229.4		10337.7	2231.0	
NC	.04	.055	.028	.3	.5					

lowing station is 63.801 but is abbreviated to allow room for "-" sign for
inning the North Tropicana Wash tributary run
-this section is at the confluence of the North and Central Tropicana Washes

X1	63.80	40	9894.9	10084.1	535	505	545			
X3	10									
GR	2241.3	8720.4	2242.1	8792.8	2241.0	8856.0	2239.5	9037.7	2238.5	9235.5
GR	2238.4	9411.5	2239.9	9475.0	2240.4	9584.1	2239.8	9646.2	2236.9	9727.9
GR	2233.1	9753.9	2233.1	9894.9	2231.5	9961.4	2229.1	9981.7	2228.4	10000.0
GR	2228.4	10015.1	2235.3	10052.4	2236.5	10084.1	2235.9	10096.0	2233.5	10123.2
GR	2232.8	10282.1	2231.7	10338.1	2232.1	10410.7	2235.1	10452.6	2235.0	10491.8
GR	2238.9	10541.6	2236.9	10911.1	2235.7	11107.0	2236.8	11165.7	2237.7	11327.0
GR	2237.8	11546.0	2237.0	11641.3	2239.6	11707.5	2238.8	11785.8	2236.6	11837.8
GR	2235.0	11877.1	2238.8	11896.1	2239.8	12139.6	2240.0	12429.9	2241.0	12442.3

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

*PROF 1

CCHV= 0.100 CEHV= 0.300
*SECNO 63.411
WATER EL=X5 CARD= 2213.600

3265 DIVIDED FLOW

63.411	10.10	2213.60	0.00	2213.60	2213.76	0.16	0.00	0.00	2212.70
4100.0	1648.2	2354.7	97.1	691.9	642.2	86.3	0.0	0.0	2210.70
0.00	2.38	3.67	1.12	0.040	0.045	0.042	0.000	2203.50	9634.32
0.000967	0.	0.	0.	0	0	0	0.00	553.26	10314.26

FLOW DISTRIBUTION FOR SECNO= 63.41 CWSEL= 2213.60

STA=	9634.	9749.	9817.	9885.	9951.	10045.	10089.	10277.	10314.
[redacted]Q=	12.4	21.6	6.0	0.1	57.4	2.2	0.1	0.0	
[redacted]A=	257.4	292.0	135.1	7.5	642.2	64.0	16.7	5.6	
VEL=	2.0	3.0	1.8	0.7	3.7	1.4	0.3	0.3	
DEPTH=	2.3	4.3	2.0	0.1	6.9	1.5	0.1	0.2	

1490 NH CARD USED
*SECNO 63.585

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

63.585	5.24	2220.44	2220.44	0.00	2221.42	0.98	1.72	0.25	2218.00
3819.0	751.1	1306.9	1761.0	152.9	131.2	243.5	20.6	9.0	2219.20
0.03	4.91	9.96	7.23	0.025	0.025	0.025	0.000	2215.20	9767.21
0.005497	930.	920.	910.	20	11	0	0.00	298.96	10711.77

FLOW DISTRIBUTION FOR SECNO= 63.58 CWSEL= 2220.44

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

STA=	9767.	9779.	9788.	9983.	10020.	10077.	10138.	10712.
PER Q=	0.1	0.1	19.6	34.2	27.9	18.2	0.0	
AREA=	2.6	1.9	148.4	131.2	135.3	108.0	0.2	
VEL=	1.0	1.0	5.0	10.0	7.9	6.4	0.3	
DEPTH=	0.2	0.2	0.8	3.6	2.4	1.8	0.0	

CCHV= 0.300 CEHV= 0.500
1490 NH CARD USED
*SECNO 63.682
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9850.0 10627.0 TYPE= 1 TARGET= -9850.000

63.682	6.24	2227.14	2227.14	0.00	2228.25	1.11	1.99	0.07	2225.80
3819.0	257.7	2982.5	578.7	93.1	321.1	122.2	26.6	12.1	2226.00
0.05	2.77	9.29	4.74	0.026	0.025	0.025	0.000	2220.90	9850.00
0.003034	450.	510.	500.	20	11	0	0.00	256.07	10106.07

FLOW DISTRIBUTION FOR SECNO= 63.68 CWSEL= 2227.14

STA=	9850.	9867.	9970.	10035.	10098.	10106.
PER Q=	0.1	6.6	78.1	14.2	0.9	
AREA=	6.6	86.4	321.1	112.4	9.7	
VEL=	0.8	2.9	9.3	4.8	3.6	
DEPTH=	0.4	0.8	4.9	1.8	1.2	

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	3	0.012	0.30	2.63	0.00	6.00	10.00	85.00	10	2	2221.24	2220.90

CHART 10 - BOX CULVERT; 90-DEGREE HEADWALL; CHAMFERED OR BEVELED INLET EDGES
SCALE 2 - INLET EDGES BEVELED 1/2-IN/FT AT 45 DEGREES (1:1)

5130, EGIC= 2240.28..MAY BE TOO LARGE IF INLET CONTROLS.
5135, EGOC= 2237.31 ..MAY BE TOO LARGE IF OUTLET CONTROLS.
*SECNO 63.698

SPECIAL CULVERT INLET CONTROL + WEIR FLOW, EG = 2231.00

3301 HV CHANGED MORE THAN HVINS

3* WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.27

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

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
2240.28	2237.31	2.75	1860.	2238.	3.327	180.0	2228.00	471.

3470 ENCROACHMENT STATIONS= 9850.0 10627.0 TYPE= 1 TARGET= -9850.000

63.698	9.66	2230.90	0.00	0.00	2231.00	0.10	2.75	0.00	2226.14
4100.0	997.0	1816.7	1286.4	501.9	546.0	915.8	29.1	12.8	2226.34
0.06	1.99	3.33	1.40	0.027	0.025	0.034	0.000	2221.24	9850.00
0.000192	85.	85.	85.	2	0	0	0.00	521.83	10371.83

FLOW DISTRIBUTION FOR SECNO= 63.70 CWSEL= 2230.90

STA=	9850.	9867.	9970.	10035.	10098.	10111.	10292.	10302.	10338.	10372.
PER Q=	1.3	23.1	44.3	19.7	2.4	8.7	0.4	0.2	0.0	
AREA=	65.1	436.8	546.0	326.8	49.1	491.6	23.6	23.6	1.1	
VEL=	0.8	2.2	3.3	2.5	2.0	0.7	0.6	0.3	0.0	
DEPTH=	3.8	4.3	8.3	5.2	4.0	2.7	2.3	0.7	0.0	

CCHV= 0.300 CEHV= 0.500
*SECNO 63.800

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2233.10 ELREA= 2236.50

63.800	5.56	2233.96	2233.96	0.00	2234.99	1.03	0.30	0.46	2233.10
4100.0	319.3	3780.7	0.0	124.1	447.9	0.0	44.5	17.8	2236.50
0.08	2.57	8.44	0.00	0.040	0.028	0.000	0.000	2228.40	9748.00
0.005933	535.	545.	505.	20	11	0	0.00	297.17	10045.17

FLOW DISTRIBUTION FOR SECNO= 63.80 CWSEL= 2233.96

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

STA=	9748.	9754.	9895.	10084.
PER Q=	0.1	7.7	92.2	
AREA=	2.5	121.6	447.9	
VEL=	1.6	2.6	8.4	
DEPTH=	0.4	0.9	3.0	

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
281.00	281.03	0.01	281.00	281.03	0.01	5	2227.143	2230.902	63.682	63.698

THIS RUN EXECUTED 23AUG93 14:54:05

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

UPRR-WSF.HC2

SUMMARY PRINTOUT

	SECNO	CWSEL	Q	DEPTH	VLOB	VCH	VROB	QLOB	QCH	QROB	TOPWID	SSTA	ENDST
*	63.411	2213.60	4100.00	10.10	2.38	3.67	1.12	1648.20	2354.73	97.06	553.26	9634.32	10314.26
*	63.585	2220.44	3819.00	5.24	4.91	9.96	7.23	751.13	1306.86	1761.01	298.96	9767.21	10711.77
*	63.682	2227.14	3819.00	6.24	2.77	9.29	4.74	257.74	2982.53	578.73	256.07	9850.00	10106.07
*	63.698	2230.90	4100.00	9.66	1.99	3.33	1.40	996.96	1816.66	1286.38	521.83	9850.00	10371.83
*	63.800	2233.96	4100.00	5.56	2.57	8.44	0.00	319.31	3780.69	0.00	297.17	9748.00	10045.17

ISF.HC2

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG

WSF.HC2

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	63.411	0.00	0.00	0.00	2203.50	4100.00	2213.60	0.00	2213.76	9.67	3.67	1420.46	1318.19
*	63.585	920.00	0.00	0.00	2215.20	3819.00	2220.44	2220.44	2221.42	54.97	9.96	527.54	515.10
*	63.682	510.00	0.00	0.00	2220.90	3819.00	2227.14	2227.14	2228.25	30.34	9.29	536.31	693.31
*	63.698	85.00	2228.00	0.00	2221.24	4100.00	2230.90	0.00	2231.00	1.92	3.33	1963.72	2960.83
*	63.800	545.00	0.00	0.00	2228.40	4100.00	2233.96	2233.96	2234.99	59.33	8.44	572.03	532.31

WSF.HC2

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	63.411	4100.00	2213.60	0.00	0.00	0.00	553.26	0.00
*	63.585	3819.00	2220.44	0.00	6.84	0.00	298.96	920.00
*	63.682	3819.00	2227.14	0.00	6.70	0.00	256.07	510.00
*	63.698	4100.00	2230.90	0.00	3.76	0.00	521.83	85.00
*	63.800	4100.00	2233.96	0.00	3.06	0.00	297.17	545.00

SUMMARY OF ERRORS AND SPECIAL NOTES

NOTE SECNO= 63.411 PROFILE= 1 WSEL BASED ON X5 CARD

CAUTION SECNO= 63.585 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 63.585 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 63.585 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 63.682 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 63.682 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 63.682 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 63.698 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 63.800 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 63.800 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 63.800 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

Clark County Regional
Flood Control District

FLOOD INSURANCE STUDY
RESTUDY
TROPICANA WASH AND TRIBUTARIES

Technical Support Data Notebook

Volume 3 of 3
Sections 7 through 10

CH2M HILL

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2	SECTION 2 CONTACT REPORTS (TELEPHONE CONVERSATION) (Volume 1)
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9	SECTION 9 MAPPING INFORMATION (Volume 3)
10	SECTION 10 MISCELLANEOUS REFERENCE MATERIALS (Volume 3)

Technical Support Data Notebook

For

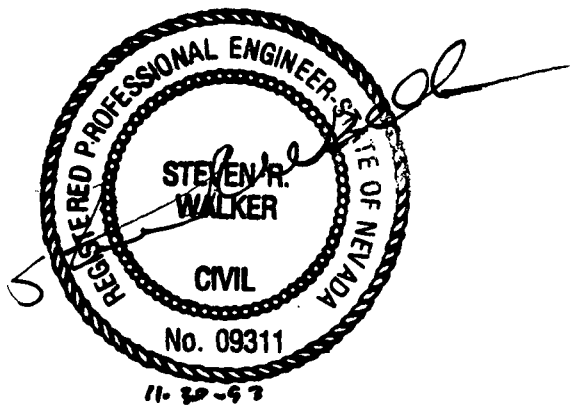
FLOOD INSURANCE STUDY

RESTUDY

TROPICANA WASH AND TRIBUTARIES

Clark County, Nevada
(Unincorporated Areas)

VOLUME III OF III



Submitted by:	Clark County Regional Flood Control District
Study Contractor:	CH2M HILL
Date Submitted:	January 20, 1993

SECTION 7

KEY TO CROSS-SECTION

(xs) LABELING

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: _____
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME _____
STATE _____
FEMA CID NO. _____

STREAM NAME _____
RUN DATE _____

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
TROPICANA WASH - MAIN BRANCH (cont'd)				
60.492	O	60.492		
60.587	P	60.587		
60.667	Q	60.667		
60.705	R	60.705		
60.800	S	60.800		
60.867	T	60.867		
60.887	U	60.887		
60.903	V	60.903		
60.912	W	60.912		
60.936	X	60.936		
60.992	Y	60.992		
61.034	Z	61.034		
61.072	AA	61.072		
61.079	AB	61.079		

Sheet 5/5 4/5

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: _____
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME _____
STATE _____
FEMA CID NO. _____

STREAM NAME _____
RUN DATE _____

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
TROPICANA WASH — MAIN BRANCH				
00.000	A	00.000		
00.066	B	00.066		
00.083	C	00.083		
00.110	D	00.1100		
60.000	E	60.000		
60.080	F	60.080		
60.135	G	60.135		
60.171	H	60.171		
60.219	I	60.219		
60.276	J	60.276		
60.301	K	60.301		
60.345	L	60.345		
60.397	M	60.397		
60.446	N	60.446		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: _____
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME _____
STATE _____
FEMA CID NO. _____

STREAM NAME _____
RUN DATE _____

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
TROPICANA WASH - MAIN BRANCH			(cont'd)	
61.093	AC	61.093		
61.116	AD	61.116		
61.141	AE	61.141		
61.164	AF	61.164		
61.235	AG	61.235		
61.339	AH	61.339		
61.390	AI	61.390		
62.566	AJ	62.566		
62.668	AK	62.668		
62.763	AL	62.763		
62.859	AM	62.859		
62.906	AN	62.906		
62.937	AO	62.937		
62.967	AP	62.967		

Sheet 4/5
3/5

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: _____
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME _____
STATE _____
FEMA CID NO. _____

STREAM NAME _____
RUN DATE _____

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
TROPICANA WASH - MAIN BRANCH (CENTRAL)				
63.061	AQ	63.061		
63.157	AR	63.157		
63.260	AS	63.260		
63.353	AT	63.353		
63.411	AU	63.411		
63.585	AV	63.585		
63.682	AW	63.682		
63.801	AX	63.801		
63.866	AY	63.866		
63.883	AZ	63.883		
63.907	BA	63.907		
63.945	BB	63.945		
63.979	BC	63.979		
64.084	BD	64.084		

Select 3/5

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: _____
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME _____
STATE _____
FEMA CID NO. _____

STREAM NAME _____
RUN DATE _____

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
TROPICANA WASH - CENTRAL BRANCH				
64,113	BE	64,113		
64,137	BF	64,137		
64,179	BG	64,179		
64,366	BH	64,366		
64,461	BI	64,461		
64,562	BJ	64,562		
64,677	BK	64,677		
64,789	BL	64,789		
64,889	BM	64,889		
64,989	BN	64,989		
65,089	BO	65,089		
65,175	BP	65,175		
65,276	BQ	65,276		
65,381	BR	65,381		

Sheet 2/5

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: _____
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME _____
STATE _____
FEMA CID NO. _____

STREAM NAME _____
RUN DATE _____

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
TROPICANA WASH - CENTRAL BRANCH				
65.483	BS	65.483		
65.573	BT	65.573		
65.671	BU	65.671		
65.771	BV	65.771		
65.871	BW	65.871		
65.972	BX	65.972		
66.073	BY	66.073		
66.181	BZ	66.181		
66.276	CA	66.276		
66.369	CB	66.369		
66.470	CC	66.470		
66.567	CD	66.567		
66.662	CE	66.662		
66.766	CF	66.766		
66.866	CG	66.866		
66.974	CH	66.974		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: _____
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME _____
STATE _____
FEMA CID NO. _____

STREAM NAME _____
RUN DATE _____

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
TROPICANA WASH - NORTH BRANCH				
90.093	A	90.093		
90.188	B	90.188		
90.203	C	90.203		
90.215	D	90.215		
90.284	E	90.284		
90.381	F	90.381		
90.476	G	90.476		
90.570	H	90.570		
90.667	I	90.667		
90.760	J	90.760		
90.840	K	90.840		
90.863	L	90.863		
90.886	M	90.886		
90.953	N	90.953		

Sheet 3/5 2/5

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: _____
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME _____
STATE _____
FEMA CID NO. _____

STREAM NAME _____
RUN DATE _____

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
TROPICANA WASH - NORTH BRANCH				
91.046	O	91.046		
91.135	P	91.135		
91.235	Q	91.235		
91.337	R	91.337		
91.434	S	91.434		
91.530	T	91.530		
91.630	U	91.630		
91.733	V	91.733		
91.831	W	91.831		
91.926	X	91.926		
92.026	Y	92.026		
92.137	Z	92.137		
92.240	AA	92.240		
92.348	AB	92.348		
92.446	AC	92.446		
92.545	AD	92.545		

Sheet 2/5

1/5

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: _____
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME _____
STATE _____
FEMA CID NO. _____

STREAM NAME _____
RUN DATE _____

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
TROPICANA	WASH - SOUTH BRANCH			
30.093	A	30.093		
30.191	B	30.191		
30.292	C	30.292		
30.393	D	30.393		
30.486	E	30.486		
30.584	F	30.584		
30.676	G	30.676		
30.779	H	30.779		
30.872	I	30.872		
30.967	J	30.967		
31.079	K	31.079		
31.173	L	31.173		
31.272	M	31.272		
31.368	N	31.368		

Sheet 2/5 1/5

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: _____
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME _____
STATE _____
FEMA CID NO. _____

STREAM NAME _____
RUN DATE _____

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
TROPICANA WASH - SOUTH BRANCH				
31.465	O	31.465		
31.565	P	31.565		
31.664	Q	31.664		
31.761	R	31.761		
31.860	S	31.860		
31.963	T	31.963		

Study Contractor: CH2M HILL

HYDRAULIC ANALYSES INDEX

Clark County, Nevada
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

HYDRAULIC ANALYSES INDEX

FLOODING SOURCE/ STREAM NAME	HYDROLOGIC METHOD/ MODEL USED	METHOD/MODEL ANALYSIS DATE	EXHIBIT NO. PAPER COPY	EXHIBIT NO. FLOPPY DISKETTES
TROPICANA WASH				
	MANNINGS "n" TABLE		6-1	
	HEC-2 NATURAL CONDITION FILES		6-2	
	• FLAM-NAT. HC2			6-6
	• I15-2-N. HC2			
	• UPRR-NAT. HC2			
	HEC-2 ENCROACHMENT FILES		6-3	
	• FLAM-ENC. HC2			
	• I15Q2-E1. HC2			
	• CTW-ENC. HC2			
	• NTW-ENC. HC2			
	• STW-ENC. HC2			
	CULVERT RATINGS / SPLIT FLOW ANALYSES		6-4	

SECTION 8

DRAFT FIS REPORT TEXT

FLOOD INSURANCE STUDY

TROPICANA WASH

CLARK COUNTY, NEVADA

JANUARY, 1993
REVISED: SEPTEMBER, 1993

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Table 5 - Floodway Data Table	After Text

EXHIBITS

Flood Profiles	After Text

FLOOD INSURANCE STUDY
TROPICANA WASH
CLARK COUNTY, NEVADA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study includes revised and updated information on the existence and severity of flood hazards for approximately 30 miles of the Tropicana Wash drainage system and 2 to 3 square miles of adjacent sheet flooding zones. The study area is located in unincorporated Clark County, Nevada, (FEMA Community Number 320003) and begins at the confluence of the Flamingo and Tropicana washes extending westward to near the base of the Spring Mountains. The information in this study will be used to update existing floodplain regulations as part of the regular phase of the National Flood Insurance Program (NIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

1.2 Authority and Acknowledgements

The topographic mapping and hydraulic analyses for this study were performed by CH2M HILL for the Clark County Regional Flood Control District (CCRFCD). Ground control and check surveys were performed by Wesco Surveys, Inc. The work was completed in November, 1992.

Discharges for the study reaches examined by detailed methods were derived from the "Las Vegas Valley Flood Insurance Study Hydrology Report, 1991" (FIS Hydrology Report) (Reference 1). For reaches studied by approximate methods, discharges were obtained from area-discharge regression curves prepared by the U.S Army Corps of Engineers (COE) (Reference 2).

1.3 Coordination

The areas of approximate and detailed studies were outlined by the CCRFCD and coordinated with Clark County Public Works (CCPW). The

CCRFCD provided available hydrologic data including guidelines and criteria for using and augmenting the data as required.

On June 10, 1992, representatives of the CCRFCD, CCPW, and CH2M HILL met for the initial coordination meeting to discuss scheduling, study methods, assumptions, and the format of the deliverable items. Throughout the project, coordination meetings were held to discuss progress and preliminary study results. In addition, each of the agencies jointly performed the initial field reconnaissance of the study area. The work has also been coordinated with concurrent studies on the neighboring Duck Creek Hydrologic Unit performed by Michael Baker Jr., Inc. (Reference 3).

Notification of this study and requests for information were sent to the following agencies:

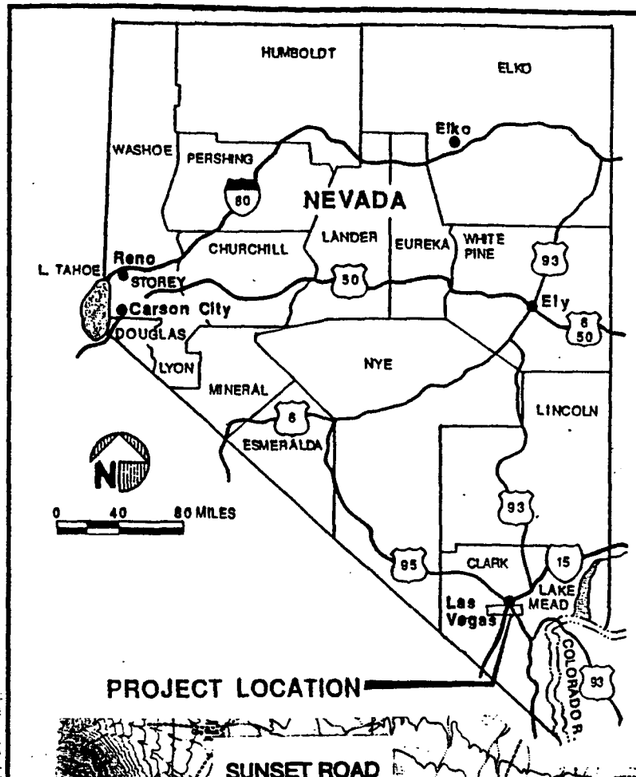
- Clark County Public Works Department
- Clark County Comprehensive Planning
- U.S. Army Corps of Engineers
- Bureau of Land Management
- U.S. Fish and Wildlife Service
- Nevada Department of Wildlife
- U.S. Geological Survey
- U.S. Soil Conservation Service
- McCarran International Airport

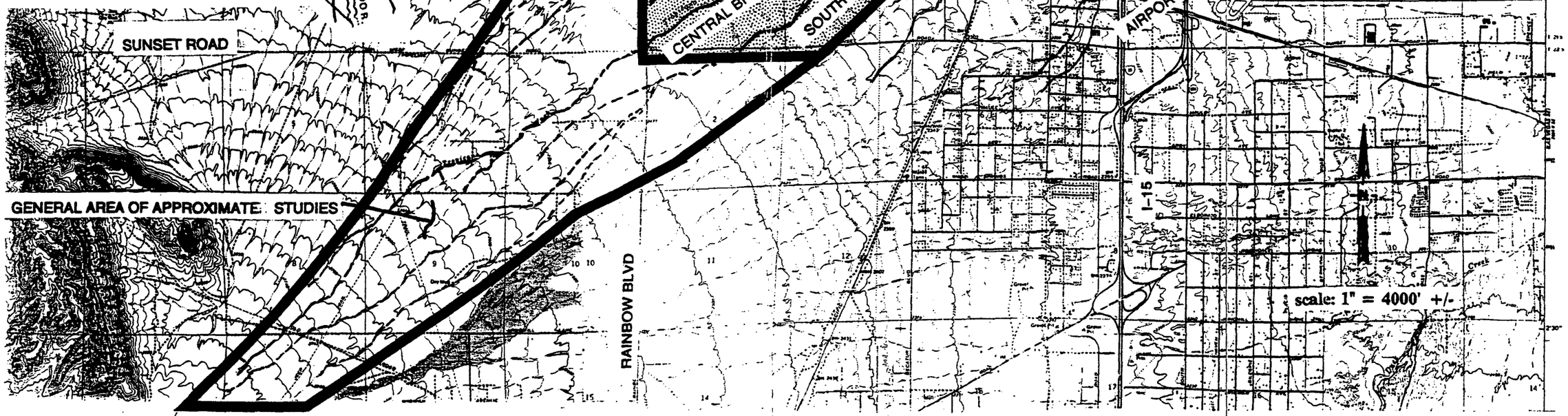
Public notices were also published in the Las Vegas Review Journal and the Las Vegas Sun.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the majority of the Tropicana Wash located in unincorporated Clark County, Nevada. The drainage area begins at the confluence with the Flamingo Wash and extends to the Spring Mountains bordering the valley on the west. The study limits are shown in Figure 1, and include delineation of those areas studied by detailed methods and those studied by approximate methods.





Key

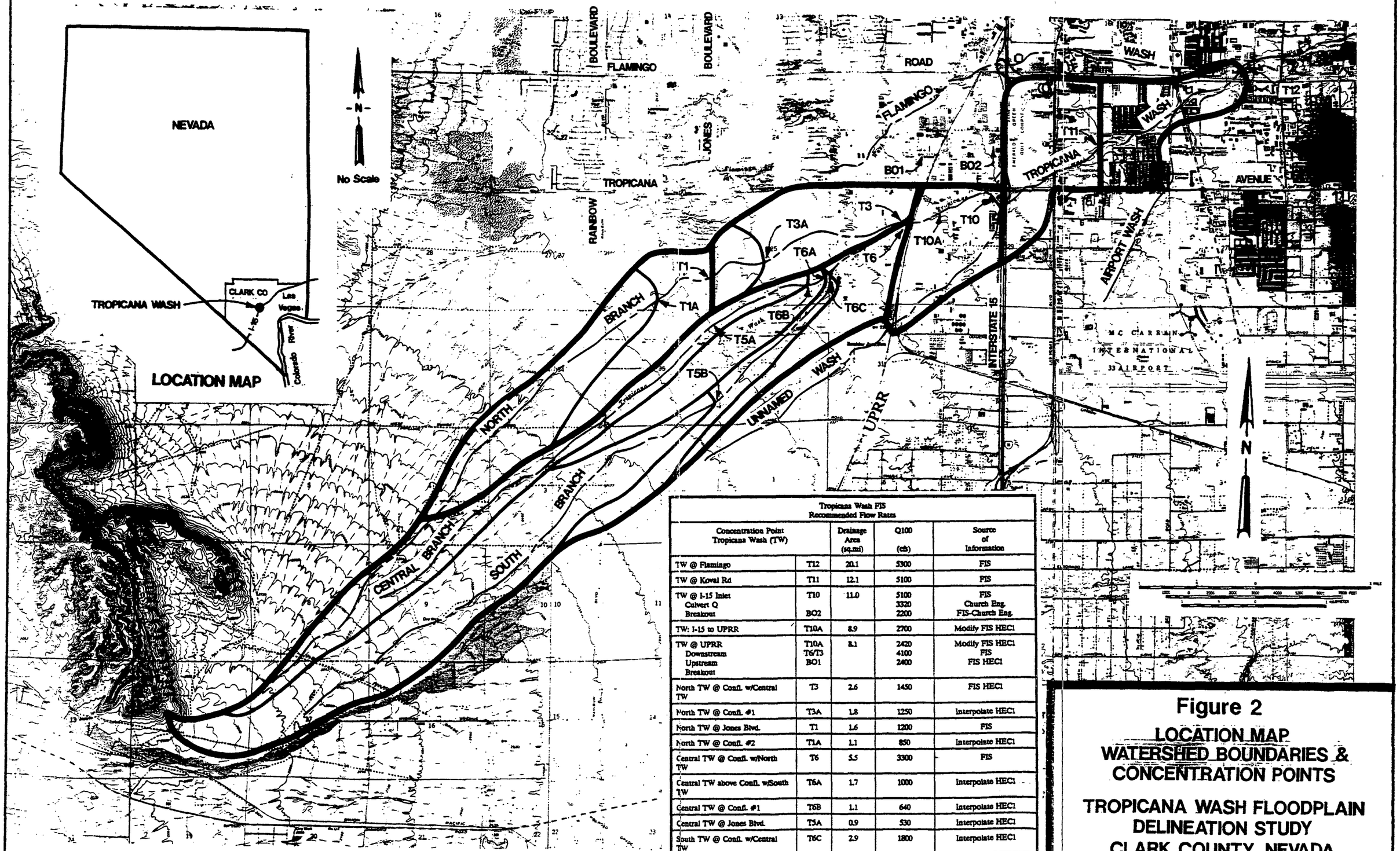
- Reaches studied by detailed methods
- Reaches studied by approximate methods
- Area of new mapping limits.

FIGURE 1

LOCATION MAP AND STUDY LIMITS

FLOOD INSURANCE STUDY FOR TROPICANA WASH
CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

CH2M HILL



Tropicana Wash FIS Recommended Flow Rates				
Concentration Point Tropicana Wash (TW)		Drainage Area (sq.mi)	Q100 (cfs)	Source of Information
TW @ Flamingo	T12	20.1	5300	FIS
TW @ Koval Rd	T11	12.1	5100	FIS
TW @ I-15 Inlet Culvert Q Breakout	T10 BO2	11.0	5100 3320 2200	FIS Church Eng. FIS-Church Eng.
TW: I-15 to UPRR	T10A	8.9	2700	Modify FIS HEC1
TW @ UPRR Downstream Upstream Breakout	T10A T6/T3 BO1	8.1	2420 4100 2400	Modify FIS HEC1 FIS FIS HEC1
North TW @ Confl. w/Central TW	T3	2.6	1450	FIS HEC1
North TW @ Confl. #1	T3A	1.8	1250	Interpolate HEC1
North TW @ Jones Blvd.	T1	1.6	1200	FIS
North TW @ Confl. #2	T1A	1.1	850	Interpolate HEC1
Central TW @ Confl. w/North TW	T6	5.5	3300	FIS
Central TW above Confl. w/South TW	T6A	1.7	1000	Interpolate HEC1
Central TW @ Confl. #1	T6B	1.1	640	Interpolate HEC1
Central TW @ Jones Blvd.	T5A	0.9	530	Interpolate HEC1
South TW @ Confl. w/Central TW	T6C	2.9	1800	Interpolate HEC1
South TW above Jones Blvd.	T5B	2.4	1500	Interpolate HEC1

BASE MAPS: USGS 7.5 MINUTE QUADRANGLES: BLUE DIAMOND SE & LAS VEGAS SW

Figure 2

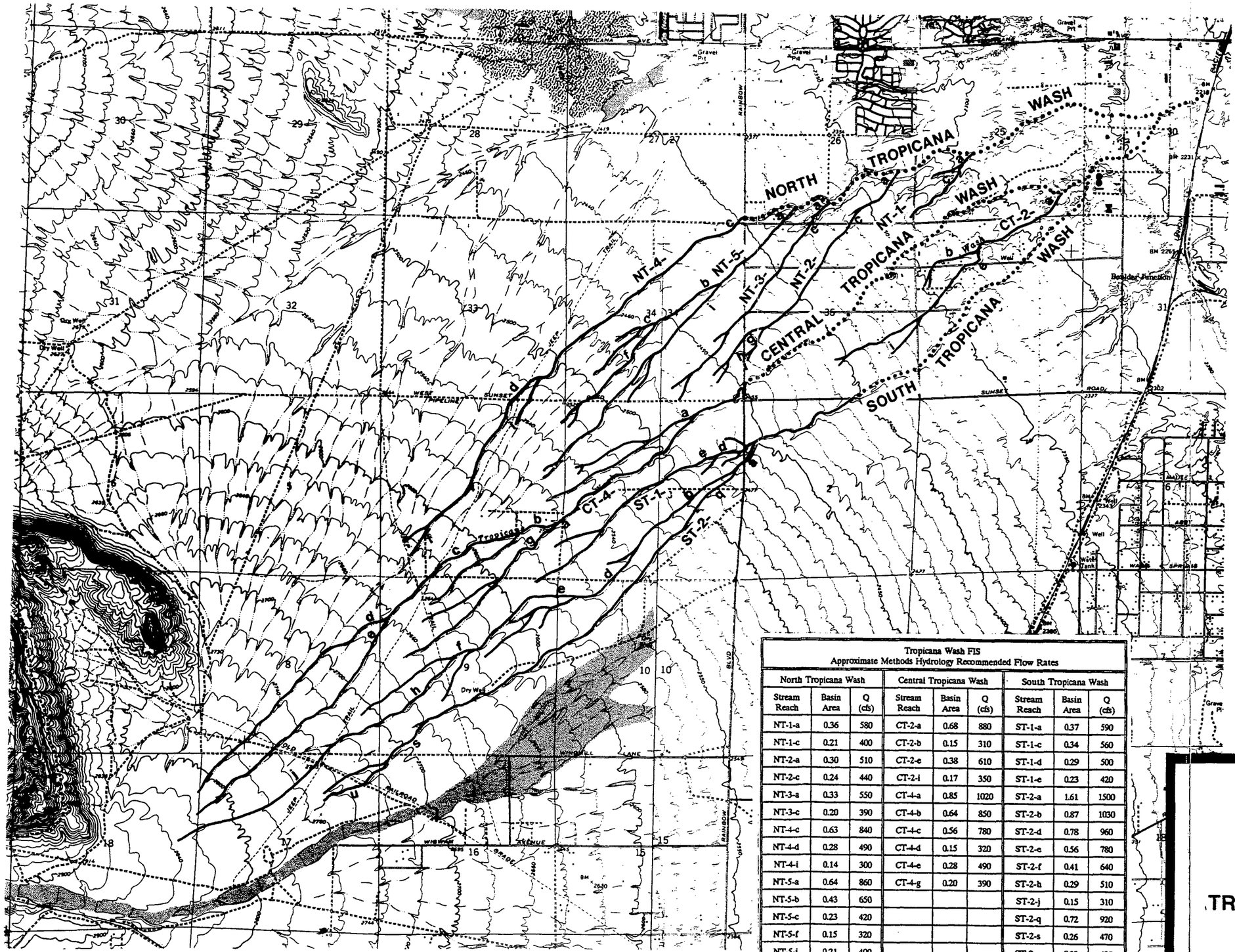
LOCATION MAP WATERSHED BOUNDARIES & CONCENTRATION POINTS

TROPICANA WASH FLOODPLAIN DELINEATION STUDY CLARK COUNTY, NEVADA

FIDD33832

7-9-92

CHMHILL



Tropicana Wash FIS Approximate Methods Hydrology Recommended Flow Rates								
North Tropicana Wash			Central Tropicana Wash			South Tropicana Wash		
Stream Reach	Basin Area	Q (cfs)	Stream Reach	Basin Area	Q (cfs)	Stream Reach	Basin Area	Q (cfs)
NT-1-a	0.36	580	CT-2-a	0.68	880	ST-1-a	0.37	590
NT-1-c	0.21	400	CT-2-b	0.15	310	ST-1-c	0.34	560
NT-2-a	0.30	510	CT-2-e	0.38	610	ST-1-d	0.29	500
NT-2-c	0.24	440	CT-2-i	0.17	350	ST-1-e	0.23	420
NT-3-a	0.33	550	CT-4-a	0.85	1020	ST-2-a	1.61	1500
NT-3-c	0.20	390	CT-4-b	0.64	850	ST-2-b	0.87	1030
NT-4-c	0.63	840	CT-4-c	0.56	780	ST-2-d	0.78	960
NT-4-d	0.28	490	CT-4-d	0.15	320	ST-2-e	0.56	780
NT-4-i	0.14	300	CT-4-e	0.28	490	ST-2-f	0.41	640
NT-5-a	0.64	860	CT-4-g	0.20	390	ST-2-h	0.29	510
NT-5-b	0.43	650				ST-2-j	0.15	310
NT-5-c	0.23	420				ST-2-q	0.72	920
NT-5-f	0.15	320				ST-2-s	0.26	470
NT-5-i	0.21	400				ST-2-u	0.23	430

Figure 3

APPROXIMATE STUDY METHODS STREAM REACHES

TROPICANA WASH FLOODPLAIN DELINEATION STUDY CLARK COUNTY, NEVADA

RDD33832

8-19-92

CH2MHILL

TABLE 1
DETAILED METHOD FLOWRATES
Tropicana Wash Flood Insurance Study
Clark County, Nevada

Concentration Point Tropicana Wash (TW)		Drainage Area (sq.mi)	Q100 (cfs)
TW @ Flamingo	T12	20.1	5300
TW @ Koval Rd	T11	12.1	5100
TW @ I-15 Inlet Culvert Q Breakout	T10 BO2	11.0	5100 3320 2200
TW: I-15 to UPRR	T10A	8.9	2700
TW @ UPRR Downstream Upstream Breakout	T10A T6/T3 BO1	8.1	2420 4100 2400
North TW @ Confl. w/Central TW	T3	2.6	1450
North TW @ Confl. #1	T3A	1.8	1250
North TW @ Jones Blvd.	T1	1.6	1200
North TW @ Confl. #2	T1A	1.1	850
Central TW @ Confl. w/North TW	T6	5.5	3300
Central TW above Confl. w/South TW	T6A	1.7	1000
Central TW @ Confl. #1	T6B	1.1	640
Central TW @ Jones Blvd.	T5A	0.9	530
South TW @ Confl. w/Central TW	T6C	2.9	1800
South TW above Jones Blvd.	T5B	2.4	1500

Flow rates used for the approximate method floodplain delineation were obtained from the COE regression curve for the Las Vegas Valley (Reference 2). A plot of the curve is shown in Figure 3.

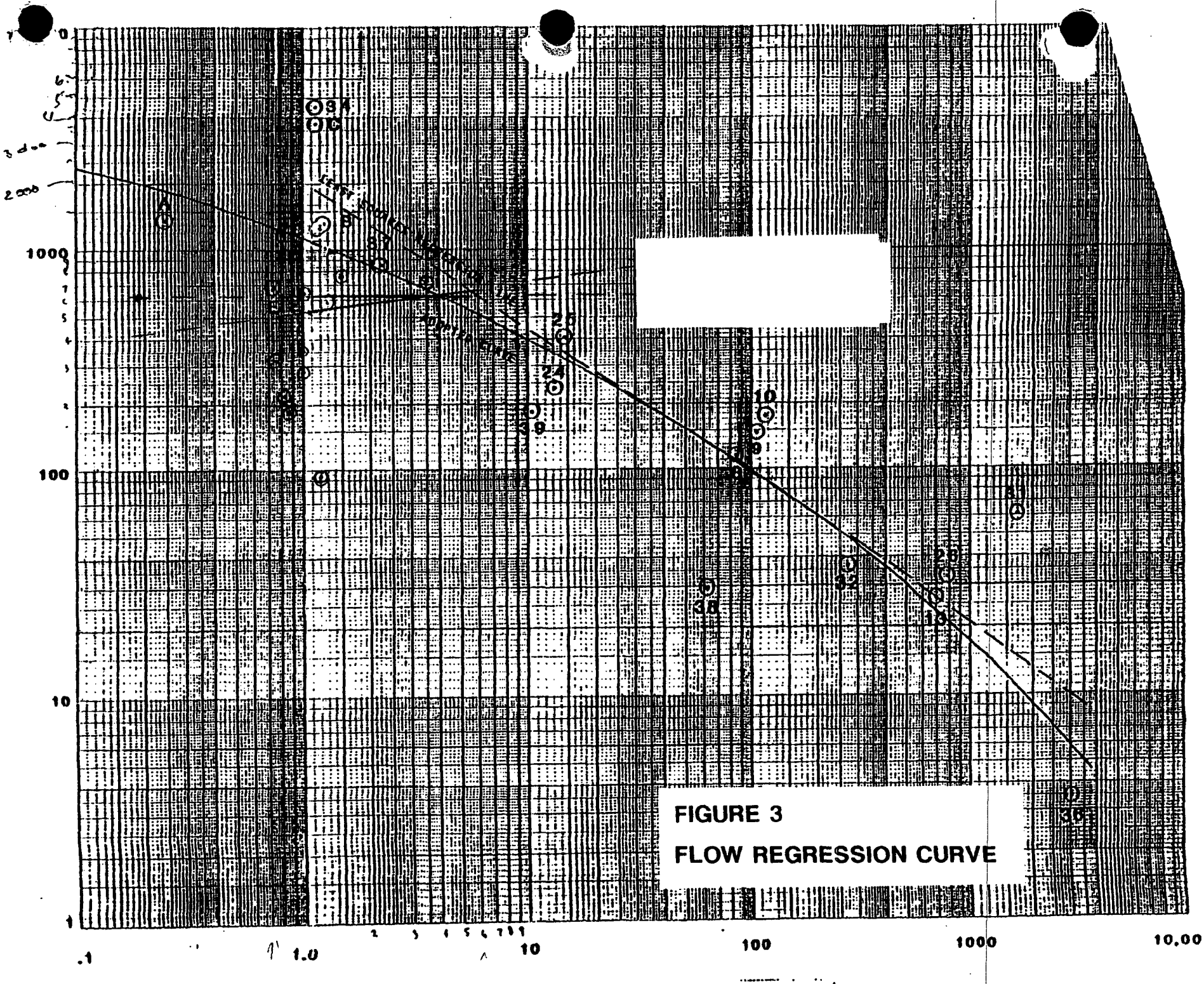


FIGURE 3

FLOW REGRESSION CURVE

3.2 Hydraulic Analyses

For areas studied by detailed methods, water surface elevations for the 100-year flood were computed using the COE HEC-2 Water Surface Profile computer program (Reference 9). Where otherwise unknown, the starting water surface elevations were developed using the slope-area method in the program. The Federal Highway Administration's computer program HY8 (Reference 10) was used to model water surface elevations and capacities at some of the culvert crossings. Undersized crossings included weir flow calculations over the roadways.

The cross-section data for each of the streams were derived from aerial mapping. The mapping was prepared specifically for this project and based on aerial photography dated June 1992. The cross-section data were digitized directly from the stereographic aerial models.

Ground control surveys, check profiles, and establishment of elevation reference marks were completed by Wesco Surveys. Vertical control is based on the National Geodetic Vertical Datum of 1929 (NGVD 1929) and horizontal control is tied into the Nevada State Plane Coordinate System (NAD 1983). Clark County survey monuments were used for control whenever possible. The topographic mapping used for most of the areas studied by approximate methods were prepared by others for an earlier study. This mapping did not use the same vertical datum as the mapping prepared for this project. Some differences in elevation were found but do not affect the detailed study reaches of this project.

Dimensions of hydraulic structures were obtained by field surveys. Table 2 lists the hydraulic structures, brief descriptions, and their respective locations on the Tropicana Wash.

TABLE 2
EXISTING HYDRAULIC STRUCTURES
Tropicana Wash Flood Insurance Study
Clark County, Nevada

Wash Mile	Location Description	Structure Description
TROPICANA WASH - MAIN BRANCH		
0.15	Flamingo Road	3-barrel, 12' wide x 3' high concrete box culvert, 189' long
0.29	Swenson Street	6-barrel, 12' wide x 4' high concrete box culvert, 127' long
0.50	Behind fire station near intersection of Paradise Road and Flamingo Road	7-barrel, 12' wide x 4' high concrete box culvert
0.70	Paradise Road	10-barrel, 10' wide x 4' high concrete box culvert
0.90	Multi-family dwelling access just upstream of Airport Wash confluence	2-barrel, 24' wide x 8.5' high, concrete arch culvert, 35' long
1.07	Multi-family dwelling access just downstream of Harmon Avenue crossing	4-barrel, 12' wide x 8' high, concrete box culverts, 34' long
1.10	Just downstream of Harmon Avenue	Drop/energy dissipation structure, 5' drop
1.12	Harmon Avenue	6-barrel, 10' wide by 4' high, concrete box culvert
1.40	Koval, downstream side of I-15/ MGM culvert	1-barrel, 21' wide x 6.5' high box culvert
2.30	Side inlet to I-15/MGM culvert at Golf Course	1-barrel, 7' wide x 3' high concrete box culvert
2.57	Main inlet to I-15/MGM culvert at Industrial Road	4-barrel, 8' wide x 7' high concrete box culvert
2.90	Bridge built with RR flat car	Free span bridge, trapezoidal channel, 23' ± bottom width, 1.5:1 side slopes, 6' high

continued....

TABLE 2
EXISTING HYDRAULIC STRUCTURES
Tropicana Wash Flood Insurance Study
Clark County, Nevada

Wash Mile	Location Description	Structure Description
2.93	Bridge built with RR flat car	Free span bridge, trapezoidal channel, 23' ± bottom width, 1.5:1 side slopes, 6' high
2.96	Bridge built with RR flat car	Free span bridge, trapezoidal channel, 23' ± bottom width, 1.5:1 side slopes, 6' high
3.38	UPRR crossing	a) 1-barrel, 9.75' diameter corrugated metal culvert, 95' long b) 2-36" pipes just south of above CMP
3.70	Arville Street	3-barrel, 10' wide x 6' high RCB
3.87	Hacienda Avenue	2-barrel, 8' wide x 5' high concrete box culvert
3.94	Footbridge just upstream of Hacienda Avenue	Free span bridge, trapezoidal channel, 22' ± bottom width, 1.5:1 side slopes, 5' high.
TROPICANA WASH - NORTH BRANCH		
0.20	Cameron Street	3-barrel, 8' wide by 4' high concrete box culvert, 66' long
0.84	Hacienda Avenue	1-barrel, 20' wide by 5' high concrete arch culvert

Channel roughness factors (Manning's n) were obtained through field inspection of the entire stream reaches and engineering judgement. The reach conditions were also documented with photos and the n values compared with published data by selecting base values and adding components for channel irregularity, obstructions, vegetation, and degree of meandering (Reference 11). Table 3 gives the Manning's n values used for the various reaches studied by detailed methods.

TABLE 3
MANNING'S n VALUES FOR DETAILED METHODS
Tropicana Wash Flood Insurance Study
Clark County, Nevada

Wash Reach	Wash Mile	n Channel	n Left Overbank	n Right Overbank
Tropicana Wash Main Branch	0.000	0.080	0.048	0.048
	0.080	0.095	0.048	0.048
	0.130	0.062	0.020	0.020
	0.171	0.032	0.025	0.025
	0.301	0.030	0.027	0.027
	0.397	0.050	0.027	0.027
	0.705	0.047	0.027	0.027
	0.867	0.022	0.100	0.022
	0.887	0.022	0.100	0.100
	0.936	0.025	0.100	0.100
	1.079	0.015	0.100	0.100
	1.141	0.025	0.100	0.100
	1.235	0.038	0.030	0.030
	1.339	0.043	0.125	0.030
	2.566	0.043	0.025	0.025
	2.763	0.046	0.025	0.025
	2.859	0.032	0.020	0.070
	3.061	0.043	0.036	0.036
	3.260	0.053	0.058	0.043
	3.411	0.045	0.040	0.042
	3.585	0.025	0.040	0.042
	3.682	0.025	0.055	0.055
	3.801	0.028	0.040	0.055

continued ...

TABLE 3
MANNING'S n VALUES FOR DETAILED METHODS
Tropicana Wash Flood Insurance Study
Clark County, Nevada

Wash Reach	Wash Mile	n Channel	n Left Overbank	n Right Overbank
Tropicana Wash Central Branch	3.886	0.032	0.025	0.025
	3.979	0.035	0.030	0.056
	4.137	0.046	0.060	0.054
	4.179	0.034	0.046	0.046
	4.366	0.041	0.043	0.098
	4.461	0.046	0.045	0.078
	4.562	0.032	0.048	0.048
	4.677	0.037	0.055	0.055
	4.789	0.044	0.055	0.055
	4.989	0.036	0.050	0.050
	5.089	0.045	0.050	0.050
	5.381	0.039	0.045	0.045
	5.573	0.034	0.041	0.041
Tropicana Wash North Branch	0.093	0.053	0.034	0.078
	0.188	0.027	0.032	0.032
	0.215	0.031	0.085	0.025
	0.284	0.033	0.085	0.025
	0.381	0.051	0.058	0.058
	0.476	0.040	0.045	0.045
	0.667	0.035	0.045	0.045
	0.886	0.035	0.050	0.050
	1.235	0.035	0.052	0.052
	1.530	0.035	0.040	0.040
	1.630	0.030	0.040	0.040
	1.926	0.038	0.045	0.045
Tropicana Wash South Branch	0.093	0.032	0.048	0.048
	0.191	0.038	0.060	0.060
	0.292	0.035	0.045	0.045
	0.584	0.033	0.043	0.043
	1.079	0.038	0.046	0.046
	1.272	0.035	0.044	0.044

tailwater conditions in the north branch and the computed water surface elevations in the south branch. Flows in excess of the culvert capacity were assumed to break over Cameron Street and continue eastward in the southern branch to the railroad berm. The break over flows were assumed to rejoin at the UPRR culvert crossing.

At the Arville Street crossing of the central branch of Tropicana Wash, a new 3-cell 10' by 6' RCBC culvert structure was designed and approved for construction by the Clark County Department of Public Works. The culvert as designed does not contain the 100-year discharge. A portion of the flow that exceeds the capacity will flow northerly within Arville right-of-way and then northeasterly as shallow sheet flow to the UPRR railroad bed. The design configuration as shown in the construction documents was used to estimate the flow characteristics at the crossing.

The HEC-2 special culvert routine was used in conjunction with a split flow analysis. Because the HEC-2 split flow routine is not compatible with tributary models, a separate model of the reach was prepared and the results incorporated into the floodway model using X5 records. The floodplain area form the flow which is conveyed in Arville Street was estimated by approximate methods based on topographic information and field evaluations.

The culverts at the UPRR were also modeled using HY8 to determine break-out flows at the railroad. The culvert capacity was subtracted from the runoff estimates upstream of the railroad to estimate the break-out discharge to the north. These flows follow north along the railroad grade for several hundred feet and then outlet into Tropicana Avenue. The runoff then flows generally within the Tropicana Avenue right-of-way to Industrial Road. At Industrial Road, the flow splits into two patterns; one flowing north and the other continuing south. Flows to the north follow Industrial Road, eventually crossing the I-15 right-of-way between the Tropicana Avenue and Flamingo Road overpasses. The south branch rejoins Tropicana Wash flows just upstream of the I-15/MGM culvert.

Break-out flow at the I-15/MGM culvert generally travels north into the depressed median of I-15. Approximately 100 cfs crosses I-15 and enters ditches surrounding the Excalibur Hotel property and is conveyed in the local storm drain system. The balance of the flow travels north in the I-15 right-of-way and joins the breakout flows from Industrial Road. Some runoff continues north in the median eventually entering the Flamingo Wash; however, the bulk of the flows crosses I-15 and enters the Dunes

Golf Course property. From the Dunes property, shallow sheet flows meander through the city streets and adjacent parking lots in a northeasterly direction and eventually drain into the Flamingo Wash.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

4.1 Floodplain Boundaries

Floodplain boundaries for the detailed studies were delineated on topographic maps with a scale of 1"=400" and a contour interval of 4 feet. Supplemental 2-foot contours were plotted in areas requiring greater definition. The boundaries of the 100-year flood were delineated using the elevations computed at each cross section by the HEC-2 models. The delineations were interpolated between cross sections using engineering judgement in conjunction with the topographic map features and known field conditions. The 500-year flood elevations were not determined by this study.

Since the cross section data were digitized directly from the stereo models, the accuracy of the data exceeds that of the contour mapping. As a result, slight discrepancies may appear between the computed elevations and the intersections of the flood limits with the contour lines.

One-hundred-year floodplain boundaries for approximate studies on areas west of Rainbow Boulevard and south of Sunset Road were delineated on topographic maps prepared for the 1984 Flood Insurance Study. Approximate study boundaries east of Rainbow Boulevard and north of Sunset Road are shown on the 1992 mapping prepared for this study.

4.2 Floodways

Floodways are typically defined as the main channel of a watercourse and the adjacent land width that must remain free of encroachments so as not to raise the 100-year water surface elevation in the watercourse more than a specified amount. The allowable rise is determined by the governing agency and for this study is 1.0 foot.

For this study, floodways were initially computed using the method 4 encroachment option in the HEC-2 computer program. This option equally reduces the conveyance on each side of the cross section, thus raising the water surface elevation, but maintaining it within the specified target value. These initial encroachments were then refined by plotting the floodplains on

the mapping, using engineering judgement to adjust the floodplains as appropriate, and verifying the resulting floodplains with the method 1 encroachment option in HEC-2. With this method, the encroachment stations are input into the model and the results reviewed to ensure the floodplain water surface elevation has not been raised more than the specified target value. The results of the floodway analysis is given on Table 5. The resulting floodways are shown on the Flood Insurance Rate maps.

Existing stream sections effected substantially by backwater conditions include the channel just upstream of the I-15/MGM culvert and the channel just upstream of the UPRR. At both of these locations, limited capacities of the structures cause breakout flows and flooding.

Floodways were not delineated on the Tropicana Wash where it flows through the I-15/MGM culvert (I-15 to Koval Lane) and through the box culvert between Paradise Road and Swenson Street. Floodways were defined for these reaches representing the approximate interior conveyance areas of the culvert structures. The floodway delineations are shown on the workmaps based on "as-built" plans. This floodway designation for the inside of the culvert is intended to provide the community a means of managing potential modifications to the structures which could reduce their capacities to convey their design discharges at the design heads.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, each floodplain area was divided into appropriate rate zones based on the floodplain boundaries and the engineering analyses. The areas were divided into flood insurance rate zones based on the following criteria:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-yr floodplains that are determined in the FIS by detailed methods. In most instances, BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-yr shallow flooding with a constant water-surface elevation (usually areas of ponding) where average depths are between 1 and 3 feet. The BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 100-yr floodplain, and areas of 100-yr sheet flow flooding where average depths are less than 1 foot, areas of 100-yr stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 100-yr flood by levees. No BFEs or depths are shown within this zone.

7.0 OTHER STUDIES

This study is intended to update and supersede the previous study performed in 1988 (Reference 13).

During the period of the Tropicana Wash study, Michael Baker Jr., Inc. concurrently prepared a study for the Duck Creek Hydrologic Unit. Portions of the Duck Creek study that border the Tropicana Wash study have been appropriately coordinated in terms of break over flows and flood insurance rate zone delineations (Reference 3).

As described previously, hydrologic data for the detailed methods analysis was derived from the FIS Hydrology Report (Reference 1).

9.0 REFERENCES

1. James M. Montgomery Consulting Engineers, Inc., Clark County Regional Flood Control District - Las Vegas Valley Flood Insurance Study Hydrology Report. September 1991.

2. U.S. Army Corps of Engineers, Hydrologic Documentation for Feasibility Study, Las Vegas Wash and Tributaries. April 1988.

3. Michael Baker Jr., Inc., Duck Creek Hydrologic Unit Technical Data Appendix, Volume I. August 1992.

4. U.S. Department of Agriculture Soil Conservation Service in Cooperation with U.S. Department of the Interior Bureau of Land Management, University of Nevada Agricultural Experiment Station and University of Arizona Agricultural Experimental Station, Soil Survey of Las Vegas Valley Area, part of Clark County, Nevada. July 1985.

5. Dames & Moore, Draft Environmental Impact Statement, Flood Control Master Plan for the Clark County Regional Flood Control District, Volume I, Environmental Setting and Impacts Analysis. October 1990.

6. James M. Montgomery Consulting Engineers, Inc., The Master Plan Update of the Las Vegas Valley for the Clark County Flood Control District, Volume II. August 1991.

7. James M. Montgomery Consulting Engineers, Inc., Las Vegas Wash and Tributaries Overflow Study, Clark County, Nevada. September 1988.

8. WRC Engineering, Inc., Hydrologic Criteria and Drainage Design Manual for the Clark County Flood Control District. October 1990.

9. U.S. Army Corps of Engineers Water Resource Center, HEC-2 Water Surface Profiles. May 1991.

10. Federal Highway Administration, HY8 Culvert Analysis Micro Computer Program. May 1987.

11. U. S. Geological Survey, Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona. April 1991.

12. Church Engineering of Nevada, Hydraulic Analysis of the MGM Grand Box Culvert. October 1991.

13. Federal Emergency Management Agency, Flood Insurance Study for Clark County, Nevada. September 1988.

TABLE 4
HYDRAULIC ANALYSIS DISCHARGES
Tropicana Wash Flood Insurance Study
Clark County, Nevada

Reach	SECNO	Q
Flamingo to I-15:	0.000	4797.3
	60.171	5300.0
	60.587	1870.0
	60.705	5300.0
	60.903	3324.0
I-15 to UPRR:	62.566	2243.0
	62.763	800.0
	63.260	710.0
Upstream of UPRR:		
Central Branch	63.411	4100.0
	63.585	3819.0
	63.682	4100.0
	63.866	2400.0
	64.179	2050.0
	64.366	3300.0
	64.677	1000.0
	64.789	640.0
	65.671	530.0
North Branch	90.093	1450.0
	91.235	1250.0
	91.530	1200.0
	92.137	850.0
South Branch	30.093	1800.0
	31.465	1500.0

HEC-2 Run		Floodway			Base Flood Water Surface Elevation			
Cross Section	Distance above Flamingo Wash (miles)	Width (feet)	Section Area (square feet)	Mean Velocity (feet per second)	Regulatory (feet NGVD)	With Floodway (feet NGVD)	Without Floodway (feet NGVD)	Increase (feet)
FLAM-ENC.HC2								
60.000	0.000	112	786	6.1	2001.1	2002.1	2001.1	1.0
60.080	0.080	87	392	12.2	2011.6	2011.6	2011.6	0.0
60.135	0.135	81	486	9.9	2022.1	2022.0	2022.1	-0.1
60.171	0.171	79	446	11.9	2024.6	2022.7	2024.6	-1.9
60.219	0.219	120	497	10.7	2027.1	2027.3	2027.1	0.2
60.276	0.276	142	877	6.0	2029.0	2029.9	2029.0	0.9
60.301	0.301	172	1321	4.0	2031.5	2031.7	2031.5	0.2
60.345	0.345	99	579	9.2	2031.1	2031.4	2031.1	0.3
60.397	0.397	77	406	13.0	2033.2	2033.2	2033.2	0.0
60.446	0.446	109	828	6.4	2037.1	2037.2	2037.1	0.1
60.491	0.491	106	450	11.8	2037.9	2037.9	2037.9	0.0
60.587	0.587	191	353	5.3	2043.8	2044.5	2043.8	0.7
60.667	0.667	356	605	3.1	2044.8	2045.8	2044.8	1.0
60.705	0.705	290	1560	3.4	2048.9	2049.9	2048.9	1.0
60.800	0.800	197	594	8.9	2050.8	2051.7	2050.8	0.9
60.866	0.866	106	449	11.8	2055.8	2055.8	2055.8	0.0
60.887	0.887	92	431	12.3	2057.0	2057.0	2057.0	0.0
60.903	0.903	104	771	4.3	2059.8	2059.7	2059.8	-0.1
60.912	0.912	120	802	4.1	2060.2	2060.1	2060.2	-0.1
60.936	0.936	123	744	4.5	2060.2	2060.1	2060.2	-0.1
60.992	0.992	107	553	6.0	2060.2	2060.1	2060.2	-0.1
61.036	1.036	95	444	7.5	2060.4	2060.4	2060.4	0.0
61.073	1.073	85	364	9.1	2060.7	2060.7	2060.7	0.0
61.080	1.080	58	356	9.3	2061.1	2061.1	2061.1	0.0
61.095	1.095	67	283	11.7	2063.8	2063.8	2063.8	0.0
61.118	1.118	109	686	4.8	2066.2	2066.2	2066.2	0.0
61.142	1.142	152	1047	3.2	2068.4	2068.4	2068.4	0.0

Table 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

UNINCORPORATED CLARK COUNTY/ NEVADA

FLOODWAY DATA

TROPICANA WASH

HEC-2 Run		Floodway			Base Flood Water Surface Elevation			
Cross Section	Distance above Flamingo Wash (miles)	Width (feet)	Section Area (square feet)	Mean Velocity (feet per second)	Regulatory (feet NGVD)	With Floodway (feet NGVD)	Without Floodway (feet NGVD)	Increase (feet)
FLAM-ENC.HC2, con't								
61.166	1.166	83	399	8.3	2068.9	2069.8	2068.9	0.9
61.237	1.237	109	332	10.0	2074.2	2074.2	2074.2	0.0
61.340	1.340	73	318	10.5	2081.9	2081.9	2081.9	0.0
61.391	1.391	88	561	5.9	2084.5	2084.6	2084.5	0.1

Table 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

UNINCORPORATED CLARK COUNTY/ NEVADA

FLOODWAY DATA

TROPICANA WASH

HEC-2 Run		Floodway			Base Flood Water Surface Elevation			
Cross Section	Distance above Flamingo Wash (miles)	Width (feet)	Section Area (square feet)	Mean Velocity (feet per second)	Regulatory (feet NGVD)	With Floodway (feet NGVD)	Without Floodway (feet NGVD)	Increase (feet)
I15Q2-E1.HC2								
62.566	2.566	613	6370	0.4	2154.7	2155.7	2154.7	1.0
62.668	2.668	48	194	11.6	2155.8	2156.8	2155.8	1.0
62.763	2.763	68	240	3.3	2161.9	2162.8	2161.9	0.9
62.859	2.859	36	89	9.0	2169.4	2169.4	2169.4	0.0
62.906	2.906	30	84	9.6	2174.1	2174.1	2174.1	0.0
62.908	2.908	30	84	9.5	2174.1	2174.1	2174.1	0.0
62.937	2.937	39	138	5.8	2176.1	2176.1	2176.1	0.0
62.940	2.940	39	137	5.8	2176.1	2176.1	2176.1	0.0
62.967	2.967	35	98	8.2	2176.5	2176.5	2176.5	0.0
62.969	2.969	35	98	8.2	2176.5	2176.5	2176.5	0.0
63.061	3.061	31	98	8.2	2181.6	2181.6	2181.6	0.0
63.157	3.157	52	129	6.2	2187.9	2187.9	2187.9	0.0
63.260	3.260	59	98	7.2	2198.8	2199.8	2198.8	1.0
63.353	3.353	86	257	2.8	2202.6	2203.3	2202.6	0.7

Table 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

UNINCORPORATED CLARK COUNTY/ NEVADA

FLOODWAY DATA

TROPICANA WASH

HEC-2 Run		Floodway			Base Flood Water Surface Elevation			
Cross Section	Distance above Flamingo Wash (miles)	Width (feet)	Section Area (square feet)	Mean Velocity (feet per second)	Regulatory (feet NGVD)	With Floodway (feet NGVD)	Without Floodway (feet NGVD)	Increase (feet)
CTW-ENC.HC2								
63.411	3.411	125	770	5.3	2213.6	2214.6	2213.6	1.0
63.585	3.585	135	419	9.8	2220.4	2220.9	2220.4	0.5
63.682	3.682	145	1118	3.7	2230.9	2231.9	2230.9	1.0
63.800	3.800	150	432	9.5	2233.9	2233.8	2233.9	-0.1
63.866	3.866	82	252	9.5	2236.2	2237.1	2236.2	0.9
63.884	3.884	80	456	5.3	2240.9	2240.7	2240.9	-0.2
63.907	3.907	58	382	6.3	2240.9	2240.8	2240.9	-0.1
63.945	3.945	57	357	6.7	2240.9	2241.1	2240.9	0.2
63.946	3.946	57	448	5.4	2242.9	2242.7	2242.9	-0.2
63.979	3.979	73	425	5.6	2243.1	2243.0	2243.1	-0.1
64.084	4.084	79	242	9.9	2245.5	2245.4	2245.5	-0.1
64.113	4.113	97	412	5.8	2247.0	2247.6	2247.0	0.6
64.137	4.137	118	295	8.1	2250.4	2250.6	2250.4	0.2
64.179	4.179	73	253	8.1	2251.7	2252.7	2251.7	1.0
64.366	4.366	61	318	10.4	2259.4	2260.2	2259.4	0.8
64.461	4.461	62	324	10.2	2266.0	2265.8	2266.0	-0.2
64.560	4.560	81	330	10.0	2273.6	2273.8	2273.6	0.2

Table 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

UNINCORPORATED CLARK COUNTY/ NEVADA

FLOODWAY DATA

TROPICANA WASH

HEC-2 Run		Floodway			Base Flood Water Surface Elevation			
Cross Section	Distance above Central Wash (miles)	Width (feet)	Section Area (square feet)	Mean Velocity (feet per second)	Regulatory (feet NGVD)	With Floodway (feet NGVD)	Without Floodway (feet NGVD)	Increase (feet)
NTW-ENC.HC2								
63.800	0.000	150	597	6.9	2233.9	2234.9	2233.9	1.0
90.093	0.093	104	188	7.7	2237.9	2237.1	2237.9	-0.8
90.188	0.188	110	211	6.9	2243.1	2242.9	2243.1	-0.2
90.203	0.203	150	328	4.4	2243.8	2243.9	2243.8	0.1
90.215	0.215	179	499	2.9	2246.6	2246.5	2246.6	-0.1
90.284	0.284	180	225	6.5	2248.3	2248.7	2248.3	0.4
90.381	0.381	174	332	4.4	2253.7	2254.4	2253.7	0.7
90.476	0.476	187	293	5.0	2258.7	2259.6	2258.7	0.9
90.570	0.570	124	273	5.3	2263.4	2264.2	2263.4	0.8
90.667	0.667	70	181	8.0	2268.6	2268.6	2268.6	0.0
90.760	0.760	68	237	6.1	2271.4	2272.0	2271.4	0.6
90.840	0.840	49	175	8.3	2274.0	2274.0	2274.0	0.0
90.863	0.863	50	369	3.9	2279.1	2279.0	2279.1	-0.1
90.886	0.886	51	286	5.1	2279.2	2279.0	2279.2	-0.2
90.953	0.953	49	171	8.5	2279.4	2279.6	2279.4	0.2
91.045	1.045	82	221	6.6	2283.2	2284.1	2283.2	0.9
91.134	1.134	92	205	7.1	2289.0	2289.3	2289.0	0.3
91.235	1.235	81	186	6.7	2295.2	2295.8	2295.2	0.6
91.337	1.337	76	214	5.8	2300.3	2301.0	2300.3	0.7
91.434	1.434	57	140	8.9	2306.2	2306.2	2306.2	0.0
91.530	1.530	63	153	7.9	2312.1	2312.4	2312.1	0.3
91.630	1.630	52	131	9.1	2318.0	2318.5	2318.0	0.5
91.733	1.733	57	152	7.9	2323.0	2323.3	2323.0	0.3
91.831	1.831	44	163	7.4	2326.5	2326.3	2326.5	-0.2
91.926	1.926	53	132	9.1	2330.2	2330.2	2330.2	0.0
92.026	2.026	32	112	10.7	2339.5	2339.9	2339.5	0.4
92.137	2.137	28	93	9.2	2348.6	2348.7	2348.6	0.1

Table 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

UNINCORPORATED CLARK COUNTY/ NEVADA

FLOODWAY DATA

TROPICANA WASH

HEC-2 Run		Floodway			Base Flood Water Surface Elevation			
Cross Section	Distance above Central Wash (miles)	Width (feet)	Section Area (square feet)	Mean Velocity (feet per second)	Regulatory (feet NGVD)	With Floodway (feet NGVD)	Without Floodway (feet NGVD)	Increase (feet)
NTW-ENC.HC2, con't								
92.240	2.240	28	102	8.3	2354.0	2354.6	2354.0	0.6
92.348	2.348	48	101	8.4	2362.2	2362.2	2362.2	0.0
92.446	2.446	35	95	8.9	2370.5	2370.5	2370.5	0.0
92.545	2.545	30	87	9.8	2380.7	2380.6	2380.7	-0.1

Table 5

HEC-2 Run		Floodway			Base Flood Water Surface Elevation			
Cross Section	Distance above Central Wash (miles)	Width (feet)	Section Area (square feet)	Mean Velocity (feet per second)	Regulatory (feet NGVD)	With Floodway (feet NGVD)	Without Floodway (feet NGVD)	Increase (feet)
STW-ENC.HC2								
64.560	0.000	180	657	5.0	2273.7	2274.7	2273.7	1.0
30.093	0.093	95	688	2.6	2275.4	2275.6	2275.4	0.2
30.191	0.191	68	189	9.5	2277.8	2278.8	2277.8	1.0
30.292	0.292	59	187	9.6	2285.5	2286.4	2285.5	0.9
30.393	0.393	52	173	10.4	2293.6	2293.6	2293.6	0.0
30.486	0.486	84	226	8.0	2299.3	2299.7	2299.3	0.4
30.584	0.584	76	203	8.9	2310.9	2310.9	2310.9	0.0
30.676	0.676	89	230	7.8	2316.8	2317.8	2316.8	1.0
30.779	0.779	85	203	8.9	2324.4	2324.4	2324.4	0.0
30.872	0.872	83	217	8.3	2330.1	2330.3	2330.1	0.2
30.967	0.967	65	194	9.3	2336.8	2337.7	2336.8	0.9
31.079	1.079	86	213	8.5	2344.6	2345.5	2344.6	0.9
31.173	1.173	56	203	8.9	2350.8	2351.5	2350.8	0.7
31.272	1.272	60	211	8.5	2356.1	2356.2	2356.1	0.1
31.368	1.368	69	189	9.5	2361.4	2361.4	2361.4	0.0
31.465	1.465	73	171	8.8	2370.5	2370.5	2370.5	0.0
31.565	1.565	50	166	9.0	2376.1	2376.6	2376.1	0.5
31.664	1.664	66	166	9.1	2383.6	2384.0	2383.6	0.4
31.761	1.761	66	166	9.0	2391.0	2391.5	2391.0	0.5
31.860	1.860	92	203	7.4	2398.0	2398.3	2398.0	0.3
31.963	1.963	60	161	9.3	2405.7	2405.7	2405.7	0.0

Table 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

UNINCORPORATED CLARK COUNTY/ NEVADA

FLOODWAY DATA

TROPICANA WASH

The flooding sources studied by detailed methods were selected by the CCRFCD and CCPW with priority given to known flood hazard areas and developed areas or areas of proposed construction. The detailed study areas encompass the following:

- The main branch of the Tropicana Wash from its confluence with Flamingo Wash to approximately 2,000 feet west of the Union Pacific Railroad (UPRR). The North and Central branches of the wash combine at this point. (Approximate Rivermile 0.0 to 3.7).

- The North Branch of the Tropicana Wash from approximately 2000 west of the UPRR to the Rainbow Boulevard crossing. (Approximate Rivermile 0.0 to 2.6 on the North Branch).

- The Central Branch of the Tropicana Wash from approximately 2000 west of the UPRR to the Rainbow Boulevard crossing. (Approximate Rivermile 3.7 to 7.0).

- The South Branch of the Tropicana Wash from its confluence with the Central Branch near Decatur Boulevard to the Sunset Road crossing. (Approximate Rivermile 0.0 to 1.9 on the South Branch).

The approximate study reaches were outlined by the CCRFCD in consultation with CCPW and extend upstream from the limits of the detailed study reaches to a point where the contributing flow is less than 300 cfs. For the purposes of this study, future street and local drainage systems are assumed to convey flows less than 300 cfs. In general, the flooding sources studied by approximate methods are identified as:

- The North Branch of the Tropicana Wash and tributaries from the limit of the Detailed Study reach upstream to a point where the flow is less than 300 cfs.

- The Central Branch of the Tropicana Wash and tributaries from the limit of the Detailed Study reach upstream to a point where the flow is less than 300 cfs.

- The South Branch of the Tropicana Wash and tributaries from the limit of the Detailed Study reach upstream to a point where the flow is less than 300 cfs.

Tributaries of the Tropicana Wash not studied include the un-named wash and the Airport Channel as shown in Figure 1.

2.2 Community Description

The study area is located in the southwest portion of the Las Vegas Valley and within the boundaries of Clark County as shown in Figure 1. The downstream portion of the Tropicana Wash watershed lies directly to the south of the City of Las Vegas and extends upstream, southwesterly to Blue Diamond Hill. The Wash is tributary to a larger drainage system that begins in the Spring Mountains on the west of the valley and conveys runoff through the Cities of North Las Vegas, Las Vegas, Henderson, and developed areas of Clark County. On the east side of the valley, the flow collects into the Las Vegas Wash which conveys the runoff to nearby Lake Mead.

The mean annual precipitation for the area is approximately 4.1 inches (Reference 4). Rainfall is generally the result of two distinctly different meteorological events. High intensity, short-duration thunderstorms typically occurring in the late summer months of July, August, and September can produce high runoff rates over small geographical areas. During the winter months, precipitation generally results from frontal and Pacific storm movements with longer durations, lower intensities, and larger aerial coverage.

Vegetation in the area consists mainly of desert brush. Creosote bush is the predominant vegetation type, and is characterized by widely spaced shrubs with an average vegetative cover ranging from less than 10 percent up to 32 percent in the lower valley areas (Reference 5). Near the base of the mountains, the vegetation changes from sparse to non-existent, giving away to the steep and rocky mountain slopes.

Land use in the area consists mainly of high density commercial, resort, and multi-family housing in the downstream reaches of the watershed east of Interstate 15 (I-15). In general, light industrial/commercial areas occur west of I-15 to the Union Pacific Railroad (UPRR). Areas between the

UPRR and Rainbow Boulevard are currently developing with a mix of single family housing, commercial, and light industrial developments. Areas west of Rainbow Boulevard and south of Sunset Road are mostly undeveloped desert land at this time.

Soils in the watershed range from SCS Hydrologic Soil Group B in the lower portion of the watershed, corresponding to moderate infiltration rates, to Group D in the upper portions with very slow infiltration rates and high runoff potential (Reference 6).

2.3 Principal Flood Problems

The headwaters of Tropicana Wash are located on the eastern slopes of the Spring Mountain range piedmont. Three main branches of Tropicana Wash convey runoff on the sparsely developed piedmont: the North, Central, and South Branches (See Figure 1). In the upper portions of the piedmont, the floodplains on the tributaries are generally quite narrow and follow the numerous incised channels that meander and eventually join into the three main branches. Downstream of Jones Boulevard, near the confluence of the three branches, portions of the washes have been channelized or diverted in association with recent medium to high density development. Undersized culverts at the UPRR and at I-15 cause some runoff to be diverted to the north, where it flows as unconfined runoff through urbanized areas until it rejoins Tropicana Wash downstream or enters Flamingo Wash. Flow conveyed by the I-15 culvert outlets downstream of Koval Lane into an earthen channel system with box culvert road crossings.

The largest flood of record on the Tropicana Wash occurred on July 3, 1975, and produced an estimated peak flow of 1,700 cfs at the I-15 culvert. The limited culvert capacities at I-15 and the UPRR prevented significant damage to the downstream urban areas (Reference 7).

Factors that may aggravate local flooding include the undersized culvert crossings at Arville Street (proposed), the UPRR, I-15 and Harmon Avenue. Some sections of the wash also have limited capacity resulting from development that has encroached into the floodplain and channel sections with limited conveyance capacity.

The CCRFCD and the United States Geological Survey jointly operate the only gage on the Tropicana Wash which is located at the Swenson Street bridge crossing. The gage was installed in March 1989.

2.4 Flood Protection Measures

No significant flood control facilities such as levees, dams, or detention basins have been constructed on the Tropicana Wash. The existing conveyance facilities are limited to culverts or bridges on the major road crossings and lining or erosion protection on portions of the wash channel.

As part of the CCPW Special Improvement District (SID) No. 67, a two-barrel, 6' x 6' box culvert is proposed for the wash crossing at Arville Street, and a 60-inch-diameter storm drain is proposed at the Cameron Street crossing. These facilities are planned for construction within one year from this study date. Information needed to analyze the improvements was obtained from construction drawings.

3.0 ENGINEERING METHODS

3.1 Hydrologic Analyses

In general, hydrologic data for detailed methods in this flood study were derived from the FIS Hydrology Report (Reference 1). This report provides 100-year recurrence interval flow rate estimates for floodplain delineation studies in Clark County, Nevada. The report has previously been accepted by FEMA and adopted by the CCRFCD. The data are based on HEC-1 computer models prepared for the various watersheds including the Tropicana Wash.

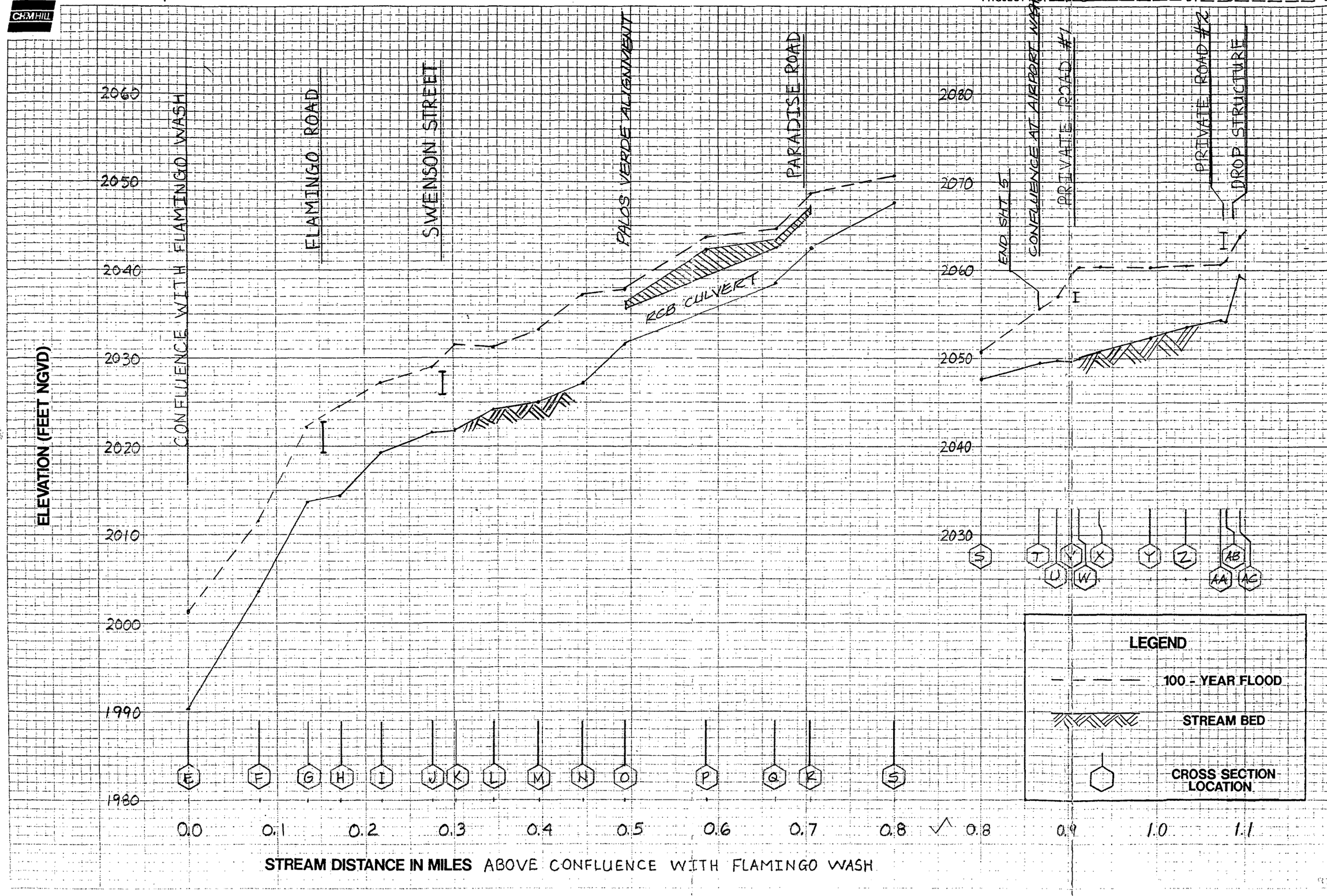
Where additional hydrologic data at intermediate concentration points were required in the detailed methods study, the adopted HEC-1 model was modified according to procedures in the CCRFCD's "Hydrologic Criteria and Drainage Design Manual" (Reference 8). The drainage basins and concentration points used for this study are shown in Figure 2. The associated flow rates are given in Table 1.

SUBJECT Tropicana Wash Profiles

PROJECT NO. RDD33832 BY HMA

SHEET NO. ____ OF ____

DATE Oct '92



FLOOD PROFILES

TROPICANA WASH - CENTRAL BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

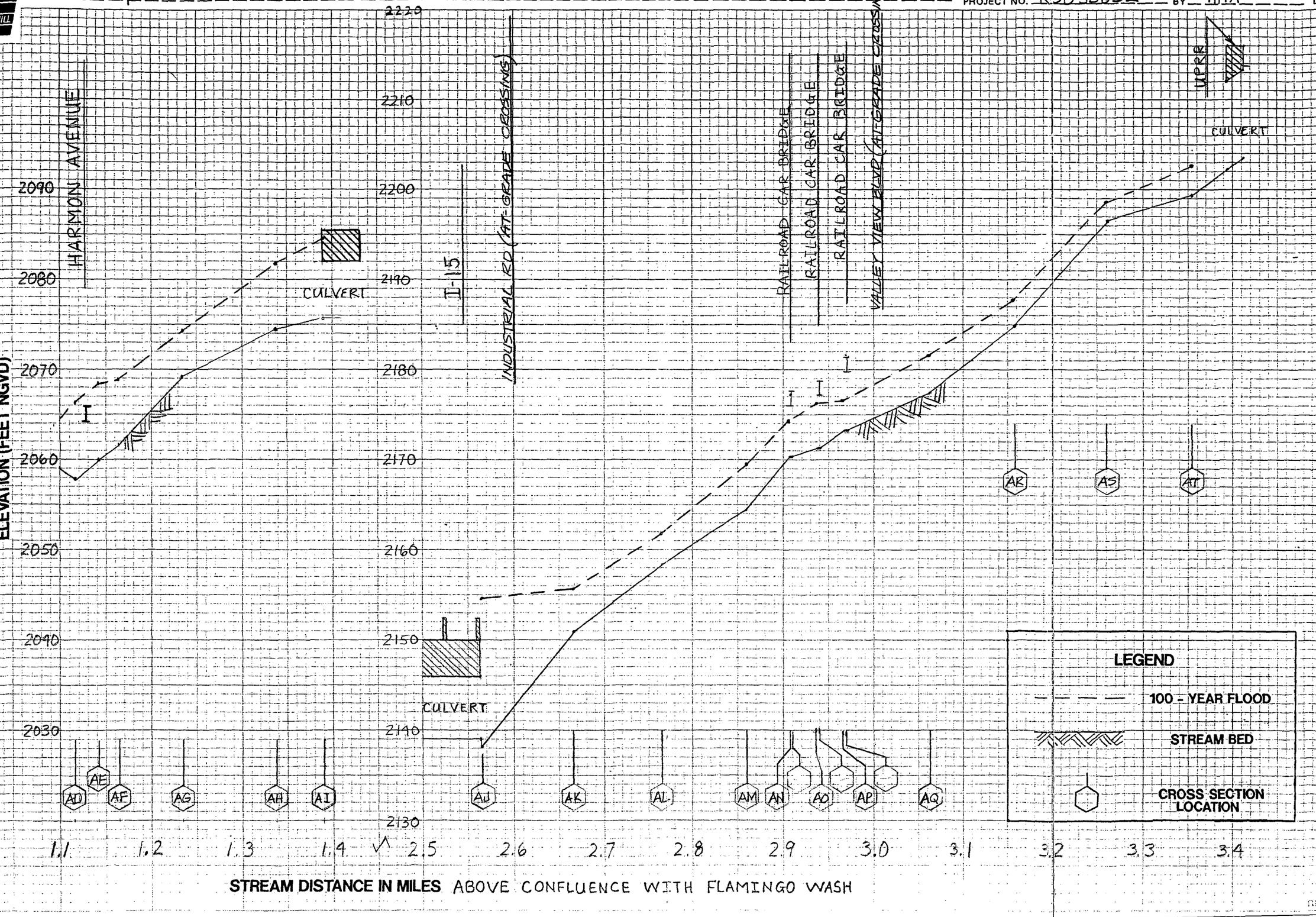
CLARK COUNTY, NV
(UNINCORPORATED AREAS)

1 of 9

SUBJECT Tropicana Wash Profiles

PROJECT NO. RDD33832 BY HMA DATE Oct 92

SHEET NO. ____ OF ____



FLOOD PROFILES

TROPICANA WASH - CENTRAL BRANCH

CLARK COUNTY, NV
(UNINCORPORATED AREAS)

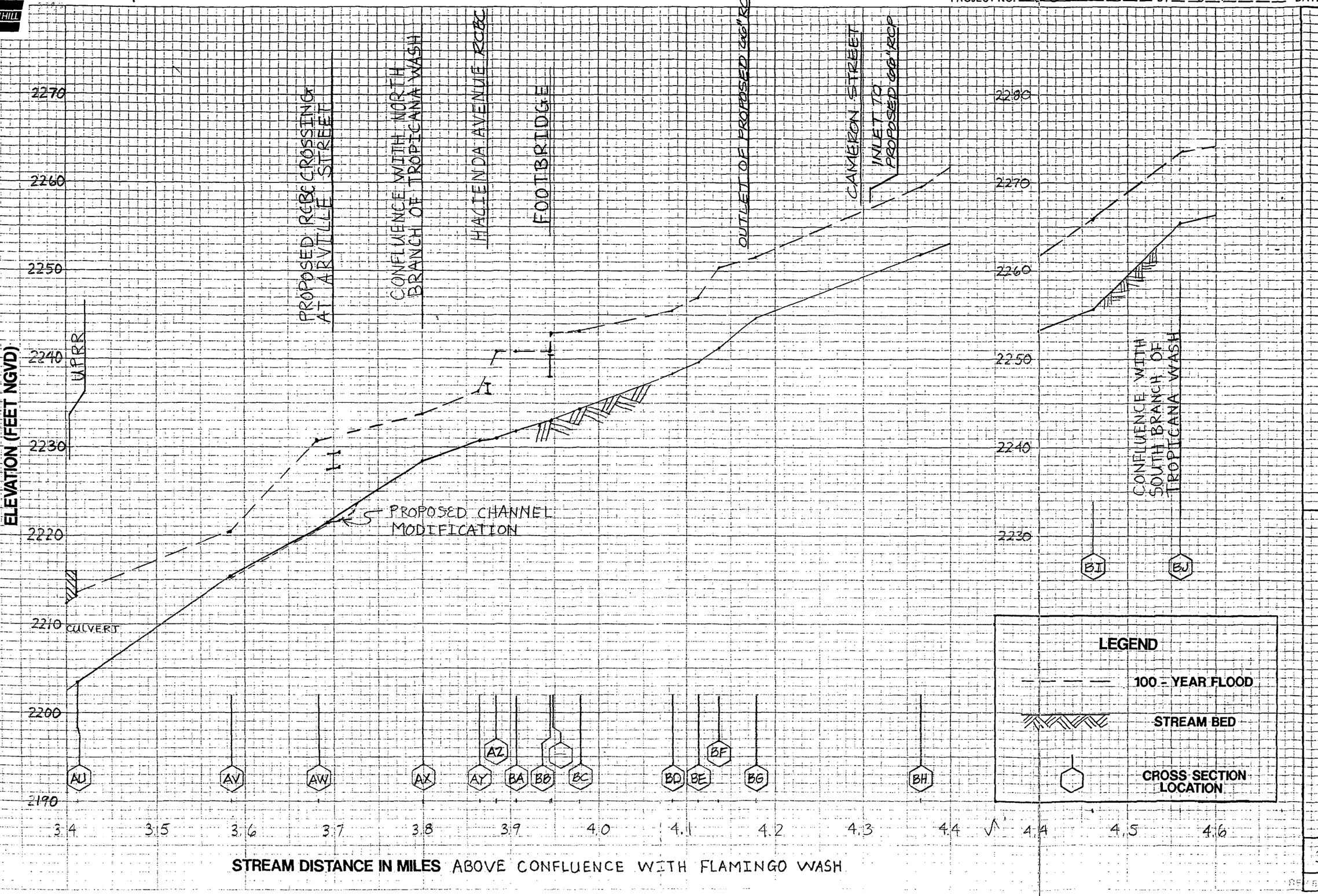
FEDERAL EMERGENCY MANAGEMENT AGENCY

2 of 9

SUBJECT Tropicana Wash Profiles

PROJECT NO. RDD33832 BY HMA DATE Oct '92

SHEET NO. ___ OF ___



FLOOD PROFILES

TROPICANA WASH - CENTRAL BRANCH

CLARK COUNTY, NV
(UNINCORPORATED AREAS)

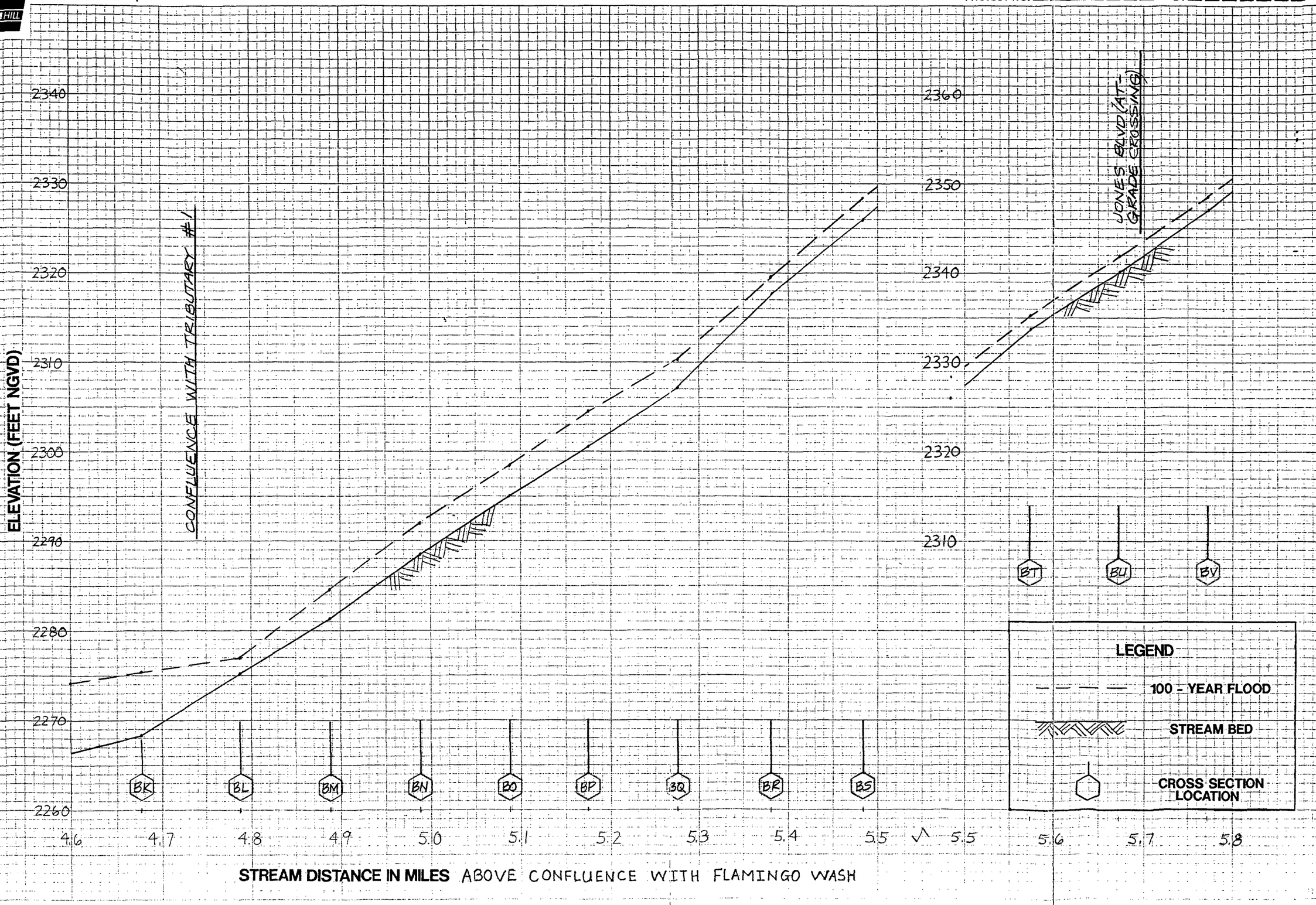
FEDERAL EMERGENCY MANAGEMENT AGENCY

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SUBJECT Tropicana Wash Profiles

PROJECT NO. RDD33832 BY HMA DATE Oct '92

SHEET NO. ____ OF ____



FLOOD PROFILES

TROPICANA WASH - CENTRAL BRANCH

CLARK COUNTY, NV
(UNINCORPORATED AREAS)

FEDERAL EMERGENCY MANAGEMENT AGENCY

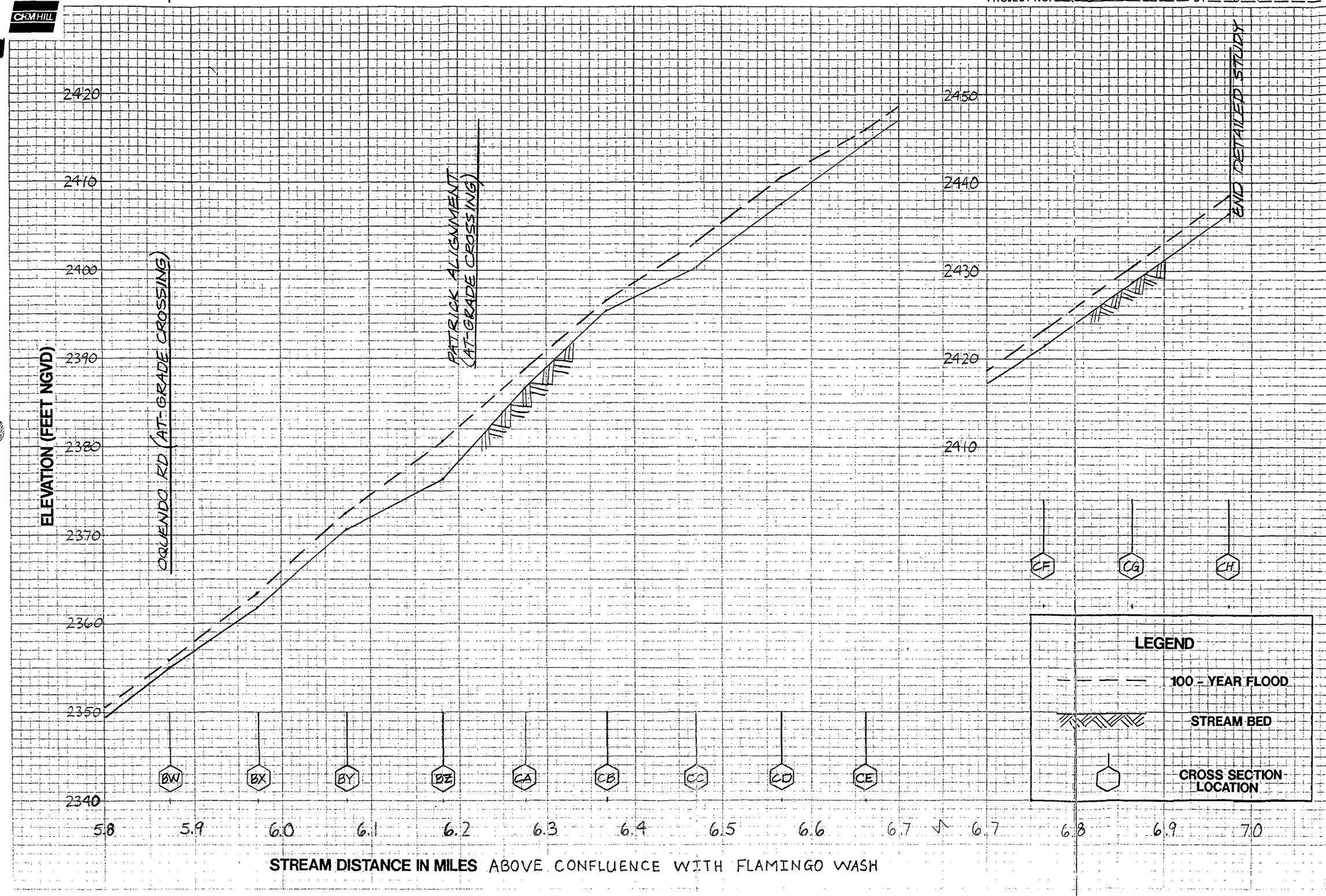
4 of 9

SUBJECT Tropicana Wash Profiles

PROJECT NO. RDD33832 BY HMA

SHEET NO. ____ OF ____

DATE Oct 92



FLOOD PROFILES

TROPICANA WASH - CENTRAL BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

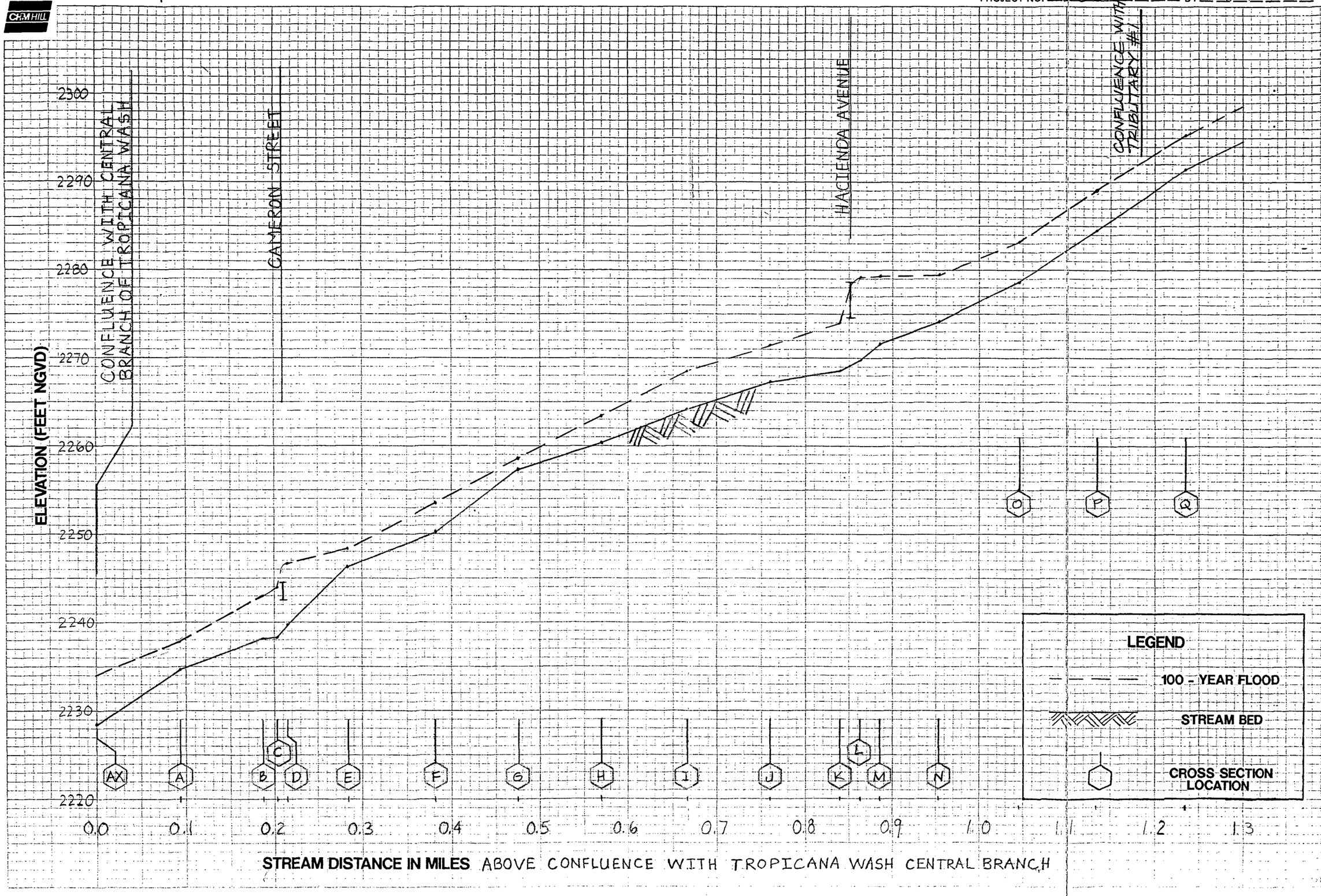
CLARK COUNTY, NV (UNINCORPORATED AREAS)

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SUBJECT Tropicana Wash Profiles

PROJECT NO. RDD33832 BY HMA DATE Oct 92

SHEET NO. ____ OF ____



FLOOD PROFILES

TROPICANA WASH - NORTH BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

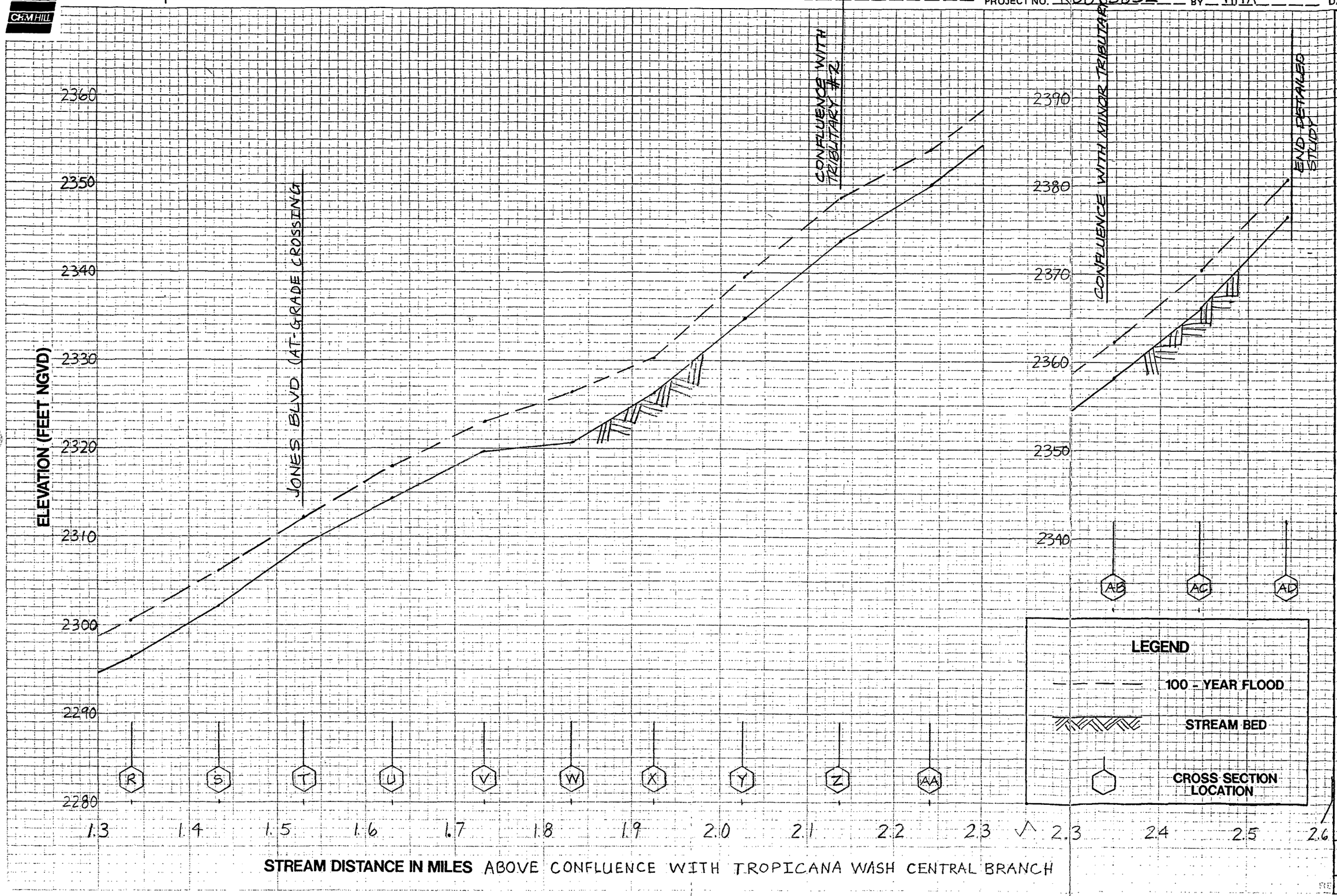
CLARK COUNTY, NV
(UNINCORPORATED AREAS)

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SUBJECT Tropicana Wash Profiles

PROJECT NO. RDD33832 BY HMA DATE Oct '92

SHEET NO. ____ OF ____



FLOOD PROFILES

TROPICANA WASH - NORTH BRANCH

CLARK COUNTY, NV
(UNINCORPORATED AREAS)

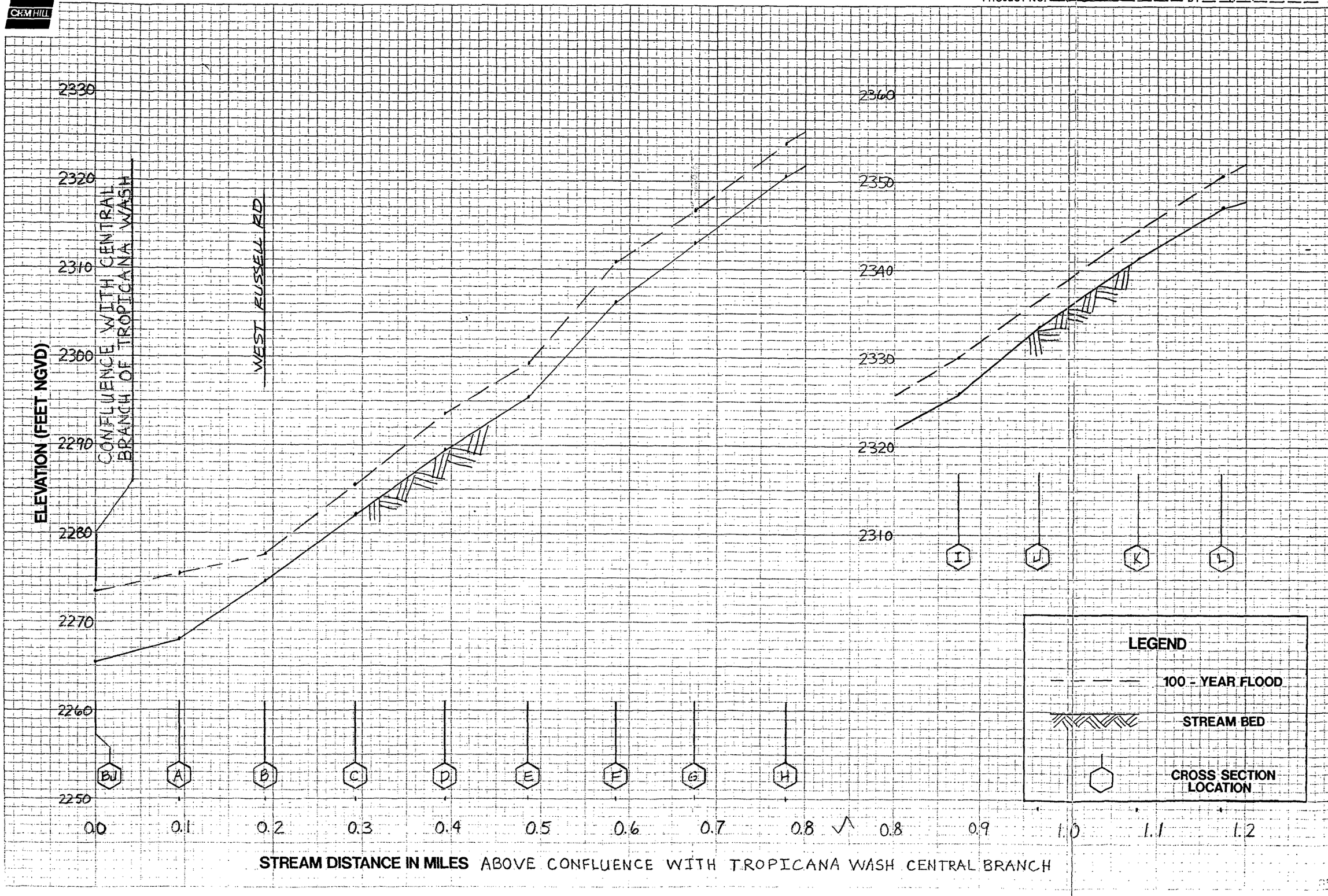
FEDERAL EMERGENCY MANAGEMENT AGENCY

REV 6/84 FORM

SUBJECT Tropicana Wash Profiles

PROJECT NO. RDD33832 BY HMA DATE Oct '92

SHEET NO. ____ OF ____



FLOOD PROFILES

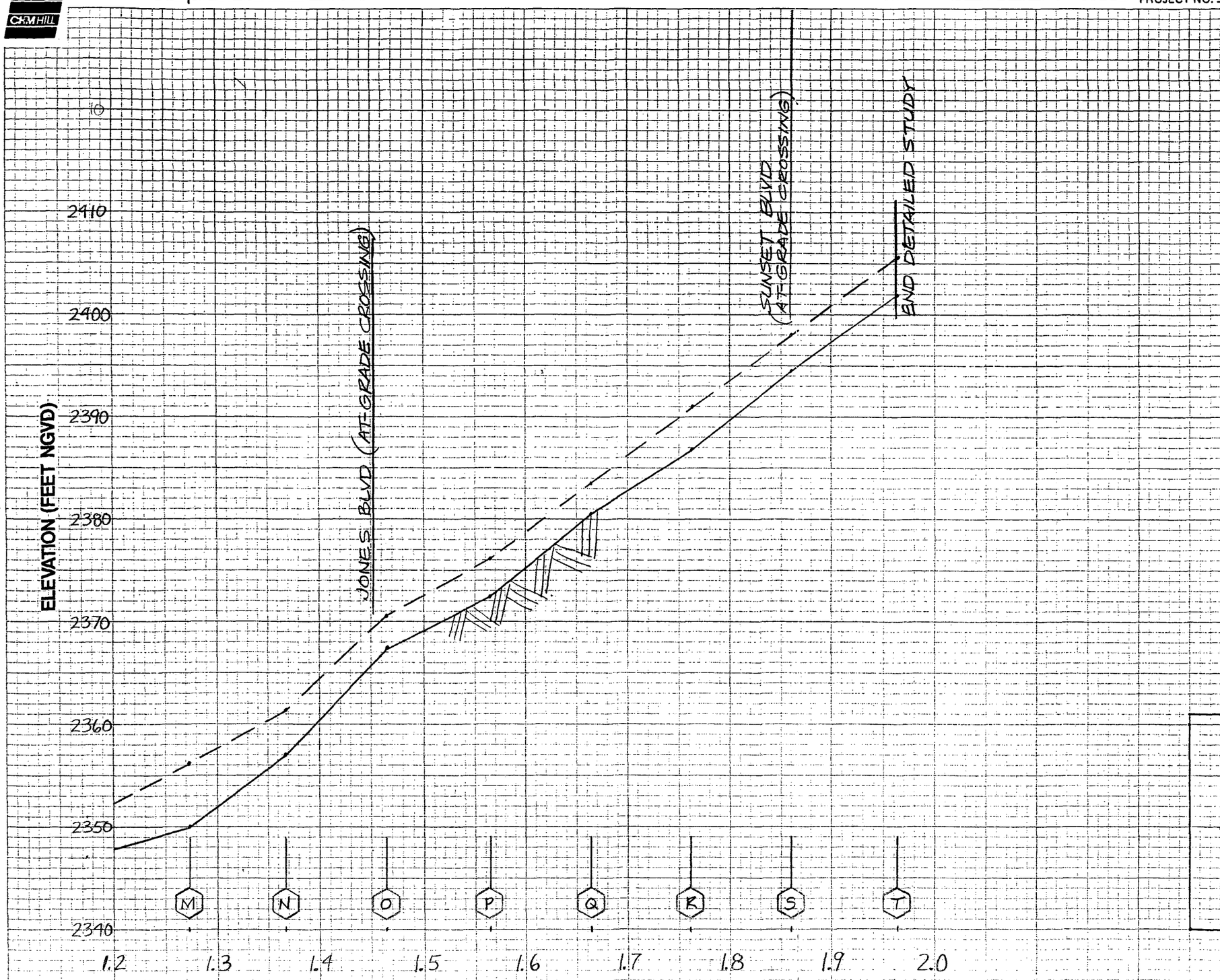
TROPICANA WASH - SOUTH BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLARK COUNTY, NV
(UNINCORPORATED AREAS)

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SUBJECT Tropicana Wash Profiles PROJECT NO. RDD33832 BY HMA DATE Oct '92 SHEET NO. ____ OF ____



LEGEND

100 - YEAR FLOOD

STREAM BED

CROSS SECTION LOCATION

FLOOD PROFILES

TROPICANA WASH - SOUTH BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLARK COUNTY, NV
(UNINCORPORATED AREAS)

9 of 9

Headwater conditions at the I-15/MGM culvert were previously modeled for the 100-year discharge (Reference 12). Since the original study, the potential headwater elevation has been raised by the addition of Jersey barriers. New headwater conditions were estimated with the Federal Highway Administration computer model HY8. The model was initially calibrated to the previous study and then the allowable headwater conditions were raised as appropriate. The resulting headwater elevation was used as the starting water surface elevation for the backwater model. The new culvert flows were subtracted from the flowrate at the head of the culvert to obtain the break out flows at I-15.

