



Colton Avenue Flood Control Improvements Project

Conditional Letter of Map Revision (CLOMR)

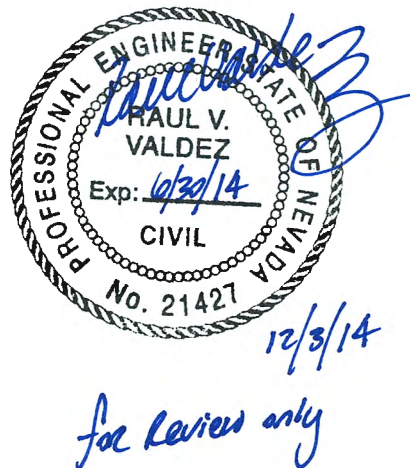


December 2013

Colton Avenue Flood Control Improvements Project North 5th Street to I-15

Conditional Letter of Map Revision

Prepared for:
CITY OF NORTH LAS VEGAS
PUBLIC WORKS DEPARTMENT



December 2013

Prepared By:

MWH AMERICAS, INC.

Jarah Parke, P.E., CFM, PMP
Raul Valdez, P.E., CFM
Charles Kajikowski Jr., P.E.



December 3, 2013

Federal Emergency Management Agency
LOMC Clearinghouse
847 South Pickett Street
Alexandria, VA 22304-4605

**Subject: Conditional Letter of Map Revision Application
Colton Avenue Flood Control Improvements Project, North Las Vegas Nevada**

To Whom This May Concern:

On behalf of the City of North Las Vegas, MWH Americas, Inc. is pleased to submit the attached application for a Conditional Letter of Map Revision for the Special Flood Hazard Area (SFHA) approximate Zone "A" encompassing Colton Avenue located within the limits of the City of North Las Vegas. Colton Avenue and the pertinent Zone "A" are depicted on Flood Insurance Rate Map (FIRM) Number 32003C2160F. This submittal includes FEMA forms MT-2 Form 1, MT-2 Form 2, MT-2 Form 3, a detailed engineering hydrology and hydraulics report, and a CD containing pertinent model runs.

As described in the attached report, the current flood zone is modified to be contained within a storm drain proposed within the Colton Avenue alignment. According to National Flood Insurance Program (NFIP) Regulations Section 72.5, this map change request is fee exempt since the study is conducted on behalf of a local agency. If you have any questions regarding the CLOMR application or supporting documentation, I can be reached at directly at 702-821-4376 or Raul.Valdez@mwhglobal.com.

Respectfully submitted,

MWH Americas, Inc.

Raul V. Valdez, P.E., CFM

Project Engineer

Enc: 1. Engineering Report
2. Data CD

Cc: Jennifer Doody, P.E., CFM (CNLV)
Dan Le, P.E., CFM (CNLV)
Jill Reilly, P.E., CFM (CCRFCD)
Jarrah Parke, P.E., PMP, CFM (MWH)

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

- ☒ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).
- ☐ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Example: 480301 480287	City of Katy Harris County	TX TX	48473C 48201C	0005D 0220G	02/08/83 09/28/90
320003	CLARK COUNTY, CITY OF NORTH LAS VEGAS	NV	32003C	2160F	11/16/11
320003	CLARK COUNTY, CITY OF NORTH LAS VEGAS	NV	32003C	2176F	11/16/11

2. a. Flooding Source: UNAMED TRIBUTARY TO THE CENTRAL FREEWAY CHANNEL

- b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
- ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: COLTON AVENUE FLOOD CONTROL IMPROVEMENTS PROJECT

4. FEMA zone designations affected: A (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

- ☒ Physical Change ☐ Improved Methodology/Data ☐ Regulatory Floodway Revision ☐ Base Map Changes
- ☐ Coastal Analysis ☒ Hydraulic Analysis ☒ Hydrologic Analysis ☐ Corrections
- ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
- ☒ New Topographic Data ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures: ☒ Channelization ☐ Levee/Floodwall ☐ Bridge/Culvert
☐ Dam ☐ Fill ☐ Other (Attach Description)

6. ☐ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

C. REVIEW FEE

Has the review fee for the appropriate request category been included?

☐ Yes

Fee amount: \$_____

☒ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/fm_fees.shtm for Fee Amounts and Exemptions.

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: RAUL VALDEZ, P.E., CFM

Company: MWH AMERICAS, INC.

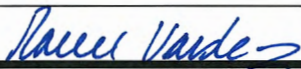
Mailing Address:
3010 WEST CHARLESTON BOULEVARD
LAS VEGAS, NEVADA 89102

Daytime Telephone No.: 702-821-4376

Fax No.: 702-878-7833

E-Mail Address: RAUL.VALDEZ@MWHGLOBAL.COM

Signature of Requester (required):



Date: 12/03/2013

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: DAN LE, P.E., CFM

Community Name: CITY OF NORTH LAS VEGAS

Mailing Address:
2250 LAS VEGAS BOULEVARD NORTH
NORTH LAS VEGAS, NEVADA 89030

Daytime Telephone No.: 702-633-1932

Fax No.: 702-649-4696

E-Mail Address: LED@CITYOFNORTHLASVEGAS.COM

Community Official's Signature (required):

Date: 12/03/2013

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: RAUL V. VALDEZ, P.E., CFM

License No.: NEVADA 21427

Expiration Date: 06/30/14

Company Name: MWH AMERICAS, INC.

Telephone No.: 702-821-4376

Fax No.: 702-878-7833

Signature:



Date:
11/29/2013

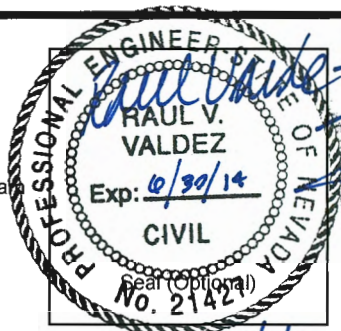
E-Mail Address:
RAUL.VALDEZ@MWHGLOBAL.COM

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)

Required if ...

- | | |
|---|---|
| ☒ Riverine Hydrology and Hydraulics Form (Form 2) | New or revised discharges or water-surface elevations |
| ☒ Riverine Structures Form (Form 3) | Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dikes |
| ☐ Coastal Analysis Form (Form 4) | New or revised coastal elevations |
| ☐ Coastal Structures Form (Form 5) | Addition/revision of coastal structure |
| ☐ Alluvial Fan Flooding Form (Form 6) | Flood control measures on alluvial fans |



for review only

FEMA CLOMR application fee explanation, to accompany form MT2-Form 1

A Review fee has not been submitted with this CLOMR Application because:

- In accordance with Section 72.5 of the NFIP regulations, review and processing fees are not required for “map changes based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective Flood Insurance Rate Map (FIRM)”

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

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ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: unamed tributary to the central freeway channel

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

- | | | |
|--|---|--|
| ☐ Not revised (skip to section B) | ☒ No existing analysis | ☒ Improved data |
| ☐ Alternative methodology | ☒ Proposed Conditions (CLOMR) | ☐ Changed physical condition of watershed |

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)
colton ave. at losee road	0.89	none	877
discharge @ cen. fwy chan	0.93	none	912

3. Methodology for New Hydrologic Analysis (check all that apply)

- | | |
|---|--|
| ☐ Statistical Analysis of Gage Records | ☒ Precipitation/Runoff Model → Specify Model: <u>hec-1 (us army corps)</u> |
| ☐ Regional Regression Equations | ☐ Other (please attach description) |

Please enclose all relevant models in digital format, maps, computations (including computation of parameters), and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit*	<u>tie into central freeway channel</u>	<u>844 (sd13518.06)</u>	<u>NONE-ZONE "A"</u>	<u>1903.09</u>
Upstream Limit*	<u>tie into zone "A" u/s of ex. (2)</u> <u>60" rwn</u>	<u>1040</u>	<u>NONE-ZONE "A"</u>	<u>1995.47</u>

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: hec-ras by usacoe & wspg by LA county flood dist.

3. Pre-Submittal Review of Hydraulic Models*

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

<u>Models Submitted</u>	<u>Natural Run</u>		<u>Floodway Run</u>		<u>Datum</u>
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name: <u>colton-ras & -us.prj</u>	Plan Name: <u>01 & 04</u>	File Name:	Plan Name:	<u>NAVD88</u>
Revised or Post-Project Conditions Model	File Name: <u>COLD18D.out</u>	Plan Name: <u>N/A</u>	File Name:	Plan Name:	<u>NAVD88</u>
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: see attached certified topographic work map

Source: colton ave topo = provided by city NLV

Date: 12/3/2013

Accuracy: colton ave topo= +/-1-ft, county topo=+/-5-ft

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach a **copy of the effective FIRM and/or FBFM**, at the same scale as the original, annotated to show the boundaries of the revised 1%-and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%-and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No
- a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot compared to pre-project conditions.
 - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.
- b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☐ Yes ☒ No
If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.
2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No
If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(A)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.
3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☒ No
If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)
4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

RIVERINE STRUCTURES FORM

PAPERWORK BURDEN DISCLOSURE NOTICE

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Flooding Source: UNAMED TRIBUTARY TO THE CENTRAL FREEWAY CHANNEL

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: COLTON AVENUE STORM DRAIN SYSTEM