A 9.75-foot-diameter CMP culvert and a 2-barrel, 36-inch CMP structure at the UPRR crossing, the RCBC culvert at Paradise Road, and the proposed culvert at Arville Street were also modeled with HY8 and the results inserted into the HEC-2 model using the X5 record option.

The hydraulic analysis for the approximate methods was performed by normal depth calculations. The cross sections were constructed from topography shown on the 1984 Flood Insurance Rate Maps and field reconnaissance.

The breakout flow characteristics at Cameron Street, the UPRR, and the I-15/MGM culvert were modeled by approximate methods.

3.3 Modeling Results

A summary of the discharges used in the hydraulic analysis is in Table 4.

Flood profiles showing the computed floodplain water-surface elevations were drawn and can be found at the end of this report (Exhibit).

Results of the modeling indicate that flow breaks out of the main Tropicana channel at two locations; namely, at the UPRR culverts and the I-15/MGM culvert. In addition flow splits occur at the proposed Cameron Street and Arville Street culverts.

At Cameron Street, the wash branches into two channels with one turning approximately 600 feet to the north and the other flowing east to the UPRR grade. The proposed culvert to be installed under CCPW SID No. 67 was modeled using HY8. The culvert begins upstream of the flow split and outlets into the northern branch. Flow through the culvert was estimated through an iterative approach by balancing the culvert capacity with the

SECTION 9

MAPPING INFORMATION

Study Contractor: CH2M HILL

MAPPING INFORMATION INDEX

CLARK COUNTY, NEVADA
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

TYPE OF MAP	MAP DATE	NO. OF SHEETS	EXHIBIT NO.
MAPPING SUMMARY			
STUDY LIMITS			
DRAFT WORK MAP	1992 (base)	5	M1 (SEPARATE)
DRAFT WORK MAPS	1984 (base)	4	M2 (SEPARATE)

Study Contractor: CH2M HILL

MISCELLANEOUS REFERENCE MATERIALS INDEX

CLARK COUNTY, NEVADA
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

INFORMATION TYPE	ITEM DATE	EXHIBIT NO.
APPROXIMATE METHODS FIELD SHEETS AND PHOTOS	6/92	msc-1
APPROXIMATE METHODS CROSS-SECTIONS	6/92	msc-2
BRIDGE FIELD DATA	6/92	msc-3
N VALUE FIELD NOTES	6/92	msc-4
CCPW DATA BASE RESEARCH	6/92	msc-5
AERIAL PANEL SURVEYS	6/92	msc-6
CHECK CROSS-SECTIONS	6/92	msc-7
ELEVATION REFERENCE MONUMENTS	10/92	msc-8

Study Contractor: CH2M HILL

MAPPING INFORMATION

WORK MAP DELINEATION SUMMARY

CLARK COUTY, NEVADA

(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

TROPICANA WASH

FIGURE 1, ATTACHED, SHOWS THE LIMITS FOR THE 1992 MAPPING (NEW MAPPING). IN GENERAL, NEW MAPPING WAS PERFORMED FOR AREAS STUDIED BY DETAILED METHODS. 100-yr floodplain and 100-yr FLOODWAY BOUNDARIES WERE PLOTTED ON THE NEW MAPPING.

THE 1984 MAPPING WAS GENERALLY USED FOR THE APPROXIMATE METHODS STUDY. 100-yr FLOODPLAINS (APPROXIMATE) WERE OVERLAYED ON THE 1984 MAPPING PREPARED FOR THE 1984 FIS.

FLAMINGO RD

TROPICANA AVE

SUNSET ROAD

GENERAL AREA OF DETAILED STUDIES
1992 MAPPING LIMITS

GENERAL AREA OF APPROXIMATE STUDIES
1984 MAPPING

NORTH BRANCH

CENTRAL BRANCH

SOUTH BRANCH

UN-NAMED WASH

TROPICANA WASH

AIRPORT WASH

McCARRAN INTERNATIONAL AIRPORT

I-15

RAINBOW BLVD

scale: 1" = 4000' +/-

Key

Reaches studied by detailed methods

Reaches studied by approximate methods

Area of new mapping limits.

FIGURE 1

STUDY LIMITS

FLOOD INSURANCE STUDY FOR TROPICANA WASH
CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

CH2M HILL

SECTION 10

MISCELLANEOUS REFERENCE MATERIALS

Study Contractor: CH2M HILL

MISCELLANEOUS REFERENCE MATERIALS INDEX

CLARK COUNTY, NEVADA
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

INFORMATION TYPE	ITEM DATE	EXHIBIT NO.
APPROXIMATE METHODS FIELD SHEETS / PHOTOS		10-1
APPROXIMATE METHODS CROSS-SECTIONS		10-2
BRIDGE FIELD DATA		10-3
N VALUE FIELD NOTES		10-4
CCRD DATA BASE RESEARCH		10-5
AERIAL PANEL SURVEYS		10-6
CHECK CROSS SECTIONS		10-7
ELEVATION REFERENCE MARKS		10-8

EXHIBIT 10-1

APPROXIMATE METHODS FIELD SHEETS

AND PHOTOS

SUBJECT Tropicana Wash BY HMA DATE 6/10/92

Approx Methods SHEET 1 OF 3

PROJECT NO. RDD 33832

North Tropicana Wash

Main Segment	Tributaries	#secs ✓	order	observed in field?	photo # (s)	basin delineated lft. bk	basin delineated rt. bk
NM-1	NT-1-a	✓	2	✓		✓	
	-b		1			✓	✓
	-c		1			✓	✓
NM-2	NT-2-a	✓	3	✓	1-15:06	✓	✓
	-b		1			✓	✓
	-c	✓	3	✓	1-15:30,31	✓	✓
	-d	✓	2	✓	15:41	✓	✓
	-e		1			✓	✓
	-f		1			✓	✓
	-g	✓	2	✓	15:49,50	✓	✓
	-h		1			✓	✓
	-i		1			✓	✓
NM-3	NT-3-a	✓	2	✓	15:12,13	✓	see Progress sheets
	-b		1				
	-c	✓	2	✓	15:30		
	-d		1				
	-e	✓	2		10:46,48		
	-f		1				
	-g		1				
NM-4	NT-4-a	✓	2	✓	see NT-9-b		
	-b	✓	2	✓	15:22		
	-c	✓✓	2	✓✓	(1) 16:00,01 (2) 16:46,50		
	-d	✓✓	2	✓✓	(1) ? (2) 7:10,11		
	-e		1				
	-f	✓	2	✓	2@17:35		
	-g		1				
	-h		1				
	-i		1				
	-j		1				
	-k		1				
NM-5	NT-5-a	✓	3	✓	2@16:09		
	-b	✓	3	✓	16:19		
	-c	✓	2	✓	2@16:32		
	-d		1				
	-e		1				
	-f	✓	2	✓	16:36		
	-g		1				

FORM 18B

SUBJECT Trop. Wash. Approx Methods BY HMA DATE 6/10/92

SHEET 2 OF 3

PROJECT NO. RDD 33832

Main Seg.	Tributary		#secs	observed in field	photo #	basin delineated lt. bk.	rt. bk.
NM-5, cont.	NT-5-	h	✓ 2				
		i	✓✓ 2	✓✓	1) 16:16 17:05 2) 2@16:59		
		j					
		k					
		l					
		m					
Central Tropicana Wash							
CM-1							
CM-2	CT-2-	a	✓ 3	✓	14:38,39	✓	✓
		b	? 2			✓	✓
		c				✓	✓
		d				✓	✓
		e	✓ 2	✓	2@14:49	✓	✓
		f	✓ 2	✓	14:57	✓	✓
		g					
		h					
		i					
CM-3	CT-3-	a	✓ 2	✓	2@11:19		
		b	✓ 2	✓	11:08		
		c					
		d					
		e					
CM-4	CT-4-	a	✓ 3	✓	2@15:07		
		b	✓ 2	✓	15:02,05		
		c	✓ 2	✓	14:51,52		
		d					
		e					
		f					
		g	✓✓ 2	✓✓	1) 2@15:00 2) 15:15		
		h					
		i					
SM-1	ST-1-	a	✓ 2	✓	2@13:34		
		b					
		c	✓ 2	✓	13:43,44		
		d	✓ 2	✓	13:38,39		
		e	✓ 2	✓	11:39,40		
		f					
		g					

See progress sheets

FORM 18B

SUBJECT Trop. Wash, Approx Methods BY HMA DATE 6/10/92

SHEET 3 OF 3

South Tropicana Wash PROJECT NO. RDD 33832

Main Seg.	Tributary	Order #secs	observed in Field	photo #(s)
SM-1, con't	ST-1-h	1 1		
SM-2	ST-2-a	✓ 3	✓	13: ,23,24,27
	b	✓ 3	✓	11:51,52,53
	c	✓ 3	✓	14:00
	d	✓ 3	✓	14:43
	e	✓ 2		
	f	✓ 2	✓	15:24
	g	1		
	h	1		
	i	1		
	j	1		
	k	1		
	l	✓ 2	✓	14:27
	m	✓ 2	✓	2(?) @ 14:34
	n	1		
	o	1		
	p	1		
	q	/// 2	vvv	(1) see ST-2-b (3) 13:51, 52 (3) 14:19
	r	1		
	s	1		

Notes

FORM 18B

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: NT-1-a
2. Mark section on map or photograph. ✓
3. Estimate bottom width (sandy portion of channel): 50'
4. Photograph main channel ✓
5. Photograph overbank ✓
6. Note highwater marks:
   Type: silts
   Elevation: 1.5'
7. Signs of Overbank Flooding/Sheet Flooding? yes, mudmarks
8. Signs of Erosion? no
9. Signs of Deposition? yes
10. Bedload size: fine sand, some small gravel
11. Obstructions which could cause backwater? no

Office:

1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos: (0.045 - 0.05)
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:

photo @ 14122 ± (?)

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

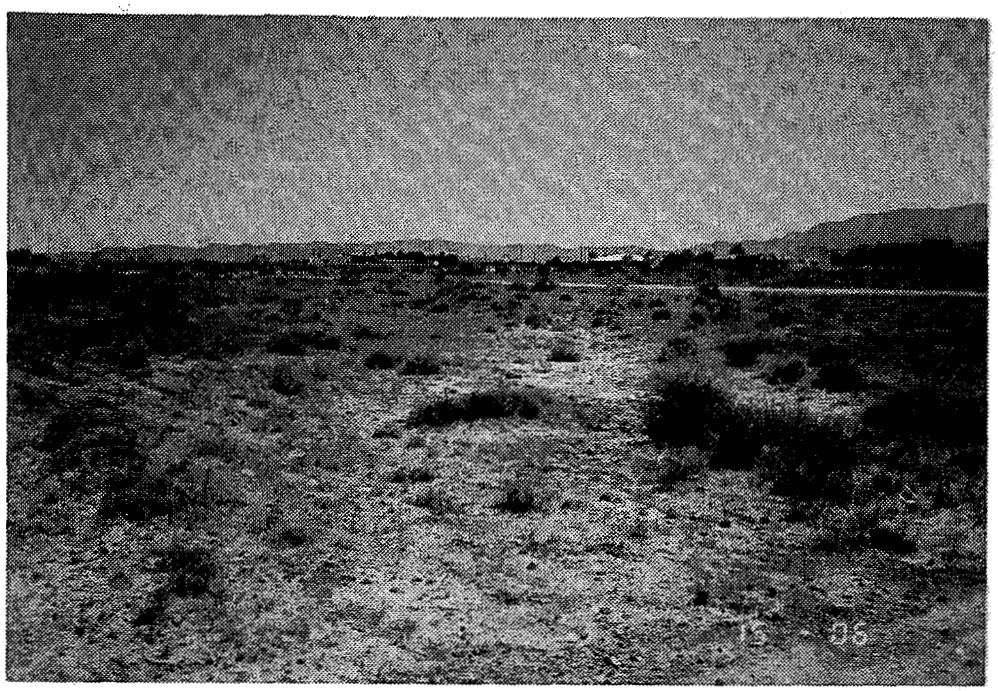
Field Data:

1. Section Location: NT-2-9
2. Mark section on map or photograph.
3. Estimate bottom width (sandy portion of channel):
4. Photograph main channel
5. Photograph overbank
6. Note highwater marks:
   Type: sheetflow
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion? no
9. Signs of Deposition? no
10. Bedload size: silt
11. Obstructions which could cause backwater? no

Office:

1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos:
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:

15:06 upstream from road, upstream from sectio
recent grading obscures wash
not contained @ section



NT-2-a

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

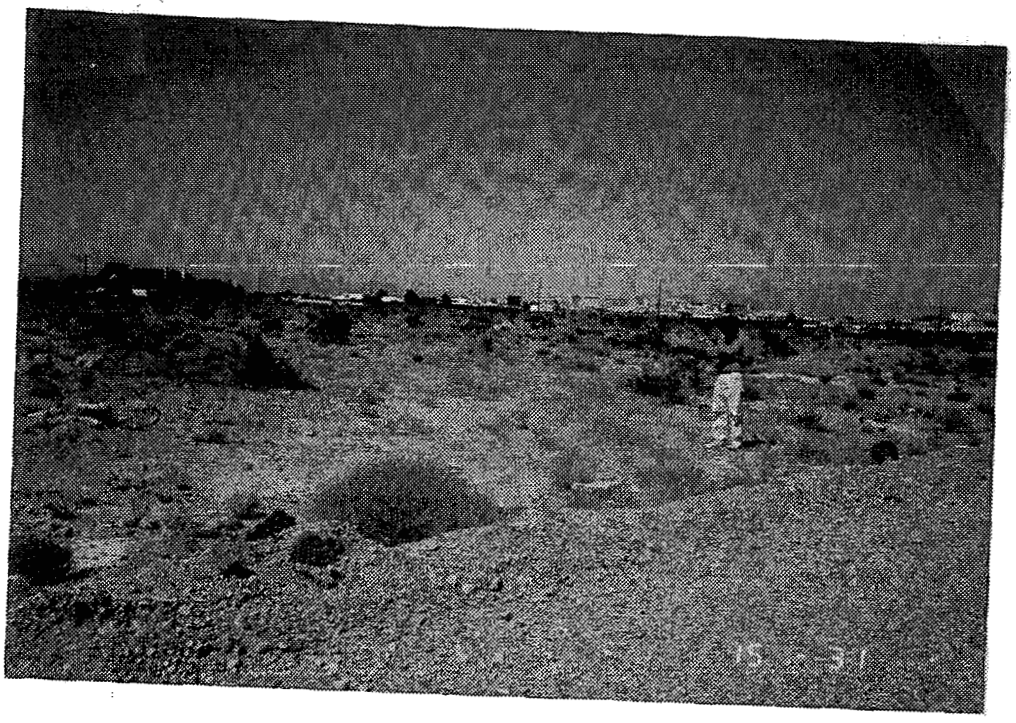
Field Data:

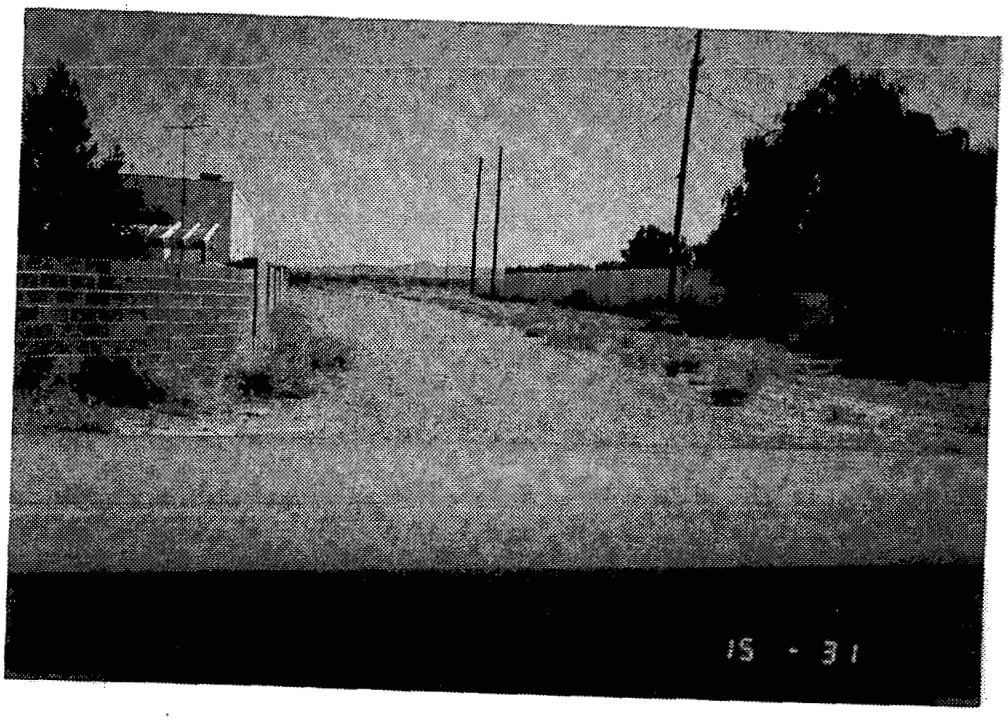
1. Section Location: NT-2-C
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 2L
4. Photograph main channel ✓
5. Photograph overbank ✓
6. Note highwater marks: sheet flow
   Type: ~~sand~~
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? ✓ sht
8. Signs of Erosion? little
9. Signs of Deposition? no
10. Bedload size: silt
11. Obstructions which could cause backwater? no

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.025
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

15:30 on road looking downstream
15:31 " " " upstream through alley





NT-2-L

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

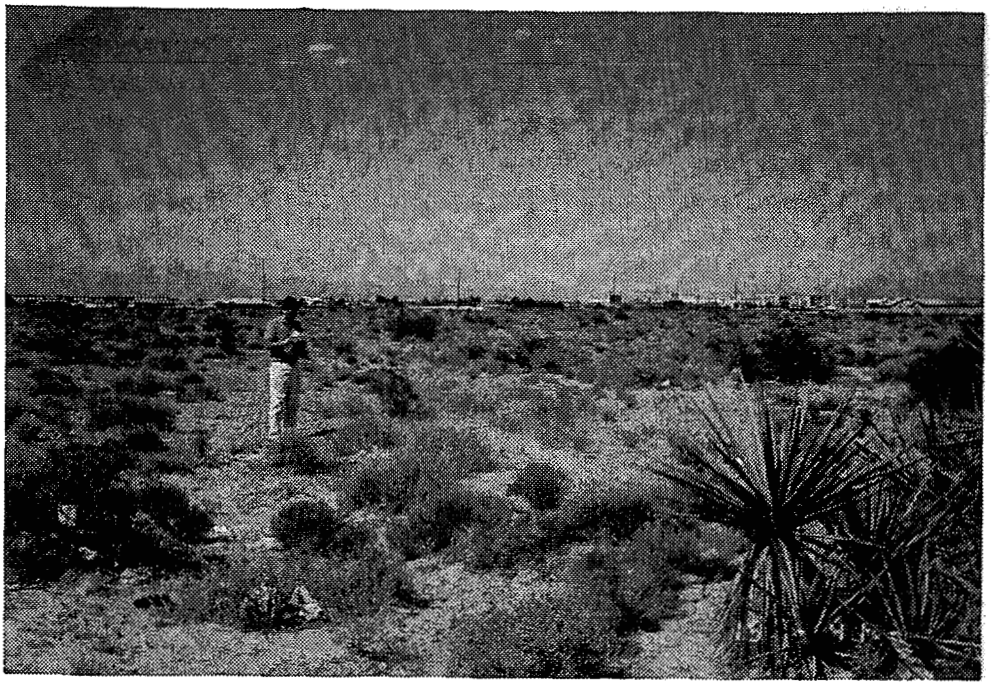
Field Data:

1. Section Location: NT-2-d
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 8'
4. Photograph main channel ✓
5. Photograph overbank ✓
6. Note highwater marks:
   Type: silt, fine sand
   Elevation: 0.5'
7. Signs of Overbank Flooding/Sheet Flooding? yes
8. Signs of Erosion? no - carbonate bed
9. Signs of Deposition? no
10. Bedload size: ?
11. Obstructions which could cause backwater? no

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.03
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

15:41, near road looking @ section
little chance of sed bulking



NT-2-d

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

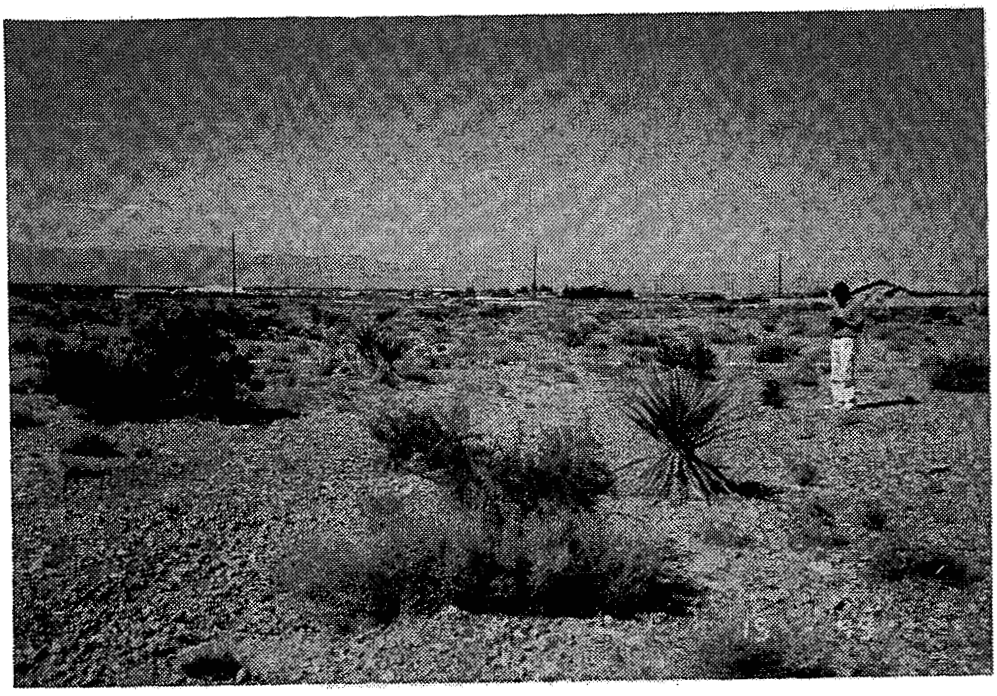
Field Data:

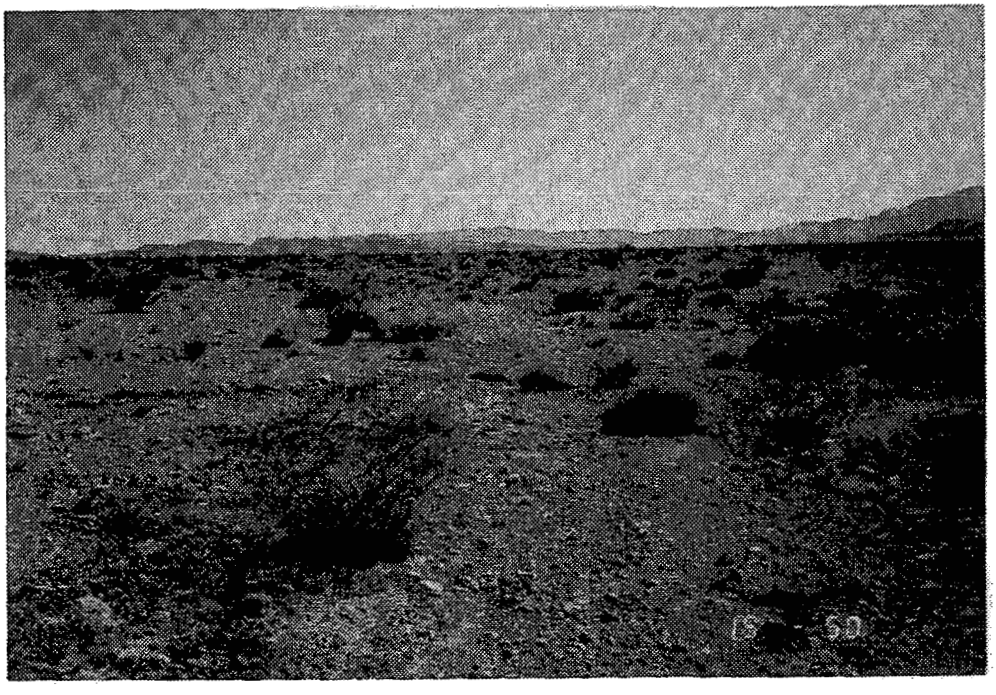
1. Section Location: NT-2-9
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 15'
4. Photograph main channel ✓
5. Photograph overbank ✓
6. Note highwater marks:
   Type: mossy stuff
   Elevation: 0.5'
7. Signs of Overbank Flooding/Sheet Flooding? yes
8. Signs of Erosion? little in bed
9. Signs of Deposition? no
10. Bedload size: can't tell
11. Obstructions which could cause backwater? no

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.025
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

15:50 looking downstream from section
15:50 " upstream " "





NT-2-9

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

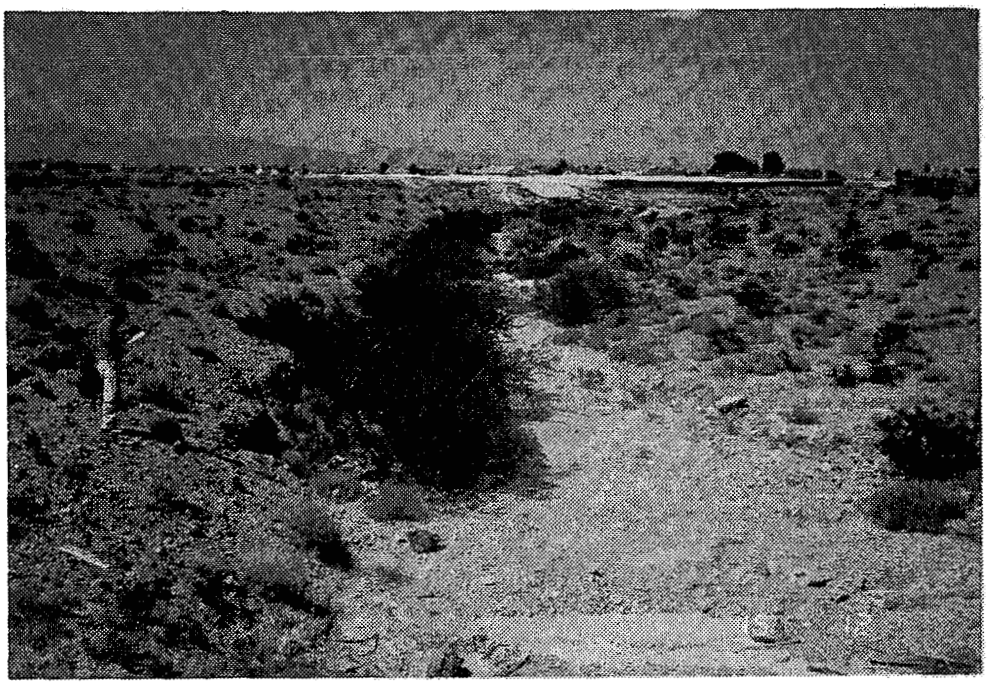
1. Section Location: NT-3-a
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 15'
4. Photograph main channel ✓
5. Photograph overbank _____
6. Note highwater marks:
   Type: no, some silt
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? no
8. Signs of Erosion? yes, incised left bank
9. Signs of Deposition? no
10. Bedload size: 2" gravel
11. Obstructions which could cause backwater? no

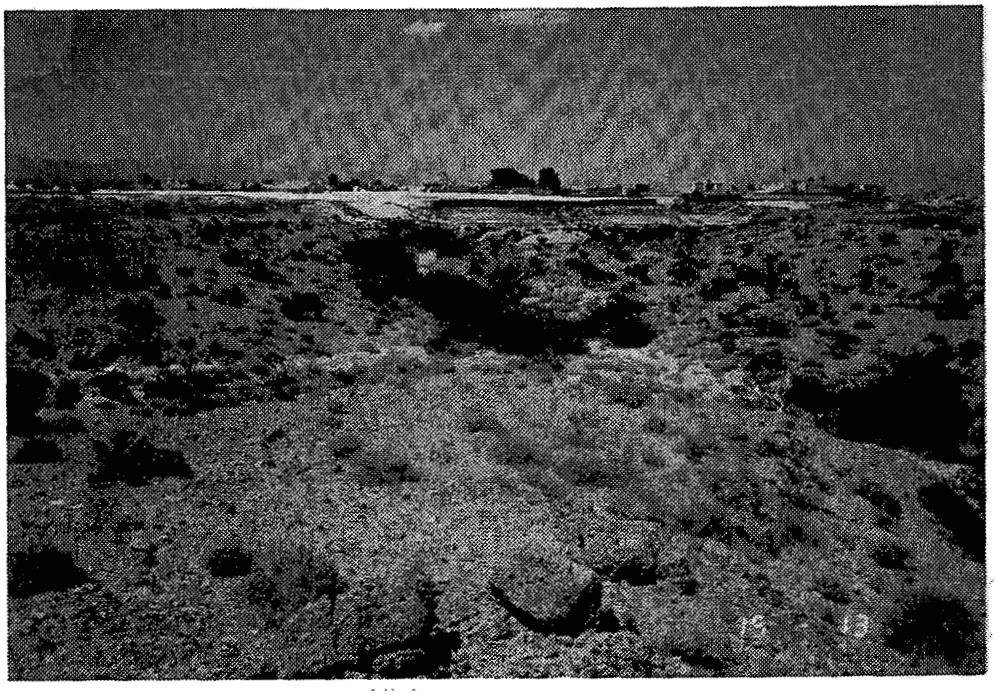
Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.035
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

photo 15:12 looking downstream from ℄ road
15:13 on left bank looking downstream

~~8~~ 9'
floodplain below terrace
headcut ends 50' s. of E-W road.





NT-3-a

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

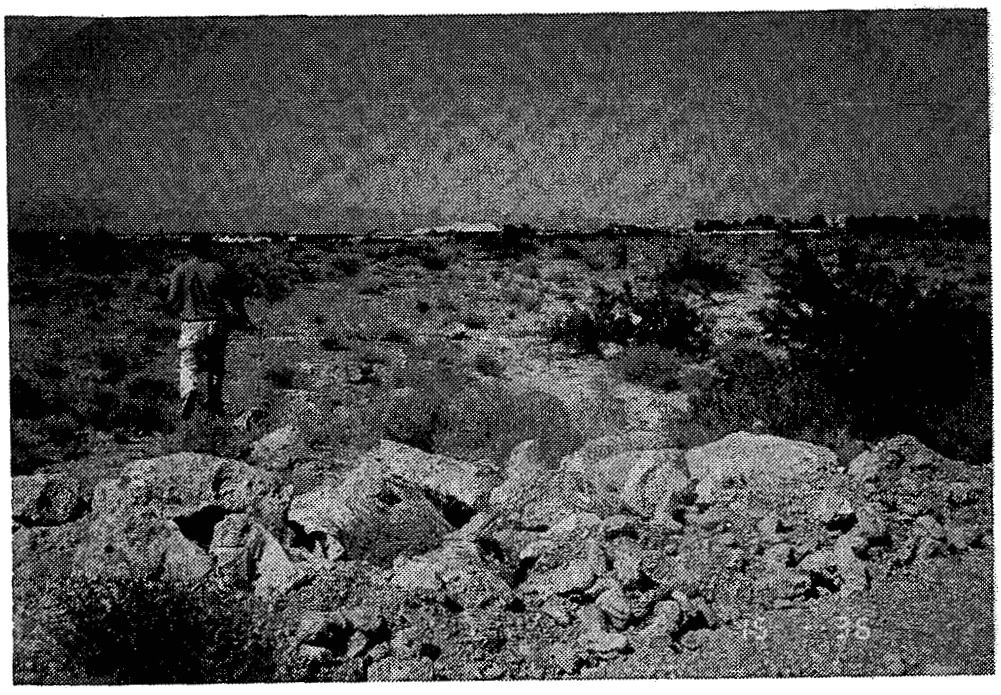
Field Data:

1. Section Location: NT-3-C
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 8'
4. Photograph-main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: silt
   Elevation: 0.5'
7. Signs of Overbank Flooding/Sheet Flooding? yes
8. Signs of Erosion? no
9. Signs of Deposition? no
10. Bedload size: silt
11. Obstructions which could cause backwater? no

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.025
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

15:36 - looking downstream from road to section



NT-3-C

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

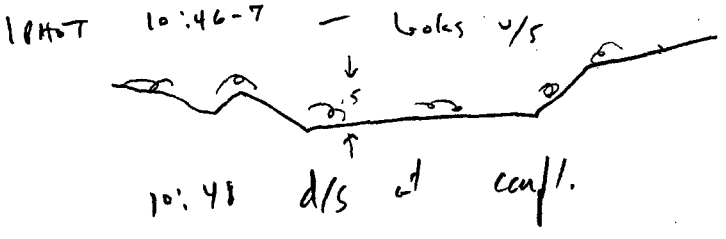
- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

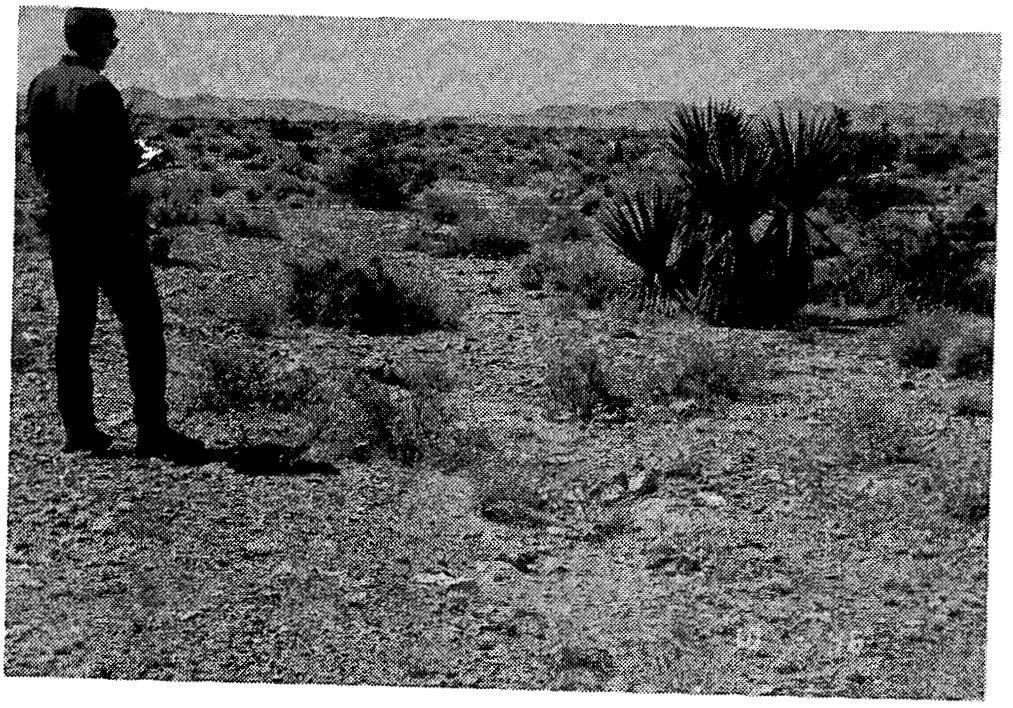
Field Data:

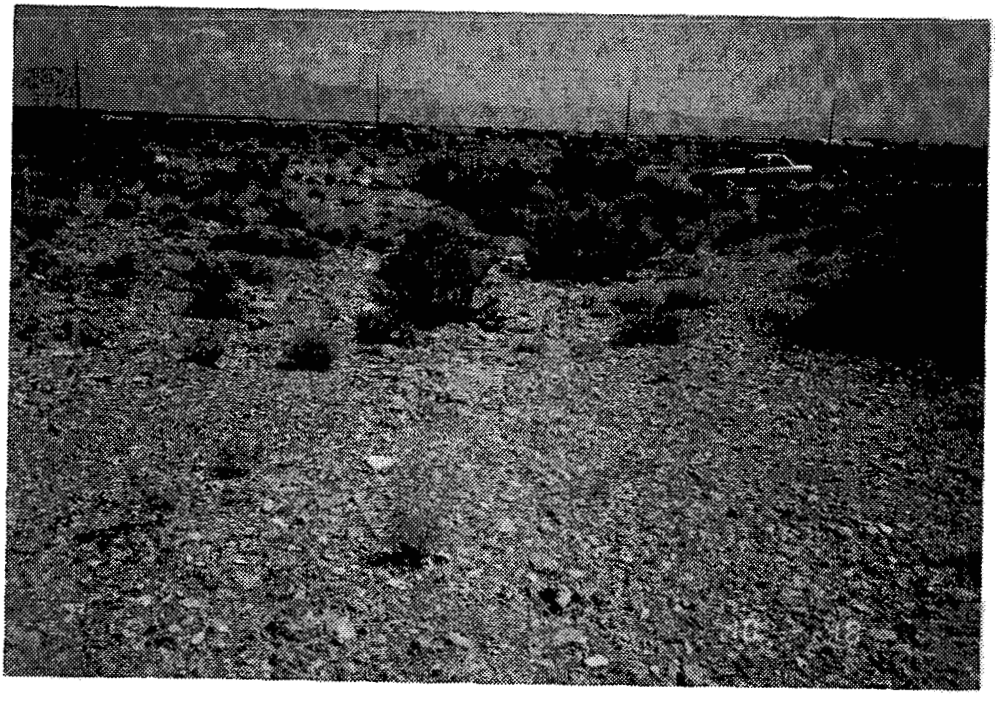
1. Section Location: NT-3-e
2. Mark section on map or photograph. ✓
3. Estimate bottom width (sandy portion of channel): ✓
4. Photograph main channel ✓
5. Photograph overbank ✓
6. Note highwater marks:
   Type: Silt
   Elevation: ½ ft
7. Signs of Overbank Flooding/Sheet Flooding? No signs, possible
8. Signs of Erosion? Some ½ ft + $CaCO_3$ -N
9. Signs of Deposition? No.
10. Bedload size: ? $CaCO_3$ in bed - silt in OB
11. Obstructions which could cause backwater? No

Office:

1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos: .025 - .030
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:







NT-3-e

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: NT-4-a see NT-4-b
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): _____
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bedload size: _____
11. Obstructions which could cause backwater? _____

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: _____
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

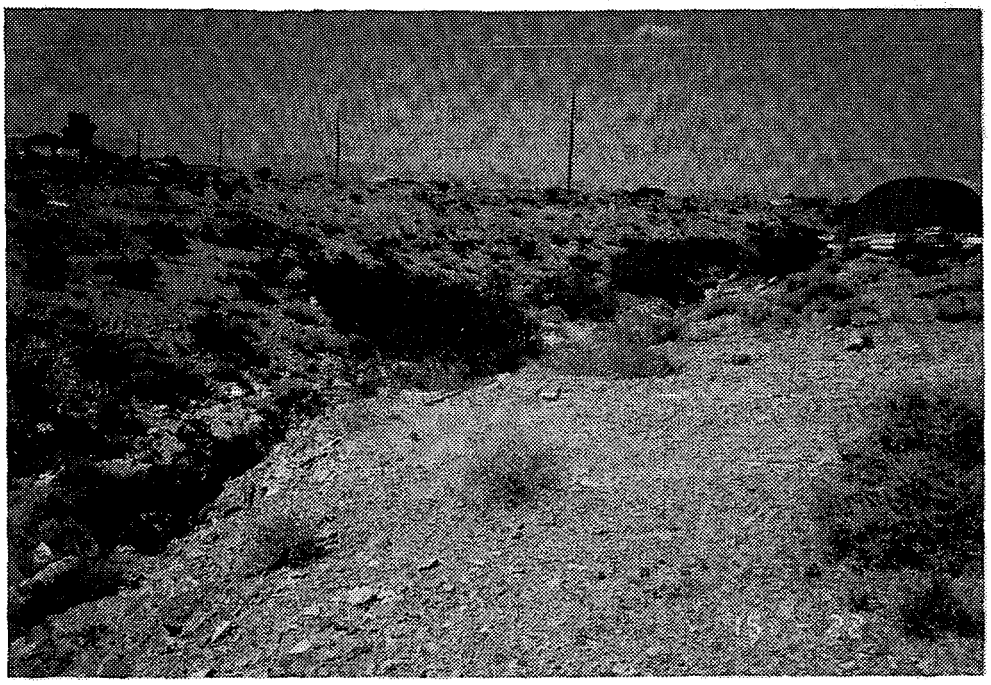
Field Data:

1. Section Location: NT-4-b
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 20'
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: silt
   Elevation: 3'
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? well incised
9. Signs of Deposition? no
10. Bedload size: 1" + finer gravels
11. Obstructions which could cause backwater? no

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.035
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

photo looking downstream
15:22
banks = floodplain limits



NT-4-b, a

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

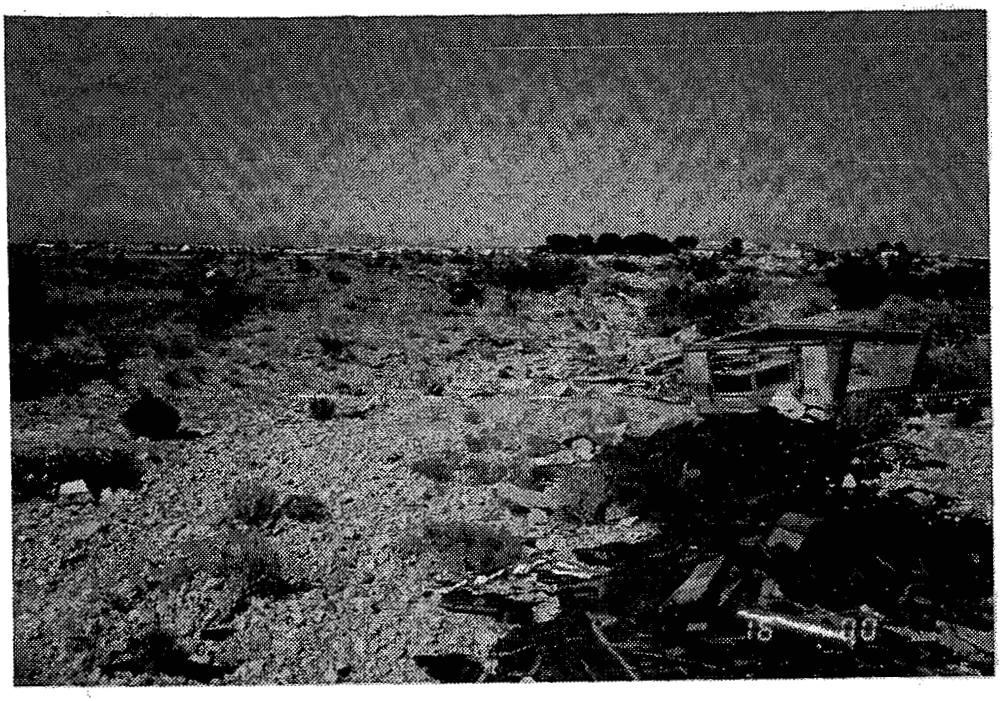
1. Section Location: NT-4-C ① d/s section
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 15'
4. Photograph main channel ✓
5. Photograph overbank _____
6. Note highwater marks:
   Type: silts
   Elevation: 0.5-0.75'
7. Signs of Overbank Flooding/Sheet Flooding? little
8. Signs of Erosion? little - low incised banks
9. Signs of Deposition? small gravel bar (could be fill)
10. Bedload size: small gravel 1" -
11. Obstructions which could cause backwater? no - some fill on left bank

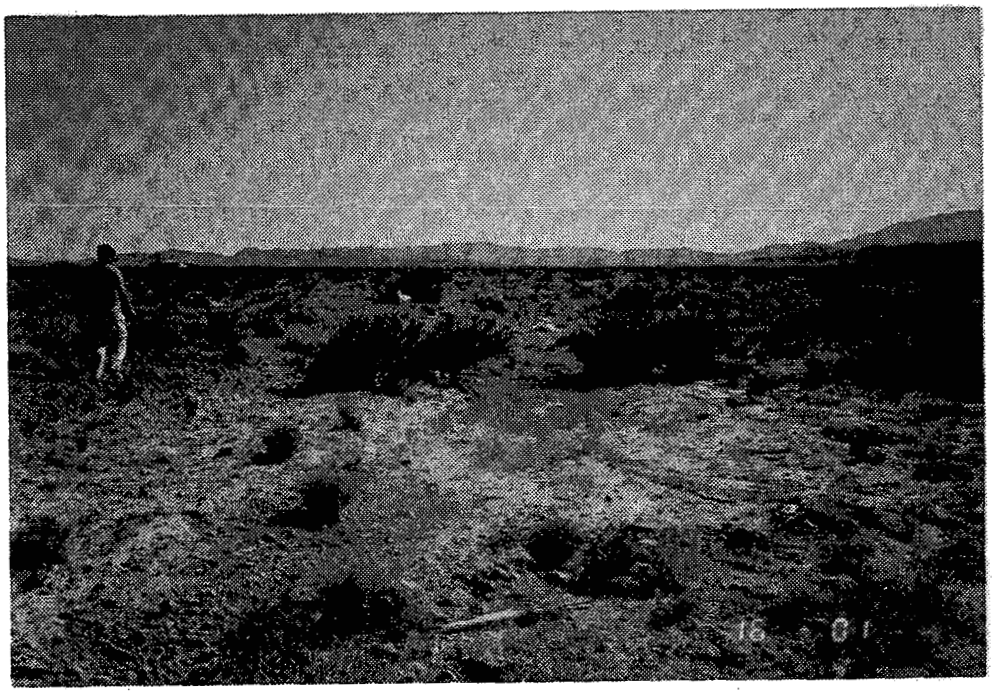
Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.025
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

16:00
15:59 WB-
^ on road looking downstream

16:01 from road looking upstream to section





NT-4-C ①

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

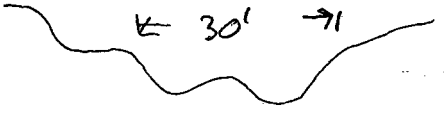
Field Data:

1. Section Location: NT-4-C (2) u/s section
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 30'
4. Photograph main channel ✓
5. Photograph overbank _____
6. Note highwater marks: not much
   Type: Sand
   Elevation: 1'
7. Signs of Overbank Flooding/Sheet Flooding? no
8. Signs of Erosion? yes, scour around veg
9. Signs of Deposition? no
10. Bedload size: coarse sand, fine gravel cardboard box
11. Obstructions which could cause backwater? no

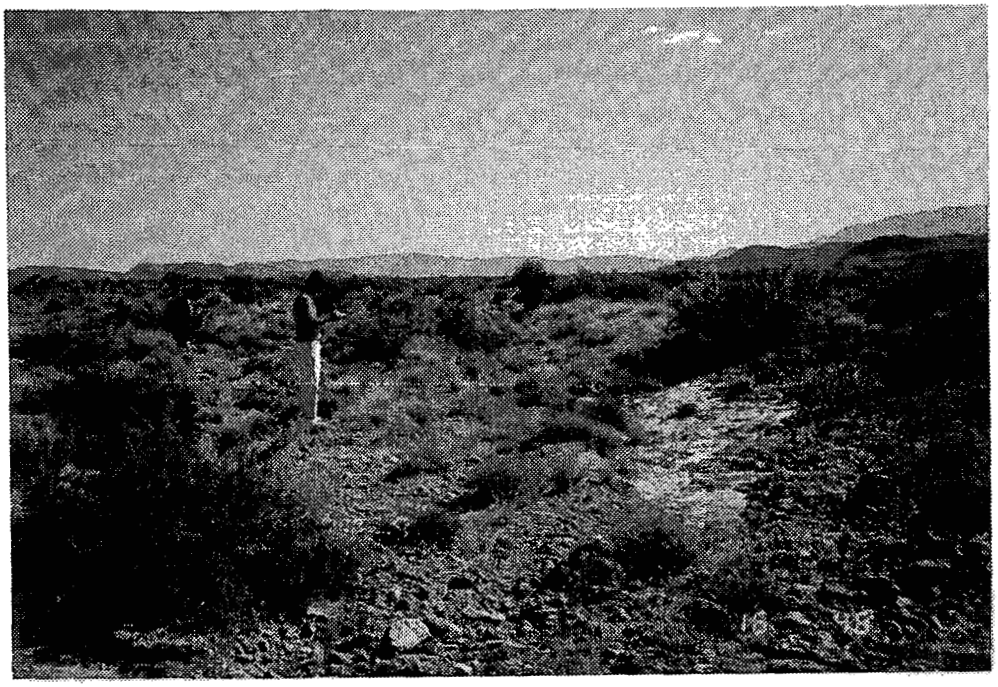
Office:

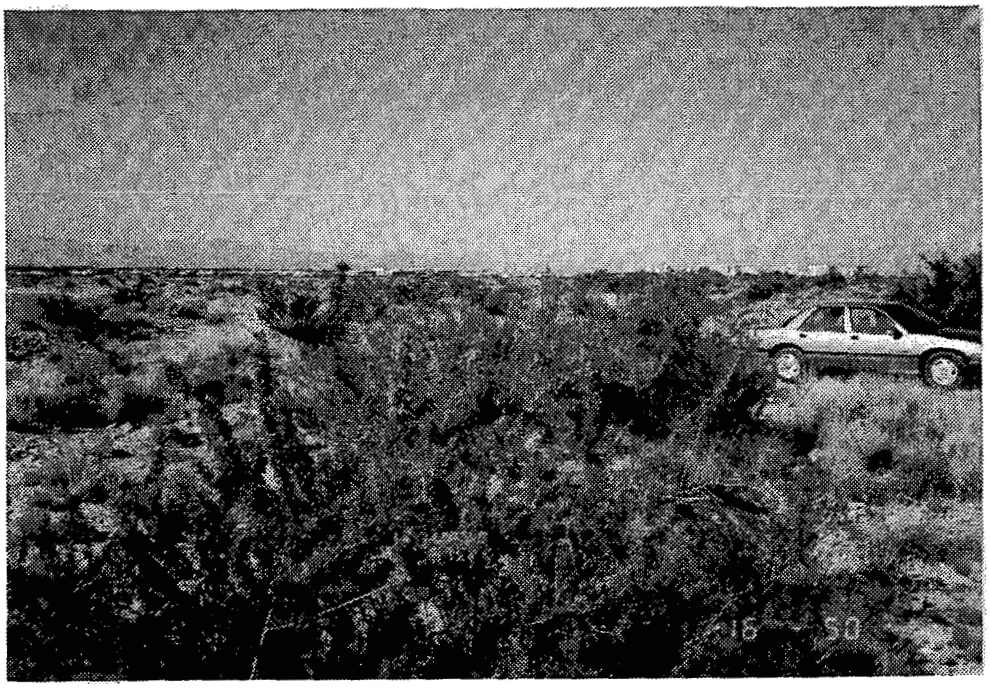
1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.035
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

photo 16:46 upstream to section



16:50 looking downstream





NT-4-C (2)

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

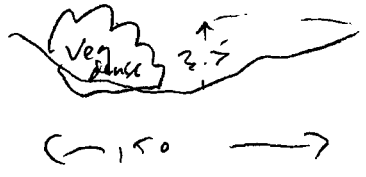
Field Data:

1. Section Location: NT-4-d ① u/s section
2. Mark section on map or photograph. —
3. Estimate bottom width (sandy portion of channel): 20
4. Photograph main channel —
5. Photograph overbank —
6. Note highwater marks:
   Type: silt
   Elevation: ½ ft
7. Signs of Overbank Flooding/Sheet Flooding? Not really
8. Signs of Erosion? scour around bad vegetation
9. Signs of Deposition? No.
10. Bedload size: sand or more
11. Obstructions which could cause backwater? No

Office:

1. Determine Q: —
2. Determine slope from topo: —
3. Estimate n from photos: .030 - .035
4. Run mannings eq'n using HEC2: —
5. Note EGL and WSEL: —
6. Map limits on topo/photo: —

2 Phot Look d/s at ch1 + ch3 (are photos 17-31's?)



Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

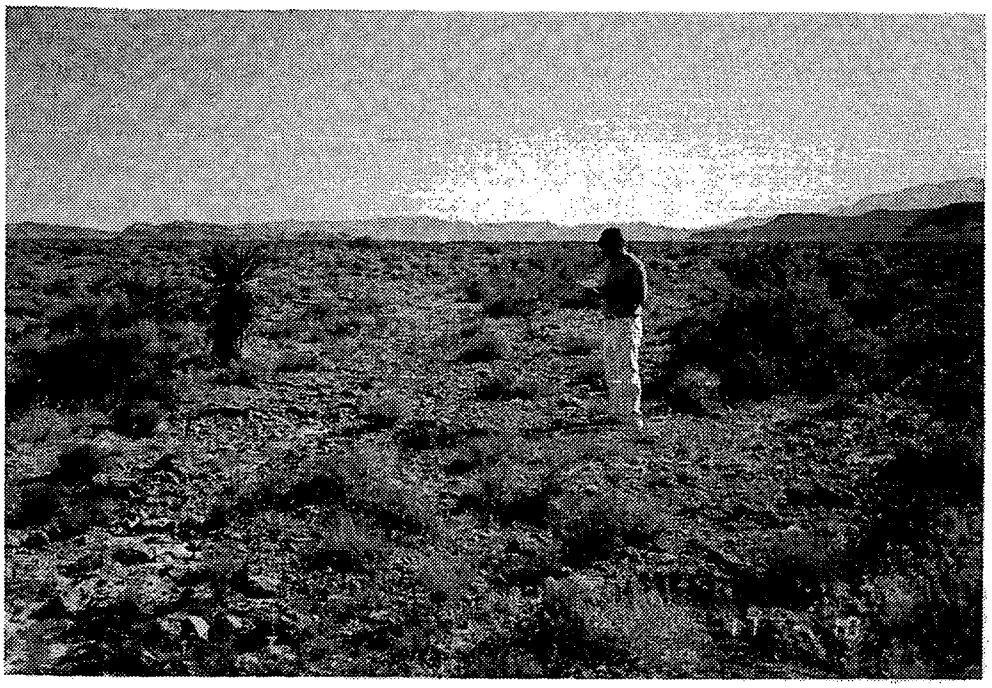
Field Data:

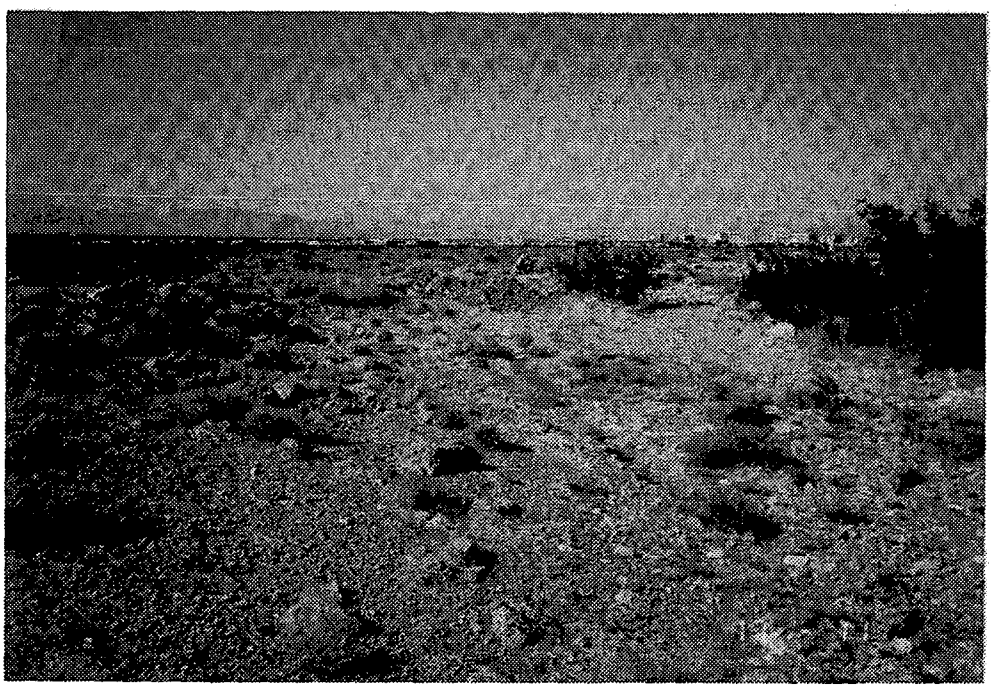
1. Section Location: NT-4-d ② d/s section
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 20'
4. Photograph main channel ✓
5. Photograph overbank ✓
6. Note highwater marks:
   Type: silts
   Elevation: 0.75'
7. Signs of Overbank Flooding/Sheet Flooding? no
8. Signs of Erosion? yes scour, broken caliche
9. Signs of Deposition? no
10. Bedload size: fine gravel
11. Obstructions which could cause backwater? fill in channel @ road otherwise no

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.03
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

17:10 - looking upstream to section
17:11 - " downstream





NT-4-d ②

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

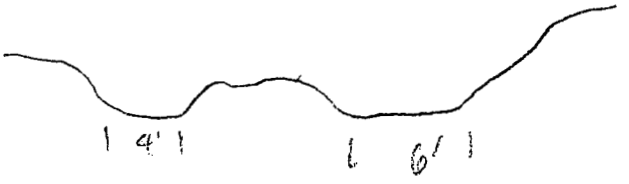
Field Data:

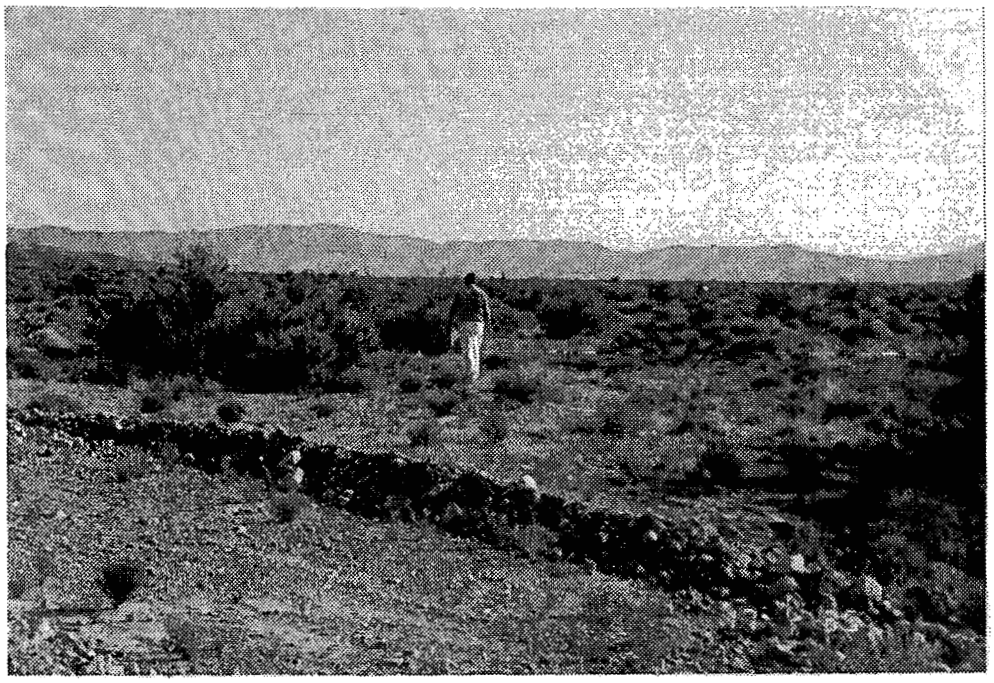
1. Section Location: NT-4-f
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): see below
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: silt
   Elevation: 1'
7. Signs of Overbank Flooding/Sheet Flooding? no
8. Signs of Erosion? yes - scour around veg., exposed caliche bed
9. Signs of Deposition? no
10. Bedload size: small gravel - 3/4" -
11. Obstructions which could cause backwater? little fill (1' berm) @ road, otherwise none

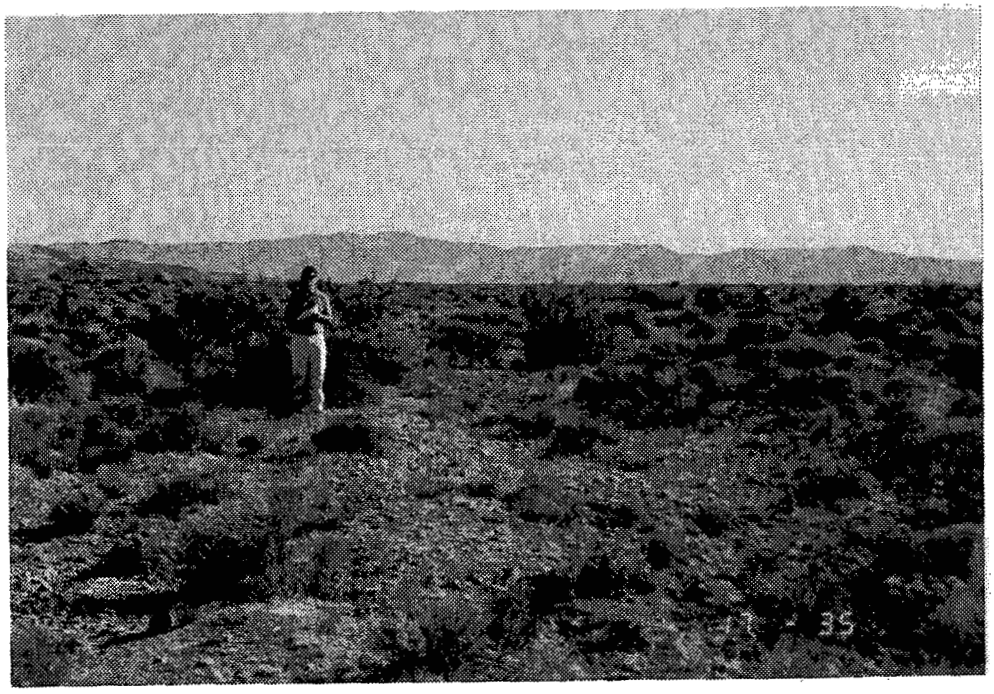
Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.035
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

photo 17:35 looking upstream @ section from near road
width - double wash







NT-4-f

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

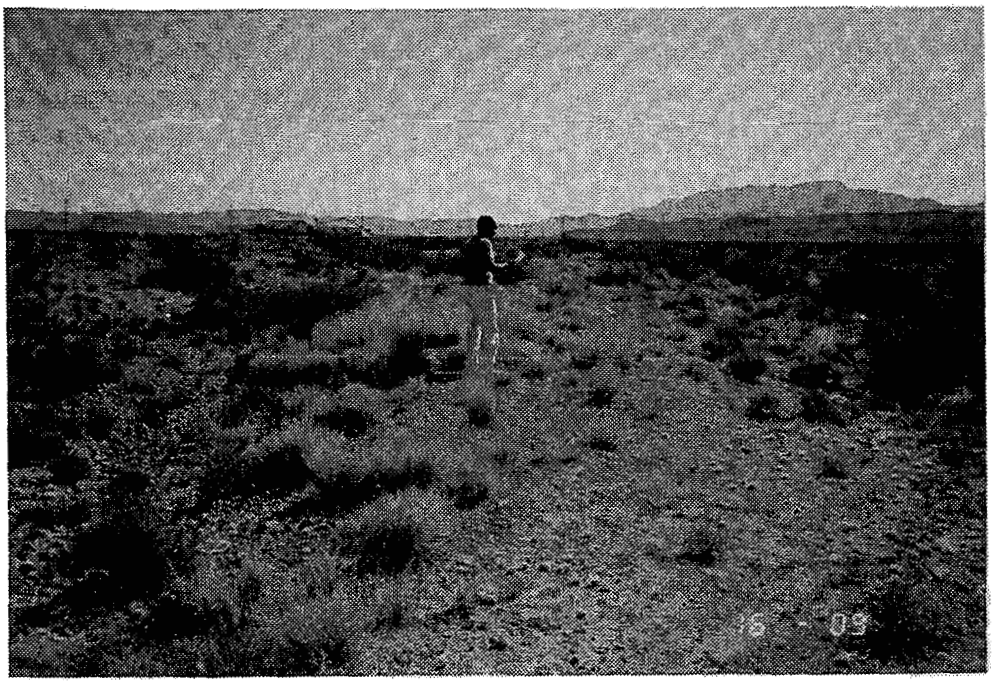
1. Section Location: NT-5-a
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): see below
4. Photograph main channel ✓
5. Photograph overbank _____
6. Note highwater marks:
   Type: not above island
   Elevation: 1.5'
7. Signs of Overbank Flooding/Sheet Flooding? no not probable
8. Signs of Erosion? yes scour holes @ veg, caliche
9. Signs of Deposition? no
10. Bedload size: fine gravel - coarse sand
11. Obstructions which could cause backwater? no

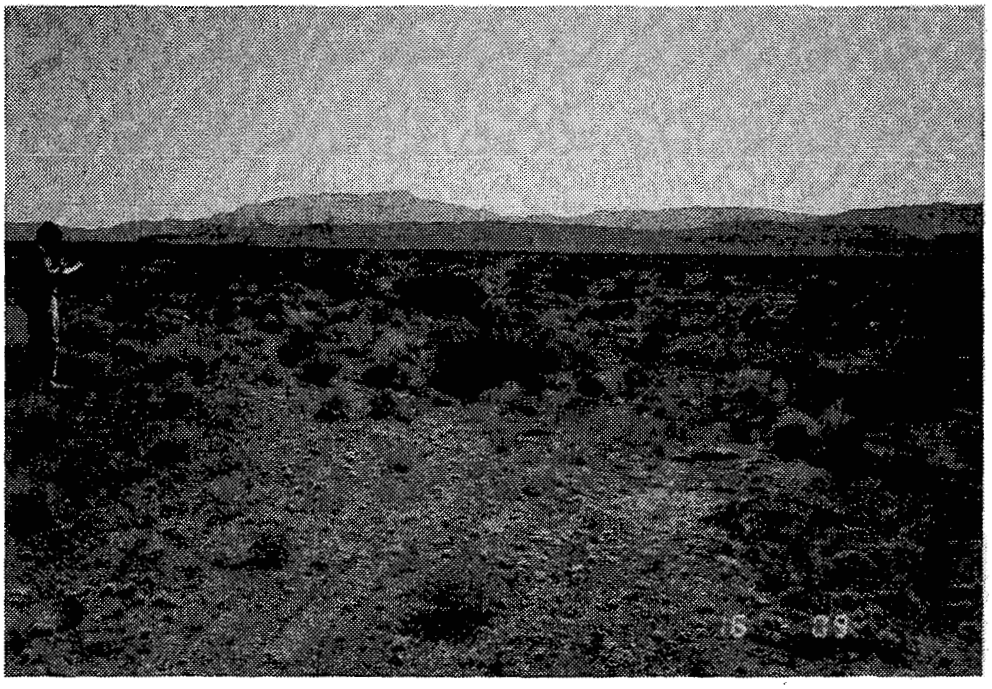
Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.035 - 0.04
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

photo 16:09 -2 photos

- double wash - East 6' wide bed
  West 20' wide "





NT-5-a

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

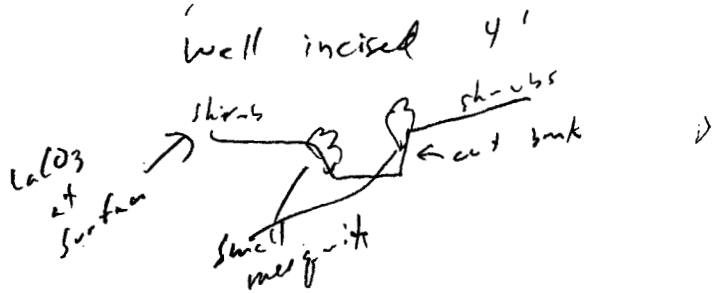
Field Data:

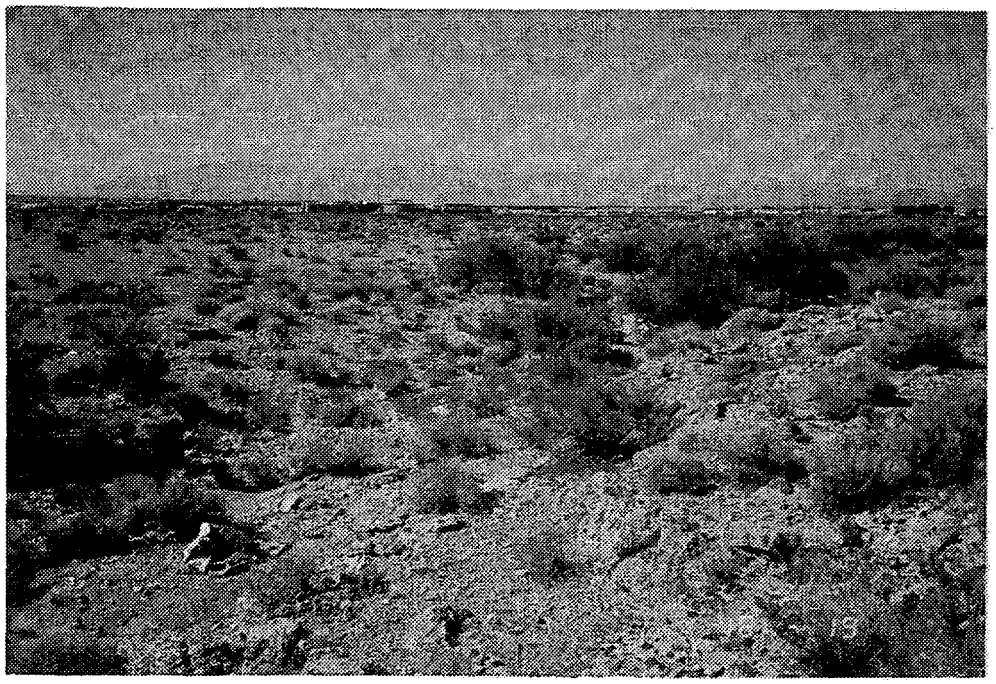
1. Section Location: NT-5-b
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 18'
4. Photograph-main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: silt
   Elevation: 1 ft
7. Signs of Overbank Flooding/Sheet Flooding? No
8. Signs of Erosion? Yes bank - some vegetation in bed
9. Signs of Deposition? No
10. Bedload size: sand to fG
11. Obstructions which could cause backwater? No

Office:

1. Determine Q: _____
2. Determine slope from topo: .035
3. Estimate n from photos: _____
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

Photo 16:19 looking DS
note eroded stage IV Calcs on RB





NT-5-b

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

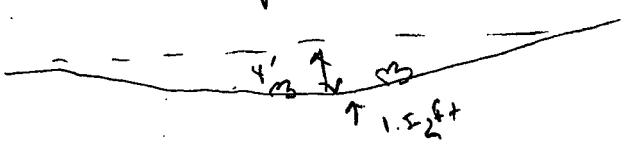
1. Section Location: NT-5-c
2. Mark section on map or photograph. ____
3. Estimate bottom width (sandy portion of channel): 15
4. Photograph main channel ✓
5. Photograph overbank ✓
6. Note highwater marks:
   Type: silt
   Elevation: ½ ft
7. Signs of Overbank Flooding/Sheet Flooding? Not really
8. Signs of Erosion? yes on $CaCO_3$ IV at surface - breaking up
9. Signs of Deposition? No
10. Bedload size: Fg + silt
11. Obstructions which could cause backwater? No

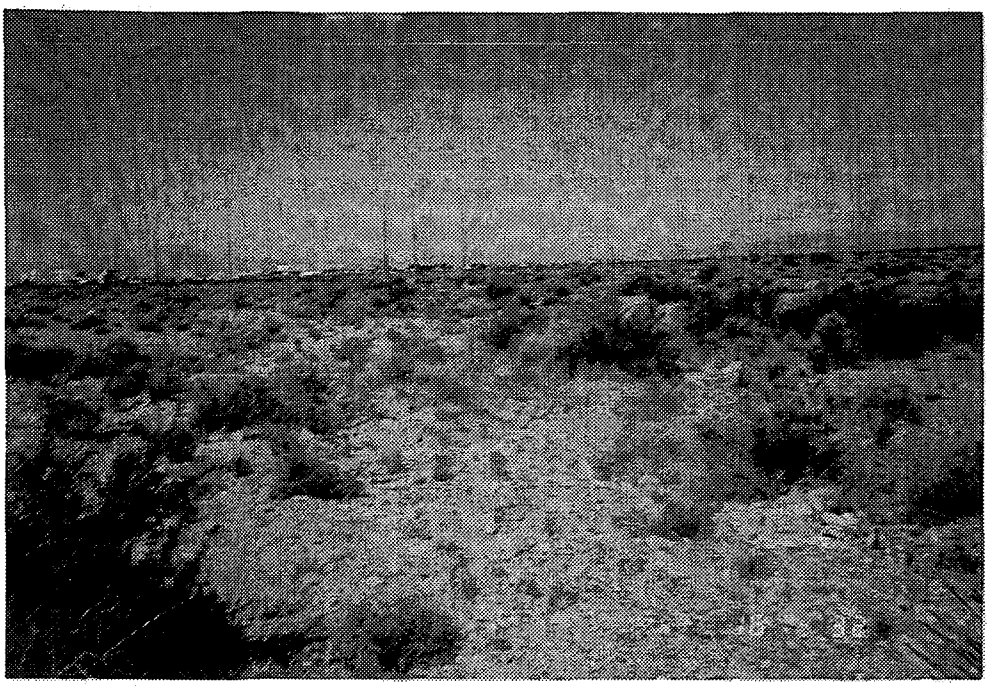
Office:

1. Determine Q: ____
2. Determine slope from topo: ____
3. Estimate n from photos: .030
4. Run mannings eq'n using HEC2: ____
5. Note EGL and WSEL: ____
6. Map limits on topo/photo: ____

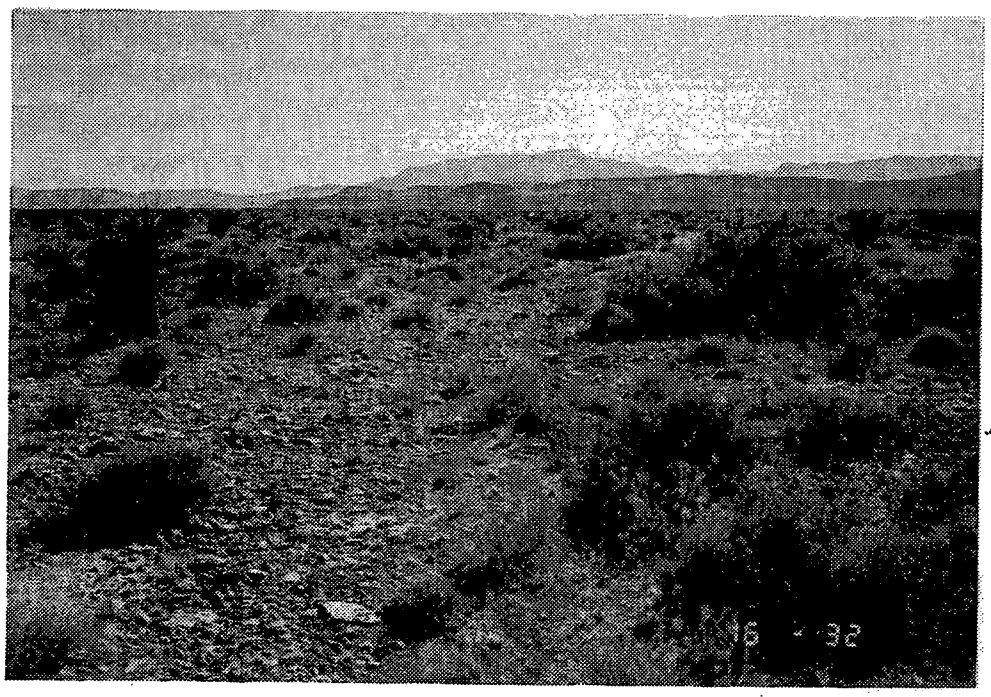
2 Pht @ 16:32 d/s carry from Sum
y/s cut to Sum

moderate incision in $CaCO_3$ IV - also exposed in interfluve @ surface





d/s



u/s

NT-5-C

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: NT-5-f
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 15'
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks: can't tell
   Type: can't tell
   Elevation: ?
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? yes- exposed caliche bed, scour holes
9. Signs of Deposition? no
10. Bedload size: fine gravel 1/4"-1/2"
11. Obstructions which could cause backwater? no

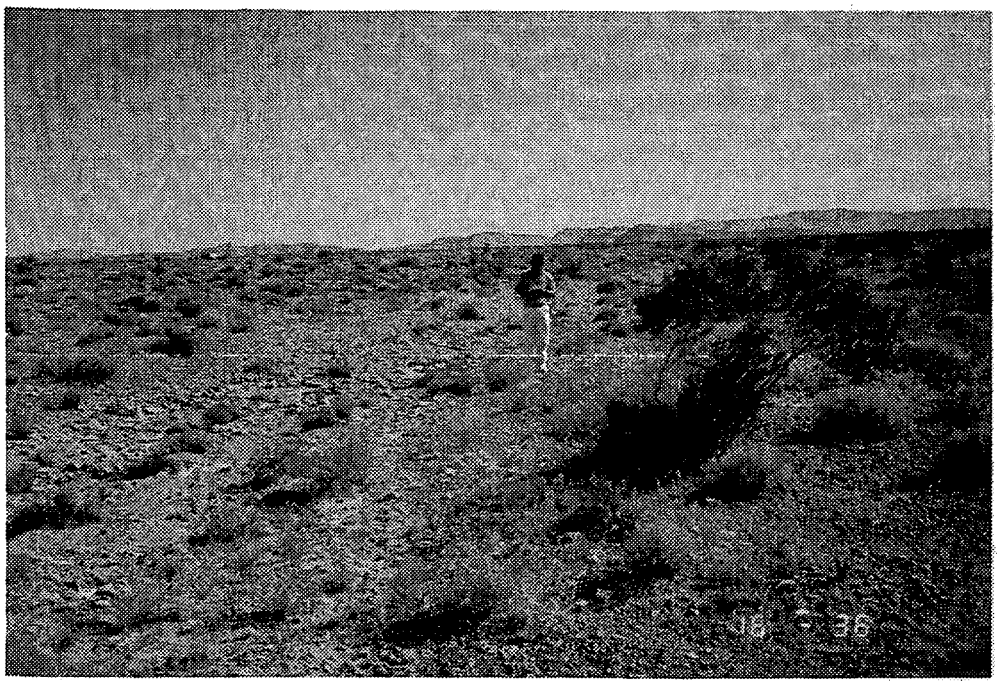
Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.03-0.035
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

photo - 16:36 looking upstream ~~at~~ to section



broken up caliche



NT-5-9

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

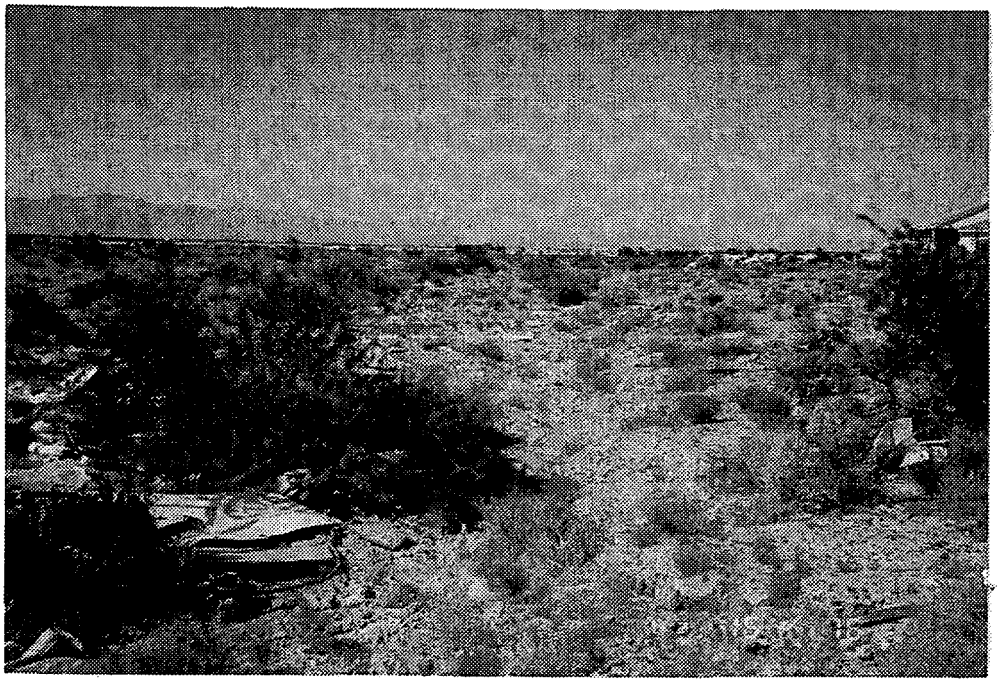
1. Section Location: NT-5-1
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 15
4. Photograph main channel ✓
5. Photograph overbank ✓
6. Note highwater marks: hard to say
   Type: silts
   Elevation: 1'
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? yes, scour holes, incised rt bank, broken caliche
9. Signs of Deposition? no
10. Bedload size: fine gravel - coarse sand
11. Obstructions which could cause backwater? no (except a couple chains)

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.035
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

16:16 looking downstream to section
- fill slope rt. bank

exposed caliche bed



NT-5-1

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

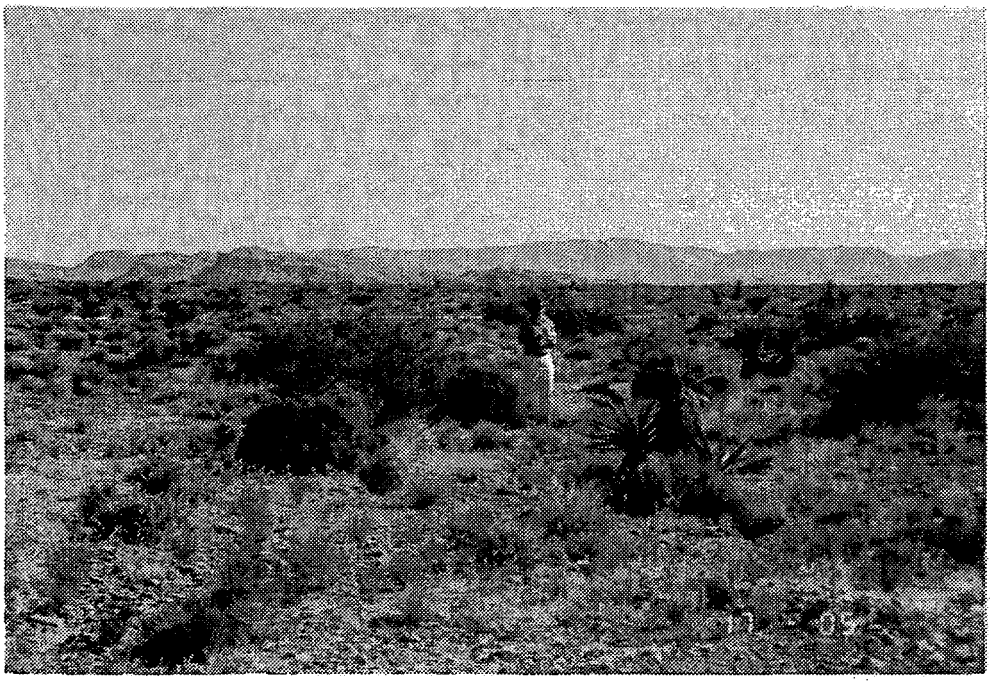
Field Data:

1. Section Location: NT-5-j ①
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 20'
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks: can't tell
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? no
8. Signs of Erosion? yes - scour around veg., small channels formed
9. Signs of Deposition? no
10. Bedload size: fine gravel - coarse sand
11. Obstructions which could cause backwater? fill @ road

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: (0.03)
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

photo 17:05 looking upstream from road to section



NT-5-j ①

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: NT-5-j (2) - d/s of (1)
2. Mark section on map or photograph. /
3. Estimate bottom width (sandy portion of channel): below
4. Photograph main channel ✓
5. Photograph overbank ✓
6. Note highwater marks:
   Type: silt
   Elevation: ½ ft
7. Signs of Overbank Flooding/Sheet Flooding? Not recent (No.)
8. Signs of Erosion? yes, caliche -1V exposed
9. Signs of Deposition? No
10. Bedload size: FG - (silt marks as susp.)
11. Obstructions which could cause backwater? No

parmit from mat'l

= sheet θ?

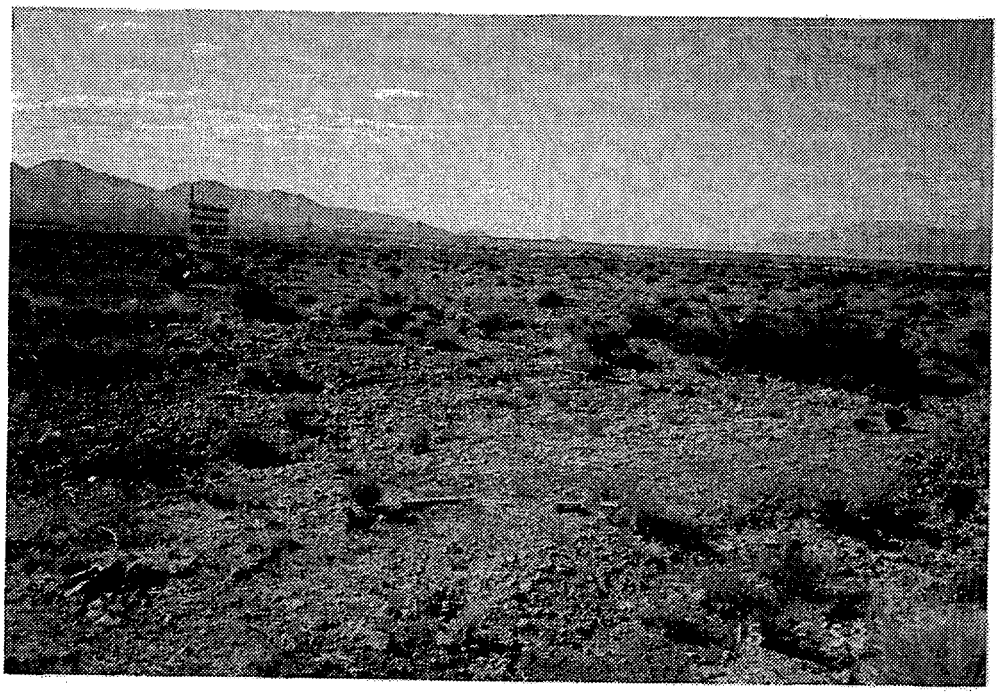
Office:

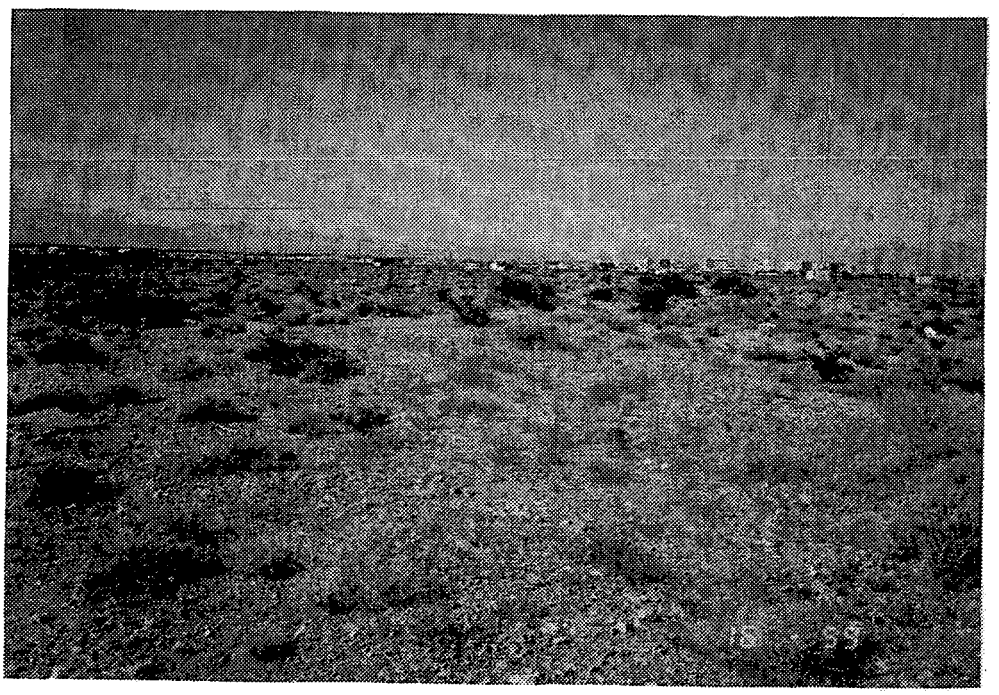
1. Determine Q:
2. Determine slope from topo: .030 - .035
3. Estimate n from photos:
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:

2 @ 16:59 d) @ f/s sign - LOB
looking x-channel)

b) Look d/s







NT-5-j ② d/s of NT-5-j ①

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

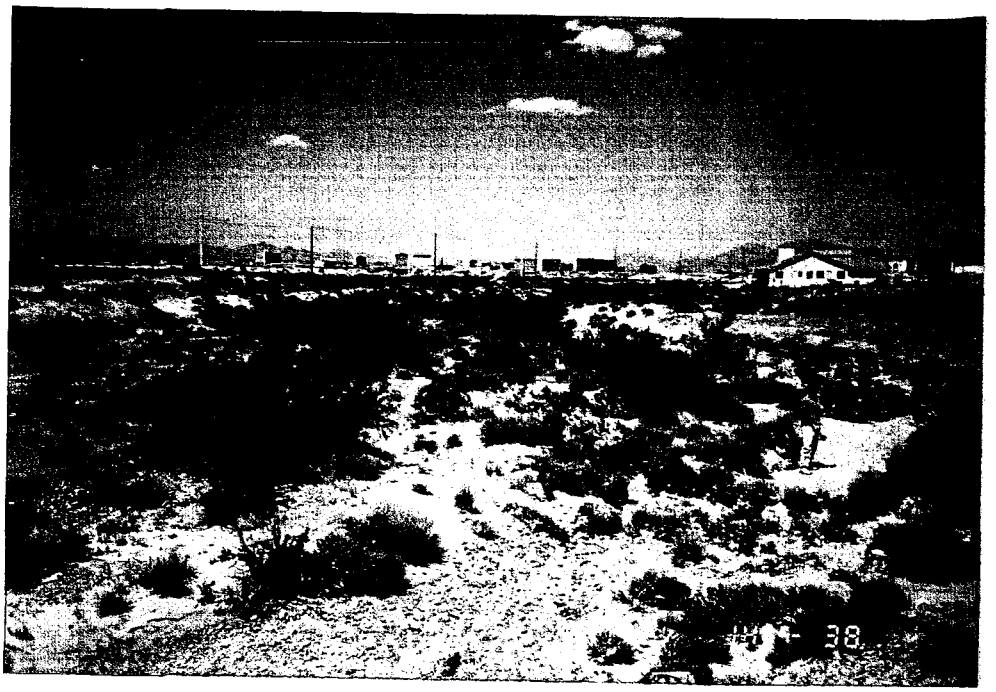
Field Data:

1. Section Location: CT-2-a
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): ~~15-20'~~
4. Photograph main channel ✓ 14:38
5. Photograph overbank ✓ 14:39
6. Note highwater marks:
   Type: sand
   Elevation: 8'/2'
7. Signs of Overbank Flooding/Sheet Flooding? no
8. Signs of Erosion? yes
9. Signs of Deposition? no
10. Bedload size: med sand, 1" gravel
11. Obstructions which could cause backwater? no

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: (0.035 - 0.40)
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

well incised; channel banks for floodplain limit
7' banks, caliche
photo from confluence down st. 14:38
2) channel bottom 14:39





CT-2-a

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: CT-2-e
2. Mark section on map or photograph. ✓
3. Estimate bottom width (sandy portion of channel): 10'
4. Photograph main channel ✓
5. Photograph overbank _____
6. Note highwater marks:
   Type: sand
   Elevation: 2'
7. Signs of Overbank Flooding/Sheet Flooding? no
8. Signs of Erosion? headcutting, entrenched
9. Signs of Deposition? _____
10. Bedload size: med sand, 1"
11. Obstructions which could cause backwater? no

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.035 - 0.04
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

photo 14:49 downstream from road
14:49 upstream " "

no headcutting
fill material on L. overbank



u/s



d/s

CT-2 · e

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: CT-2-f
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): _____
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: change in color
   Elevation: 1 - 1½'
7. Signs of Overbank Flooding/Sheet Flooding? yes
8. Signs of Erosion? not much; bed of caliche
9. Signs of Deposition? no
10. Bedload size: unknown
11. Obstructions which could cause backwater? no

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.02; 0.025
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

photo 14:57
- hard carbonate bed, moderately well armored



CT - 2 - f

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

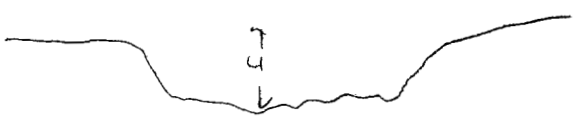
- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: C T - 3 - a
2. Mark section on map or photograph. ✓
3. Estimate bottom width (sandy portion of channel): 15'
4. Photograph main channel ✓ 11:19 look u/s + 11:19 u/s
5. Photograph overbank
6. Note highwater marks:
   Type: silt
   Elevation: 1'
7. Signs of Overbank Flooding/Sheet Flooding? No
8. Signs of Erosion? Yes steep ch! going to entrenched main channel
9. Signs of Deposition? No
10. Bedload size: Gravel - character of Cog-IV
11. Obstructions which could cause backwater? No

Office:

1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos: .035 higher turbulence by uneven bottom + steep slopes
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:







CT - 3 - a

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

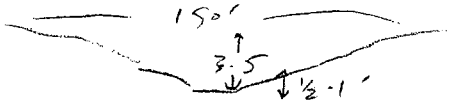
Field Data:

1. Section Location: CT-3-b
2. Mark section on map or photograph. ✓
3. Estimate bottom width (sandy portion of channel): 8'
4. Photograph main channel ✓
5. Photograph overbank ✓
6. Note highwater marks:
   Type: blk mass ~ 3/4 FT
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding? No
8. Signs of Erosion? scour to $CaCO_3$-IV
9. Signs of Deposition? No
10. Bedload size: FS - blocks of $CaCO_3$-IV cemented pebbles in matrix
11. Obstructions which could cause backwater? No

Office:

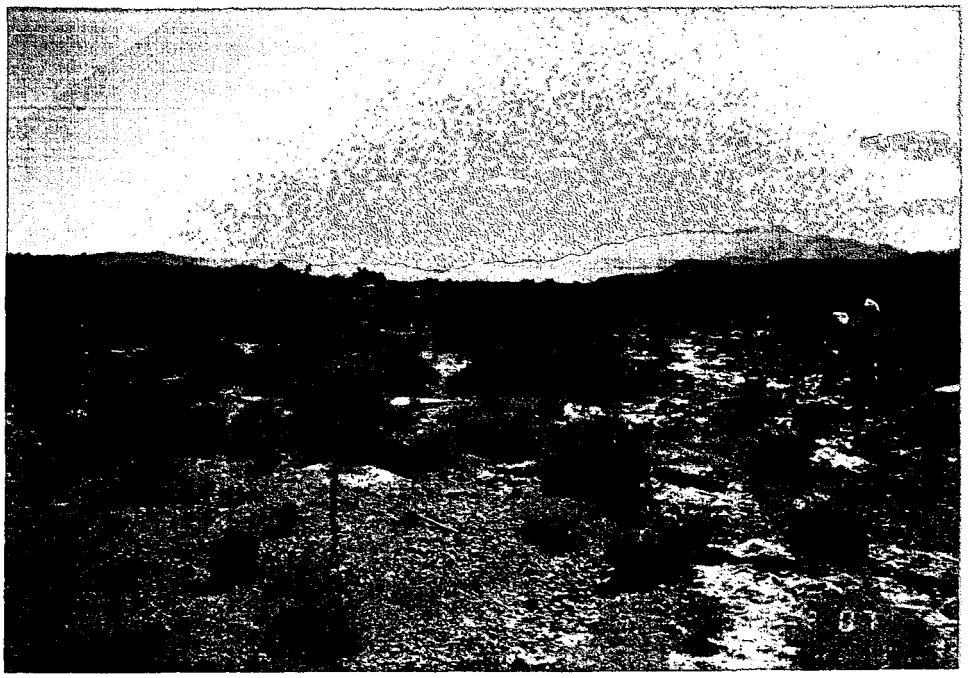
1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos: .025
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:

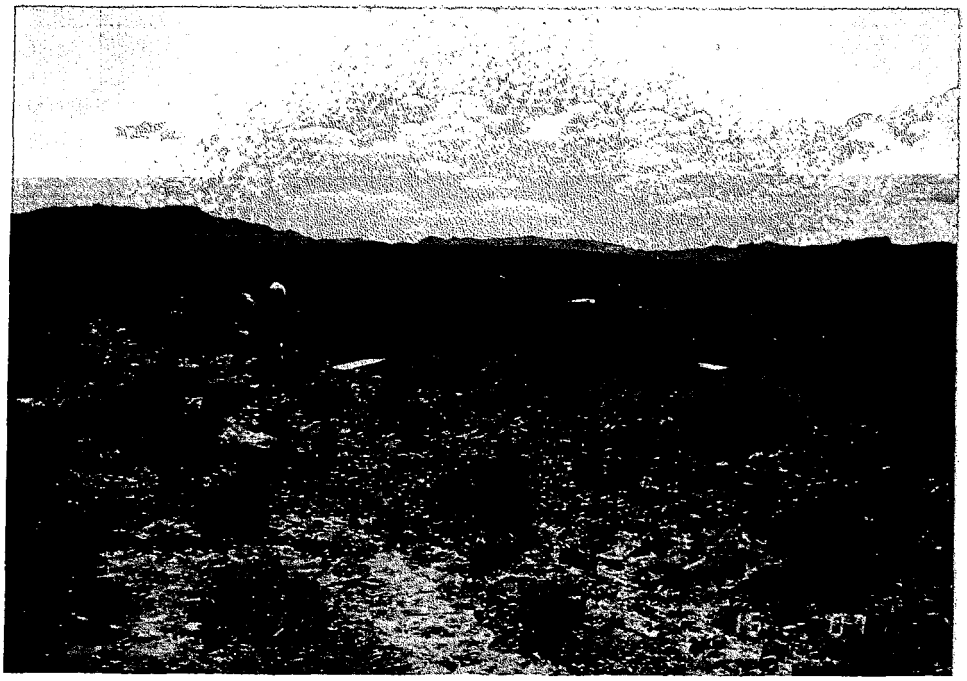
11:08 look N/S





CT - 3 - b





CT-4-a

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

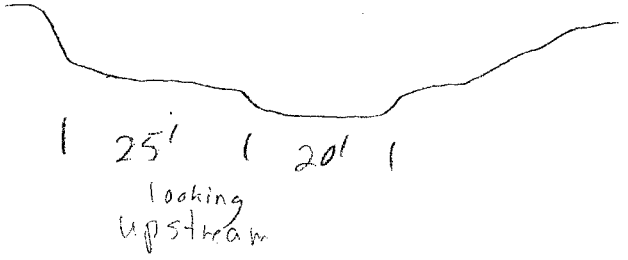
Field Data:

1. Section Location: CT-4-9 WA
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 20'
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: silt
   Elevation: 1½'
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? yes exposed caliche bed, scour @ veg
9. Signs of Deposition? no
10. Bedload size: med gravel (?) 1"(?)
11. Obstructions which could cause backwater? ~~bo~~ road which is 1' higher than bed

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.03 - 0.035
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

15:07 looking upstream



Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

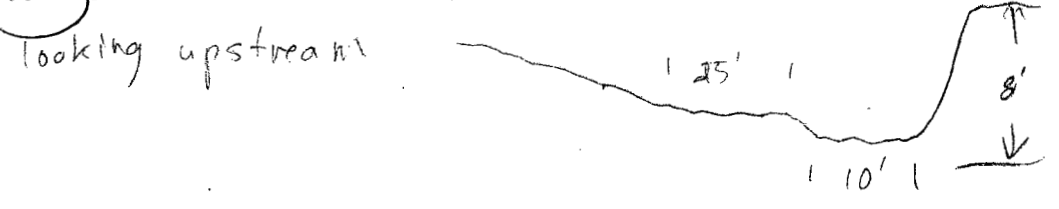
1. Section Location: CT-4-6
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 10'
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: silt
   Elevation: 1-1½'
7. Signs of Overbank Flooding/Sheet Flooding? no
8. Signs of Erosion? yes - exposed caliche, scour incised lt. bank
9. Signs of Deposition? no
10. Bedload size: 1" ± gravel
11. Obstructions which could cause backwater? no besides 55gal drums

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.04
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

2.

15:02 looking upstream
15:05 " downstream





CT-4-b



CT-4-b

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

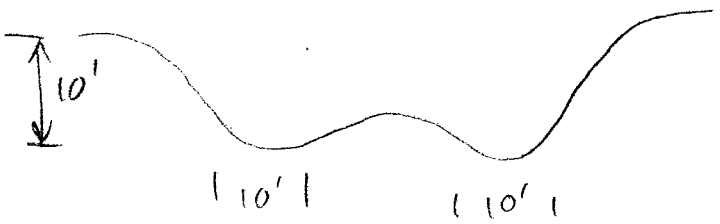
Field Data:

1. Section Location: CT-4-c
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 40
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: silt
   Elevation: 1' - 1.5'
7. Signs of Overbank Flooding/Sheet Flooding? no
8. Signs of Erosion? yes, scour around veg, rt channel has exposed caliche
9. Signs of Deposition? no
10. Bedload size: med to fine gravels
11. Obstructions which could cause backwater? no

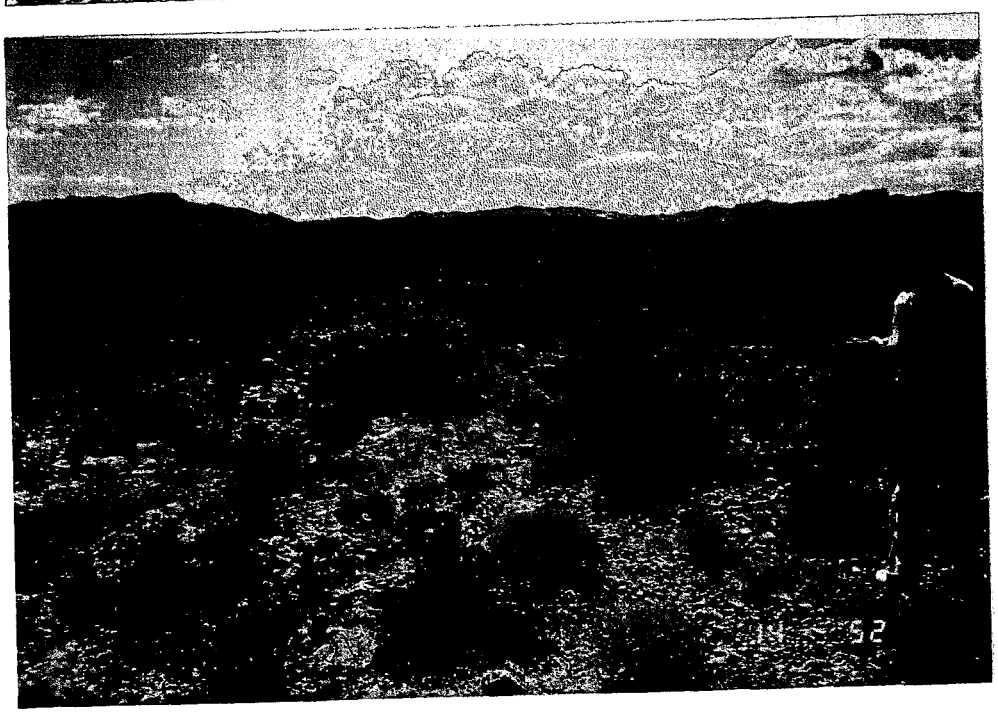
Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.035
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

1451 looking upstream from left bank
1452 " " " rt channel bottom







CT-4-c

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: CT-4-9 ①
2. Mark section on map or photograph. ~
3. Estimate bottom width (sandy portion of channel): 20
4. Photograph main channel 15:00 LB, RB
5. Photograph overbank ~
6. Note highwater marks:
   Type: 1 ft silt
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding? No!
8. Signs of Erosion? bed
9. Signs of Deposition? no
10. Bedload size: F-G
11. Obstructions which could cause backwater? No

Office:

1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos: .030 .035
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:







CT-4-9-①

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: CT-4-9-(2)
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): ~~8~~ 10'
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: silt
   Elevation: 1'
7. Signs of Overbank Flooding/Sheet Flooding? no
8. Signs of Erosion? yes - scour @ veg
9. Signs of Deposition? no
10. Bedload size: 1/4" - 1" gravel
11. Obstructions which could cause backwater? no

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.035 - 0.04
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

15:15 looking upstream

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: ST-1-a
2. Mark section on map or photograph. ✓
3. Estimate bottom width (sandy portion of channel): 40
4. Photograph main channel ✓
5. Photograph overbank ✓
6. Note highwater marks:
   Type: silt
   Elevation: spill over Rd
7. Signs of Overbank Flooding/Sheet Flooding? No, incised
8. Signs of Erosion? Yes, Road grade failing, fill matl
9. Signs of Deposition? No
10. Bedload size: cobbles
11. Obstructions which could cause backwater? Not d/s

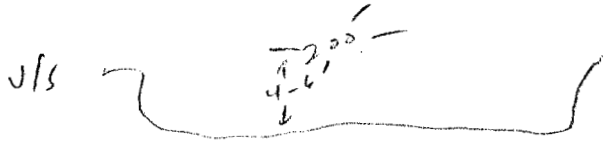
Office:

1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos: .035
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:



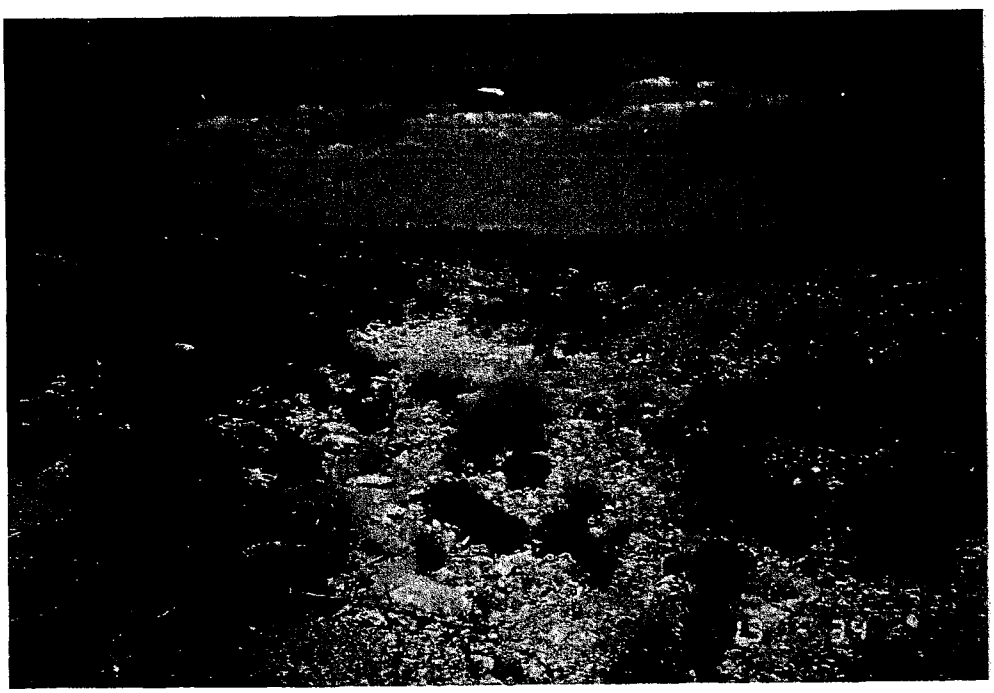
2 PHOTO's @ 13:34

use banks as l/l





looking upstream to road from rt. bank



ST-1-a

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: ST-1-C
2. Mark section on map or photograph. —
3. Estimate bottom width (sandy portion of channel): 75
4. Photograph main channel —
5. Photograph overbank —
6. Note highwater marks:
   Type: silt
   Elevation: 6' ponding vs. road grade
7. Signs of Overbank Flooding/Sheet Flooding? No
8. Signs of Erosion? No
9. Signs of Deposition? Yes, silt mud cracks
10. Bedload size: ? silty sand deposited
11. Obstructions which could cause backwater? Yes: plainbow weed stream banks

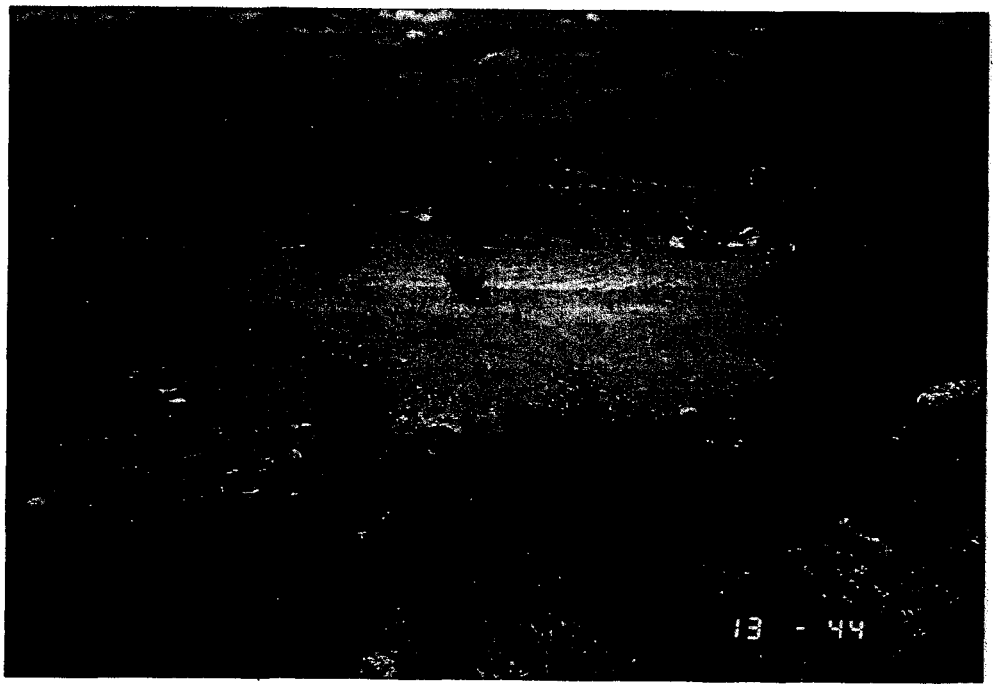
Office:

1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos: backwater
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:

13:43 - 1 headcut to S of ponding area

13:44 - ponding area





ST - 1 - c

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: ST-1-d
2. Mark section on map or photograph. ✓
3. Estimate bottom width (sandy portion of channel): 4'
4. Photograph main channel
5. Photograph overbank
6. Note highwater marks:
   Type: silt
   Elevation: 2'
7. Signs of Overbank Flooding/Sheet Flooding? No
8. Signs of Erosion? ($CaCO_3$ sheet breakup on streambed
9. Signs of Deposition? N.
10. Bedload size: gravel
11. Obstructions which could cause backwater? Yes, Rainbow Rd d/s
    No culvert, much ponding size

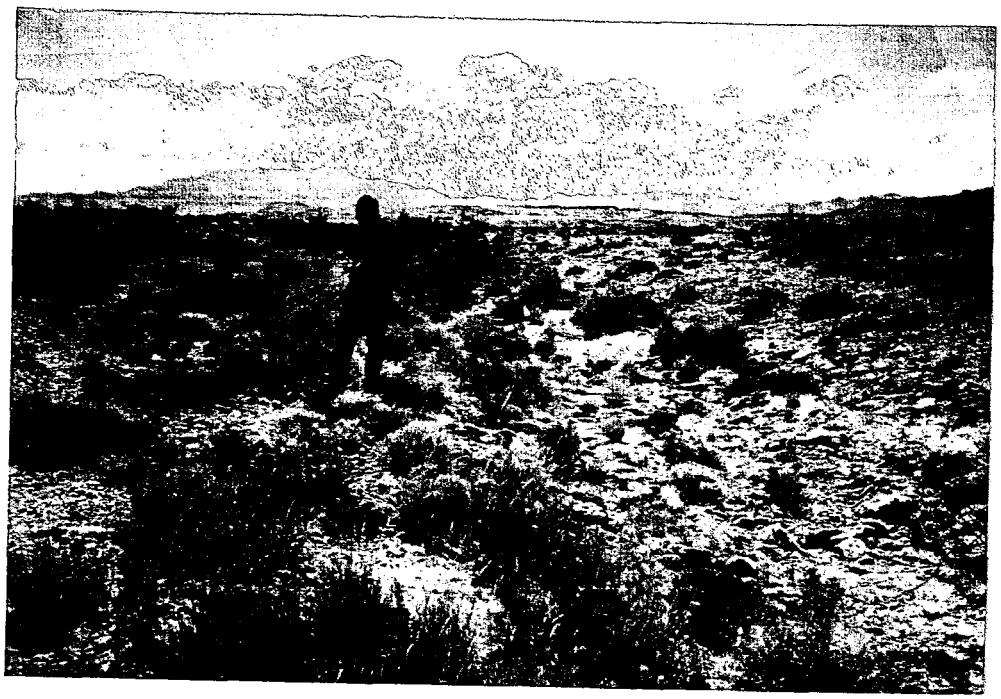
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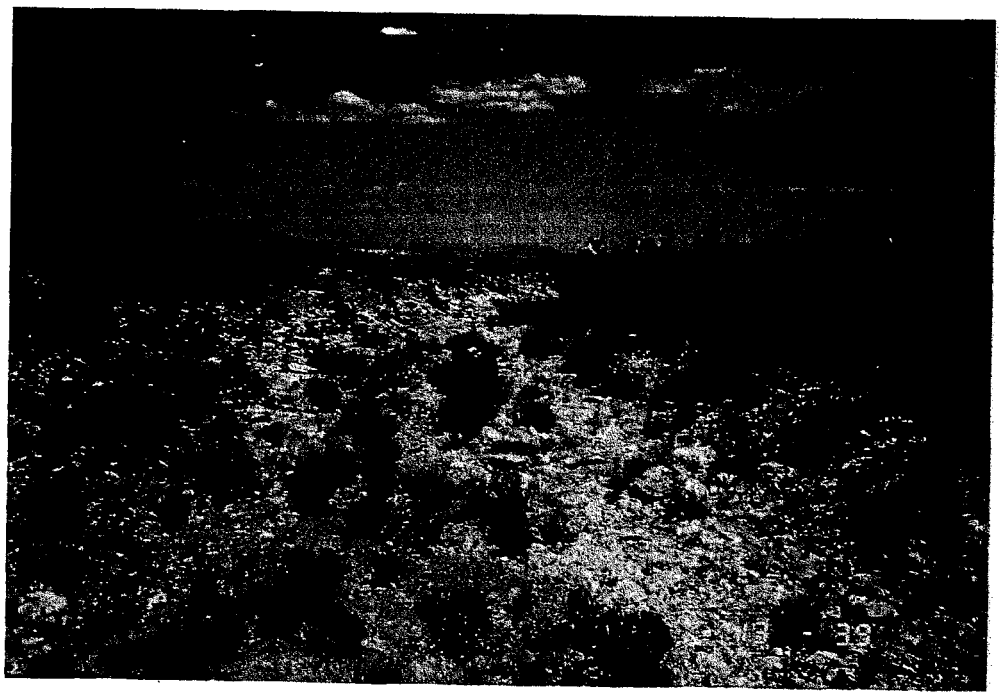
1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos: .035
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:

13:38 - u/s

13:39 - d/s

use banks as l/b





ST-1-d

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: ST-1-e
2. Mark section on map or photograph. —
3. Estimate bottom width (sandy portion of channel): 20
4. Photograph main channel ✓
5. Photograph overbank —
6. Note highwater marks:
   Type: minor silt
   Elevation: 1½ - 1 ft
7. Signs of Overbank Flooding/Sheet Flooding? No
8. Signs of Erosion? bed to CO3 - IV
9. Signs of Deposition? No
10. Bedload size: 4" CaCO3 frags
11. Obstructions which could cause backwater? No

Office:

1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos:
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:

fairly well defined

11:39 u/s

11:40 d/s







ST-1-e

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: ST-2-a
2. Mark section on map or photograph. ✓
3. Estimate bottom width (sandy portion of channel): 20
4. Photograph main channel ✓
5. Photograph overbank _____
6. Note highwater marks:
   Type: None
   Elevation: guess at 1'
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? headcut - scour to $CaCO_3$-IV
9. Signs of Deposition? No
10. Bedload size: Gravel ½-1"
11. Obstructions which could cause backwater? No.

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: .035
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

Photo of headcut 75' u/s Rainbow (13:22) ?.

13:23 Photo look d/s

huge headcut d/s (13:26) of Rainbow by

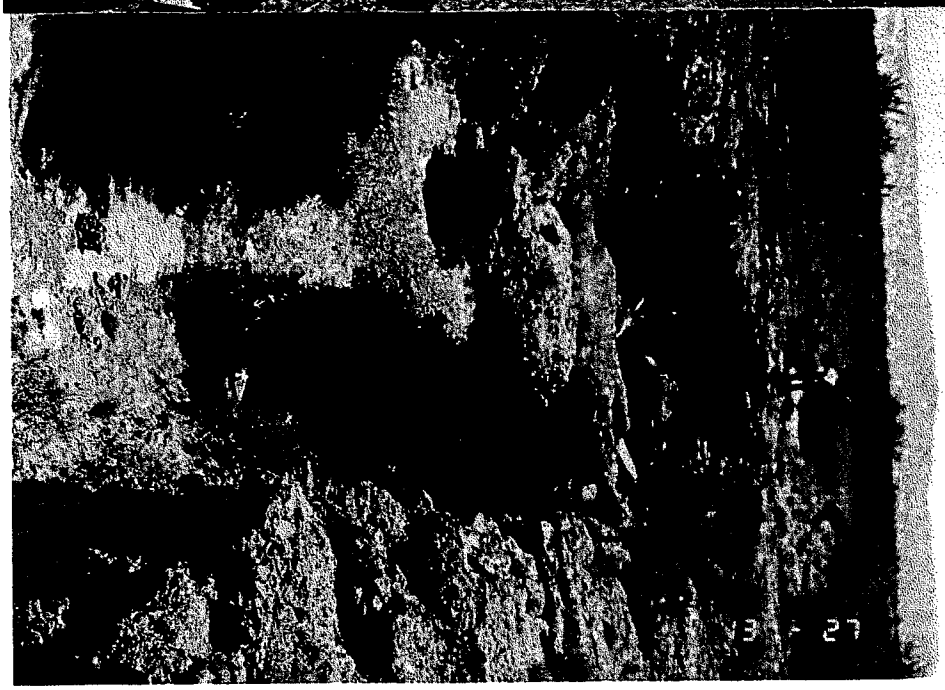
13:27 look u/s at headcut note $CaCO_3$ to bottom of cut



d/s



ST-2-a



Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

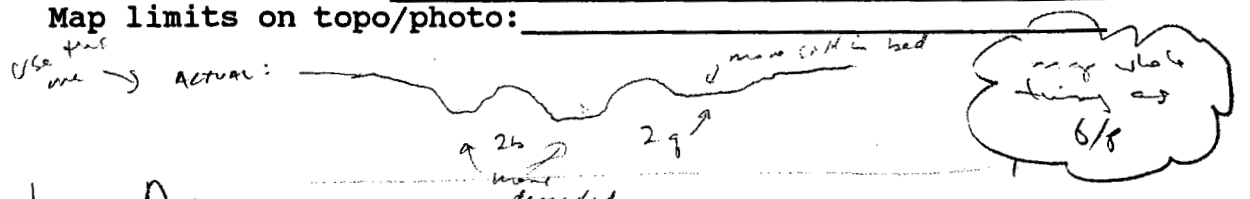
- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

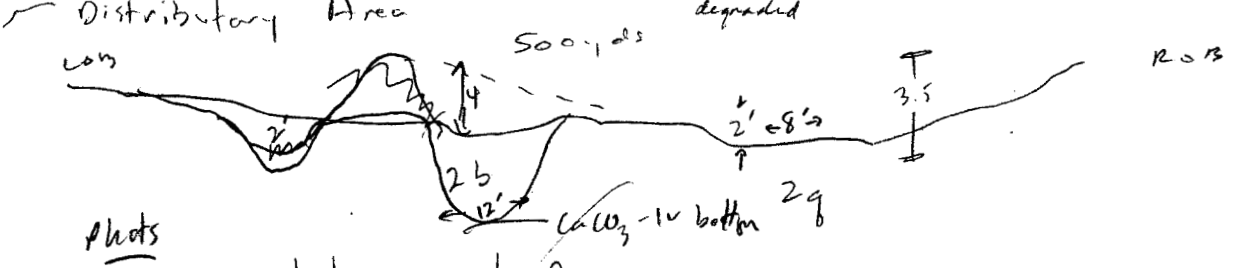
Field Data:

1. Section Location: ST-2-b (Combine w/ ST-2-q-①)
2. Mark section on map or photograph. —
3. Estimate bottom width (sandy portion of channel): See diagram
4. Photograph main channel —
5. Photograph overbank —
6. Note highwater marks:
   Type: silt - 1.5
   Elevation: —
7. Signs of Overbank Flooding/Sheet Flooding? —
8. Signs of Erosion? bed scour
9. Signs of Deposition? —
10. Bedload size: well rounded cobbles, lots silt
11. Obstructions which could cause backwater? —

Office:

1. Determine Q: —
2. Determine slope from topo: —
3. Estimate n from photos: .035 - .030
4. Run mannings eq'n using HEC2: —
5. Note EGL and WSEL: —
6. Map limits on topo/photo: —





Photos
11:51 - look u/s at 2q
11:52 " d/s " "
11:53 - " u/s at 2b

complex distrib. flow
overbank seems a bit softer





ST-2-b



Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

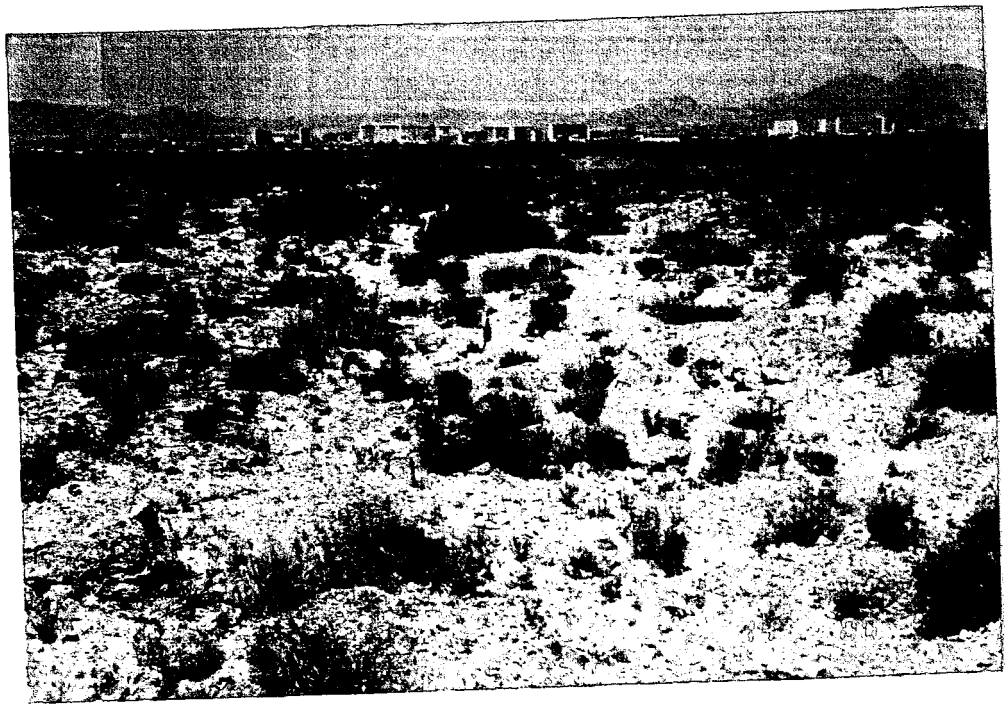
Field Data:

1. Section Location: ST-2-d
2. Mark section on map or photograph. —
3. Estimate bottom width (sandy portion of channel): 8'
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: silt + black mss
   Elevation: ?
7. Signs of Overbank Flooding/Sheet Flooding? possible
8. Signs of Erosion? Yes, bed
9. Signs of Deposition? only material pushed from road ring
10. Bedload size: gravel
11. Obstructions which could cause backwater? No.
    Some overflow channels in RDB

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: .030 - .035
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

14:00 Lake d/s



ST - 2 - d

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

1. Section Location: ST-2-e
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 25
4. Photograph main channel 14:43
5. Photograph overbank _____
6. Note highwater marks:
   Type: silt
   Elevation: 1.5'
7. Signs of Overbank Flooding/Sheet Flooding? No
8. Signs of Erosion? bed
9. Signs of Deposition? No
10. Bedload size: FC
11. Obstructions which could cause backwater? No

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: .035
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____



ST-2-e

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

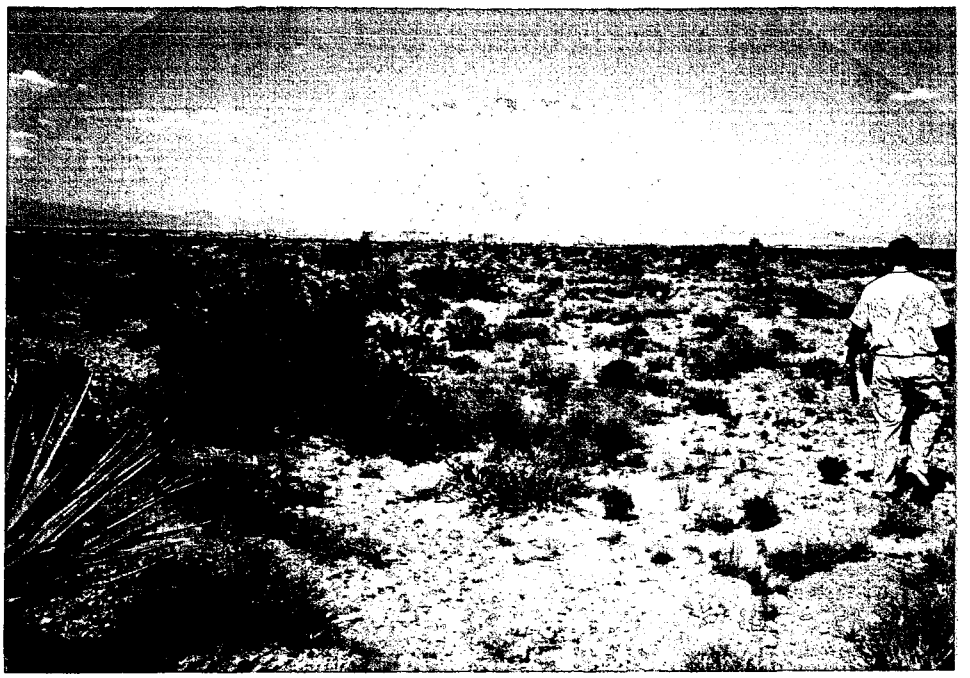
Field Data:

1. Section Location: ST-2-h
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 10'
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: silt (hard to see)
   Elevation: 0.5'
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? yes, scouring, exposed caliche in bed
9. Signs of Deposition? a little in channel
10. Bedload size: coarse sand to fine gravel (1/4"±)
11. Obstructions which could cause backwater? no

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: 0.031
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

15:24 downstream



ST-2-h

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

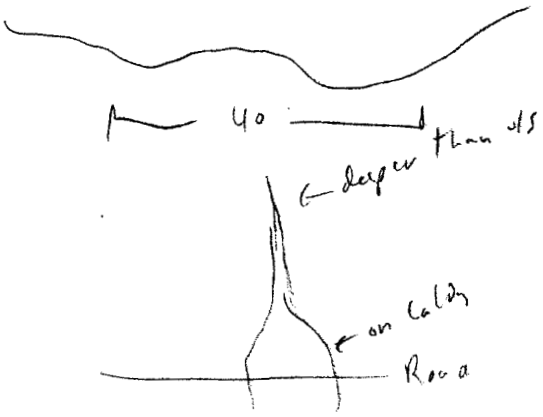
Field Data:

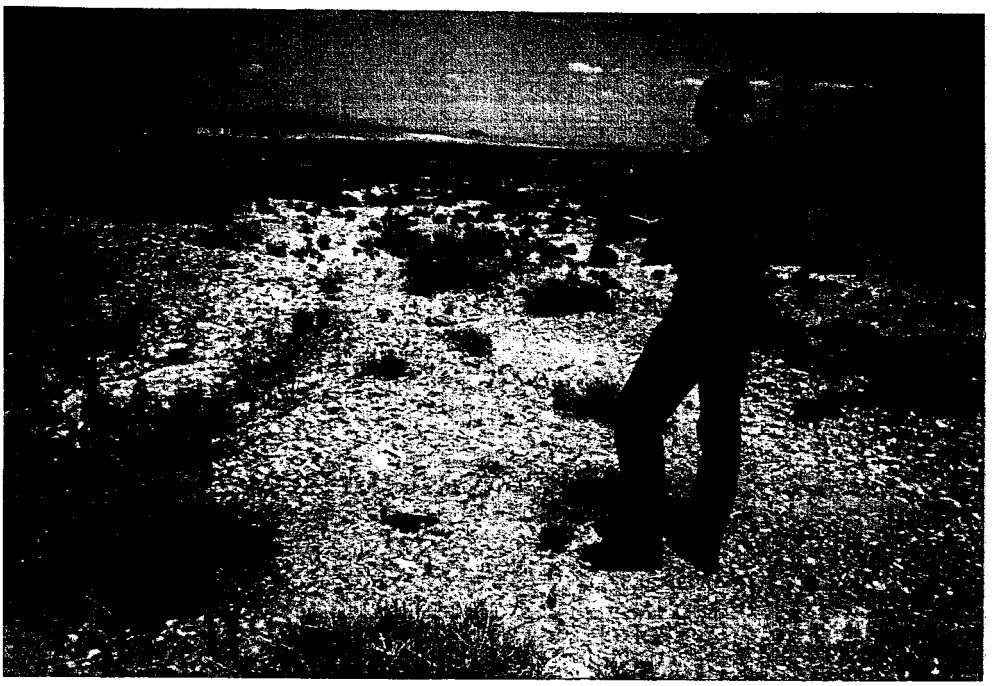
1. Section Location: ST - 2 - 2
2. Mark section on map or photograph. ✓
3. Estimate bottom width (sandy portion of channel): 40
4. Photograph main channel ✓
5. Photograph overbank ✓
6. Note highwater marks:
   Type: silt
   Elevation: 1.5 ft
7. Signs of Overbank Flooding/Sheet Flooding? Not really
8. Signs of Erosion? yes, bed no bank
9. Signs of Deposition? fringe
10. Bedload size: cobbles on bed
11. Obstructions which could cause backwater? No.

Office:

1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos: .035
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:

14:27 - look d/s





ST-2-8

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

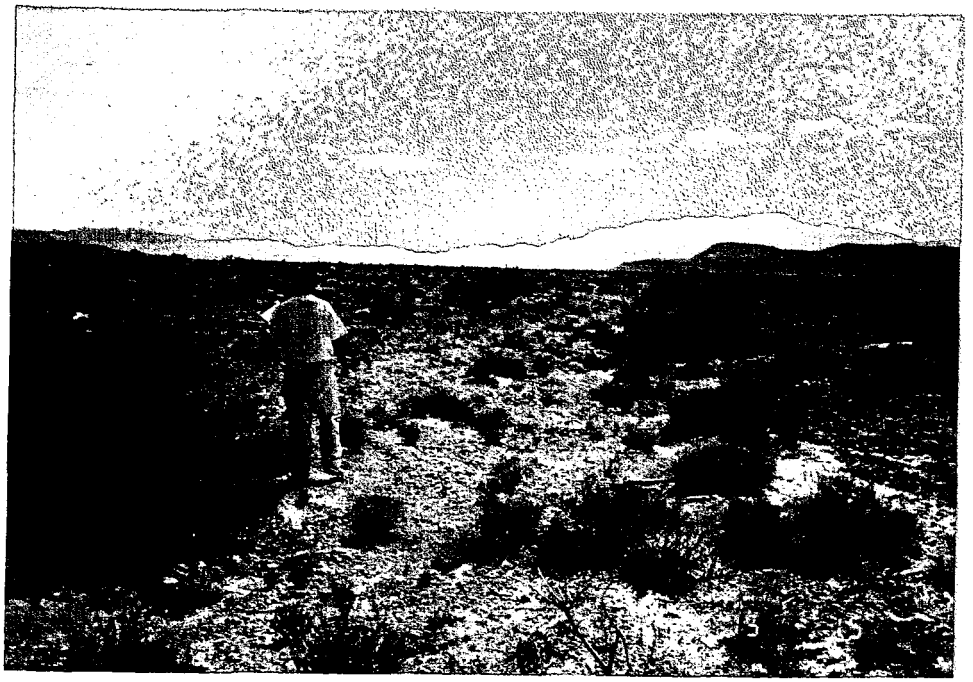
1. Section Location: ST- 2 - m
2. Mark section on map or photograph. _____
3. Estimate bottom width (sandy portion of channel): 15'
4. Photograph main channel _____
5. Photograph overbank _____
6. Note highwater marks:
   Type: silt black mass
   Elevation: 1'
7. Signs of Overbank Flooding/Sheet Flooding? Not much
8. Signs of Erosion? usual
9. Signs of Deposition? No
10. Bedload size: Gravel
11. Obstructions which could cause backwater? No

Office:

1. Determine Q: _____
2. Determine slope from topo: _____
3. Estimate n from photos: .03 - .035
4. Run mannings eq'n using HEC2: _____
5. Note EGL and WSEL: _____
6. Map limits on topo/photo: _____

2 Phot 14:31 look d/s

2nd phot.?



CT-4-g-②



ST-2-M

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data: (for ST-2-q1, see ST-2-b)

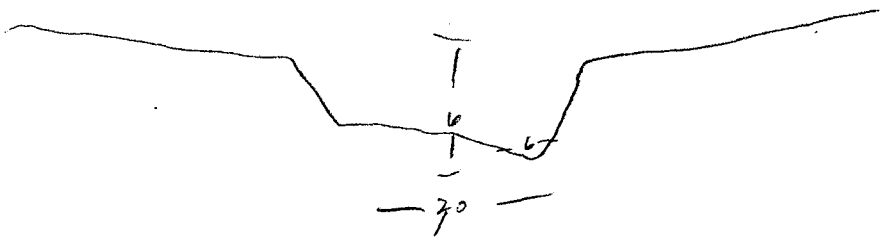
1. Section Location: ST-2-q2
2. Mark section on map or photograph. ~
3. Estimate bottom width (sandy portion of channel): 30'
4. Photograph main channel ~
5. Photograph overbank
6. Note highwater marks:
   Type: silt
   Elevation: at road crossing low pt from backwater?
7. Signs of Overbank Flooding/Sheet Flooding? No, incised
8. Signs of Erosion? bed exposed (a few ft)
9. Signs of Deposition? from backwater - silt
10. Bedload size: gravel
11. Obstructions which could cause backwater? road fill

Office:

1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos:
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:

13:51 pht look S at road fill replacement

13:54 look U/S







ST-2-92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Approximate Methods: Field Notes

Procedure:

- Use Mannings Equation. WSEL = EGL
- Choose typical cross section for maximum length in reach. Minimum 1 section per mile.
- Use datum on 4 ft contour interval topo maps.

Field Data:

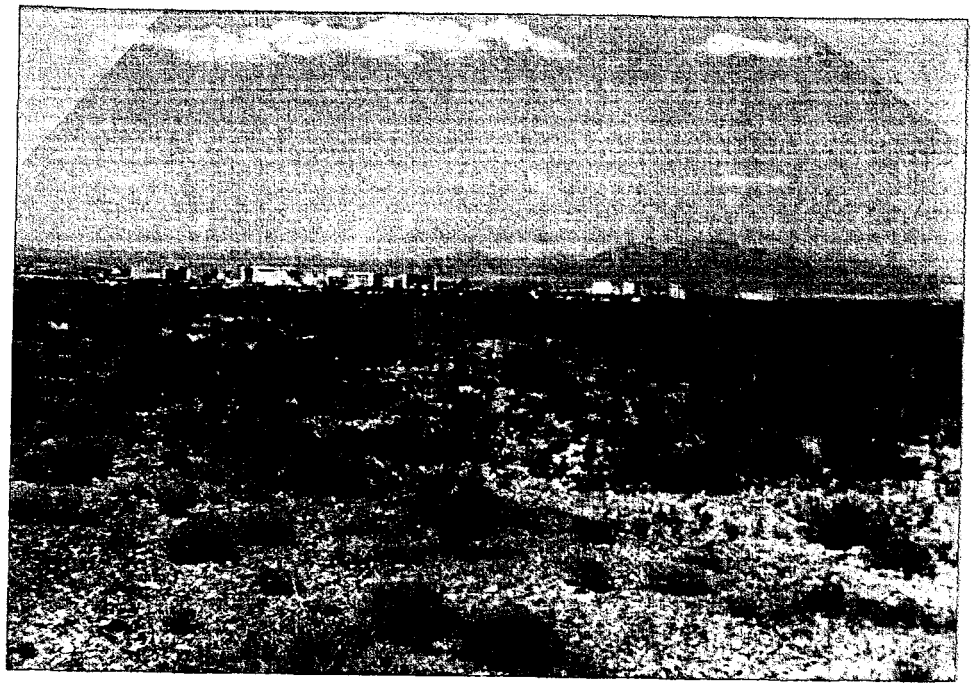
1. Section Location: ST-2-q_3 (upstream most section of segment q)
2. Mark section on map or photograph.
3. Estimate bottom width (sandy portion of channel): 12
4. Photograph main channel 14:19
5. Photograph overbank ~~14:20~~
6. Note highwater marks:
   Type: silt (clots)
   Elevation: 3' (from scour holes) 1' rest
7. Signs of Overbank Flooding/Sheet Flooding? No, f/p softer than
8. Signs of Erosion? scour holes
9. Signs of Deposition?
10. Bedload size: MG + sandy silt
11. Obstructions which could cause backwater? No

Office:

1. Determine Q:
2. Determine slope from topo:
3. Estimate n from photos: .035
4. Run mannings eq'n using HEC2:
5. Note EGL and WSEL:
6. Map limits on topo/photo:



ST-2-93



ST-2-1 looking downstream 2/ because this
[illegible] near ST-2h and ST-3-a Promis
ST-2-A

?





EXHIBIT 10-2

APPROXIMATE METHODS

CROSS - SECTIONS

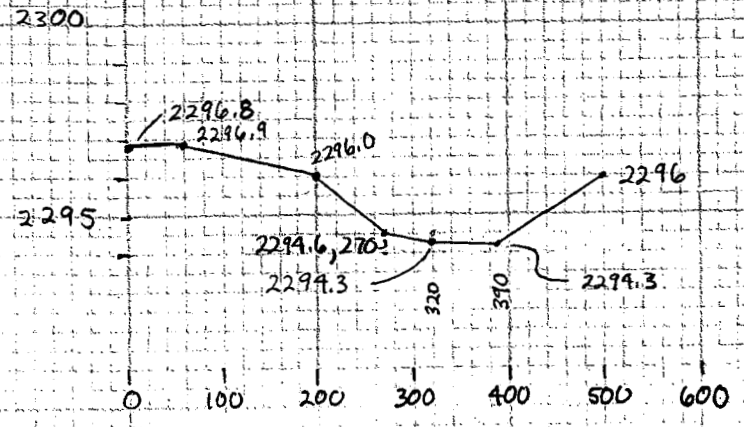
SUBJECT Tropicana Wash — BY HMA — DATE 6/23/92

North Wash Cross-sections — SHEET 1 OF 18

PROJECT NO. RDD 33832

NM-1

NT-1-a



slope = 8/40 = 0.0195 ft/ft

n = 0.047

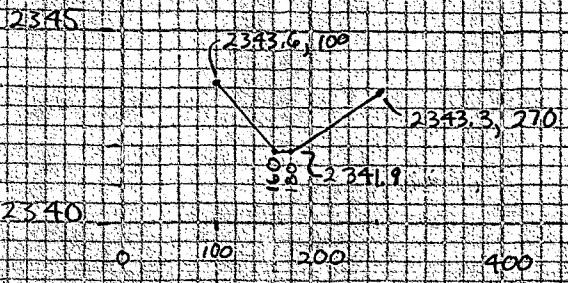
SUBJECT Tropicana Wash BY HMA DATE 6/23/92

North Wash Cross-sections SHEET 2 OF 18

PROJECT NO RDD 33832

NM-2

NT-2-a

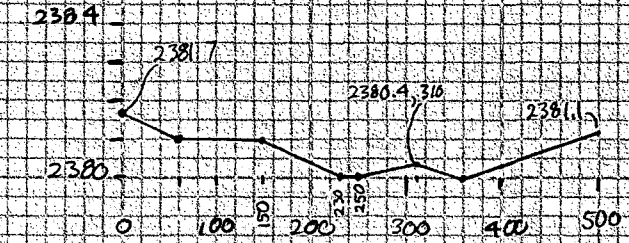


Slope = 4/235 = 0.0170 ft/ft

n = 0.04

* area was recently graded so channel geometry estimated from JMM topo, 1984

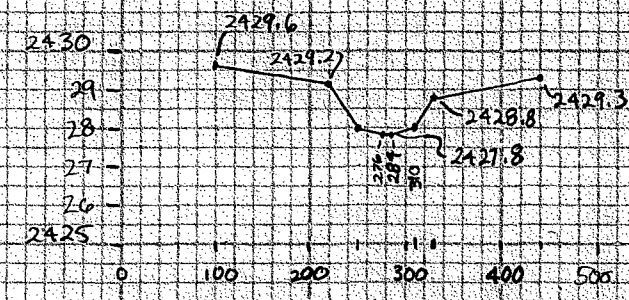
NT-2-c



slope = 8/550 = 0.0145 ft/ft

n = 0.025

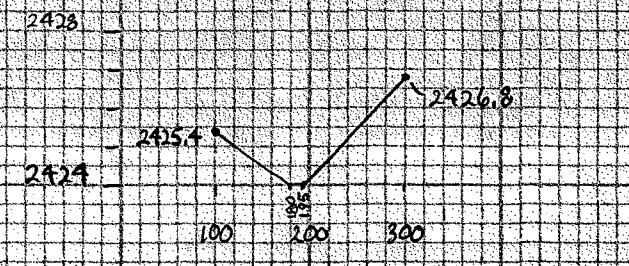
NT-2-d



slope = 8/510 = 0.0157 ft/ft

n = 0.03

NT-2-g



slope = 8/570 = 0.0140 ft/ft

n = 0.025

FORM 188

SUBJECT Tropicana Wash BY HMA DATE 6/23/92

North Wash Cross-Sections SHEET 3 OF 18

PROJECT NO ROD 33832

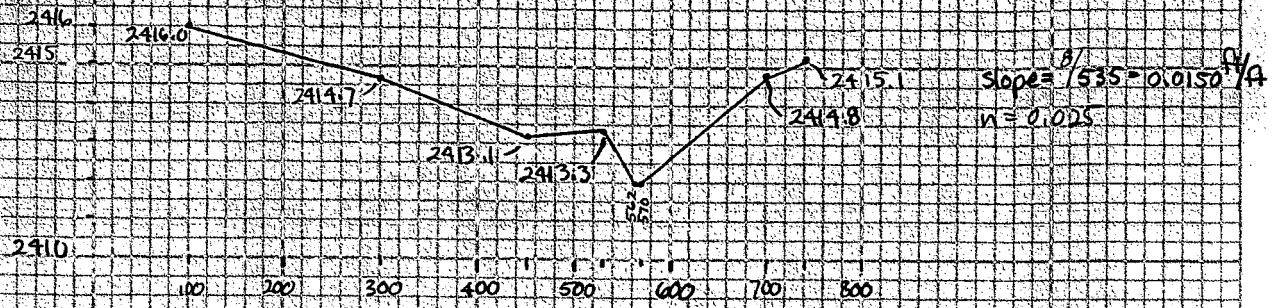
NM-3

NT-3-a elev., sta.: 2364, 100; 2364, 125; 2360, 140; 2356, 150; 2352, 190; 2348, 220; 2346.8, 240; 2346.8, 260; 2348, 270; 2360, 285; 2364, 405

slope = 4/540 = 0.0074 ft/ft

n = 0.035

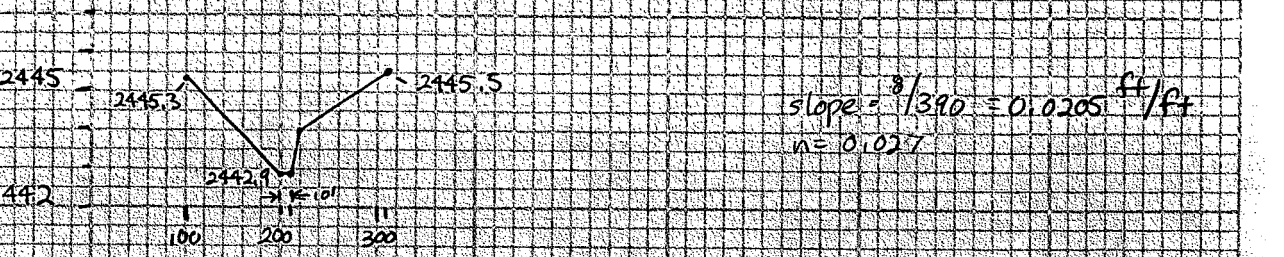
NT-3-c



slope = 8/535 = 0.0150 ft/ft

n = 0.025

NT-3-e



slope = 8/390 = 0.0205 ft/ft

n = 0.027

SUBJECT Tropicana Wash — BY HMA — DATE 6/23/92

North Cross-Sections — SHEET 4 OF 18

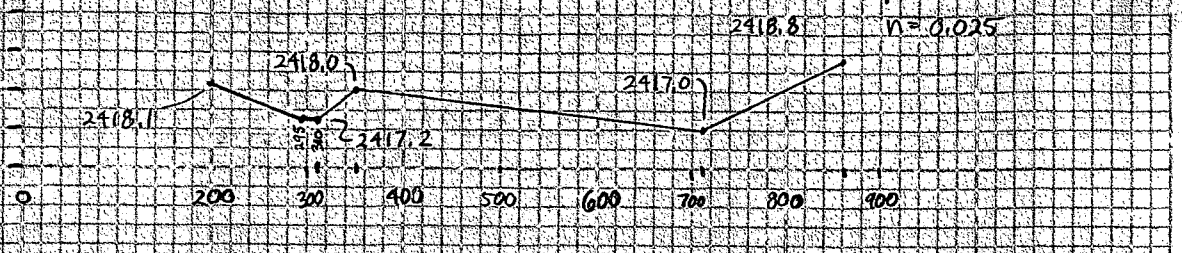
PROJECT NO RDD 33832

NM-4

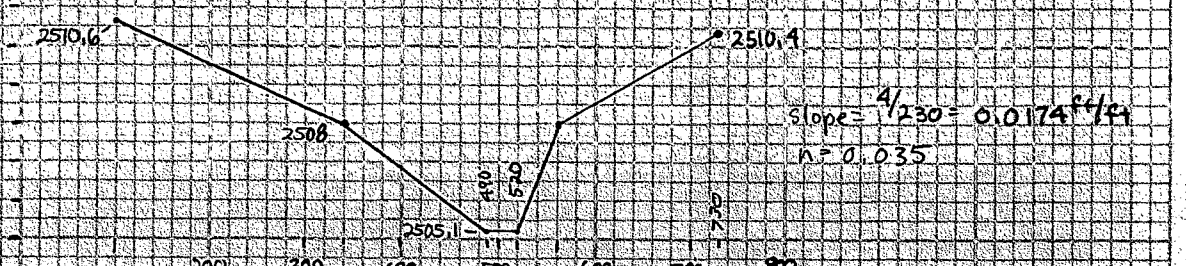
NT-4-a use cross-section from NT-4-b except drop elevs by 7'

NT-4-b elev., sta.: 2388.4, 100; 2388, 170; 2384, 240; 2380, 255; 2376, 280; 2370, 305; 2370, 375; 2376, 328; 2380, 340; 2384, 375; 2388, 405;
slope = 12/780 = 0.0154, n = 0.035

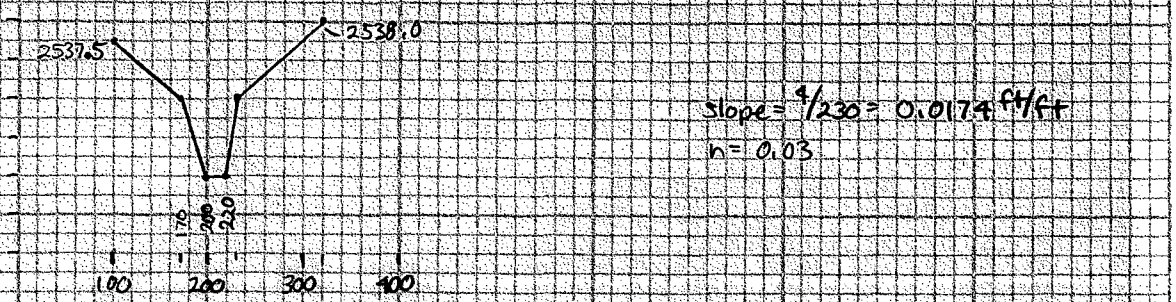
NT-4-c-①/s



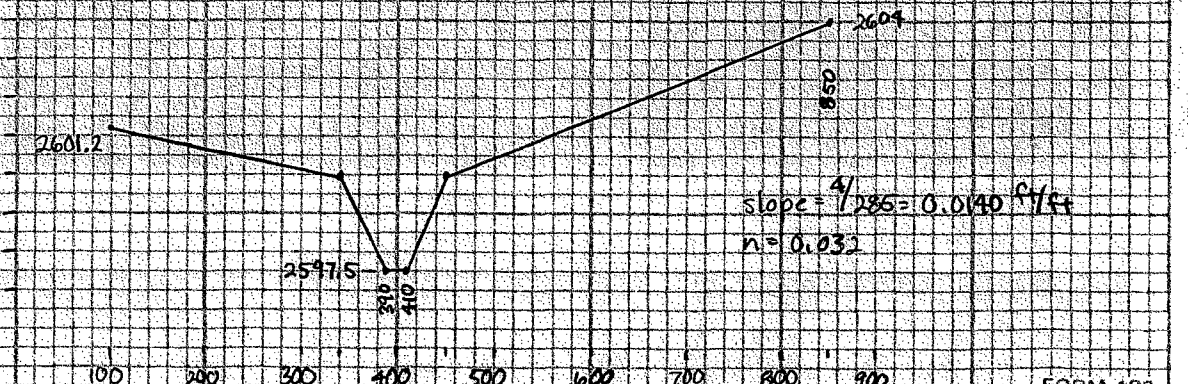
NT-4-c-②/s



NT-4-d-②/s



NT-4-d-①/s



FORM 188

SUBJECT Tropicana Wash
North Wash Cross-Sections

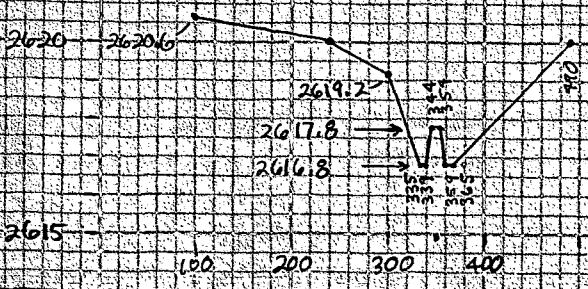
BY HMA DATE 6/24/92

SHEET 5 OF 18

PROJECT NO RDD 33832

NM-4, con't

NT-4-C



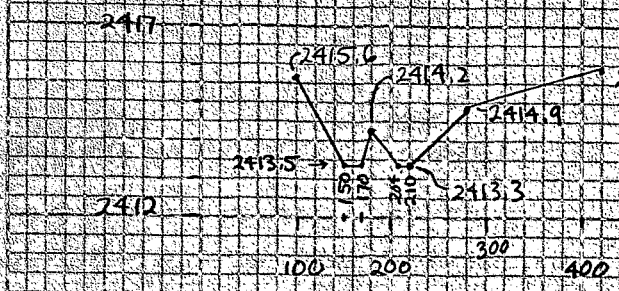
slope = 4/240 = 0.0167 ft/ft

n = 0.035

SUBJECT Tropicana Wash BY HMA DATE 6/23/92
North Wash Cross-Sections SHEET 6 OF 18
PROJECT NO. RDD 33832

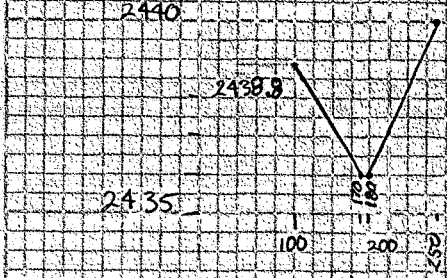
NM-5

NT-5-a



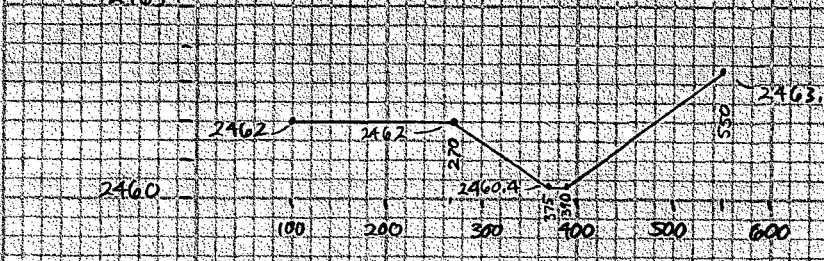
Slope = 4/340 = 0.0118 ft/ft
n = 0.037

NT-5-b



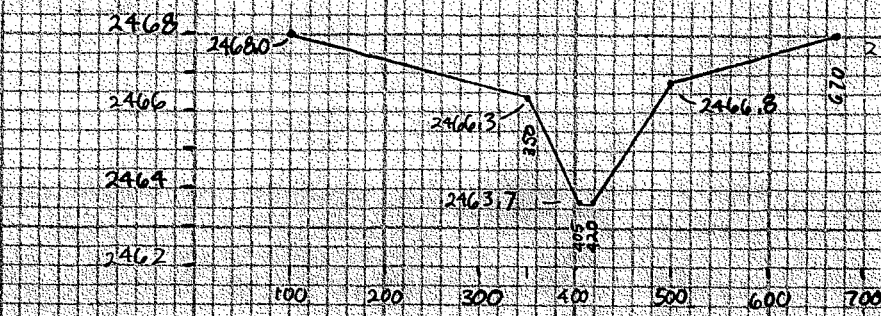
Slope = 8/560 = 0.0143 ft/ft
n = 0.035

NT-5-c



Slope = 8/480 = 0.0167 ft/ft
n = 0.03

NT-5-f



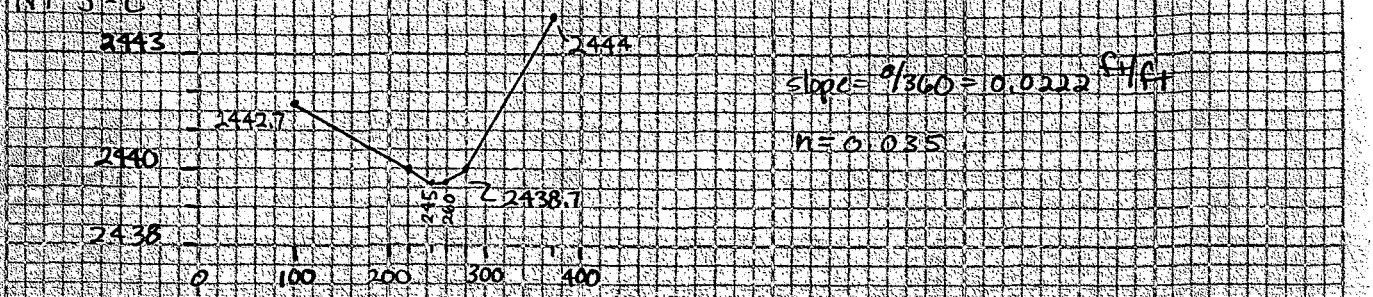
Slope = 8/540 = 0.0148 ft/ft
n = 0.032

FORM 188

SUBJECT Tropicana Wash — North Wash cross-sections — BY HMA — DATE 6/23/92 — SHEET 7 OF 18 — PROJECT NO RDD 33832

NM-5, con't

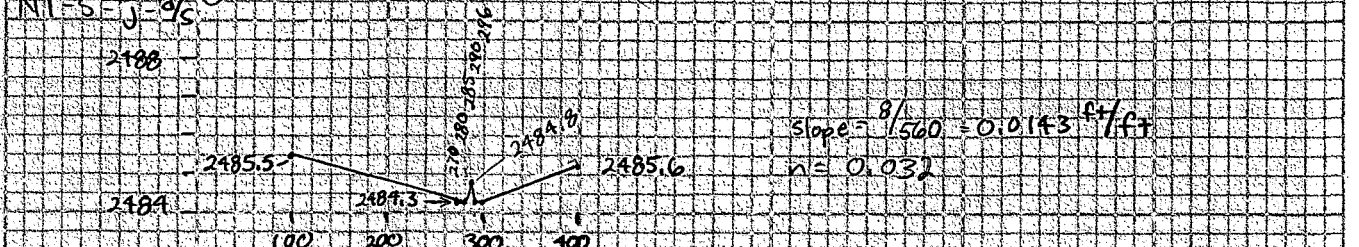
NT-5-C



slope = 8/360 = 0.0222 ft/ft

n = 0.035

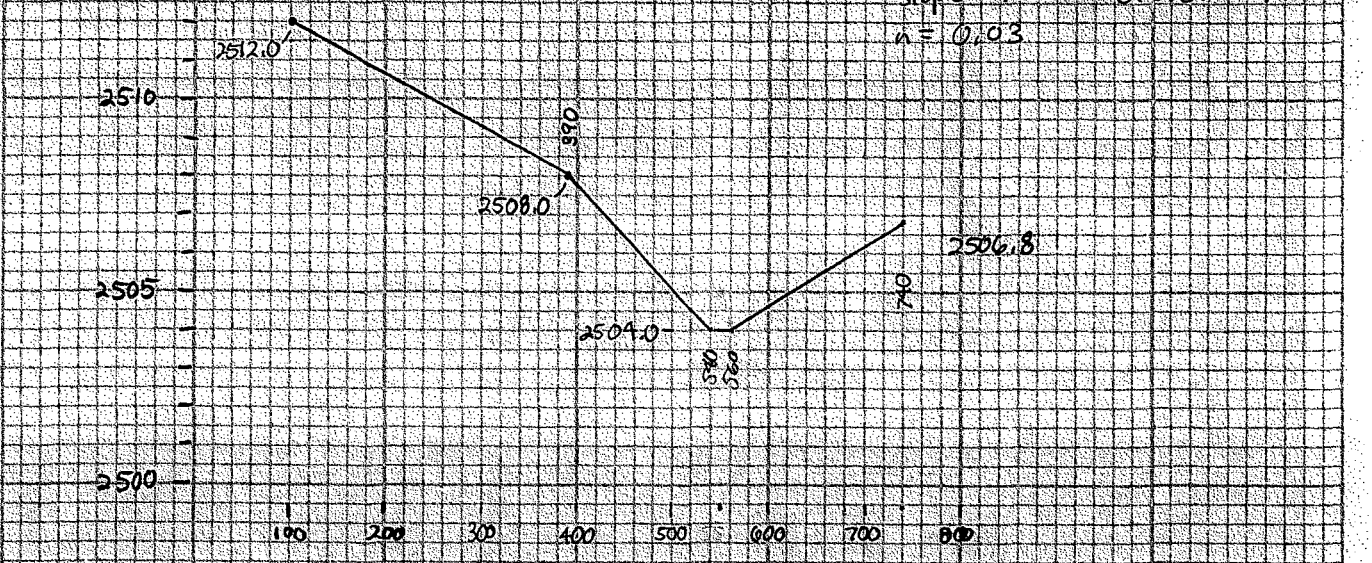
NT-5-J-d/s ②



slope = 8/560 = 0.0143 ft/ft

n = 0.032

NT-5-J-u/s ①



slope = 8/530 = 0.0151 ft/ft

n = 0.03

SUBJECT Tropicana Wash — BY HMA — DATE 6/24/92

Central Wash Cross-Sections — SHEET 8 OF 18

PROJECT NO RDD 33832

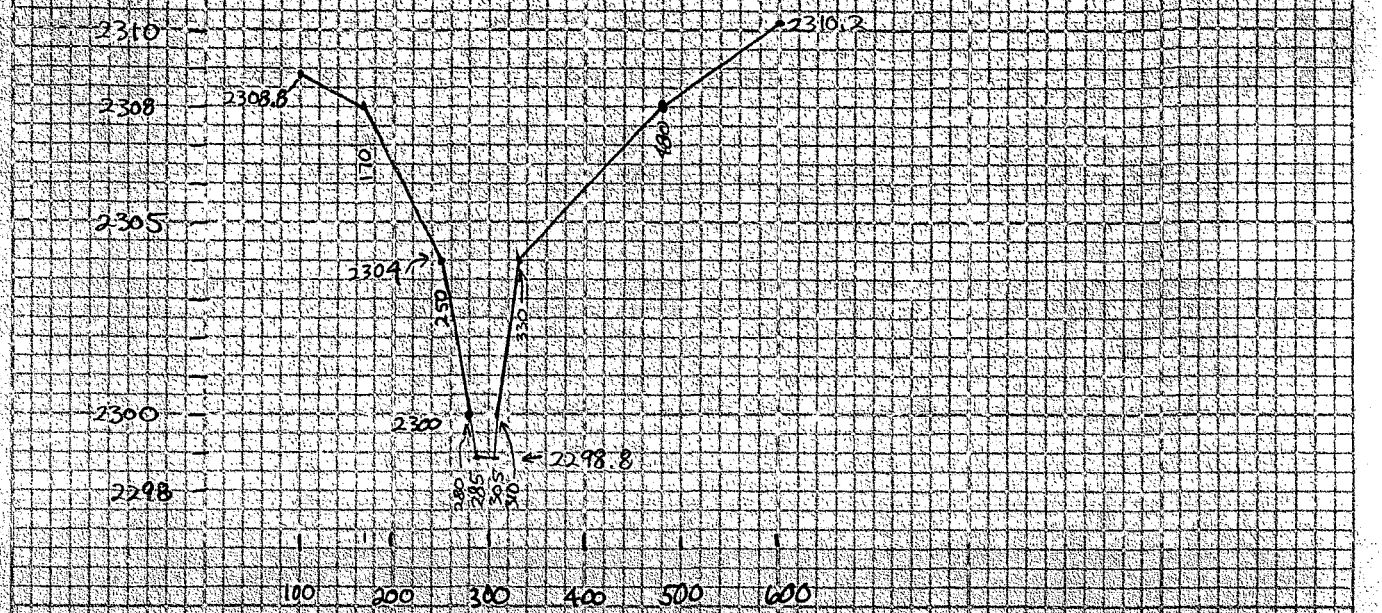
CM-1 = no sections

CM-2

CT-2-a

slope = 4/250 = 0.0160 ft/ft

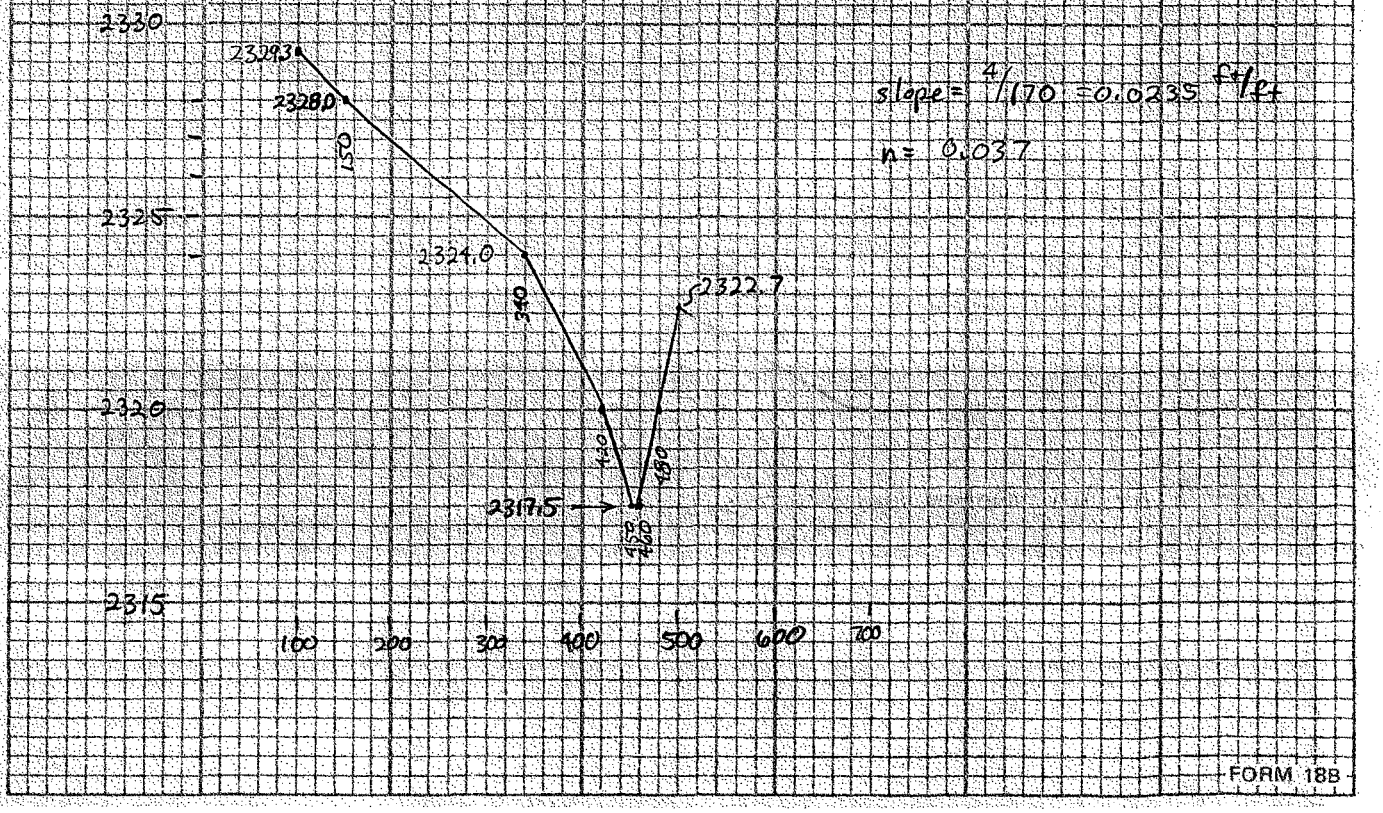
n = 0.037



CT-2-e

slope = 4/170 = 0.0235 ft/ft

n = 0.037



FORM 188

SUBJECT Tropicana Wash BY HMA DATE 6/25/92

Central Wash Cross-Sections SHEET 9 OF 18

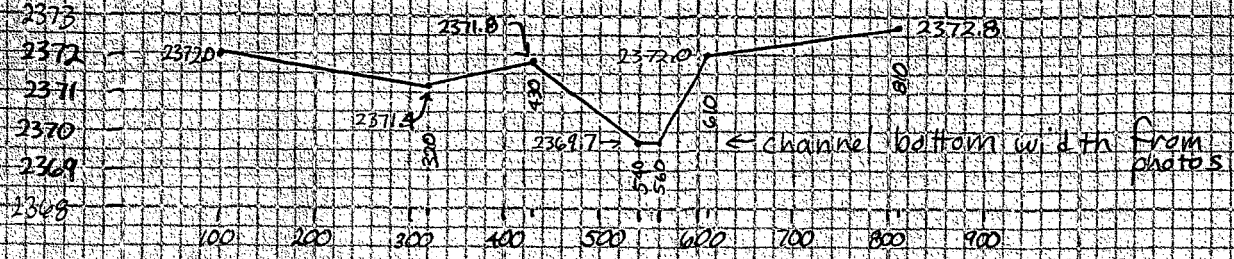
PROJECT NO. RDD 33832

CH-2, con't

CT-2-P

slope = 2/120 = 0.01667 ft/ft

n = 0.022



← channel bottom width from photos

FORM 18B

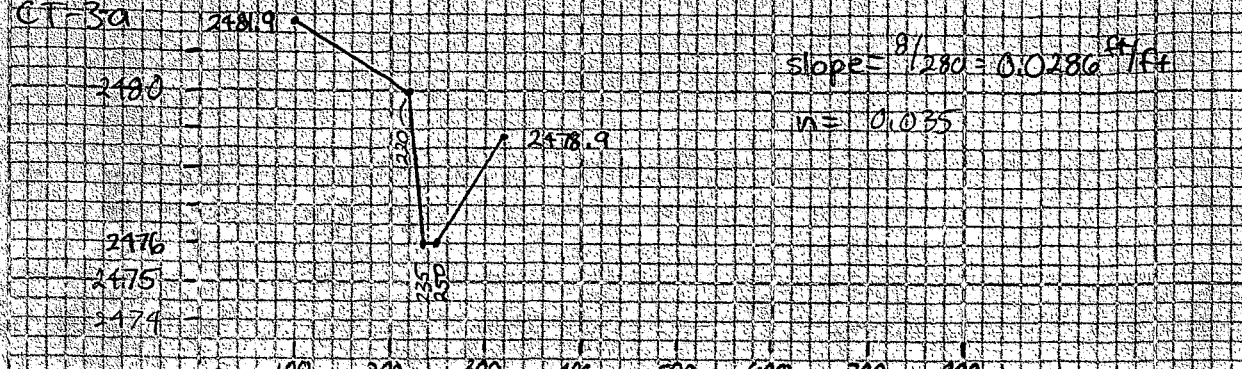
SUBJECT Tropicana Wash — Central Wash Cross-sections BY HMA DATE 6/26/92

SHEET 10 OF 18

PROJECT NO RDD 33832

CM-3

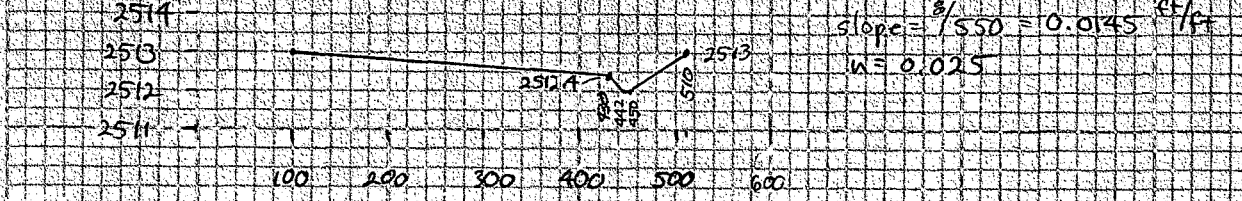
CT-3a



Slope = 8/1280 = 0.0286 ft/ft

n = 0.035

CT-3-b



Slope = 8/550 = 0.0145 ft/ft

n = 0.025

FORM 188

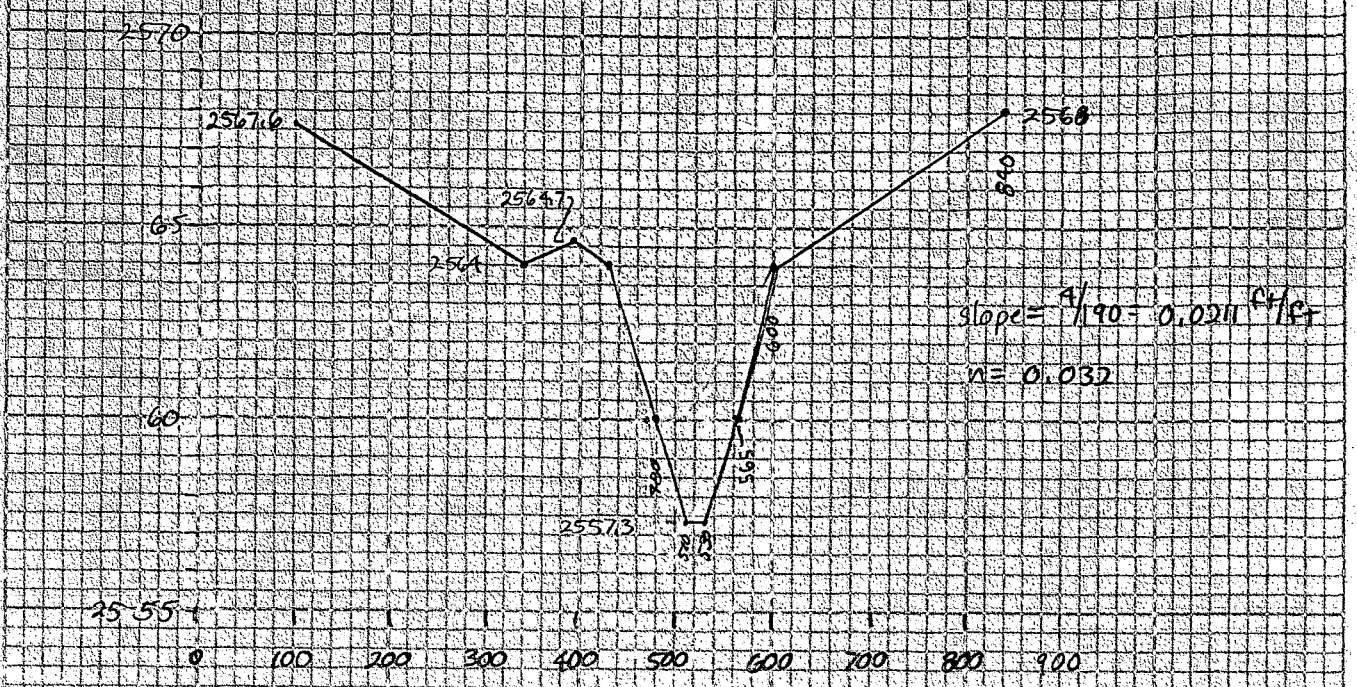
SUBJECT Tropicana Wash BY HMA DATE 6/26/92

Central Wash Cross Sections SHEET 11 OF 18

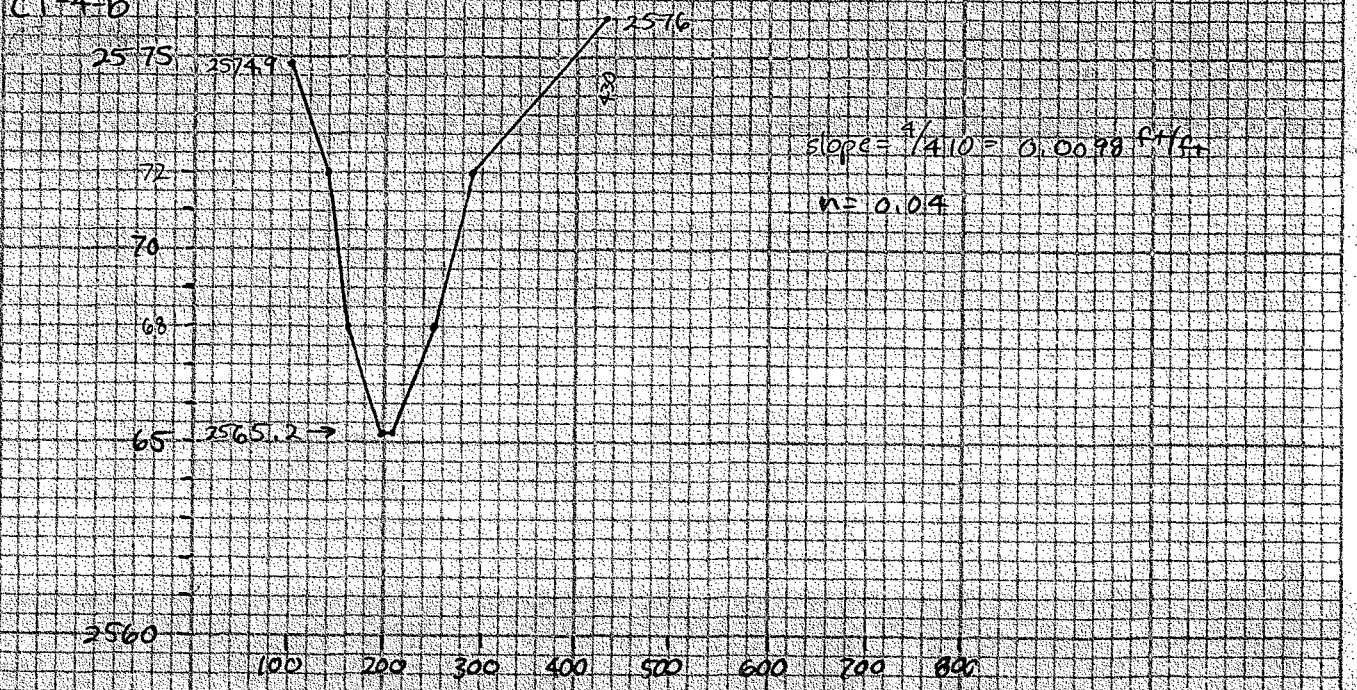
PROJECT NO. PDD 33832

CM-4

CT-4-a



CT-4-b

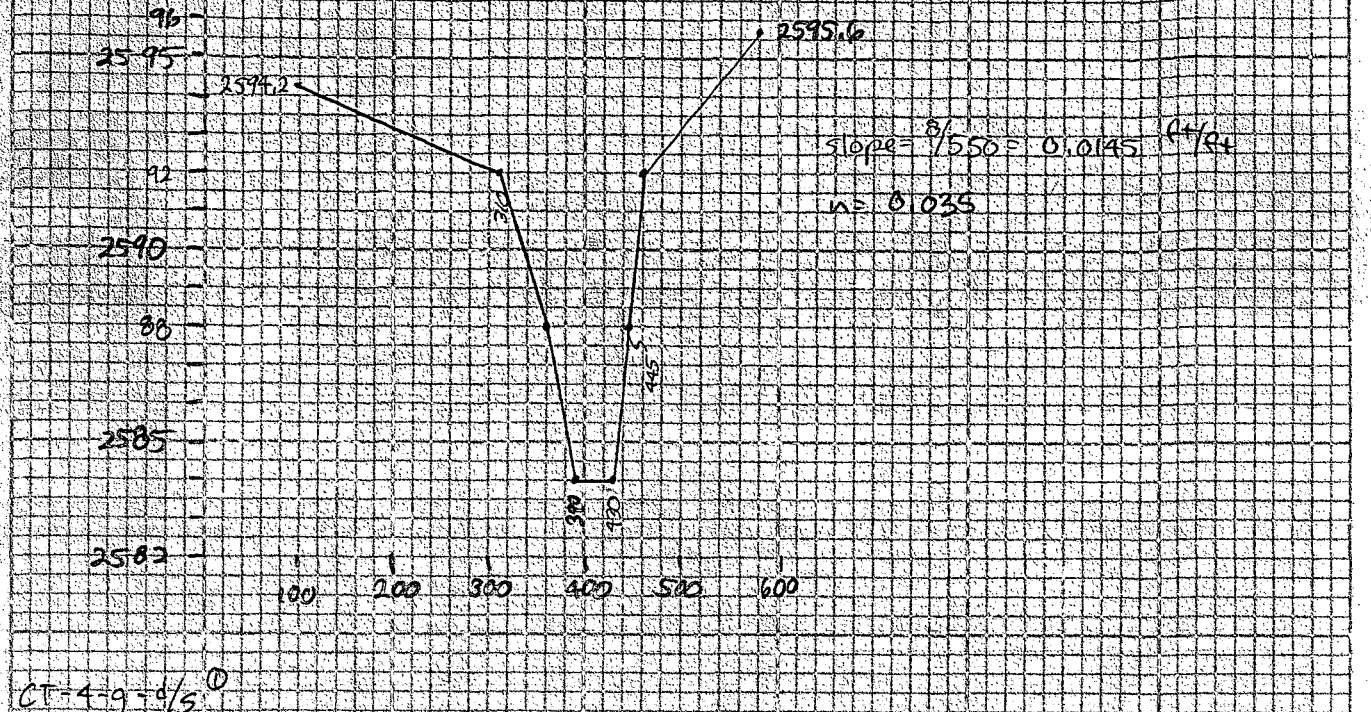


FORM 188

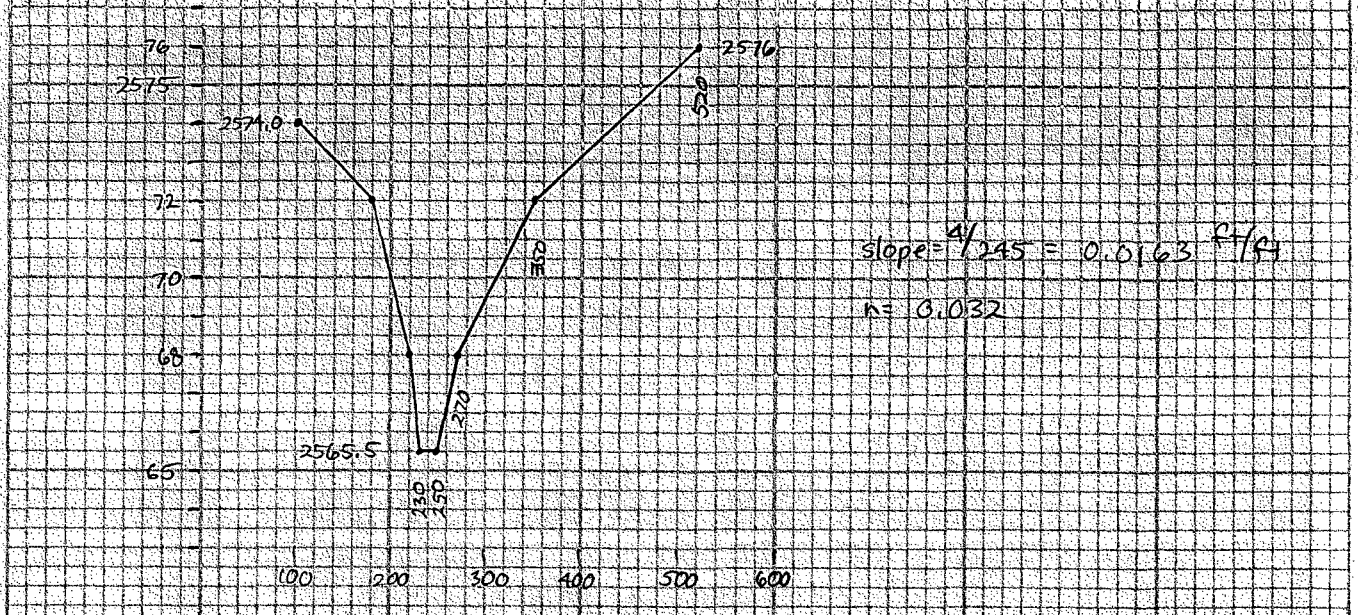
SUBJECT Tropicana Wash — Central Wash Cross-Sections — BY HMA — DATE 6/26/92 — SHEET 12 OF 18 — PROJECT NO RDD 33832

CM-4, con't

CT-4-C



CT-4-g-d/s ①



FORM 188

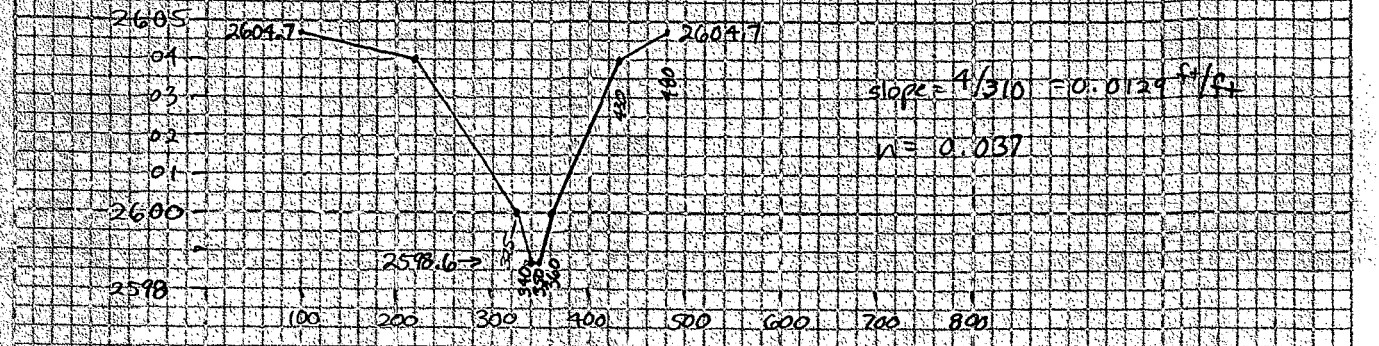
SUBJECT Tropicana Wash — BY HMA — DATE 6/26/92

Central Wash Cross-sections — SHEET 13 OF 18

PROJECT NO. RDD 3383

CM-4 cont'd

CT-4-9-W/S ②



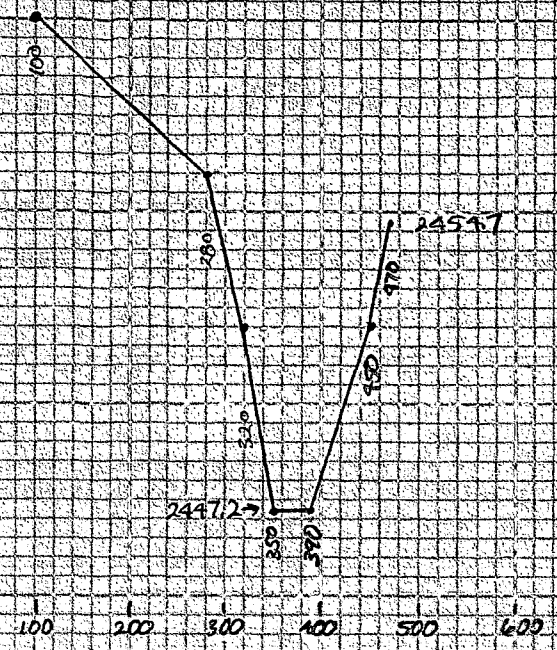
slope = 4/310 = 0.0129 ft/ft

n = 0.037

SUBJECT Tropicana Wash South Wash Cross-Sections BY HMA DATE 6/26/92
SHEET 14 OF 18
PROJECT NO RDD 33832

SM-11

ST-1-a



Slope = 4/370 = 0.0108 ft/ft

n = 0.035

Rainbow Road between ST-1-a and ST-1-C ; file = ST-1-RRd.HC2

Sta, El. ; Sta, El. : 100, 2461.3 ; 250, 2460 ; 580, 2458.2 ; 650, 2460 ; 785, 2464

Q = Q@ ST-1-C

to model, set up cross-section w/a steep slope and n=0.015. Then increase slope until critical depth is found.

FORM 18B

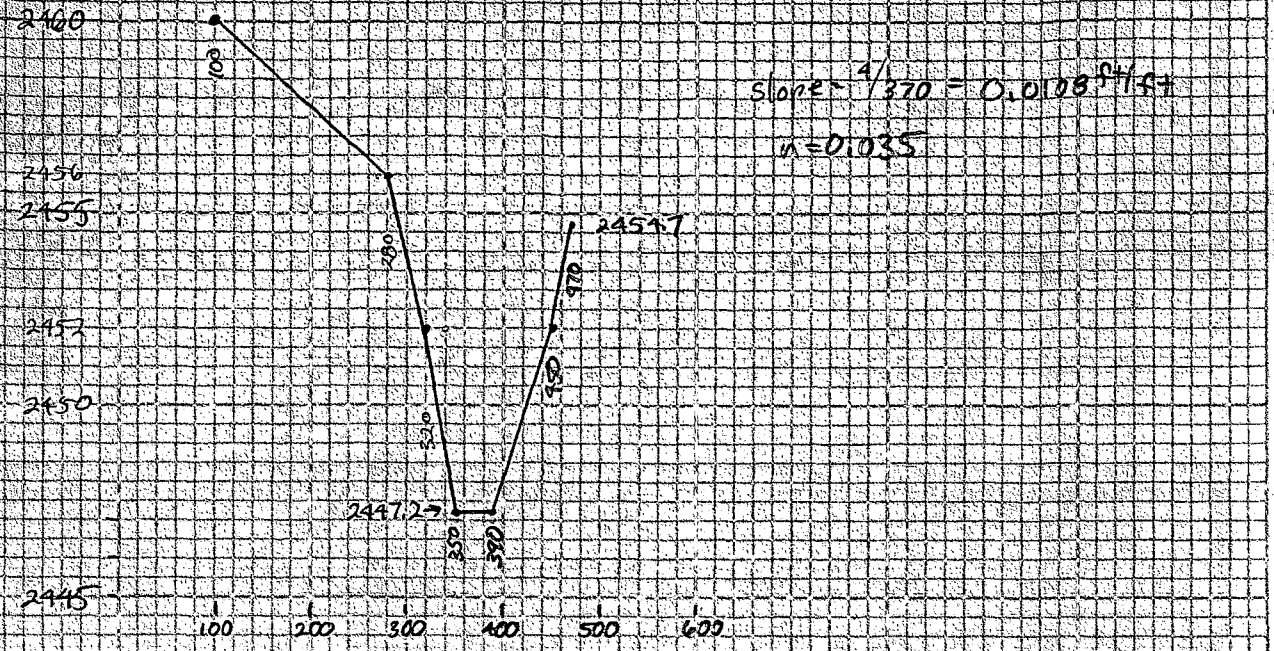
SUBJECT Tropicana Wash BY HMS DATE 6/26/92

South Wash Cross-Sections SHEET 14 OF 18

PROJECT NO. RDD 33832

ST-1

ST-1-a



slope = 4/370 = 0.0108 ft/ft

n = 0.035

Rainbow Road between ST-1-a and ST-1-C ; file = ST-1-RRd.HC2

Sta., El. ; Sta., El. : 100, 2461.3 ; 250, 2460 ; 580, 2458.2 ; 650, 2460 ; 785, 2464

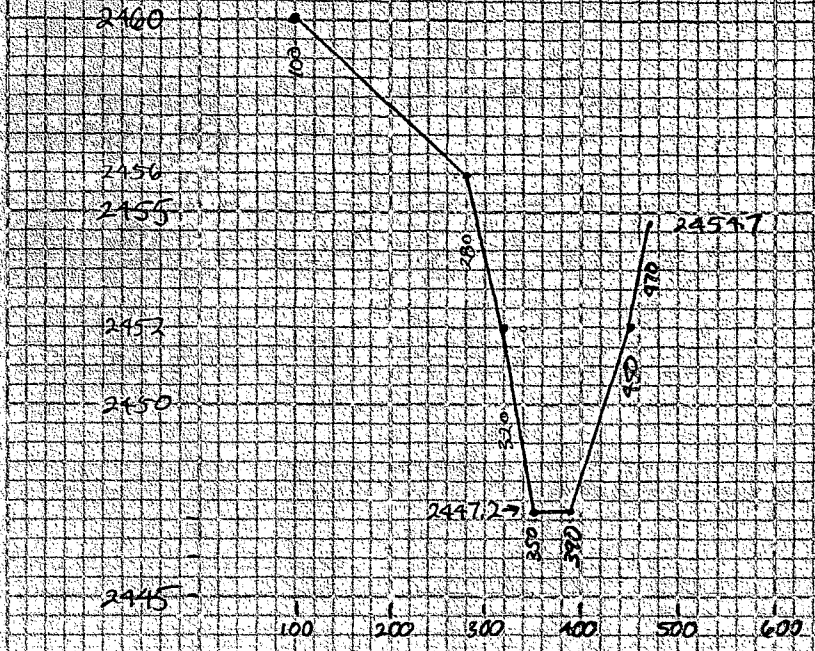
Q = Q@ ST-1-C

to model, set up cross-section w/a steep slope and n=0.015. Then increase slope until critical depth is found.