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: IN COLTON AVE. BETWEEN N 5TH ST & CENTRAL FREEWAY CHANNEL

Downstream Limit/Cross Section: _____

Upstream Limit/Cross Section: _____

2. Name of Structure: _____

Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: _____

Downstream Limit/Cross Section: _____

Upstream Limit/Cross Section: _____

3. Name of Structure: _____

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: _____

Downstream Limit/Cross Section: _____

Upstream Limit/Cross Section: _____

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

B. CHANNELIZATIONFlooding Source: UNAMED TRIBUTARY TO THE CENTRAL FREEWAY CHANNELName of Structure: COLTON AVENUE STORM DRAIN SYSTEM1. Hydraulic ConsiderationsThe channel was designed to carry 912 (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions☐ Other locations (specify): _____2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator
☐ Weir ☒ Other (Describe): INLET STRUCTURE4. Sediment Transport ConsiderationsAre the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

☐ Dimensions (height, width, span, radius, length)	☐ Distances Between Cross Sections
☐ Shape (culverts only)	☐ Erosion Protection
☐ Material	☐ Low Chord Elevations – Upstream and Downstream
☐ Beveling or Rounding	☐ Top of Road Elevations – Upstream and Downstream
☐ Wing Wall Angle	☐ Structure Invert Elevations – Upstream and Downstream
☐ Skew Angle	☐ Stream Invert Elevations – Upstream and Downstream
	☐ Cross-Section Locations

4. Sediment Transport ConsiderationsAre the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

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Appendices

Appendix A – Figures

- *Figure 1- Location Map*
- *Figure 2A – FIRM Map 1*
- *Figure 2B – FIRM Map 1*
- *Figure 3-Soils Map*
- *Figure 4-Basin Map*
- *Figure 5A-Existing Condition Flood Plain Exhibit 1*
- *Figure 5B- Existing Condition Flood Plain Exhibit 2*
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- *Figure 5D- Comparison Summary Table*
- *Figure 6-Annotated FIRM Map*
- *Figure 7-Storm Drain Exhibit*

Appendix B – Hydrologic Calculations and Analyses

- *B-1: Design Rainfall & Reference Material**
- *B-2: Soil Composite Curve Number Calculations & Reference Material**
- *B-3: Sub Basin Composite Curve Number Calculations**
- *B-4: Sub Basin Lag Time Calculations**
- *B-5: Ultimate Condition 100-Year HEC-1 Model*

Appendix C – Hydraulic Analyses and Calculations

- *C-1: Existing & Proposed Upstream HEC-RAS Analysis (COLTON-RAS-US.prj)*
- *C-2: Existing Downstream HEC-RAS Analysis (COLTON-RAS.prj)*
- *C-3: Existing Dual 60" RCP WSPG Analysis (COLEX60.out)*
- *C-4: Existing Triple 54" CMP WSPG Analysis (COLEX54.out)*
- *C-5: Proposed Condition Colton Avenue Storm Drain WSPG Analysis (COL18D.out)*
- *C-6: Proposed Condition Colton Avenue Storm Drain Drop Inlet and Lateral Calculations**
- *C-7: Proposed Condition Colton Avenue Street Section Calculations**
- *C-8: Central Freeway Channel WSPG Analysis (FWC9.out)**

Appendix D – Reference Material*

- *D-1: Central Freeway Channel Drainage Map**
- *D-2: Central Freeway Channel 100-Year HEC-1 Model**

Appendix E – Data CD

Appendix F – Proposed Construction Plans (submitted separately)

Single Asterisk (*) Denotes appendix material is only included electronically on the attached Data CD

1.0 Introduction

1.1 Background

This technical report presents a hydrologic and hydraulic analysis performed in support of the Colton Avenue Flood Control Improvements Project Conditional Letter of Map Revision (CLOMR). The CLOMR is being submitted to the Federal Emergency Management Agency (FEMA) by the City of North Las Vegas (CNLV). Colton Avenue Flood Control Improvements Project consists of construction of both storm drain infrastructure and roadway improvements within public right of way. Improvements span from North 5th Street to a proposed confluence at the existing channel adjacent to Interstate-15 (I-15), herein referred to as the Central Freeway Channel (see **Figure 1**).

Colton Avenue is currently categorized as a Special Flood Hazard Area (SFHA) “Zone A” per **Figures 2A** and **2B**, (Federal Emergency Management Agency (FEMA) Flood Insurance Map (FIRM) Panel Number 32003C2160F).

Improvements proposed with this CLOMR are categorized as Clark County Regional Flood Control District (CCRFCDD) Facilities (ID Mile LVCL 0000) per the Las Vegas Valley Master Plan Update (MPU) of 2008.

1.2 Objectives

Proposed infrastructure improvements have been developed to accomplish the following primary objectives:

- Intercept surface flows discharged at the southwest corner of the North 5th Street and Colton Avenue intersection by existing dual 60-inch diameter reinforced concrete pipes (RCP) and convey them below grade within a storm drain system.
- Construct half street improvements along with curb and gutter within portions of Colton Avenue where there is currently none.
- Revise the street cross section from an inverted crown to a regular crown street.
- Collect additional surface flows draining into Colton Avenue via drop inlets and convey them below grade within the storm drain system.
- Contain the Flood Zone within the proposed storm drain facility, thereby removing adjacent commercial and industrial properties from the SFHA.