SUBJECT Tropicana Wash BY HMA DATE 6/26/92
South Wash Cross-Sections SHEET 14 OF 18
PROJECT NO RDD 33832

SM-1

ST-1-a



Slope = 4/370 = 0.0108 ft/ft

n = 0.035

Rainbow Road between ST-1-a and ST-1-C, file = ST-1-RRd.HC2

Sta, El. ; Sta, El. : 100, 2461.3 ; 250, 2460 ; 580, 2458.2 ; 650, 2460 ; 785, 2464

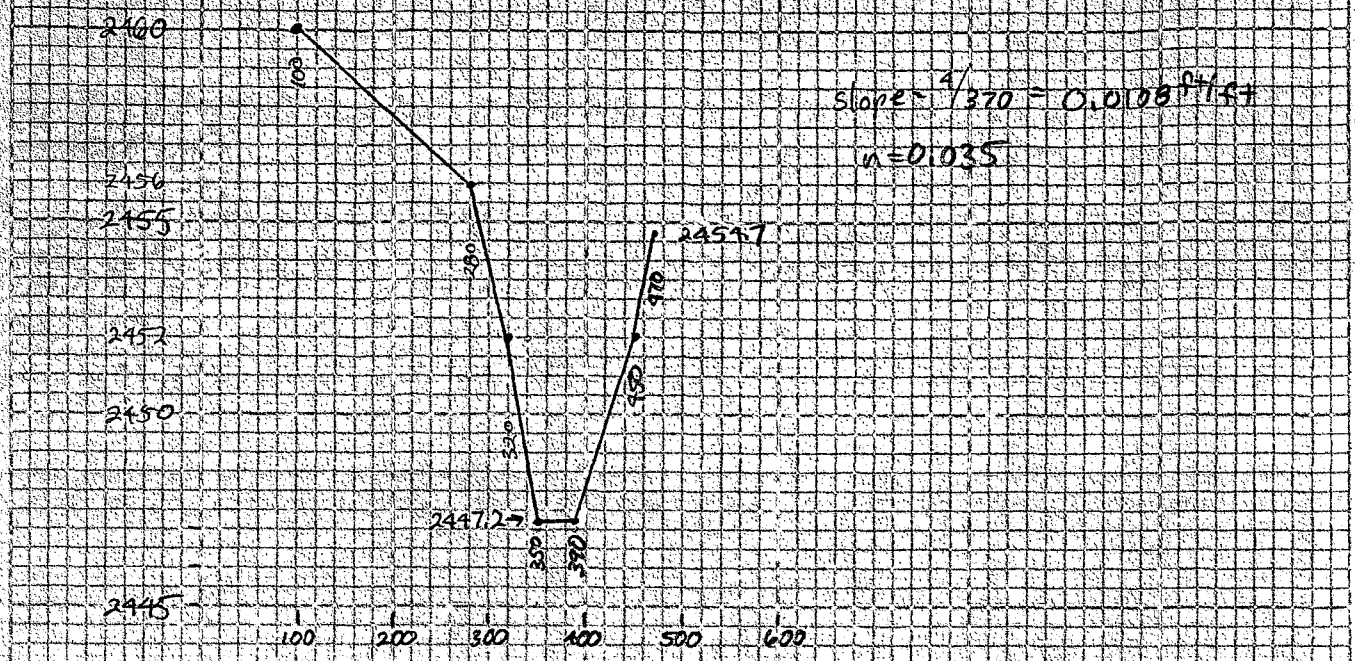
Q = Q@ ST-1-C

to model, set up cross-section w/a steep slope and n=0.015. Then increase slope until critical depth is found.

SUBJECT Tropicana Wash South Wash Cross-Sections BY HMA DATE 6/26/92
SHEET 14 OF 18
PROJECT NO. RDD 33832

ST-1

ST-1-a



Rainbow Road between ST-1-a and ST-1-C; file = ST-1-RRd.HC2

Sta., El.; Sta.: 100, 2461.3; 250, 2460; 580, 2458.2; 650, 2460; 785, 2464

Q = Q@ ST-1-C

to model, set up cross-section w/a steep slope and n=0.015. Then increase slope until critical depth is found.

FORM 188

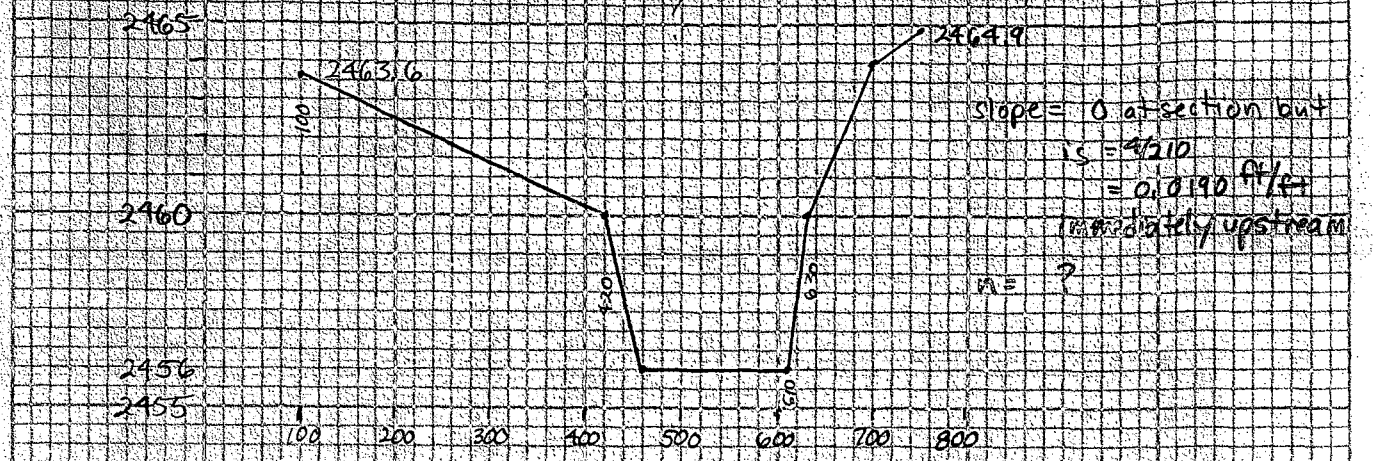
SUBJECT Tropicana Wash South wash cross sections BY HMA DATE 6/26/92

SHEET 15 OF 18

PROJECT NO BDD33832

SM-1, con't

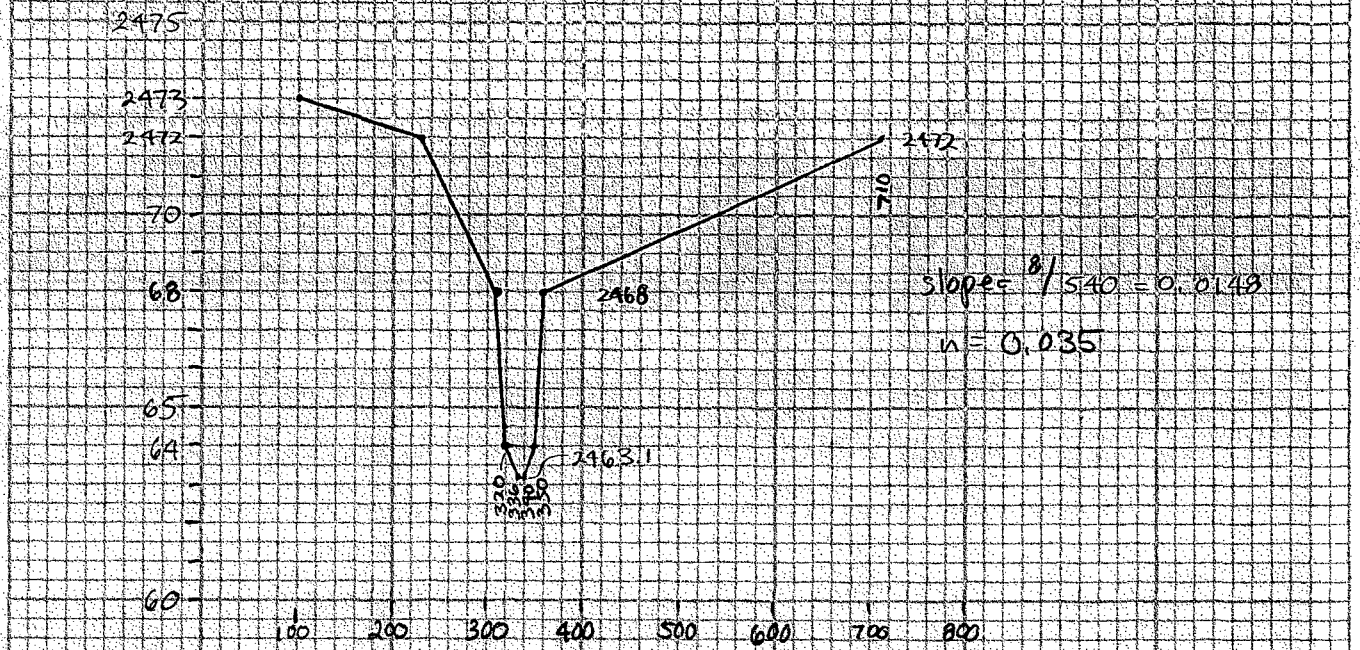
ST-1-C



Slope = 0 at section but
$S = 4/210 = 0.0190$ ft/ft
Immediately upstream

n = ?

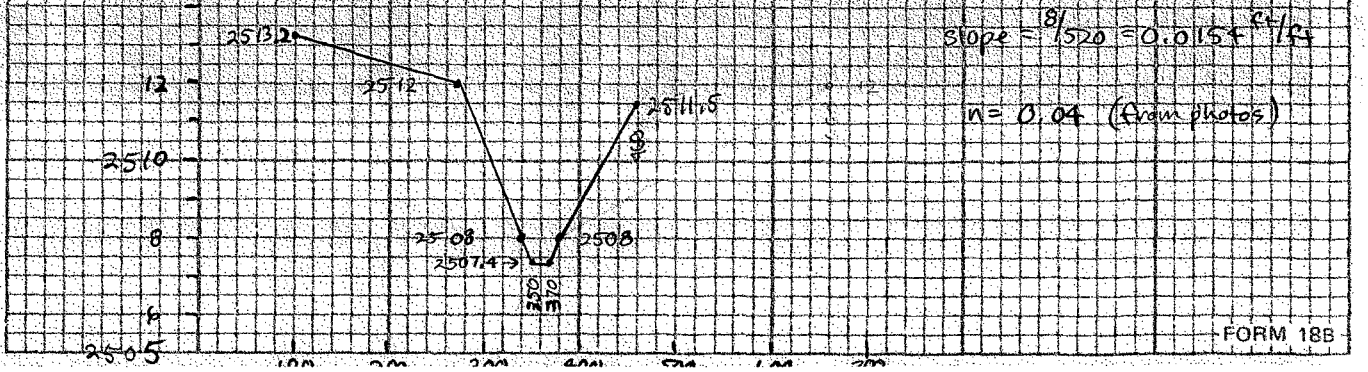
ST-1-d



Slope = $8/540 = 0.0148$

n = 0.035

ST-1-E



Slope = $8/1520 = 0.0115$ ft/ft

n = 0.04 (from photos)

FORM 18B

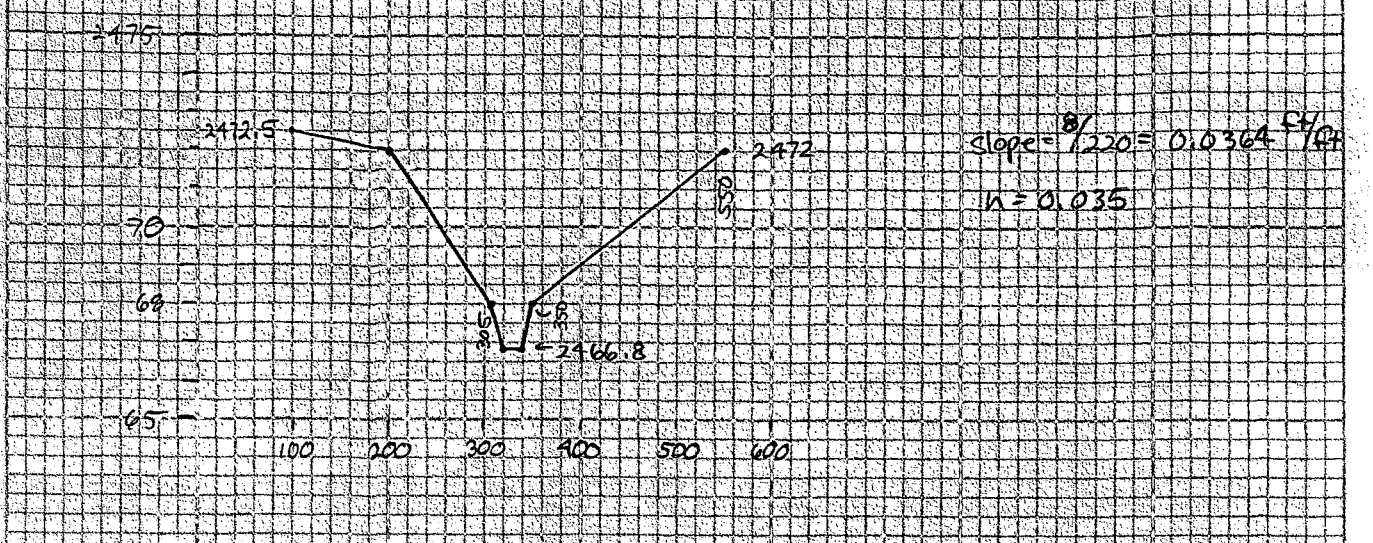
SUBJECT Tropicana Wash South Wash Cross-Sections BY HMA DATE 6/26/92

SHEET 16 OF 18

PROJECT NO. 20D 33832

SM-2

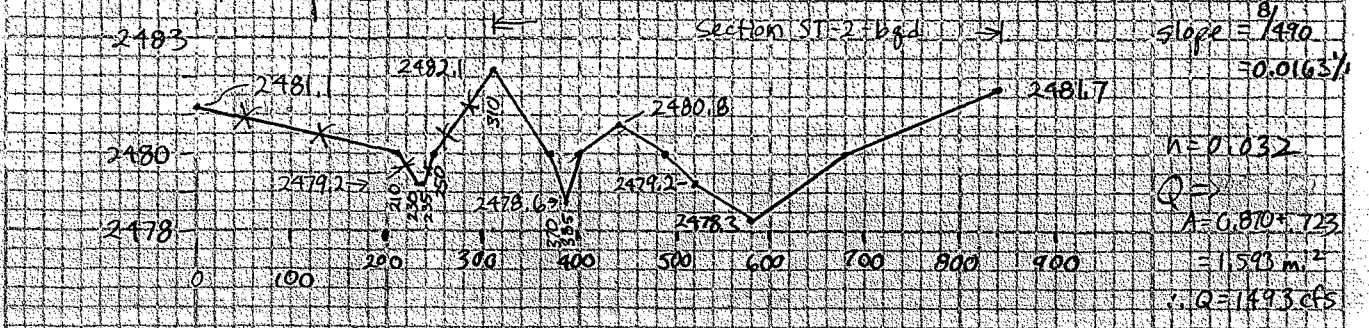
ST-2-a



slope = 8/1220 = 0.0364 ft/ft

n = 0.035

ST-2-b + ST-2-g+l



Section ST-2-b&d →

slope = 8/490 = 0.0163 ft/ft

n = 0.032

Q =>

A = 0.870 + .723 = 1.593 m.²

∴ Q = 149.3 cfs

ST-2-d



slope = 8/480 = 0.0167 ft/ft

n = 0.032

FORM 188

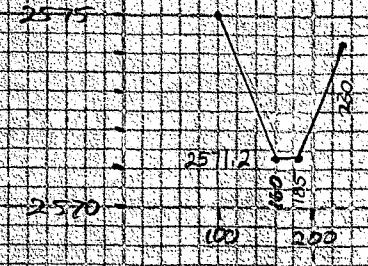
SUBJECT Tropicana Wash BY HMA DATE 6/26/92

South Wash Cross-Sections SHEET 17 OF 18

PROJECT NO. RDD 33832

SM-2 con't

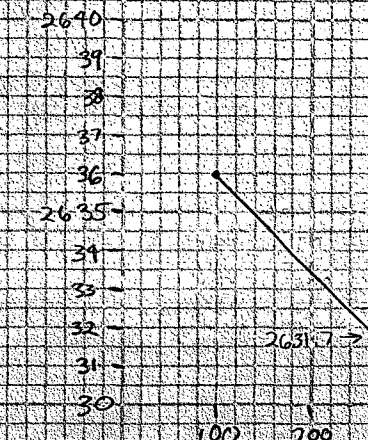
ST-2-e



slope = 4/240 = 0.0167 ft/ft

n = 0.035

ST-2-f

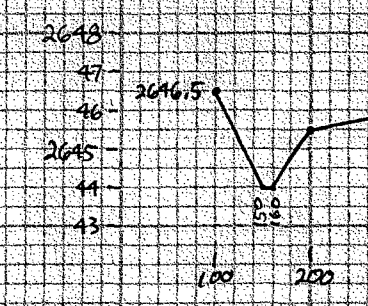


slope = 8/425 = 0.0188 ft/ft

n = 0.03 (from sec ST-2-h which is near ST-2-f)

bed width derived from topo & info from ST-2-e

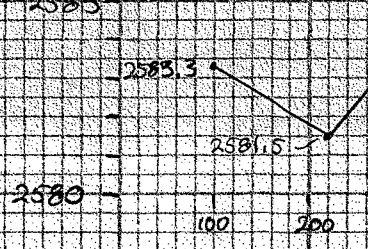
ST-2-h



slope = 8/470 = 0.0170

n = 0.03

ST-2-l



slope = 4/195 = 0.0205 ft/ft

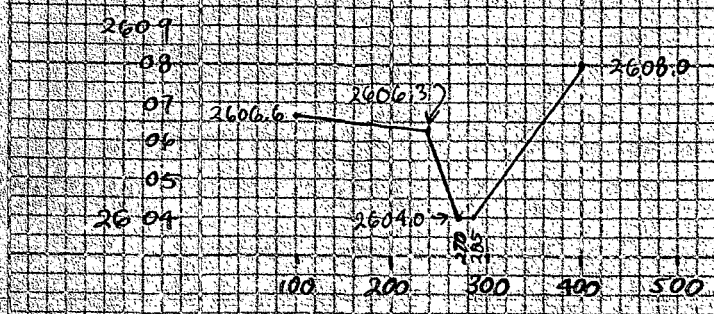
n = 0.035

FORM 188

SUBJECT Tropicana Wash South Wash Cross-Sections BY HMA DATE 6/30/92
SHEET 18 OF 18
PROJECT NO. R00 33832

ST-2, cont

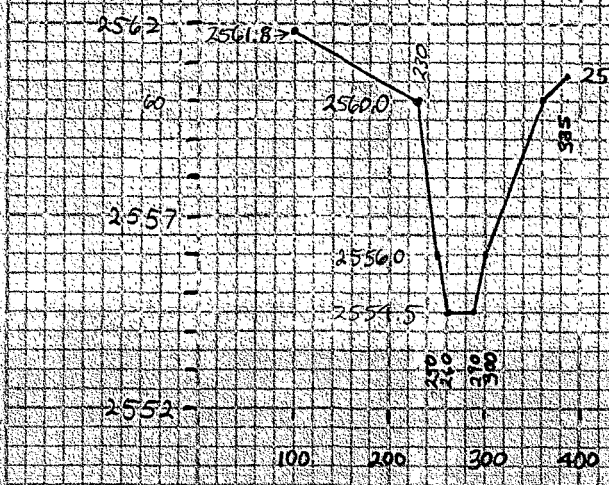
ST-2-m



slope = 9/375 = 0.0213 ft/ft

n = 0.032

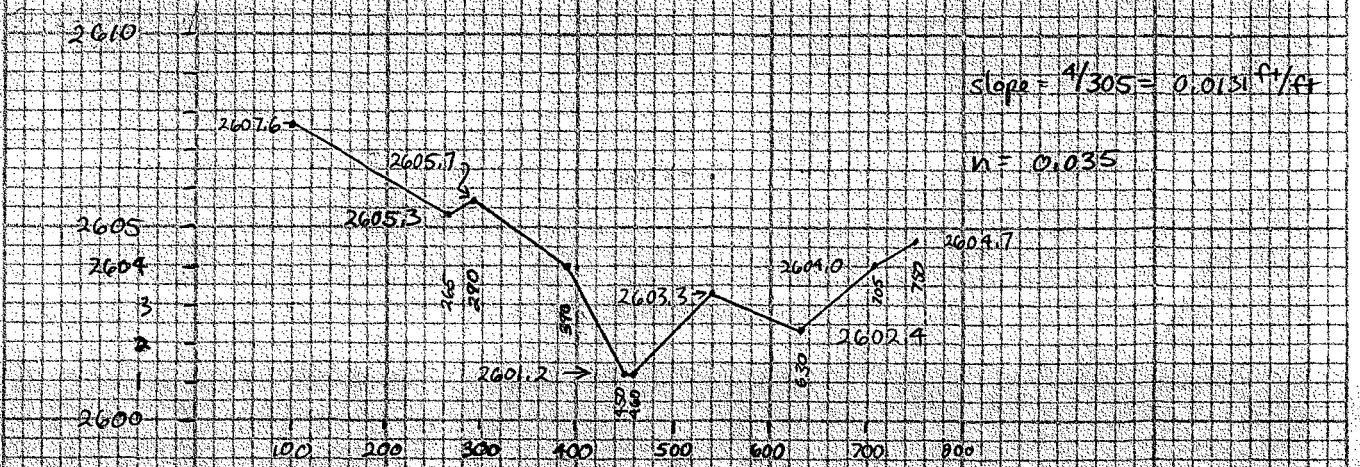
ST-2-q = ② (mid channel)



slope = 9/595 = 0.0134 ft/ft

n = 0.04 (from photos)

ST-2-q-③(W's)



slope = 4/305 = 0.0131 ft/ft

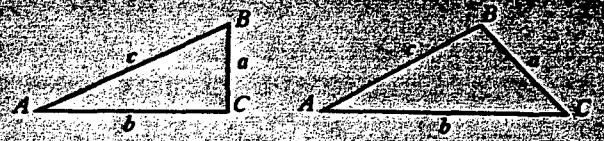
n = 0.035

FORM 18B

EXHIBIT 10-3

BRIDGE FIELD DATA

FORMULAE FOR SOLVING RIGHT TRIANGLES



$$\text{Sin } A = \frac{a}{c} = \text{Cos } B \qquad \text{Cot } A = \frac{b}{a} = \text{Tan } B$$

$$\text{Cos } A = \frac{b}{c} = \text{Sin } B \qquad \text{Sec } A = \frac{c}{b} = \text{Cosec } B$$

$$\text{Tan } A = \frac{a}{b} = \text{Cot } B \qquad \text{Cosec } A = \frac{c}{a} = \text{Sec } B$$

Given	Required	Solution
A, c	B, a, b	$B = 90° - A, a = C \sin A, b = C \cos A.$
A, b	B, a, c	$B = 90° - A, a = b \tan A, C = \frac{b}{\cos A}.$
A, a	B, b, c	$B = 90° - A, b = a \cot A, C = \frac{a}{\sin A}.$
a, c	A, B, b	$\sin A = \frac{a}{c}, \cos B = \frac{a}{c}, b = \sqrt{(c+a)(c-a)}$
a, b	A, B, c	$\tan A = \frac{a}{b}, \cot B = \frac{a}{b}, c = \sqrt{a^2 + b^2}$

FORMULAE FOR SOLVING OBLIQUE TRIANGLES

Given	Required	Solution
A, a, b	B, c	$\sin B = \frac{b \sin A}{a}, c = \frac{a \sin C}{\sin A}$
A, B, a	b	$b = \frac{a \sin B}{\sin A}$
a, b, C	A, c	$A + B = 180° - C, C = \frac{a \sin C}{\sin A}$
a, b, c	Area	side $\frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	area $= \frac{bc \sin A}{2}$
A, B, C, a	Area	area $= \frac{a^2 \sin B \sin C}{2 \sin A}$

MADE IN U.S.A.

CH2M HILL

Tropicana Wash

F.I.S.

Hydraulic Structure Survey

6-10 thru 6-11, 1992

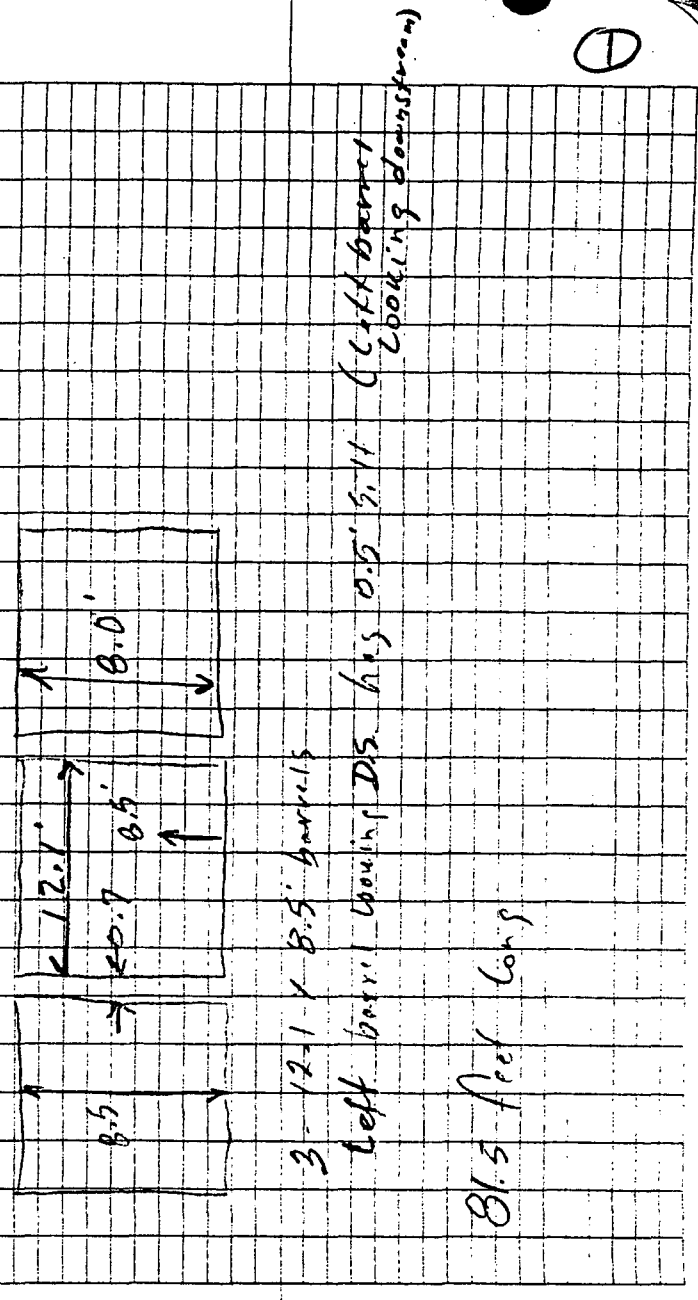
RDD 33832.A2.10

Mitchell
WINSOR

Note all Left & Right References are Looking downstream

H.I. = 1.29' above TBM - N.E Corner concrete @ guardrail

W.S 100' downstream ±	16.38
Invert D.S. Right Culvert	14.02
Invert D.S. Center Culvert	14.9
" " Left Culvert	14.4
Low Chord Right D.S.	5.9
" " Center D.S	6.1
" " Left D.S.	6.0
℄ Culvert ℄ Roadway	1.95
Low Chord U.S. Left	5.0
" " " center	5.0
" " " Right	5.1
Invert U.S. Right	15.2
" " Center	14.6
" " Left	14.1
W.S. - 100' Upstream	12.85



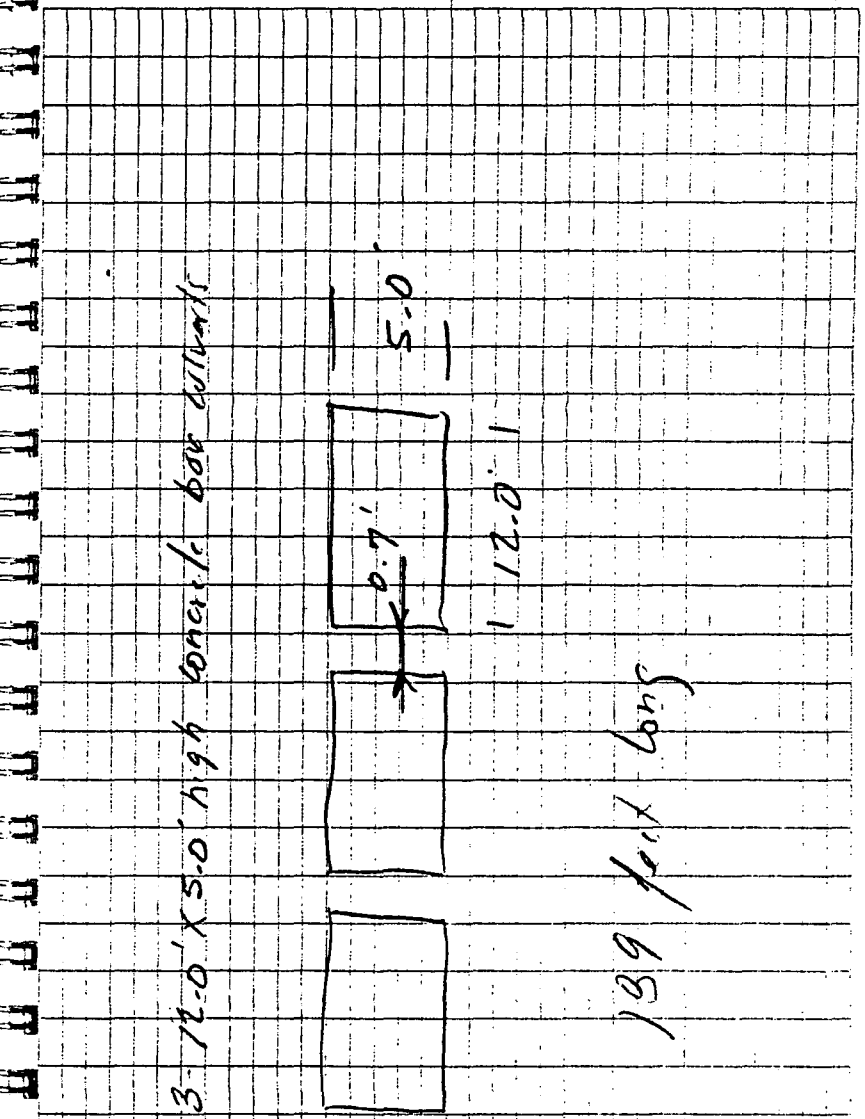
Tropicana Wash @ Flamingo

TBM.

H.I = 4.68 above TBM - N.E bolt of handrail @ N.E Corner of wingwall on downstream side of culverts

L.C. Left D.S.	9.6	
Invert " "	14.6	
L.C. Center D.S.	9.7	
Invert " "	13.3	Sand bar
L.C. Right D.S.	9.5	
Invert Right D.S.	13.6	
℄ ℄	3.6	
L.C. Left U.S.	7.5	
Invert " "	12.9	
L.C. Center U.S.	7.5	
Invert " "	12.9	
L.C. Right U.S.	7.6	
Invert " "	13.1	

189 feet long from stadia



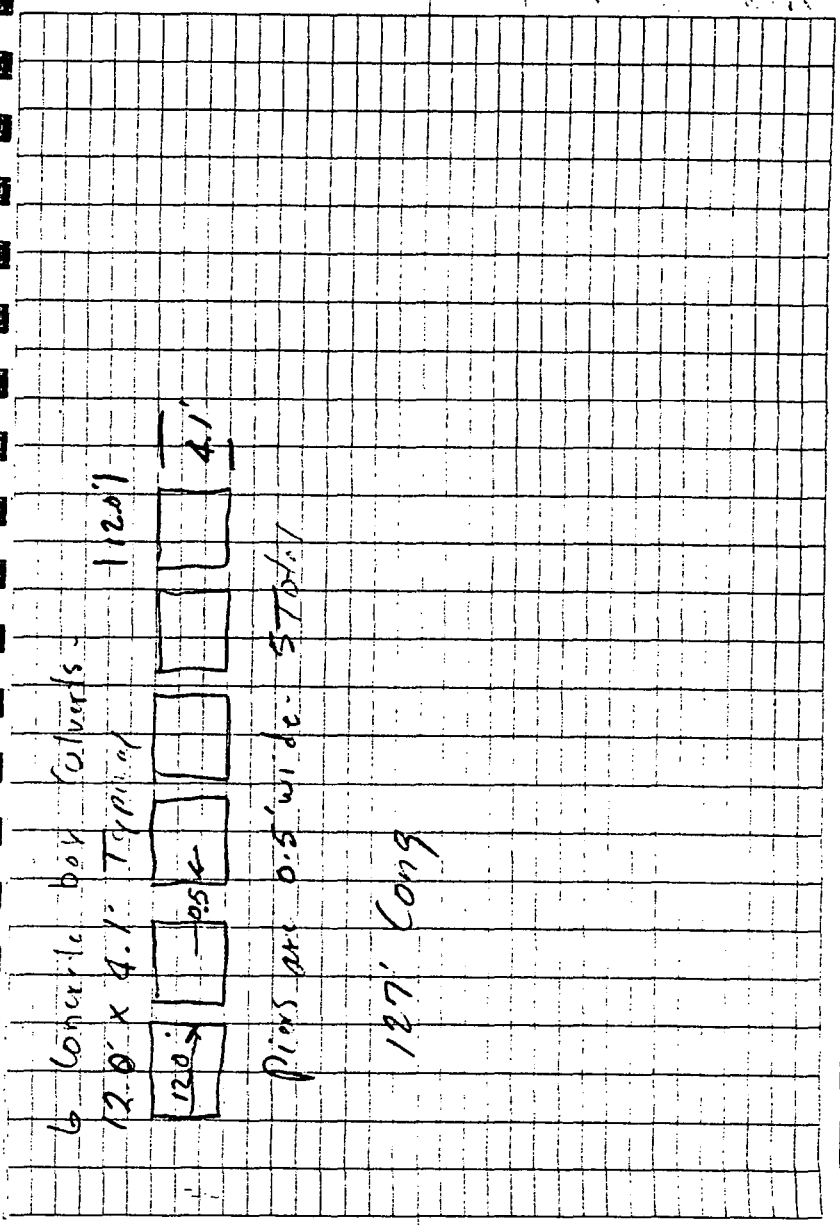
Tropicana Wash @ Swenson

TBm. S.W. side of Stilling well - Top of 6" I beam bracket 1.3' below Top of Concrete hand Rail on S.W. side of Bridge (upstream)

TBm 2.91

Invert Right U.S.	13.1
Low Chord Right U.S.	9.1
Invert Left U.S.	13.1
L.C. Left U.S.	9.1
℄ ℄	5.0
Invert Right D.S.	13.5
L.C. Right D.S	9.5
Invert Left D.S	13.5
L.C Left D.S.	9.5

6 - 12.0' X 4.1' high Concrete Box Culverts



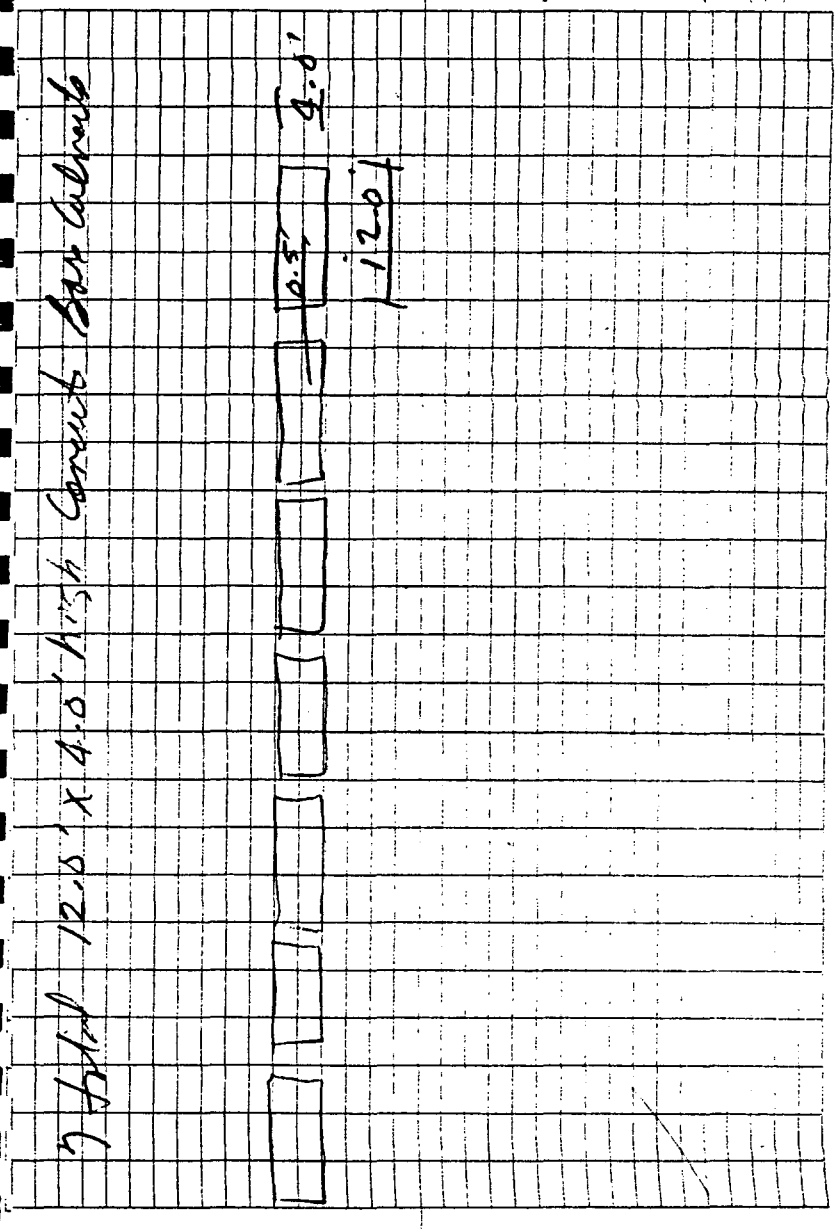
Tropicana Wash @ Fire Station

TBM - Top of ½" Rebar - 0.4' above cinder block wall 25' south of Right Culvert

H.I: 0.900 bare TBM

Invert Right D.S.	12.5
L.C. Right D.S.	8.5
Invert Left D.S.	12.9
L.C. Left D.S.	8.9
Invert middle D.S.	12.7
L.C. middle D.S.	8.7

7 - 12.0' x 4.0' high Concrete Box Culverts



Tropicana Wash @ Paradise

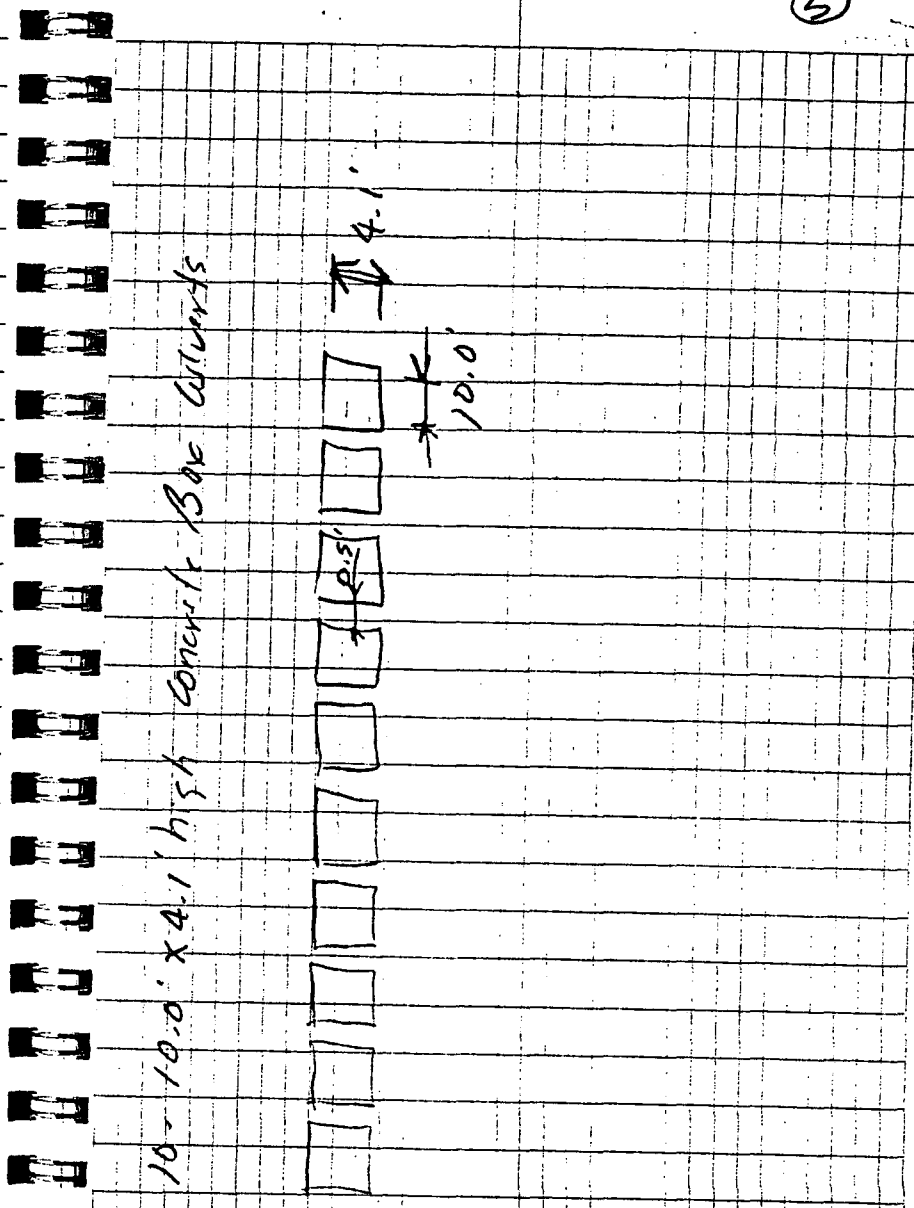
TBM - S.E bolt of handrail base @ N.W. 4.46 corner of bridge along sidewalk

H I : 4.46 down TBM

Invert Left U.S.	10.4
L.C. Left U.S.	6.4
3 barrel from RT - U.S. Invert	10.3
3rd " " " - U.S Low chord	6.3
Top of Road @ ℄ Culverts	5.3

10 ϕ ov Culverts. Total -

10.0' X 4.1' high with 0.5' piers



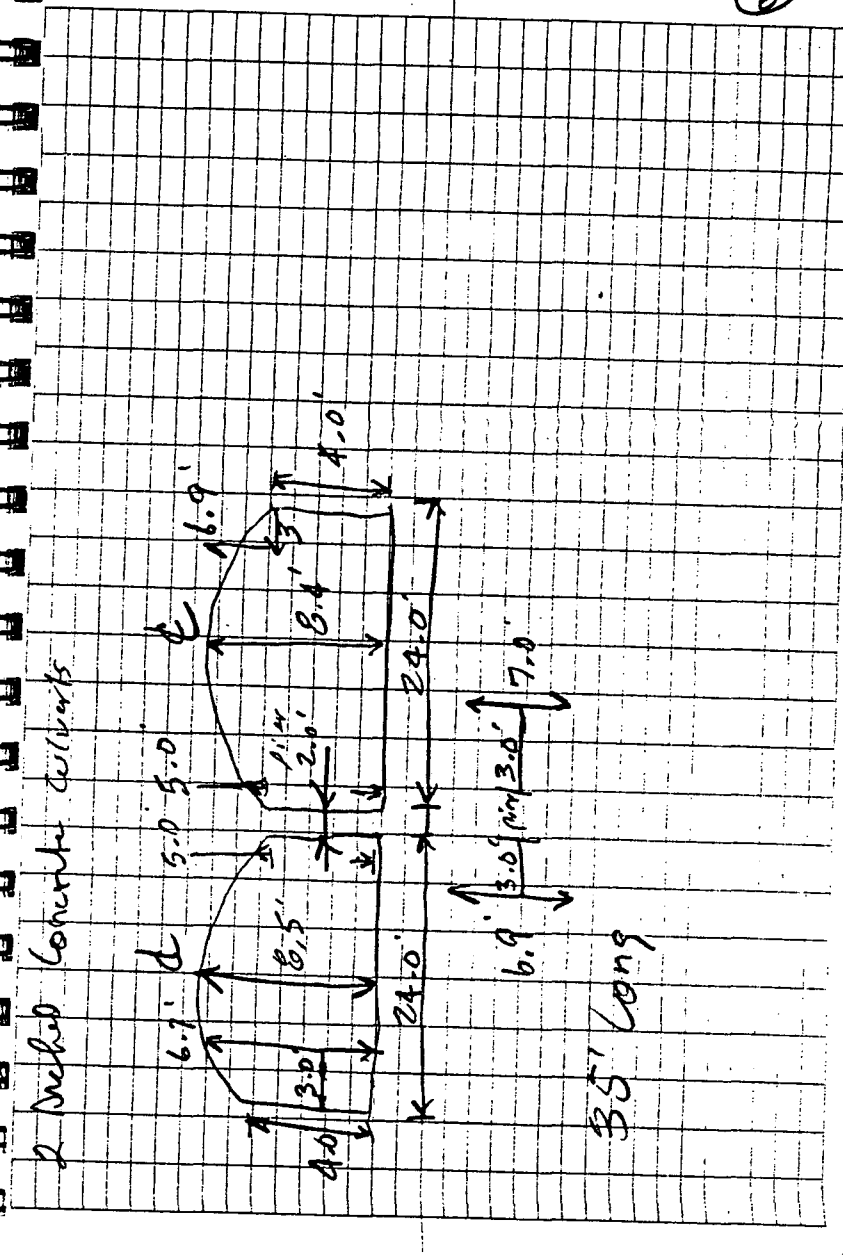
Tropicana Wash Just D.S. from Harbor Island

TBM Top of fire plug @ S.W. Corner bridge

2,13 = H.I. above TBM.

INVERT Left U.S.	14.0
L.C. Left U.S.	5.6
INVERT Right U.S.	14.1
L.C. Right U.S.	5.5
℄ ℄	2:8
INVERT D.S. Left	13.6
L.C. D.S. Left	5.5
INVERT D.S. Right	13.9
Low chord D.S. Right	5.5

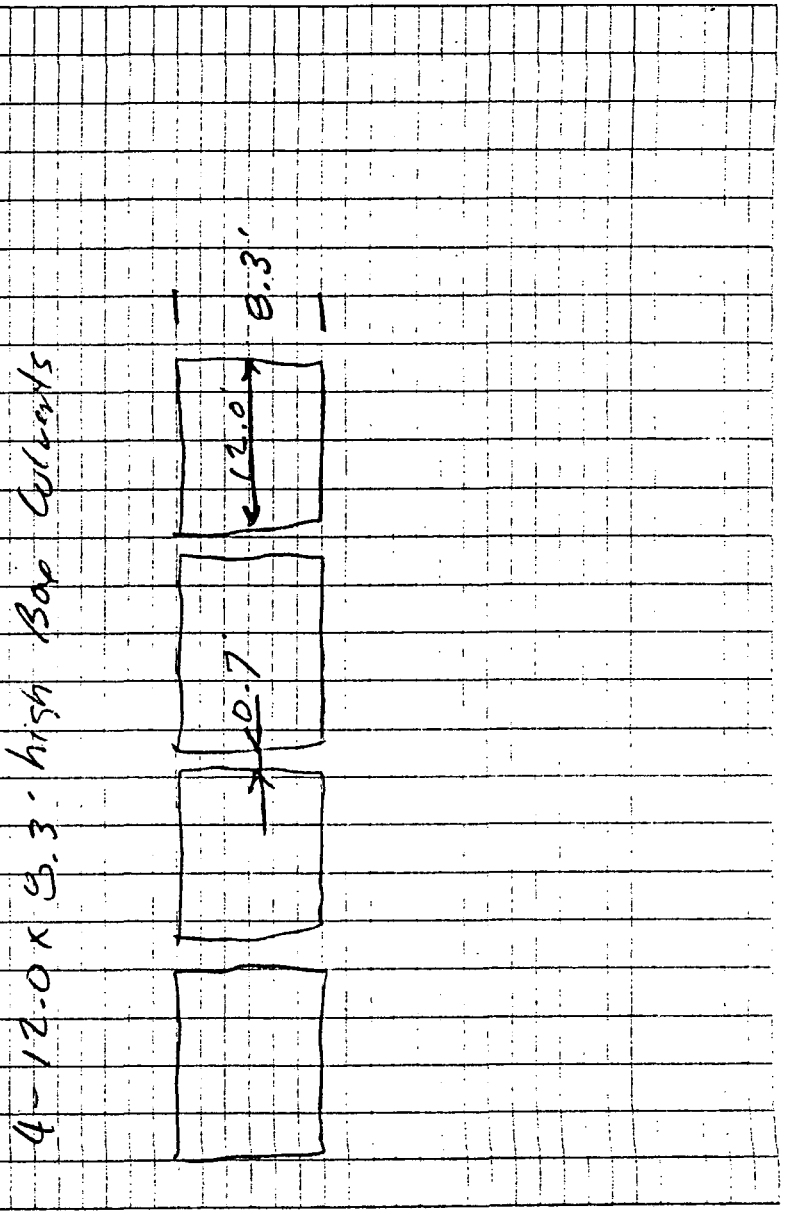
2 Arched Concrete Culverts



Tropicana Wash
@ Harbor Island Bridge
TBM - Top of Rock on S.W. Corner of
1.02 Lamp post @ N.W. Corner of bridge
(Left Bank on upstream side) -
H.I: 1.02' above TBM

Invert U.S. Left side	15.1
L.C. U.S. Left side	6.9
Invert U.S. Right side	15.1
L.C. U.S. Right	6.9
℄ ℄	6.0
Invert D.S. Left barrel	15.6
L.C. D.S. Left side	7.1
Invert D.S. Right side	15.5
Low Chord - Right side D.S.	7.1

4 Concrete Box Culverts - 12.0' x 8.3' high
Length - 39.0'



ENERGY DISIPATORS & cinder Block wall

TBM - Top of Rock @ N.W Camp Post

1.02 - IN same location as previous page

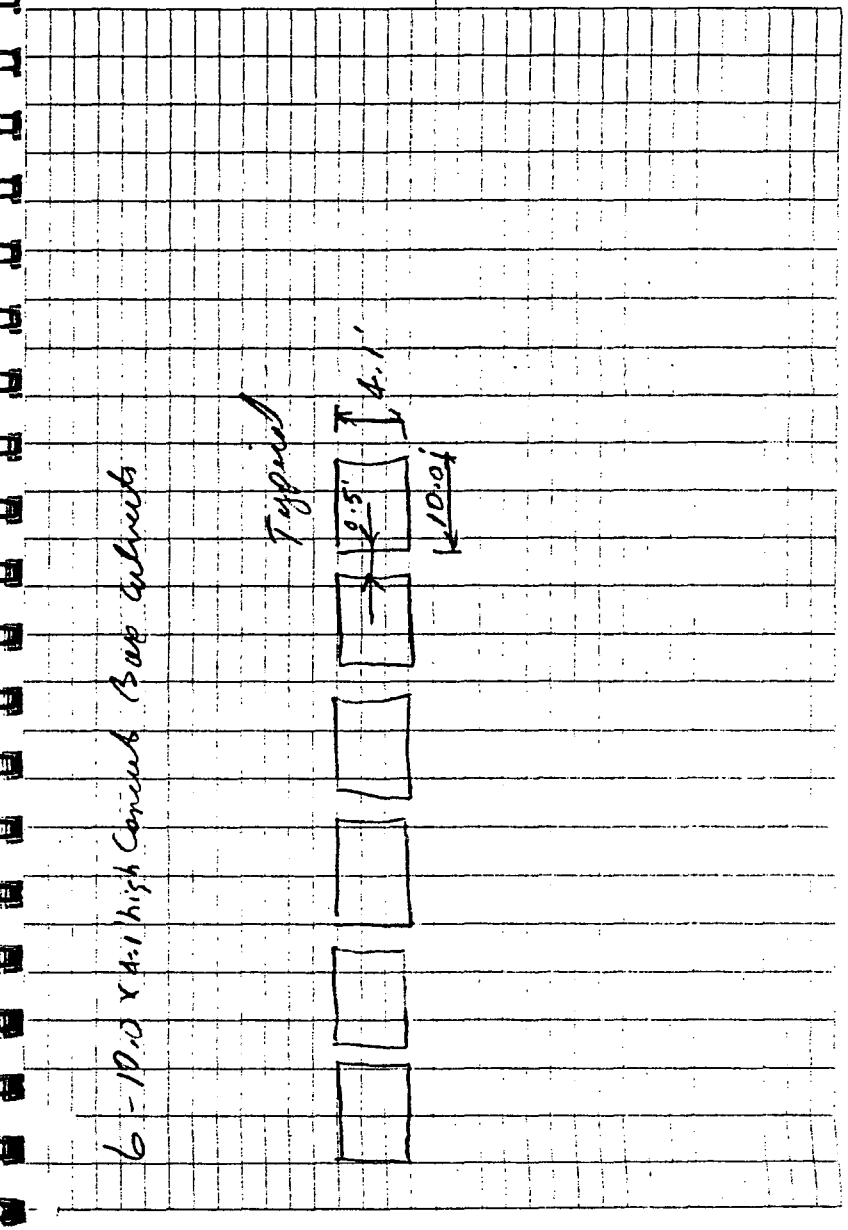
Invert @ Rock wall Left side	14.9
Top of wall Left side	13.1
Invert @ U.S. side wall Left side	14.9
Invert @ D.S. side wall Right side	14.9
Top of Wall Right side	13.1
Invert @ U.S. side wall Right	14.9
Top of Concrete Block - Right side	11.3
Top of Concrete Blocks - Left side	11.3
INVERTS - U.S. & D.S. @ Blocks	14.9
INVert D.S. @ Drop wall Right side	14.8
Top of wall @ Right side	9.8
INVert D.S. @ Left side	14.8
Top of wall @ Left side	9.8

Tropicana Wash @ Harman

H.I - 1.02 from TBM- N.W lamppost

Invert Right box culvert D.S.	9.3
Low chord Right D.S.	5.3
Invert Left D.S.	9.1
Low chord Right D.S.	5.1
Roadway @ ℄ downstream	4.0
℄ ℄	3.5
Invert Right U.S.	8.8
Low chord Right U.S	4.2
Invert Left U.S.	8.1 5.1
Low chord Left U.S.	4.2

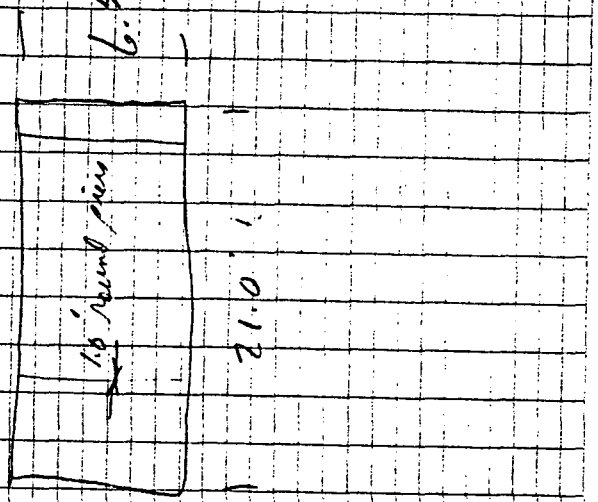
6-10.0 x 4.1' high Concrete Box culverts



@ D.S. end of Loading Culvert
TBM - N.W. corner of wing wall
Top - 9' West of West edge of Culvert
2.68 - Top of small Rock
H.I. 2.65' above BM.

Invert ± @ D.S. end	7.0
Low chord	0.9

Concrete Box culverts
2 1.0' x 6.5' high Concrete



Inlet @ Golf Course

TBM. Top of Concrete headwall
N.W. corner
N.J. 4.95 above TBM,

Invert C.M.S. edge culvert	9.4
Low chord	6.4
Top Concrete headwall @ ℄	4.9

Concrete Culvert:

7.0' wide x 3.0' high
rectangle. Concrete - Single Culvert

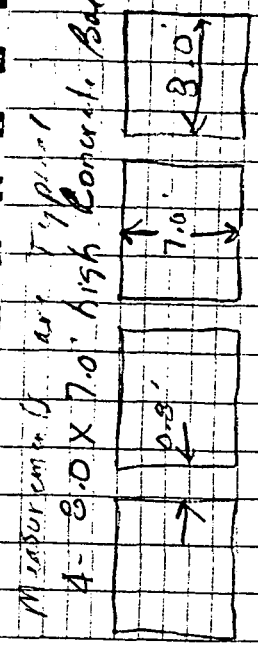
Tropicana Wash @ U.S. edge 3 mile long
Culvert - @ Industrial

TBM - Nail in headwall of 3.0' Culvert on D.S. side of Industrial & in Tropicana wash. elevation is painted ~~2145.14~~ Rev 46.994

HI 3.41' above TBM

Invert U.S. Left side	9.0
Low Chord U.S. Left side	2.0
Invert U.S. Right side	9.0
Low Chord - Right side U.S.	2.0

4 Concrete Box Culverts
3.0' wide x 7.0' high



Tropicana Wash @ First Railroad Car Bridge Downstream of Valley View

TBM - Top of bolt on downstream @ N.E. Corner of Bridge
H.I. 4.65 above TBM

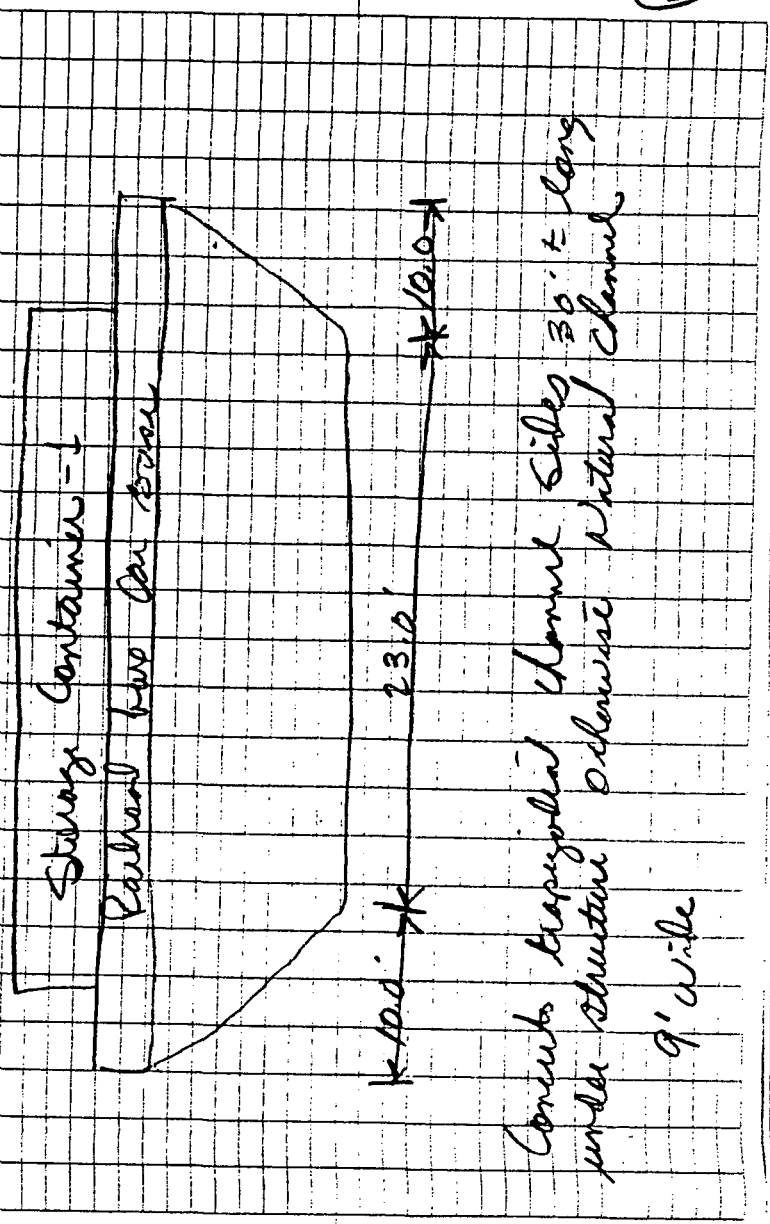
Top of Rod @ ℄ = same elevation as TBM

Invert U.S.	13.2
Low chord U.S.	6.8

Reset to Shoot D.S. elevations
H.I. 4.31 above TBM. Bolt head as noted above

INVERT D.S.	13.2
Stringer on D.S. side	8.0

Note - Low chord is 7.2 Rod Reading or 1.2 feet below the Stringer



Second Railroad bridge D.S. - Tropicana wash (middle Bridge)
H.I. 4.31 above TBM - Same location as last shots

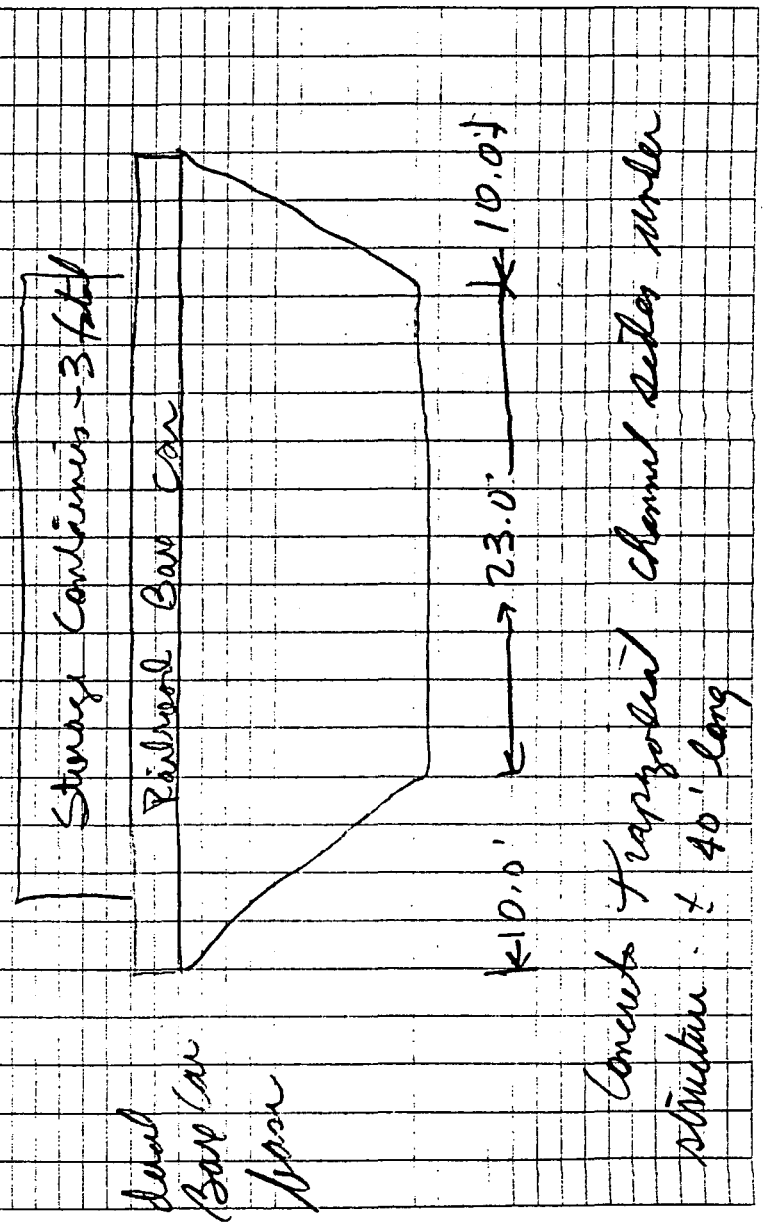
INvert d.s. 14.1
low chord is 6.1 feet above INvert.

P- bolt head @ S.W Corner bridge most S.W bolt

TBM-A 5.45
+ 4.48 to H.I.

INvert D.S. 13.3
Note. TBM-A is SAme elev as Top of Roadway
L.C. on D.S. side is ± 6.3' above Invert

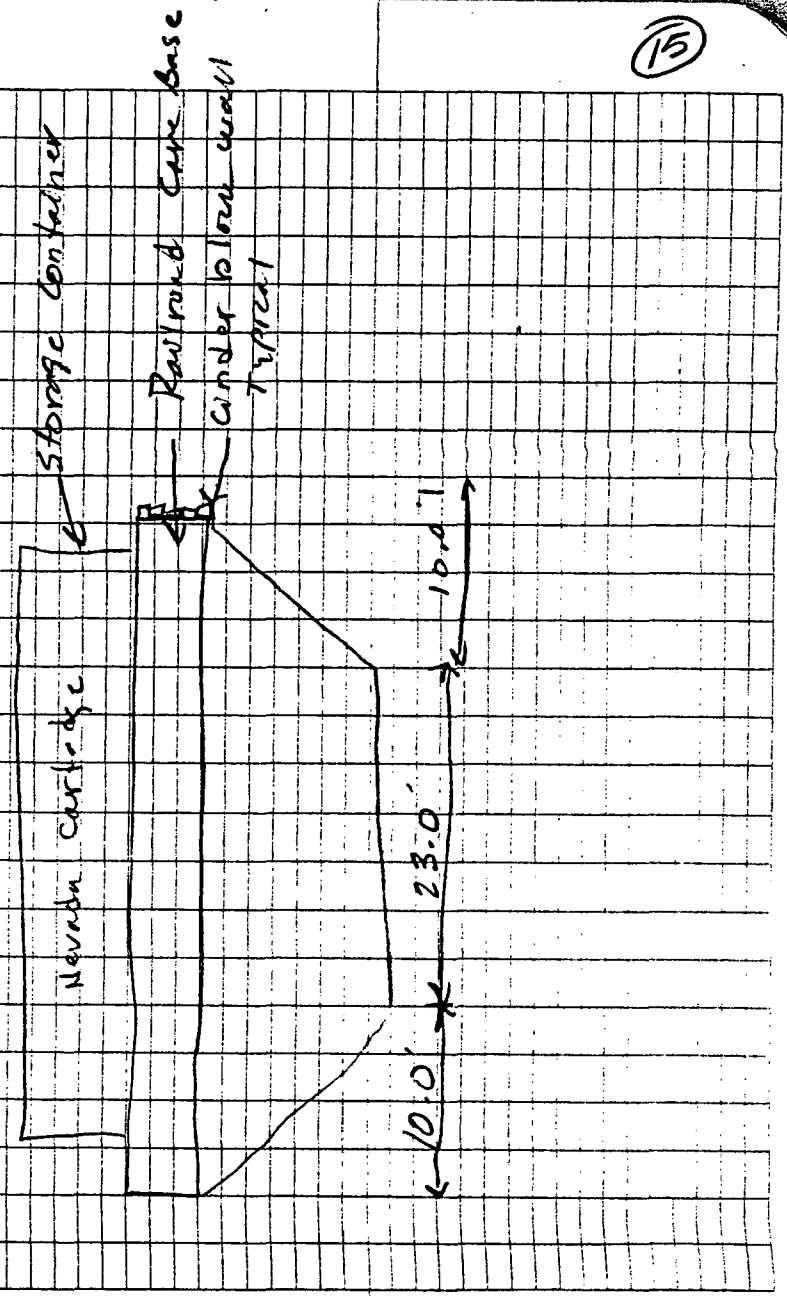
Dual Railroad Car bear



3rd bridge D.S.

Note N.I. = same as previous

Invert @ 4 s. ℄ 14.6
Low chord: ± 5.9' above Invert ℄
Top of Roadway @ ℄ 6.4
did not shoot D.S. elevations -
No Need - subtract ± 0.1' from
upstream values



Tropicana Wash @ Railroad bridge (UPRR)

TBM - Top of galvanized sign nailed 32842 on S.E corner Top of Railroad

1.38 = H.I. is 1.3± above TBM

Invert D.S.	19.2
Low chord D.S.	9.8
℄ ℄	3.5
Low chord upstream	9.5
Invert upstream	18.6

Circular CMP. 9.75' Dia

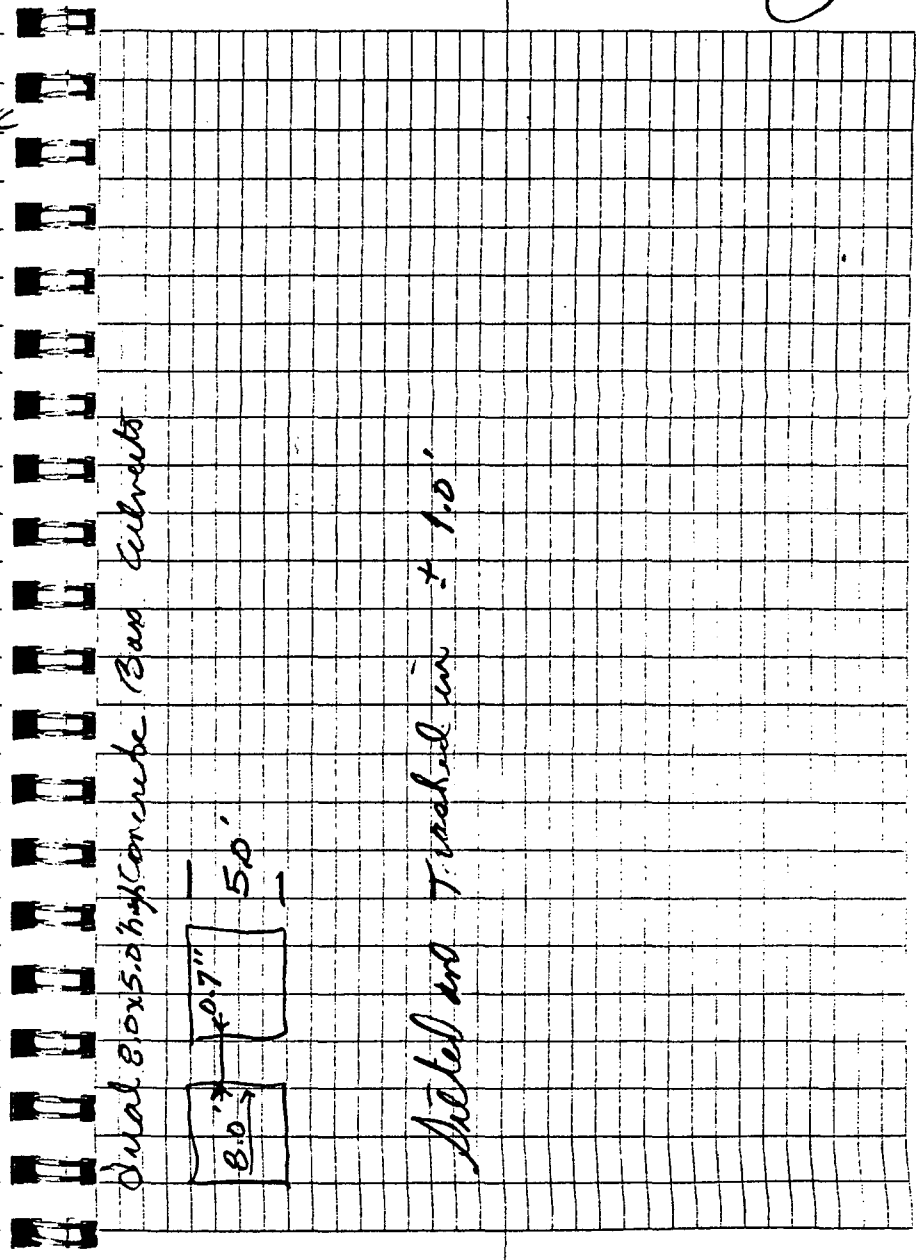
95' long

Tropicana wash @ Hacienda

Top of Fire Hydrant 70' west of downstream edge Culvert @ N side sidewalk
2.13 = H.I. above TBM.

Invert D.S Right Culvert	10.7
Low chord D.S. Right	6.8
Invert D.S Left Culvert	10.7
Low chord D.S Left	6.8
℄ ℄	5.3
Invert U.S Left side	10.8
Low chord U.S Left side	6.3
Invert U.S. Right side	10.3
Low chord U.S. Right	6.3

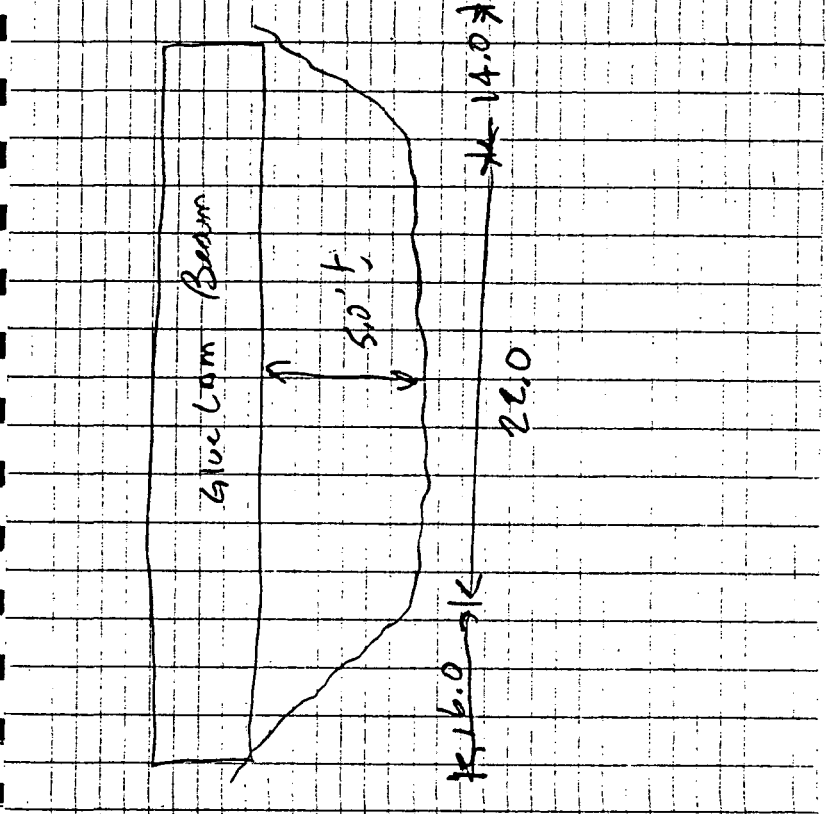
Dual 8.0x 5.0' high Concrete Box Culverts



Tropizarka wash @ footbridge
TBM.
West Bridge abutment - N.E corner of
Concrete on d.s side of bridge @ Corner

U.I: 4.36' above TBM
Bridge is only 4.6 wide

~~16~~ 12	Invert D.S.	10.2
	Low chord D.S.	5.3
	℄ ℄	2.9



North Tropicana wash @ ? (Cameron St.)
Hi = 1.32 feet above Top of fire Hydrant @ N.W. Corner Culverts

Upstream Culverts silted badly
3 box culverts

Invert U.S. Left side	9.9
L.C. U.S. Left side	7.0
Invert Center U.S.	9.2
L.C. U.S. Center	7.1
Invert U.S. Right	10.3
L.C. U.S. Right	7.1
℄ ℄	4.8
Invert D.S. Right	10.5
L.C. D.S. Right	7.8
Invert D.S. Center	10.9
Low Chord D.S. Center	7.7
Invert D.S. Left	10.1
L.C. D.S. Left	7.7

(9)

Ditch 1.0' deep @ inlet in U Gallons

3' Concrete Box Culverts 6.0' x 4.0' high

9.0'

1.8'

Length = 66.0'

Slope = 8%

Actual Width = 3.0' x 4.0' high

9.0' across 1'-0" angle

Area at 1.8' on Slope

Actual width =

North

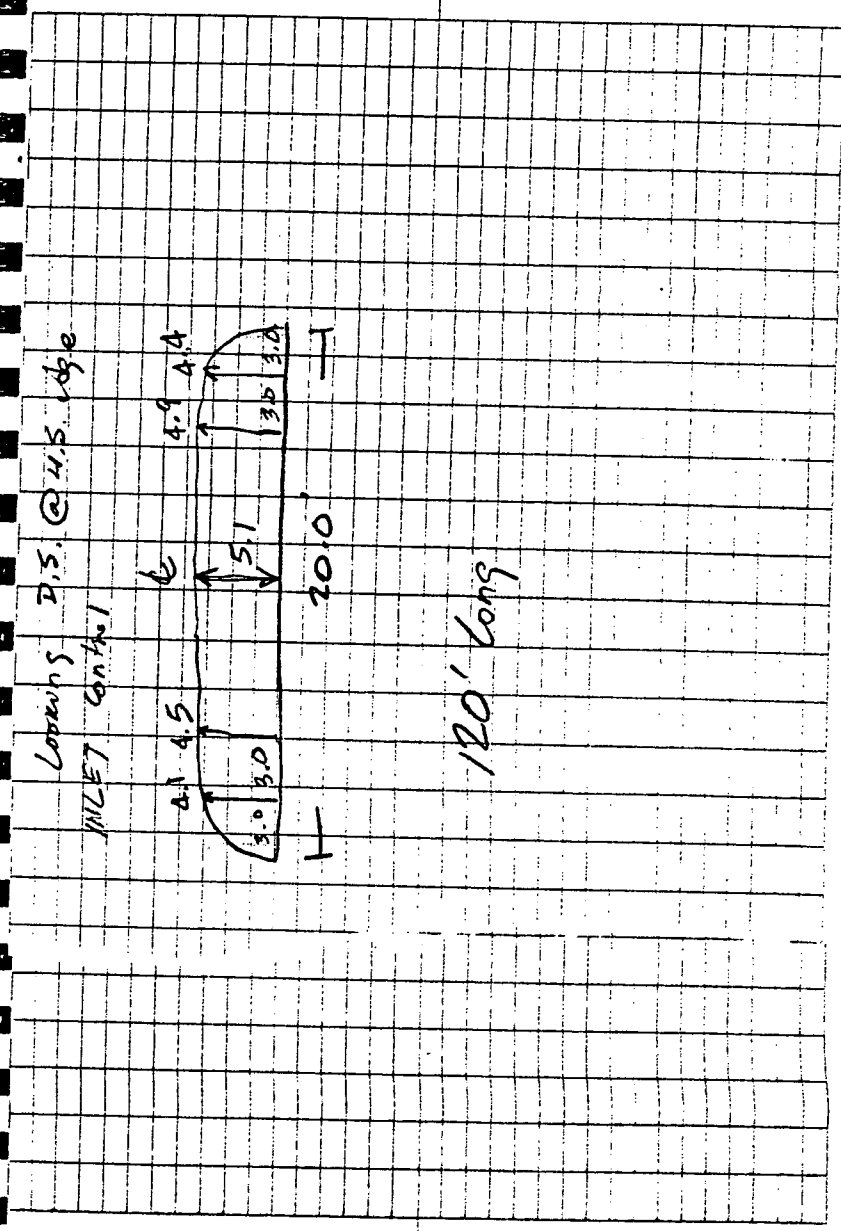
~~Indiana~~ Wash @ Hacienda - Mark upstream

TBM - N.W. corner of L-B headwall - NOT WINGWALL - on upstream side of Culvert

|| J. = 6.07' above TBM

Single Arched Culvert

Invert U.S.	13.3
Low chord U.S	8.3
Invert D.S.	13.9
Low chord D.S.	8.9
℄ ℄	5.0



(1)

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: Flamingo Wash @ Cambridge
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes - 6 total
4. Survey structure yes TBM on bridge - See survey Notes
5. Culvert type Concrete Box Culvert length 81.5
6. Inlet type Box Culvert NO training walls
7. Inlet conditions Silted / Trash
8. Signs of Erosion? NO
9. Signs of Deposition? 1 foot @ outlet and through Culverts
10. Obstructions which could cause backwater? Silt / Boulders
11. Skew angle 180 to flow
12. Pier description Concrete Box Culvert. Piers @ inlet are rounded
13. Comments 3 barrels Piers 0.7'

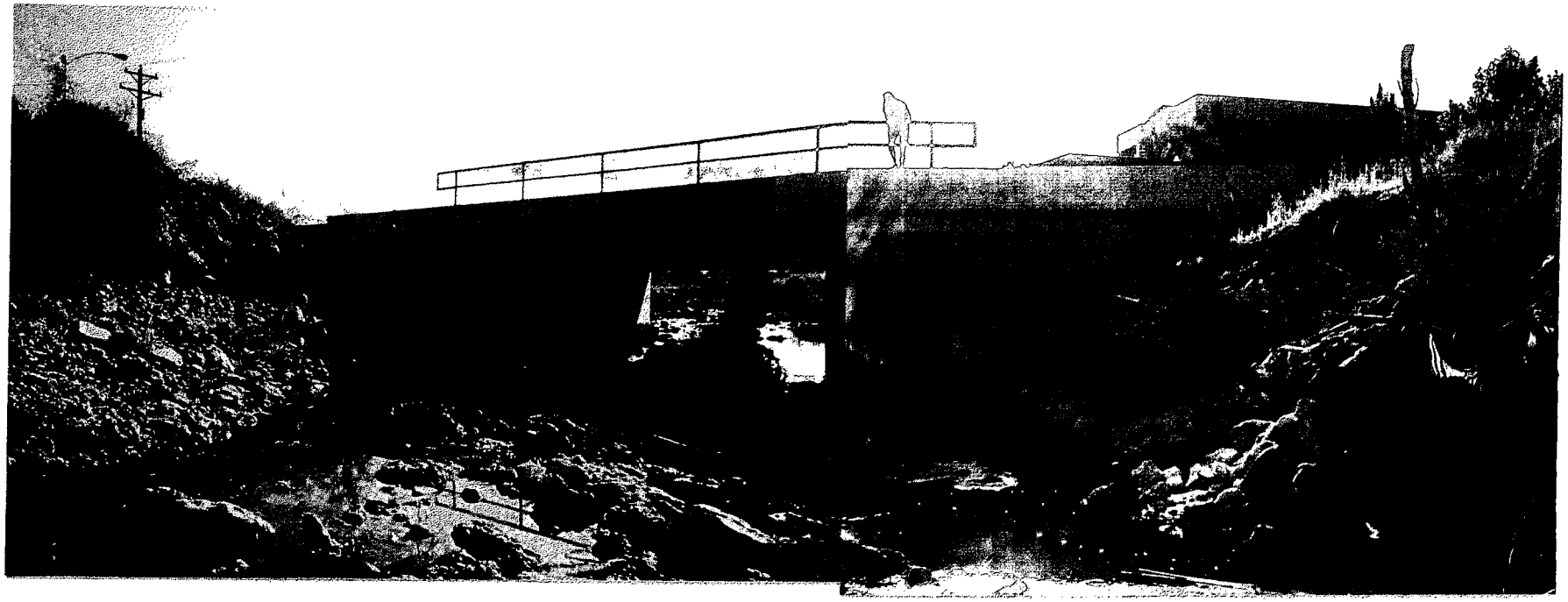
Date_____ by_____



Downstream side of Box Culverts



Looking Downstream from Downstream side of Box Culverts



Upstream side of Box Culverts



Looking Upstream from upstream side of Box culverts

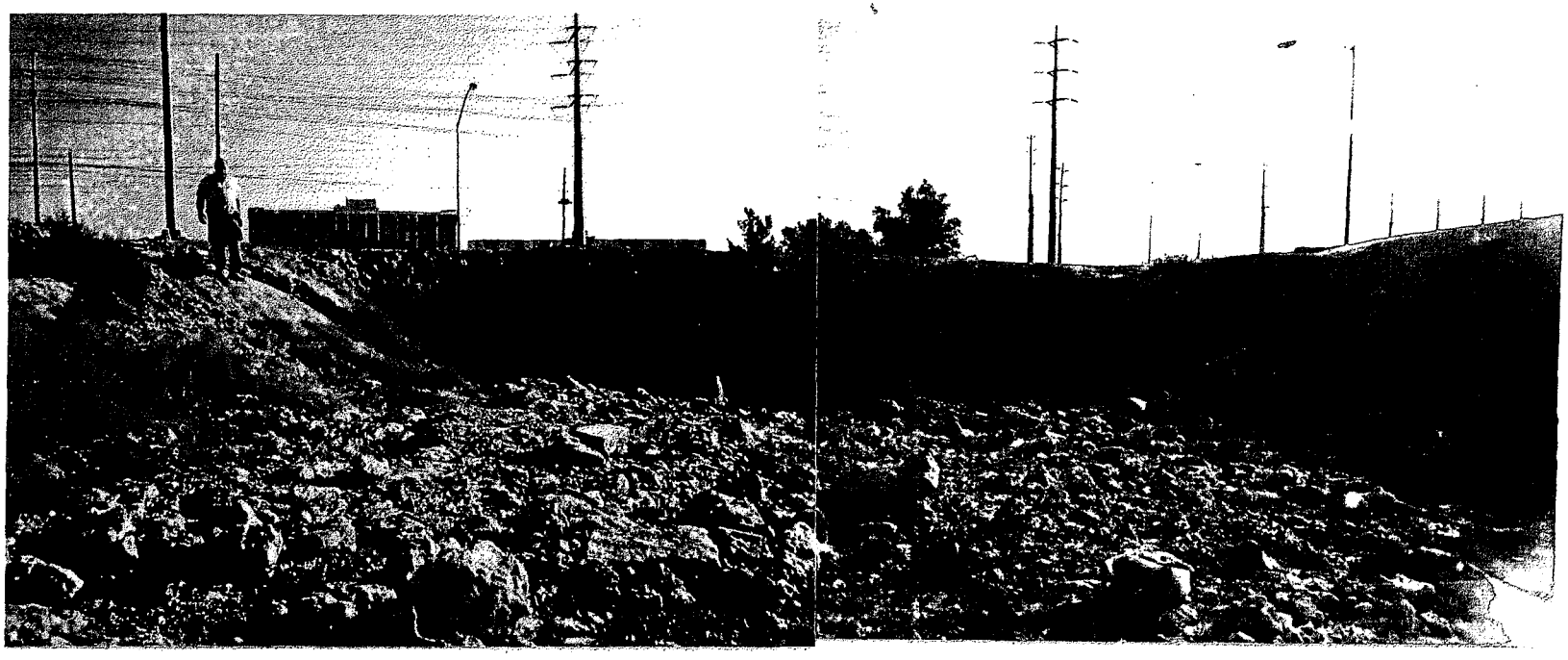
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: @ Flamingo
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes - 6 total
4. Survey structure yes TBM _____
5. Culvert type 3 - 12.0' x 5.0' high Conc. box length 189
6. Inlet type Concrete - 45° flowing wing walls
7. Inlet conditions Large boulders 1.0' ± @ inlet
8. Signs of Erosion? No
9. Signs of Deposition? yes - Downstream
10. Obstructions which could cause backwater? weeds/silt @ D.S.
11. Skew angle 0 to flow
12. Pier description extended 10' upstream. rounded wall
13. Comments _____

Date_____ by_____



Looking Downstream of Upstream side of culverts @ Flamingo



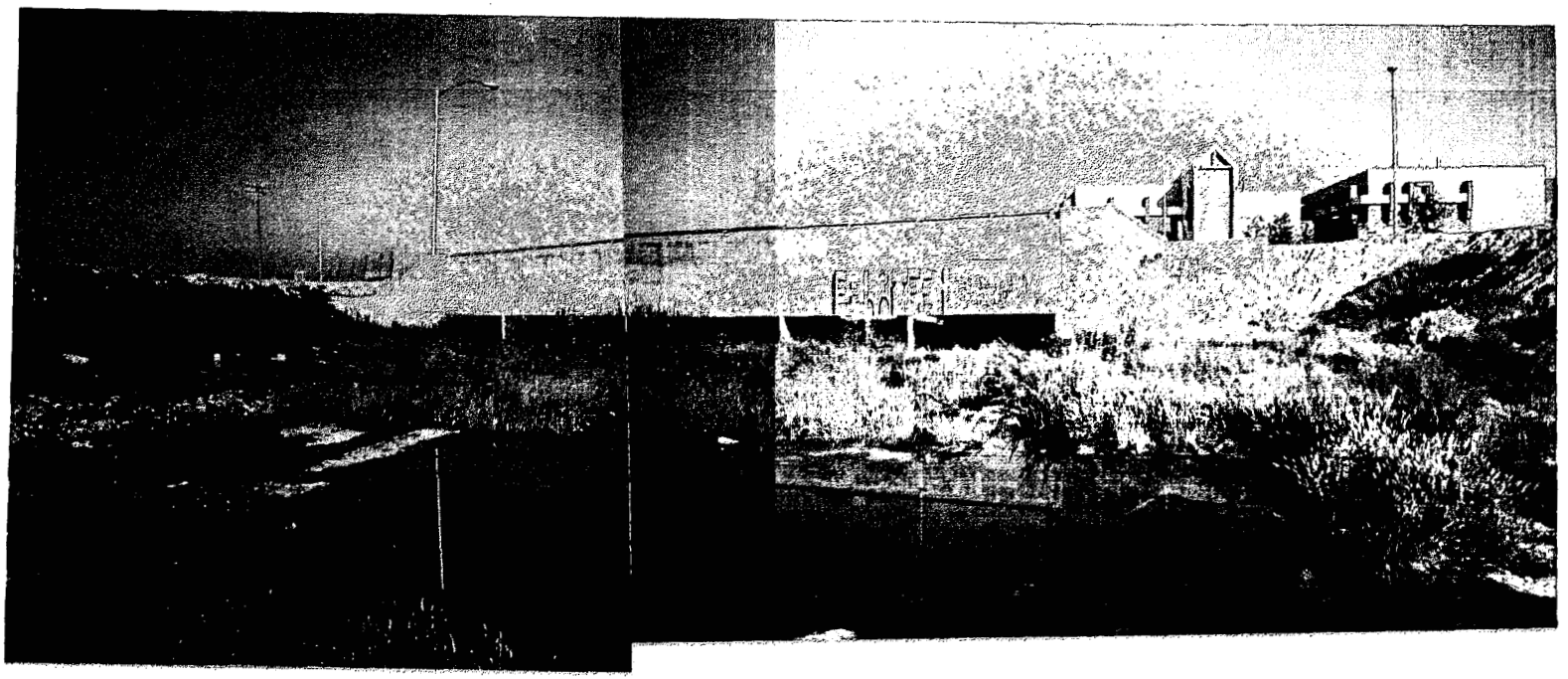
Looking Upstream of Upstream side of culverts @ Flamingo



Looking Upstream on the Downstream side of Culverts @ Flamingo



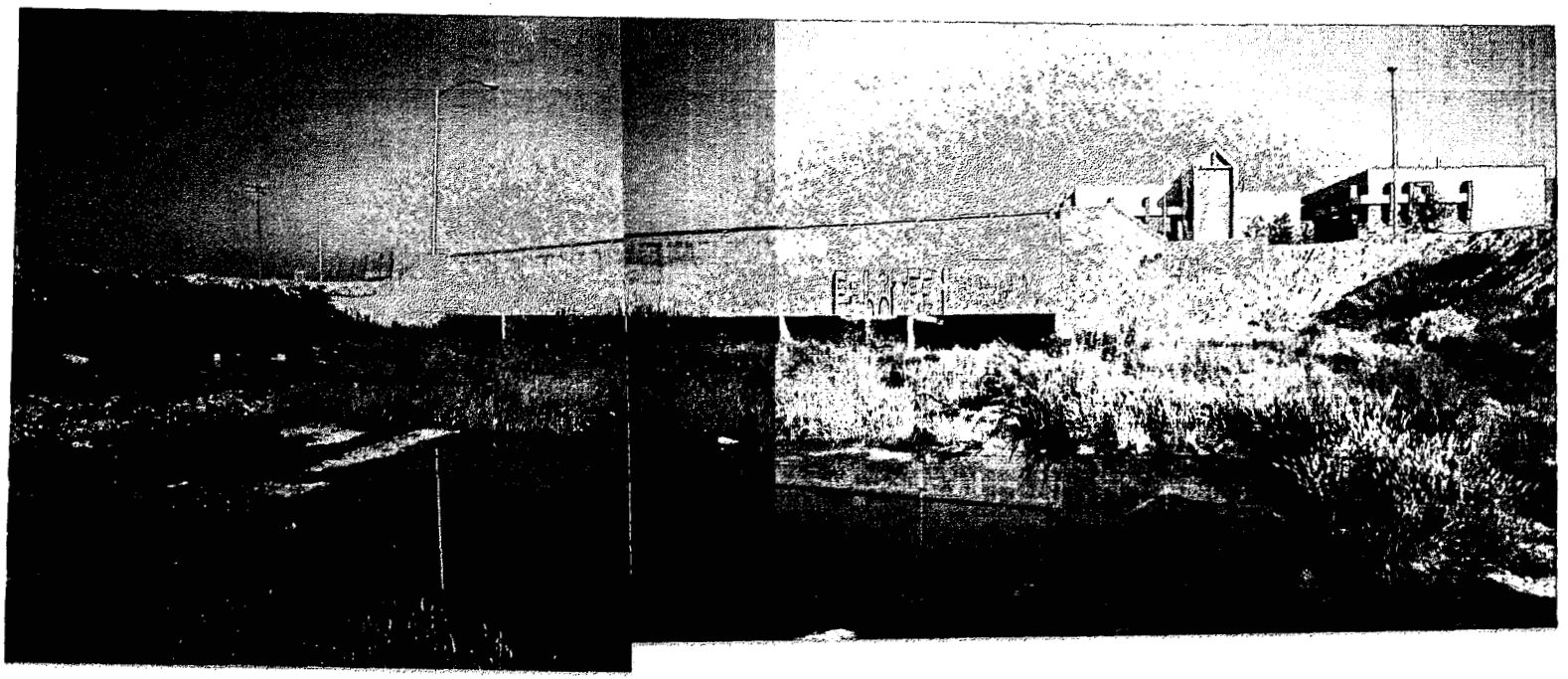
Looking Downstream on the Downstream side of culverts @ Flamingo



Looking Upstream on the Downstream side of Culverts @ Swenson



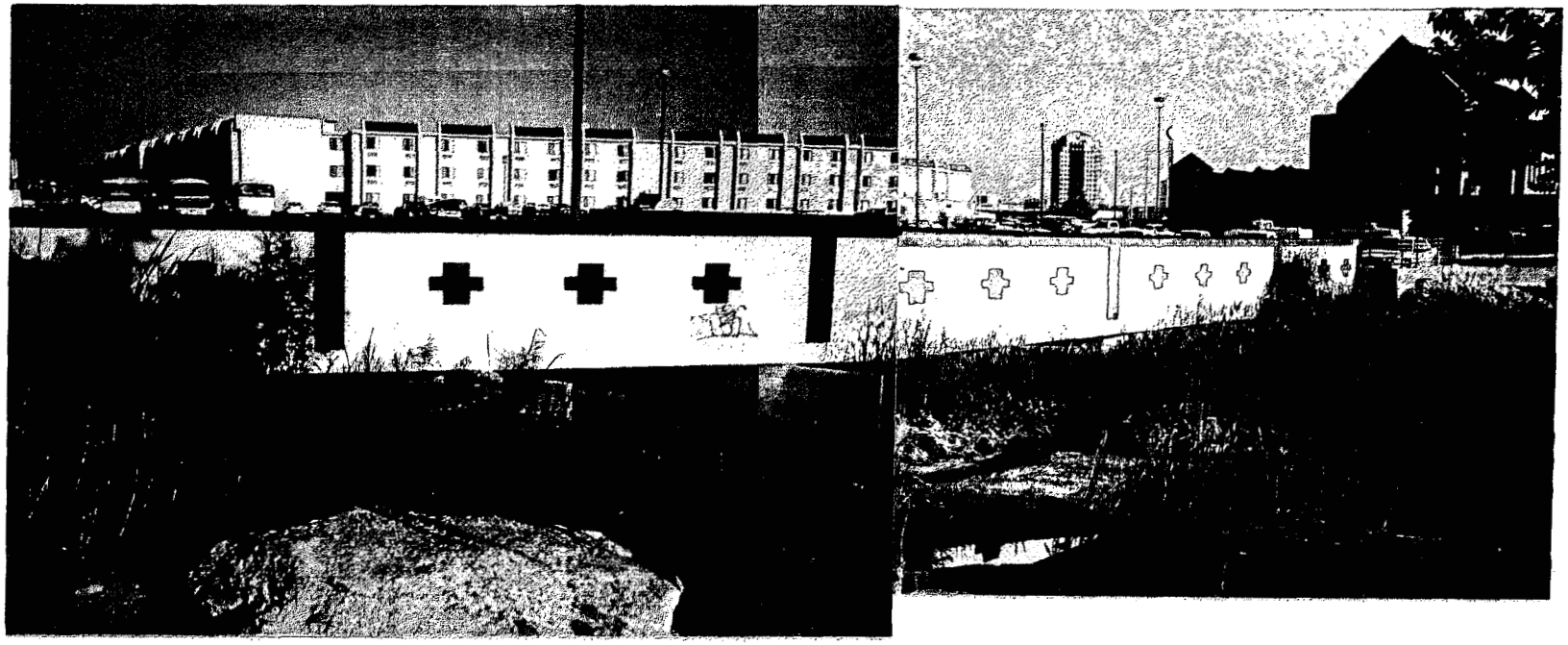
Looking Downstream on the Downstream side of Culverts



Looking Upstream on the Downstream side of Culverts @ Swenson



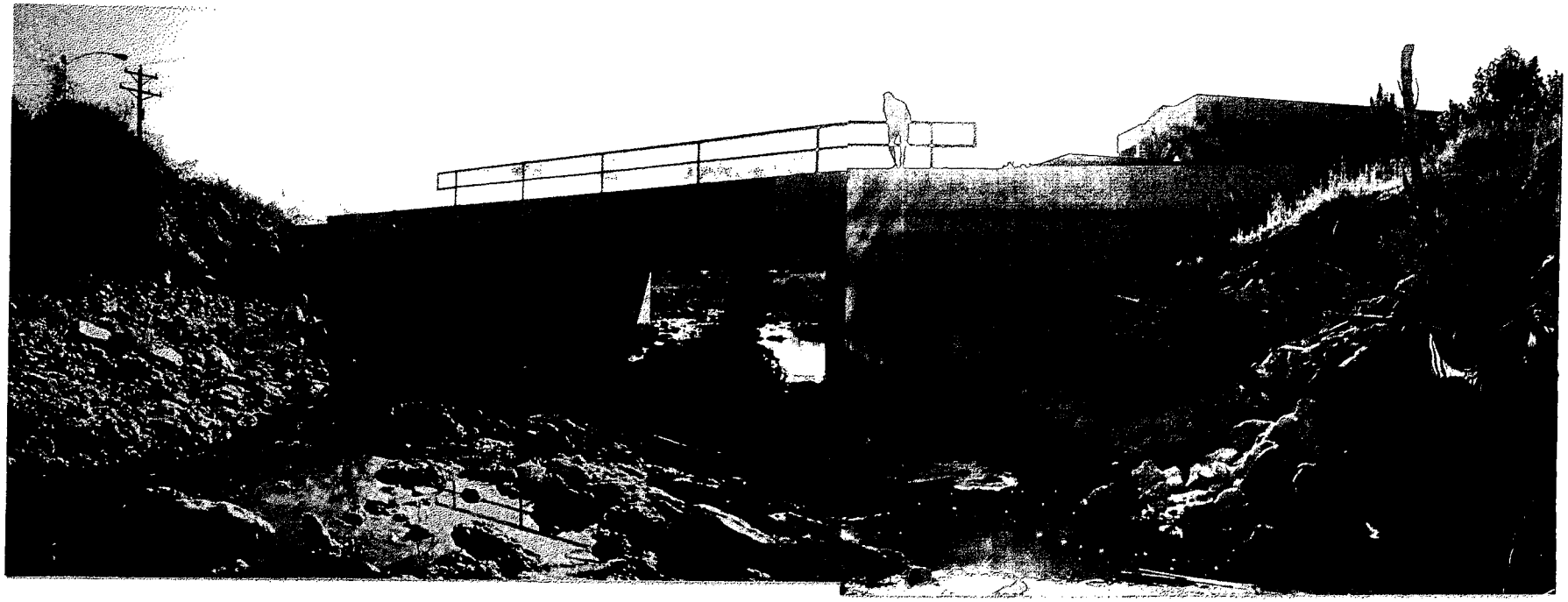
Looking Downstream on the Downstream side of Culverts