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2.0 Design Criteria

2.1 Hydrology

The Colton Avenue Flood Control Improvements Project was designed based on the ultimate condition 100-year flood. Peak discharge flows tributary to Colton Avenue were determined by performing a detailed hydrology analysis. The CCRFCD Hydrologic Criteria and Drainage Design Manual (HCDDM) was referenced while preparing the design hydrology.

All hydrologic calculations and analyses are provided in **Appendix B**.

2.1.1 Land Use

Several sources of information were utilized to categorize the land use types within the tributary Colton Avenue watershed such as county aerial photography, MPU land use GIS layers, and site investigations. The majority of the watershed is entirely developed with residential, commercial, schools, parks, roads, and graded areas. Although minor outlying parcels were observed to be undeveloped in current aerial photography, for the purposes of the curve number calculations in this report it is assumed that the entire watershed is 100 percent developed.

2.1.2 Soils

The delineated watershed area is located within the Soil Survey of the Las Vegas Valley Area, Nevada, Part of Clark County (Soil Survey No. NV 788). Information for Soil Survey NV 788 was obtained from the United States National Resources Conservation Service (NRCS). Specifically, the watershed sub basins are encompassed within the following soil types:

- 200-Glencarb Silt Loam
- 301-Las Vegas gravelly fine sand loam, 2 to 4 percent slopes
- 302-Las Vegas McCarran-Grapevine complex 0 to 4 percent slopes
- 307-Las Vegas-Skyhaven complex, 0 to 4 percent slopes
- 325-McCarran fine sandy loam, 0 to 4 percent slopes
- 380-Skyhaven very fine sandy loam, 0 to 4 percent slopes

Refer to **Figure 3** in **Appendix A** for the Soils Map depicting soil boundaries encompassing drainage sub basins.

2.1.3 Curve Numbers

Composite curve number calculations were performed for each delineated sub basin. The composite curve number is determined by the weighted method, which requires multiplying the land use percentage for each sub basin by the corresponding land use type curve number for each soil type found with the delineation boundary. Land use curve numbers were referenced from

the HCDDM Tables 602 and 602A. Composite curve number calculations are provided in **Appendix B**.

2.1.4 Design Precipitation

Design precipitation depths were referenced from the National Oceanic and Atmospheric Administration (NOAA) Atlas Map (Figure 506 of the HCDDM). All delineated sub basin areas are geographically located within the McCarran Airport Rainfall Area. As such, a 6-hour, 100-year precipitation depth of 2.77 inches was utilized. A precipitation depth of 1.58 inches was used for the 6-hour, 10-year event. The precipitation depths mentioned above were not adjusted by HCDDM Table 501 factors since the sub basins are located within the McCarran Airport Rainfall Area.

2.1.5 Depth Area Reduction Factors

Depth area reduction factors (DARF's) were utilized in the hydrologic analysis to adjust runoff flow. The DARF's were referenced from Table 502 of the HCDDM and summarized in **Table 2.1** below:

Table 2-1: DARF Summary

Cumulative Drainage Area (sq mi)	Manning's Roughness Coefficient "n"
0.0 – 0.50	0.990
0.50 - 1.00	0.975

2.1.6 Storm Distribution

The design storm for the Project is referenced from Table 503 of the HCDDM. This particular storm is characterized as the 6-hour, 100-year frequency rainfall event. A 100-year recurrence interval is defined as having 1.0 percent chance of being equaled or exceeded in any given year. Specifically, the "SDN3" distribution was modeled since the area of the tributary watershed is characterized as 0.93-square miles and SDN3 applies to drainage areas less than 8 square miles.

2.1.7 Sub Basin Delineations

The drainage watershed tributary to Colton Avenue was divided into 27 sub basins. The area was broken up based on examination of the available topography and field reconnaissance investigations. Refer to **Figure 4** within **Appendix A** for the Existing / Ultimate condition basin map.

2.1.8 Time of Concentration and Lag Time

Time of concentration (T_c) is the time required for water to flow from the most remote part of the drainage sub basin to the outlet point. In the SCS method, the time of concentration is used to determine the time to peak of the unit hydrograph, and subsequently the peak runoff and volume. Specifically, time of concentration consists of an initial overland flow time (T_i) plus the time of

travel (T_t) in storm sewers, paved gutters, roadside drainage ditches, or drainage channels. Initial overland flow time can be estimated with terrain slope and surface cover. Travel time can be estimated from the hydraulic properties of ditches, gutters, or channels. Equations utilized to calculate initial overland flow time, travel time, time of concentration, and lag time are presented below:

$$\text{Initial Overland Time: } T_i = 1.8 (1.1 - K) L_o^{1/2} / S^{1/3}$$

Where:

- K is flow resistance ($K = 0.0132CN - 0.39$)
- CN is curve number (explained in subsequent section)
- L_o is length of overland flow
- S is average basin slope in percent

$$\text{Travel Time: } T_t = [L_1 / (V_1)] + [L_2 / (V_2)]$$

Where:

- L is the travel distance in units of feet
- V is the average velocity of the flow in feet per second ($V = CS^{1/2}$)

The velocity equation (V) is based on Manning's Equation. The "C" coefficient is a function of the factors in Manning's Equation, where:

- S is average basin slope in feet per feet
- $C = 1.49 / [nR^{2/3}]$
- n is Manning's Roughness Coefficient
- R is hydraulic radius in feet ($R = A/P$)
- A = flow area in square feet
- P = wetter perimeter in feet

Two different "C" coefficients are approximated for use in the travel time equation. A "C" coefficient of 14.8 represents wide channel flow assuming a hydraulic depth, D, of 0.25 feet and a Manning's n coefficient of 0.04 for undeveloped conditions. A "C" coefficient of 29.4 represents wide channel flow assuming a hydraulic depth, D, of 0.7 feet and a Manning's n coefficient of 0.04 for undeveloped conditions. For sub basins analyzed in this study, the first 500 feet of the travel time length uses the low "C" coefficient and the remaining travel time

length uses the larger “C” coefficient. The travel time calculation calculates the travel time separately for the V1 and V2 portions of the basin and adds them together to give the total travel time for the basin.

Time of concentration was found by adding the initial overland time and travel time.

Time of Concentration: $T_C = T_i + T_t$

Time of concentration was subsequently converted to lag time. Lag time is equal to the lag (in hours) between the center of mass of rainfall excess and the peak unit hydrograph. Lag time can be approximated by the following empirical equation:

Lag Time: $T_{LAG} = T_C \times 0.60$

The time of concentration and lag time computations for all sub basins were performed using the equations listed above, which were referenced from the HCCDM and Standard Form 4 computation sheet. Detailed computations are provided in **Appendix B**.

2.1.9 Hydrologic Routing

The Muskingum-Cunge methodology was used for hydrologic routing in HEC-1. Specifically, the Muskingum-Cunge methodology requires the following input parameters: segment length, Manning’s roughness coefficient, slope, bottom width, side slope, and reach geometry description (trapezoidal, rectangular, or circular).

2.1.10 Computer Modeling

The rainfall-runoff hydrologic modeling analysis presented herein was prepared using the United States Army Corps of Engineers (USACOE) Hydrologic Engineering Center’s HEC-1 Version 4.0 software. Specifically, the analysis utilizes the Soil Conservation Service (SCS) Dimensionless Unit Hydrograph methodology. This particular methodology was published by the SCS in 1985 and is well accepted throughout in Southern Nevada. In summary, the HEC-1 software provides rainfall runoff flow rates and volumes from sub basin drainage areas after rainfall losses from depression storage and infiltrations are taken into account.

2.1.11 Hydrology Results

Results from the HEC-1 model for the 100-year storm peak runoff flow rates for both sub basins and combination points are summarized in **Table 2-2**.

Table 2-2: Hydrology Peak Flow Summary

Sub Basin Label	Area (ac)	Peak Q100 (cfs)
ULT-1A	40.04	80
ULT-1B	81.82	138
ULT-1C	77.30	163
ULT-1D	74.23	152
ULT-1E	22.11	43
ULT-1F	8.68	20
ULT-2A	17.68	42
ULT-2B	8.50	21
ULT-2C	20.48	50
ULT-2D	20.02	47
ULT-2E	35.00	61
ULT-2F	16.30	34
ULT-2G	45.28	102
ULT-2H	5.69	6
ULT-2I	3.33	3
ULT-3A	11.76	32
ULT-3B	17.26	45
ULT-3C	4.59	12
ULT-3D	8.85	24
ULT-3E	6.77	18
ULT-3F	14.10	35
ULT-3G	4.70	13
ULT-3H	2.54	6
ULT-3J	14.92	34
ULT-3K	10.38	24
ULT-3L	17.91	36
OFF-1	5.76	18

Table 2-2 Continued: Hydrology Peak Flow Summary

Combination Point Label	Area (sq.mi.)	Peak Q100 (cfs)
CP-1	0.44	495
CP-2	0.53	555
CP-3	0.04	62
CP-4C	0.06	74
CP-4B	0.07	80
CP-4A	0.74	740
CPD1	0.05	77
CPD2	0.02	42
CP-5	0.82	807
CP-6A	0.03	48
CP-6B	0.04	55
CP-6	0.89	877
CP-7	0.93	912

3.0 Proposed Storm Drain System

This section describes the proposed storm drain system within Colton Avenue. A set of construction plans is provided in **Appendix F**.