Looking Upstream on the Downstream side of culverts @ Fire Station



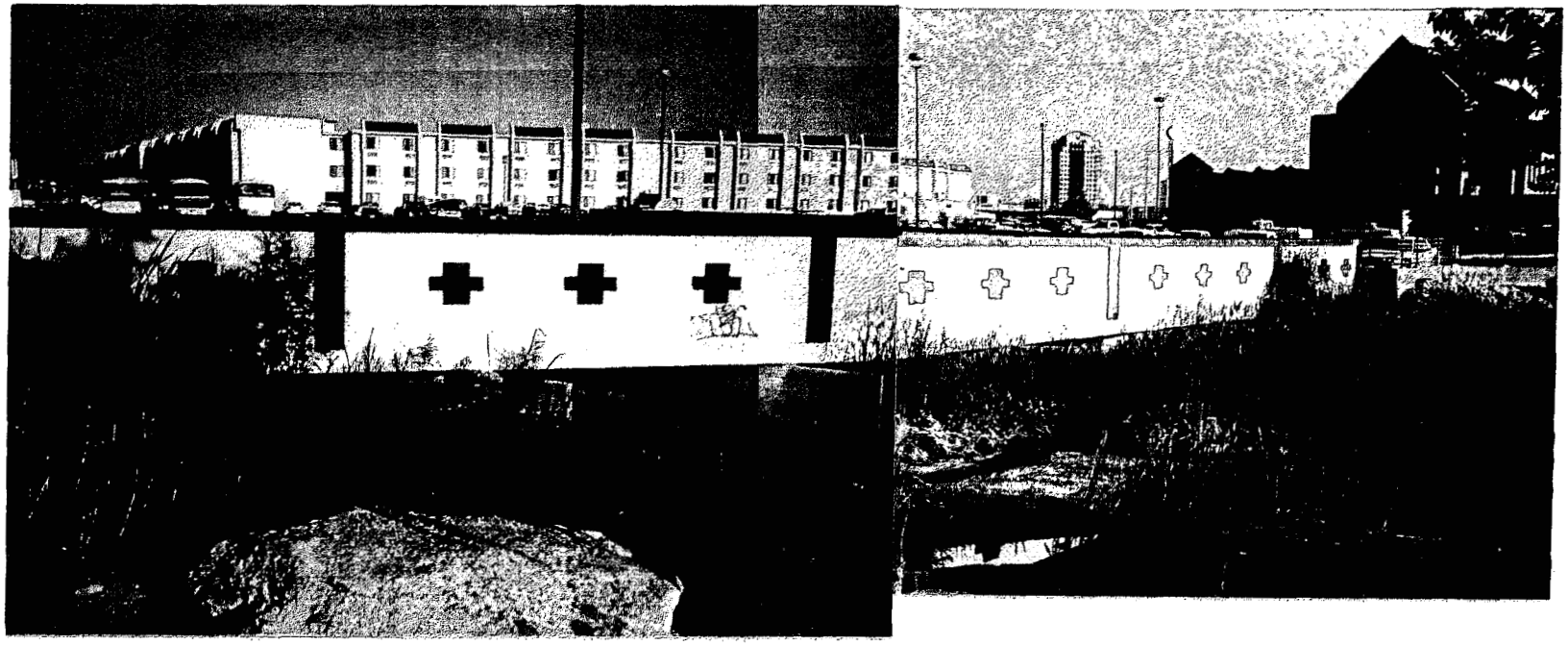
Looking Downstream from Downstream side of culverts @ Fire Station



Upstream side of Box Culverts



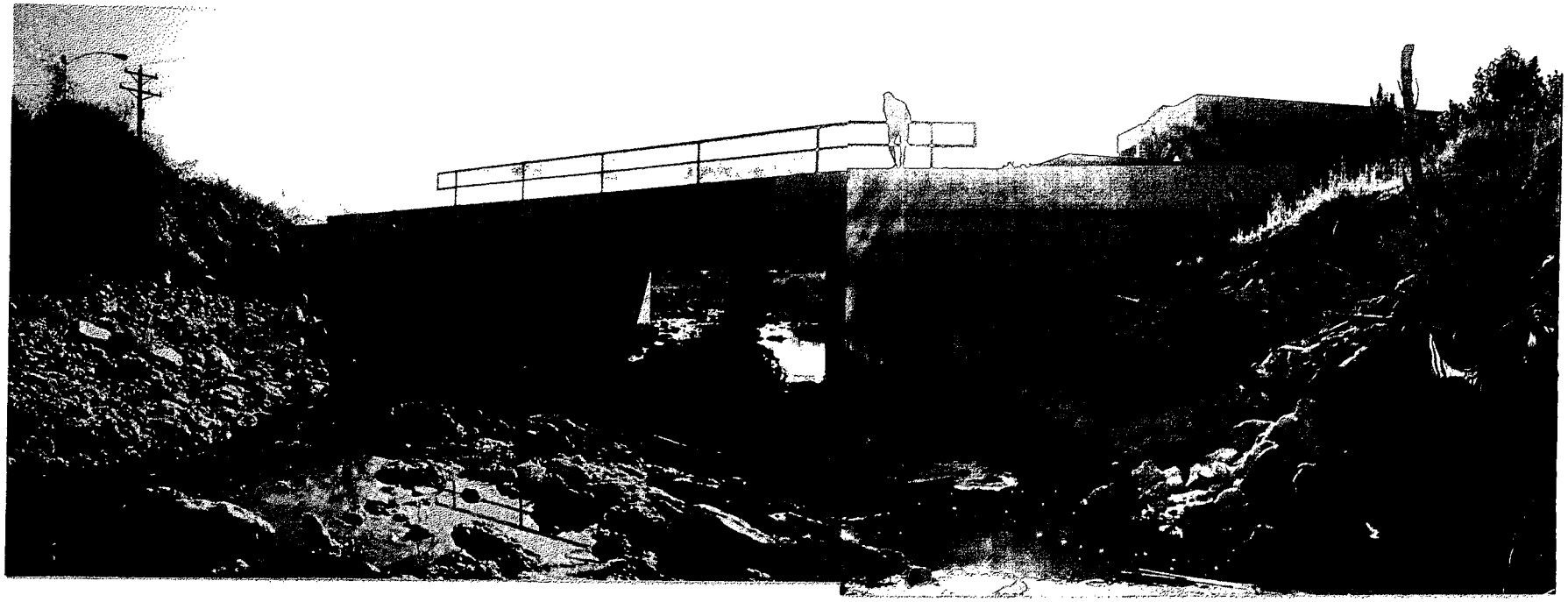
Looking Upstream from upstream side of Box culverts



Looking Upstream on the Downstream side of culverts @ Fire Station



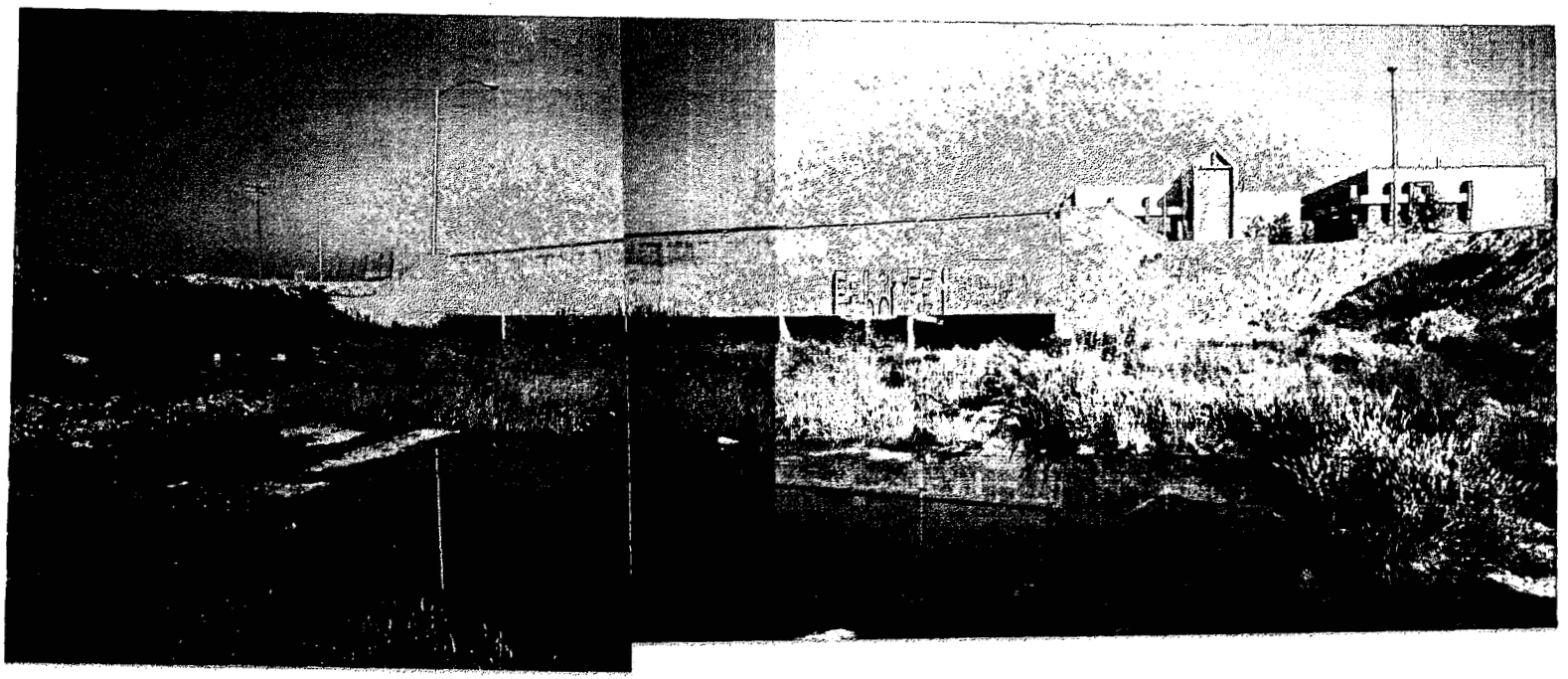
Looking Downstream from Downstream side of culverts @ Fire Station



Upstream side of Box Culverts



Looking Upstream from upstream side of Box culverts



Looking Upstream on the Downstream side of Culverts @ Swenson



Looking Downstream on the Downstream side of Culverts



Looking Downstream on the Upstream side of culverts @ Swenson



Looking Upstream from the Upstream side of culverts

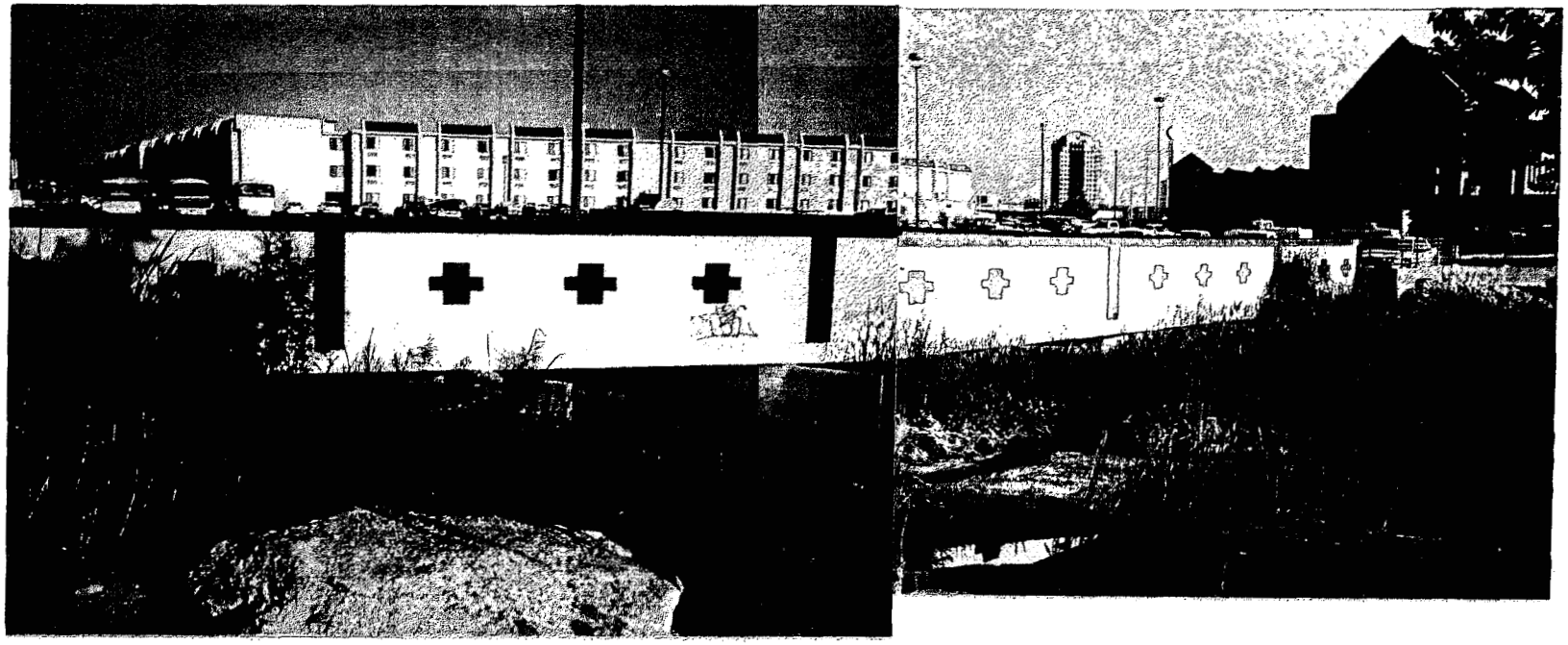
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: @ Fire Station
2. Mark section on map or photograph. _____
3. Photograph inlet N/A outlet yes
4. Survey structure yes TBM top of ½" rebar top of wall on S end station
5. Culvert type Concrete Box length N/A
6. Inlet type N/A
7. Inlet conditions N/A
8. Signs of Erosion? NO
9. Signs of Deposition? yes - Downstream
10. Obstructions which could cause backwater? Silt / weeds Downstream
11. Skew angle 90° to flow
12. Pier description Concrete cinder blocks
13. Comments _____

Date_____ by_____



Looking Upstream on the Downstream side of culverts @ Fire Station



Looking Downstream from Downstream side of culverts @ Fire Station

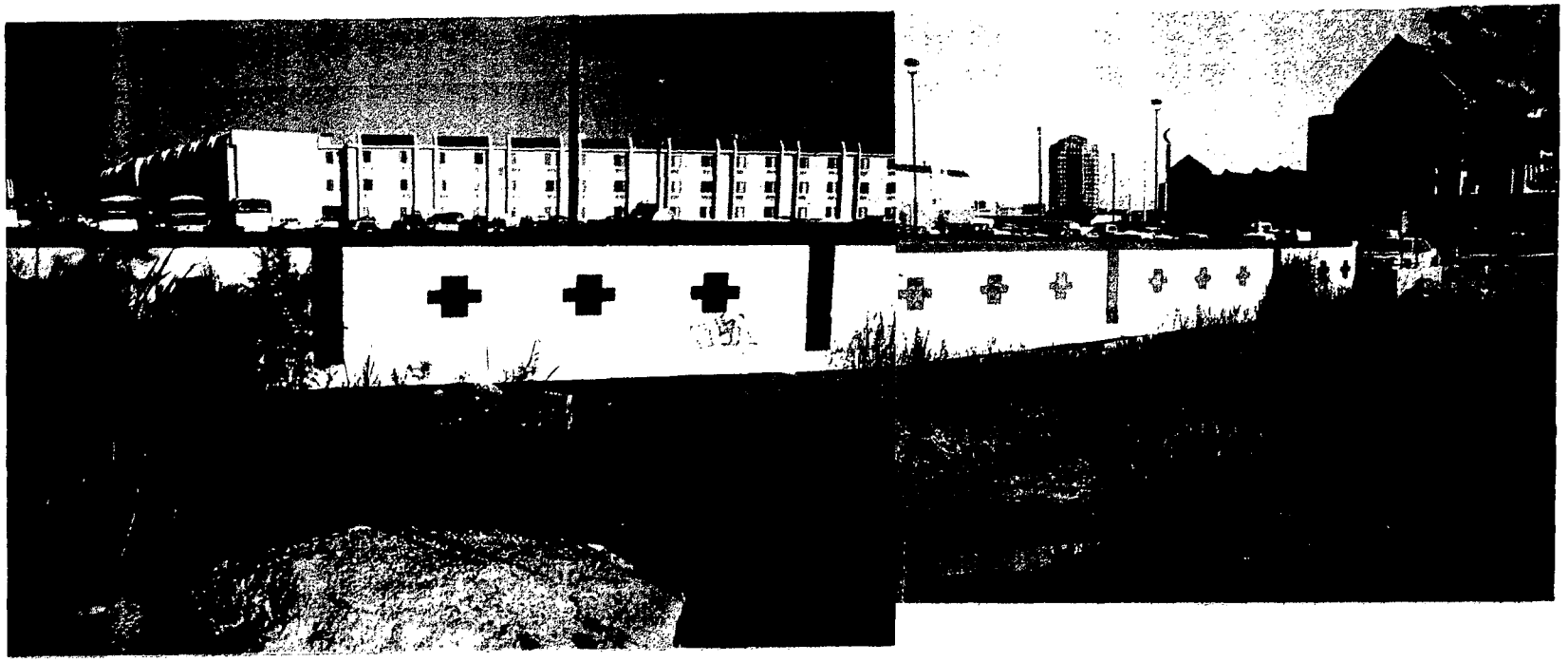
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: @ Paradise
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet N/A 6 total pictures
4. Survey structure yes TBM Top of bolt @ N.W. corner
5. Culvert type 10 - Concrete box length N/A
6. Inlet type Concrete -
7. Inlet conditions silted in R.O.B.
8. Signs of Erosion? No
9. Signs of Deposition? @ Rover bank
10. Obstructions which could cause backwater? Silt in R.O.B.
11. Skew angle 90° to flow
12. Pier description Concrete culvert rounded piers @ inlet
13. Comments _____

Date_____ by_____



Looking Upstream on the Downstream side of culverts @ Fire Station



Looking Downstream from Downstream side of culverts @ Fire Station

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: @ Paradise
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet N/A 6 total pictures
4. Survey structure yes TBM Top of bolt @ N.W. corner
5. Culvert type 10 - Concrete box length N/A
6. Inlet type Concrete -
7. Inlet conditions silted in R.O.B.
8. Signs of Erosion? No
9. Signs of Deposition? @ R.O.B. overbank
10. Obstructions which could cause backwater? Silt in R.O.B.
11. Skew angle 90° to flow
12. Pier description Concrete culvert rounded piers @ inlet
13. Comments _____

Date_____ by_____



Looking Downstream from the Upstream side of culverts @ Paradise



Looking Upstream from Upstream side of Culverts @ Paradise

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: just D.S. from Harbor Island
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes spillway full
4. Survey structure yes TBM Top of fire hydrant - S.W. corner
5. Culvert type 2 Adobe concrete length 35.6'
6. Inlet type 90° No training walls
7. Inlet conditions good
8. Signs of Erosion? NO
9. Signs of Deposition? some - minor
10. Obstructions which could cause backwater? None -
11. Skew angle 0
12. Pier description 1 square nosed 2.0' wide
13. Comments _____

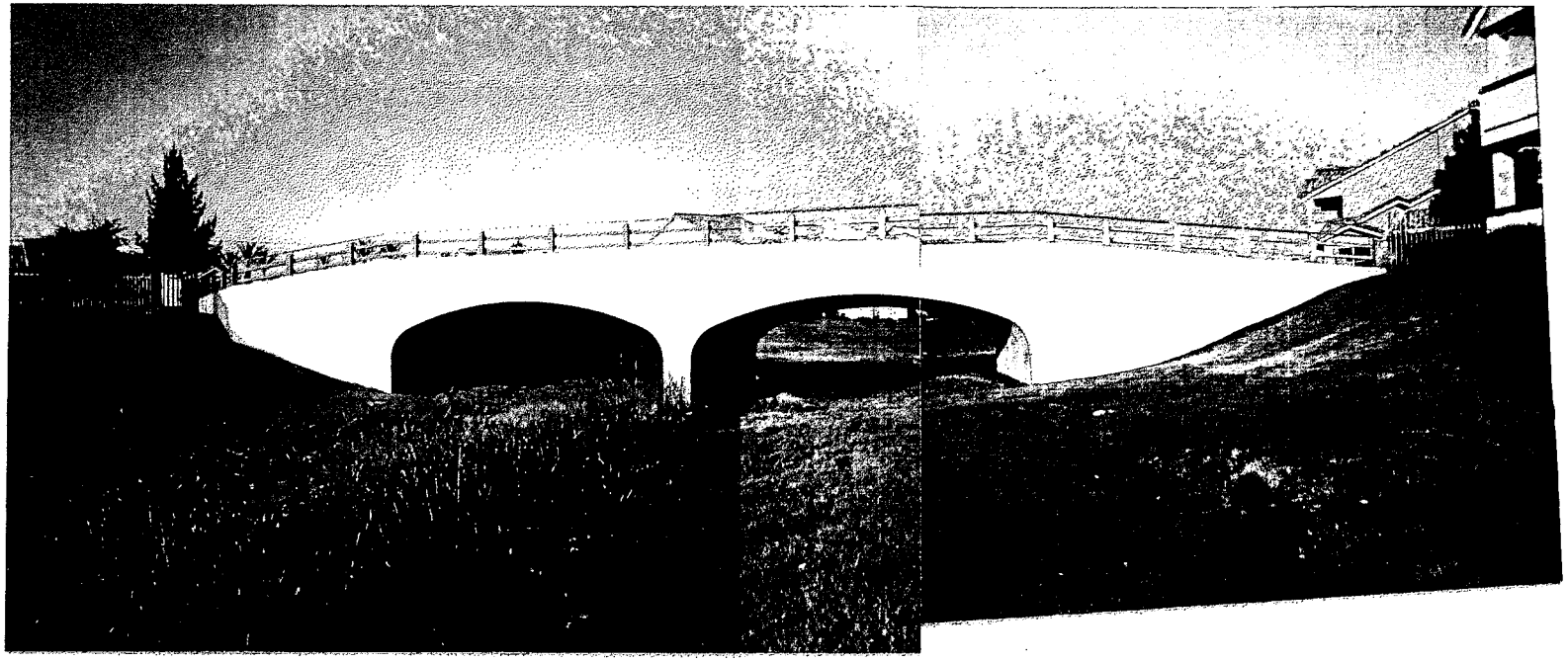
Date_____ by_____



Looking Downstream from the Upstream side of Arch Culverts Downstream of HARBOR ISLAND MOTEL



Looking Upstream from Upstream side of Arch Culverts



Looking Upstream from Downstream side of Arch culverts



Looking Downstream from Downstream side of Arch Culverts

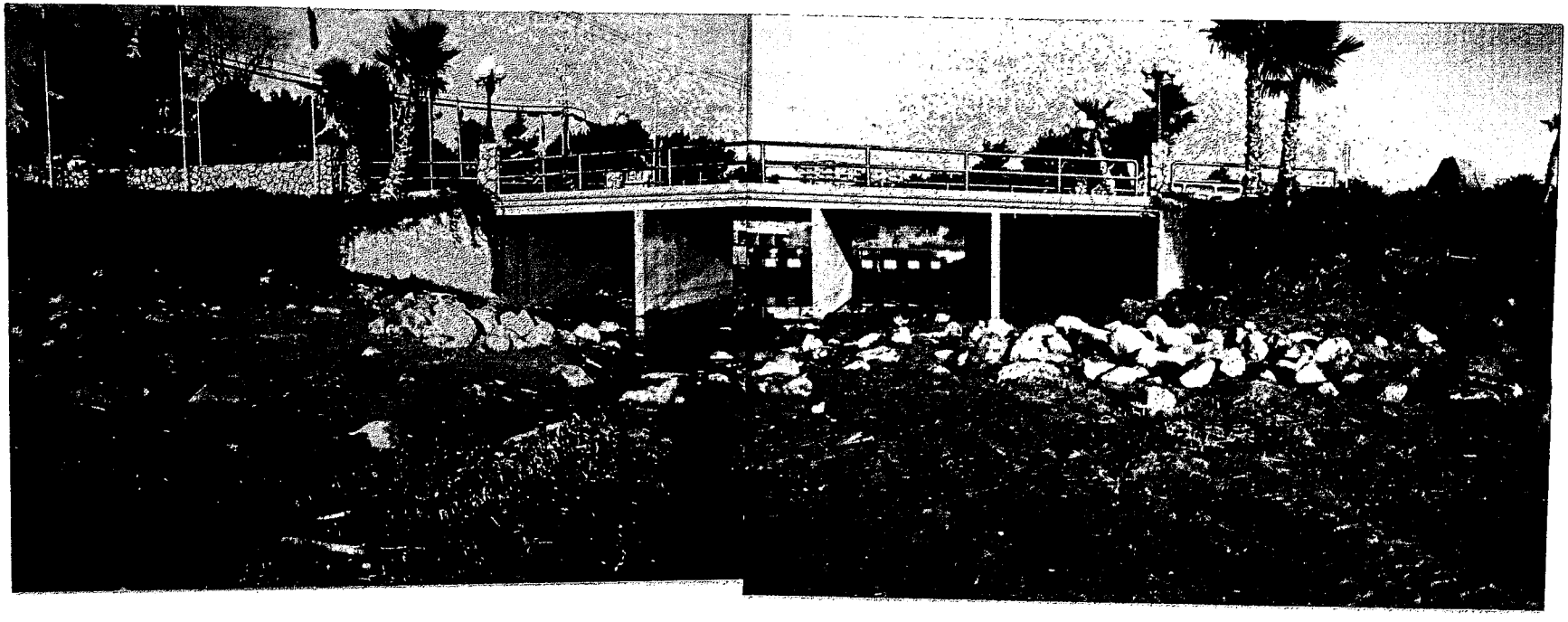
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: @ inlet to Harbor Island
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes Took 4 Total
4. Survey structure yes TBM Top of Rock @ N W Corner Curb, See survey Notes
5. Culvert type Concrete Box length 34'
6. Inlet type Concrete
7. Inlet conditions Good
8. Signs of Erosion? NO - Concrete
9. Signs of Deposition? NO - Concrete
10. Obstructions which could cause backwater? None
11. Skew angle 0
12. Pier description _____
13. Comments _____

Date_____ by_____



Looking Upstream on the Downstream side of Culverts @ INLET to HARBOR ISLAND MOTEL



Looking Downstream from Downstream side of culvert



Looking Downstream from the Upstream side of Culverts that access HARBOR ISLAND MOTEL

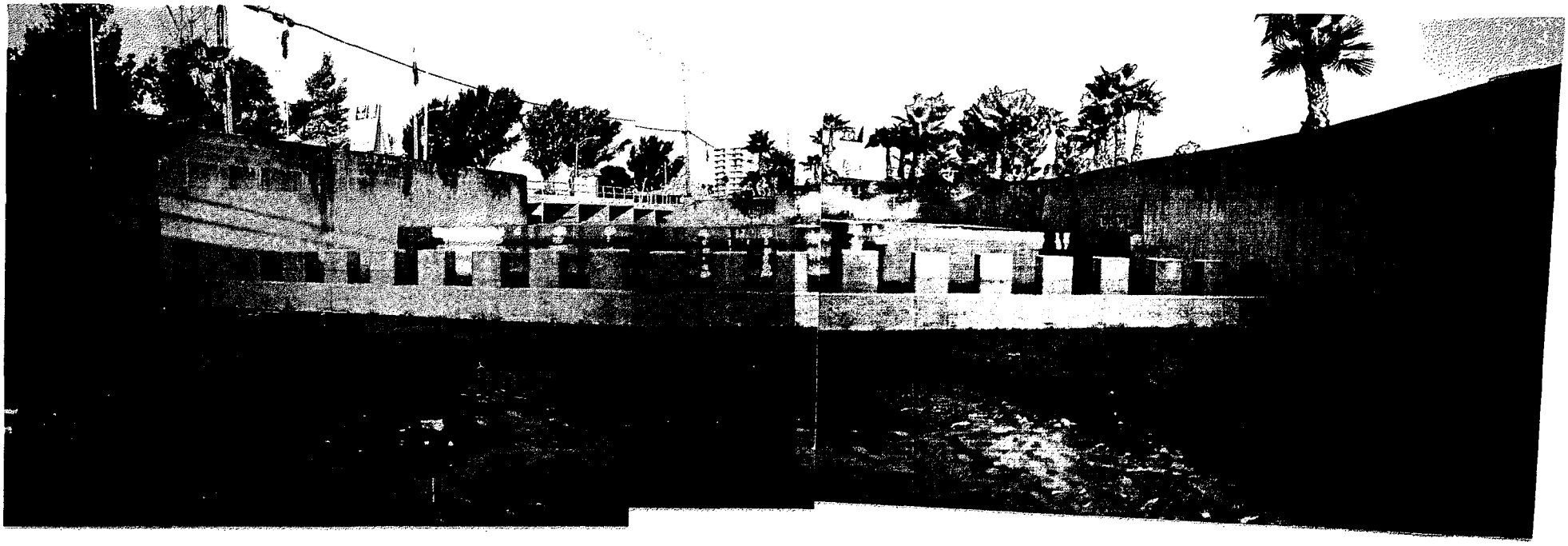
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: @Drop structure & energy dissipator
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet - 4 total photos
4. Survey structure yes TBM lamp post bolt.
5. Culvert type N/A length _____
6. Inlet type N/A
7. Inlet conditions N/A
8. Signs of Erosion? -
9. Signs of Deposition? -
10. Obstructions which could cause backwater? _____
11. Skew angle _____
12. Pier description _____
13. Comments See photographs & survey notes for dimensions and elevations

Date_____ by_____



DROP STRUCTURE & ENERGY DISSIPATOR
Looking Upstream From access culverts to HARBOR Island

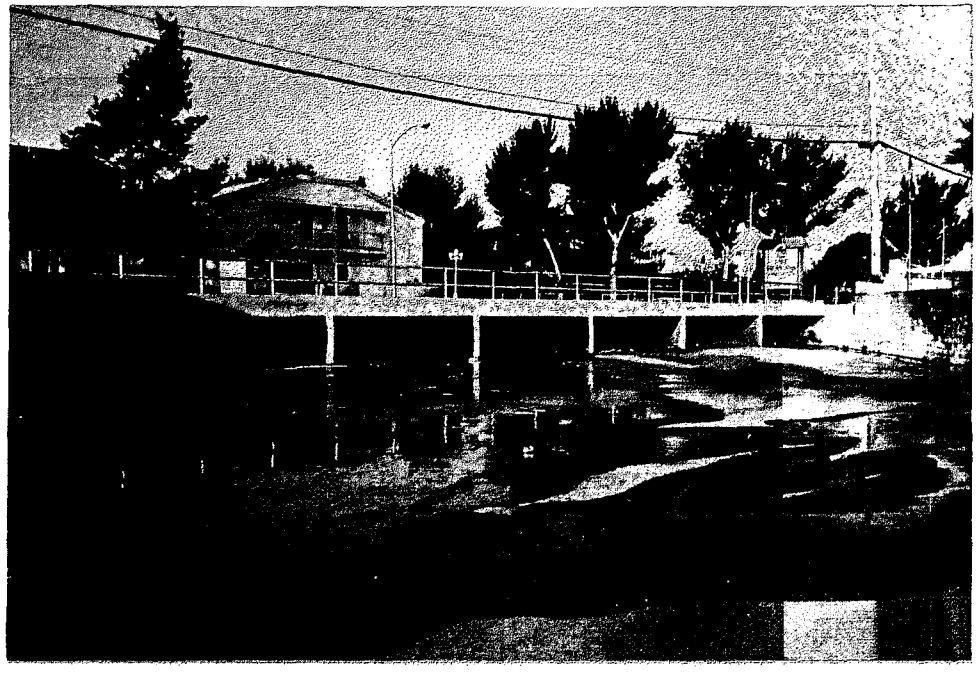
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

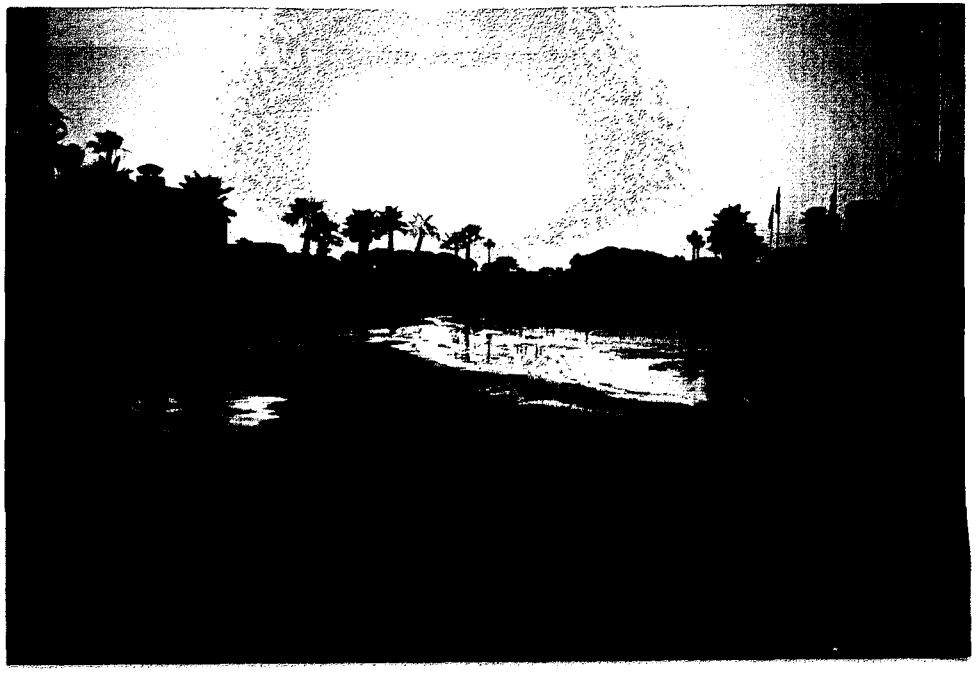
Field Data:

1. Structure Location: Haumon
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes - 4-1st + 2@Downstream - 6 total
4. Survey structure yes TBM Compact bolt
5. Culvert type Concrete Box - 6 Total length 179'
6. Inlet type 90° approach
7. Inlet conditions Silted
8. Signs of Erosion? No
9. Signs of Deposition? yes.
10. Obstructions which could cause backwater? Silt @ inlet
11. Skew angle 90° to flow
12. Pier description Box culvert - 2 inlet piers are rounded - 0.5' wide
13. Comments _____

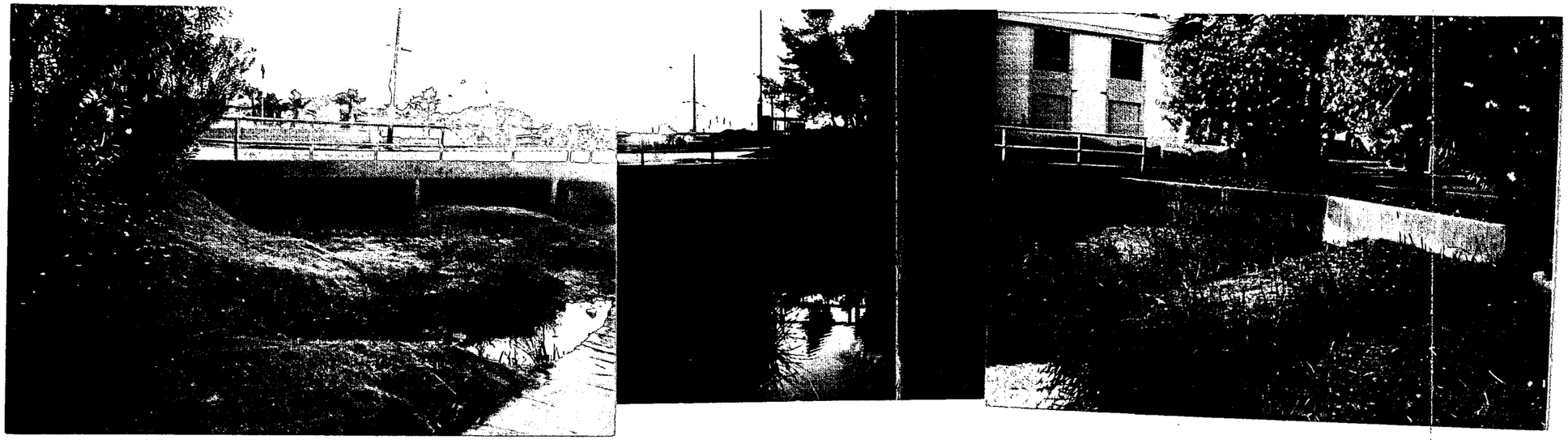
Date_____ by_____



LOOKING Upstream on the Downstream side of culverts @ HARMON



Looking Downstream on the Downstream side of culverts @ HARMON



LOOKING DOWNSTREAM ON THE UPSTREAM SIDE OF CULVERTS AT HARMON



Looking UPSTREAM on the Upstream side of culverts @ HARMON

(10)

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: @ Downstream end of Long culvert
2. Mark section on map or photograph. _____
3. Photograph inlet N/A outlet yes 3 pictures total
4. Survey structure yes TBM Top of Small Rock @ N.W. Corner Concrete wall just West of culvert outlet
5. Culvert type Concrete Box length N/A
6. Inlet type N/A
7. Inlet conditions N/A
8. Signs of Erosion? NO
9. Signs of Deposition? yes
10. Obstructions which could cause backwater? piers inside culvert
11. Skew angle _____
12. Pier description round
13. Comments _____

Date_____ by_____



Looking Upstream on the Downstream End of Long Culvert



Looking Downstream on the Downstream End of Long Culvert

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: Swenson
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes 6 pictures total
4. Survey structure yes TBM Top of I Beam @ CMP gaging Station
5. Culvert type Concrete Box-6 total length 127.0'
6. Inlet type Concrete
7. Inlet conditions silted somewhat
8. Signs of Erosion? No
9. Signs of Deposition? minor
10. Obstructions which could cause backwater? minor silt
11. Skew angle 180° to flow
12. Pier description Concrete piers @ inlet are rounded
13. Comments _____

Date_____ by_____

(11)

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: INLET @ GOLF COURSE
2. Mark section on map or photograph. _____
3. Photograph inlet _____outlet_____
4. Survey structure ____TBM_____
5. Culvert type_____length_____
6. Inlet type _____
7. Inlet conditions _____
8. Signs of Erosion?_____
9. Signs of Deposition?_____
10. Obstructions which could cause backwater? _____
11. Skew angle _____
12. Pier description _____
13. Comments _____

_____

Date_____ by_____

(12)

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures: Just Downstream of Industrial Road

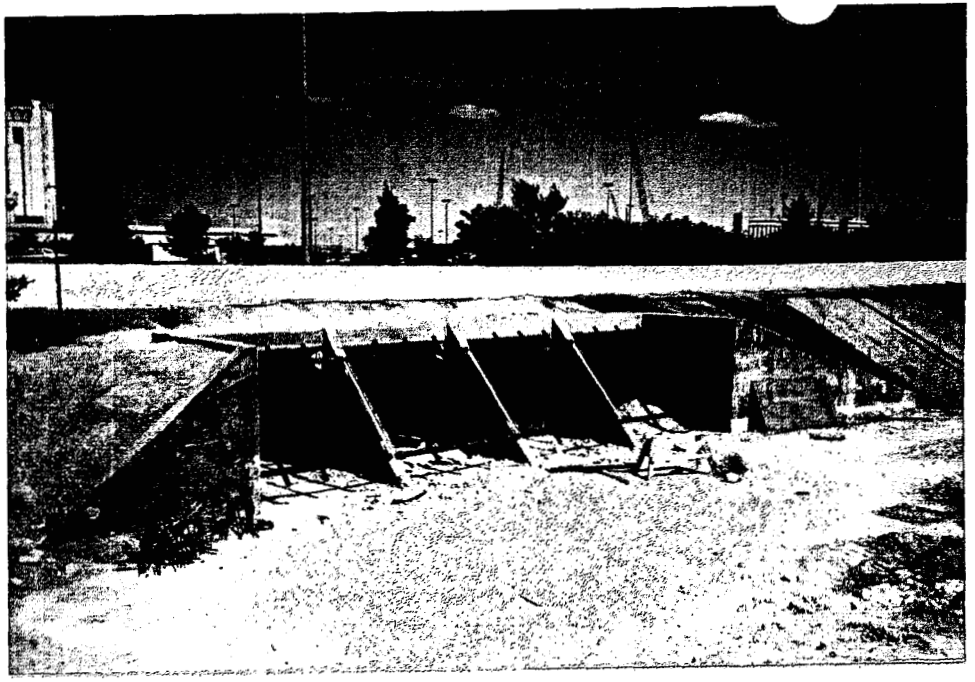
Field Data:

1. Structure Location: @ Inlet to Looooooooong Culvert
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet Not on this one page took 3 total
4. Survey structure yes TBM Nail in headwall 75' U.S. of Inlet
5. Culvert type Concrete Box length LONG
6. Inlet type square wing walls
7. Inlet conditions New Trash Racks @ Inlet
8. Signs of Erosion? NO
9. Signs of Deposition? Not yet ?
10. Obstructions which could cause backwater? Trash Racks
11. Skew angle ?
12. Pier description square nose
13. Comments _____

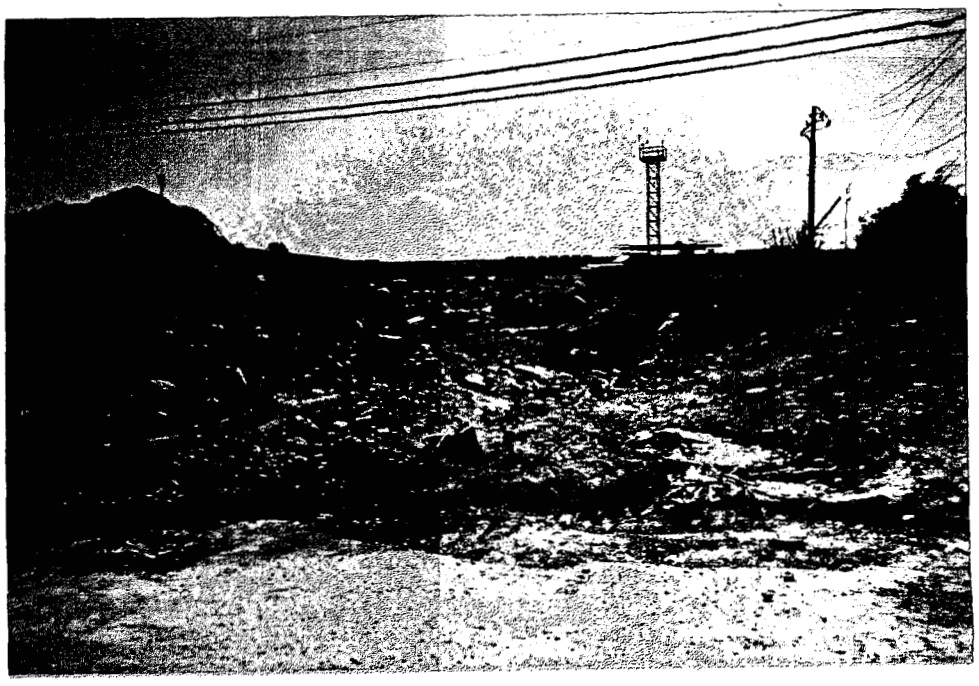
Date_____ by_____



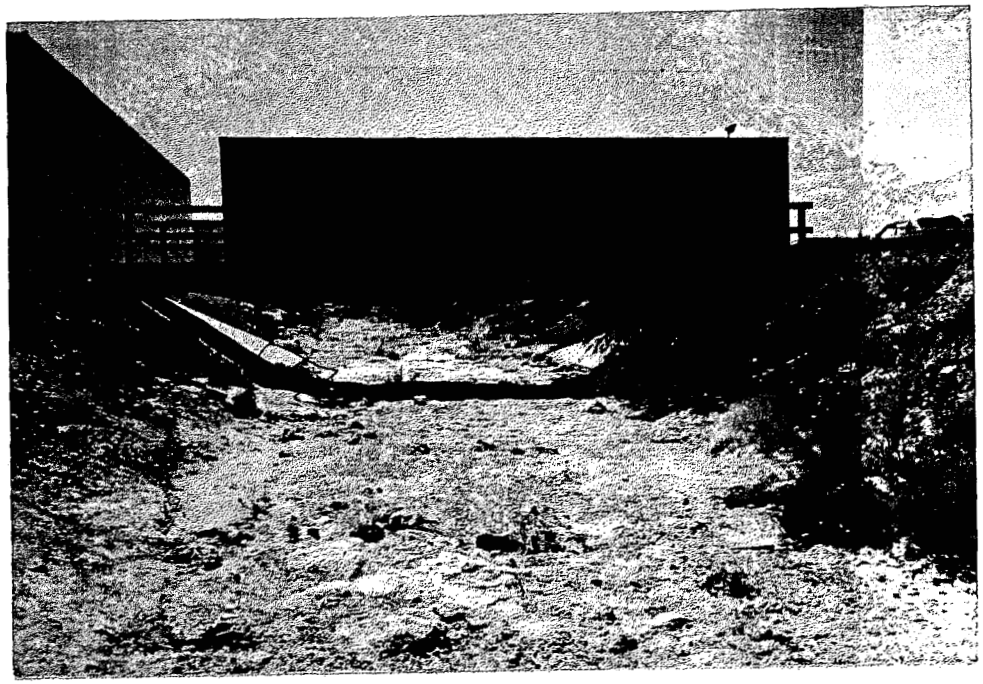
INLET TO LONG CULVERT LOOKING SOUTH ALONG I-15



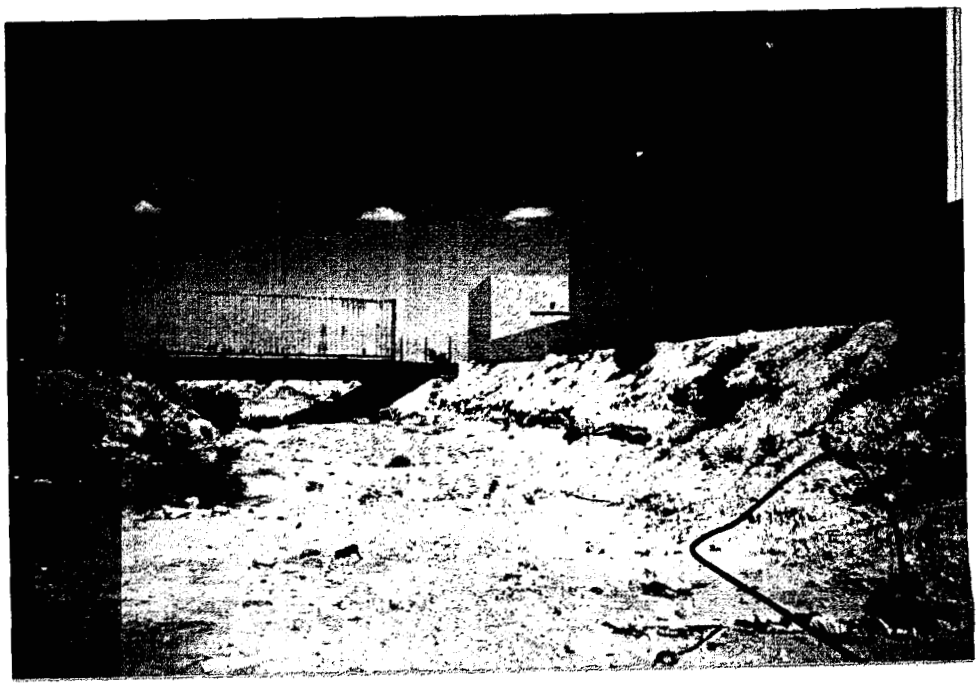
INLET TO LONG CULVERT.



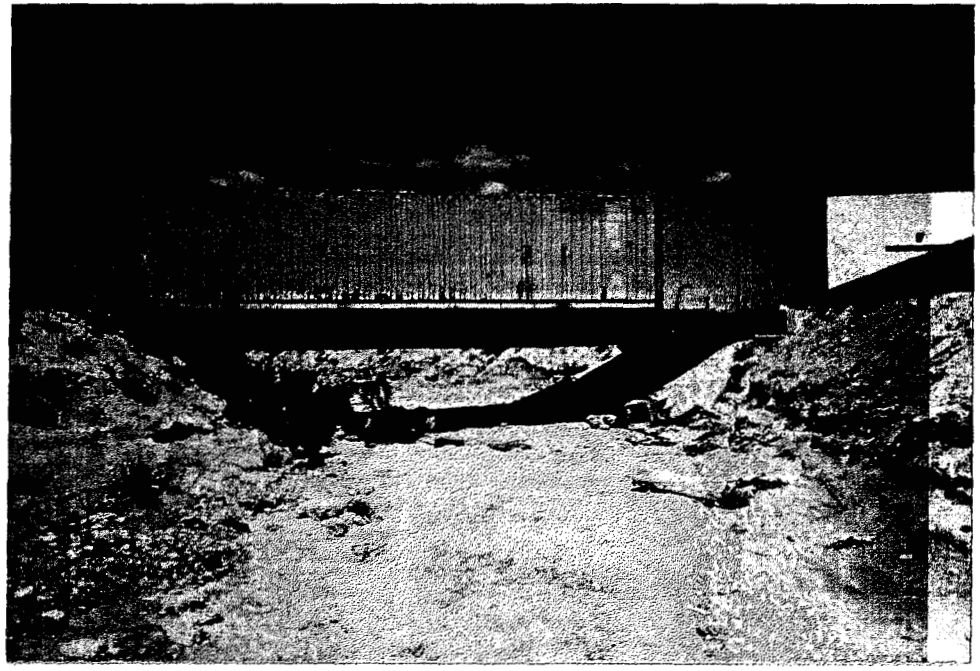
LOOKING upstream (WEST) on the upstream side of long Culvert



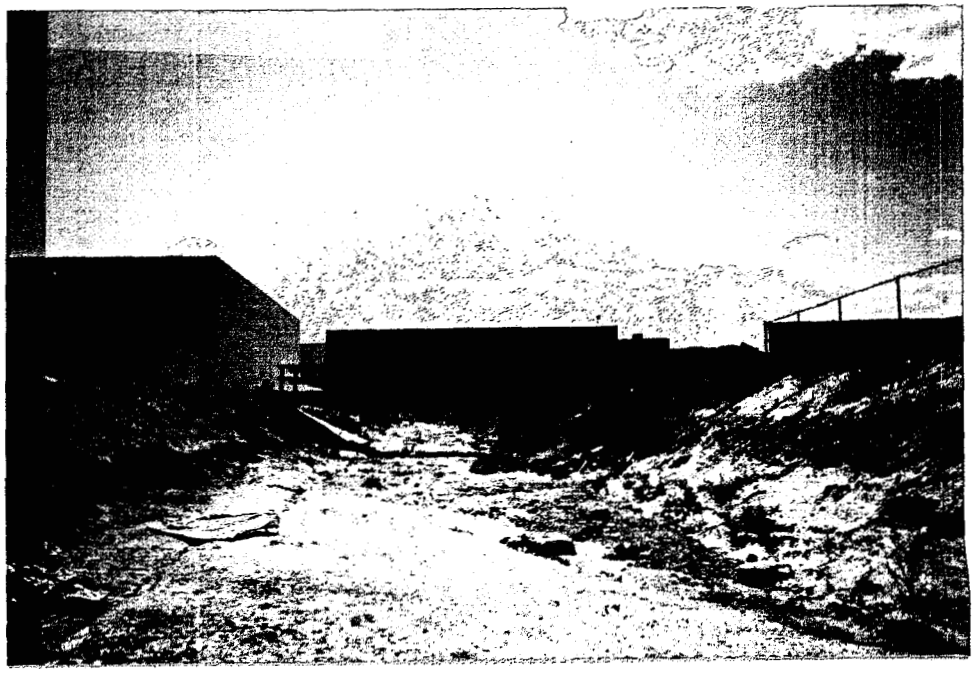
Looking Upstream from the Downstream side of 2nd RR CAR BRIDGE



Looking Downstream from the Downstream side of first RR CAR BRIDGE



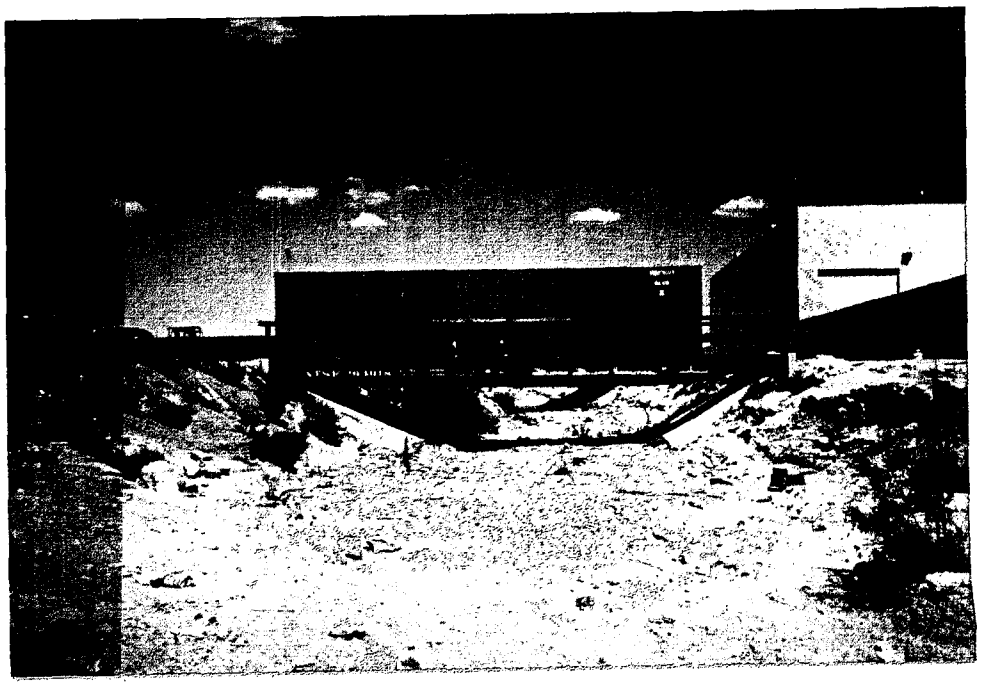
Looking Downstream on the Upstream side of 2nd RR car Bridge



Looking Upstream on the Upstream side of 2nd RR car Bridge.



Looking Upstream from the upstream side of 1st RR car bridge



Looking Downstream on the Upstream side of 1st RR car bridge

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data: Storage Container
Downstream from Valley View

1. Structure Location: 1st Railroad Box Car Box Bridge
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes 1 total
4. Survey structure ___ TBM _____
5. Culvert type N/A length 9'
6. Inlet type N/A
7. Inlet conditions good
8. Signs of Erosion? NO
9. Signs of Deposition? NO
10. Obstructions which could cause backwater? None
11. Skew angle 0
12. Pier description None
13. Comments _____

Date_____ by_____

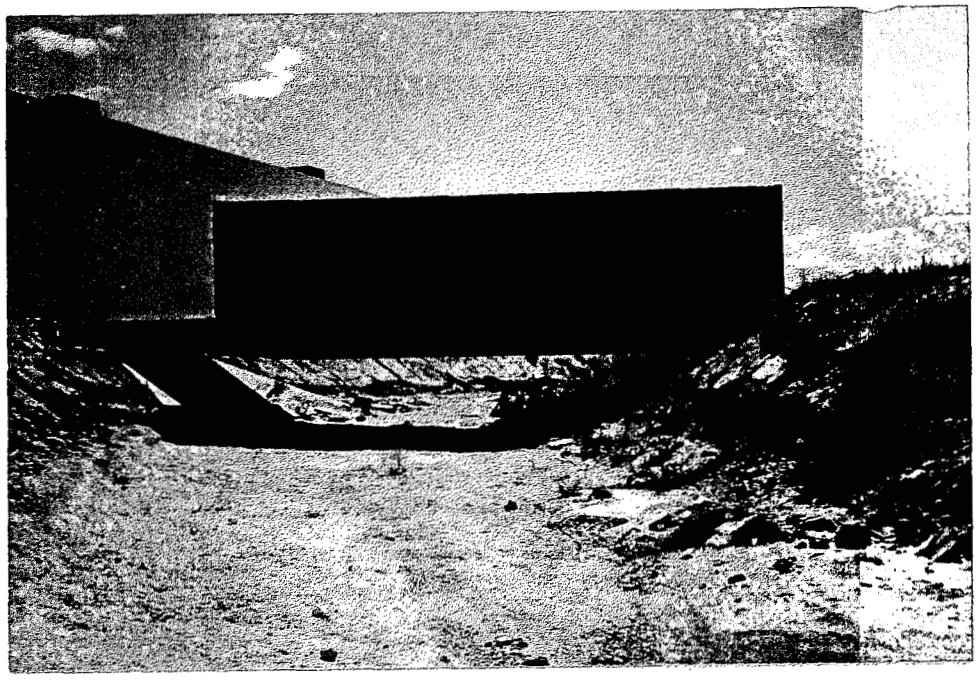
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

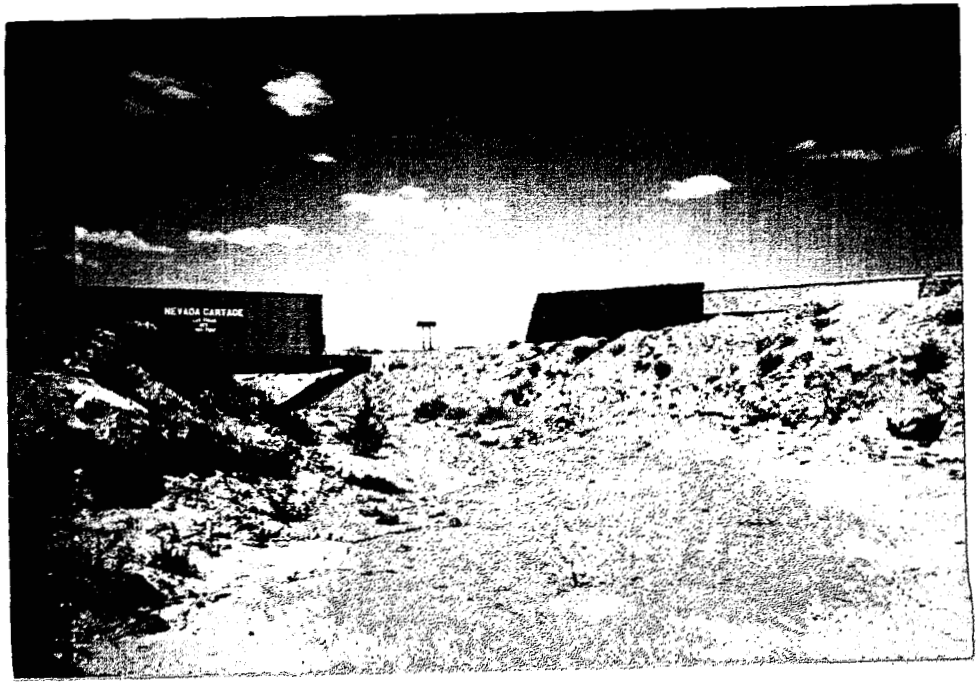
Field Data: 2nd Storage Container

1. Structure Location: Railroad Car Base
2. Mark section on map or photograph.
3. Photograph inlet yes outlet yes Total
4. Survey structure ? TBM
5. Culvert type N/A length 20'
6. Inlet type N/A
7. Inlet conditions good
8. Signs of Erosion? ND
9. Signs of Deposition? ND
10. Obstructions which could cause backwater? None
11. Skew angle on bend - Ø Skew
12. Pier description None
13. Comments Base has Super Shock Control (in photo)

Date _____ by _____



Looking Upstream on the Downstream side of 2nd RR CAR BRIDGE



Looking Downstream on the Downstream side of 2nd RR CAR BRIDGE

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

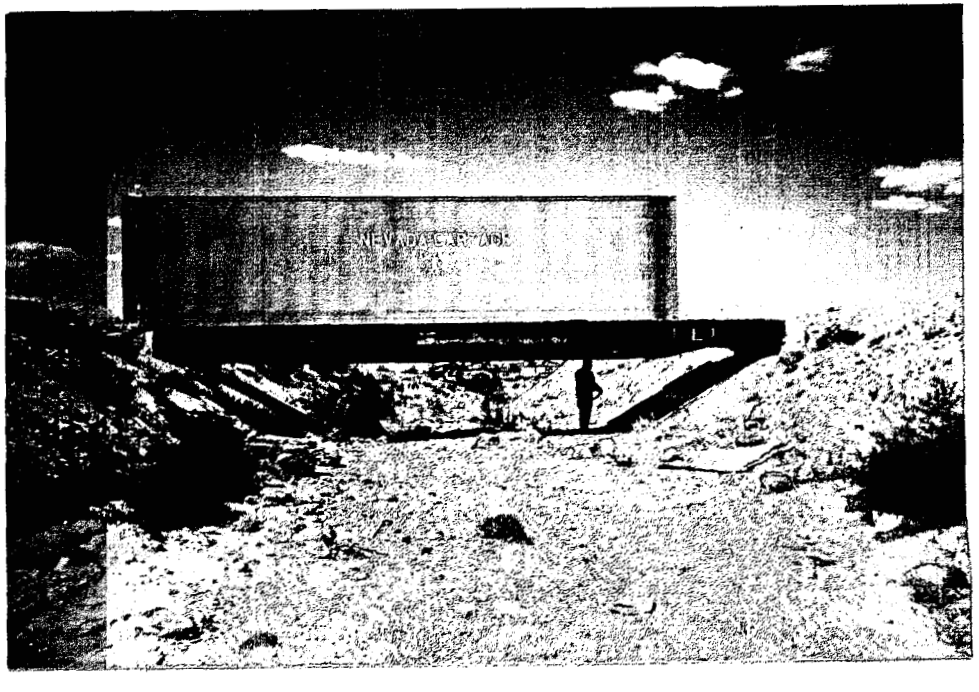
Field Data: Storage Containers - Railroad Base

1. Structure Location: 3rd downstream from Valley View
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes 4 total
4. Survey structure _____ TBM Bolt head on second bridge
5. Culvert type N/A length 9'
6. Inlet type Smooth channel - No INlet
7. Inlet conditions good
8. Signs of Erosion? NO
9. Signs of Deposition? NO
10. Obstructions which could cause backwater? NO
11. Skew angle None
12. Pier description None
13. Comments Railroad Base Car Base - Trapezoidal Concrete Channel sides + 30' Long Underneath - Natural Channel U.S & D.: Concrete channel sides

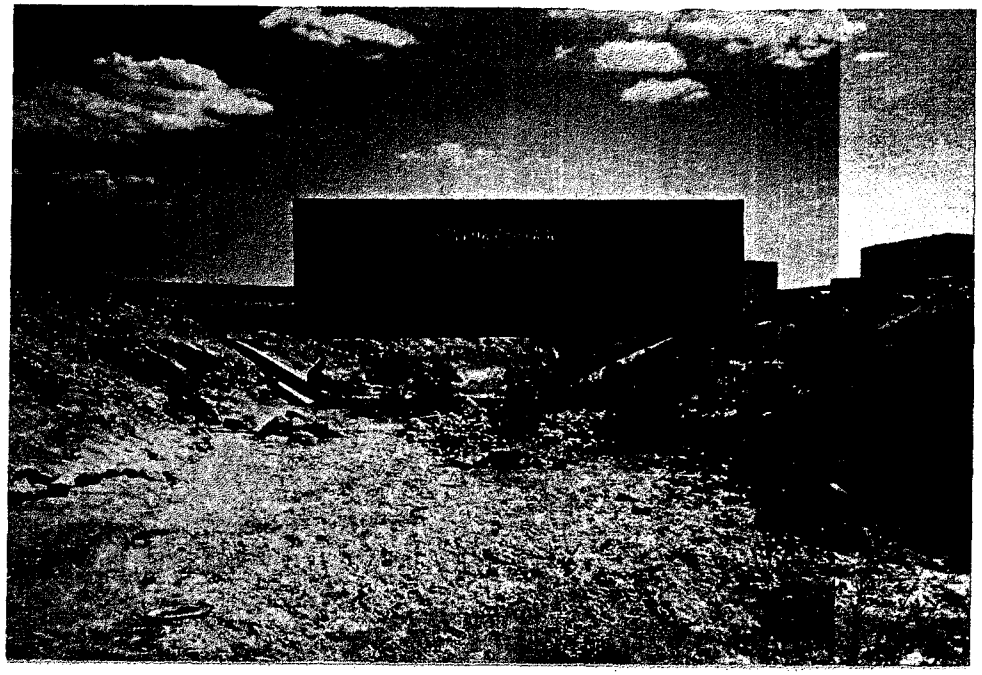
Date_____ by_____



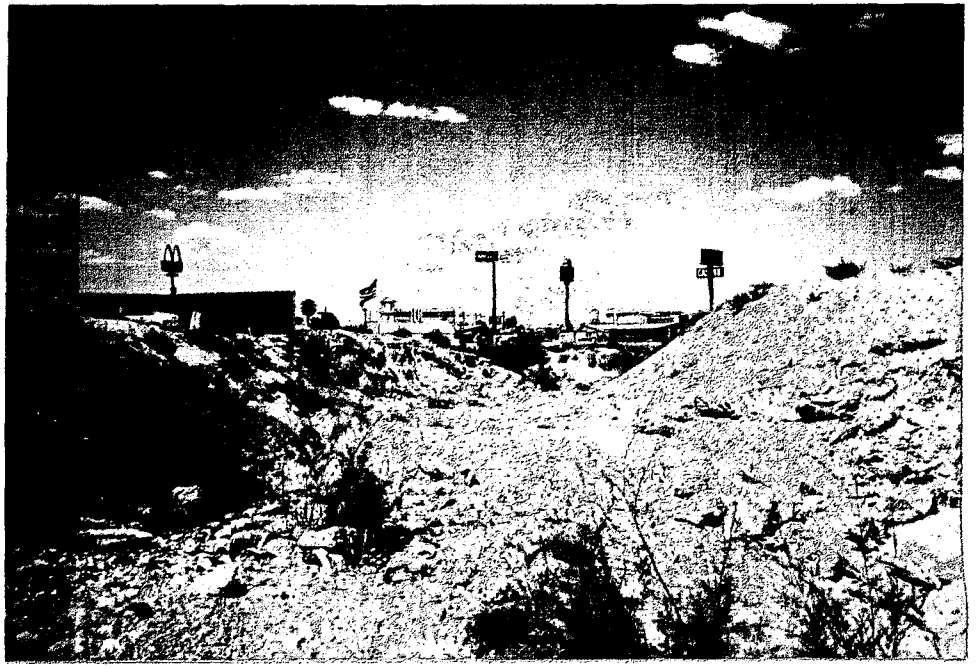
Looking Upstream on the Upstream side of 3rd RR CAR BRIDGE



Looking Downstream on the Upstream side of 3rd RR CAR BRIDGE



Looking Upstream on the Downstream side of 3rd RR CAR BRIDGE



Looking Downstream on the Downstream side of 3rd RR car BRIDGE

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: Railroad - UPRR
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes from 5 total 3 up 2 down
4. Survey structure yes TBM sign @ S.E. top near rails
5. Culvert type CMP - 9.75' dia length 25'
6. Inlet type square
7. Inlet conditions good
8. Signs of Erosion? some @ inlet but O.K.
9. Signs of Deposition? some silt in culvert
10. Obstructions which could cause backwater? None -
11. Skew angle 0
12. Pier description None
13. Comments _____

Date_____ by_____



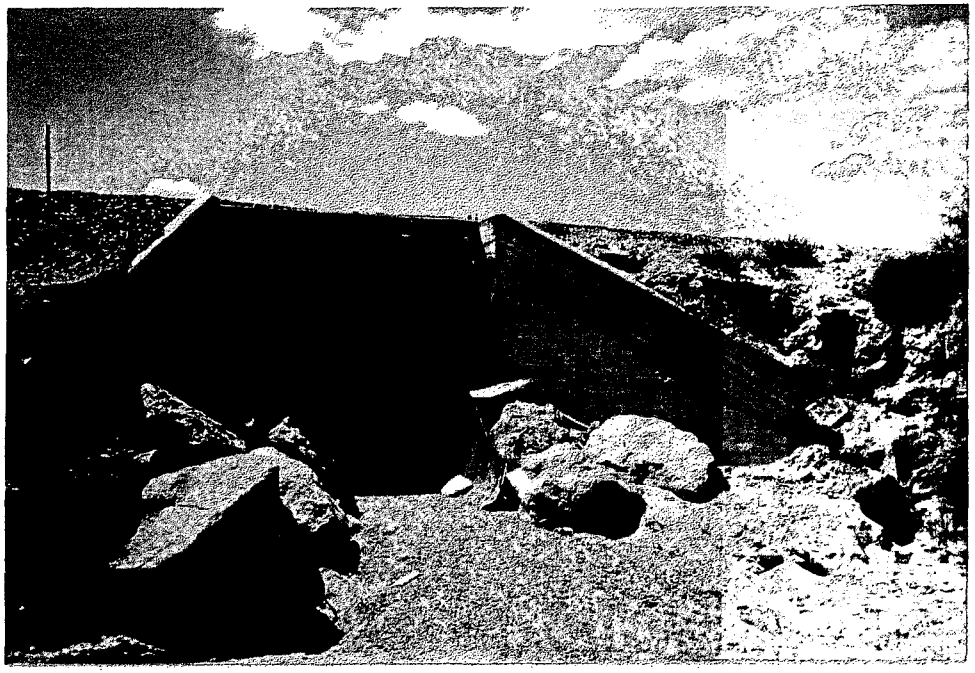
Looking Downstream on the Upstream side of RR culvert



Looking Upstream on INLET side of RR culvert



Looking Downstream on INLET to RR culvert



Looking Upstream on outlet end of RR culvert



Looking Downstream on outlet end of RR culvert

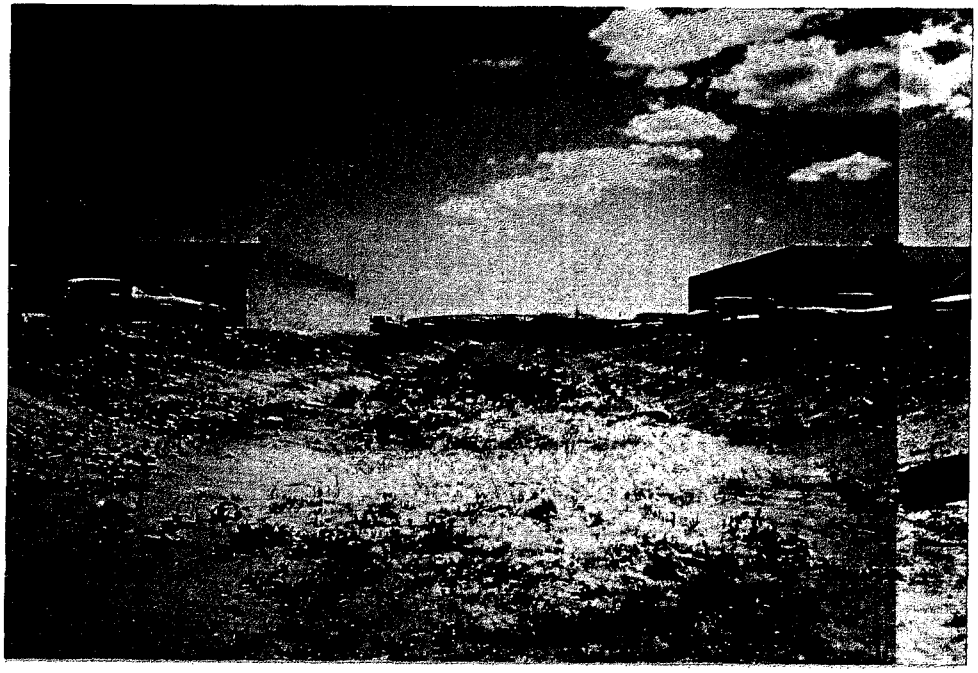
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

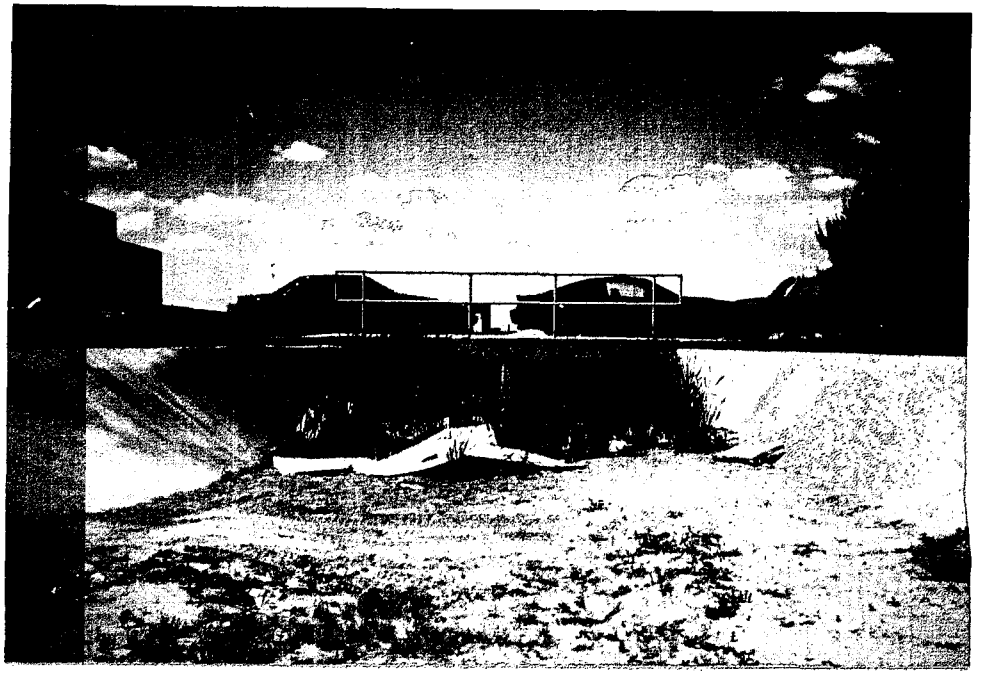
Field Data:

1. Structure Location: Tropicana Wash @ Hacienda D.S. of Footbridge
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes Took 4 total photographs
4. Survey structure yes TBM fire hydrant top - 70' west of D.S. edge
5. Culvert type Concrete Box - 2 length 80'
6. Inlet type Apron - from Trapezoidal to Culvert
7. Inlet conditions Silted
8. Signs of Erosion? No
9. Signs of Deposition? Rats - Cattails - Trash
10. Obstructions which could cause backwater? Weeds Trash
11. Skew angle None - 0
12. Pier description Concrete Square Nose
13. Comments _____

Date_____ by_____



Looking Upstream on the Upstream side of culvert



Looking Downstream on Upstream side of culvert



Looking Upstream on the Downstream side of culvert



Looking Downstream on the Downstream side of Culvert.

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: Foot bridge
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes Took 4 photos Total
4. Survey structure ~ TBM Left Bank Abutment - N.E Corner Concrete
5. Culvert type None - footbridge - Trapizodal length _____
6. Inlet type good NO obstructions
7. Inlet conditions Good
8. Signs of Erosion? NO
9. Signs of Deposition? NO
10. Obstructions which could cause backwater? None
11. Skew angle None
12. Pier description None
13. Comments _____

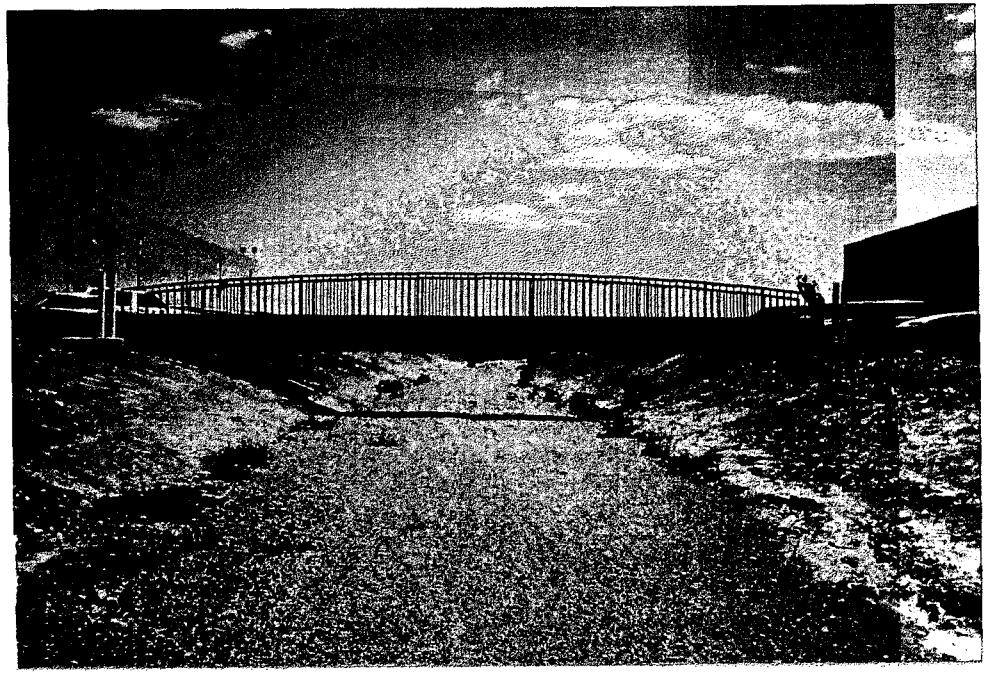
Date_____ by_____



Looking Upstream from Foot-Bridge



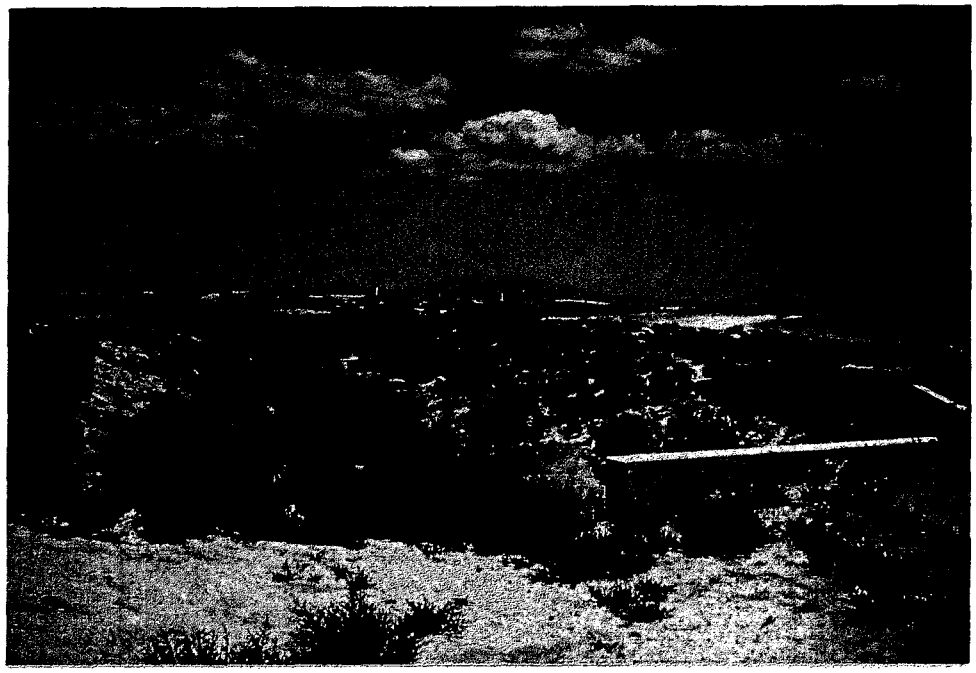
Looking Downstream on Upstream side of Footbridge



Looking Upstream on the Downstream side of Foot bridge



Looking Downstream of Foot Bridge



Looking Downstream
on the Downstream side



Looking Upstream
on the upstream side



Looking Upstream
on Downstream side

(20)

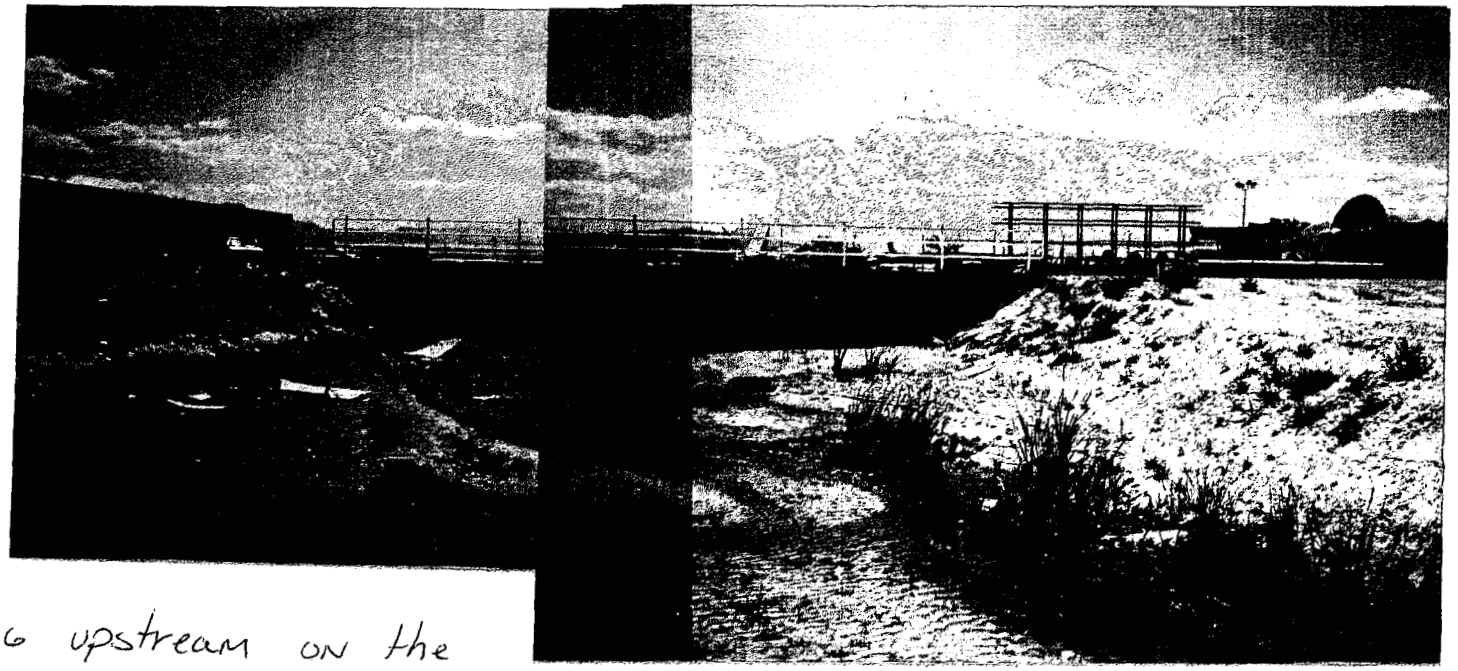
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: Hacienda - North Tropicana Wash
2. Mark section on map or photograph. _____
3. Photograph inlet ____ outlet ____ Took 6 photo: Total
4. Survey structure ✓ TBM N.W corner upstream Headwall - NOT wingw.
5. Culvert type concrete Arch length 120'
6. Inlet type 45° wingwalls
7. Inlet conditions good
8. Signs of Erosion? downstream
9. Signs of Deposition? upstream inlet control
10. Obstructions which could cause backwater? weeds downstream
11. Skew angle 90° to flow
12. Pier description None
13. Comments _____

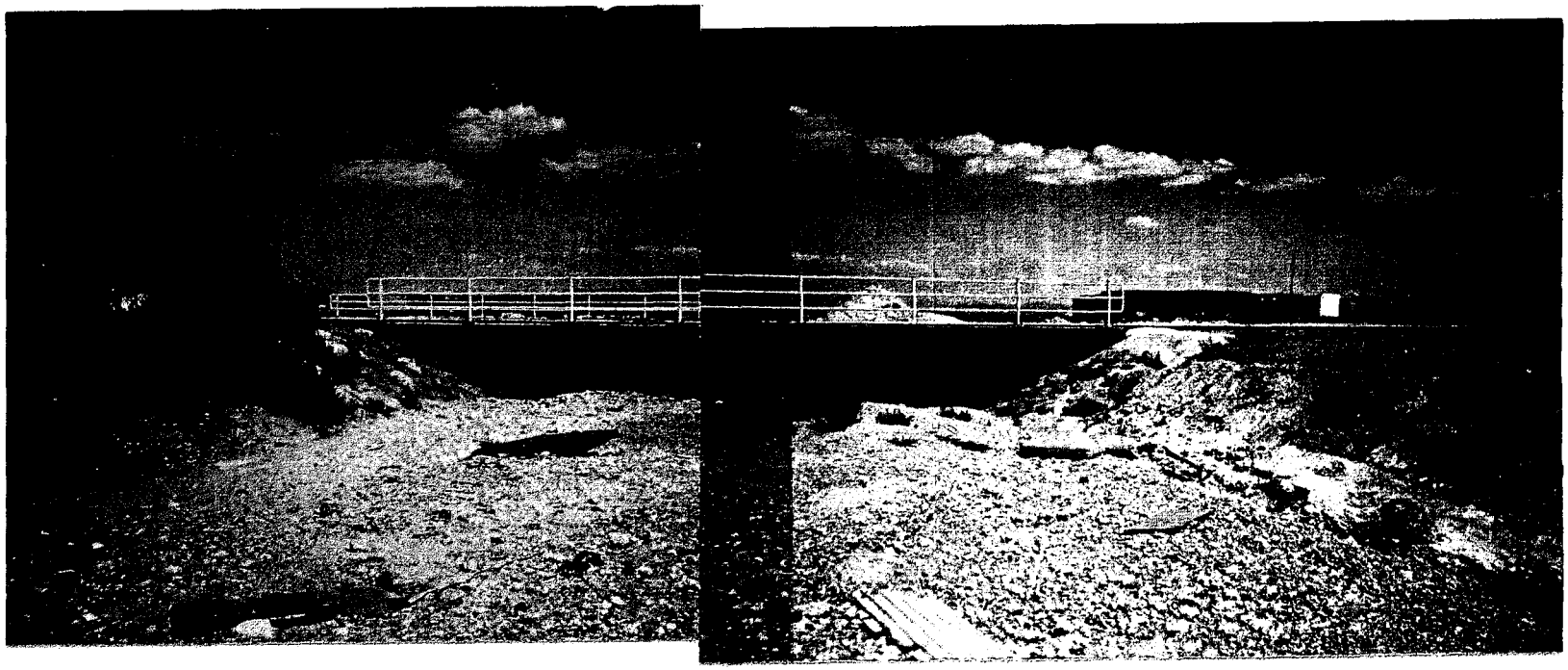
Date 6-10-92 by John Wen



Looking upstream on the Downstream side of culverts



Looking Downstream of Culverts



Looking Downstream on the Upstream side of Culvert



Looking Upstream on Upstream side of culvert

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Hydraulic Structures:

Field Data:

1. Structure Location: North ↑ Tropicana wash Near Oak Mont Furniture
2. Mark section on map or photograph. _____
3. Photograph inlet yes outlet yes - Topic 6 Total
4. Survey structure ✓ TBM Top of fire hydrant - N.W upstream Corner
5. Culvert type 3 Concrete Box length 66.0'
6. Inlet type 90° - Gunnited Channel upstream 15 feet ±
7. Inlet conditions silted
8. Signs of Erosion? NO
9. Signs of Deposition? yes - upstream silted
10. Obstructions which could cause backwater? silt
11. Skew angle 8/9
12. Pier description 90° Concrete
13. Comments _____

Date_____ by_____



Looking Downstream from the upstream side of culvert

EXHIBIT 10-4

n VALUE FIELD NOTES

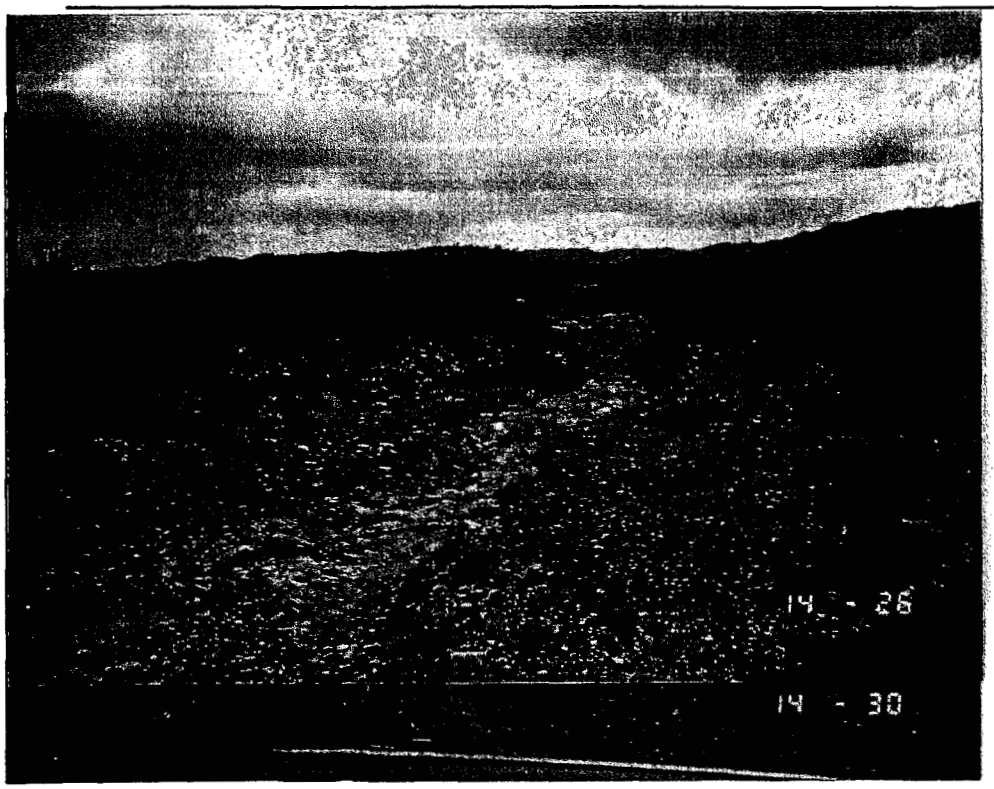
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: 55
2. Mark section on map or photograph. _____
3. Estimate bottom width : 10' & 15 (2 channels)
4. Photograph main channel 1426 & 14:30
5. Photograph overbank "
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? bankscar
9. Signs of Deposition? _____
10. Bank height: 3-4
11. Obstructions which could cause backwater? _____
12. NCH 04 NLOB 05 NROB 05
13. Comments: _____

Braided channel



By: SLW Date: 6/23

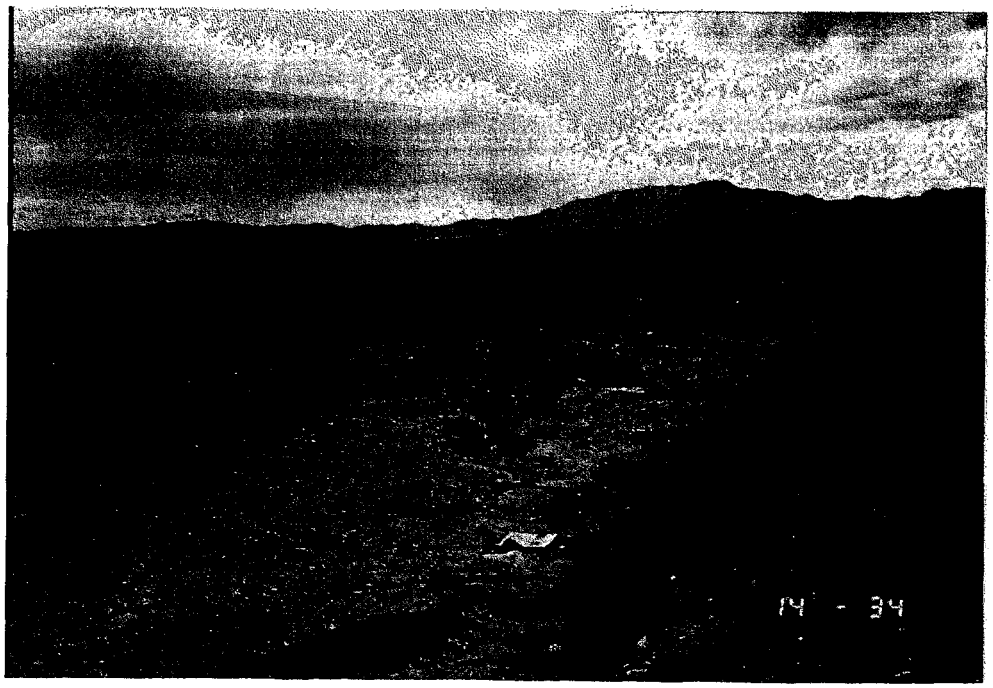
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: SC
2. Mark section on map or photograph. _____
3. Estimate bottom width : 30
4. Photograph main channel 14:34
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: 6-8
11. Obstructions which could cause backwater? _____
12. NCH 098 NLOB 045 NROB 045
13. Comments: _____

Channel has multi. channel some debri dumping



By: SW Date: 4/6/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: 1 CAMBRIDGE - D.S. OF BRIDGE
2. Mark section on map or photograph. _____
3. Estimate bottom width : 20'
4. Photograph main channel 7:42
5. Photograph overbank _____
6. Note highwater marks:
   Type: N/A
   Elevation: N/A
7. Signs of Overbank Flooding/Sheet Flooding? N/A
8. Signs of Erosion? BENCHES ERODED AT BEND DS
9. Signs of Deposition? No
10. Bank height: 30'
11. Obstructions which could cause backwater? N/A
12. NCH 0.035 NLOB 0.025 NROB 0.028
13. Comments: COMPOUND CHANNEL W/ LOW FLOW INCISED CHANNEL. BANK HEIGHT 30'



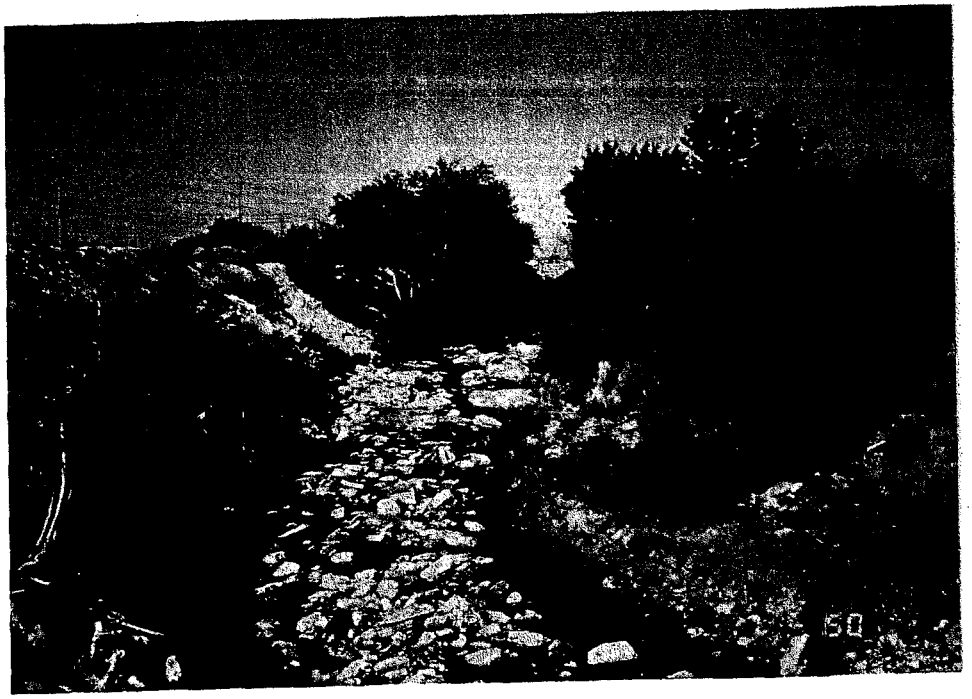
By: RTD Date: 6/11/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: 2 CAMBRIDGE US OF B/2106
2. Mark section on map or photograph. _____
3. Estimate bottom width : 35'
4. Photograph main channel 7:52
5. Photograph overbank _____
6. Note highwater marks:
   Type: NA
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? NA
8. Signs of Erosion? MINOR BANK SLOUGHING
9. Signs of Deposition? NA
10. Bank height: 3'
11. Obstructions which could cause backwater? _____
12. NCH .05 NLOB .045 NROB .045
13. Comments: CHANNEL BANKS HEAVILY VEGITATED - Trees: Bushes - SALT CEDAR.