3.1 Inlet Structure

An inlet structure is proposed to tie in to the dual 60-inch reinforced concrete pipes (RCP's) at the existing above ground headwall outlet. The inlet structure will be a concrete cast in place structure with a sloping invert which will convey the above ground discharged flow below grade into the proposed storm drain system. The inlet structure will therefore eliminate surface flows from directly discharging onto Colton Avenue.

3.2 Proposed Storm Drain Sewer

The proposed storm drain system consists of reinforced concrete boxes (RCB's) and begins at North 5th Street and extends easterly within Colton Avenue to the existing Central Freeway Channel. Multiple combination curb and gutter inlets are proposed along Colton Avenue to intercept street flow and discharge into the storm drain system. The storm drain transitions into a 102-inch diameter RCP upstream of the existing Union Pacific Rail Road (UPRR) track, crosses beneath the track embankment, and ties into the existing Central Freeway Channel. In summary the storm drain is categorized by the following segments:

- 1,267 linear feet of 7-foot by 6-foot RCB
- 1,328 linear feet of 9-foot by 6-foot RCB
- 131 linear feet of 102-inch diameter RCP

3.3 Outlet Confluence Channel Structure

The existing Central Freeway Channel cross section geometry is trapezoidal in shape with a 20-foot wide bottom, 10-foot depth, and 1.5-foot horizontal:1-foot vertical side slopes. To accommodate the proposed storm drain system connection at the Central Freeway Channel a confluence is proposed to be constructed at the connection point. The confluence reconstruction entails transitioning from a trapezoidal section to a 35-foot wide, 13-foot high rectangular section upstream of the storm drain tie in point. The Colton Avenue storm drain ties in with a curved 9-foot wide rectangular channel.

Downstream of the storm drain tie in point the channel section changes to a 45-foot wide, 13-foot high rectangular section. The proposed rectangular channel section transitions back into the

existing trapezoidal section downstream of the storm drain connection point. In summary, the proposed outlet channel confluence structure consists of the following segments:

- 100-linear feet of existing trapezoidal to 35-foot wide rectangular channel transition
- 80-linear feet of 35-foot wide, 13-foot high rectangular channel
- 88-linear feet of 40-foot wide, 13-foot high rectangular channel
- 50-linear feet of 40-foot wide rectangular to existing trapezoidal channel transition

The central freeway channel is analyzed in WSPG (File *FWC9.out*) which takes into account the proposed Colton Avenue storm drain confluence junction. The water surface elevation at the junction is referenced as the tail water for the storm drain model. All WSGP models are provided in **Appendix C**.

4.0 CLOMR Hydraulics

A HEC-RAS analysis was prepared for Colton Avenue for the existing conditions. The hydraulic software model utilized for analysis of the proposed Colton Avenue storm drain is Water Surface Pressure Gradient (WSPG) developed by the Los Angeles County Flood Control District. WSPG utilizes the energy equation methodology for closed conduit flow and the standard step method for open channel flow. The following Manning's Roughness coefficients were utilized in the analyses:

Table 4-1: Roughness Coefficient Summary

Surface Condition	Manning's Roughness Coefficient "n"
Concrete Pavement & Pipe	0.013
Asphalt Pavement	0.016
Clean Earth	0.025
Earth with heavy grass	0.030
Grouted Rip Rap	0.028

A data CD is provided in **Appendix E**, which includes all electronic files for the hydraulic models performed with this CLOMR, as well as the existing and proposed SFHA boundary files in DWG format.

4.1 Existing Condition Street Hydraulics

Two separate HEC-RAS analyses were performed in the preparation of this CLOMR for the Project. A HEC-RAS (upstream file: *COLTON-RAS-US.prj*) analysis was performed for the terrain located upstream of two existing 60-inch diameter RCP storm drains discharging flows into the North 5th Street and Colton Avenue intersection. Clark County geographic information system (GIS) 5- and 25-foot interval topography from 2005 was used to prepare the upstream HEC-RAS cross sections. This analysis was run using a mixed flow regime with the ultimate condition flows determined in the hydrology analysis. The boundary conditions are normal depth based on bed slope at the upstream end and critical depth at the downstream end. Based on the HEC-RAS analysis results, the delineated flood zone boundary ties horizontally into the existing SFHA "Zone A" between cross sections 1040 and 1030 (see **Figure 5A** within **Appendix A**).

A subsequent HEC-RAS (downstream file: *COLTON-RAS.prj*) analysis is prepared for the terrain immediately downstream of the existing dual 60-inch diameter RCP storm drain. The downstream HEC-RAS analysis encompasses Colton Avenue and extends to the Central Freeway Channel. The existing flown 1- and 5-foot interval topography of Colton Avenue was

used to cut cross sections of the street inverted crown along the project extents. The cross sections were supplemented with survey shot elevations at the gutter lips, flow lines, and top of curbs. The downstream HEC-RAS analysis was run using a mixed flow regime with the ultimate condition flows determined in the hydrology analysis.

The downstream boundary condition for the HEC-RAS Analysis entitled *COLTON-RAS.prj* was determined by performing a WSPG hydraulic analysis (*COLEX54.out*) of three existing parallel 54-inch diameter storm drain corrugated metal pipes (CMP) discharging directly into the Central Freeway Channel. The headwater depth determined from the WSPG analysis for the triple 54-inch diameter CMP's at the upstream end was referenced as the starting water surface elevation for the downstream boundary condition.

The existing dual 60-inch diameter RCP storm drain pipes located in between the *COLTON-RAS-US.prj* and *COLTON-RAS.prj* are approximately 1,000 linear feet long. Due to the excessive length, the storm drain was modeled separately in the WSPG model. Both the upstream and downstream boundary conditions of the WSPG model use the water surface elevations reported by both respective HEC-RAS analyses.

The water surface boundary extent and base flood elevation (BFE) results reported by HEC-RAS were exported and transposed to **Figures 5A** through **5B** within **Appendix A**.

4.2 Proposed Condition Street Hydraulics

In the proposed condition, it is assumed that the storm drain system is constructed within Colton Avenue along with all combination curb and gutter inlets, inlet structure, and Central Freeway Channel confluence. A WSPG analysis (*COL18D.out*) is performed for the proposed storm drain system. The downstream boundary condition for the Colton Avenue storm drain system is referenced from a channel hydraulic analysis performed for the Central Freeway Channel. Results of the Colton Avenue WSPG model indicates that the hydraulic grade line (HGL) is located a minimum of 1-foot below the finished grade along Colton Avenue. Therefore the 100-year flow is contained within the storm drain in Colton Avenue.

The proposed condition and BFE's resulting from the WSPG analysis are summarized in **Figures 5C** and **5D**. An annotated FEMA FIRM is provided as **Figure 6** which depicts the proposed condition and **Figure 7** provides a summary of the proposed storm drain system with the drop inlet interception capacity summary. All aforementioned figures are provided in **Appendix A**. Pertinent storm drain analyses, drop inlet calculations, lateral analyses, and street normal depth calculations are provided in **Appendix C**.

4.3 Pre and Post Construction Comparison

The results of both existing and proposed BFE's hydraulic analyses are summarized in **Table 4-2** below:

Table 4-2: BFE Summary

Hydraulic Analysis Model File	Colton Avenue Storm Drain Station	HEC-RAS Cross Section	Existing Condition BFE (feet NAVD88)	Proposed Condition BFE (feet NAVD88)	BFE Difference (feet)
<i>HEC-RAS Analysis: COLTON-RAS-US.prj</i>	--	1040	1995.47	1995.47	0.00
	--	1035	1992.77	1992.77	0.00
	--	1030	1991.79	1991.79	0.00
	--	1025	1990.90	1990.90	0.00
	--	1020	1989.16	1989.16	0.00
	--	1015	1987.39	1987.39	0.00
	--	1010	1987.41	1987.41	0.00
	--	1005	1986.71	1986.71	0.00
<i>EX (2) 60" RCP WSPG Analysis: COL60EX.out</i>	90+00.78	--	1986.71	1986.71	0.00
	95+01.31	--	1977.71	1977.71	0.00
	100+01.83	--	1969.84	1969.84	0.00
<i>HEC-RAS Analysis: COLTON-RAS.prj</i>	100+01.30	1000	1969.48	1968.96	-0.52
	100+21.91	998	1968.63	1958.98	-9.65
	100+42.57	996	1968.67	1953.58	-15.09
	100+63.99	994	1968.77	1952.92	-15.85
	100+85.39	992	1968.59	1952.27	-16.32
	101+06.86	990	1967.62	1951.61	-16.01
	101+24.24	988	1967.37	1951.08	-16.29
	101+51.44	986	1967.26	1950.45	-16.81
	101+95.21	984	1967.21	1950.44	-16.77
	102+45.27	982	1966.46	1949.72	-16.74
	102+70.24	980	1965.65	1949.17	-16.48
	102+95.27	978	1964.64	1948.64	-16.00
	103+45.26	976	1963.23	1947.54	-15.69
	103+95.24	974	1961.16	1946.37	-14.79
	104+45.30	972	1959.19	1945.20	-13.99
	104+95.28	970	1957.20	1944.04	-13.16
	105+45.47	968	1955.59	1942.87	-12.72
	105+95.42	966	1954.39	1941.70	-12.69
	106+22.30	964	1954.09	1941.07	-13.02
	106+52.31	962	1953.57	1940.37	-13.20
	106+82.08	960	1953.22	1939.68	-13.54
	107+02.26	958	1952.81	1939.21	-13.60
	107+52.29	956	1951.46	1938.04	-13.42
	108+02.23	954	1950.05	1936.88	-13.17
	108+52.30	952	1948.10	1935.71	-12.39
	109+02.29	950	1946.33	1934.54	-11.79
	109+52.37	948	1944.57	1933.38	-11.19
	110+02.28	946	1942.67	1932.21	-10.46