By: RTD Date: 6/11/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: (3) CONFLUENCE TROP W/ FLAMINGO
2. Mark section on map or photograph. _____
3. Estimate bottom width : _____
4. Photograph main channel 7:57
5. Photograph overbank _____
6. Note highwater marks:
   Type: BANK SCOUR
   Elevation: 5.5'
7. Signs of Overbank Flooding/Sheet Flooding? N/A
8. Signs of Erosion? BANK SLOUGHING
9. Signs of Deposition? N/A
10. Bank height: 10'
11. Obstructions which could cause backwater? _____
12. NCH 0.075 NLOB 0.04 NROB 0.04
13. Comments: BOTTOM VERY HEAVILY VEGITATED



By: RTD Date: 6/11/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: (4) Between confluence and FLAMINGO BR
2. Mark section on map or photograph. _____
3. Estimate bottom width : 30'
4. Photograph main channel 8:08
5. Photograph overbank _____
6. Note highwater marks:
   Type: NA
   Elevation: NA
7. Signs of Overbank Flooding/Sheet Flooding? NA
8. Signs of Erosion? NA
9. Signs of Deposition? NA
10. Bank height: 20'
11. Obstructions which could cause backwater? NA
12. NCH 0.075 NLOB 0.035 NROB 0.035
13. Comments: BOTTOM HEAVILY VEGITATED overbank grubbed but cattails with fill, tracks of new vegetation



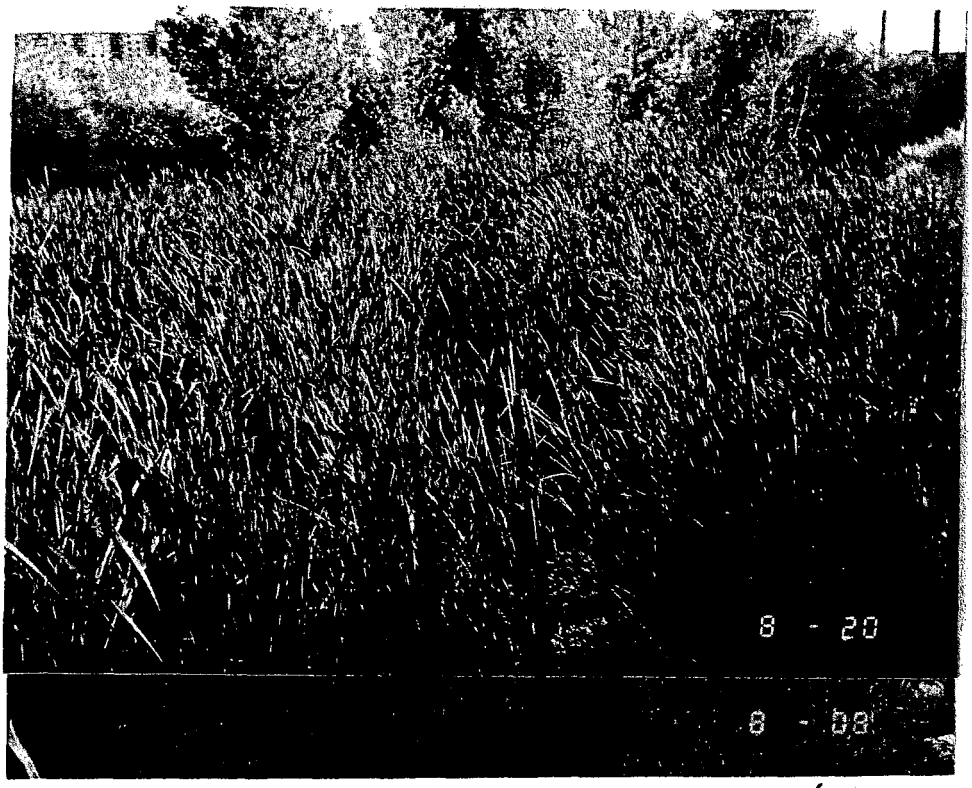
By: SLW Date: 6/4/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: (5) DS OF FLAMINGO BR
2. Mark section on map or photograph.
3. Estimate bottom width : 40'
4. Photograph main channel 8:18 ?
5. Photograph overbank
6. Note highwater marks:
   Type: N/A
   Elevation: N/A
7. Signs of Overbank Flooding/Sheet Flooding? N/A
8. Signs of Erosion? N/A
9. Signs of Deposition? N/A
10. Bank height: 20'
11. Obstructions which could cause backwater? N/A
12. NCH .035 NLOB .020 NROB .020
13. Comments: BOTTOM VEGITATED W/TULES Grass overbank 3' HIGH BERM BOTH SIDES



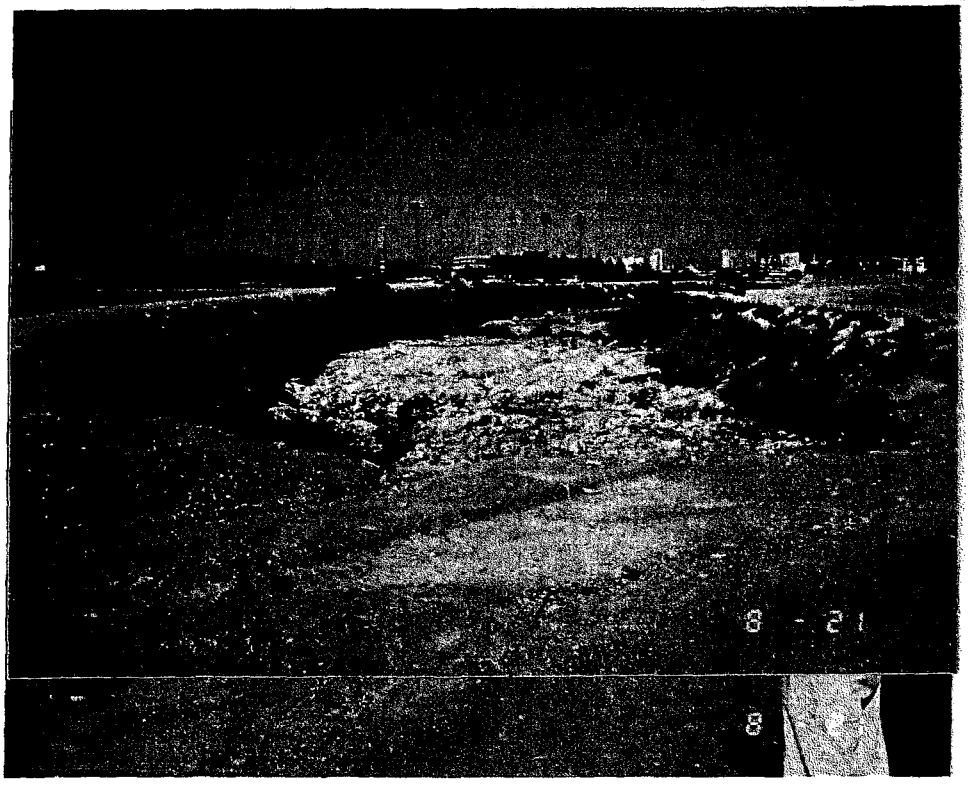
By: RTD Date: 6/4/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: 6 US OF FLAMINGO BR
2. Mark section on map or photograph. _____
3. Estimate bottom width : 40
4. Photograph main channel 8:21
5. Photograph overbank 8:21 ROB
6. Note highwater marks:
   Type: NA
   Elevation: NA
7. Signs of Overbank Flooding/Sheet Flooding? NA
8. Signs of Erosion? MINOR BANK EROSION
9. Signs of Deposition? _____
10. Bank height: _____
11. Obstructions which could cause backwater? _____
12. NCH .028 NLOB .025 NROB .025
13. Comments: _____



By: RTD Date: 6/11/96

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: ⑦ US OF SWENSON BR
2. Mark section on map or photograph. _____
3. Estimate bottom width : 70'
4. Photograph main channel 8:28
5. Photograph overbank _____
6. Note highwater marks:
   Type: NA
   Elevation: NA
7. Signs of Overbank Flooding/Sheet Flooding? NA
8. Signs of Erosion? NA
9. Signs of Deposition? NA
10. Bank height: 12'
11. Obstructions which could cause backwater? _____
12. NCH 0.028 NLOB 0.025 NROB 0.025
13. Comments: ALERT GUAGE AT STATION. GRADE CONTROL STRUCTURE 300' U/S OF Swenson BR



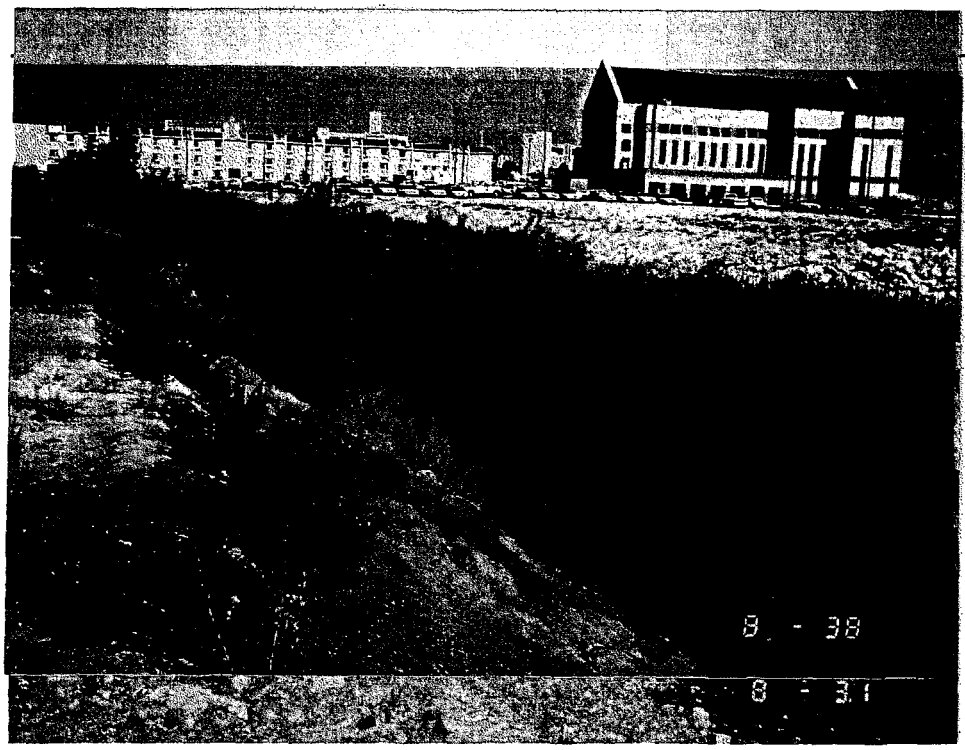
By: RTD Date: 6/11/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: ⑧ Between Swenson Br AND Long Culvert
2. Mark section on map or photograph. _____
3. Estimate bottom width : 60'
4. Photograph main channel 8:31 & 8:38
5. Photograph overbank _____
6. Note highwater marks:
   Type: NA
   Elevation: NA
7. Signs of Overbank Flooding/Sheet Flooding? NA
8. Signs of Erosion? NA
9. Signs of Deposition? NA
10. Bank height: 20'
11. Obstructions which could cause backwater? _____
12. NCH 0.05 NLOB .025 NROB .025
13. Comments: Bottom Heavily Vegitated w/ Tules



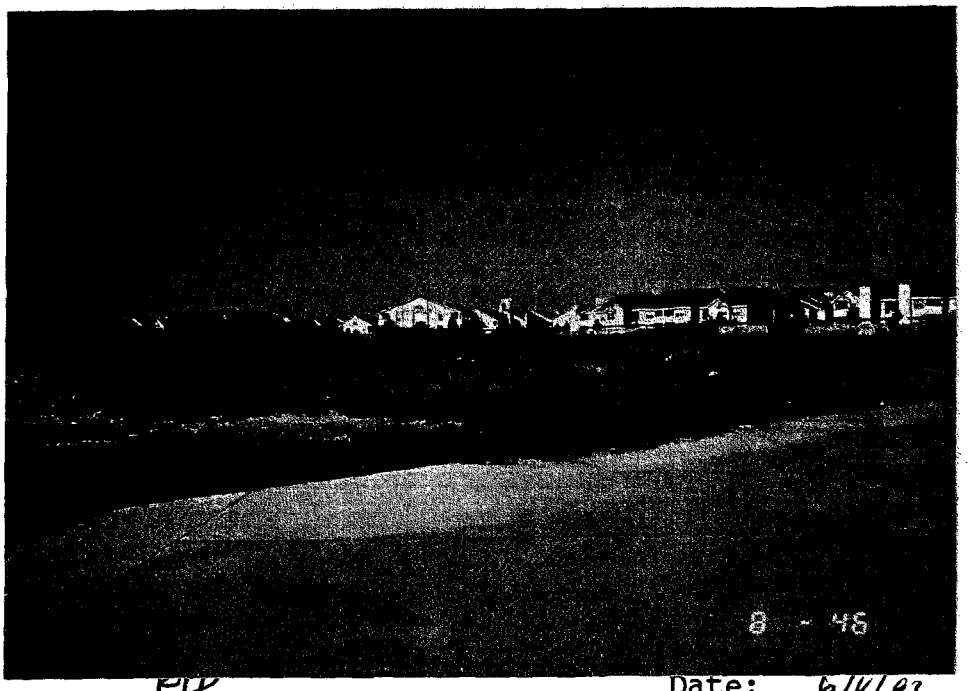
By: RTP Date: 6/11/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: @ US OF PARADISE
2. Mark section on map or photograph. _____
3. Estimate bottom width : _____
4. Photograph main channel 8:46
5. Photograph overbank _____
6. Note highwater marks:
   Type: N/A
   Elevation: N/A
7. Signs of Overbank Flooding/Sheet Flooding? N/A
8. Signs of Erosion? N/A
9. Signs of Deposition? N/A
10. Bank height: 4'
11. Obstructions which could cause backwater? N/A
12. NCH .04 NLOB .025 NROB .025
13. Comments: VERY WIDE IRM SHALLOW CHANNEL.
    PROPOSED DEVELOPMENT ON LOB MOVING FOR
    FILL DIRT



By: RD Date: 6/4/92

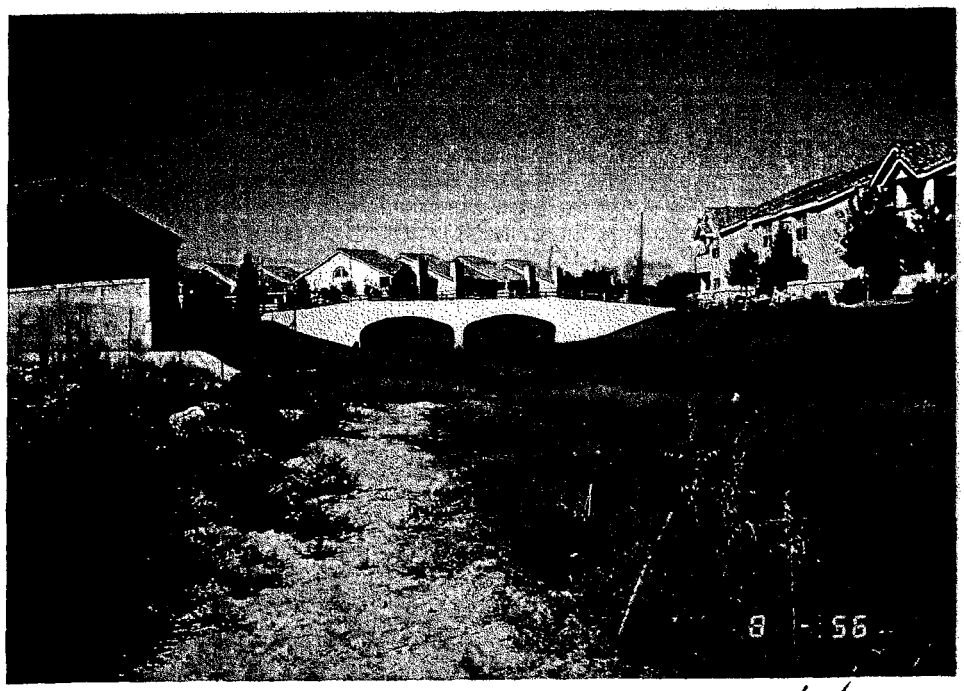
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: @ CONF AIRPORT WASH & TRIB
2. Mark section on map or photograph. _____
3. Estimate bottom width : 50'
4. Photograph main channel B:56
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: _____
11. Obstructions which could cause backwater? _____
12. NCH .022 NLOB 0.022 NROB 0.022
13. Comments: GRASS LINED CHANNEL U/S OF CONF.

EXPANSION / CONTRACTION @ CONF. 0.2 & 0.4



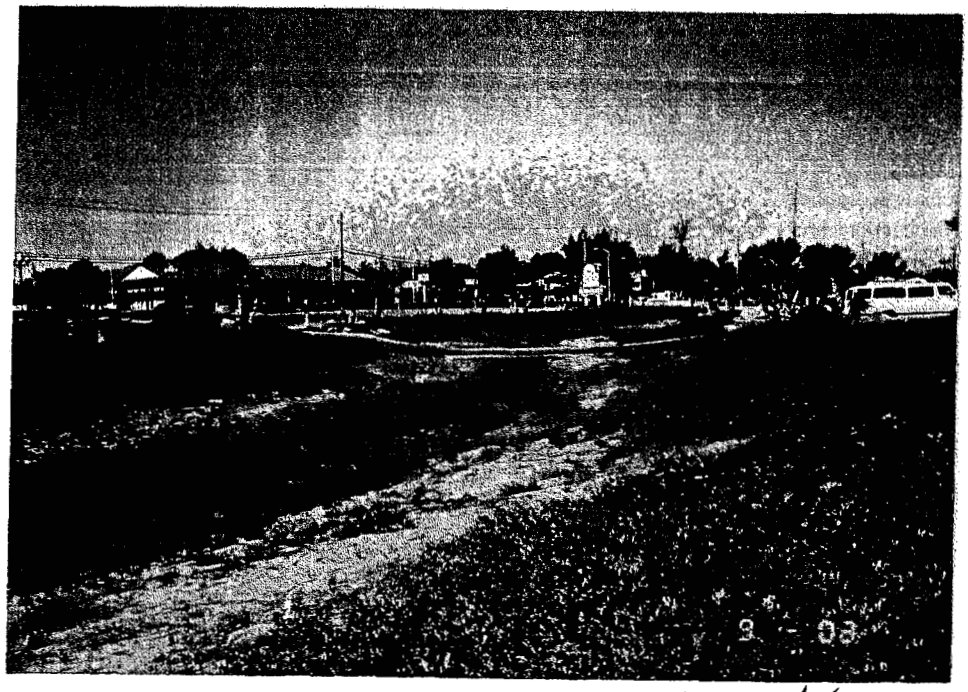
By: SBW Date: 6/4/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: 11 THROUGH HARBOR ISLAND
2. Mark section on map or photograph. _____
3. Estimate bottom width : 40
4. Photograph main channel 9:03
5. Photograph overbank _____
6. Note highwater marks:
   Type: NA
   Elevation: NA
7. Signs of Overbank Flooding/Sheet Flooding? NA
8. Signs of Erosion? NA
9. Signs of Deposition? NA
10. Bank height: 12'
11. Obstructions which could cause backwater? NA
12. NCH .025 NLOB .025 NROB .025
13. Comments: SMOOTH / MAINTAINED / UNIFORM CHANNEL



By: MTD Date: 6/4/92

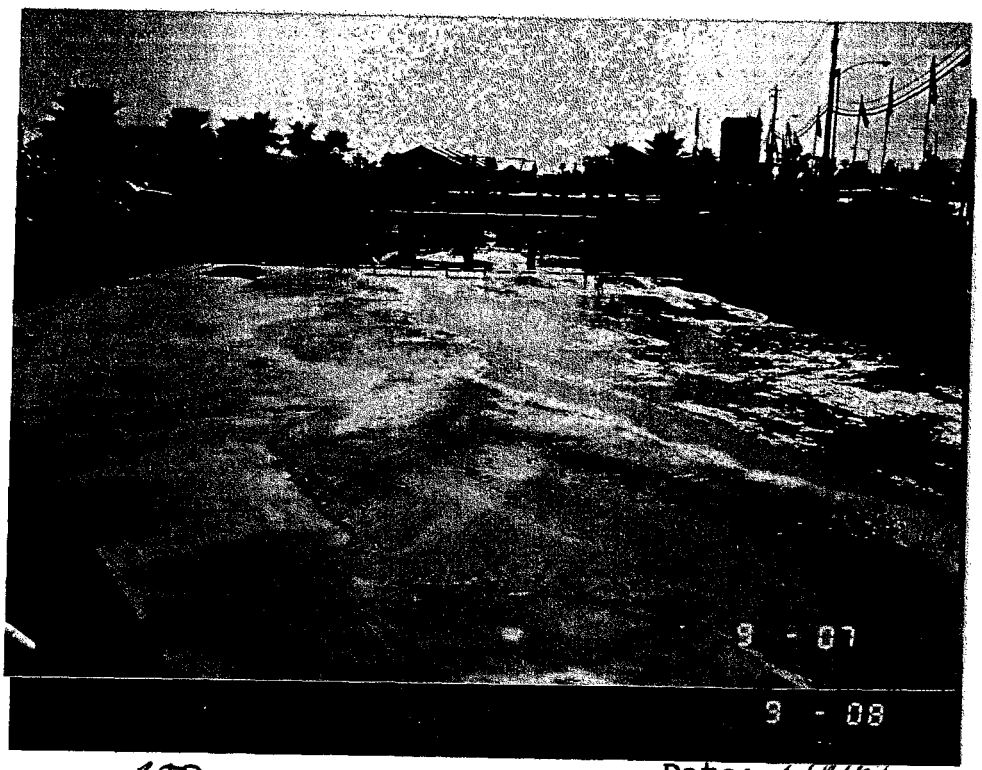
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: (12) DS of Harmon BR
2. Mark section on map or photograph. _____
3. Estimate bottom width : 50'
4. Photograph main channel 9:07 & 9:08
5. Photograph overbank _____
6. Note highwater marks:
   Type: NA
   Elevation: NA
7. Signs of Overbank Flooding/Sheet Flooding? SEE BELOW
8. Signs of Erosion? NA
9. Signs of Deposition? NA
10. Bank height: 10'
11. Obstructions which could cause backwater? NA
12. NCH .016 NLOB .025 NROB .025
13. Comments: Rectangular concrete channel

History of flow going over RD @ Harmon. US channel or Br way under capacity



By: RTD Date: 6/14/96

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: (13) US OF HARMON
2. Mark section on map or photograph. _____
3. Estimate bottom width : 40'
4. Photograph main channel 9:14
5. Photograph overbank _____
6. Note highwater marks:
   Type: NA
   Elevation: NA
7. Signs of Overbank Flooding/Sheet Flooding? FLOW OVER HARMON
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: 5'
11. Obstructions which could cause backwater? HARMON BR
12. NCH .025 NLOB .025 NROB .025
13. Comments: CHANNEL CAPACITY LESS THAN 100 CFS



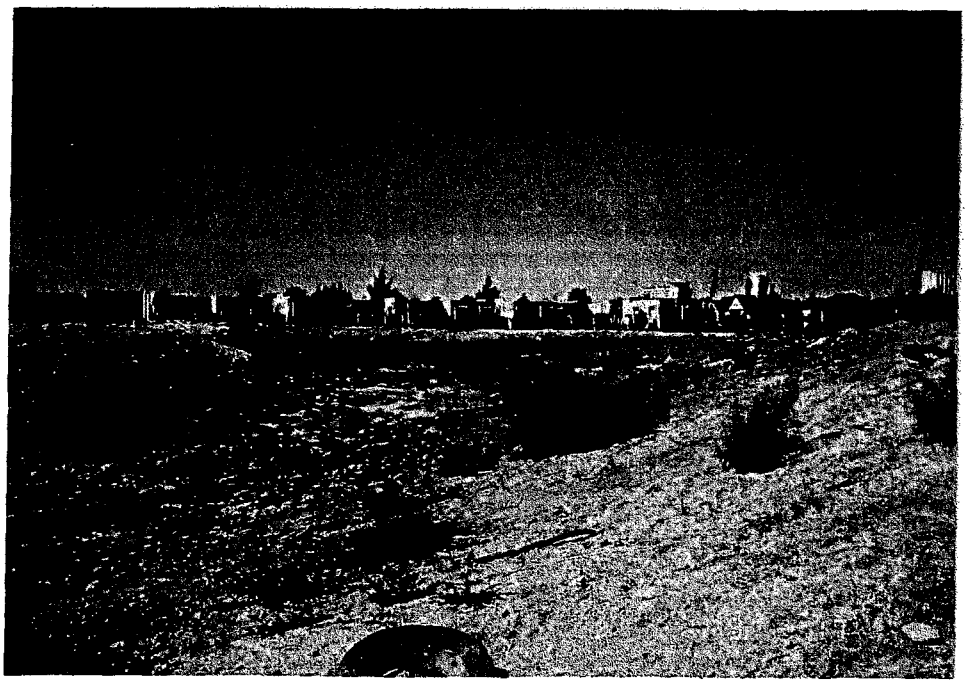
By: RTD Date: 6/11/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: (14) US OF HARMON
2. Mark section on map or photograph. _____
3. Estimate bottom width : _____
4. Photograph main channel _____ 9:17
5. Photograph overbank _____
6. Note highwater marks:
   Type: NA
   Elevation: NA
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? NA
9. Signs of Deposition? NA
10. Bank height: 12'
11. Obstructions which could cause backwater? _____
12. NCH 0.035 NLOB .03 NROB .03
13. Comments: Recently cleared. SHARP BEND AT HARMON WITH CHANNEL THAT HAS CAPACITY FOR LESS THAN 100 CFS



By: RD Date: 6/4/02

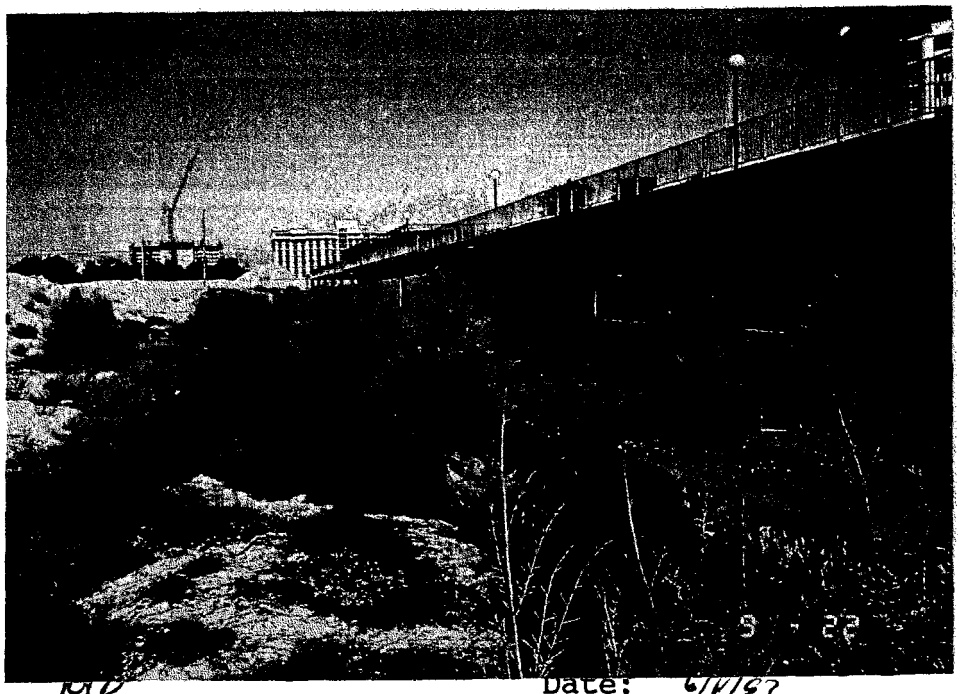
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: (15) NEXT TO APARTMENT PARKING GARAGE
2. Mark section on map or photograph. _____
3. Estimate bottom width : 50'
4. Photograph main channel 9:22
5. Photograph overbank _____
6. Note highwater marks:
   Type: NA
   Elevation: NA
7. Signs of Overbank Flooding/Sheet Flooding? NA
8. Signs of Erosion? ✓
9. Signs of Deposition? —
10. Bank height: 12'
11. Obstructions which could cause backwater? _____
12. NCH 0.040 NLOB .03 NROB .03
13. Comments: _____

PARKING GARAGE - IN EFFECTIVE FLOW AREA



By: _____ Date: 6/11/02

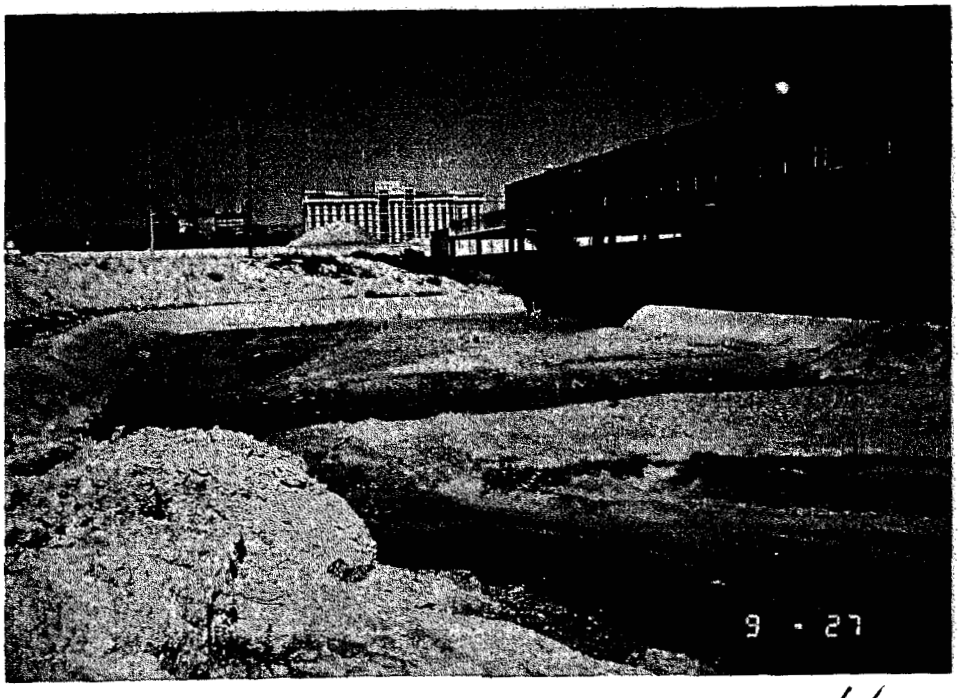
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: (6) D.S. OF KOVAL - CULVERT outlet
2. Mark section on map or photograph. _____
3. Estimate bottom width : 40' to 80' (80' at outlet)
4. Photograph main channel 9:27
5. Photograph overbank _____
6. Note highwater marks:
   Type: NA
   Elevation: NA
7. Signs of Overbank Flooding/Sheet Flooding? NA
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: 10'
11. Obstructions which could cause backwater? —
12. NCH .03 NLOB .03 NROB .03
13. Comments: APARTMENT PARKING LOT ON ROB - VERT FACE.

CONTRACTION/EXPANSION .3 .5



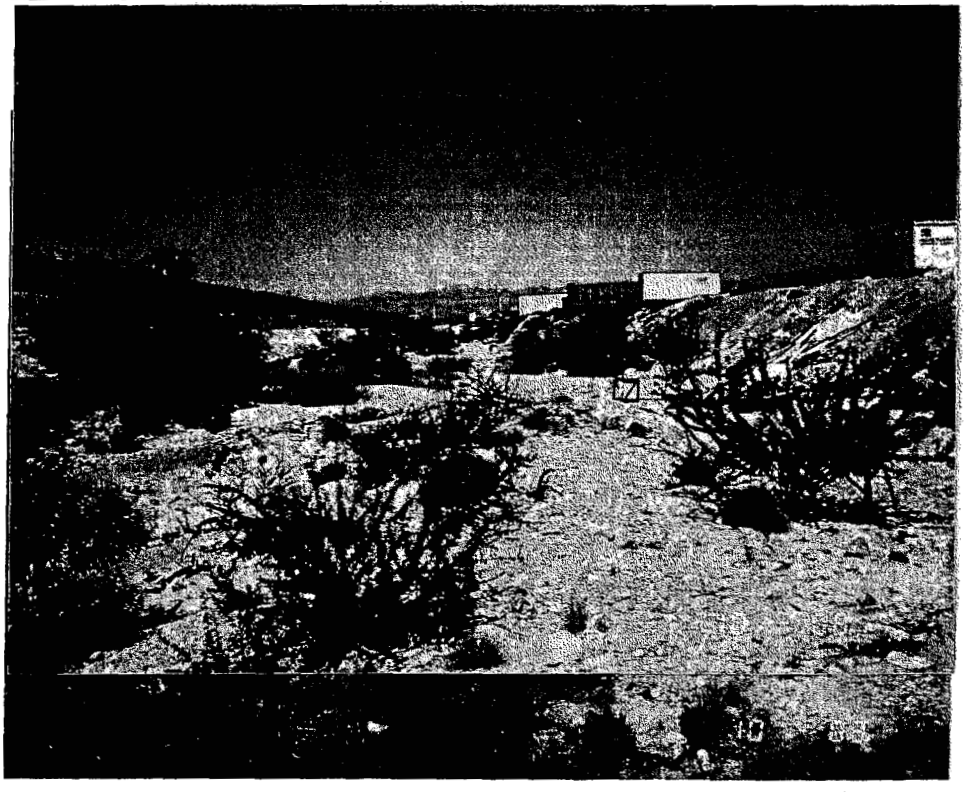
By: KTD Date: 6/4/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: 17 JUST US OF INDUSTRIAL X-ING
2. Mark section on map or photograph. _____
3. Estimate bottom width : 20
4. Photograph main channel 10803 & 10:16
5. Photograph overbank _____
6. Note highwater marks:
   Type: HWM
   Elevation: NA
7. Signs of Overbank Flooding/Sheet Flooding? SHEET FLOW OVER INDUSTRIAL
8. Signs of Erosion? BANK SLOUGHING
9. Signs of Deposition? SOME DEPOSITION
10. Bank height: 6'
11. Obstructions which could cause backwater? _____
12. NCH 0.040 NLOB 0.025 NROB 0.025
13. Comments: LOTS OF DEBRIS AND DUMPING



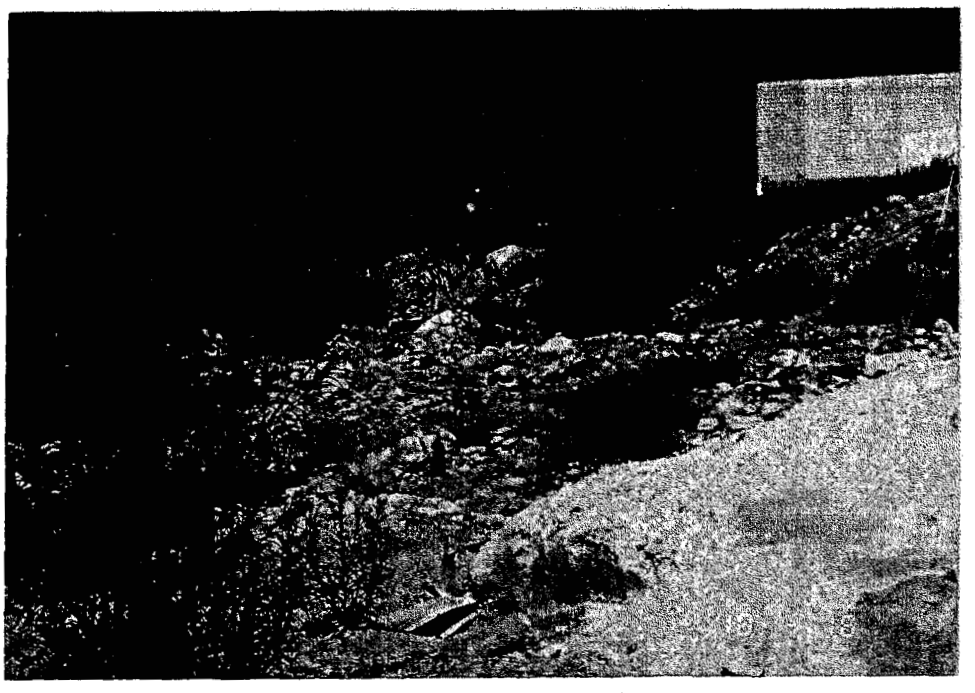
By: RTD Date: 6/11/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: 1B 600' US OF INDUSTRIAL
2. Mark section on map or photograph. _____
3. Estimate bottom width : 60'
4. Photograph main channel 10:06 3
5. Photograph overbank _____
6. Note highwater marks:
   Type: —
   Elevation: —
7. Signs of Overbank Flooding/Sheet Flooding? —
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: 12'
11. Obstructions which could cause backwater? _____
12. NCH 0.045 NLOB 0.025 NROB 0.025
13. Comments: Irregular and rough channel- narrows and steepens DS - Deposition JUST U.S. OF NARROW SECTION



By: RTD Date: 6/14/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: 19 1000' us of Jones
2. Mark section on map or photograph. ____
3. Estimate bottom width : 20
4. Photograph main channel 10:19
5. Photograph overbank 10:19
6. Note highwater marks: /
   Type: ____
   Elevation: /
7. Signs of Overbank Flooding/Sheet Flooding? /
8. Signs of Erosion? erosion at toe of side slopes
9. Signs of Deposition? None
10. Bank height: 10-12'
11. Obstructions which could cause backwater? ____
12. NCH 0.03 NLOB .02 NROB 0.05
13. Comments: Fairly clean bottom - Hard cemented material



By: MTD Date: 6/4/25

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

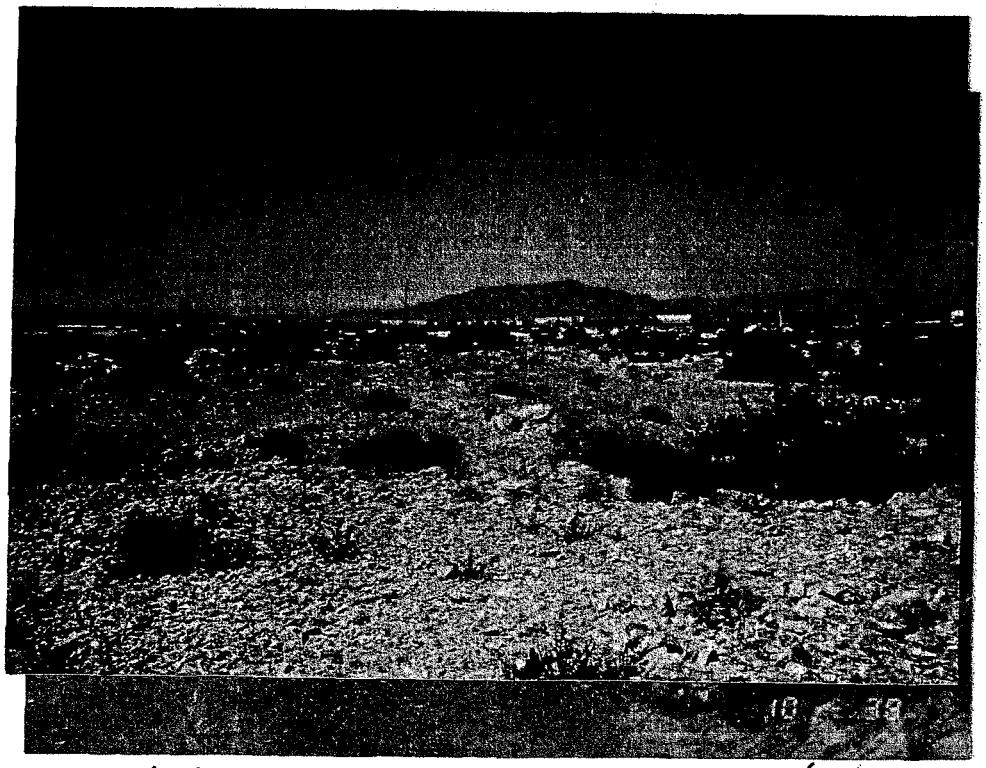
Detailed Methods: Field Notes

Field Data:

1. Section Location: 20 US OF VALLEY VIEW
2. Mark section on map or photograph. _____
3. Estimate bottom width : 25' - 40' varies
4. Photograph main channel 10:38
5. Photograph overbank — 10:41 LOB
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? yes
8. Signs of Erosion? SOME BANK - MINOR
9. Signs of Deposition? SOME - RIPPLES
10. Bank height: 4' ON LOB 10-12' ON ROB
11. Obstructions which could cause backwater? _____
12. NCH 0.04 NLOB .04 NROB .04
13. Comments: _____

ROAD DIP XING AT VALLEY VIEW

ELEVATED 2'



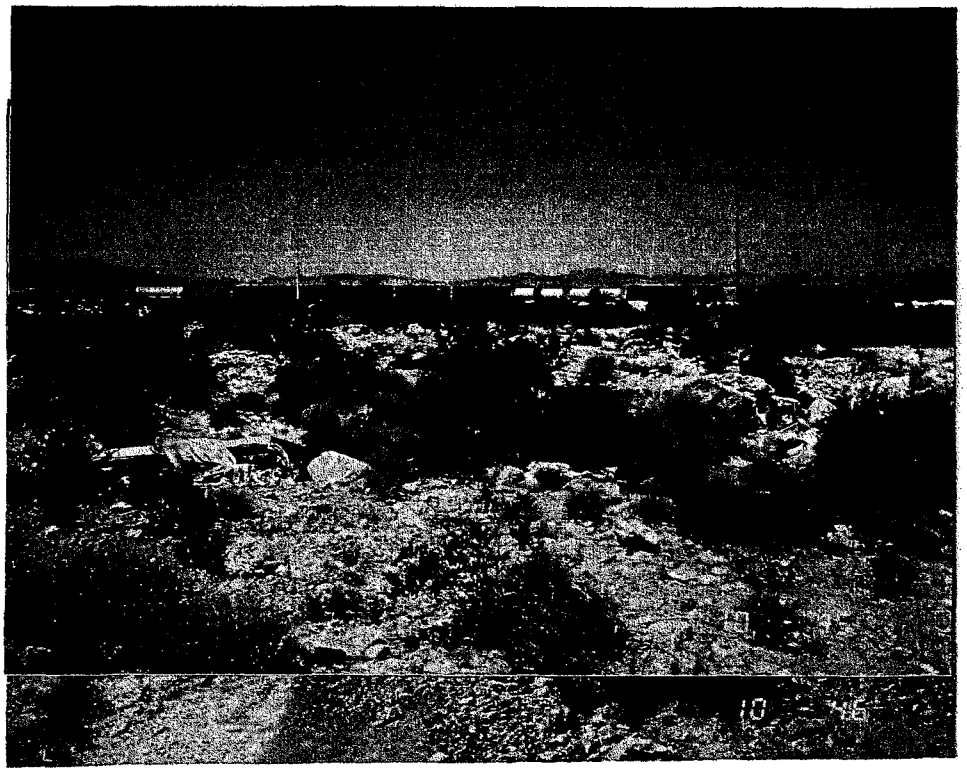
By: KTD Date: 6/6/93

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: Z1 Between Valley View & RR
2. Mark section on map or photograph. _____
3. Estimate bottom width : 20'
4. Photograph main channel 10:44
5. Photograph overbank 10:45
6. Note highwater marks:
   Type: /
   Elevation: /
7. Signs of Overbank Flooding/Sheet Flooding? yes
8. Signs of Erosion? /
9. Signs of Deposition? /
10. Bank height: 8' - 10'
11. Obstructions which could cause backwater? _____
12. NCH 0.05 NLOB 0.045 NROB 0.060
13. Comments: ROB will braid under high flows. ROB rough & irregular



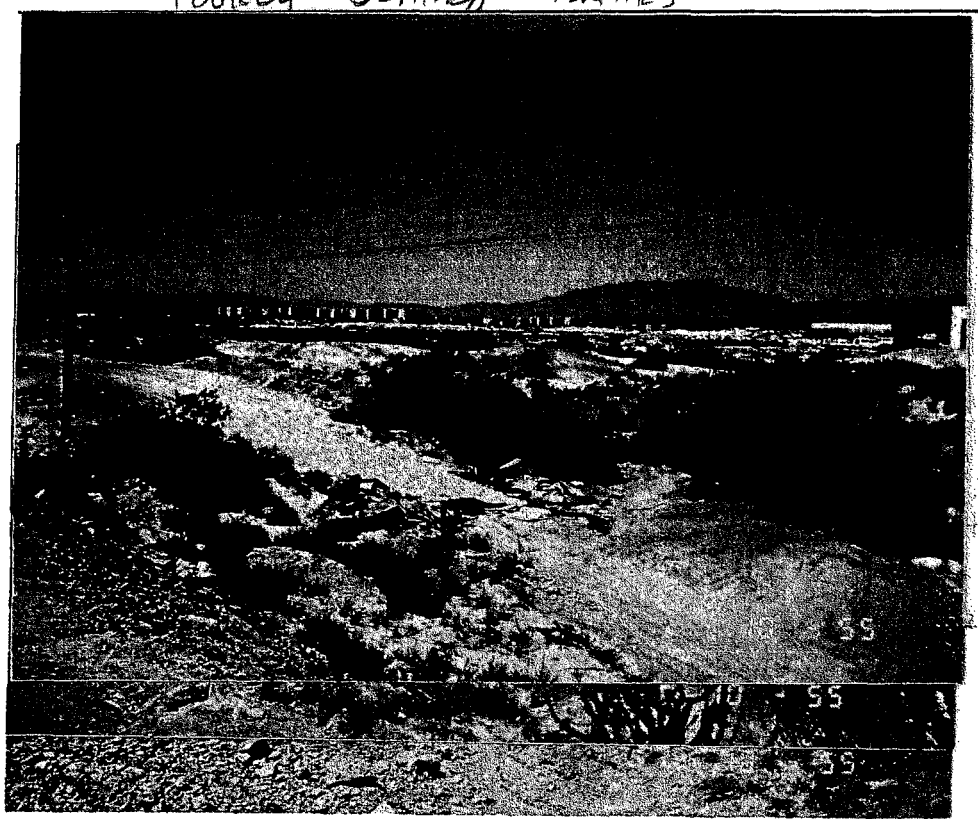
By: _____ Date: _____

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: 22 US OF RR
2. Mark section on map or photograph. _____
3. Estimate bottom width : 15
4. Photograph main channel 10:55
5. Photograph overbank 10:55 10:55
6. Note highwater marks:
   Type: /
   Elevation: /
7. Signs of Overbank Flooding/Sheet Flooding? yes
8. Signs of Erosion? Incised Low Flow Channel
9. Signs of Deposition? /
10. Bank height: 6'
11. Obstructions which could cause backwater? RR culvert
12. NCH 0.045 NLOB 0.045 NROB 0.045
13. Comments: Bottom meanders, Rough
    Poorly Defined Banks



By: RTD Date: 6/4/97

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: N1 Just US OF ARVILLE
2. Mark section on map or photograph. _____
3. Estimate bottom width : _____
4. Photograph main channel 11:32
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: _____
11. Obstructions which could cause backwater? _____
12. NCH_____ NLOB_____ NROB_____
13. Comments: _____



By: RTD Date: 6/11/97

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

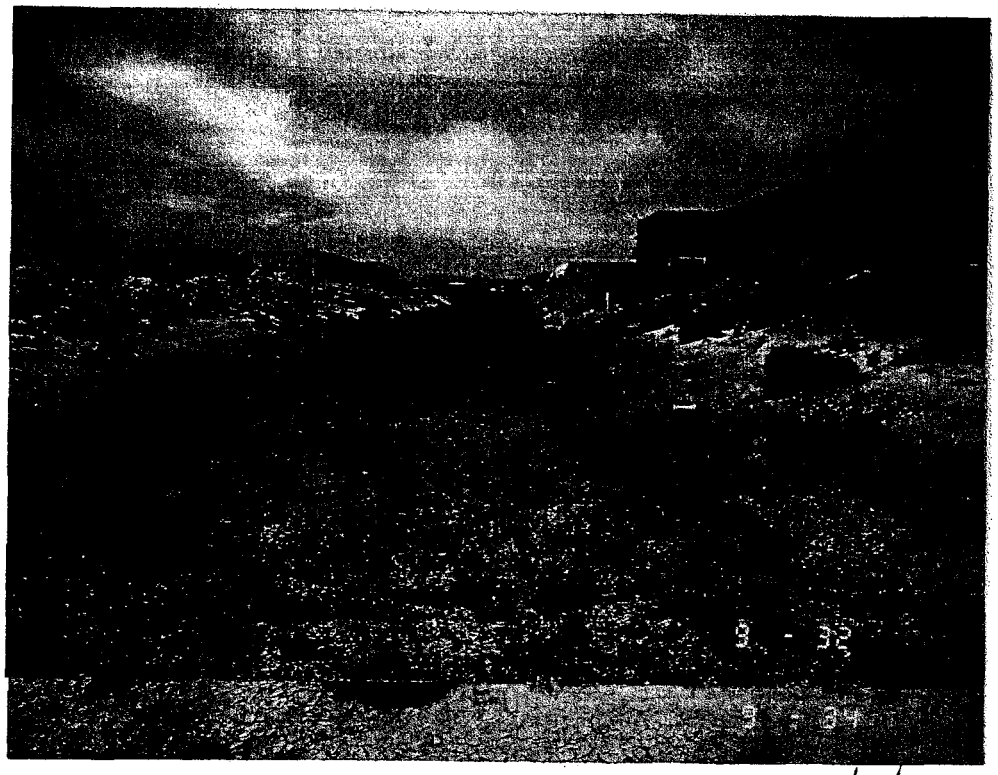
Detailed Methods: Field Notes

Field Data:

1. Section Location: N2
2. Mark section on map or photograph. ✓
3. Estimate bottom width : 30'
4. Photograph main channel 9:32
5. Photograph overbank 9:34
6. Note highwater marks:
   Type: N/A
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height: 4'
11. Obstructions which could cause backwater?
12. NCH 03028 NLOB .055 NROB .040
13. Comments:

Fill & Debris in Overbanks

confluence is poorly defined



By: SDee Date: 6/23/97

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: N3
2. Mark section on map or photograph. —
3. Estimate bottom width : 10 - 20'
4. Photograph main channel 9:39
5. Photograph overbank 9:39
6. Note highwater marks:
   Type: HP
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding? yes flow debris & clay cracking
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height: 2 - 5'
11. Obstructions which could cause backwater? Fill & Debri
12. NCH .05 NLOB .080 NROB .080
13. Comments: channel has been filled randomly w/ dirt & construction debris Flow path undefined



By: SW Date: 6/23

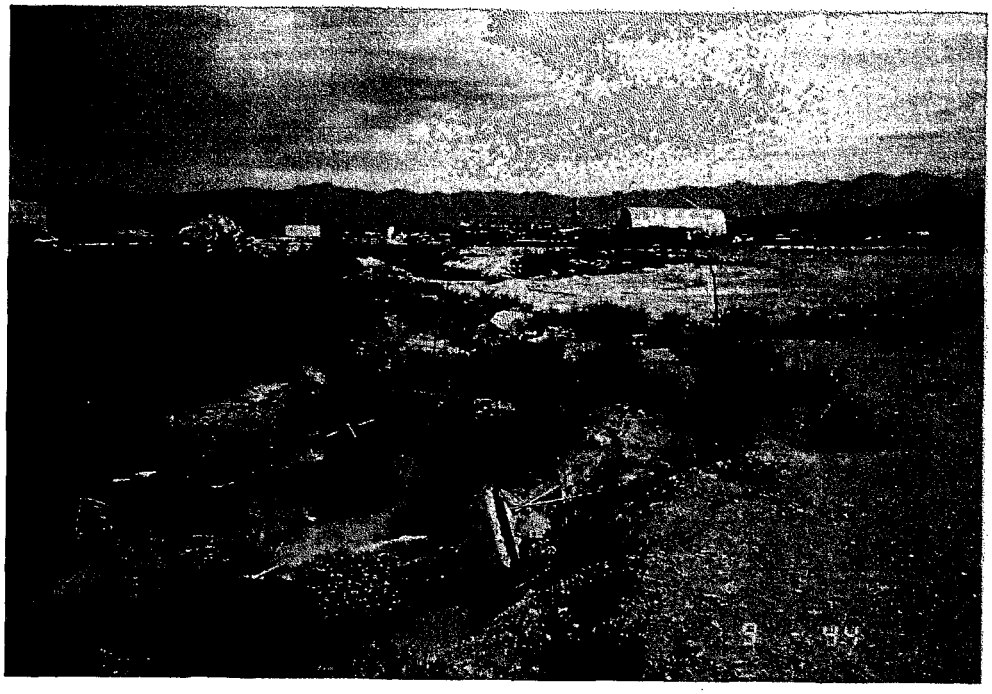
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: N 4
2. Mark section on map or photograph. ~~844~~ 1
3. Estimate bottom width : 5'
4. Photograph main channel 9:44
5. Photograph overbank "
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding? yes
8. Signs of Erosion? yes
9. Signs of Deposition? yes
10. Bank height: 3'
11. Obstructions which could cause backwater? yes debr. & fill
12. NCH .048 NLOB .08 NROB .032 (graded & cleared
13. Comments:

moderate vegetation - debri & dumped fill in ch & LOS



By: STW Date: 6/23/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: N 5
2. Mark section on map or photograph. —
3. Estimate bottom width : ~~25~~ 15
4. Photograph main channel 9: 48
5. Photograph overbank "
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion? yes
9. Signs of Deposition? yes
10. Bank height: 4'
11. Obstructions which could cause backwater? no
12. NCH 028 NLOB 03 NROB 03
13. Comments: constructed chan d.s. from 3 cell CBC chan shows deposition ~ 200' ds from CBC then downcutting as constructed chan ends



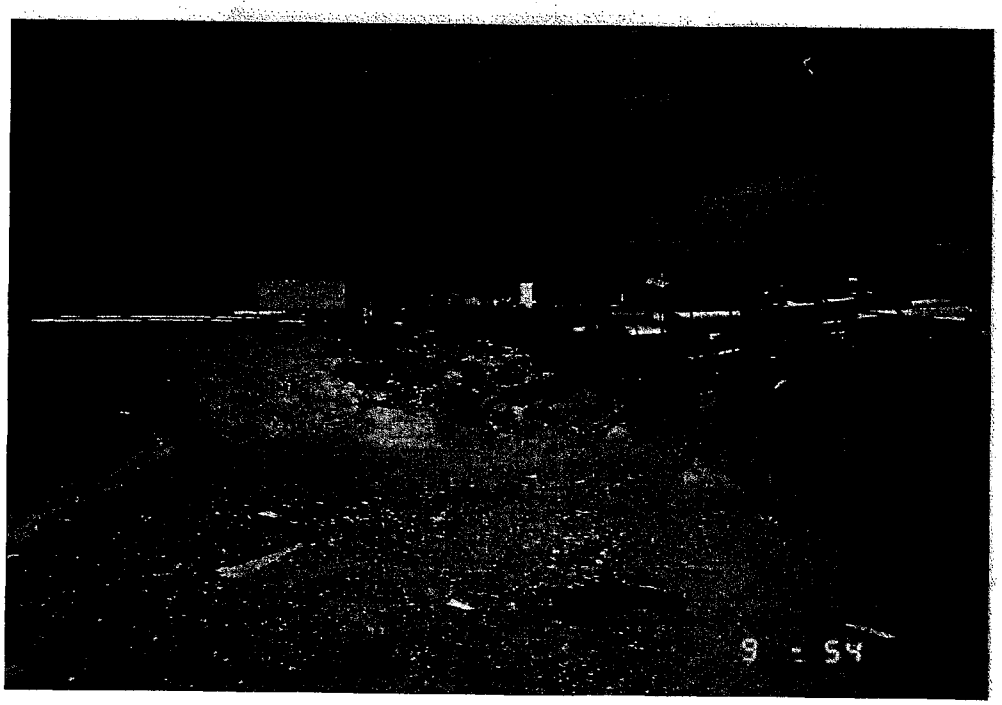
By: SHW Date: 6/22/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: NL
2. Mark section on map or photograph. ✓
3. Estimate bottom width : 25
4. Photograph main channel 9:55
5. Photograph overbank
6. Note highwater marks:
   Type: scour line
   Elevation: 3' above invert
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion? ✓
9. Signs of Deposition? upstrm of culvert entrance
10. Bank height: 5'
11. Obstructions which could cause backwater?
12. NCH 03 NLOB 022 NROB .1
13. Comments: graded ch upstrm of ~~dot~~ CBC ≈ 80' then unimproved scoured channel LOB graded ROB fenced storage for ~~Engr~~ Sign co



By: SKW Date: 6/23/92

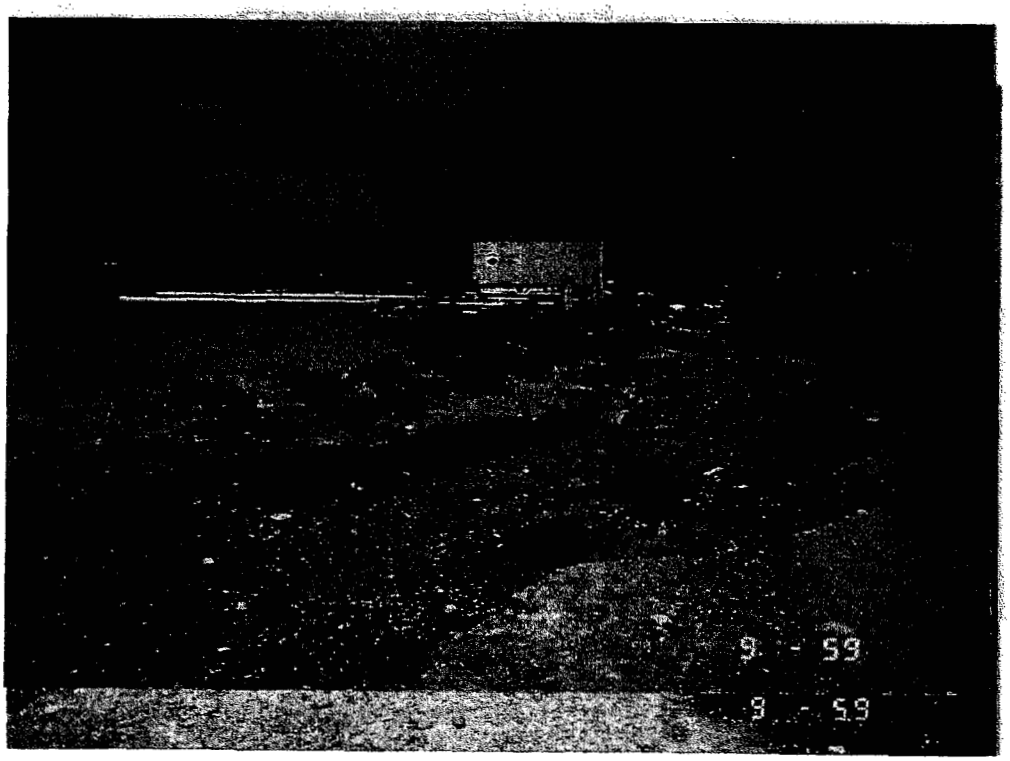
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: H7
2. Mark section on map or photograph. —
3. Estimate bottom width : 10'
4. Photograph main channel 9:59
5. Photograph overbank 9:59
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion? channel is downcut 2-3'
9. Signs of Deposition?
10. Bank height:
11. Obstructions which could cause backwater? fence about 100 yd ds of transition (photo 10:12)
12. NCH .035 NLOB .022 NROB .1
13. Comments:

chain link fence - at 2 SXNS partially damaged by flow & debris



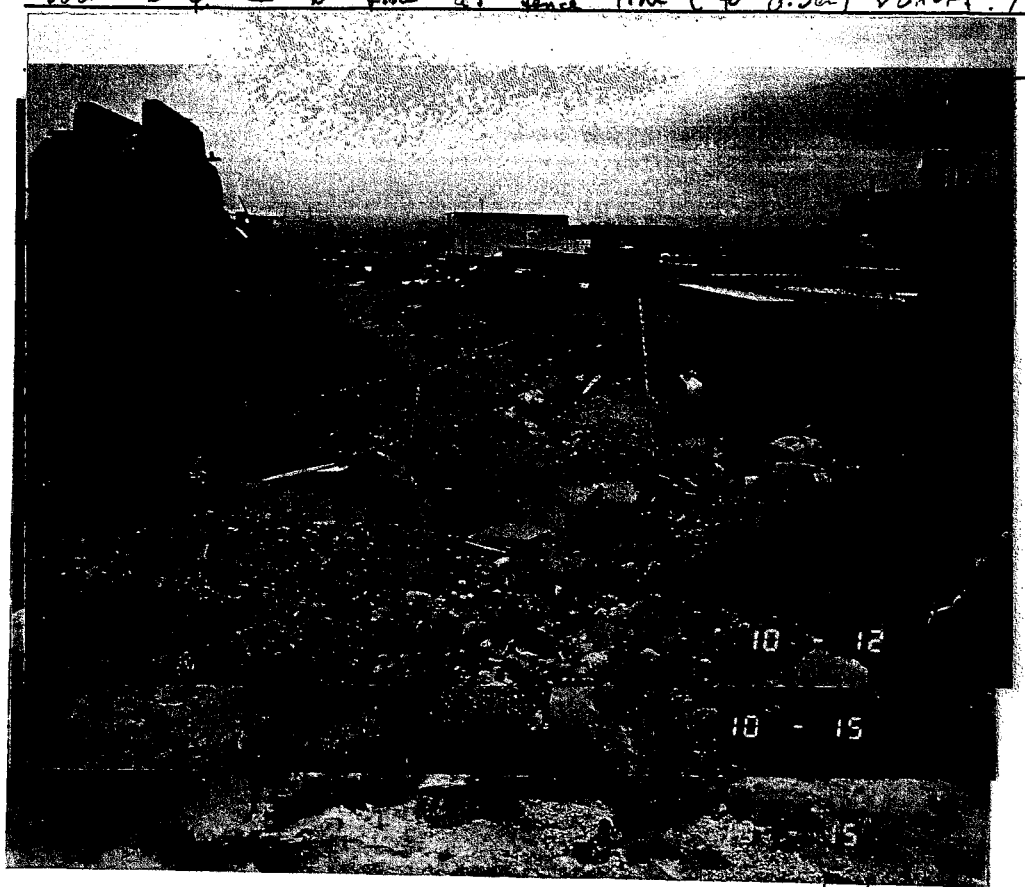
By: SBW Date: 6/21/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: NP
2. Mark section on map or photograph. ✓
3. Estimate bottom width : NA
4. Photograph main channel 10:15
5. Photograph overbank 10:5 - fill placed on LOB blocking flow
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding? yes
8. Signs of Erosion? yes
9. Signs of Deposition? yes
10. Bank height: undefined 1-3'
11. Obstructions which could cause backwater? fill blocks flow
12. NCH 05 NLOB 05 NROB 05
13. Comments: channel becomes undefined - fill placed along overbank ⊥ to flow at fence line (to divert runoff?)



By: SPW Date: 6/23/92

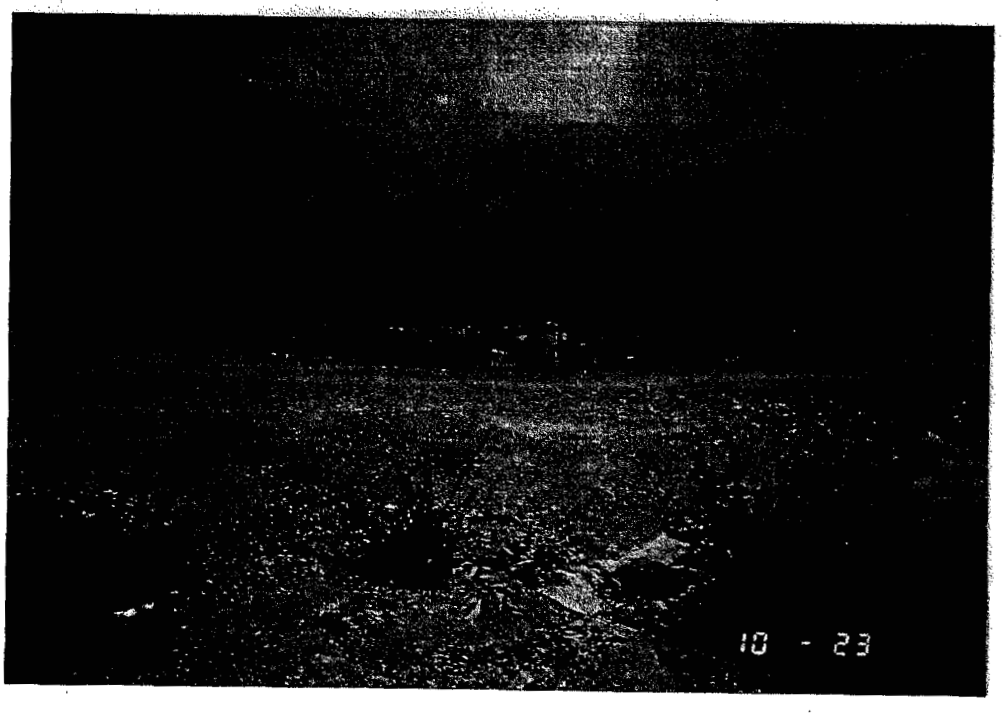
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: N9
2. Mark section on map or photograph. /
3. Estimate bottom width : NA
4. Photograph main channel 10:22
5. Photograph overbank
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height:
11. Obstructions which could cause backwater?
12. NCH_____ NLOB_____ NROB_____
13. Comments:

Dip Crossing - Dirt berm on u.s. side to block flow



By: SW Date: 6/23/98

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: N10
2. Mark section on map or photograph. —
3. Estimate bottom width : 6-8
4. Photograph main channel 13:06 ds 13:27
5. Photograph overbank
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height: 2-3
11. Obstructions which could cause backwater? berm at road x-ing
12. NCH .04 NLOB .045 NROB .045
13. Comments:

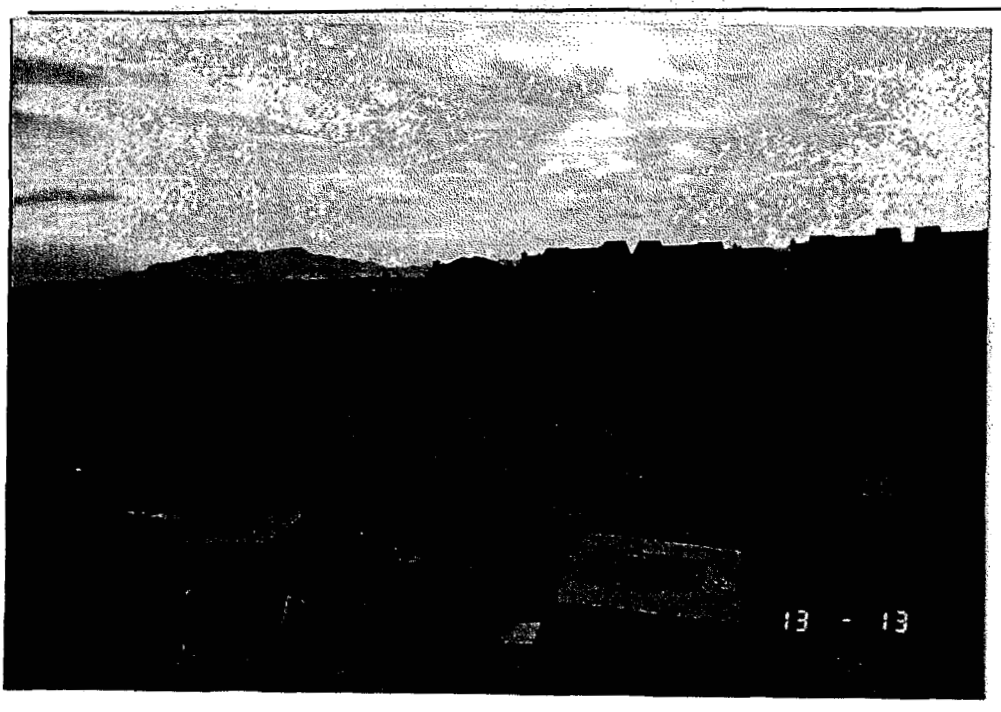
By: SKW Date: 6/23/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: N 11
2. Mark section on map or photograph. —
3. Estimate bottom width : 20'
4. Photograph main channel 13.13
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: 3-6
11. Obstructions which could cause backwater? Dumped trash & debr.
12. NCH 032 NLOB 040/045 NROB 040/045
13. Comments: _____



By: SLW Date: 6/23/92

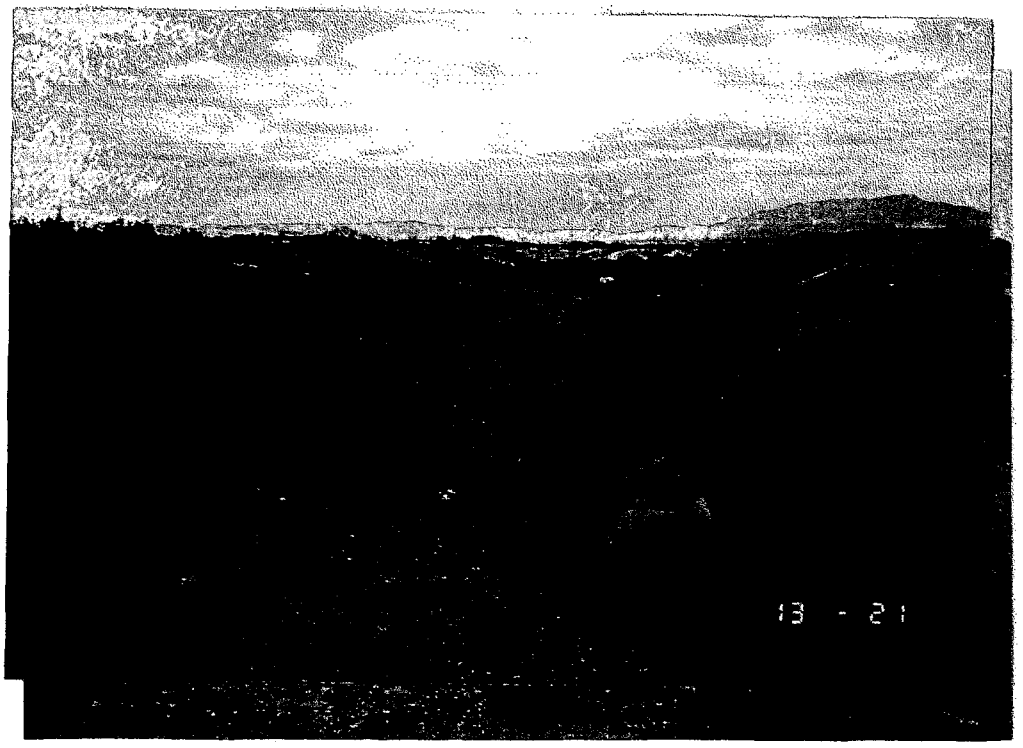
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: N/2
2. Mark section on map or photograph. _____
3. Estimate bottom width : 15 - 20
4. Photograph main channel 13:21 13:27
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: 15 - 20
11. Obstructions which could cause backwater? _____
12. NCH 035 NLOB 045 NROB 045
13. Comments: _____

Gravel low flow ch terrace on ROB - ± 200 m. ch
channel opens into broad alluvial terrace 100 - 300 m w/ low flow ch



By: SLW Date: 6/23/97

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: N13
2. Mark section on map or photograph. ✓
3. Estimate bottom width : 6'
4. Photograph main channel 13:37
5. Photograph overbank
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height: 3-5
11. Obstructions which could cause backwater?
12. NCH .035 NLOB .05 NROB .05
13. Comments: channel width / depth vary also nob varies check on photos average = 0.04-.06



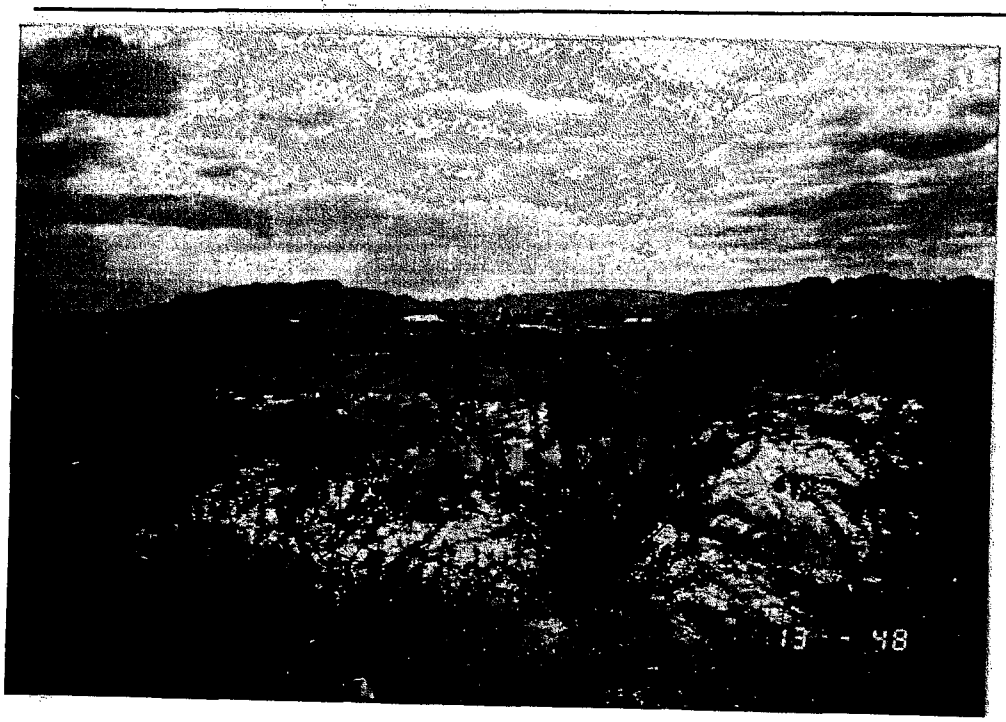
By: SW Date: 6/23/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: N 14
2. Mark section on map or photograph. _____
3. Estimate bottom width : NA
4. Photograph main channel 13:49
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: NA
11. Obstructions which could cause backwater? _____
12. NCH 040 NLOB 05 NROB 05
13. Comments: Banding area - channel undefined



By: _____ Date: _____

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: N 15
2. Mark section on map or photograph. _____
3. Estimate bottom width : 25
4. Photograph main channel 14.00
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: 8-20+
11. Obstructions which could cause backwater? _____
12. NCH 035 NLOB 045 NROB 045
13. Comments: This SXN has been channelized - moved, graded & filled



By: SLW Date: 6/28/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C1
2. Mark section on map or photograph. _____
3. Estimate bottom width : 25'
4. Photograph main channel 12:27 ds
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: _____
11. Obstructions which could cause backwater? foot bridge
12. NCH 028 NLOB 025 NROB 025 Parking 90° barrel
13. Comments: constructed maintained ch



By: SAW Date: 6/23/98

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C.2b
2. Mark section on map or photograph. 12:22
3. Estimate bottom width : 25'
4. Photograph main channel 12:22 (ds)
5. Photograph overbank -
6. Note highwater marks:
   Type: -
   Elevation: -
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height: 4
11. Obstructions which could cause backwater? wall encroachment downstream c.s. and
12. NCH ~~050~~ 045 NLOB 050 NROB 030 (peaking)
13. Comments:



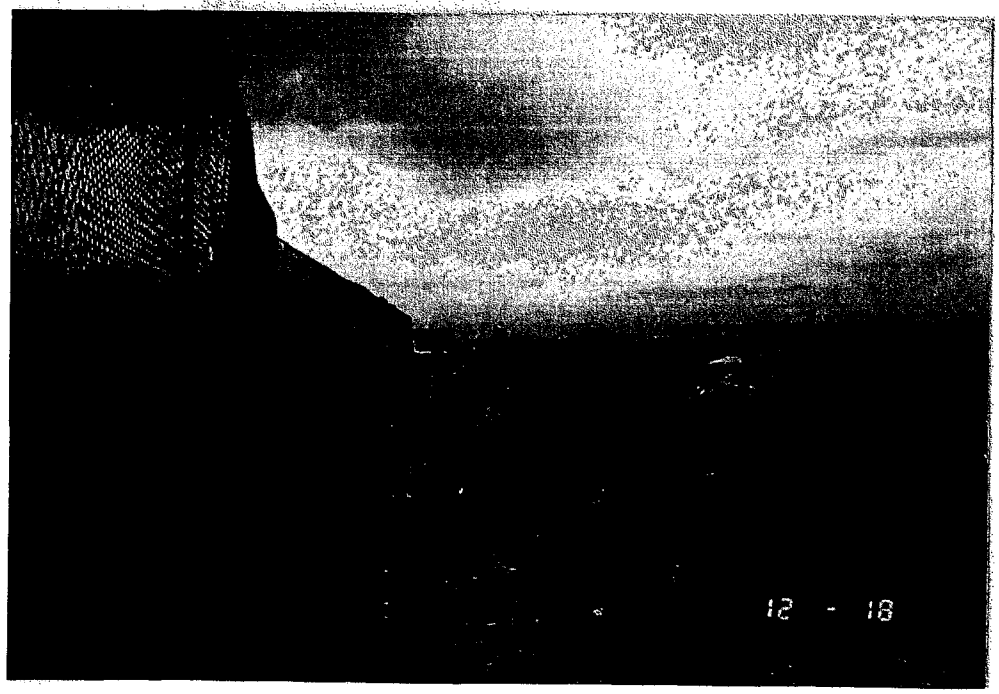
By: [signature] Date: 6/23/97

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C2
2. Mark section on map or photograph. _____
3. Estimate bottom width : 5
4. Photograph main channel 12:19
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: 12
11. Obstructions which could cause backwater? _____
12. NCH .038 NLOB 045 NROB Wall
13. Comments: Wall encroaches into ROB Dumped debri on ROB



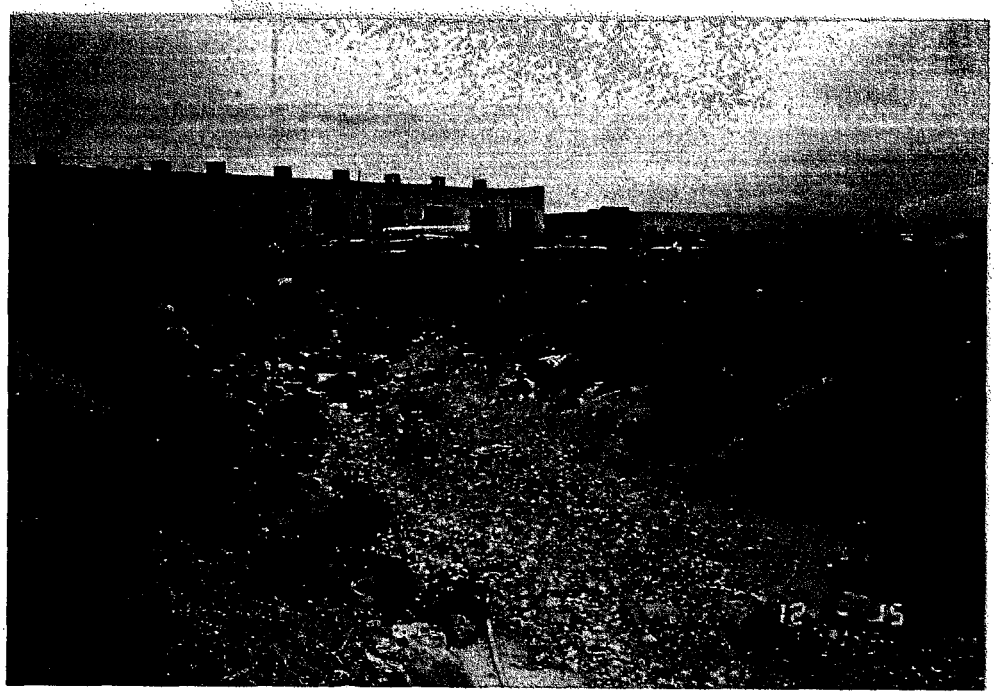
By: SMW Date: 6/23/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C2A
2. Mark section on map or photograph. ~
3. Estimate bottom width : 22'
4. Photograph main channel 12:15 (ds)
5. Photograph overbank
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height: 7
11. Obstructions which could cause backwater?
12. NCH 031 NLOB 042 NROB 042
13. Comments: chan const ds.



By: JW Date: 6/23

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C3
2. Mark section on map or photograph. _____
3. Estimate bottom width : 50-60'
4. Photograph main channel 12:11
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: 4'
11. Obstructions which could cause backwater? _____
12. NCH 020 NLOB ~~0.1~~ 0.1 NROB 0.1
13. Comments: Flow N in Roadway



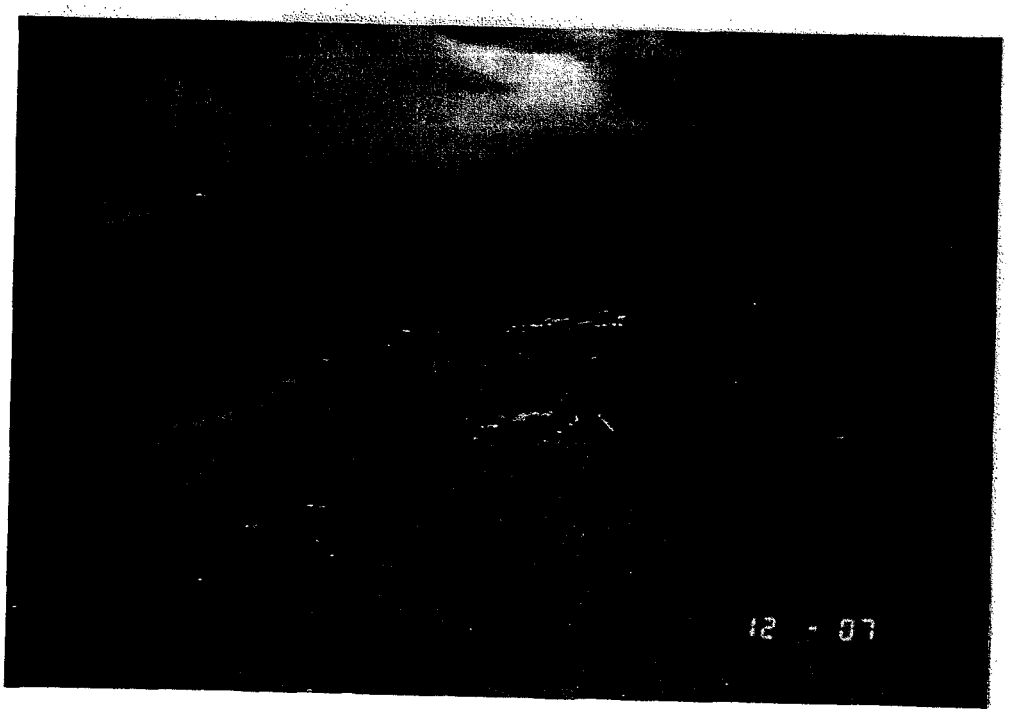
By: SLW Date: 6/23/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C4
2. Mark section on map or photograph. —
3. Estimate bottom width : 30'
4. Photograph main channel 12:07
5. Photograph overbank
6. Note highwater marks:
   Type: debri
   Elevation: 3'
7. Signs of Overbank Flooding/Sheet Flooding? -
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height: 4-6'
11. Obstructions which could cause backwater? Dip section of soil at ds end
12. NCH 040 NLOB Blocked NROB .1 - .2
13. Comments: channel fills to bosal depth & empties into a street section flow splits N & E pofos



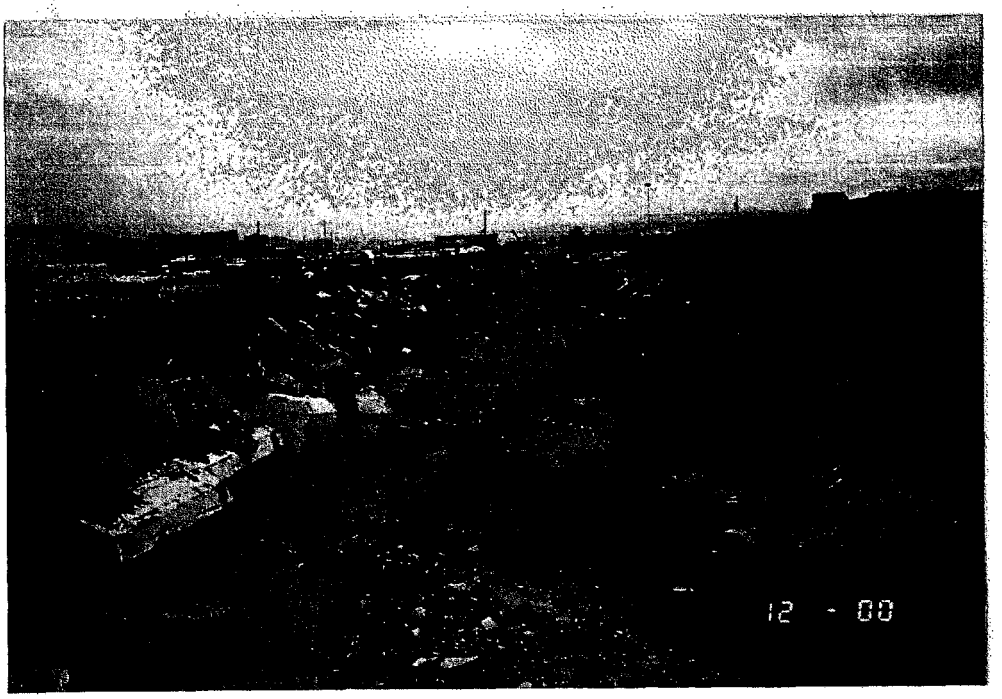
By: _____ Date: _____

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C685
2. Mark section on map or photograph. /
3. Estimate bottom width : 25'
4. Photograph main channel 12:00 (Looking ds)
5. Photograph overbank -
6. Note highwater marks:
   Type: -
   Elevation: -
7. Signs of Overbank Flooding/Sheet Flooding? -
8. Signs of Erosion? Severe bank erosion
9. Signs of Deposition?
10. Bank height: 20-25'
11. Obstructions which could cause backwater?
12. NCH 04 NLOB 0.1 NROB 0.6
13. Comments: well defined ch. Dumped debri @ rip-rap



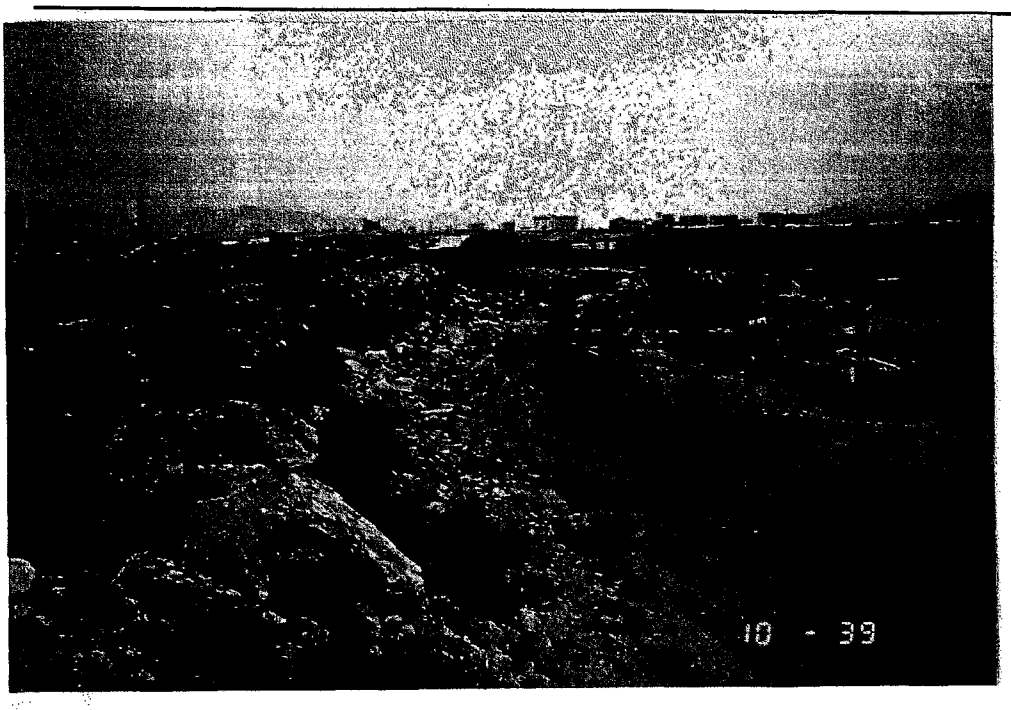
By: SDW Date: 6/23/22

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C7
2. Mark section on map or photograph. —
3. Estimate bottom width : 20'
4. Photograph main channel 10:39 (looking D.S)
5. Photograph overbank
6. Note highwater marks:
   Type: bank scour
   Elevation: 4-5 ~~ft~~ above inv
7. Signs of Overbank Flooding/Sheet Flooding? no
8. Signs of Erosion?
9. Signs of Deposition? at confluence
10. Bank height: 15-20'
11. Obstructions which could cause backwater?
12. NCH .045 NLOB .08 NROB .04
13. Comments: LOB fenced construction yard



By: SHe Date: 6/23

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C8
2. Mark section on map or photograph. ✓
3. Estimate bottom width : 20'
4. Photograph main channel 10:45
5. Photograph overbank
6. Note highwater marks:
   Type: bank scour
   Elevation: 4-5'
7. Signs of Overbank Flooding/Sheet Flooding? NO
8. Signs of Erosion? bank sloughing
9. Signs of Deposition? at confluence
10. Bank height: 10-20'
11. Obstructions which could cause backwater? no
12. NCH 0.03 NLOB 0.05 NROB 0.05
13. Comments:



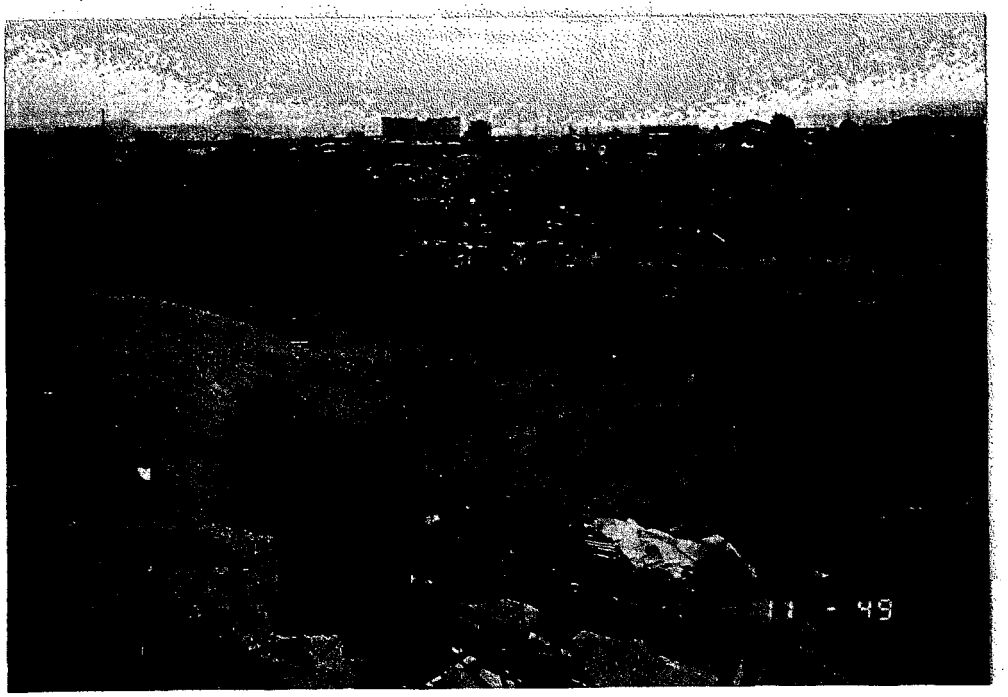
By: SDW Date: 6/23

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C 9
2. Mark section on map or photograph. _____
3. Estimate bottom width : 10' (LP)
4. Photograph main channel 11:49 looking ds
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: 2-3' (LP) 20'+ Terrace
11. Obstructions which could cause backwater? _____
12. NCH 035 LF NLOB 05 NROB 05
13. Comments: incised LF ch ~ broad terrace basin prob. pond. w/ inef. flow. basin littered w/ fill & dumped debris.



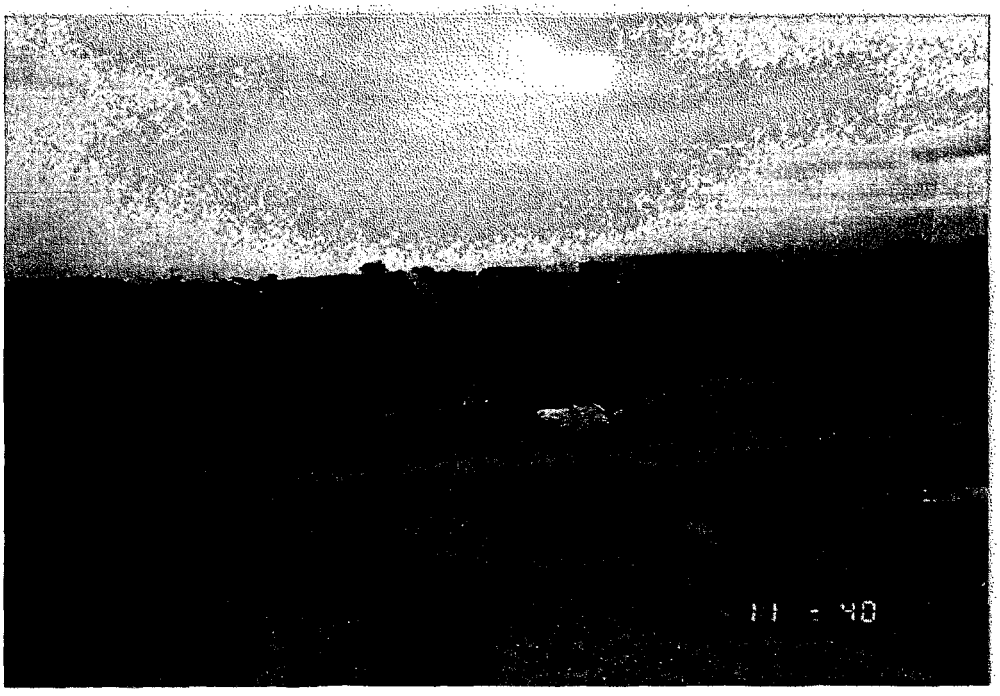
By: SLW Date: 6/28/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C10
2. Mark section on map or photograph. _____
3. Estimate bottom width : 3-6
4. Photograph main channel 11:40 (looking d.s)
5. Photograph overbank _____
6. Note highwater marks:
   Type: _____
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? _____
9. Signs of Deposition? _____
10. Bank height: 2-4 (low flow)
11. Obstructions which could cause backwater? _____
12. NCH 095 NLOB 03-5 NROB 055
13. Comments: Chnl poorly defined. small low flow ch braided terrace w/ des veg, fill, & dumped debri 12:10 (ds)



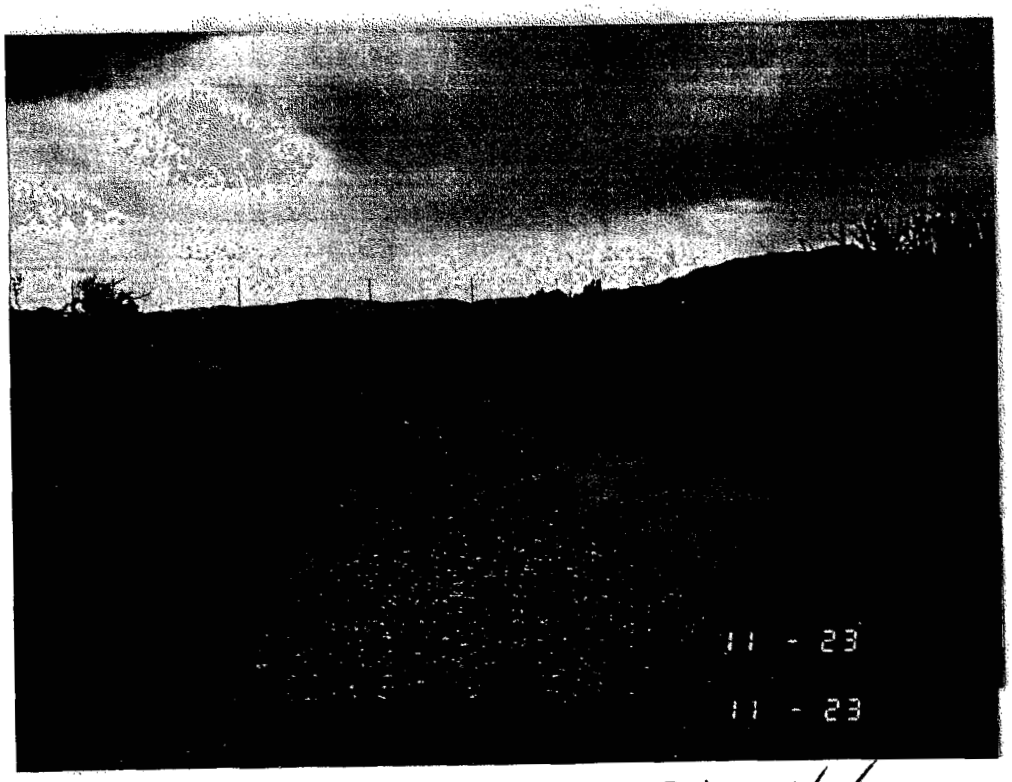
By: SW Date: 6/23

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: CH
2. Mark section on map or photograph. -
3. Estimate bottom width : 4 ft - 15'
4. Photograph main channel 11:23
5. Photograph overbank 11:27
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding? yes
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height: Low flow 2-4' Terrace 6-15
11. Obstructions which could cause backwater?
12. NCH 030 (Low) NLOB 055 NROB 055
13. Comments: Incised low flow w/ Terrace of width from 50' 100'+



By: SR Date: 6/23/99

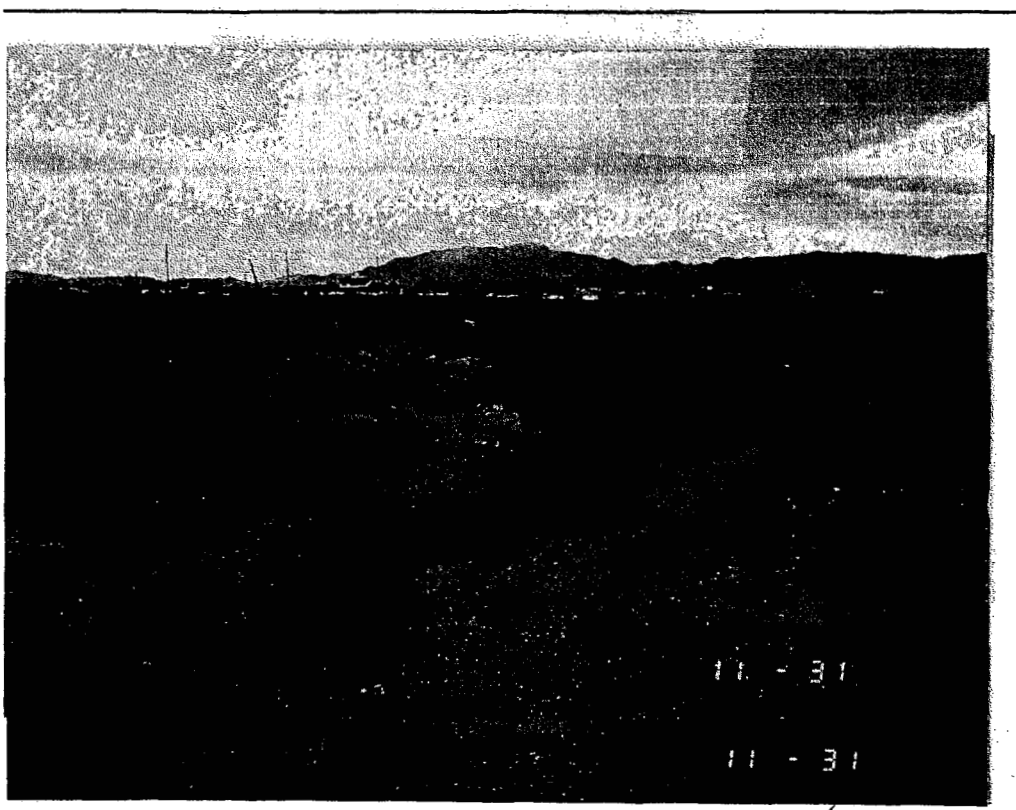
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C/12
2. Mark section on map or photograph. —
3. Estimate bottom width : 5' - 8'
4. Photograph main channel 11:31
5. Photograph overbank 11:31
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height: 3-15' OB Terrace on ROB
11. Obstructions which could cause backwater?
12. NCH 045 NLOB 055 NROB 055
13. Comments:

Mod wall-defined alluvial ch



By: SLew Date: 6/03

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C14
2. Mark section on map or photograph. –
3. Estimate bottom width : 4
4. Photograph main channel 14:07
5. Photograph overbank
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height: 1'±
11. Obstructions which could cause backwater?
12. NCH 040 NLOB 048 NROB 048
13. Comments: Channel bass little defined



By: SLW Date: 6/23/92

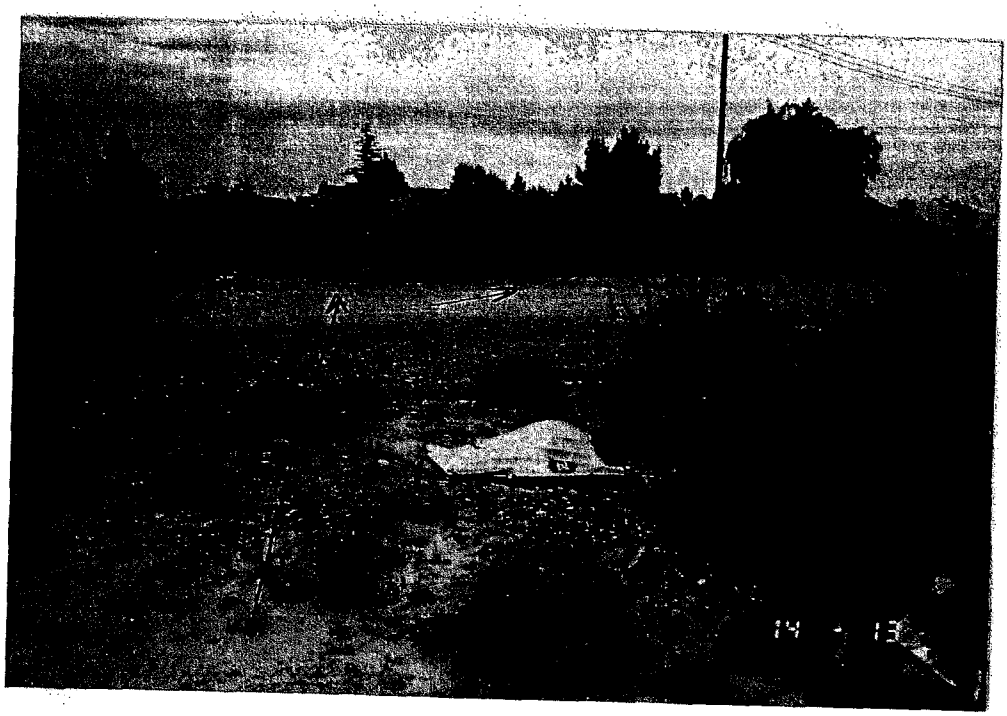
Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: C18
2. Mark section on map or photograph. –
3. Estimate bottom width : 0
4. Photograph main channel 14:13
5. Photograph overbank
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height:
11. Obstructions which could cause backwater?
12. NCH_____ NLOB_____ NROB_____
13. Comments:

House lot blocks wash Looking is at wall SW corner of lot



By: SRW Date: 6/23/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: 51
2. Mark section on map or photograph. —
3. Estimate bottom width : 15-20
4. Photograph main channel 10:47
5. Photograph overbank —
6. Note highwater marks:
   Type: bank scour
   Elevation: 3-5'
7. Signs of Overbank Flooding/Sheet Flooding? —
8. Signs of Erosion? bank sloughing
9. Signs of Deposition?
10. Bank height: 15-20'
11. Obstructions which could cause backwater?
12. NCH 0.03 NLOB 05 NROB 04-05
13. Comments:



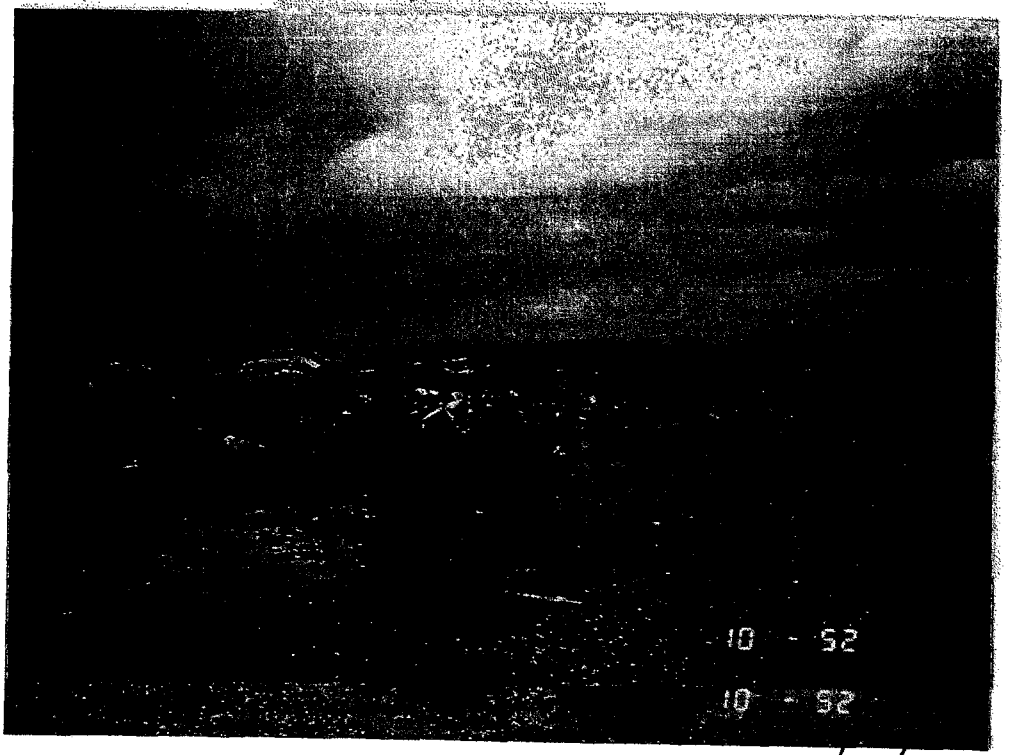
By: SRW Date: 6/23/97

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: S2
2. Mark section on map or photograph. _____
3. Estimate bottom width : 15-20
4. Photograph main channel 10:52 (2 shots)
5. Photograph overbank -
6. Note highwater marks:
   Type: NA
   Elevation: _____
7. Signs of Overbank Flooding/Sheet Flooding? -
8. Signs of Erosion? -
9. Signs of Deposition? -
10. Bank height: 10-15 (2' for low flow channel
11. Obstructions which could cause backwater? EXPANSION
12. NCH 04 NLOB ~~05~~ 05 NROB ~~05~~ 05
13. Comments: channel widens - some inactive flow areas dumped debris in ch - gravel low flow ch w/ brush incised terrace littered w/ fill & debris - Prob shared bfcs LCHS & RCHS with low flow bank.



By: SW Date: 6/23/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: S3
2. Mark section on map or photograph. —
3. Estimate bottom width : 20-30
4. Photograph main channel 11:04
5. Photograph overbank —
6. Note highwater marks:
   Type:
   Elevation:
7. Signs of Overbank Flooding/Sheet Flooding?
8. Signs of Erosion?
9. Signs of Deposition?
10. Bank height: 10-20
11. Obstructions which could cause backwater?
12. NCH 035 NLOB 045 NROB 045
13. Comments: chan becomes more defined gravel bed
    des. veg banks



By: SLW Date: 6/23/92

Tropicana Wash FIS
CCRFCD - Las Vegas, NV

Detailed Methods: Field Notes

Field Data:

1. Section Location: S4
2. Mark section on map or photograph. _____
3. Estimate bottom width : 15-20
4. Photograph main channel 14:20
5. Photograph overbank _____
6. Note highwater marks:
   Type: debri
   Elevation: 2-3'
7. Signs of Overbank Flooding/Sheet Flooding? _____
8. Signs of Erosion? bank scour
9. Signs of Deposition? _____
10. Bank height: 3-6
11. Obstructions which could cause backwater? Some debri downstream
12. NCH .035 NLOB .045 NROB .045
13. Comments: _____



By: S Bell Date: 6/23/98

EXHIBIT 10-5

CCPW DATA BASE RESEARCH

1 RUTH ... CLRKD
=N=

CCPW DATA BASE OR DRAINAGE REPORT IN THE STUDY AREA

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
922	35-21-60	PM 207-81
923	35-21-60	PM 153-82
961	35-21-60	PM 064-84
62	35-21-60	PM 027-89
1963	35-21-60	PM 002-89
1964	35-21-60	SELMAN
1965	35-21-60	PM 112-87
2059	35-21-60	PM 228-89
2106	35-21-60	PM 027-89
3021	35-21-60	PM 088-90
3105	35-21-60	PM 146-89
3155	35-21-60	PM 048-90
3180	35-21-60	CELLULAR ONE CELL SITE
3181	35-21-60	PM 028-91
0	35-21-60	HUNTER
0	35-21-60	PM 141-91
	35-21-60	PM 309-90

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
922	35-21-60	03-033	QUAIL/BRONCO
923	35-21-60	03-034	PATRICK/REDWOOD
1961	35-21-60	13-013	PATRICK/MANN
1962	35-21-60	13-014	PATRICK/REDWOOD
1963	35-21-60	13-015	BRONCO/OQUENDO
1964	35-21-60	13-016	RUSSELL/SORREL
1965	35-21-60	13-017	OQUENDO/SORRELL
2059	35-21-60	14-032	POST/CLYDE
106	35-21-60	15-009	PATRICK/REDWOOD
3021	35-21-60	30-003	SORREL/SOBB
3105	35-21-60	31-044	OQUENDO/BRONCO
3155	35-21-60	33-012	BRONCO/QUAIL
3180	35-21-60	33-037	SOBB/TORREY PINES
3181	35-21-60	33-038	QUAIL/EL CAMIMO
0	35-21-60	35-021	SOBB/TORREY PINES
0	35-21-60	36-004	PATRICK/MANN
	35-21-60	36-009	PATRICK/MANN

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
	35-21-60	PM 309-90
	35-21-60	PM 146-89
	35-21-60	AYERS
	35-21-60	PM 048-90 ADDITION
	35-21-60	BLATT

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
	35-21-60	36-009	PATRICK/MANN
	35-21-60	36-038	OQUENDO/BRONCO
	35-21-60	D-2	QUAIL/EL CAMINO
	35-21-60	D-1	QUAIL/BRONCO
	35-21-60	D-4	POST/REDWOOD

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
924	36-21-60	PM 041-85
925	36-21-60	PM 154-83 ZAMPELL
926	36-21-60	WILLIG FREIGHT LINES
927	36-21-60	PM 256-80
1966	36-21-60	PM 243-87
1967	36-21-60	PM 220-88
1968	36-21-60	PM 125-89, PM 126-89
2097	36-21-60	PM 243-89
2105	36-21-60	PACIFIC PECOS OFFICE
3006	36-21-60	REGENCY ESTATES
3016	36-21-60	PM 198-90
3027	36-21-60	420-520-007
3069	36-21-60	PM 325-90
3078	36-21-60	PM 325-90
	36-21-60	PM 104-91
	36-21-60	PM 315-90
	36-21-60	PM 224-91

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
924	36-21-60	03-035	PONDEROSA/RED ROCK
925	36-21-60	03-036	QUAIL/RED ROCK
926	36-21-60	03-037	QUAIL/VALLEY VIEW
927	36-21-60	03-038	PATRICK/LINDELL
1966	36-21-60	13-018	POST/WESTWIND
1967	36-21-60	13-019	POST/DUNEVILLE
1968	36-21-60	13-020	POST/LINDELL
2097	36-21-60	14-070	PATRICK/WESTWIND
2105	36-21-60	15-008	PEPPER/PECOS
3006	36-21-60	29-025	POST/DUNEVILLE
3016	36-21-60	29-035	QUAIL/WESTWIND
3027	36-21-60	30-009	RUSSELL/MOHAWK
3069	36-21-60	31-008	PATRICK/LINDELL
3078	36-21-60	31-017	PATRICK/LINDELL
	36-21-60	38-003	PATRICK/DUNEVILLE
	36-21-60	D-7	REDROCK/QUAIL
	36-21-60	D-10	QUAIL/REDROCK

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
	36-21-60	PM 224-91
	36-21-60	PM 168-89

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
	36-21-60	D-10	QUAIL/REDROCK
	36-21-60	D-3	TECO/WESTWIND

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
909	26-21-60	HACIENDA ESTATES
910	26-21-60	CASA MESA VILLAS
911	26-21-60	FOOTHILL VILLAGE #4
912	26-21-60	GESSLER ESTATES
1936	26-21-60	CORAL POINT
1937	26-21-60	RUSSELL BRONCO
1938	26-21-60	TROPICANA/TORREY APARTMENTS
1939	26-21-60	LDS 61ST WARD
1940	26-21-60	PM 043-88
1941	26-21-60	PM 051-89
1942	26-21-60	ST. JOHNS CHURCH
1943	26-21-60	THE TRAILS
1944	26-21-60	SPRING VALLEY #1
1946	26-21-60	VAC 068-87
1947	26-21-60	CREATIVE KIDS CHILD CARE PM 062-88
1948	26-21-60	LEWIS HOMES DEL ROSA
1949	26-21-60	SPRING VALLEY #2

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
909	26-21-60	03-020	DIABLO/MANN
910	26-21-60	03-021	TROPICANA/TORREY PIN
911	26-21-60	03-022	HACIENDA/TORREY PINE
912	26-21-60	03-023	HACIENDA/MANN
1936	26-21-60	12-052	HACIENDA/MANN
1937	26-21-60	12-053	RUSSELL/BRONCO
1938	26-21-60	12-054	TROPICANA/TORREY
1939	26-21-60	12-055	HACIENDA/EL CAMINO
1940	26-21-60	12-056	DIABLO/EL CAMINO
1941	26-21-60	12-057	RUSSELL/DEWEY
1942	26-21-60	12-058	HACIENDA/EL CAMINO
1943	26-21-60	12-059	TROPICANA/RAINBOW
1944	26-21-60	12-060	FLAMINGO/RAINBOW
1946	26-21-60	12-062	RAWHIDE/EL CAMINO
1947	26-21-60	12-063	RENO/TORREY PINES
1948	26-21-60	12-064	HACIENDA/EL CAMINO
1949	26-21-60	13-001	HACIENDA/TORREY PINE

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
1949	26-21-60	SPRING VALLEY #2
1950	26-21-60	SPRING VALLEY COMMUNITY HOSPITAL
1945	26-21-60	MARION B. EARL
577	26-21-60	DIABLO ESTATES # 2
2595	26-21-60	DIABLO ESTATES 1
0	26-21-60	GRANT SAYWER HIGH SCHOOL
2957	26-21-60	GRANT SAWYWER JR. HIGH SCHOOL
2983	26-21-60	SPRING OAK 5
2987	26-21-60	DAUGHARTHY
2988	26-21-60	MOUNT DIABLO ESTATES #1
3022	26-21-60	SPANISH TRAILS CONDOS
3215	26-21-60	ST. JOHNS GREEK ORTHODOX
	26-21-60	JOHNAS ESTATES
	26-21-60	CASTLE VISTA ESTATES
0	26-21-60	DIABLO ESTATES
	26-21-60	MOUNT DIABLO ESTATES AMENDMENTS

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
1949	26-21-60	13-001	HACIENDA/TORREY PINE
1950	26-21-60	13-002	HACIENDA/RAINBOW
1945	26-21-60	12-061	TROPICANA/TORREY PIN
2577	26-21-60	22-007	DIABLO/TORREY PINES
2595	26-21-60	22-025	DIABLO/TORREY PINES
0	26-21-60	D-2	MESA VISTA/SORREL
2957	26-21-60	28-019	DIABLO/REDWOOD
2983	26-21-60	29-002	HACIENDA/REDWOOD
2987	26-21-60	29-006	
2988	26-21-60	29-007	DIABLO/MANN
3022	26-21-60	30-004	HACIENDA/RAINBOW
3215	26-21-60	34-025	HACIENDA/EL CAMINO
	26-21-60	35-043	RUSSELL/EL CAMINO
	26-21-60	36-034	DIABLO/BRONCO
0	26-21-60	D-8	DIABLO/TORREY PINES
	26-21-60	D-9	DIABLO/MANN

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
908	25-21-60	SPEAR APARTMENTS #9
1924	25-21-60	212 UNIT APARTMENT COMPLEX
1925	25-21-60	RANCHO SIERRA
1926	25-21-60	THE ISLANDER (STONE GATE COLONY)
1927	25-21-60	RENAISSANCE VILLA APARTMENTS
1928	25-21-60	RENAISSANCE VILLAS II
1930	25-21-60	TROPICANA/LINDELL MINI STORAGE
1931	25-21-60	TROPICANA PARK APARTMENTS
1932	25-21-60	VILLAGE OF REMINGTON OAKS
1933	25-21-60	TROPICANA BAY SHORE APARTMENTS
1934	25-21-60	THE ISLANDER (STONE GATE COLONY)
1935	25-21-60	THE VILLAGE AT MEADOW RIDGE
2066	25-21-60	THE ISLANDER (STONE GATE COLONY)
2067	25-21-60	THE ISLANDER (STONE GATE COLONY)
2068	25-21-60	RANCHO SIERRA
2103	25-21-60	LAGUNA DEL REY (FORMERLY NORMANDIE)
2108	25-21-60	NORMANDY COURT

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
908	25-21-60	03-019	TROPICANA/DUNEVILLE
1924	25-21-60	12-040	TROPICANA/LINDELL
1925	25-21-60	12-041	HACIENDA/JONES
1926	25-21-60	12-042	BELL/REDROCK
1927	25-21-60	12-043	HACIENDA/LINDELL
1928	25-21-60	12-044	HACIENDA/LINDELL
1930	25-21-60	12-046	TROPICANA/LINDELL
1931	25-21-60	12-047	TROPICANA/RENO
1932	25-21-60	12-048	RENO/DUNEVILLE
1933	25-21-60	12-049	TROPICANA/REDROCK/DU
1934	25-21-60	12-050	RENO/LINDELL
1935	25-21-60	12-051	RENO/LINDELL
2066	25-21-60	14-039	BELL/REDROCK
2067	25-21-60	14-040	
2068	25-21-60	14-041	HACIENDA/JONES
2103	25-21-60	15-006	TROPICANA/JONES
2108	25-21-60	15-011	HACIENDA/DUNEVILLE

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
2108	25-21-60	NORMANDY COURT
1929	25-21-60	BRONKEN ENG
2589	25-21-60	JYDSTRUP ELEM SCHOOL
3090	25-21-60	THE KEYS CONDOS UPDATE
3224	25-21-60	THE KEYS
	25-21-60	WESTPARK CONDOS 1,2
	25-21-60	CLUB MARBELLA

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
2108	25-21-60	15-011	HACIENDA/DUNEVILLE
1929	25-21-60	12-045	HACIENDA/LINDELL
2589	25-21-60	22-019	RENO
3090	25-21-60	31-029	
3224	25-21-60	34-034	RENO/LINDELL
	25-21-60	37-009	RENO/EDMOND
	25-21-60	D-11	RENO/EDMOND

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
1326	30-21-61	ADDISON SAW, INC.
1327	30-21-61	AUSTIN HARDWOODS
1328	30-21-61	CLIMATE CONTROL MANUFACTURING FACILITY
1329	30-21-61	GOLDSTRUM ENTERPRISES
1330	30-21-61	HUMANE SOCIENTY-ANIMAL HAVEN
1331	30-21-61	INTERMOUNTAIN FARMERS PROPERTY
1332	30-21-61	MASCO PARK I
1333	30-21-61	MAZATLAN PLAZE
1334	30-21-61	MKNK WAREHOUSE COMPLEX
1335	30-21-61	J. R. PORTER CONSTRUCTION
1336	30-21-61	J. A. TIBERTI CONSTRUCTION CO.
1337	30-21-61	PM 173-83
1338	30-21-61	GOMES PROPERTY, PM 168-81
1339	30-21-61	TIBERTI/SONTOLI UPRR SPUR LINE
1340	30-21-61	TIBERTI COMPANY
1341	30-21-61	
2089	30-21-61	JORDAN PARK INDUST

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
1326	30-21-61	04-129	RUSSELL/CAMERON
1327	30-21-61	04-130	TROPICANA/ARVILLE
1328	30-21-61	05-001	
1329	30-21-61	05-002	HACIENDA/CAMERON
1330	30-21-61	05-003	RAWHIDE
1331	30-21-61	05-004	TROPICANA/ARVILLE/WY
1332	30-21-61	05-005	BELL/ARVILLE
1333	30-21-61	05-006	RENO/ARVILLE
1334	30-21-61	05-007	RENO/ROGERS
1335	30-21-61	05-008	DEWEY/WYNN
1336	30-21-61	05-009	DEWEY/WYNN
1337	30-21-61	05-010	HACIENDA/CAMERON
1338	30-21-61	05-011	HACIENDA/CAMERON
1339	30-21-61	05-012	RUSSELL/CAMERON
1340	30-21-61	05-013	DEWEY/WYNN
1341	30-21-61	05-014	DEWEY/VALLEY VIEW
2089	30-21-61	14-062	BELL/SHUSTER

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
3221	30-21-61	GOLDEN SHOWCASE PHASE 2
	30-21-61	RENO/ROGERS DEVELOPMENT
	30-21-61	HACIENDA SQUARE 2
	30-21-61	JORDAN PARK
	30-21-61	RUSSELL ROAD STORAGE YARD
	30-21-61	VALLEY VIEW/ALI BABA INDUSTRIAL PARK

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
3221	30-21-61	34-031	ALI BABA/VALLEY VIEW
	30-21-61	35-020	RENO & ROGERS
	30-21-61	38-002	HACIENDA/ROGERS
	30-21-61	38-001	SCHUSTER/BELL
	30-21-61	D-11	RUSSELL/UPRR
	30-21-61	D-4	ALI BABA/VALLEY VIEW

_NUM	SEC_TS_RNG----------	DN_S_TITLE----------
2089	30-21-61	JORDAN PARK INDUST
2313	30-21-61	COROLLOS TROPICANA MOTORS
2314	30-21-61	DAVIS NUSERY
2315	30-21-61	BUDGET RENT-A-CAR
2316	30-21-61	RENO/SCHIRLLS
2317	30-21-61	FALCONI/STERLING
2318	30-21-61	GOLDEN SHOWCASE
2319	30-21-61	STEVE GOMES BUILDING
2320	30-21-61	CRAIG ELECTRIC
2321	30-21-61	GRAPHICS WEST
2322	30-21-61	ALAN B. CURTIS INDUSTRIAL PARK
2323	30-21-61	HACIENDA INDUSTRIAL PARK
2324	30-21-61	HALS, INC.
2325	30-21-61	MANNING CONSTRUCITON PARKING
2326	30-21-61	JOHN MARTIN INDUSTRIAL PARK
2327	30-21-61	HACIENDA INDUSTRIAL PARK
2328	30-21-61	OFFICE/WAREHOUSE #1

DN_S_NUM	SEC_TS_RNG----------	ROLL_FLASH	LOCATION----------
2089	30-21-61	14-062	BELL/SHUSTER
2313	30-21-61	18-005	TROPICANA/DECATUR
2314	30-21-61	18-006	BELL/CAMERON
2315	30-21-61	18-007	TROPICANA/ROGERS
316	30-21-61	18-008	RENO/SCHIRILLS
2317	30-21-61	18-009	TROPICANA/CAMERON
2318	30-21-61	18-010	ALIBABA/VALLEY VIEW
2319	30-21-61	18-011	HACIENDA/CAMERON
2320	30-21-61	18-012	RENO/ARVILLE
2321	30-21-61	18-013	TROPICANA/VALLEYVIEW
2322	30-21-61	18-014	HACIENDA/ARVILLE
2323	30-21-61	18-015	HACIENDA/ARVILLE
2324	30-21-61	18-016	DEWEY/VALLEY VIEW
2325	30-21-61	18-017	HACIENDA/VALLEY VIEW
2326	30-21-61	18-018	RAWHIDE/VALLEY VIEW
2327	30-21-61	18-019	HACIENDA/VALLEYVIEW
2328	30-21-61	18-020	MESAVISTA/VALLEYVIEW

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
[illegible]328	30-21-61	OFFICE/WAREHOUSE #1
[illegible]9	30-21-61	HACIENDA/DECATUR WAREHOUSE
[illegible]30	30-21-61	HACIENDA SQUARE
2331	30-21-61	P & S METAL SUPPLY
2332	30-21-61	PM 186-87
2333	30-21-61	PM 191-87
2575	30-21-61	PELOQUIN
2582	30-21-61	SANBORN
2583	30-21-61	ARVILLE CONSTRUCTION
2584	30-21-61	PM 023-89
2858	30-21-61	TROPICANA WASH
2968	30-21-61	LARKIN PROPERTIES
3088	30-21-61	NEVADA READY MIX
3098	30-21-61	SANDLIN LUMBER
3162	30-21-61	RENO/ARVILLE
3168	30-21-61	LARKIN PROPERTIES
3221	30-21-61	GOLDEN SHOWCASE PHASE 2

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
2328	30-21-61	18-020	MESAVISTA/VALLEYVIEW
2329	30-21-61	18-021	HACIENDA/DECATUR
2330	30-21-61	18-022	HACIENDA/RODGERS
2331	30-21-61	18-023	ROGERS/ALI BABA
2332	30-21-61	18-024	RENO/ARVILLE
2333	30-21-61	18-025	RENO/DECATUR
[illegible]575	30-21-61	22-005	INDUSTRIAL/ARVILLE
[illegible]582	30-21-61	22-012	HACIENDA/CAMERON
2583	30-21-61	22-013	RAWHIDE/ARVILLE
2584	30-21-61	22-014	RUSSELL/DECATUR
2858	30-21-61	26-053	ALI BABA/DECATUR
2968	30-21-61	28-030	HACIENDA/ARVILLE
3088	30-21-61	31-027	HACIENDA/MESA VISTA
3098	30-21-61	31-037	DIABLO/ARVILLE
3162	30-21-61	33-019	RENO/ARVILLE
3168	30-21-61	33-025	HACIENDA/ARVILLE
3221	30-21-61	34-031	ALI BABA/VALLEY VIEW

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
1320	29-21-61	CB DISPLAY
1321	29-21-61	DESERT HONDA
22	29-21-61	BOMBERG-WHITNEY
1323	29-21-61	VALLEY VIEW INDUSTRIAL CENTER
1324	29-21-61	STEVENS WAREHOUSE
1325	29-21-61	TROPICANA WASH S. FORK VAC 27-82
2292	29-21-61	SHOP/WAREHOUSE
2293	29-21-61	BEKINS MOVING & STORAGE
2294	29-21-61	PM 082-87
2295	29-21-61	INDUSTRIAL PARK
2296	29-21-61	INDUSTRIAL BUSINESS PARK
2297	29-21-61	MARK I INDUSTRIAL PARK
2298	29-21-61	GALLAGHER PLUMBING
2299	29-21-61	SUN GOULD STEEL COMPANY
2300	29-21-61	PM 124-88
2301	29-21-61	G. E. MOFFATT
2302	29-21-61	EXCALIBUR

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
1320	29-21-61	04-123	RENO/PROCYON
1321	29-21-61	04-124	TROPICANA/VALLEY
1322	29-21-61	04-125	DIABLO/PROCYON
1323	29-21-61	04-126	HACIENDA/VALLEY VIEW
1324	29-21-61	04-127	DIABLO/PROCYON
1325	29-21-61	04-128	
2292	29-21-61	17-056	RUSSELL/PROCYON
2293	29-21-61	17-057	HACIENDA/WALLEY VIEW
94	29-21-61	17-058	DIABLO/PROCYON
2295	29-21-61	17-059	HACIENDA/POLARIS
2296	29-21-61	17-060	ALI BABA/INDUSTRIAL
2297	29-21-61	17-061	
2298	29-21-61	17-062	DIABLO/VALLEY VIEW
2299	29-21-61	17-063	DEWEY/PROCYON
2300	29-21-61	17-064	DEWEY/PROCYON
2301	29-21-61	17-065	DIABLO/POLARIS
2302	29-21-61	17-066	TROPICANA/LVBS.

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
2302	29-21-61	EXCALIBUR
2303	29-21-61	EXCALIBUR (ADDITIONAL PARKING)
04	29-21-61	EXCALIBUR
2305	29-21-61	R.F.T. INVESTMENTS
2306	29-21-61	OFFICE/WAREHOUSE #2
2307	29-21-61	RENO-ALI BABA INDUSTRIAL PARK
2308	29-21-61	RENO/VALLY VIEW
2309	29-21-61	SOUTHSTAR DEVELOPMENT
2310	29-21-61	SANBORN
2311	29-21-61	VAC 066-86
2312	29-21-61	LEWIS HOMES OFFICE COMPLEX
2859	29-21-61	TROPICANA WASH
3074	29-21-61	DAYS INN MOTEL
3176	29-21-61	SUN GOULD STEEL
3204	29-21-61	ACE TAXI CAB CO.
	29-21-61	CIRCUS CIRCUS PROJECT X

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
2302	29-21-61	17-066	TROPICANA/LVBS.
2303	29-21-61	17-067	TROPICANA/LVBN
2304	29-21-61	17-068	TROPICANA/LVBS
2305	29-21-61	17-069	BELL/POLARIS
2306	29-21-61	17-070	DIABLO/VALLEY VIEW
2307	29-21-61	17-071	RENO/ALI BABA
2308	29-21-61	17-072	RENO/VALLEY VIEW
2309	29-21-61	18-001	HACIENDA/LVBS
2310	29-21-61	18-002	ALI BABA/VALLEY VIEW
311	29-21-61	18-003	
2312	29-21-61	18-004	HACIENDA/PLOARIS
2859	29-21-61	26-054	I-15/VALLEY VIEW
3074	29-21-61	31-013	TONOPAH/LV WASH
3176	29-21-61	33-033	DEWEY/PROCYON
3204	29-21-61	34-014	RENO/VALLEY VIEW
	29-21-61	D-10	LVBS

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DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
1239	20-21-61	CLOUD CARPET AL GREENBAUM
1240	20-21-61	BAROQUE WAREHOUSE
41	20-21-61	CASTELLO BEVERAGE
242	20-21-61	GROVE BUSINESS PARK
1243	20-21-61	HARMON INDUSTRIAL
1244	20-21-61	INTERSTATE INDUSTRIAL PARK
1245	20-21-61	KENTUCKY FRIED CHICKEN
1246	20-21-61	LA MESA R.V.
1247	20-21-61	MARNELL CORRAO
1248	20-21-61	SIERRA LANDSCAPING COMPANY
2206	20-21-61	KING 8 HOTEL/CASINO
2207	20-21-61	HARMON COMMUNITY DEVELOPMENT
2208	20-21-61	LA MESA R.V.
2209	20-21-61	PALMS BUSINESS
2210	20-21-61	SOUTHTECH
2211	20-21-61	PALMS BUSINESS CENTER III
2212	20-21-61	LLOYDS REFRIGERATION

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
1239	20-21-61	04-042	TOMPKINS/INDUSTRIAL
1240	20-21-61	04-043	TOMPKINS/UPRR
1241	20-21-61	04-044	
1242	20-21-61	04-045	TOMPKINS/POLARIS
1243	20-21-61	04-046	HARMON/INDUSTRIAL
1244	20-21-61	04-047	HARMON/INDUSTRIAL
1245	20-21-61	04-048	PROCYON/TROPICANA
1246	20-21-61	04-049	NAPLES/INDUSTRIAL
1247	20-21-61	04-050	HARMON/VALLEY VIEW
1248	20-21-61	04-051	HARMON/VALLEY VIEW
2206	20-21-61	16-050	TROPICANA/INDUSTRIAL
2207	20-21-61	16-051	HARMON/POLARIS
2208	20-21-61	16-052	TOMPKINS/INDUSTRIAL
2209	20-21-61	16-053	POLARIS/TOMPKINS
2210	20-21-61	16-054	HARMON/INDUSTRIAL
2211	20-21-61	16-055	TOMPKINS/POLARIS
2212	20-21-61	16-056	PROCYON/TOMPKINS

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
2960	20-21-61	PM 090-90
3101	20-21-61	POLARIS BUSINESS PARK
3149	20-21-61	COSTELLO BEVERAGE
3219	20-21-61	MINAMI NEVADA
	20-21-61	CATELLO TILE
	20-21-61	IN-N-OUT BURGER
	20-21-61	POLARIS OFFICE COMPLEX

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
2960	20-21-61	28-022	TEE PEE/HELENA
3101	20-21-61	31-040	NAPLES/POLARIS
3149	20-21-61	33-006	FLAMINGO/VALLEY VIEW
3219	20-21-61	34-029	TROPICANA/I-15
	20-21-61	35-047	ROCHELLE/INDUSTRIAL
	20-21-61	37-002	TROPICANA/INDUSTRIAL
	20-21-61	D-9	POLARIS*ROCHELLE

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
2212	20-21-61	LLOYDS REFRIGERATION
2213	20-21-61	MINAMI NEVADA INC., PM 006-90
14	20-21-61	PM 171-86
2215	20-21-61	PM 110-88
2216	20-21-61	PM 170-88
2217	20-21-61	RYDER TRUCK RENTAL
2218	20-21-61	SACON PROCYON WAREHOUSE
2219	20-21-61	SAXTON DEVLEOPMENT
2220	20-21-61	SAXTON PHASE II
2221	20-21-61	JIM SAXTON
2222	20-21-61	THE SPORTS FORM
2223	20-21-61	TIBERTI COMPANY
2224	20-21-61	PM 184-88
2225	20-21-61	UNIVERSAL RESORT
2588	20-21-61	SANBORN VALLEY VIEW POINT
2892	20-21-61	UNION PACIFIC PROPERTY
2960	20-21-61	PM 090-90

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
2212	20-21-61	16-056	PROCYON/TOMPKINS
2213	20-21-61	16-057	TROPICANA/ US 91
2214	20-21-61	16-058	HARMON/POLARIS
2215	20-21-61	16-059	NAPLES/PROCYON
2216	20-21-61	16-060	TOMPKINS/POLARIS
2217	20-21-61	16-061	HARMON/POLARIS
2218	20-21-61	16-062	NAPLES/PROCYON
2219	20-21-61	16-063	UPPR/TOMPKINS
220	20-21-61	16-064	HARMON/VALLEY VIEW
2221	20-21-61	16-065	HARMON/UPPR
2222	20-21-61	16-066	HARMON/INDUSTRIAL
2223	20-21-61	16-067	PROCYON/TOMPKINS
2224	20-21-61	16-068	FLAMINGO/VALLEY VIEW
2225	20-21-61	16-069	TROPICANA/LVBS
2588	20-21-61	22-018	ROCHELLE/VALLEYVIEW
2892	20-21-61	27-031	
2960	20-21-61	28-022	TEE PEE/HELENA

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
1249	21-21-61	MARIE ANTOINETTE
1250	21-21-61	MEDITERRANEAN VILLAGE
51	21-21-61	MGM HOTEL
2087	21-21-61	PM 158-90
2226	21-21-61	PM 048-88 ALL SEASONS INN
2227	21-21-61	BALLY'S GRAND FEDERAL CREDIT UNION
2228	21-21-61	BALLEY'S GRAND PARKING LOT
2229	21-21-61	EL JARDIN PLAZ
2230	21-21-61	FOUNTAIN SUITES
2231	21-21-61	HARMON/KOVAL SHOPPING CENTER
2232	21-21-61	MLY APARTMENTS
2233	21-21-61	SUPER 8 MOTEL
2234	21-21-61	TRAVEL LODGE EXPANSION
3134	21-21-61	POLO TOWERS
3169	21-21-61	LAKE TROPICANA CONDOS
	21-21-61	CHEVRON
0	21-21-61	MGM GRAND HOTEL AND THEME PARK

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
1249	21-21-61	04-052	
1250	21-21-61	04-053	HARMON/BERMUDA ROAD
1251	21-21-61	04-054	FLAMINGO/LVBS
2087	21-21-61	14-060	HARMON/KOVAL
2226	21-21-61	16-070	FLAMINGO/BERMUDA
2227	21-21-61	16-071	HARMON/AUDRIE
2228	21-21-61	16-072	FLAMINGO/LVBS
2229	21-21-61	16-073	FLAMINGO/PARADISE
230	21-21-61	16-074	FLAMINGO/FREDDA
2231	21-21-61	16-075	HARMON/KOVAL
2232	21-21-61	16-076	DECKOW/TOMPKINS
2233	21-21-61	16-077	ROCHELLE/KOVAL
2234	21-21-61	16-078	HARMON/LVBS
3134	21-21-61	32-014	HARMON/LVBS
3169	21-21-61	33-026	HARMON/LAMAR
	21-21-61	38-022	LAS VEGAS/TROPICANA
0	21-21-61	D-8	TROPICANA/LVBS

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
0	21-21-61	MGM GRAND HOTEL AND THEME PARK

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
0	21-21-61	D-8	TROPICANA/LVBS

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
1252	22-21-61	ALAMO RENT-A-CAR
1253	22-21-61	AMBASSADOR INN
1254	22-21-61	JACK CASON
55	22-21-61	CHALET VEGAS
257	22-21-61	NATHAN ADELSON HOSPICE
1258	22-21-61	SWENSON STREET (SWALE? DRAIN)
1259	22-21-61	UNLV - THOMAS & MACK CENTER
2235	22-21-61	MCCARRAN INTERNATIONAL AIRPORT
2236	22-21-61	PICERNE
2237	22-21-61	PICERNE (CONT'D)
2238	22-21-61	HOWARD JOHNSONS HOTEL
2239	22-21-61	BUDGET/SNAPPY CAR RENTAL
2240	22-21-61	HARDROCK CAFE
2241	22-21-61	FIRE STATION #18
2242	22-21-61	VALUE RENT-A-CAR
2243	22-21-61	SAINT TROPEZ VILLAS
2244	22-21-61	SAINT TROPAZ VILLAGE II

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
1252	22-21-61	04-055	HARMON/PARADISE
1253	22-21-61	04-056	FALMINGO/PARADISE
1254	22-21-61	04-057	FLAMINGO/PARADISE
1255	22-21-61	04-058	NAPLES/PARADISE
1257	22-21-61	04-060	TROPICANA/SWENSON
1258	22-21-61	04-061	NAPLES/SWENSON
1259	22-21-61	04-062	TROPICANA/SWENSON
2235	22-21-61	16-079	SUNSET/PARADISE
2236	22-21-61	16-080	HARMON/PARADISE
237	22-21-61	17-001	HARMON/PARADISE
2238	22-21-61	17-002	FLAMINGO/PARADISE
2239	22-21-61	17-003	TROPICANA/TROPICANA
2240	22-21-61	17-004	HARMON/PARADISE
2241	22-21-61	17-005	FLAMINGO/PARADISE
2242	22-21-61	17-006	HARMON/PARADISE
2243	22-21-61	17-007	HARMON/PARADISE
2244	22-21-61	17-008	HARMON/PARADISE

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
2244	22-21-61	SAINT TROPAZ VILLAGE II
2860	22-21-61	TROPICANA WASH CURVE DATA
2984	22-21-61	DESERT RESEARCH INSTITUTE
3083	22-21-61	PM 061-91
3091	22-21-61	HARD ROCK HOTEL/CASINO
	22-21-61	PM 061-91
	22-21-61	LAS VEGAS DISCOUNT GOLF & TENNIS

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
2244	22-21-61	17-008	HARMON/PARADISE
2860	22-21-61	26-055	TROPICANA WASH
2984	22-21-61	29-003	FLAMINGO/SWENSON
3083	22-21-61	31-022	BERMUDA/PARADISE
091	22-21-61	31-030	HARMON/PARADISE
	22-21-61	D-2	HARMON/PARADISE
	22-21-61	36-023	HARMON/PARADISE

DN_S_NUM	SEC_TS_RNG	DN_S_TITLE
1181	15-21-61	BLUE HARBOR CLUB APARTMENTS
1182	15-21-61	CAMBRIDGE CONDOS
83	15-21-61	CASA BLANCA V CONDOS
1184	15-21-61	FLAMINGO EXECUTIVE PARK
1185	15-21-61	GROVE, INC.
1186	15-21-61	TERRY HESS
1187	15-21-61	LEROY PROPERTIES
1188	15-21-61	PARADISE COLONY CONDO
1189	15-21-61	PARADISE SOUTH
1190	15-21-61	THE PARK
1191	15-21-61	PARK PLACE VILLAS
1192	15-21-61	PINE PARK APARTMENTS
1193	15-21-61	WINDSOR TOWN HOMES
1194	15-21-61	SIERRA PARADISE APARTMENTS
2128	15-21-61	PALOS VERDES
2129	15-21-61	MORNING STAR APARTMENTS
2130	15-21-61	GOLDSTEIN

DN_S_NUM	SEC_TS_RNG	ROLL_FLASH	LOCATION
1181	15-21-61	03-088	SIERRA VISTA/SWENSON
1182	15-21-61	03-089	KATIE/CAMBRIDGE
1183	15-21-61	03-090	CASA BLANCA/SWENSON
1184	15-21-61	03-091	FLAMINGO/CAMBRIDGE
1185	15-21-61	03-092	KATIE/CAMBRIDGE
1186	15-21-61	03-093	
1187	15-21-61	03-094	FLAMINGO/PARADISE
1188	15-21-61	03-095	ELM/PARADISE
89	15-21-61	03-096	TWAIN/PARADISE
1190	15-21-61	03-097	TWAIN/PARADISE
1191	15-21-61	03-098	KATIE/SWENSON
1192	15-21-61	03-099	TWAIN/PARADISE
1193	15-21-61	03-100	
1194	15-21-61	03-101	SIERRA VISTA/PARADIS
2128	15-21-61	15-031	
2129	15-21-61	15-032	ROCHELLE/SPENCER
2130	15-21-61	15-033	TWAIN/PARADISE

_NUM	SEC_TS_RNG----------	DN_S_TITLE----------
_.30	15-21-61	GOLDSTEIN
2131	15-21-61	GALAXY TOWER
2132	15-21-61	LAS VEGAS CONVENTION CENTER PARKING
2133	15-21-61	CAMBRIDGE CENTER
2134	15-21-61	BUDGET HOTEL & CASINO
2135	15-21-61	TARGET SHOPPING CENTER
2136	15-21-61	RV JONES (REGENCY) 60 UNITS
2139	15-21-61	PACIFIC HARBORS CAMBRIDGE
2140	15-21-61	SHELTER ISLAND CLUB APARTMENTS
2141	15-21-61	SIERRA VISTA II
2877	15-21-61	SWENSON DRAINAGE
2919	15-21-61	PARADISE-FLAMINGO WASH
	15-21-61	PALOS VERDES MINI STORAGE FLAMINGO WASH MODS

DN_S_NUM	SEC_TS_RNG----------	ROLL_FLASH	LOCATION----------
2130	15-21-61	15-033	TWAIN/PARADISE
2131	15-21-61	15-034	DESERT INN/CAMBRIDGE
2132	15-21-61	15-035	DESERT INN/PARADISE
2133	15-21-61	15-036	KATIE/CAMBRIDGE
2134	15-21-61	15-037	DESERT INN/SWENSON
2135	15-21-61	15-038	FLAMINGO/MARYLAND
2136	15-21-61	15-039	SWENSON/SIERRAVISTA
2139	15-21-61	15-042	KATIE/CAMBRIDGE
2140	15-21-61	15-043	TWAIN/CAMBRIDGE
.41	15-21-61	15-044	PARADISE/SWENSON
2877	15-21-61	27-017	DESERT INN/FLAMINGO
2919	15-21-61	27-058	PARADISE
	15-21-61	D-11	FLAMINGO*PALOS VERDE

RECEIVED
FEB 27 1985
CLARK COUNTY PUBLIC WORKS

AL JOHNSON'S

PARCEL MAP

DRAINAGE STUDY

S T R
36-21-60
ROLL 03 · FLASH 35

FEBRUARY 26, 1985

DELTA ENGINEERING INC.
LAS VEGAS, NEVADA

DELTA ENGINEERING INC.

ENGINEERING • LAND SURVEYING • LAND PLANNING • SUBDIVISIONS

4500 WEST OAKEY BLVD. • PHONE (702) 877-0955 • LAS VEGAS, NEVADA 89102

February 26, 1985

Clark County Department of Public Works
Public Services Building
401 South Fourth Street
Las Vegas, Nevada 89101

Attention: Mr. Lou Vita

Re: Parcel Map of W½ SE¼ SW¼ NW¼ Section 36, T.21S., R.60E., M.D.M., Clark County, Nevada.

Submitted herewith for your approval are the figures and hydrology and hydraulics calculations for the referenced parcel map. This is intended to fulfill the requirement of the Clark County Land Development Guideline in conformance with Chapter II, Improvement Standards of Clark County.

The v-ditch and street systems will carry the required 10, 25, and 100 year return period peak discharges. The development of this parcel map area will add less than one cubic foot per second to the existing discharge and therefore will not create a flood hazard for down stream property.

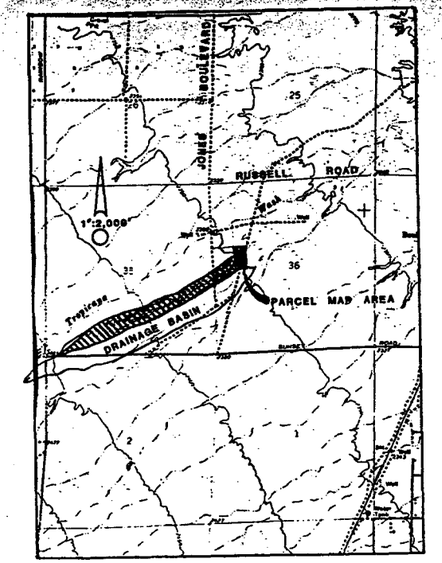
If you should require additional information, please call me.

Sincerely,
DELTA ENGINEERING, INC.

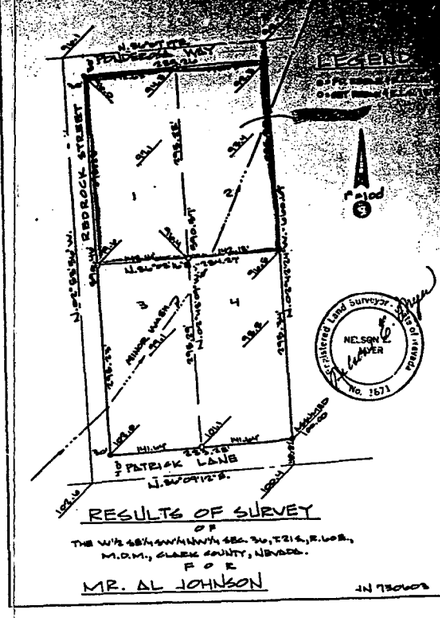
Edmund J. Wojcik, P.E.
Vice President

EJW:dh

REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA No. 4317 — Edmund J. WOJCIK CIVIL



VICINITY MAP



RESULTS OF SURVEY
OF
THE W½ SE¼ SW¼ NW¼ SEC. 36, T21S, R.60E., M.D.M., CLARK COUNTY, NEVADA.
FOR
MR. AL JOHNSON

JN 730603

DELTA ENGINEERING INC.

BY Ed Wojcik DATE 2/25/85 SUBJECT DRAINAGE STUDY SHEET NO 1 OF 3
CHKD BY ____ DATE ____ FOR AL JOHNSON'S PARCEL MAP JOB NO 730603

HYDROLOGY — USE TR-55 GRAPH METHOD

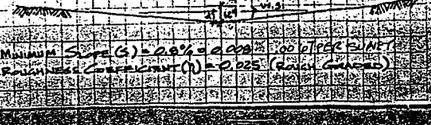
SEE ATTACHED COMPUTATION SHEETS FOR THE SOURCE OF THE SUMMARY OF RESULTS:

DRAINAGE BASIN (T) RETURN PERIOD FOR DESIGN	(q_p) PEAK DISCHARGE
10 YEARS	11 cfs 39ch
25 YEARS	16 cfs 57ch
100 YEARS	25 cfs 75ch

HYDRAULICS

CONSIDER USING A V-DITCH ALONG THE EXISTING MINOR WASH ALIGNMENT DIAGONALLY ACROSS THE PARCEL MAP AREA OR NORTH ALONG REDROCK STREET THEN EAST ALONG PONDEROSA WAY.

20'x1' V-DITCH



Minimum Slope (S) = 2.8% = 0.028 — 100 FEET PER MILE
Roughness Coefficient (n) = 0.025 (Rock Lined)

DELTA ENGINEERING INC.

BY Ed Wojcik DATE 2/25/85 SUBJECT DRAINAGE STUDY SHEET NO 2 OF 3
CHKD BY ____ DATE ____ FOR AL JOHNSON'S PARCEL MAP JOB NO 730603

TRY WATER DEPTH (d) = 0.8'

CROSS SECTIONAL AREA (A) = 0.8' x 8' = 6.4 s.f.
HYDRAULIC RADIUS (R) = 6.4/16.2 = 0.40

DESIGN DISCHARGE (q_p) = $\frac{1.486}{n}(R)^{2/3}(S)^{1/2}A$

$q_{10} = \left(\frac{1.486}{0.025}\right)(0.40)^{2/3}(0.028)^{1/2}(6.4)$

$q_{10} = (59.44)(0.543)(0.089)(6.4)$

$q_{10} = 18.9$ cfs > 16 cfs but < 25 cfs NA

TRY WATER DEPTH (d) = 0.9'

(A) = 0.9' x 9' = 8.1 s.f.
(R) = 8.1/18.2 = 0.444

$q_{25} = \left(\frac{1.486}{0.025}\right)(0.444)^{2/3}(0.028)^{1/2}(8.1)$

$q_{25} = (59.44)(0.582)(0.089)(8.1)$

$q_{25} = 24.9$ cfs < 25 cfs OK

Velocity (V) = q/A

$V = 24.9/8.1$

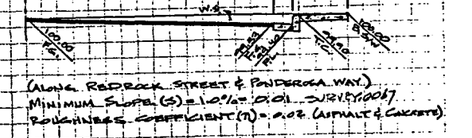
$V = 3.0$ fps

DELTA ENGINEERING INC.

BY Ed Wojcik DATE 2/26/85 SUBJECT DRAINAGE STUDY SHEET NO 3 OF 3
CHKD BY ____ DATE ____ FOR AL JOHNSON'S PARCEL MAP JOB NO 730603

30' HALF STREET

SOMETIME IN THE FUTURE FULL OFF-SITE IMPROVEMENTS WILL BE REQUIRED.


23'
W.S.
6"
6"
6"

EUGENE ZAMPELL
3690 EAST HARMON AVE.
LAS VEGAS, NEVADA 89120

RECEIVED
APR - 7 1986
CLARK COUNTY PUBLIC WORKS

April 4, 1986

Clark County Flood Control
401 South 4th Street
Las Vegas, Nv. 89101

To Whom It May Concern:

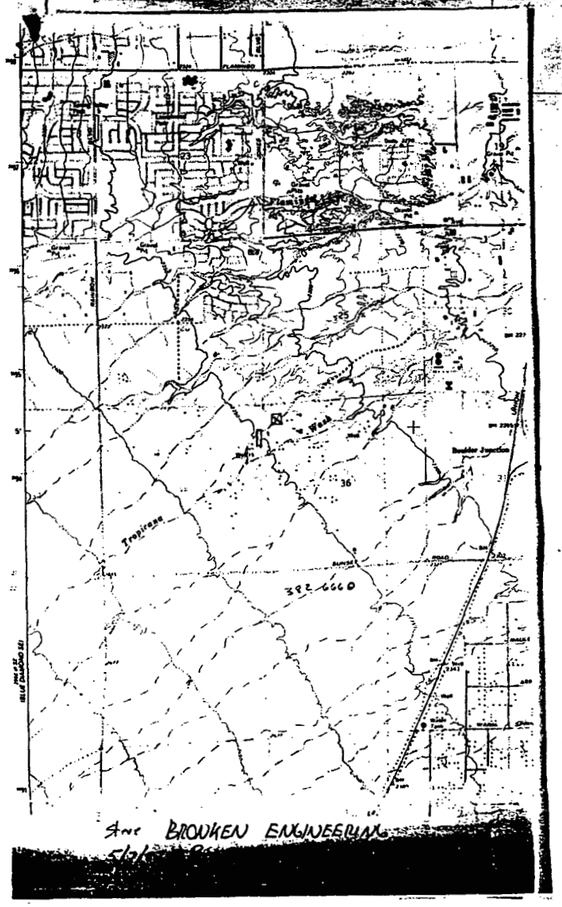
I own a house at 5765 Redrock, which is located at the southeast corner of Russell and Jones. There is a small wash located in the rear of the property. I would like to have this wash filled in, as it has not been in use since I purchased the property. If you would please check on this matter and advise me of your decision.

Your immediate attention to this matter is greatly appreciated.

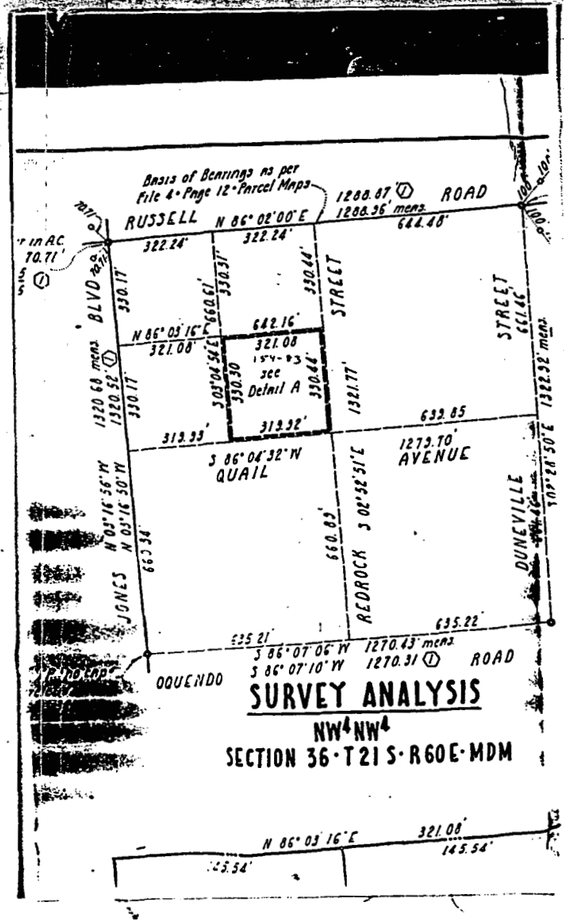
Yours Very Truly,

Eugene Zampell

EZ/bh



SAE BROWKEN ENGINEERING
5/6



Clark County
Department of Public Works

April 15, 1986

Eugene Zampell
3690 East Harmon Avenue
Las Vegas, Nevada 89120

5765 REDROCK - PM 154-83 (APN 420-510-010)

Your request to fill in the wash crossing your property at the above address is denied.

A drainage study for PM 154-83 submitted by Karsten Bronken, P.E. dated November 4, 1983, and our comments dated January 4, 1984, and July 2, 1984, require that this wash be maintained thru the parcel.

If you have any questions or need additional information, please contact me at 386-4644.

M. J. DANNING
DIRECTOR OF PUBLIC WORKS

BY: Bob T. Lederburg, P.E.
Senior Engineer

GTC:bs

Request to fill wash made again by Steve Bronken 5/7/87, and was again denied by CCFC.

COMMISSIONERS
Thalia M. Dondero, Chairman • Manuel J. Cortez, Vice-Chairman
Jay Brigham, Paul J. Christensen, Karen Hayes, William U. Pierson, Bruce L. Woodbury
Donald L. "Pat" Sharp, County Manager

CLARK COUNTY, NEVADA

FROM Civil - CLERK/ENGR. OFFICE FLOOD CONTROL
[illegible] ENGINEERING
[illegible] INDUSTRIAL ROAD
LAS VEGAS, NV

TO

MEMO
☐ URGENT – REPLY IMMEDIATELY
☐ NO REPLY REQUIRED

DATE 7 2 84
SUBJECT DRAINAGE STUDY
ZAMPELL PM 154-83

MESSAGE THE ABOVE REFERENCED DRAINAGE STUDY HAS NOT BEEN APPROVED DUE TO LACK OF INFORMATION
THE DRAINAGE AREA FOR THE WASH GOING THRU THIS PARCEL WAS ERRONEOUS. ANOTHER THAN YOUR STUDY INDICATES A DRAINAGE STUDY AT HATHAWAY LANE AND MANN ST IS ON THE SAME WASH AND [illegible] COMPUTED @ Q100 = 1370 c.f.s.

REPLY

CLARK COUNTY, NEVADA

FROM G. Anderson OFFICE LAND DEVELOPMENT
Steve Varretta Varela
Flood Control

TO

MEMO
☒ URGENT – REPLY IMMEDIATELY
☐ NO REPLY REQUIRED

DATE: Jan 3, 1984
SUBJECT: Quail Avenue
PM 154-83

MESSAGE: Please have your group review the above referenced parcel map. The property owner wants to re-route an existing wash.
Please provide me with a response as soon as possible

G. Anderson

REPLY See comments on back. They said to provide adequate drainage to handle 50yr (peak) storm easterly as into CC following existing [illegible] Developer/Engineer should design [illegible] Comments required.

FM 154-83 - ZAMPELL PARCEL R60 T21 S36 NW4

THE FOLLOWING INFORMATION RELATES TO THE TOPOGRAPHIC MAP AND THE PARCEL:

1) THE WASH IS DOMINATED BY NUMEROUS QUAD 25 MAPS. IT ENTERS THE SW SIDE OF PARCEL



- 1982 FLOOD 10 MAJOR FLOWS FOLLOWED THE ALIGNMENT
- ARROYO BLOCKED BY TREES, ROCKS, BOULDERS AND TRANSPORT
- ALIGNMENT OF 3 TRIANGLE MARKS ARE TROPICANA WASH TRIBUTARY UNDER SAME DRAINAGE BUT ALSO IT AS ALIGNMENT
- 100 YEAR (Q) FOR THIS LOCATION = 650 - 700 c.f.s.
- ARE AND AS CAPACITY FLOW TO [illegible] c.f.s.
- Q 100 = 1.9 [illegible] c.f.s.

Karsten T. Bronken
Consulting Engineer
1818 Industrial Road • Las Vegas, Nevada
385-6000

RECEIVED
NOV 0 3 1983
CLARK COUNTY PUBLIC WORKS

Nearly all completed - Dave Swanson - 871-0567
November 4, 1983
FM 154-83

TO: Clark County Flood Control
FROM: Karsten T. Bronken, P.E., Consulting Engineer
SUBJECT: FLOOD STUDY - MR. & MRS. ZAMPELL PARCEL MAP

The undersigned has made an onsite inspection of the subject property and the area that contributes storm waters near or through the immediate vicinity. Also, I have reviewed the preliminary planning conducted by Clark County Flood Control of this area in Las Vegas Valley.

The northerly major Tropicana Wash channel is approximately one-half mile north of the subject property. The other major Tropicana Wash branch is approximately three-quarters of a mile south of subject property. The area in between these two major channels is, for the most part, on the apex of the alluvial fan that is prevalent in this area. There are several minor drainage channels on the apex of the alluvial fan in question, one of which traverses subject property. The drainage area contributory to this property is approximately 37 acres in size. (See enclosed U.S.G.S. Quad Map).

The following rational formula was used to determine storm water runoff.

C = 0.20
I = 1.11

Q = 0.20
1.11 x 37 acres = 8.2 c.f.s.

Q = C I A

A = 37 acres
I = 1.11 inches per hour
C = 0.20
Q = 8.2 c.f.s.

Also enclosed is a copy of the parcel map of subject property. Outlined in green are two alternates for the handling of the anticipated storm water flows. Alternate No. 1 would be the interception of this flow at Quail Avenue and directing it to the wash as such time that Quail Avenue is developed to its capacity of a 60 foot right-of-way constructed to present street standards. Is 45 c.f.s. Alternate No. 2 would intercept the storm waters

Continued

* Storm's Rainfall Tables
** Clark County Flood Control Manual (Tables)

Flood Study Report to
Clark County Flood Control
11/4/83
Page 2.

at the westerly boundary of subject property and place the waters in a 13-foot drainage channel running from the westerly boundary to the easterly boundary. A "V" ditch 10-foot wide and 12-inches deep, when flowing full, would have a capacity of 35 c.f.s.

As this area develops and streets are improved, these very small drainage areas can readily intercept and handle the anticipated storm water flows. From inspection, it appears that Quail Avenue can more than adequately handle the storm waters anticipated in the immediate area of the subject property.

Respectfully submitted,

Karsten T. Bronken, P.E.
Consulting Engineer

KTB/cb

NOT LEGIBLE FOR MICROFILMING

F-7

TR-55 HYDROLOGY FOR SMALL WATERSHEDS (TR-55)
PEAK DISCHARGE WORKSHEET
FOR CHAPTER 4 (APPENDICES D & E)

Project _____ By _____ Date _____

Checked _____ Date _____

Sizes Peak Discharge Computations for up to 3 Storms: Type II, Duration 24 hours.

1. Data: Watershed Condition = _____ (present or future).

   Drainage Area (Da) = _____ acres. Ave. Watershed Slope (S) = _____ %.

2. Runoff Curve Number (CN)

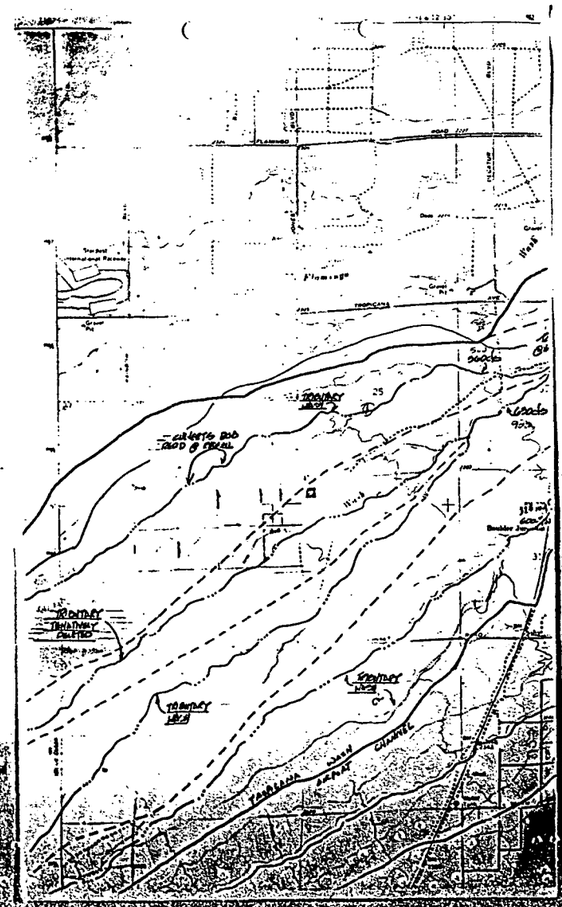
Hydrologic Soil Group (Appendix A)	Land Use Description Include Treatment, Practice & Condition (Table 2-2)	CN (Table 2-2)	% or Area (acres) (b)	Product (3)x(4) (5)
D	Fallow	94		
	Row crops, poor (with HC)	88		
	Row crops, good (with HC)	85		
	Totals =			

CN (weighted) = [total product / total area] = _____ use CN = 92

	1st Storm	2nd Storm	3rd Storm	
1. Rainfall Frequency (F)	10	25	100	yrs.
Rainfall Depth (P)	3.0	3.8	5.0	inches
4. Runoff Depth (Q) Use P, CN, and Table 2-1.	1.26	1.91	3.17	inches
5. Basic Peak Discharge (q_u) Use T_c, Da, Q, and Figure D-2. For graph label: (check one)	37			cfs/sq mi/in of Q
6. Watershed Slope Factor Use T_c, Da, and Table D-1.	1.00			
7. Peak Discharge (q_p) where q_p = Stage 4a x 5 x 6	46.6	72.6	117.4	cfs
	10cfs	12cfs	15cfs	acre

See Steps 8 to 13 for adjustments that may be applicable.

(TR NOTICE 55-A, September 1981)


Flamingo
TRAILWAY
CABLETTE ROD
TODD & CANAL
TRAILWAY
TRAILWAY
TRAILWAY

RED 12-2-83

Karsten T. Bronken
Consulting Engineer
1818 Industrial Road • Las Vegas, Nevada
383-8680

November 4, 1983

TO: Clark County Flood Control
FROM: Karsten T. Bronken, P.E., Consulting Engineer
SUBJECT: FLOOD STUDY - MR. & MRS. ZAMPELL PARCEL MAP

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The following rational formula was used to determine storm water runoff.

C = 0.20
I = 1.11

Q = 0.20
1.11 x 37 acres = 8.2 c.f.s.

Q = C I A
A = 37 acres
I = 1.11 inches per hour [1.]
C = 0.20 [2.]
Q = 8.2 c.f.s.

Also enclosed is a copy of the parcel map of subject property. Outlined in green are two alternates for the handling of the anticipated storm water flows. Alternate No. 1 would be the interception of this flow on Quail Avenue and directing some to the east. At such time that Quail Avenue is developed, the capacity of a 60' right-of-way constructed to present street standards is 45 c.f.s. Alternate No. 2 would intercept the storm waters

Continued -----

1. Steele's Rainfall Tables
2. Los Angeles County Flood Control Runoff Tables

½ MILE E/B JONES STRAIN BUREAU = 0.0[illegible]00

NW 35-21-60

Flood Study Report to
Clark County Flood Control
11/4/83
Page 2.

1360

at the westerly boundary of subject property and place the waters in a 10-foot drainage channel running from the westerly boundary to the easterly boundary. A "V" ditch 10-foot wide and 12-inches deep, when flowing full, would have a capacity of 35 c.f.s.

As this area develops and streets are improved, these very small drainage areas can readily intercept and handle the anticipated storm water flows. From inspection, it appears that Quail Avenue can more than adequately handle the storm waters anticipated in the immediate area of the subject property.

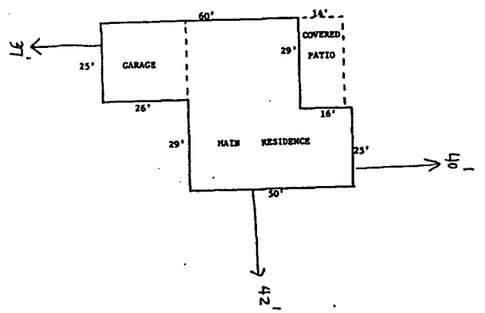
Respectfully submitted,

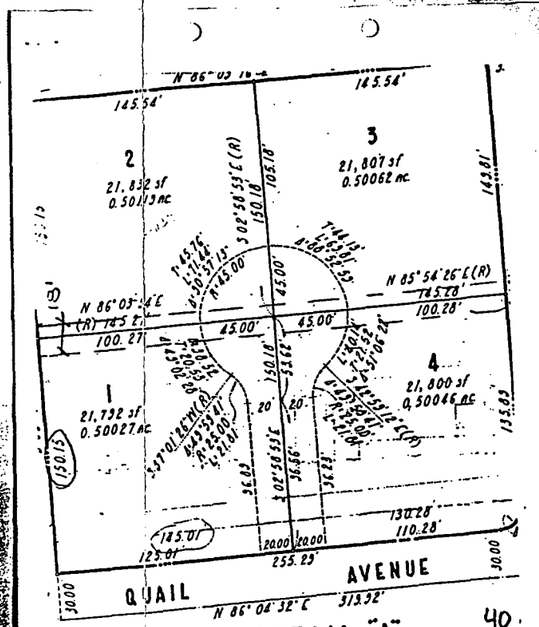
Karsten T. Bronken

Karsten T. Bronken, P.E.
Consulting Engineer

KTB/cb

PERIMETER OUTLINE OF SUBJECT PROPERTY





DETAIL "A"
SE¼ NW¼ NW¼ NW¼

ect PARADISE SOUTH DWG. B-85

JOB # 85020

PREFERRED EQUITIES BY RL

N FLOW RATE Q = 6000 cfs

SECTIONAL AREA OF WATER THAT CAN
ED IN THE CHANNEL BEFORE OVERFLOW
M CHANNEL PROFILE)
857.9 ft²
984.2 ft² ⇒ CONTROLS

: FORMULA

$\frac{1.49}{n} A R^{2/3} S^{1/2}$

WHERE n = 0.025

R = A/P

P = WETTED PERIMETER
= 127.8 FT

R = 857.9/127.8 = 6.71'

S = SIN θ

SIN θ = h_L/L

h_L = 3879 - 3660 = 2.05'

L = 140'

SIN θ = 2.05/140 = 0.01305

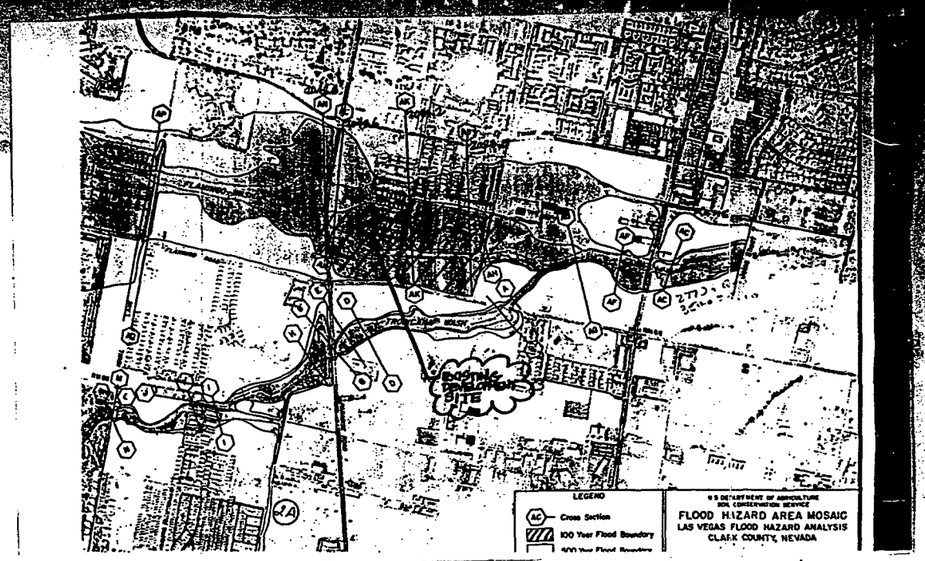
NEL $Q_{(MAX)} = \frac{1.49}{0.025}(857.9)(6.71)^{2/3}(0.01305)^{1/2}$

= 21,407 cfs > 6000 cfs

∴ EXISTING EXCAVATED CHANNEL
WILL CONTAIN DESIGN FLOW RATE

JOHN R. VEGA
CONSULTING ENGINEERS

Sheet ____ of ____

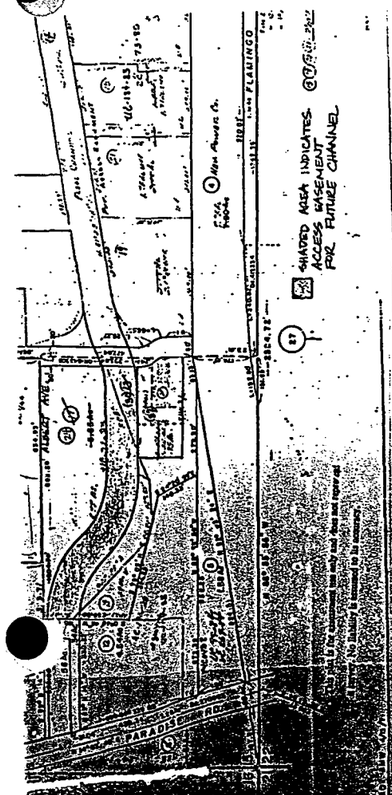


In the event that the earth bern at Paradise Road at the west end of the undeveloped lot collapsed, the water will still be directed to the new channel by an additional earth bern which now protects the entire block wall on the south property line of the Sheffield Inn. Water will not be able to reach the Paradise South development as long as the earth bern remains intact.

The present design flow for the Flamingo Wash is 6000 cfs. The channel was surveyed to determine if the design flow will be contained within the boundaries of the channel. Theoretically, as shown in the attached calculations, the maximum allowable flow in the channel before overflow of the earth berms occurs is 21,407 cfs, which far exceeds the design flow rate. Therefore, as long as the earth berms are not undermined by the current, the channel has the capacity to contain the 6000 cfs design flow rate.

In the event that the present channel walls do not remain intact, the effects of the 100 year flood need to be considered. Based on the Flood Hazard Area Mosaic, Las Vegas Flood Hazard Analysis, Clark County, Nevada (included), the development is within the 100 Year Flood Boundary. Interpolation between the water surface elevations given for cross sections AK and AL on the map yields a water surface elevation of 2039.3 feet for the 100 year flood at the development. The topographic map of the development indicates a minimum finish floor elevation of 2044.6 feet for the existing buildings. The difference in elevations between the finish floor of the buildings and the 100 year flood water surface elevation is 5.3 feet, which exceeds the minimum differential requirement of 18 inches.

A channel w
Wash adjace
6000 cfs.
developsent
area (inclu
access ease



ROLL 3 FLASH 96

15 21 61

DRAINAGE STUDY

FOR

PARADISE SOUTH

CLARK COUNTY, NEVADA

CLIENT: PREFERRED EQUITIES CORPORATION

JOHN R. VEGA
CONSULTING ENGINEERS
3301 W. SPRING MOUNTAIN ROAD, SUITE 15
LAS VEGAS, NEVADA 89102 (702) 871-3383

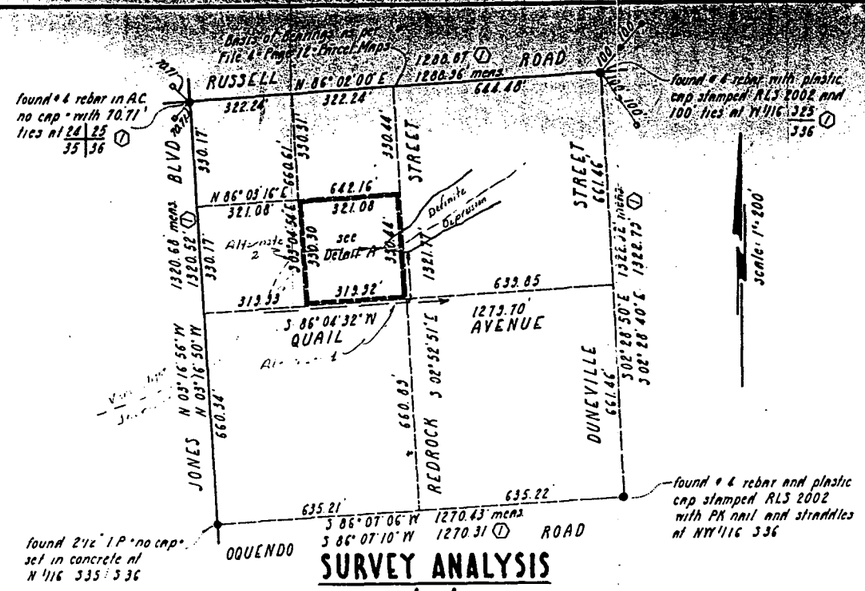
PARADISE SOUTH

DRAINAGE STUDY

The PARADISE SOUTH development consists of existing residential apartment buildings on a 10.9 acre site. It is located in the southwest quarter of the southwest quarter of Section 15, of Township 21 South, Range 61 East, M.D.B.&M., Clark County, Nevada. The development site is bounded on the north by Twain Avenue, on the south by Albert Avenue, on the east by Paradise Road, and on the west by Palos Verdes Road. The surrounding areas to the north and east are residential, the area to the west is commercial, and the area to the south is undeveloped. The area to the south includes the Flamingo Wash. The exact location of our project is included.

Until recently, the natural flow of the Flamingo Wash was across Paradise Road, into an undeveloped lot between a shopping center to the south and the Sheffield Inn to the north on Paradise Road, and from there to the east in a flood plain to the south of the Paradise South development. Due to debris and lack of grading in the undeveloped lot on Paradise Road, water accumulated against the block wall on the south property line of the Sheffield Inn, causing the wall to collapse. The flow has since been blocked from entering the lot by an earth bern on Paradise Road, and is directed south to an alley adjacent to the shopping center, which then directs the water to the east. At this point the water is confined within earth berms which have been recently excavated by the County, forming a channel to contain the flow.





SURVEY ANALYSIS

NW¼NW¼

SECTION 36 · T 21 S · R 60 E · MDM

SURVEYOR'S CERTIFICATE

I, Richard N. Brand, a registered [illegible] State of Nevada, certify that:

1. This is a true and accurate representation of the lands surveyed under my supervision at the instance of Isaac Zampell and Eugene Zampell.
2. The lands surveyed lie within the NW¼NW¼ section 36, T. 21 S., R. 60 E., M.D.M., and the survey was completed on June 17, 1983.
3. This plat complies with applicable state statutes and any local ordinances.
4. The monuments are of the character shown and occupy the positions indicated.

dated this ____ day of _____, 1983.

Richard N. Brand
R.L.S. 4535

OWNERS' CERTIFICATE AND DEDICATION

Isaac Zampell & Eugene Zampell do hereby certify that we are the owners of the lands shown hereon and do hereby consent to the preparation and recordation of this plat and have caused said lands to be surveyed and platted into parcels and streets as shown and do hereby offer and dedicate the public streets to Clark County, Nevada, its successors and assigns, for the use of the public, and any easements shown hereon, for the construction and maintenance of subterranean utilities and such street grading and drainage as may be required by NRS 278.010 through 278.630, inclusive.

Isaac Zampell date Eugene Zampell date

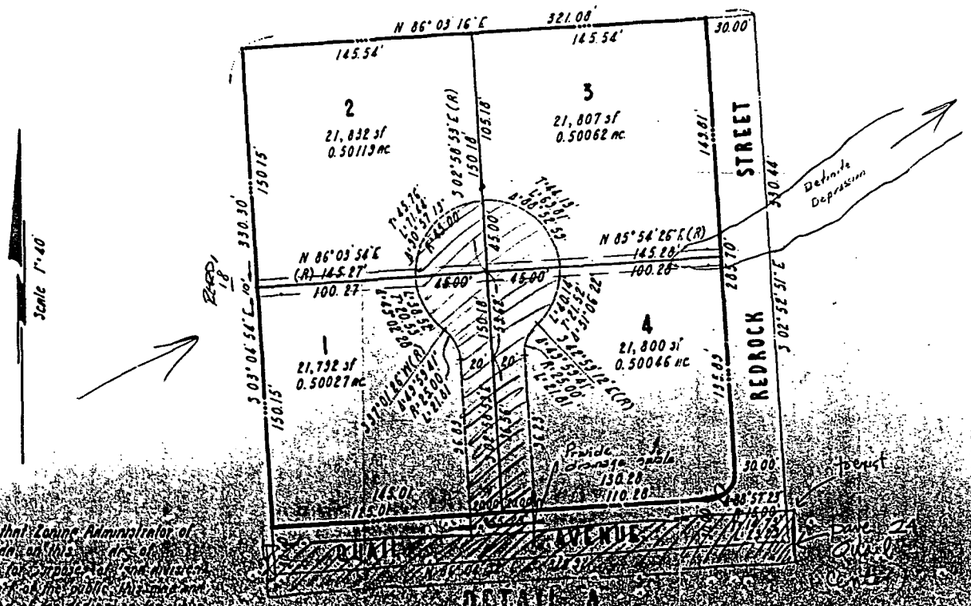
ACKNOWLEDGMENT

State of Nevada } ss.
County of Clark }

On this day of , 1983, personally appeared before me, a notary public, Isaac Zampell & Eugene Zampell who acknowledged to me that they executed this instrument.

notary public

my commission expires: _____



APPROVED:

This is to certify that Zoning Administrator of Clark County, Nevada on this ____ day of ____ 1983 did approve the tentative map of said subdivision and did accept on behalf of the public all parcels and streets offered for dedication on said map and did approve the annexation of all parcels offered for dedication to the Las Vegas Valley Water District.

John A. Pappageorge
Zoning Administrator date

Dave Swanson - 821-6567

PARCEL MAP

A DIVISION OF THE SE¼NW¼NW¼NW¼
SECTION 36, T 21 S., R 60 E.
M.D.M.
CLARK COUNTY NEVADA

Instrument
Official Records Book ____
Filed at the request of
SUN SURVEY
date ____ at ____ M.
FILE ____ PAGE ____
OF PARCEL MAPS
Clark County, Nevada
Joan L. Mill, Recorder
fee ____

Baughman / Turner Inc.

LETTER OF TRANSMITTAL

LAS VEGAS, NEVADA OFFICE

Date	01/22/85 — 15-21-61
Attention	Gus Gedeszbury
	Jack Cason

RECEIVED
JAN 22 1985
CLARK COUNTY PUBLIC WORKS

TO Clark County Flood Control Dept.

GENTLEMEN:

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
2			Hydrology Study

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ 19____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO _____ SIGNED: Richard J. Baughman/pad

If enclosures are not as noted, kindly notify us at once.

JACK CASON
ROLL 4 - FLASH 57
22-21-61

HYDROLOGY STUDY

SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.B.&M.

CLARK COUNTY, NEVADA

PREPARED FOR:

JACK CASON

PREPARED BY:

BAUGHMAN & TURNER, INC.
2325 WEST CHARLESTON BOULEVARD
LAS VEGAS NEVADA 89102
702-870-8711

REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA
RICHARD J. BAUGHMAN
CIVIL
1-22-85
No. 7162

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Slope Adjustment Factors.....16
Runoff Depth Chart.....17

The purpose of this Hydrology Study is to determine the existence of potential flood hazards which might affect the site. This Study intends to show what measures, if any, the Developer of the site should take in order to protect his property against flood damage.

Data used in the analysis of this Study was obtained from field observation and utilising available topographic maps.

All runoff calculations for this Hydrology Study are based on the methods as outlined in the publication "Urban Hydrology for Small Watersheds (TR-55)" as published by the U.S. Soil Conservation Commission.

LOCATION AND EXISTING TOPOGRAPHY

The subject site is described as a portion of the Northwest Quarter (NW 1/4) of the Northwest Quarter (NW 1/4) of the Northwest Quarter (NW 1/4) of the Northwest Quarter (NW 1/4) of Section 22, Township 21 South, Range 61 East, M.D.B.&M., Clark County Nevada. It is further described as Clark County Assessors Parcel No. 15-27-009 and is located at the Southwest corner of Flamingo and Paradise Roads. The site is bounded on the South by vacant land, on the West by an existing motel, to the North of Flamingo Road by vacant land, and to the East of Paradise Road by an existing hotel-casino.

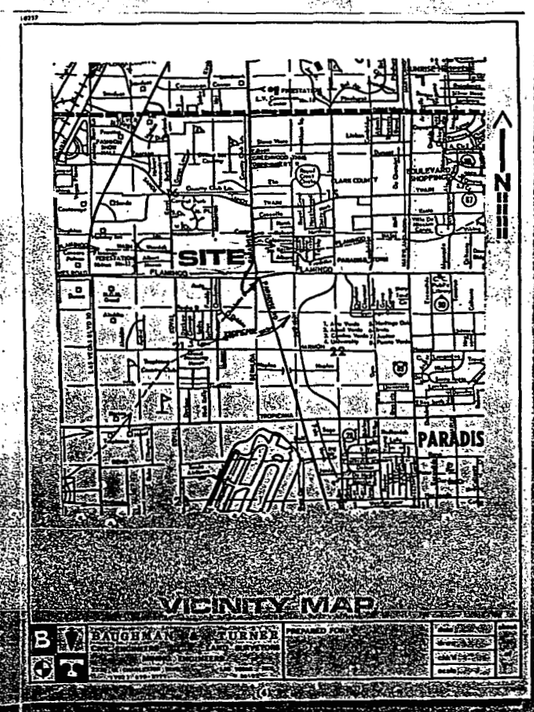
The subject land, as well as the lands immediately surrounding it has a general slope from West to East at an approximate grade of 1%. Potential storm runoff which could impact the site coming from the general upland drainage area is diverted by the existing motel and is collected within the right-of-way of Flamingo Road. Potential runoff eministing from the motel is diverted by an existing paved drainage swale running from South to North along East side of the motel and is discharged into Flamingo Road. Under the conditions of the proposed reconstruction of Flamingo Road by the State Highway Department, including the installation of drop inlets at the two curb returns, upland runoff will not cross the subject site.

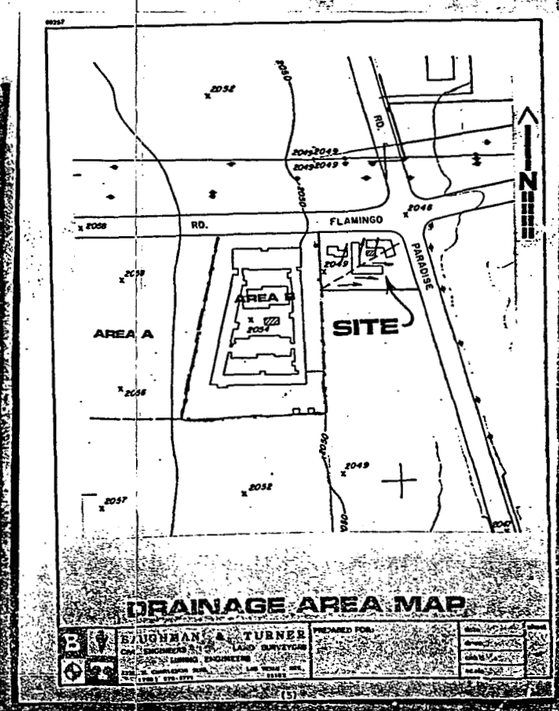
The site is not within the 100 year flood hazard boundaries

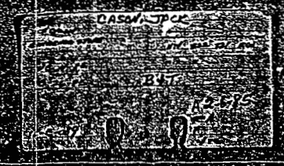
SUMMARY AND RECOMMENDATIONS

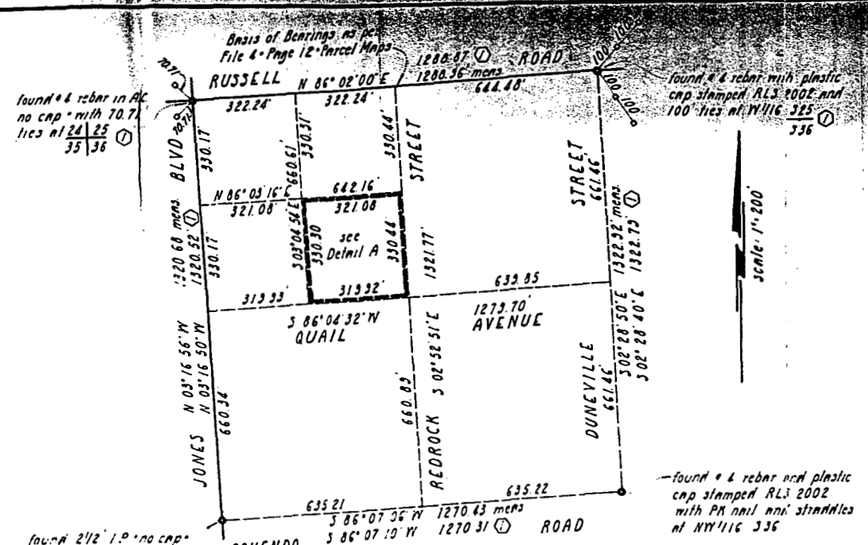
The only flood control concern in the development of the subject site is the discharge of potential runoff generate from the site. The upland areas generating a total runoff of 18.7 c.f.s. discharge into Flamingo Road with a capacity of 29.9 c.f.s.

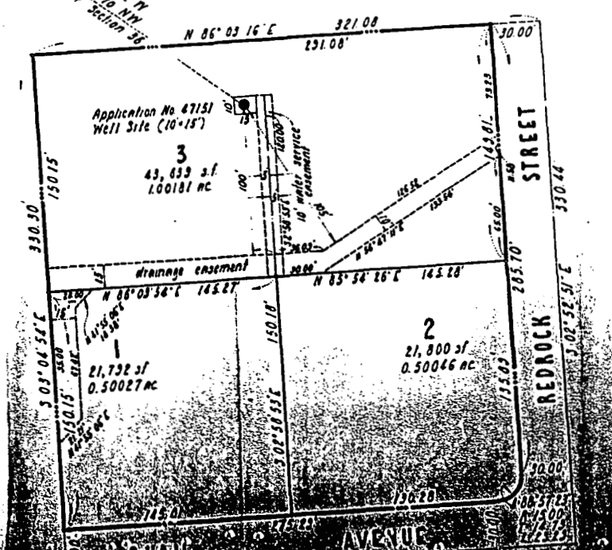
The site itself should be graded so that the runoff will discharge into Flamingo Road (4.6 c.f.s) and into Paradise Road (4.3 c.f.s). Each street has the capacity to carry those quantities of flow. Flamingo as previously stated and Paradise Road to flow to an existing drop inlet located approximately 600 feet South of the site.











SURVEYOR'S CERTIFICATE

I, Richard N. Brand, a Registered Land Surveyor in the State of Nevada, certify that:

1. This is a true and accurate representation of the lands surveyed under my supervision at the instance of Isaac Zampell and Eugene Zampell.
2. The lands surveyed lie within the NW¼NW¼ Section 36 T. 21 S., R. 60 E., M.D.M., and the survey was completed on June 17, 1983.
3. This plat complies with applicable state statutes and any local ordinances.
4. The monuments are of the character shown and occupy the positions indicated.

dated this 17th day of June, 1983.

Richard N. Brand
Richard N. Brand
R.L.S. 4535

OWNERS' CERTIFICATE AND DEDICATION

Isaac Zampell & Eugene Zampell do hereby certify that we are the owners of the lands shown hereon and do hereby consent to the preparation and recordation of this plat and have caused said lands to be surveyed and platted into parcels and streets as shown and do hereby offer and dedicate the public streets to Clark County, Nevada, its successors and assigns, for the use of the public, and any easements shown hereon, for the construction and maintenance of subterranean utilities and such street grading and drainage as may be required by NRS 278.010 through 278.630, inclusive.

Isaac Zampell 6/27/83 — Isaac Zampell — date
Eugene Zampell 6/27/83 — Eugene Zampell — date

ACKNOWLEDGMENT

State of Nevada } ss.
County of Clark }

On this 27 day of June, 1983, personally appeared before me, a notary public, Isaac Zampell & Eugene Zampell who acknowledged to me that they executed this instrument.

Humberto E Linares
notary public
Humberto E Linares

my commission expires: Dec 7, 1987

APPROVED:

This is to certify that Zoning Coordinator of Clark County, Nevada, on this ___ day of ___, 1983, did approve for purposes of land use and zoning, and accept on behalf of the public, this plat and any parcels of land set for dedication to public use in conformity with the terms of the offer of dedication per NRS 278.010 through 278.630.

Zoning Coordinator: Greg Borgel
date

LEGEND

- ● point fd. - as shown
- • set rebar & cap - RLS 4535
- —— water easement

PARCEL MAP

A DIVISION OF THE SE¼NW¼NW¼NW¼ SECTION 36 T. 21 S. R. 60 E. M.D.M.

CLARK COUNTY NEVADA

FM 154-83

Instrument No. ___
Official Records Book ___
Filed at the request of SUN SURVEY
on ___ Page ___
Of PARCEL MAPS
Clark County, Nevada, records
JOHN R. SWIFT, Recorder
Fee: ___ Deputy

HARMON AVE.

HARMON

BLVD.

LAS VEGAS

TROPICANA AVE.

KOVAL

DECKOW

AMAR

CHANEL

FLOOD

MEDITERRANEAN VILLAGE

BLOCK FENCE

NEW PAVED DRIVE

BLOCK WALL

2-24" RCP @ 0.30% CAPACITY = 21.5 cfs

19.5 cfs

21.5 cfs

12.5 cfs

6.10 cfs

EL. 2106

MH. 531 2071.80

ASPH.

DRAINAGE MAP FOR MEDITERRANEAN VILLAGE

Prepared by KRAEMER ENGR. CO.

RALPH L. KRAEMER No. 7888 REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA

11-30-82

MEDITERRANEAN VILLAGE
ROLL 4 FLASH 53
S T R
21 21 61

VERTICAL DATUM IS MEAN SEA LEVEL
PROJECTION NEVADA STATE COORDINATE SYSTEM
ZONE EAST

SCALE 1" = 100'

CONTOUR INTERVAL

SHEET NO.

CLARK COUNTY REGIONAL AERIAL MAPPING PROJECT

COORDINATED BY
CLARK COUNTY REGIONAL PLANNING COUNCIL
118 SOUTH FOURTH STREET, LAS VEGAS, NEV.

TOPOGRAPHIC MAP OF
S 1/2 OF SECTION 21 T 21 S, R 61 E
M.D.B. & M.
CLARK COUNTY, NEVADA

DATE 10-82

SHEET 2 OF 2

AMBASSADOR INN
ROLL 04 · FLASH 56
22-21-61

MEMO
URGENT – REPLY IMMEDIATELY
NO REPLY REQUIRED
12-17-85
CT: AMBASSADOR INN
KING LOT
is approved.
DATE

KRAEMER ENGINEERING CO., INC.
3355 S. Highland Dr., Suite 102
Las Vegas, Nevada 89109
(702) 732-0517

December 5, 1985

Clark County Public Works
Flood Control Department
401 South Fourth Street
Las Vegas, Nevada 89101
Attn: Mr. Lou Vita

Re: Drainage Report for 2.7 acre parking lot addition to the Ambassador Inn Hotel

Dear Mr. Vita,

The Ambassador Inn Hotel is presently remodeling and as a result must increase its parking capacity by 172 spaces. This will be accomplished when a newly acquired parcel along Paradise Road is built as shown on attached Exhibit A.

The existing Ambassador Inn Hotel has a six foot block fence along its westerly and southerly boundaries and drains entirely to Flamingo Road. The new parking lot will drain 5.8 cfs to Paradise Road which drains southerly to a drop inlet approximately seventy south into a 24-inch RCP which then drains easterly across Paradise Road. Any overflow at this point would find its way into Tropicana Wash which flows across Paradise Road 400 feet south of the parking lot. This concrete structure consists of ten 4' X 10' barrels and has an invert elevation of 43.4 which is 3.7 feet lower than the lowest (southeast) corner of the parking lot. (See Exhibit B).

Should you have any questions concerning this proposed project please contact this office at your earliest possible convenience.

Very truly yours,

Ralph L. Kraemer

Ralph L. Kraemer, P.E.

REGISTERED PROFESSIONAL ENGINEER-STATE OF NEVADA
RALPH L. KRAEMER
CIVIL
No. 1096

RLK/et
CC: Richard Hainsworth

RECEIVED
DEC 5 1985
COUNTY PUBLIC WORKS

4.D
2:35

MARIE ANTOINETTE
ROLL 4 FLASH 52

31-21-61

July 22, 1975

Mr. Albert Gereten, Jr.
The Gereten Companies
9777 Wilshire Blvd., Suite 600
Beverly Hills, California 90212

Subject: Storm Drainage - Marie Antoinette

Dear Mr. Gereten:

Pursuant to your request, the undersigned has made a study of the drainage conditions as they affect the Marie Antoinette apartment project.

The Tropicana Wash traverses this property. During the design phase, the undersigned designed a fully enclosed box culvert that traverses under a portion of the parking garage. The flow capacity of this culvert is 3,500 cubic feet per second. Drainage structures upstream from the Marie Antoinette have a flow capacity varying from 2,800 to 3,200 cubic feet per second. The State Highway Department, when designing Interstate Highway 15 west of the Strip, made a complete hydrology study of the Tropicana Wash and its tributaries. Their study indicates that the maximum storm water runoff in the Tropicana Wash is 3,200 cubic feet per second.

The undersigned has made measurements of the depth of flow in the box culvert under the parking garage at the Marie Antoinette project. It has been determined from these measurements that 2,000 cubic feet per second flow was experienced during the July 3, 1975 storm.

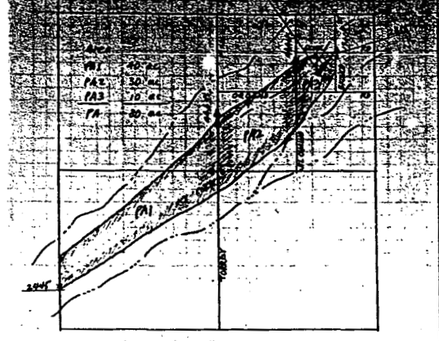
This report is being submitted to Mr. James Scholl, Flood Control Engineer for Clark County Public Works Department, for his review and comments.

Trusting this meets with your approval, I am

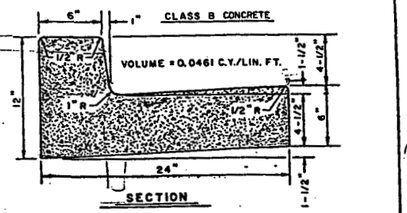
Very truly yours,

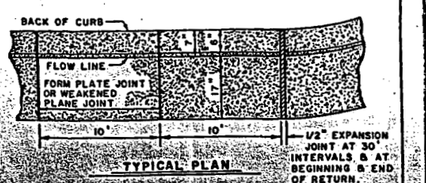
Karsten T. Bronken, P.E.
Consulting Engineer

KTB/ab
cc: Mr. James Scholl



± 25 ± Acre Parcel :
The NE ¼ of the SW ¼ of the NE ¼ of the NE ¼ of Section 35 T.21S. R.60 E. M.D.B.&M





NOTE: EXPANSION JOINTS SHALL BE FLUSH ON UNEXPOSED SURFACES FROM 5' BACK FOR EXPANSION JOINT & WEAKENED PLANE JOINTS. SEE DWG. NO. D-18

	BASE	CONCRETE	JOINT FILL
SECTION REFERENCE	200-2	201 Para.	207.0 Para.

CURB & GUTTER TYPE

UNIFORM STANDARD DRAWINGS FOR CLARK COUNTY AREA

ISSUED 11/77 | REV | DWG NO D-19 | PAGE 76

S 35 T21S R60E

PM807-81

ROLL 3 FLASH 33

HYDROLOGY STUDY

Prepared for:

Fred Buchanan
7050 W. Desert Inn Rd.
Las Vegas, Nevada 89102

2.5± Acre Parcel

The NE 1/4 of the SW 1/4 of the NE 1/4 of the NE 1/4 of Section 35 Township 21 South Range 60 East M.D.B.&M

Clark County Area, Nevada

Prepared by:

Baughman & Turner, Inc.
2325 West Charleston Blvd.
Las Vegas, Nevada 89102

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Drainage Calculations for Ditch & Streets.....21-22
Grading Plan.....23

1. Natural drainage pattern except ... Drainage with ... boundaries. ... Overall.
3 ... drainage ... would ... 1" = 20'

Purpose and Intent

The purpose and intent of this Hydrology Study is to determine what effect storm runoff will have on the development of this proposed parcel, and what effects the development of this proposed parcel will have on the surrounding area. This report examines the existing storm runoff that flows to the parcel from the Southwest, and the effects of potential development within this drainage area.

Calculations for this Hydrology Study are based on the methods as outlined in the publication "Urban Hydrology for Small Watersheds" (TP-55) as published by the U. S. Soils Conservation Commission.

Proposed Development

The future development of this 2.5± Acre Parcel will eventually require the construction of street improvements for both Quail Road along the North property line, and Bronco Street along the East property line. Both future streets will have 60 foot right of ways. The construction of each street will have a centerline profile that follows the existing contours, with the intersection of the two streets being the drainage direction for each street. The gradient will be approximately 1.0% for each. When constructed they will be capable of carrying runoff within drainage Area EA.

The future development of the four 2.5± Acre Parcels within the Southwest Quarter (SW 1/4) of the Northeast Quarter (NE 1/4) of the Northeast Quarter (NE 1/4) of this Section 35 will also require eventual street improvements for El Camino and Oquendo Roads. Three of these parcels can reasonably be graded to drain surface runoff to its future street (See Map page 11). The Southwest parcel, however, will require a possible drainage easement, through the Northwest parcel, where the drainage swale naturally flows. This easement will more than likely be relocated to the East property line such that runoff will be able to drain North to Quail Road. This easement should become combined with the drainage easement proposed for the Buchanan parcel. If no easement is provided for, this Southwest parcel will require regrading and fill in excess of seven (7) feet.

The future development within drainage Area EA could occur sporadically or all at once. Sporadic development will increase the curve number of the drainage area, directly increase the runoff. If the area were developed all at once, the drainage area would be reduced in size but the curve number would increase. The ultimate development of this drainage Area EA would show the following:

1. That portion of the EA (PA1) West of Torrey Pines would be intercepted by the street improvements and discharged at some point to the North into the tributary channel.

2. Development of Oquendo Road would likewise intercept runoff from EA (PA2) on the East side of Torrey Pines. (The major channel crossing Oquendo Road to the West of Torrey Pines would not intercept but pass the runoff North.

3. El Camino Road will eventually cut off runoff from the West and discharge it to the North (probably including Oquendo Road).

4. The ultimate drainage Area EB (PA3) would therefore consist of runoff from the Southwest Quarter (SW 1/4) of the Northeast Quarter (NE 1/4) of the Northeast Quarter (NE 1/4) of this Section 35. Runoff through the drainage easement would consist of 3± Acres. Runoff at Quail Road and Bronco Streets would be 10 Acres maximum.

5. Bronco Street is to be graveled between Oquendo Road and Quail Road. Quail Road is to be graveled along the North property line. Drainage ditches will be required along the sides of each

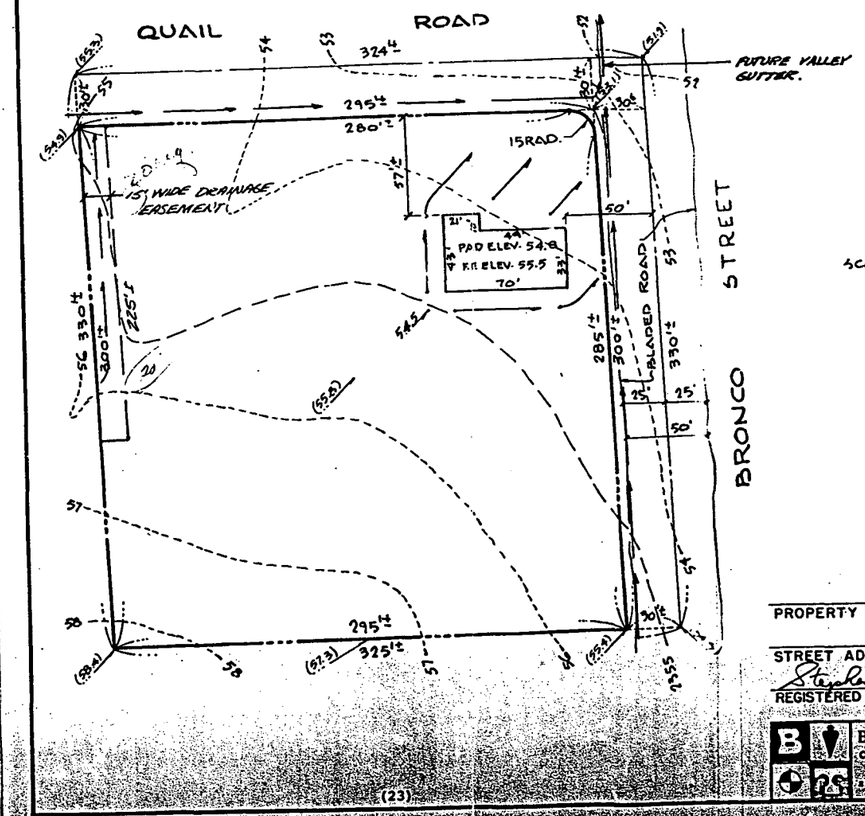
STORM WATER RUNOFF (24 HOUR PRECIPITATION)
(AFTER DEVELOPMENT)

DRAINAGE BASIN	AREA (ACRES)	CN	Tc (hr)	PEAK DISCHARGE CFS/IN	RUNOFF DEPTH (IN) 10 YR	25 YR	50 YR	100 YR	RUNOFF (EACH BASIN) (CFS) 10 YR	25 YR	50 YR	100 YR
PA1	Cutoff at Torrey Pines 16.8	90		15.3 (1.61)	1.09	1.44	1.71	1.98	18.7	22.0	26.2	30.3
PA2	Cutoff at El Camino Road 16.1	90		16.5 (1.61)	1.09	1.44	1.71	1.98	18.0	23.8	28.2	32.7
PA3	Ultimate Drainage at Quail Road and Bronco Street 10.2	90		10.8 (1.61)	1.09	1.44	1.71	1.98	11.8	15.6	18.5	21.4
PA	Total Maximum Drainage at Quail Road and Bronco Street 44.9	90		33.0	1.09	1.44	1.71	1.98	36.0	47.5	56.4	65.3
					1.09	1.44	1.80	1.98	33.8	44.4	52.8	61.4
					1.09	1.44	1.80	1.98	34.4	44.9	53.5	61.1
					1.09	1.44	1.80	1.98	14.4	19.0	22.8	26.1
					1.09	1.44	1.80	1.98	82.0	108.3	128.5	148.0

APPENDIX

GRADING PLAN

THE NE¼ OF THE SW¼ OF THE NE¼ OF THE NE¼ OF SECTION 35, TOWNSHIP 21 SOUTH, RANGE 60 EAST, M.D.B. & M.



SCALE: 1" = 50'

BENCH MARK

B.M. #C105W'25 REBAR IN SOUTHBOUND LANE OF JONES @ RUSSELL ROAD. ELEV. = 2339.49 C.C.C.D. DATUM

STEPHEN F. [illegible] No. 1333 REGISTERED LAND SURVEYOR STATE OF NEVADA

LEGEND

(98.0) EXISTING ELEV.

98.4 FINISH DESIGN ELEV.

DRAINAGE SWALE (1% MIN.)

NOTE:
THIS PLAN HAS BEEN PREPARED FOR GRADING PURPOSES ONLY. THE LOCATION AND CONFIGURATION OF STRUCTURES ON THE PROPERTY ARE TO BE DETERMINED FROM OWNERS PLOT PLAN. THIS IS NOT A MAP OF SURVEY.

PROPERTY OWNER _____ DATE _____

STREET ADDRESS _____ APP'D. CLARK COUNTY FLOOD CONTROL

Stephen F. Turner
REGISTERED LAND SURVEYOR

BAUGHMAN & TURNER
CIVIL ENGINEERING — LAND SURVEYORS
MINING ENGINEERS
2329 W. CHARLESTON BLVD. LAS VEGAS, NEV. 89102
(702) 870-8771

PREPARED FOR: FRED BUCHANAN

date NOV. 1981
drawn L.J.T.
chkd C.E.C.
scale 1" = 50'

(23)

16x

EXHIBIT 10-6

AERIAL PANEL SURVEYS

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588
FAX NO. (702) 367-8145

LETTER OF TRANSMITTAL

CH2M Hill
2030 E Flamingo
Las Vegas NV

JOB # : CH2M 004
Tropicana Wash

N: Ted Davis

DATE June 5 1992

nsmitted via:

_Messenger ____Mail ____Fax ____Other

IES	ORIGINAL	DESCRIPTION
1	____	Shts 1 & 2 of 2 Trop Wash Aerial Panel
	____	Locations & Elevs (Values 807, 808, 809 to follow)
	____	Shts 1 - 13 Level Notes
1	____	Three Shts from Assoc Consulting Horiz Control
	____	
	____	

IMENTS: Copy of this package sent to Mike Beske in Redding this date

BY:

EIVED BY

:/trans

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

T R O P I C A N A W A S H

A E R I A L P H O T O G R A M M E T R Y C O N T R O L

JUNE 05, 1992 FOR: CH2M HILL

PROFESSIONAL LAND SURVEYOR — STATE OF NEVADA
WILLIAM T. AVERY
No. 5571

6-05-92

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT Panel Locations
CLIENT CH2M 004
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE N/S SHEET NO. 1 OF 2

901 5' Circle SE Quad Twain & Maryland on Sidewalk
CC BM 6C11 14W4 1989.385 NE Cor Maryland & Twain
NEAR PC on MARYLAND
901 EL 1990.39

902 5' Circle PK Nail & Spring Mtn 200' west of I 15
CCBM 7C11 17 NW6 2134.728 NE Cor Polaris
on Spring Mtn Near PC
902 EL 2119.08

903 20' ΔP 100' west of Industrial 600' South of Hacienda
CCBM 6C11 29W4 2198.153 NW Cor Hacienda & UV Near PC UV
903 EL 2178.02

904 5' Circle & INT TROP & LINDELL WELLMON
CCBM 7C10 13S4 2278.431 NE Cor Flamingo & Lindell
7C10 24S4 2274.036 North Side Trop 0.5 miles west of
Decatur 90' West of SE Cor of Block wall for Trailer Park
904 EL 2272.56

905 20' ΔP 100'E & 50'N & INT RAINBOW & Oquendo
CCBM 7C10 23SW5 2348.839 NE Cor Trop & Rainbow near PC
on Rainbow
905 EL 2409.55

801 5' Circle in SW NE Cor Edison & Paradise
CCBM 6C11 15 NWW6 2046.626 NE Cor Paradise Rd
& Edison Ave Near PC on Paradise
801 EL 2046.77

802 5' Circle & Flamingo opp NE Cor BALLYS
CCBM 7C11 21 NNW6 2086.161 NE Cor Flamingo & Audrie PC Flam.
802 EL 2084.16

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT PANEL LOCATIONS
CLIENT CH2M 004
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE N/A SHEET NO. 2 OF 2

803 5' Circle west side Industrial 3000' S. of Flamingo
CCBM 6C11 20SW6 2160.806 NE Cor Polaris & Tompkins
Near PC Polaris
CCBM 6C11 20W6 2144.783 SE Cor Polaris & Harmon
Near PC HARMON
803 EL 2130.95

804 20' AP 50' west of UNLV Football Practice Geld
CCBM 6C11 22W6 2050.888 NE Cor Paradise & Harmon
CCBM 6C11 22NWW6 2046.672 East side Paradise at
Flam Wash Box North of South Driveway Villa De Paradise Apts
804 EL 2036.13

805 5' Circle Near Int of Schuster & Graphic Center in Punt
CCBM 6C11 20SW5 2175.817 NE Cor Trop & UV PC Trop
CCBM 6C11 29NWW6 2191.043 SE Cor UV & Reno PC UV
805 EL 2190.41

806 20' AP 500'E of Powerline 100S of Hacienda
CCBM 6C11 30E6 2217.14 BLM B/C E 1/16 cc Sec30 1957 Hacienda
& Wynn
CCBM 7C11 19SW5 2245.206 NE Cor Trop & Decatur PC Trop
806 EL 2274.45

807 20' AP 400N & 300E of Russel & Duneville

808 20' AP 100' N of Sunset 3/4 mile East of Rainbow

809 20' AP 150'N & 150'E of Sunset & Rainbow

810 5' Circle in SW NW Cor Hacienda & Rainbow
CCBM 7C10 23SW5 2348.839 NE Cor Trop & Rainbow
Near PC Rainbow 810 EL 2376.67

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT PANEL LEVELS
CLIENT CH2M 004
CALCULATED BY MTL RR DATE 5-27-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 1 OF _____

RS HI ES ELEV

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
CCBM 6C11 14 S W N 6	717 572 428 ✓	1992.20		1986.482	~~CCBM 6C11~~ EAST SIDE ~~14 S W N 6~~ MARYLAND PKWY NORTH ELEVATOR ASK
TP1			493 340 189 ✓	1988.80	E.P.
	861 656 655 450 ✓	1995.36			
TP2			583 429 274 ✓	1991.07	T C
	493 443 394 ✓	1995.50			
PANEL 901			554 510 466 ✓	1990.40	1990.39
	574 517 518 462 ✓	1995.58			
TP3			607 452 298 ✓	1991.06	T C.
	501 307 113 ✓	1994.13			
TP4			858 675 493 ✓	1987.38	EP
	495 319 380 284 ✓	1991.18			
CCBM 6C11 14 S W N 6			536 467 397 ✓	1986.51	
	Σ 28 76		Σ 28 73	Δ 0.03	

WESCO SURVEYS, INC.
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SUITE 60
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(702) 367-0588

PROJECT PANEL Levels
CLIENT CH2M 004
CALCULATED BY MTL RR DATE 5-27-97
CHECKED BY DATE
SCALE SHEET NO 2 OF

BS + HI FS. ELEV

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
CCBm 7C11 17 NW6	360,195,030 ✓	2136.68		2134.728	NE QUAD SPRING MTN & POLARIS
TP1			1095,913,731 ✓	2127.55	TC ISLAND
	341,249,156 ✓	2130.04			
PANEL 902			1234,1095,958 1096	2119.08	200' west of I-15
	1246,105,964 ✓	2130.13			
TP1			349,258,166 ✓	2127.55	
	973,829,685 ✓	2135.84			
~~CCBm 7C11 17NW6~~					
TP2	~~360,210,061~~		360,210,061 ✓	2133.74	
	620,587,555 ✓	2139.61			
CCBm 7C11 17NW6			510,487,464 ✓	2134.74	
	Σ 2965		Σ 2964	Δ 0.01	

WESCO SURVEYS, INC.
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PROJECT PANEL Levels
CLIENT CH2M OC4
CALCULATED BY MTL RR DATE 5-27-92
CHECKED BY DATE
SCALE SHEET NO. 3 OF

BS+ HI FS- ELEV

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
CCBM 6C11 29W4	677 592 591 507 ✓	2204.07		2198.153	NE Quad PC Valley View
TP1			929 784 640 ✓	2196.23	TC
	253 132 133 013	219756			
TP2			1100 953 954 809 ✓	2188.02	EP
	332 217 216 103 ✓	2190.19			
TP3			1026 889 880 750	2181.31	SET Spike
	600 395 189 ✓	2185 26			
TP4			1064 910 755 ✓	2176.16	SET Ginny
	692 522 353 ✓	2181.38			!
PANEL 903			423 353 334 245 ✓	2178.04	2178.02
	432 328 330 324 226 ✓	2181.33			
TP5			553 390 341 229 ✓	2177.42	SET Spike
	955 822 690 ✓	2185.64			
TP6			700 512 323 ✓	2180.52	SET Ginny
	1085 915 914 745 ✓	2189.67			
TP7			272 1A 056 ✓	2188.03	EP
	1232 1060 890 ✓	2198.64			
TP8	-0-		307 180 056 ✓	2196.84	EP
	834 694 556 ✓	2203.79			
CCBM 6C11 29WA			618 560 501 ✓	2198.19	
	E 56.81		E 56.77	Δ .04	

WESCO SURVEYS, INC.
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PROJECT PANEL LEVELS
CLIENT CH2M 004
CALCULATED BY MLTL RR DATE 5-27-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 4 OF _____

RS + HI FS - ELEV

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
CCBM TC10 7454	376 343 319	227747		2274.036	
WELL MON.			528 491 455	2272.56	TRUP & Lindell Shot ON Rim
	536 500 464	2277.56			
			386 352 318	2274.04	
				Δ 0.00	

WESCO SURVEYS, INC.

3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT TROP WASH PANELS
CLIENT CH2M HILL
CALCULATED BY TGM RR DATE 5-28-92
CHECKED BY _____ DATE _____
SCALE ~~ELEV~~ SHEET NO. 1A OF _____

B/S HI F/S

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
BM	553 543 533	52.06		2046.626	CCBM 6C11 ON NW C NE QUAD EDISON & PARADISE
AP 801			536 529 522	2046.77	EDISON & PARADISE NE QUAD
	640 533 426	52.10			
			557 546 536	2046.64	
				Δ 0 01	
BM — MISSING				2056.888	CCBM 6C11 22 W C NE QUAD PARADISE & HARMON
BM	626 525 423 ✓	51.92		2046.672	CCBM 6C11 22 NW C NO OF SO. DIV FAULTSTONE CREEK
					APTS ON EAST SIDE OF PARADISE (U.S. 93 HARMON/FLAMINGO)
TP 1			671 569 466 ✓	46.23	MARK IN A.C.
	424 308 192 ✓	49.31			
TP # 2			852 722 593 ✓	42.09	MARK ON T/C WEST SIDE OF SWENSON
	484 356 229 ✓	45.65			
TP 3			759 623 487 ✓	39.42	TOP OF ROCK
	419 392 245 ✓	42.74			
AP 801			723 661 599	36.13	WEST SIDE OF UNLV FOOTBALL PRACTICE FIELD 2036.13
	702 640 578 ✓	42.53			
TP 5 (RETURN)				399 311 224 ✓	39.42

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
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(702) 367-0588

PROJECT TROP WASH POINTS
CLIENT CLARK COA
CALCULATED BY TBM RL DATE 5-28-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 5 OF _____

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
TP 3 RETURN	718 590 462 ✓	45.32			
TP 2 RETURN			459 324 188 ✓	42.08	
	843 713 584 ✓	49.21			
TP 1 RETURN			415 298 182 ✓	46.23	
~~BM~~	682 579 476 ✓	52.02			
			637 535 434 ✓	2046.67	
BM	464 377 285 ✓	89.93		~~[illegible]~~ 2086.161	ACBM 7C11 21 NNW C NE QUAD FLAMINGO / MAIDEN
AP 802			671 577 484 ✓	84.16	@ FLAMINGO OPPOSITE NE COR BALLY'S 2084.16 (5' CIRCLE)
	645 550 456 ✓	89.66			
BM			442 350 259 ✓	86.16	

WESCO SURVEYS, INC.
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SUITE 60
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PROJECT TROP W/SH PANELS
CLIENT CURM HILL
CALCULATED BY TRH RR DATE 5-28-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 6 OF _____

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
BM	538 467 396 ✓	45.48		2160.806	6CII 20 SW 6 CCBM NE QUAD POLARIS/TOMPKINS
TP 1			885 778 671 ✓	57.70	TOP BACK CURB @ NEAR BCR COMMERC. D/W EAST (SO. SIDE)
	235 138 041	59.08			
TP 2			1081 1023 965 ✓	48.85	T/C ± 650 EAST OF POLARIS SO SIDE OF TOMPKINS
	257 183 109 ✓	50.68			
TP 3			1444 1365 1287 ✓	37.03	T/C NO SIDE TOMKINS ± 250' WEST OF INDUST.
	434 305 176 ✓	40.08			
TP 4			953 831 708 ✓	31.77	T/C ± 250 NO. OF TOMPKINS WEST SIDE OF INDUSTRIAL
	462 429 396 ✓	36.06			
AP 803			542 511 481 ✓	30.95	2130.95
	528 498 467 ✓	35.93			
TP 4 (RETURN)			448 416 383 ✓	31.77	
	952 829 706 ✓	40.06			
TP 3 (RETURN)			432 303 174 ✓	37.03	

WESCO SURVEYS, INC.
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SUITE 60
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PROJECT TROF WASH PANELS
CLIENT Gulf Hill
CALCULATED BY [illegible] DATE 5-28-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 7 OF _____

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
TP3 (RETURN)	1408 1328 1248 ✓	50.31			
			[redacted]		
TP2 (RETURN)			217 145 073 ✓	48.86	
	1090 1032 974	✓ 59.18			
TP1 (RETURN)			[redacted] 147 ✓ 050	57.71	
	945 837 729 ✓	66.08			
BM			596 526 456	60.82	

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
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(702) 367-0588

PROJECT TROPICANA WASH PANELS
CLIENT CH2M HILL
CALCULATED BY KH RL DATE 5-29-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 8 OF _____

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
BM	379 260 142 ✓	93.64		2191.043	CCBM 4411 29NWW6 SE QUAD VALLEY VIEW & RENO
TP 1			757 616 476 ✓	87.48	TOP OF ROCK ± 200' SO OF BELL DR. : WEST SIDE OF VALLEY VIEW
	430 324 219 ✓	90.72			
TP ~~#~~ 2			1097 768 759 ✓	81.44	T/C @ SW QUAD GRAPHIC CTR & VALLEY VIEW
	1546 1218 1069 ✓	93.62			
AP 805			507 321 135 ✓	90.41	5' OD CIRCLE @ SHUSTER & GRAPHIC CENTER 2190.41
	486 308 114 ✓	93.41			
TP 2 (RETURN)			1325 1196 1068 ✓	81.45	
		~~46~~			
	1078 729 760 ✓	90.74			
TP 1 (RETURN)			431 226 221 ✓	87.48	
	698 567 497 ✓	93.15			
			341 212 089 ✓	91.03	

WESCO SURVEYS, INC.
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SUITE 60
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PROJECT TROPICANA WASH PANELS
CLIENT CH. M 00L
CALCULATED BY [illegible] DATE 5-29-92
CHECKED BY _____ DATE _____
SCALE NTS SHEET NO. 8 9 OF _____

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
.		NOT IN	! →		CCBM 7C10 23SWG NE QUAD TROPICANA & RAINBOW
BM	1091 1007 ✓ 1008 924	55.29		2245.206	CCBM 7C11 193WS
TP 1			199 117 ✓ 035	54.12	EDGE PAVEMNT ± 200' NO SO. OF TROP, EAST SIDE DECATUR
	1089 941 793 ✓	63.53			
TP 2			610 459 ✓ 307	58.94	SET SPIKE ± 800' SO. OF TROP, EAST SIDE DECATUR
	602 457 ✓ 313 318	63.51			
TP 3			1038 894 ✓ 750	54.57	SET SPIKE ± 1400' SO. OF TROP. EAST SIDE DECATUR
	651 498 ✓ 345	59.55			
TP 4			744 595 447 ✓	53.60	SET SPIKE ± 2000' SO. OF TROP. EAST SIDE DECATUR
	849 700 ✓ 701 554	60.61			
TP 5			462 276 ✓ 091 098	57.85	TOP ROCK @ ± 50' SW OF DECATUR / HACIENDA
	1053 893 733	~~66~~.78			
TP 6			119 068 ✓ 016	66.10	TOP ROCK ± 400' WEST OF DECATUR ~~SWEST~~ HACIENDA
	1256 1152 ✓ 048	77.62			
AP 806			392 315 238 ✓	74.47	2274.45

WESCO SURVEYS, INC.
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SUITE 60
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PROJECT Tropicana Wash Panels
CLIENT CLU 004
CALCULATED BY [illegible] DATE 5-29-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO 9 & 10 OF _____

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
AP 80% (RETURN)	372 295 ✓ 216	77.42			
TP6 (RETURN)			1236 1132 ✓ 1028	66.10	
	150 100 ✓ 52	67.10			
TP5 (RETURN)			1086 966 ✓ 766	57.84	
	466 274 ✓ 086	60.60			
TP4 (RETURN)			843 700 ✓ 557	53.60	
	759 606 ✓ 607 455	59.67			
TP3 (RETURN)			658 509 ✓ 360	54.58	
	1031 879 ✓ 727	63.37			
TP2 (RETURN)			579 442 ✓ 306	58.95	
	617 471 ✓ 324	63.66			
TP1 (RETURN)			1105 ~~955~~ 852 ✓ 799	54.14	
	359 276 181	56.84			
			1239 1160 ✓ 1081	45.24	
	Σ 85 48		Σ 85 45	Δ 003	

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT TROP WASH
CLIENT CH2M HILL
CALCULATED BY TEM MTL RR DATE
CHECKED BY DATE 6-3-92
SCALE SHEET NO. 1 OF

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
					TC 10 22 SS E6
BM	268 172 080 ✓	60.94		2364.198	TC 10 22 SE 6 NO SIDE TROP @ CCBM SE RETURN KNOLL/OCO
TP 1			1164 1004 845 ✓	55.90	
	357 209 061	57.99			TOP FGR EAST ON NO. SIDE TROP & TREETWOOD
TP 2			1065 856 726 ✓	49.03	TOP F/C NEAR SC. RETURN @ SW QUAD TROP / RAINBOW
	895 709 523 ✓	56.12			
TP 3			331 232 133	53.80	T/C @ NO. END HEADWALL @ FLAMINGO WASH/~~TROP~~ X-SECT WEST SIDE RAINBOW
	1133 975 818 ✓	63.55			
TP 4			201 108 015 ✓	62.47	T/C WEST SIDE RAINBOW ± 600' S. OF TROPICANA
	~~1077~~ ~~875~~ 773 ✓				APPROX OPPOSITE ENTRANCE TO "TRAILS" APTS.
	1077 950 823 ✓	71.97			
TP 5			~~377~~ ~~213~~ 44 ✓		
			392 267 142 ✓	69.30	T/C
	812 658 ~~659~~ 506 ✓	75.89			
TP 6			300 163 025 ✓	74.26	T/C
	748 624 499 ✓	80.50			
PANEL 810			508 384 260 ✓	76.66	2376 67
	470 366 241 ✓	80.32			

WESCO SURVEYS, INC.

3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

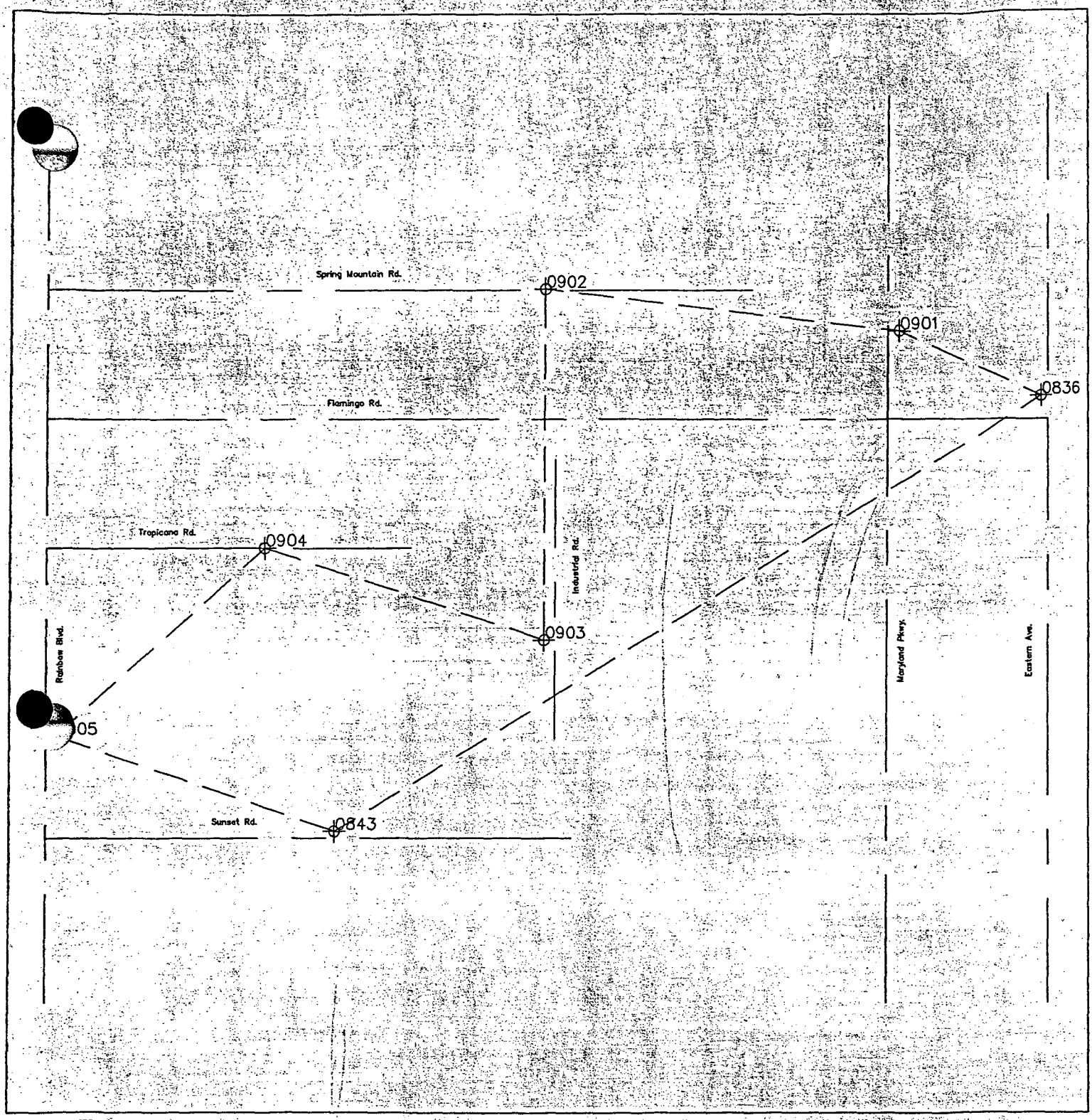
PROJECT TROP WASH
CLIENT CH2M HILL
CALCULATED BY TLH NTL RR DATE 6-3-97
CHECKED BY DATE
SCALE SHEET NO. 12 OF

STATION	BS / SLOPE	HI / ELEV	FS / GRADE	C / F	REMARKS
TP 6			730 605 481	74.27	T/C/RETURN RUN
	300 154 009	75.81			
TP5			796 650 505	64.31	T/C/ RETURN RUN
	383 257 131	71.88			
TP4			1066 940 816	62.48	T/C/ RETURN RUN
	259 190 121	64.38			
TP3			1214 1059 903	53.79	T/C BY HEAD WALL RETURN RUN
	337 239 141	56.18			
TP 2			882 716 550	49.02	T/C @ RETURN S-W QUAD RETURN RUN
	1086 911 736	58.13			
TP1			365 224 083	55.89	T/C FCR NE QUAD TROP & Treet wood
	1152 998 844	65.87			
CCBM			268 169 070	64.18	

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0688

PROJECT Trap Wash
CLIENT CH2M 004
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 13 OF _____

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
PANEL 810	+(-7.02 / -7.02) 7.04	8371		2376 67	
TP1			+11.96 / +11.96	95 67	
TP1	+(-1.58 / -1.60) 1.62	9729			
905			+12.26 / +12.26	2409.50	2409 55 w/Δ
905	+(11.92 / 11.92) 11.91	9764			
TP1			-1.96 / -1.98	95 67	
TP1	+(12.12 / 12.12)	8355			
810			-6.88 / -6.86	76 68	
	-15 43		-15 38	Δ 0.05	
	— —	—	—	— —	
Panel 905	(-2.92 / -2.92)			2409 55	
CCBM			10.40 / 10.42	22 88	2 C10 35W4 DRILL AL PLATE CONC MON
CCBM	(-3.64 / -3.66)				2 C10 35W4
CCBM			11 40 / 11 38	37.91	2 C10 35 SWW6
CCBM	(-5.20 / -5.20)				2 C10 35 SWW6
Panel 809			7 30 / 7 32	2450.42	2450 42



STATE PLANE COORDINATE CONVERSION FACTORS

Mean Radius of Curvature (Ra): (Meters)	6371545.198
Mean Surface Elevation: (Meters)	664.000
Max. (Meters)	734.400
Min. (Meters)	593.400
Mean Elevation Factor:	0.99989585
n Scale Factor:	0.99991611
Combined Factor:	0.99981197

To Convert an SPC Grid Distance to a Surface Distance
Multiply GRID * 1.00018807

N

1"=500'

ASSOCIATED CONSULTING INC.
2245 N. DECATUR BLVD.
LAS VEGAS, NEVADA 89108
TEL. (702) 647-9265

1 METER = 3.2808333333 FEET

NAME	NORTH (y) FEET	EAST (x) FEET	HEIGHT FEET	GEOID FEET	ELLIPS HT FEET	WESCO LEVELS
0836	26743901.548	793212.144	1946.89	.00	1946.89	
0843	26728051.728	767115.762	2325.94	.00	2325.94	
0901	26746289.752	787923.956	1990.38	.00	1990.38	1990.39
0902	26747810.569	774846.029	2119.09	.00	2119.09	2119.08
0903	26735024.151	774845.442	2178.05	.00	2178.05	2178.02
0904	26738365.165	764531.224	2271.65 Top B/C Addolt	.00 To Rim →	2271.65	2272.56 rim
0905	26731523.856	756918.614	2409.37(1)	.00	2409.37	2409.55

STATE PLANE COORDINATE CONVERSION FACTORS

Mean Radius of Curvature (Ra)	=	6371545.198 Mtrs.
Mean Geoid Height	=	.0 Mtrs.
Mean Surface Elevation	=	664. Mtrs.
Max. Elevation	=	734.4 Mtrs.
Min. Elevation	=	593.4 Mtrs.
Mean Elevation Factor	=	.99989585
Mean Scale Factor	=	.99991611
Combined Factor	=	.99981197

To Convert an SPC Grid Distance to A Surface Distance
Multiply GRID * (1.00018807)

NOTES:

(1) Verify with leveled data.

WESCO SURVEYS, INC.

3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588
FAX NO. (702) 367-8145

LETTER OF TRANSMITTAL

TO: CH2M Hill
2030 E [illegible] Ste 250
Las Vegas 89119
ATTN: Ted Davis

JOB # : CH2M004
Duck Creek
Aerial Control
DATE 7-16-98

Transmitted via:

X Messenger ____ Mail ____ Fax ____ Other

COPIES	ORIGINAL	DESCRIPTION
1	____	1 of 2 & 2 of 2 Panel Locations Descript
1	____	Assoc Consulting Map Location
____	____	and calculations
____	____	
____	____	
____	____	

COMMENTS: _____

BY: Bill Avery

RECEIVED BY _____

wd3/trans

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

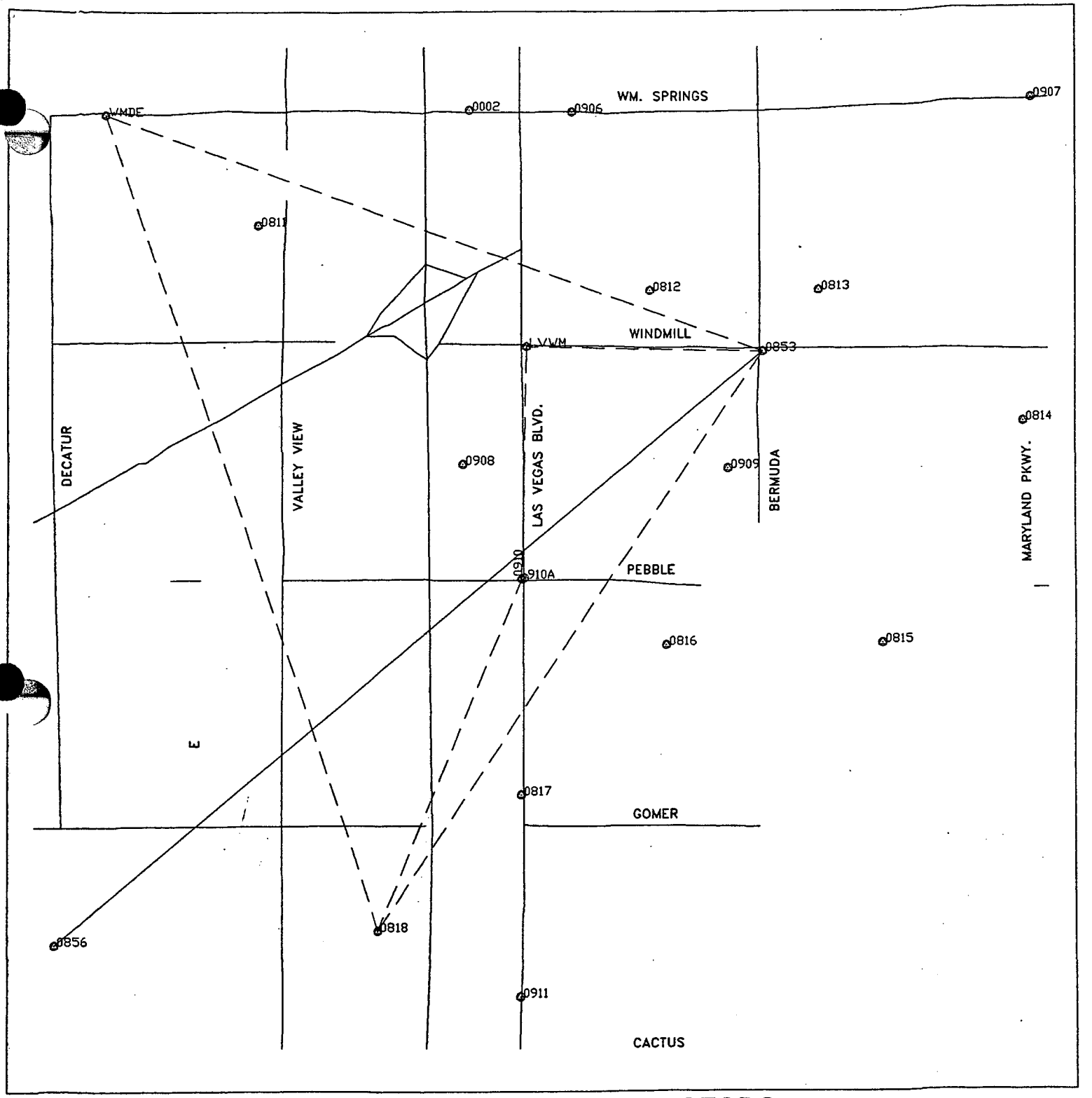
PROJECT CHzM 004
CLIENT PANEL LOCATIONS
CALCULATED BY _____ DATE 5-22-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 1 OF 2

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
Panel #818					150'+- N. Pile Rd. & Industrial
					PK nail ⊙
Panel #811					NE Qd Robindale + Schuster St.
					R.R. spike X
Panel #906					1,000'+- East L.V. Blvd 50'+- N & Warm Spgs
					⊙ P.K. nail
D2 ~~Panel~~ 10 Traverse Point 002	SW cor West	Trans Pad Westerly	OPP T BAR M	Saddletop Bldg Before	1000' West of LV Blvd
Panel #907				I15	150'+- East of Abbyville & Warm Springs Rd
					P.K. nail ⊙
Panel #819					1,400'+- North Windmill Ln. on Amigo St at end
					of AC. P.K. NAIL ⊙
Panel #812					200'+- East Gilespie & Mesa Verde
					P.K. nail ⊙
Panel #909					℄ Intersec. Wigwam + Fairfield.
					on AL CAP PLS 5269 Fullstone. ⊙
Panel #908					℄ Intersec. Wigwam 1,400'+- West L.V. Blvd. on Fnd AL CAP PLS 7812 ⊙
Panel #910					℄ Intersec. L.V. Blvd & Pebble on Fnd RR Spike ⊙
Panel #817					800'+- South Richmar on L.V. Blvd
					Set P.K. ⊙

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PROJECT CHZM 004
CLIENT PANEL LOCATIONS
CALCULATED BY _____ DATE 5-22-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 2 OF 2

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
Panel #911					1,500'+- South of Pile on L.V. Blvd.
					P.K. nail ⊙
Panel # 816					1,800'+- South x 600'+- East of the intersection
Also Painted ○		Sewer MH			Gilespie + Pebble
Blue w white Center		600'W	100'S	of 816	Set RR Spike X
East Side Gilespi					(should check 1st
Panel # 815					4900'+- East x 1200'+- South of Gilespie +
Set Δ'Y'	Panel				Pebble intersection
on	1/16 Cor	T 22S R61E S 1/16 S 22 1957	1300' South	of Pebble	Set RR Spike X
			150' W of	Dirt Rd	
Panel # 814					1000'+- west of End Pavement of Camero
					X 100'+- north of
					Dirt Road Set RR Spike X



STATE PLANE COORDINATE CONVERSION FACTORS

Mean Radius of Curvature (Ra): (Meters)		6371498.129
Mean Surface Elevation: (Meters)		679.000
Max. (Meters)		727.200
Min. (Meters)		628.500
Mean Elevation Factor:	0.99989789	
Mean Scale Factor:	0.99991726	
Combined Factor:	0.99981516	

To Convert an SPC Grid Distance to a Surface Distance
Multiply GRID * 1.00018487

N
1"=3000'

ASSOCIATED CONSULTING INC.
2245 N. DECATUR BLVD.
LAS VEGAS, NEVADA 89108
TEL. (702) 647-9265

POINT DESCRIPTIONS

NAME	DESCRIPTION
0853	Clark Co. GIS monument. B/C in top curb, Windmill and Bermuda. Tied for elevation to CCBM OC21 15NWS.
0856	Clark Co. GIS monument. B/C in conc., NW quad Decatur and Pyle. Horiz. control station.
WMDE	PK nail in A/C ±20 W. of CCBM OC21 7NNW6 at Wm. Springs and Cameron. Vert. control station.
LVWM	CCBM OC21 9SWS. Top curb near 7-11 sign at Windmill and Las Vegas Blvd. Vert. ref. station.
0002	SW cor. of transformer pad 28cm. above natural ground.
0811	Aerial panel point.
0812	PK nail in A/C at aerial panel point ±200 ft. East of intersection of Gillespie and Mesa Verde. Flush w/ surface.
0813	PK nail 1400 ft. N. of Windmill on Amigo. Approx. 10' S. and 10' E. of A/C mrkd "ESI PLS 6305" at NW cor. of subdivision. Flush w/ surface.
0814	R.R. spike in panel pt. ±1000' W. of pavement end on Camero St. and ±100' N. of dirt road. Flush w/ surface.
0815	Aerial panel point.
0816	Aerial panel point.
0817	PK nail set in panel point, ±800' S. of Richmar on Las Vegas Blvd. ±20' W. of centerline of road. Flush w/ surface.
0818	PK nail set in panel point, ±150 N. of Pyle Rd. on Industrial. Flush w/ surface. Tied to CCBM OC21 29N6.
0906	PK nail set in panel point, ±1000 ft. E. of LV Blvd., ±50 ft. N. of centerline of Wm. Springs Rd. near Haven substation. Flush w/ surface.
0907	PK nail set in panel point, ±150' E. of Abbyville St. in centerline of Wm. Springs Rd. Flush w/ surface.

0908 Al. cap in panel point, mrkd "K.E. RLS 7812", at intersection of Wigwam and Parvin St. Flush w/ surface.

0909 Al. cap in panel point, mrkd "Fulstone PLS 5269" at Wigwam and Fairfield Ave. Flush w/ surface.

0910 R.R. spike in panel point, intersection of Pebble and LV Blvd. Point is 2 in. below surface. Vert. Check Sta.

910A Temp. offset station to point 0910. No panel point.

0911 Aerial panel point.

1 METER = 3.2808333333 FEET

NAME	NORTH (y) FEET	EAST (x) FEET	HEIGHT FEET	GEOID FEET	ELLIPS HT FEET	
0813	26718630.703	784311.643	2140.61	-94.28	2046.33	
0853	26717259.075	783083.283	2173.06	-94.28	2078.78	
0811	26720107.475	771739.825	2306.98	-93.99	2212.99	
WMDE	26722552.733	768349.651	2343.79	-93.87	2249.93	
0818	26704413.035	774445.216	2287.95	-94.41	2193.54	
0856	26704112.455	767187.137	2385.78	-94.28	2291.50	
910A	26712219.968	777747.352	2235.16	-94.29	2140.87	
0817	26707410.817	777683.740	2247.93	-94.40	2153.53	
0911	26702968.638	777666.456	2264.77	-94.51	2170.26	
0816	26710735.433	780947.277	2207.42	-94.39	2113.03	
0908	26714751.977	776347.588	2254.61	-94.21	2160.40	
0909	26714663.631	782305.483	2194.00	-94.33	2099.67	
0815	26710768.186	785736.624	~~2190.05~~	-94.48	2095.56	Cr 2188.87
0814	26715652.412	788857.405	2142.98	-94.44	2048.55	
0907	26722844.287	789050.000	2061.89	-94.28	1967.61	
0002	26722664.990	776481.354	2244.15	-94.03	2150.12	
0906	26722614.924	778788.193	2216.62	-94.07	2122.55	
0812	26718623.177	780556.192	2201.73	-94.20	2107.53	
LVWM	26717365.699	777779.550	2240.61	-94.18	2146.43	
0910	26712193.295	777686.873	2237.79	-94.29	2143.50	

STATE PLANE COORDINATE CONVERSION FACTORS

Mean Radius of Curvature (Ra)	=	6371498.129	Mtrs.
Mean Geoid Height	=	-28.7	Mtrs.
Mean Surface Elevation	=	679.	Mtrs.
Max. Elevation	=	727.2	Mtrs.
Min. Elevation	=	628.5	Mtrs.
Mean Elevation Factor	=	.99989789	
Mean Scale Factor	=	.99991726	
Combined Factor	=	.99981516	

To Convert an SPC Grid Distance to A Surface Distance
Multiply GRID * (1.00018487)

ACCURACIES (m):

		D. LAT.	D. LON.	VERT.
0813	0853	0.027	0.040	0.040
0811	WMDE	0.032	0.042	0.033
0818	0811	0.050	0.049	0.033
0818	0856	0.029	0.037	0.051
0818	WMDE	0.065	0.063	0.000
0856	0811	0.039	0.042	0.058
0856	WMDE	0.053	0.056	0.051
910A	0817	0.029	0.039	0.037
910A	0818	0.027	0.035	0.028
910A	0911	0.036	0.043	0.040
0817	0911	0.030	0.042	0.041
0818	0817	0.027	0.039	0.038
0818	0911	0.028	0.039	0.039
910A	0816	0.028	0.039	0.040
910A	0908	0.028	0.039	0.040
0816	0908	0.033	0.042	0.045
0909	910A	0.025	0.036	0.036
0909	0816	0.028	0.039	0.039
0909	0908	0.030	0.041	0.044
0815	0814	0.033	0.047	0.048
0815	0909	0.034	0.045	0.045
0907	0814	0.037	0.048	0.048
0907	0815	0.041	0.051	0.050
0907	0909	0.031	0.043	0.045
0811	910A	0.036	0.036	0.034
0907	0853	0.035	0.049	0.055
0907	0813	0.032	0.046	0.050
910A	0811	0.036	0.036	0.034
910A	0002	0.050	0.063	0.060
910A	0906	0.050	0.064	0.062
910A	0853	0.025	0.035	0.028
910A	0812	0.043	0.060	0.060
910A	LVWM	0.041	0.057	0.056
910A	0910	0.038	0.055	0.055
0811	0002	0.041	0.058	0.060
0811	0906	0.043	0.060	0.064
0811	0853	0.039	0.042	0.033
0811	0812	0.046	0.060	0.066
0811	LVWM	0.042	0.057	0.059
0811	0910	0.049	0.060	0.060
0811	910A	0.036	0.036	0.034

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588
FAX NO. (702) 367-8145

LETTER OF TRANSMITTAL

JOB # : CH2M004
Tropicana Wash

DATE June 8 1992

CH2M Hill
1030 East Flamingo
Suite 250 LV NV 89119

N: Jed Davis

nsmitted via:

___Mail ___Fax ___Other

___Messenger

OPIES	ORIGINAL	DESCRIPTION
2	___	Copies of Aerial Control for Trop Wash
		Shts 14 of 23 thru 23 of 23
		Please forward one set to your office in Redding to Mike Beaste

COMMENTS:

BY: [signature]

RECEIVED BY

wd3/trans

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT _____
CLIENT CH2M HOA
CALCULATED BY KM RA DATE 6-5-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. ~~15~~ 14 OF 23

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
PANEL 809	-(+13.46 +13.44	36.97		2450.42	
IRON PIPE & B/C TP 1			-1.34 -1.36	35.62	"US. CADASTRAL SURVEY BLM W1/4 S35 S2 1955"
	-(+15.90 +15.90	19.72			
IRON PIPE & B/C TP 2			-5.70 -5.70	14.02	"1/4 S35 S2 US CADASTRAL SURVEY BLM 1954"
	-(+16.86 +16.86	~~2396.56~~ 97.16			
* IRON PIPE & B/C SS			* +0.60 +0.60	97.76	US CADASTRAL SURVEY E 1/16 S35 S2 BLM 1955
PANEL 808			-1.98 -1.98	~~2394.58~~ 95.18	
	-(+13.76 +13.76	~~80.82~~ 81.42			
* SS			* +16.32 +16.32	97.74	E 1/16 S35 S2 AS BEFORE
TP 3			-7.50 -7.50	~~73.32~~ 73.22	SPIKE & CHASER
	-(+7.92 +7.92	~~65.40~~ 65.60			
TP 1			-1.94 -1.94	~~63.46~~ 64.06	SPIKE & CHASER
	-(+6.68 +6.68	57.38			
BRASS CAP IN CONC			+2.50 +2.50	59.88	"... R16E ... CADASTRAL SURVEY ... 1/4 ... 955" @ PATRICK & JONES
	-(+10.12 +10.12	49.76			

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT _____
CLIENT CH2M ODA
CALCULATED BY KM RL DATE 6-5-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. ~~76~~ 15 OF 23

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
TP5		4976	+0.34 +0.34	50.10 2"	PIPE W/HUB & TACK IN CONC. @ OQUENDO & JONES
	+10.22 +10.22	39 88			
TP6			-0.44 -0.44	3944	REBAR W/ REMAINS OF & PLASTIC CAP @ RUSSELL / JONES
	+10.80 +10.80	2864			
TP7			-5.06 -5.06	23.58	SPIKE & CHASER NE QUAD RUSSEL & DUNNEVILLE
	+4.76 +4.76	1882			
NEL807			+1.00 +1.00	1982	
	+1.22 +1.22	1860			
TP8			+7.20 +7.20	25.80	SPIKE & CHASER. ±300' N. OF HACIENDA ±50' EAST OF JONES ON HILL TOP
	+7.22 +7.22	(+11.86 +11.80)	2313 97 HI		
TP9			(+558 / +554) +0.60 +0.60	14 57 19 55	BRASS CAP IN T/C "RLS 6201 RM 44.90" @ END OF CURB, SW COR OF CASABLANCA APTS. EAST SIDE JONES
	+17.14 +17.14	2302 41 ~~97 43~~			
			+3.70 +3.70	~~06.11~~ ~~06.13~~	SPIKE & CHASER ± 500' So: OF TROP, EAST SIDE JONES
	+8.26 +8.26	9785			
CCBM			+3.84 +3.84		TC10 ZASWS NE QUAD JONES / TROP. DRIVE RIVET & PLATE
				01.69 (2301.856)	IN T/C NEAR PC TROPICANA Δ 0.17

E -14893 ~~E -14431~~ ~~E 3-44~~ ~~E -479~~ +0.20 Δ-14873 (E -14856

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT _____
CLIENT CH2M OC4
CALCULATED BY VM RR DATE 6/5/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 16 OF 23

TATION	SLOPE	ELEV	GRADE	C / F	REMARKS
BM	-4.92 -4.92				TROPICANA & JONES NE QUAD
D1			+13.52 +13.50		B/C IN T/C (R.M.) PLS 5918
	-7.74 -7.76				
2			+9.76 +9.76		T/C ± 150' EAST OF FLAMINGO WASH & @ NO. SIDE OF TROPICANA
	-2.56 -2.56				
			+8.68 +8.70		

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT
CLIENT CH2M OOA
CALCULATED BY TCM DATE 6-5-92
CHECKED BY DATE
SCALE SHEET NO. 17 OF 23

ATION	SLOPE	ELEV	GRADE	C / F	REMARKS
					NW QUAD RAINBOW/HACIENDA
EL 810	-2.76 -2.78				
1			+10.56 +10.58		ROCK
	-0.96 -0.96				
2			+9.02 +9.02		
	-1.88 -1.88				
TP3 EL 905			+7.68 +7.68	2409.55 ✓	
	-5.02 -5.02				
TP4			+8.30 +8.30	22.88	2C10 35W4
	-5.90 -5.90				
TP5			+9.18 +9.18		2C10 35SW46
	-3.16 -3.16				
EL 809			+9.36 +9.36	2450.47	

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT Trig Levels Fenna For Check
CLIENT CH2M004
CALCULATED BY RR WS DATE 6-8-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO 18 OF 23

ATION	BS SLOPE	HI ELEV	FS GRADE	ELEV C/F	REMARKS
	+5.02 +2.04				CCBM 7C10 24 SW NE QUAD Jones & T-cp
9 Δ			+4.42 +4.40		
9 Δ	- {+3.44 +3.42	+3.42			
9			+16.60 16.88		
9	- {+5.56 +5.54				
B			+11.86 11.80		

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT TIEVELS FOR FAMA
CLIENT CH2M 004
CALCULATED BY RR WA DATE 6-8-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 19 OF 23

STATION	BS SLOPE	HI ELEV	FS GRADE	C / F	REMARKS
TP2	7.09	56.12		2349.03	Top F/C So Ret SW Quad
TP3			2.32	53 80	Top / Rainbow
	9.75				
TP4			1.08	62.47	
	9 50				
TP5			2.67	69.30	
	6.59				
TP6			1.63	74.26	↓
	6.24				↓
PANEL 810			3.84	76^{67}	See Sht 11
	TRIG	LEVELS			
PANEL 810	-7.02				
TP 1			+11.96	2395^{65}	9565
	-1.59				
~~905~~			~~+12.26~~		
905			+12.26	2409^{50}	09.50 (2409^{55} #905 HOLD)
	-2.92				
~~ECTB~~					
CCBM			+ 10.41	2422^{68}	(2203) 2 C10 35WF
CCBM	-3.65				
CCBM			11.39	$2437^{\cancel{67}\ 92}$	2 C10 35SWW6
	-5.20				

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT Levels for Fema
CLIENT CH2M004
CALCULATED BY RR WS DATE 6/8/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 20 OF 23

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
PANEL 809			+7.31	2450.~~43~~ 42	5038 = 2450.42
					(PANEL 809 = 2450 42 *)
	+13.45				
TP1			-1.35	2435 62	85.58
	+15.90				
TP2			-5.70	2414 02	13 98
	+16.86				
Iron Pipe SS		*	+0.60	2397.76	US Cadastral Survey E1/16 S35 S32 BLM 1955
Panel 808			-1.98	2395.18	95.14 (2395.23 # 809)
	+13.76				
SS			+16.32	97.74	US Cadastral Survey E1/16 S35 S32 BLM 1955
TP3			-7.50	2373.92	73.88
	+7.92				
TP4			-1.94	2364.06	64 02
	+6.68				
BRASS Cap/conc			+2.50	2359 ~~5984~~ 86	R60E Cadastral Survey /4 1955
	+10.12				
TP5			+0.34	2350.10	~~4350~~ 5006

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT Levels for Fema
CLIENT CH2M 004
CALCULATED BY RR WA DATE 6/8/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 21 OF 23

ATION	SLOPE	ELEV	GRADE	C / F	REMARKS
	+10.22				
TP 6			-0.44	2339 44	~~3272~~ 39.40
	10.80				
TP 7			-5.06	2323 56	~~11 66~~ 23 54
	+4.76				
807			+1.00	2319.62	~~15.70~~ 19 76 (2319.92 # 807)
	+1.22				
TP 8 ~~809~~			+7.20	2325.80	~~04 66~~ ~~19 08~~ 25.76
	+11.83				
9			~~+5.56~~ +0.60	2319.53 ~~2308.41~~	~~96 40~~ ~~12.80~~ 19 48
	+17.14	(~~+6.83~~)			
			(~~+3.42~~)		
w CHASER			+3.70	2306.09	~~99 36~~ 06.04
	+8.26	(~~+4.41~~)			
CB-1			(~~-0.84~~) +3.84	8054 2301.67	TC 10 24 SWS GCEL 2301.86 2301.62 2301.63 Δ0.19
	-4.92				

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT Levels for Fema
CLIENT CH2M004
CALCULATED BY RR WS DATE 6-8-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO 22 OF 23

ATION	SLOPE	ELEV	GRADE	C / F	REMARKS
P1			+13.51	2320.10	
	-7.75				
P2			+9.76	2337.61	
	-2.56				
2			+8.69	2348 06	TOP F/C So Ret SW QUAD
					Trop RAINBOW
				= 2349 03	
				Δ -0.17 feet	in 6 miles

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0688

PROJECT Levels for Fema Trop Wash
CLIENT CH_2M 004
CALCULATED BY W/A DATE 6-8-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 23 OF 23

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
Aerial Panel		807		ELEV	2319.92
Aerial Panel		808		ELEV	2395.23
Aerial Panel		809		ELEV	2450.42

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT
CLIENT CH2M HOA
CALCULATED BY KM RA DATE 6-5-92
CHECKED BY DATE
SCALE SHEET NO ~~15~~ 14 OF 23

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
PANEL 809	-(+13.46 +13.44	36.97		2450.42	
IRON PIPE & B/C TP 1			-1.34 -1.36	35.62	~~W/A~~ "US. CADASTRAL SURVEY BLM W 1/16 S35 S2 1955"
	-(+15.90 +15.90	19.72			
IRON PIPE & B/C TP 2			-5.70 -5.70	14.02	"V. S35 S2 US CADASTRAL SURVEY BLM 1954"
	-(+16.86 +16.86	~~2396.56~~ 97.16			
* IRON PIPE & B/C SS			* +0.60 +0.60	97.76	US CADASTRAL SURVEY E 1/16 S35 S2 BLM 1955
PANEL 808			-1.98 -1.98	~~2394.58~~ 95.18	
	-(+13.76 +13.76	~~00.82~~ 81.42			
* SS			* +16.32 -16.32	97.74	E 1/16 S35 S2 AS BEFORE
TP 3			-7.50 -7.50	73.~~34~~ 92	SPIKE & CHASER
	-(+7.92 +7.92	~~65.40~~ 66.00			
TP 4			-1.94 -1.94	~~63.46~~ 64.06	SPIKE & CHASER
	-(+6.68 +6.68	57.38			
BOS CAP IN CONC ON			+2.50 +2.50	59.88	"... RLOE ... CADASTRAL SURVEY ... 1/4 ... 955" @ PATRICK & JONES
	-(+10.12 +10.12	49.76	~~+2.50~~		

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT
CLIENT CH2M OMA
CALCULATED BY RM RL DATE 6-5-92
CHECKED BY DATE
SCALE SHEET NO. ~~7~~ 15 OF 23

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
TP5		49 76	+0.34 +0.34	50.10 2"	PIPE W/HUB & TACK IN CONC. @ OQUENDO & JONES
	+10.22 +10.22	39 88			
TP6			-0.44 -0.44	39 44	REBAR W/ REMAINS OF & PLASTIC CAP @ RUSSELL / JONES
	+10.80 +10.80	28 64			
TP7			-5.06 -5.06	23.58	SPIKE & CHASER NE QUAD RUSSEL & DUNNEVILLE
	+4.76 +4.76	18 82			
PANEL 807			+1.00 +1.00	19 82	
	+1.22 +1.22	18 60			
TP8			+7.20 +7.20	25.80	SPIKE & CHASER ±300' N. OF HACIENDA ±50' EAST OF JONES ON HILL TOP
	+7.22 +7.22	(+11.86 +11.80)	2313 97 HI		
TP9			(+556 +0.60 +554 +0.60)	14 ~~57~~ 19 55	BRASS CAP IN T/C "PLS 6201 RM 44.90" @ END OF CURB. SW COR OF CASABLANCA APTS. EAST SIDE JONES
	+17.14 +17.14	230241 ~~9713~~			
				~~06.11~~ ~~06.13~~	
			+3.70 +3.70		SPIKE & CHASEL ± 500' SO: OF TROP, EAST SIDE JONES
	+8.26 +8.26	97 85			
CCBM			+3.84 +3.84		TC 10 ZASWS NE QUAD JONES / TROP. DRIVE RIVET & PLATE
				01.69 (2301.856)	IN T/C NEAR PC TROPICANA Δ 0.17

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT
CLIENT CH2M 004
CALCULATED BY VM 1212 DATE 6/5/92
CHECKED BY DATE
SCALE SHEET NO. 16 OF 23

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
CCBM	-4.92 -4.92				TROPICANA & JONES NE QUAD
TP1			+13.52 +13.50		B/C IN T/C (RM.) PLS 5918
	-7.74 -7.76				
TP2			+9.76 +9.76		T/C = 150' EAST OF FLAMINGO WASH & @ NO. SIDE OF TROPICANA
	-2.56 -2.56				
			+8.68 +8.70		

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0688

PROJECT _____
CLIENT CH2M OOA
CALCULATED BY TCM QC DATE 6-5-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 17 OF 23

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
PANEL 810	-2.76 -2.78				NW QUAD RAINBOW/HACIENDA
TP1			+10.56 +10.58		ROCK
	-0.96 -0.96				
TP 2			+9.02 +9.02		
	-1.88 -1.88				
TP3 PANEL 905			+7.68 +7.68	2409.55✓	
	-5.02 -5.02				
CCBM TP4			+8.30 +8.30	22.88	2C10 35WL
	-5.90 -5.90				
CCBM TP5			+9.18 +9.18		2C10 35SWW6
	-3.16 -3.16				
PANEL 809			+9.34 +9.36	2450[47]	

WESCO SURVEYS, INC.

3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT Trig Levels Fema For Check
CLIENT C4₂M004
CALCULATED BY RR WS DATE 6-8-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 18 OF 23

STATION	BS SLOPE	HI ELEV	FS GRADE	ELEV C / F	REMARKS
	~~+20.24~~ ~~+20.04~~				CCBM 7C10 24 SW NE QUAD Jones #T-9P
TP 9 Δ			+4.42 +4.40		
TP 9Δ	- {+3.44 ~~+3.48~~	+3.42			
TP 9			+16.60 ~~16.68~~		
TP 9	- {+5.50 +5.54				
TP B			+11.86 11.80		

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT TIEVELS FOR FEMA
CLIENT CH2M 004
CALCULATED BY RR WA DATE 6-8-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO 19 OF 23

STATION	BS SLOPE	HI ELEV	FS GRADE	C / F	REMARKS
TP 2	7.09	56.12		2349.03	Top F/C So Ret SW Quad
TP 3			2.32	53 80	Trap / Rainbow
	9.75				
TP 4			1.08	62.47	
	9 50				
TP 5			2.67	69.30	
	6.59				
TP 6			1.63	74.26	!
	6.24				↓
PANEL 810			3.84	76 67	See Sht 11
	TRIG	LEVELS			
PANEL 810	-7.02				
TP 1			+11.96	2395 65	9565
	-1.59				
~~905~~			~~+12.26~~		
905			+12.26	2409 50	09.50 (2409 55 #905 HOLD
	-2.92				
~~ECB~~					
CCBM			+ 10.41	2422 88	2203) 2 C10 35 W f
CCBM	~~*~~ - 3.65				
CCBM			11.39	2437 ~~67~~ 92	2202 C10 35 SWW6
	-5.20				

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT Levels for Fema
CLIENT CH2M004
CALCULATED BY RR WS DATE 6/8/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 20 OF 23

ATION	SLOPE	ELEV	GRADE	C / F	REMARKS
VEL 809			+7.31	2450.43	5038 = 2450.42
					(PANEL 809 = 2450.42 *)
	+13.45				
P 1			-1.35	2435.62	85.56
	+15.90				
P 2			-5.70	2414.02	1398
	+16.86				
on P.pe SS		*	+0.60	2397.76	US Cadastral Survey E1/16 S35 S2 BLM 1955
hel 808			-1.98	2395.18	95.14 (2395.23 ± 809)
	+13.76				
SS			+16.32	97.74	US Cadastral Survey E1/16 S35 S2 BLM 1955
P 3			-7.50	2373.92	73.08
	+7.92				
P 4			-1.94	2364.06	64.02
	+6.68				
CAP/Conc			+2.50	2359.86 S35 S34	R60E Cadastral Survey /4 1955
	+10.12				
TOE					4550 5006

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT Levels for Fema
CLIENT CH2M 004
CALCULATED BY RR WA DATE 6/6/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 21 OF 23

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
	+10.22				
TP 6			-0.44	2339 44	~~32 72~~ 39.40
	10.80				
TP 7			-5.06	2323 56	~~15 00~~ 23 54
					1
	+4.76				
PANEL 807			+1.00	2319.82	~~15.70~~ 1978 (2319.92 #807)
	+1.22				
Puget ~~808~~ TP 8			+7.20	2325.80	~~04 68~~ 19.08 25.76
	+11.83				
TP 9			~~+5.58~~ +0.60	2319.53 ~~2308.41~~	~~90 40~~ 12.80 19 40
	+17.14 (~~+16.83~~)				
			(~~+3.42~~)		
SPK/W CHASER			+3.70	2306.09	~~99 36~~ 06.04
	+8.26	(~~+4.41~~)			
CCBM			(~~-0.04~~) +3.84	2301.67 8054	TC 10 24 SWS GCEL 2301.86 2301.62 2301.63 Δ0.19
	-4.92				

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
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(702) 367-0588

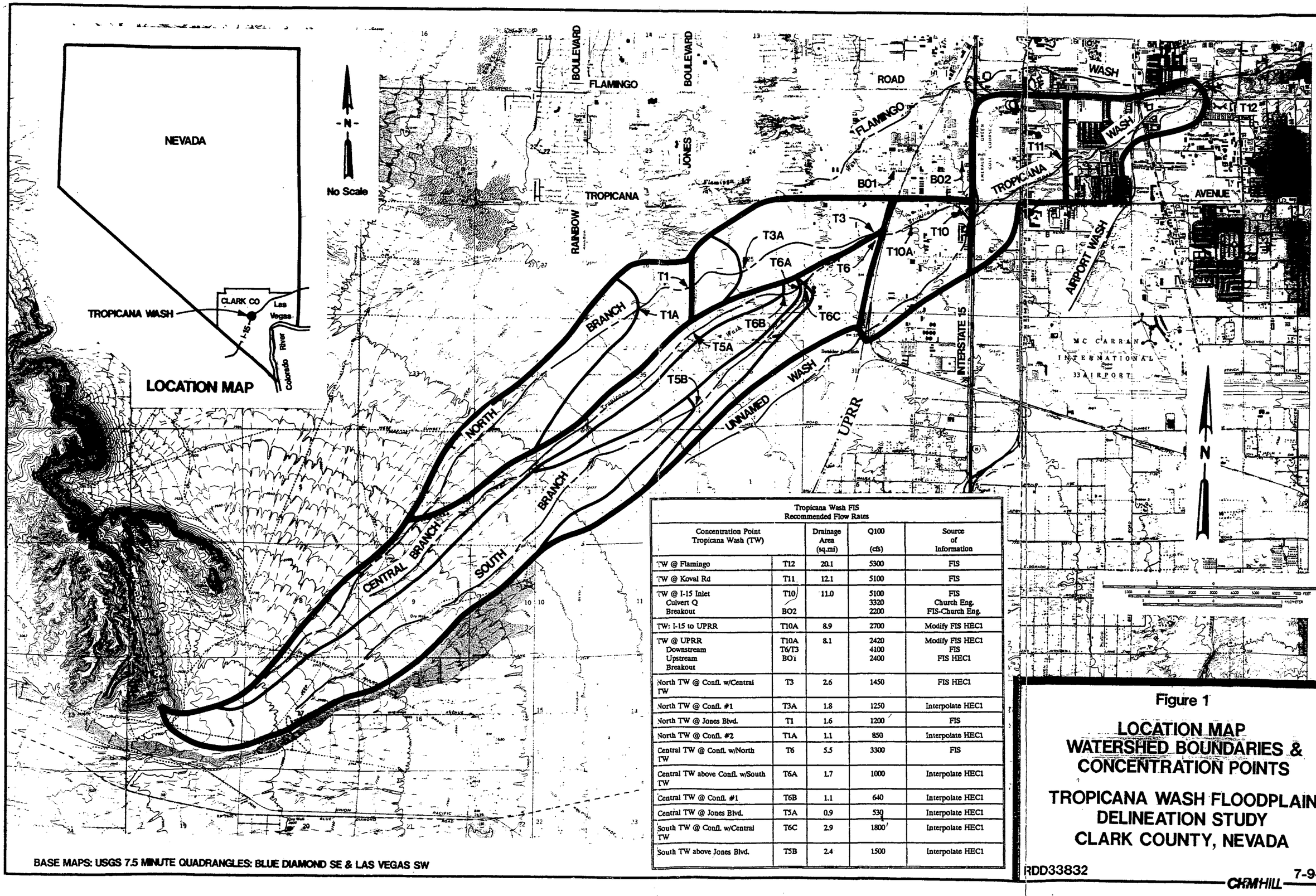
PROJECT Levels for Fema
CLIENT CH2M004
CALCULATED BY RR WS DATE 6-8-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 22 OF 23

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
TP1			+13.51	2320.10	
	-7.75				
TP2			+9.76	2337.61	
	-2.56				
TP2			+8.69	2348.66	TOP F/C So Ret SW QUAD
					Trop RAINBOW
				= 2349.03	
				Δ -0.37 feet	in 6 miles

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT Levels for Fema Trop Wash
CLIENT CH2M 004
CALCULATED BY W/A DATE 6.8.92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 23 OF 23

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
Aerial Panel		807	ELEV		2319.92
Aerial Panel		808	ELEV		2395.23
Aerial Panel		809	ELEV		2450.42



Tropicana Wash FIS Recommended Flow Rates				
Concentration Point Tropicana Wash (TW)		Drainage Area (sq.mi)	Q100 (cfs)	Source of Information
TW @ Flamingo	T12	20.1	5300	FIS
TW @ Koval Rd	T11	12.1	5100	FIS
TW @ I-15 Inlet Culvert Q Breakout	T10 BO2	11.0	5100 3320 2200	FIS Church Eng. FIS-Church Eng.
TW: I-15 to UPRR	T10A	8.9	2700	Modify FIS HEC1
TW @ UPRR Downstream Upstream Breakout	T10A T6/T3 BO1	8.1	2420 4100 2400	Modify FIS HEC1 FIS FIS HEC1
North TW @ Confl. w/Central TW	T3	2.6	1450	FIS HEC1
North TW @ Confl. #1	T3A	1.8	1250	Interpolate HEC1
North TW @ Jones Blvd.	T1	1.6	1200	FIS
North TW @ Confl. #2	T1A	1.1	850	Interpolate HEC1
Central TW @ Confl. w/North TW	T6	5.5	3300	FIS
Central TW above Confl. w/South TW	T6A	1.7	1000	Interpolate HEC1
Central TW @ Confl. #1	T6B	1.1	640	Interpolate HEC1
Central TW @ Jones Blvd.	T5A	0.9	530	Interpolate HEC1
South TW @ Confl. w/Central TW	T6C	2.9	1800	Interpolate HEC1
South TW above Jones Blvd.	T5B	2.4	1500	Interpolate HEC1

BASE MAPS: USGS 7.5 MINUTE QUADRANGLES: BLUE DIAMOND SE & LAS VEGAS SW

Figure 1

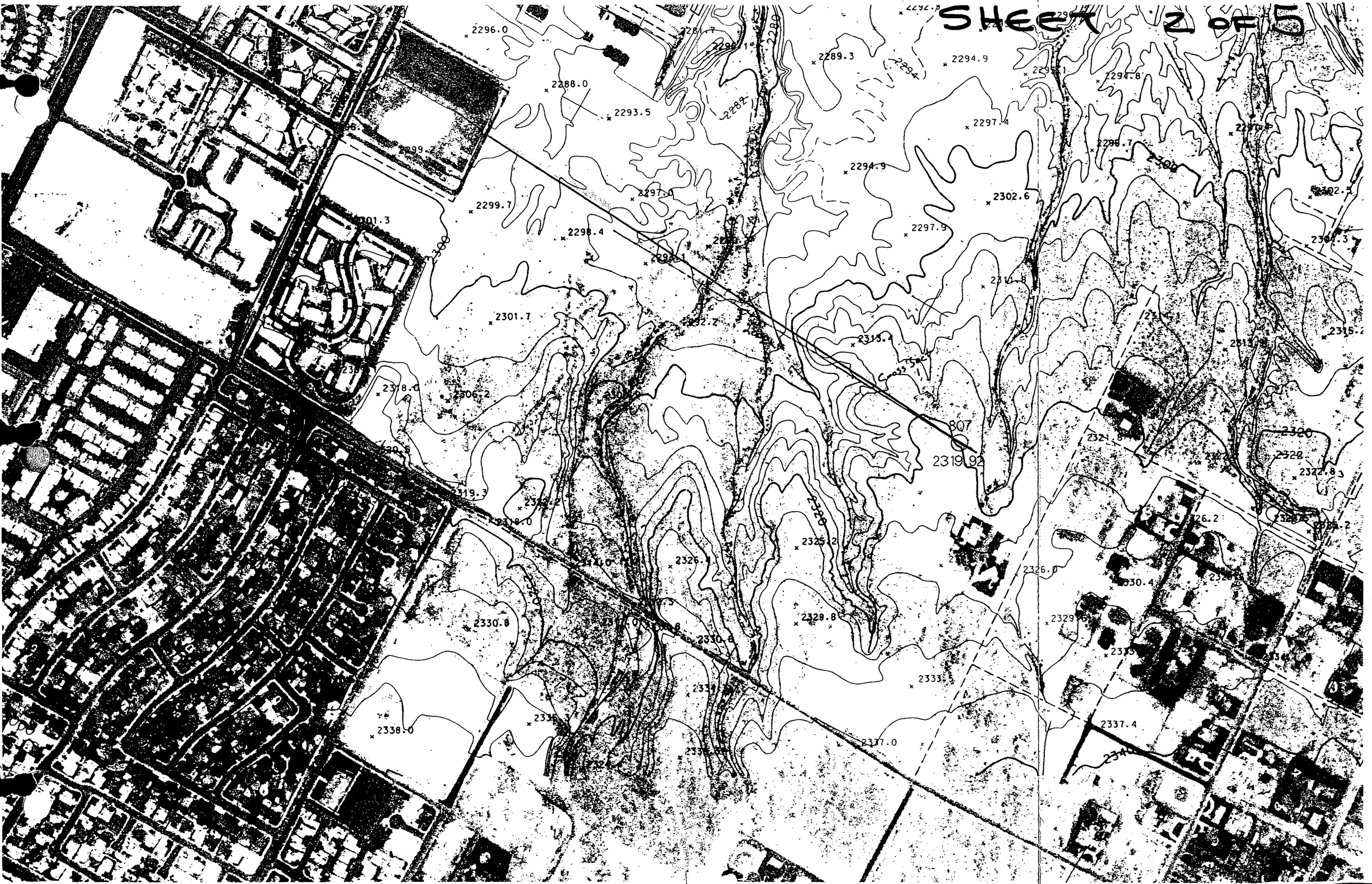
LOCATION MAP WATERSHED BOUNDARIES & CONCENTRATION POINTS

TROPICANA WASH FLOODPLAIN DELINEATION STUDY CLARK COUNTY, NEVADA

RDD33832

7-9-92

CH2MHILL


2296.0
2288.0
2293.5
2299.7
2298.4
2301.7
2318.0
2306.2
2319.3
2330.8
2338.0
2289.3
2294.9
2297.4
2294.9
2302.6
2297.9
2313.4
2319.92
2325.2
2329.8
2333
2337.0
2326.0
2330.4
2337.4
2321.8
2328
2322.8

Sheet 3 of 5

SHEET 5 OF 5

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT FEMA TROP WASH X SECT 2
CLIENT CH2M HILL 004
CALCULATED BY RR WA DATE 9/29/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 1 OF 2

STATION	~~H DIST~~ SLOPE	~~H DIST~~ ELEV	~~Δ ELEV~~ GRADE	~~ELEV~~ CIF	REMARKS
	TC Pol			Mod HI	2198.56
AP 805	000.00	817.28	-8.14 -8.16	2190.41 ✓	0 ✓
℄ VG	"	772.82	-8.68	2189.88	0+44.5 ✓
AC	"	673.56	-7.20	2191.36	1+43.7 ✓
AC	"	574.54	-5.88	2192.68	2+42.7 ✓
Ed AC GB	"	465.50	-4.58	2193.98	3+51.8 ✓
GB	"	420.22	-2.38	2196.18	3+97.1 ✓
Top	"	396.60	-0.80	2197.76	4+20.7 ✓
Toe	"	365.10	-2.42	2196.14	4+52.2 ✓
Toe	"	274.10	-2.32	2196.24	5+43.2 ✓
~~Top~~ GB	"	239.00	+0.54	2199.10	5+78.3 ✓
Top	"	149.14	+1.72	2200.28	6+68.1 ✓
Top	"	129.50	+1.96	2200.52	6+87.6 ✓
Toe	"	66.14	+0.42	2198.98	7+51.1 ✓
CB	"	23.30	+1.70	2200.26	7+93.5 ✓
Top	180+00.00	5.80	+2.67	2201.23	8+23.1 ✓ NW Cor of bldg south
Toe	"	23.08	-2.76	2195.80	of AP 805 8+44.4 ✓
Gr	"	112.14	-2.34	2196.22	9+24.4 ✓
Top	"	162.54	-1.74	2196.82	9+75.6 ✓
GB	"	171.16	-2.98	2195.58	9+84.2 ✓
	"	178.68	-1.94	2196.62	9+91.7 ✓
	"	190.28	-1.68	2196.88	10+06.6 ✓
Toe	"	204.72	-3.52	2195.04	10+20.9 ✓
Tp	"	228.94	-2.28	2196.28	10+42.2 ✓
Tp	"	249.60	-2.22	2196.34	10+66.9 ✓
Toe	"	269.12	-5.38	2193.18	10/6/92 10+86.4 ✓
Toe	"	292.34	-5.20	2193.36	11+09.6 ✓
Top	"	312.54	-0.14	2198.42	11+29.8 ✓

PROFESSIONAL LAND SURVEYOR WILLIAM J. AVERY No. 5571 STATE OF NEVADA

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT FEMA / TROP WASH X Sect 2
CLIENT CLS M H, II 004
CALCULATED BY RR LB DATE 9/29/92
CHECKED BY DATE
SCALE SHEET NO. 2 OF 3

STATION	H & SLOPE	H DIST ELEV	ΔELEV GRADE	ELEV C+F	REMARKS
				MOD HI 2198.56	
GR	180:00:00	374.36	+0.56	2199.12	11+91.4 ✓
Toe	"	427.40	+0.46	2199.02	12+44.7 ✓
GB	"	500.62	+3.72	2202.28	13+17.3 ✓
Top	"	523.00	+8.96	2207.52	13+40.3 ✓
GB	"	618.60	+9.74	2208.30	14+35.9 ✓
Toe	"	647.02	+7.14	2205.70	14+64.3 ✓
Toe	"	668.76	+6.92	2205.48	14+86.0 ✓
GB	"	708.16	+8.44	2207.00	15+25.4 ✓
Top	"	734.48	+8.70	2207.26	15+51.6 ✓
Toe	"	758.98	+7.22	2205.78	15+76.3 ✓
TOP	"	825.88	+9.30	2207.86	16+43.2 ✓
GB	"	831.46	+6.86	2205.42	16+48.7

LAND SURVEYOR — STATE OF NEVADA — No. 5511 — 10/8/92

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT Fema Trap Wash X Sect 3
CLIENT CH2M Hill 004
CALCULATED BY RR WA DATE 9/29/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 1 OF 2

STATION	~~H Δ SLOPE~~	~~N Dist ELEV~~	~~Δ Elev GRADE~~	~~Elev CTF~~	REMARKS
	ELEV 2027.87		MOD HI CCBM	2023.63 TCII 15 84	NE Cor Swenson Plaza Near pc Flamingo
TE HET Set	55°50'E		of East	BC Swenson	
Wall	0.00.00	523.70	-2.72	2020.91	Block Wall 55°50'E of BC
Gr	"	432.60	-2.20	2021.43	0+91.1
"	"	340.00	-2.08	2021.55	1+83.7
"	"	272.62	-2.46	2021.17	2+51.1
Top	"	258.48	-1.68	2021.95	2+65.2
Toe	"	255.46	-3.06	2020.57	2+68.2
Top	"	241.54	-3.12	2020.51	2+82.2
Toe Wash	"	220.24	-10.94	2008.69 2013.69	4° Boot : : -14.94 3+33.5
" "	"	194.46 194.46	-10.46	2009.17 2013.17	" " : : -14.46 3+29.5
Top	"	169.78	-3.34	2020.29	3+55.3
Gr	"	138.00	-2.74	2020.89	3+69.2
Gr	"	90.42	+0.78	2024.41	4+33.3
Gr	"	45.98	+0.54	2024.17	4+77.1
Gr	180.00.00	46.98	+3.68	2027.31	4+70.1
Gr	"	136.58	+5.02	2028.65	4+36.3
Gr *	"	231.40	+6.12	2029.75	4+21.1
Gr	"	332.90	+5.34	2028.97	4+16.6
~~Gr~~ BW	"	429.14	+3.00	2027.43	4+52.8
CC BM	182.48.35	435.88	+4.24	2027.87	10/8/92 4+59.6
℄ Island	180.00.00	495.60	+4.90	2028.53	10+19.3
B/C	"	546.33 34	+3.74	2027.37	MARK 16+76.8
	X @ Mark		B/C	Mod HI	2024.15
HET	0.00.00	546.33	+2.48	2026.63	
CC BM	349.08.18	112.90	+3.72	2027.87	
Gr	180.00.00	106.72	+1.94	2026.09	11+76.8
" Toe	"	182.38	+2.76	2026.91	12+52.4
Top	"	198.38	+5.46	2029.61	12+68.4

PROFESSIONAL LAND SURVEYOR — STATE OF NEVADA — WILLIAM AVERY — No. 5571

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT Fem. Trop Wash X Sect 3
CLIENT C H : M Hill 004
CALCULATED BY RR WS DATE 9/29/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 2 OF 2

STATION	H & SLOPE	H DIST ELEV	ΔELEV GRADE	ELEV C/E	REMARKS
			Mod	HI 2024.15	~~12+74.5~~
Top	80.00.00	2045.0	+5.40	2029.55	12+74.5 ✓
Toe	"	2206.0	+1.88	2022.03 / 2026.03	4° Boot ° ° - 12 12+90.5
"	"	2670.6	+1.78	2023.71 / 2025.93	" ° ° - 22 13+37.5 ✓
Toe	"	2871.2	+6.54	2030.69	13+57.5 ✓
Top	"	2979.0	+6.58	2030.73	13+68.0
Toe	"	3050.6	+4.58	2028.73	13+75.1 ✓
Gr	"	3764.4	+3.10	2027.25	14+37.5 ✓
"	"	4747.0	+4.72	2028.87	15+44.0 ✓
Gr Set Sp.K	"	5731.0	+6.58	2030.73	16+43.1

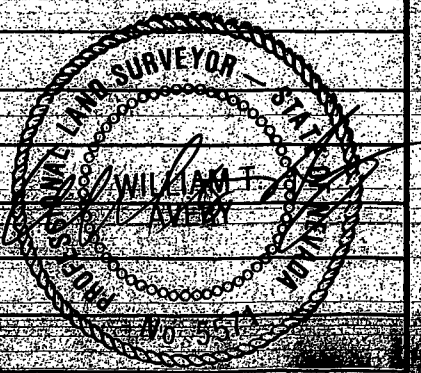
PROFESSIONAL LAND SURVEYOR — STATE OF NEVADA
WILLIAM T. LAVERY
No. 5539

10/8/92

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0566

PROJECT Fema Trop Wash Map Sections
CLIENT CH2M Hill 004
CALCULATED BY wtd DATE 9/30/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 1 OF 2

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
		Cross	Sec 1		
0~		2319.9			
0+50		20.0			
2+40		20.0			
4+60		16.0			
5~		12.0			
6+50		08.0			
7+20		08.0			
7+60		12.0			
9+10		08.0			
9+80		04.0			
10~		2300.0			
10+40		96.0			
12+50		92.0			
16+80		92.0			
17~		96.0			
17+80		96.0			
18+40		92.0			
19~		92.0			
20+70		96.0			
23+50		96.0			
[redacted]					
[redacted]		Cross	Sec 2		
0~		90.4			
1+50		92.0			
4+00		96.0			
6~		2200.0			
7+10		"			
7+60		"			
8+30		"			



10/8/92

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT Fema Trop Wash Map Sections
CLIENT CH2M Hill 004
CALCULATED BY [redacted] DATE 9/30/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 2 OF 2

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
		Cross	Sec 2	Cont	
8+60		96.0			
10~		96.0			
11+10		96.0			
12+20		2200			
13+40		04.0			
13+50		08.0			
14+40		08.0			
15+50		08.0			
16+50		04.0			
		Cross	Sec 3		
0~		2022			
2+80		20			
3+10		12			
3+40		12			
3+60		20			
4+50		24			
5+50		28			
9+40		28			
11~		28			
12+80		28			
13~		22			
13+30		22			
13+40		28			
15~		28			

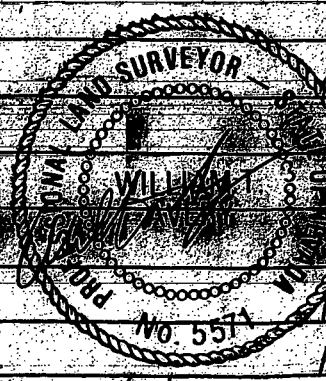
PROFESSIONAL LAND SURVEYOR — STATE OF NEVADA
WILLIAM A. WEBB
No. 6571

10/8/92

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

PROJECT FEMA TROP WASH X Sect 1
CLIENT CH2M Hill 004
CALCULATED BY RR WD DATE 9/21/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 1 OF 2

STATION	AR SLOPE	N DIST ELEV	A ELEV GRADE	ELEV C / F	REMARKS
TE H46 Set on P.O.L Mod HI 2300 29					
CP 807	0.00.00	827 84	+116.2 +11.64	2319.92 ✓	0 ~
Gr	"	720 40	+11.12	2319.41	0+94 1
"	"	631.64	+10.72	2319.01	1+96 2
"	"	533 44	+9.74	2318.03	2+94 4
"	"	436 86	+8.58	2316.87	3+96 98
Top	"	350.30	+6.40	2314.69	4+77 5
TOE ℄ WASH	"	301.84	+1.42	2309.71	5+26 0
℄ WASH	"	249 96	-1.14	2307.15	5+77 2
TOP	"	215.48	-0.06	2308.23	6+12 4
TOE	"	145.44	-4.04	2304.251	6+82 4
℄ TRAIL 12' Wide	"	122.30	-2.40	2305.89	7+05 5
TOE	"	107.16	-3.42	2304.87	7+20 7
TOP	"	50.50	+2.14	2310.43	7+77 5
TOP	180.00.00	2654	+2.32	2310.61	8+56 4 SE Cor Jr/Sr High School
~~G.B.~~	"	~~TSC 28~~	~~-6.48~~	~~2303.29~~	~~9+47 1~~
Gr	"	119.30	-5.00	2303.29	9+47 1
℄ B	"	136.28	-6.48	2301.81	9+61 1
TOE	"	179 87	-12.88	2295.41	10+07 7
Gr	"	272.00	-14.44	2293.85	10+94 2
"	"	363.54	-15.16	2293.13	11+86
"	"	461.30	-16.56	2291.73	12+89 4
"	"	531.26	-17.48	2290.81	13+79 1
Top	"	624.60	-17.26	2291.03	14+52 4
TOE	"	637.00	-19.28	2289.01	14+64 8
Top	"	644.64	-16.86	2291.43	14+72 5
Gr	"	738 58	-16.16	2292.13	15+66 4
Gr	"	821.68	-16.34	2291.95	16+54 5
TOE	"	867.42	-16.80	2291.49	16+85 3



WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0585

PROJECT FEMA TROP WASH X SEC 1
CLIENT CH2M HILL 004
CALCULATED BY RR WO DATE 9/29/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 2 OF 2

STATION	ΔR.T SLOPE	H DIST ELEV	Δ ELEV GRADE	ELEV CTP	REMARKS
				Mod	HI 2308.29
TOP	180 00 00	878.44	-12.20	2296.09	17+06.5
TOP	"	932.56	-11.66	2296.63	17+60.4
TOE	"	992.28	-15.90	2292.39	18+20.1
GR	"	1084.48	-15.62	2292.67	19+12.3
GR	"	1179.37	-13.20 -13.20	2295.09	26+67.2 BF Ginny

PROFESSIONAL LAND SURVEYOR
STATE OF NEVADA
WILLIAM AVERY
No. 5517
10/8/92

EXHIBIT MSC-8

ELEVATION REFERENCE MARKS

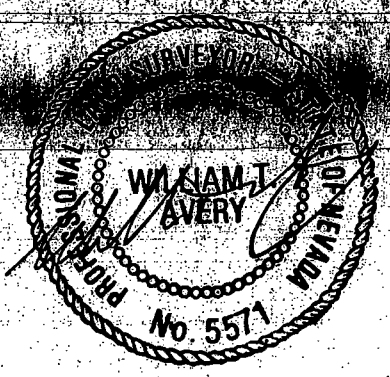
WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
LAS VEGAS, NEVADA 89102
(702) 367-0588

TROPICANA WASH

E. R. M. 's

EAST OF I 15

CLARK COUNTY, NEVADA



10/16/92

WESCO SURVEYS, INC.
3305 WEST SPRING MOUNTAIN ROAD
SUITE 60
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(702) 367-0588

PROJECT ERM 'A' 3 wires
CLIENT
CALCULATED BY VRM, MTL DATE 10-16-92
CHECKED BY WH DATE "
SCALE — SHEET NO. 1 OF 2

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
BM	4.02			2016.797	TC11 15SSE6 DRIVE RVT. 2½" AL. PLATE NE QUAD FLAMINGO/CAMBRIDGE NEAR ℄ OF FLAMINGO
	3.22✓				
	2.42				
		2020.02			
TP1			9.88		~~320±~~ Top of CURB
			9.08✓		East side Cambridge,
			8.29		North of Flamingo
	0.66			2010.94	320±
	1.27✓				
	1.89				
		2012.21			
TP2			10.40		Top of CURB East
			9.81✓		side of Cambridge,
			9.22		560± North of Flamingo
				2002.40	
	1.76				
	~~1.03~~ 1.01✓				
	0.30				
		2003.43			
ERM			5.92		TBM SET @ North
			5.11✓		END of Bridge, Top
			4.30		of CURB. 870±
				1998.32	North of Flamingo
	6.14				East side ~~Cambridge~~ Cambridge
	~~5.30~~ 5.31✓				CHISELED
	4.46				
		~~2003.62~~ 2002.78			
TP2			1.92		
			1.22✓		10/16/92
			0.52	~~2001.56~~	200240

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PROJECT ERM 'A' 3 WIRES
CLIENT
CALCULATED BY VRM, MTL DATE 10-16-92
CHECKED BY WH DATE "
SCALE SHEET NO. 2 OF 2

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
TP2	10.95				
	~~10.29~~ 10.28 ✓				
	9.61				
TP3		~~2014.84~~ 2012.68			
			2.26		
			1.74 ✓		
			1.21		
				~~2010.10~~ 2010.94	
	9.67				
	~~8.91~~ 8.90				
	8.13				
		~~2019.00~~ 2019.84			
BM			3.87		
			3.05 ✓		
			2.24		
				2016.79	

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PROJECT ERM 'B' 3wires
CLIENT
CALCULATED BY VRM, MTL DATE 10-16-92
CHECKED BY wtd DATE "
SCALE SHEET NO. 1 OF 1

STATION	SLOPE	ELEV.	GRADE	C / F	REMARKS
BM	8.02			2027.867	7011 15SA DRIVE RIVET & 2"x2" AL. PLATE NE QUAD. FLAMINGO & SWENSON NEAR P.C OF FLAMINGO
	6.91✓				
	5.80				
		2034.78		2006.10	
ERM			3.99		Chisled X, East
			3.29✓		side Swenson @
			2.60		Top of curb, North
				2031.49	end of Bridge
	3.82				360 ± South of
ERM	3.12✓				FLAMINGO.
	2.42				
		2034.61			
BM			7.85		
			6.75✓		
			5.65		
				2027.86	

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PROJECT ERM 'C' & 'D'
CLIENT CH2M-004
CALCULATED BY VRM, MTL DATE 10-16-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 1 OF 4

STATION	BS ~~SLOPE~~	HI ~~ELEV~~	FS ~~GRADE~~	ELEV ~~CIT~~	REMARKS
BM 22+~~51.72~~ 30				2054.776	STATE HWY. DEPT BLC IN CONC. 750 NORTH OF
	5.14	58.63			TROP. AVE. 2' EAST OF
	3.85 ✓				EAST CURB ON PARADISE
	2.56				14' SOUTH OF PP
		58.63 ✓			224+30.68 DIST
					SET 11-22-60
					CC STID 221513
TP1			655		
			~~5.19~~ 5.18 ✓	2053.45	PAINT MARK WEST
			3.80		SIDE PARADISE
				~~54.83~~ 53.45 ✓	
	4.20				
	~~2.79~~ 2.78 ✓	56.23			
	1.38				
		~~56.21~~ 56.24 ✓			
TP2			6.08		PAINT MARK WEST
			~~4.12~~ 4.11 ✓	2052.12	SIDE OF PARADISE
			2.14		NORTH SIDE OF S D/W
				~~54.07~~ 52.13 ✓	
	632	56.74			
	462 ✓				
	292				
		~~56.99~~ 56.75 ✓			
TP3			809		PAINT MARK SW QUAD
			639 ✓	2050.35	SOUTH RETURN OF
			468		HARMON & PARADISE
				~~52.31~~ 50.36 ✓	
	952	58.14			
	~~780~~ 779 ✓				
	608				
		~~58.39~~	58.16 ✓		

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PROJECT ERM C & D
CLIENT CH2M-004
CALCULATED BY VRM, MTL DATE 10-16-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 2 OF 4

STATION	BS SLOPE	HI ELEV	FS GRADE	ELEV CTF	REMARKS
TPA	~~434~~		434		PAINT MARK South
	260✓		260✓	2055.54	SIDE ~~Harbor~~ HARMON
	086		086		700± West of
				~~55.79~~ 55.56✓	PARADISE
	965	6346	~~965~~		
	792✓				
	619				
		63.48✓			
TP5			285		PAINT MARK
			178✓	2061.68	NORTH SIDE HARMON
			072		EAST SIDE D/W ~~710±~~ 1250
				61.70✓	WEST of PARADISE 1250±
	685	68.02			
	635✓ ~~634~~				
	585				
		68.05✓			
ERM 'C'			403		chisled X ON ERM 9
			352✓	2064.50	NORTH SIDE of HARMON
			302		~~1010~~ 1450± WEST of
				64.53✓	PARADISE, EAST
	925	70.96			SIDE of D/W
	646✓				IN Front of HARBOUR
	467				ISLAND Apts.
		70.99✓			
ERM 'D'			697		chisled X ON PC ERM 10
			534✓	2065.62	of HARMON, ON Bridge
			370		@ TOP of CURB opposite ℄ of
	700	70.97		65.65✓	KIBLER, ~~1400~~ 2135±
	536✓ ~~535~~				WEST of PARADISE
	373	71.01✓			

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PROJECT ERM 'C' & 'D'
CLIENT CH2M-004
CALCULATED BY VRM, MTL DATE 10-16-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 3 OF 4

STATION	BS SLOPE	HI ELEV	FS GRADE	ELEV C / F	REMARKS
ERM 'C'			824 ~~644~~		
			~~644~~ 465 ✓	2064.53	
			465		
				64.57 ✓	
	254	65.89			
	136 ✓				
	019				
		65.93 ✓	1297		
TP4			1034 ✓	2055.55	
			~~779~~		
				55.59 ✓	
	441	58.35		✓	
	281 ✓ (280)				
	122				
		58.40 ✓			
TP3					
			989		
			802 ✓	2050.33	
			614		
				50.38 ✓	
	832	56.96			
	~~662~~ 663				
	494				
		57.01 ✓			
TP2			657		
			486 ✓	2052.10	
			315		
	654	56.48		52.15 ✓	
	439 ✓ (438)				
	223	56.54			

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PROJECT ERM 'C' & 'D'
CLIENT CH2M-004
CALCULATED BY VRM, MTL DATE 10-16-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 4 OF 4

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
TP1			425		
			303 ✓	2053.45	
			181		
				53.51 ✓	
	671	58.79			
	535 534				
	~~534~~				
	399				
		58.86 ✓			
BM			530		
			~~402~~ 401 ✓	2054.78	
			272	✓	
				~~54.85~~	
	$\Sigma 65^{69}$		$\Sigma 65^{62}$	$\Delta 0.07$	
		✓	$\sqrt{2} \times 0.05 = 0.07$		OK w/in

WESCO SURVEYS, INC.
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TROPICANA WASH

E. R. M. 's

WEST OF I 15

CLARK COUNTY, NEVADA



10/14/92

WESCO SURVEYS, INC.
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SUITE 60
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(702) 367-0588

PROJECT Trop Wash ERM's West
CLIENT C H2M Hill
CALCULATED BY RR WA DATE 10/16/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO 1 OF 4

STATION	BS SLOPE	HI ELEV	FS GRADE	ELEV CIF	REMARKS
					See Shts 11, 12, & 13 for Levels CCBM TO ΔP 905
AP 905	6.39	15.94		2409 55	
CCBM			5.36	10 50	2C10 35NWW6
				2410 63	Per County
—	—	—	—	—	—
CCBM	+5.46 547	16.10		2410 63	2C10 35NWW6
Brass Cap			-3.86	2412.24	BRASS CAP @ INT RAINBOW & Oquendo ERM
Brass Cap	+1.22	13.46			
TP 1 PK			-7.68	2405.78	100' WEST OF Santa Margarita ON Oquendo
TP 1	+0.50 051	06.29			West of Redwood on Oquendo
TP 2 PK			-9.92	2396.37	
TP 2	+1.85	98.22			
TP 3 PK			-10.54	2387.68	
TP 3	+2.00 201	89.69			
AL CAP TP4			-8.25	2381.44	@ INT Oquendo & Torrey Pines "DUCHARME" ERM
TP 4	+1.65	83.09			
TP 5 PK			-10.20	2372.89	EAST OF MANN ON Oquendo
TP 5	+0.29 030	73.19			
TP 6 PK			-8.74	2364.45	
TP 6	+1.62	66.07			
TP 7			-10.08	2355.99	EAST OF BRONCO ON Oquendo
					10/16/92
TP 7	+3.10 311	59.10			

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PROJECT TROP WASH ERM's West
CLIENT CH2M HILL
CALCULATED BY RB WA DATE 10/16/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 2 OF 4

STATION	BS SLOPE	HI ELEV	FS GRADE	ELEV ~~C/F~~	REMARKS
TP 8			-8.75	2350.35	E INT JONES & Oquendo 2" PIPE IN CONC ERM
TP 8	1.58	51.93			
TP 9 PK			-9.96	2341.97	
TP 9	1.08 (109)	43.06			
TP 10 PK			-9.75	2333.31	East of Dunneville on Oquendo
TP 10	+1.19	34.50			
TP 11 PK			-11.26	2323.24	EAST OF WESTWIND ON Oquendo
TP 11	+~~4.93~~ 4.94	28.18			
TP 12			-7.41	2320.77	BRASS CAP 50' IN OF LINDELL IN AC ON Oquendo
					"USCE LA DIST TD 9211" 1½" DIA. ERM
TP 12	+0.82	21.59			
TP 13 GUNNEY			-9.29	2312.30	330N 330E of TP12
TP 13	+2.69 (270)	15.00			
TP 14			-11.74	2303.26	660N of Oquendo 200E of MOHAWK
TP 14	+1.99	05.25			
TP 15 GUNNEY			-14.28	2290.97	
TP 15	+6.69	97.66			ERM
TP 16			-4.06	2293.60	set Rebar & AL CAP PLS 5571 ERM 5'S/5'E of Steel Pole `NorPwrMCD -5'
					1400'N of Oquendo 660E of Mohawk
TP 16	+1.60 (161)	95.21			
TP 17 GUNNEY			-6.34	2288.87	
TP 17	+9.20	98.07			

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PROJECT Trop Wash ERMs West
CLIENT CH2M HILL
CALCULATED BY RR WA DATE 10/16/97
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 3 OF 4

STATION	BS ~~SLOPE~~	HI ~~ELEV~~	FS ~~GRADE~~	ELEV C / F	REMARKS
TP 18 Gurney			-4.87	2293.20	
TP 18	+2 40	95.60			
TP 19 Gurney			-11.45	2284.15	
TP 19	+1.40	85 55			
AP 806			-11.10	2274.45	[2274^{45}]
	$\Sigma 53^{26}$		$\Sigma 189^{53}$	Δ -136^{27}	[136^{18}]
	See SHT 9 & 10 of Aerial For Closure to CCBM				
	TOTAL	Error	2245.13 − 2245.21	wesco county	
		Δ	+0.08 =	CC	
		$\sqrt{3\frac{1}{2}}$ Miles	×	0.05 =	0.09 ALLOWABLE

WESCO SURVEYS, INC.
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PROJECT TROPICANA WASH PANELS
CLIENT CH2M HILL
CALCULATED BY [illegible] DATE 5-29-92
CHECKED BY _____ DATE _____
SCALE NTS SHEET NO. 8 9 OF _____

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
		NOT IN	! →		CCBM 7C10 23SWS NO QUAD TROPICANA & RAINBOW
BM	1091 1007 1008 924 ✓	55.29		2245.206	CCBM 7C11 19SWS
TP 1			149 117 ✓ 035	54.12	EDGE PAVEMNT ± 200' So. OF TROP, EAST SIDE DECATUR
	1089 941 793 ✓	63.53			
TP 2			610 459 ✓ 307	58.94	SET SPIKE ± 800' So. OF TROP, EAST SIDE DECATUR
	602 457 ✓ 313 318	63.51			
TP 3			1038 894 ✓ 750	54.57	SET SPIKE ± 1400' So. OF TROP., EAST SIDE DECATUR
	651 498 ✓ 345	59.55			
TP 4			744 595 447 ✓	53.60	SET SPIKE ± 2000' So. OF TROP., EAST SIDE DECATUR
	849 700 ✓ 701 554	68.61			
TP 5			462 276 ✓ 091 098	57.85	TOP ROCK @ ± 50' SW OF DECATUR / HACIENDA
	1053 893 733	~~66~~ .78			
TP 6			119 068 ✓ 016	66.10	TOP ROCK ± 400' WEST OF DECATUR / ~~[illegible]~~ HACIENDA
	1256 1152 ✓ 1048	77.62			
TP 806			392 315 238 ✓	74.47	2274.45

WESCO SURVEYS, INC.
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PROJECT Tropicana Wash Panels
CLIENT CH2M 004
CALCULATED BY [illegible] DATE 5-29-92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO 9 10 OF _____

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
AP 80% (RETURN)	372 295 ✓ 218	77.42			
TP6 (RETURN)			1236 1132 ✓ 1028	66.10	
	150 100 ✓ 050	67.10			
TP5 (RETURN)			1086 926 ✓ 766	57.84	
	466 274 ✓ 086	60.60			
TP4 (RETURN)			848 700 ✓ 557	53.60	
	759 607 ✓ 455	59.67			
TP3 (RETURN)			658 509 ✓ 360	54.58	
	1031 879 ✓ 727	63.37			
TP2 (RETURN)			579 442 ✓ 306	58.95	
	617 471 ✓ 324	63.66			
TP1 (RETURN)			1105 952 ✓ 799	54.14	
	359 276 181	56.84			
			1239 1160 ✓ 1081	45.24	
	E 85 48		E 85 45	A 003	

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PROJECT TROP WASH
CLIENT CH2M OOA
CALCULATED BY TLM DATE
CHECKED BY DATE 6-3-92
SCALE SHEET NO. 1 OF

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS TC10 22 SSE6
BM	268 174 080 ✓	65.94		2364.198	TC10 22SE6 NO SIDE TROP @ CCBM SE RETURN KNOLLWOOD
TP 1			1164 1004 845 ✓	55.90	
	357 209 061	57.99			TOP FOR EAST ON NO. SIDE TROP & TREETWOOD
TP 2			1065 896 728 ✓	49.03	TOP F/C NEAR SO. RETURN @ SW QUAD TROP / RAINBOW
	895 709 523 ✓	56.12			
TP 3			331 232 133	53.80	T/C @ NO. END HEADWALL @ FLAMINGO WASH/~~RAINBOW~~ X-SECT WEST SIDE RAINBOW
	1133 975 818 ✓	63.55			
TP 4			201 108 015 ✓	62.47	T/C WEST SIDE RAINBOW ± 600' SO. OF TROPICANA APPROX OPPOSITE ENTRANCE TO "TRAILS" APTS.
	~~1017 895 773~~ ✓				
	~~1017~~ 950 823 ✓	71.97			
TP 5			377 243 114 ✓		
			392 267 142 ✓	69.30	T/C
	812 668 659 506 ✓	75.89			
TP 6			300 163 025 ✓	74.24	T/C
	748 624 499 ✓	80.50			
PANEL 810			508 384 260 ✓	76.66	2376 C7
	470 366 241 ✓	80.32			

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PROJECT TROP WASH
CLIENT CH2M HILL
CALCULATED BY RLH MTL RR DATE 6-3-92
CHECKED BY DATE
SCALE SHEET NO. 12 OF

STATION	BS / SLOPE	HI / ELEV	FS / GRADE	ELEV / C / F	REMARKS
TP 6			730 605 481	74.27	T/C/RETURN RUN
	300 194 009	75.81			
TP 5			796 650 505	69.31	T/C/ RETURN RUN
	303 257 131	71.88			
TP 4			1066 940 814	62.48	T/C/ RETURN RUN
	259 190 121	64.38			
TP 3			1214 1059 903	53.79	T/C by HEAD WALL RETURN RUN
	337 239 141	56.18			
TP 2			802 716 550	49.02	T/C @ RETURN SW QUAD RETURN RUN
	1086 941 796	58.13			
TP 1			365 224 083	55.89	T/C FCR NE QUAD TROP & Treatwood
	1157 998 844	65.87			
CCBM			268 169 070	64.18	

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PROJECT Trap Wash
CLIENT CH2M 004
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 13 OF _____

STATION	SLOPE	ELEV	GRADE	C / F	REMARKS
Panel 810	+ (-7.02 / -7.02) 704	8371		2376 67	
TP1			+ 11.96 / 11.96	95 67	
TP1	+ (-1.58 / -1.60) 162	9729			
905			+ 12.26 / + 12.26	2409.50	2409 55 w/Δ
905	+ (11.92 / 11.92) 1191	9764			
TP1			-1.96 / -1.98	95 67	
TP1	- (12.12 / 12.12)	8355			
810			-6.88 / -6.86	76 68	
	-15 43		-15 38	Δ 0.05	
	— — —		— —	— —	
Panel 905	(-2.92 / -2.92			2409 55	
CCBM			10.40 / 10.42	22 88	2 C10 35W4 Dr. Rip Al Plate Conc Mow (2 2 94 cuys)
CCBM	(-3 64 / -3 66				2 C10 35W4
CCBM			11 40 / 11 38	37.91	2 C10 35 SWW6 (2438 02 cc Bm)
CCBM	(-520 / -520				2 C10 35 SWW6
Panel 809			7 30 / 7 32	2450.42	2450.42

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PROJECT Trop Wash ERM's West
CLIENT CH2M Hill
CALCULATED BY RR WA DATE 10/16/92
CHECKED BY _____ DATE _____
SCALE _____ SHEET NO. 4 OF 4

STATION	BS SLOPE	HI ELEV	FS GRADE	ELEV CIF	REMARKS
AP 806	+3.34	77.79		2274.45	
TP A Chiseled			-16.94	2260.85	
TP A	+ 0.43 (1.48)	61.29			
TP B			-8.65	2252.64	
TP B	+2.71	55.35			
TP C ERM			-5.54	2249.81	Tp Nut NE Cor Upper Flange Hyd ERM South Side HACIENDA 250 West of Cameron
TP C	+0.25 (0.26)	50.07			
SS CCBM			* -6.89	2243.18	[2243.17 Per County] 9C11 30W6 SE Cor Hac/Cameron
TP D PK			-9.64	2240.43	BC So Hacienda 300E Cameron
TP D	+2.64	43.07			
TP E PK			-6.80	223.27	So Hacienda 300 west of Orville PK @ Back of Curb
TP E	+3.58 (3.59)	39.86			
TP F			-9.88	2229.98	
TP F	+3.52	33.50			
TP G ERM			-4.81	2228.69	NW Nut UPPER FLANGE Hyd ERM 800' E of Orville So Side Hacienda
TP G	+3.31	32.00			
TP E			-14.86	2217.14	END BLM Brass Cap T21S R61E E 1/16 COR S 30 1957
	Σ 19.78		Σ -77.12 =	(-57.34) Error Closure 0.03	CCBM 6C11 30 EC El 2217.14 (Δ 57.31)
	—	—	—	—	—
CCBM 6C11 29NWW6	+2.74	93.78		2191.04	SE Cor Valley View & Reno
TP ERM			-4.50	2189.28	NEW Bolt UPPER FLANGE HYD ERM So Side Reno 350 E of Valley View
TP ERM	+ 4.55	93.83			
CCBM			-2.79	91.04	
	Σ 7.29		Σ -7.29	Δ 0.00	