**Colton Avenue Flood Control
Improvements Project
North 5th Street to the I-15 Channel**

Hydraulic Analysis Model File	Colton Avenue Storm Drain Station	HEC-RAS Cross Section	Existing Condition BFE (feet NAVD88)	Proposed Condition BFE (feet NAVD88)	BFE Difference (feet)
HEC-RAS Analysis: COLTON-RAS.prj	110+52.35	944	1941.26	1931.04	-10.22
	110+87.27	942	1940.15	1930.23	-9.92
	111+09.83	940	1939.70	1929.70	-10.00
	111+32.31	938	1940.61	1929.18	-11.43
	111+82.32	936	1939.75	1928.11	-11.64
	112+32.41	934	1938.47	1927.28	-11.19
	112+82.40	932	1938.66	1926.74	-11.92
	113+32.25	930	1937.42	1926.20	-11.22
	113+82.27	928	1936.64	1925.67	-10.97
	114+32.28	926	1936.68	1925.13	-11.55
	114+82.31	924	1935.84	1924.59	-11.25
	115+32.33	922	1934.73	1924.05	-10.68
	115+82.30	920	1933.45	1923.51	-9.94
	116+32.35	918	1931.71	1922.97	-8.74
	116+82.24	916	1930.23	1922.44	-7.79
	117+32.32	914	1929.29	1921.90	-7.39
	117+82.25	912	1928.61	1921.36	-7.25
	118+32.35	910	1928.27	1920.82	-7.45
	118+82.32	908	1927.66	1920.20	-7.46
	119+34.06	906	1927.12	1918.45	-8.67
	119+83.97	904	1926.42	1917.66	-8.76
	120+34.15	902	1925.73	1916.85	-8.88
	120+83.97	900	1925.10	1916.05	-9.05
	121+33.93	898	1924.33	1915.25	-9.08
	121+83.93	896	1923.66	1916.08	-7.58
	122+33.92	894	1922.93	1915.85	-7.08
	122+83.96	892	1922.41	1915.48	-6.93
	123+33.96	890	1921.55	1915.11	-6.44
	123+83.93	888	1921.09	1914.74	-6.35
	124+33.87	886	1920.14	1914.37	-5.77
	124+83.91	884	1919.42	1914.00	-5.42
	125+33.88	882	1918.59	1913.58	-5.01
	125+83.98	880	1918.03	1913.14	-4.89
	126+33.98	878	1917.08	1912.71	-4.37
	126+84.09	876	1916.61	1912.28	-4.33
	127+33.87	874	1915.57	1911.84	-3.73
	127+84.17	872	1916.20	1911.41	-4.79
	128+34.10	870	1915.77	1910.98	-4.79
	128+84.10	868	1915.44	1910.49	-4.95
	130+05.05	866	1913.76	1908.40	-5.36

Colton Avenue Flood Control
Improvements Project
North 5th Street to the I-15 Channel

Hydraulic Analysis Model File	Colton Avenue Storm Drain Station	HEC-RAS Cross Section	Existing Condition BFE (feet NAVD88)	Proposed Condition BFE (feet NAVD88)	BFE Difference (feet)
HEC-RAS Analysis: COLTON-RAS.prj	130+58.80	864	1913.31	1907.69	-5.62
	131+08.82	862	1912.52	1907.20	-5.32
	131+58.75	860	1912.23	1906.70	-5.53
	132+11.49	858	1912.42	1906.18	-6.24
	132+58.92	856	1912.40	1905.70	-6.70
	133+08.78	854	1912.37	1905.21	-7.16
	133+58.76	852	1912.36	1904.71	-7.65
	134+08.82	850	1912.34	1904.22	-8.12
	134+58.98	848	1912.33	1903.72	-8.61
	134+90.91	846	1912.31	1903.40	-8.91
	135+18.06	844	1912.20	1903.09	-9.11

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5.0 Conclusion

The Colton Avenue Flood Control Improvements Project, when constructed, will remove the existing SFHA “Zone A” depicted on Panel Number 32003C2160F located along Colton Avenue, between North 5th Street and the Central Freeway Channel. The proposed BFE’s are substantially lower when compared to the existing BFE’s, therefore the 100-year flow will be contained within storm drain along the Colton Avenue street alignment.

The portion of the SFHA “Zone A” located north of the North 5th Street and Colton Avenue intersection is mapped incorrectly as shown in the FEMA FIRM’s. The hydraulic analysis models for the existing dual 60-inch diameter dual RCP’s indicates that the 100-year base flow is contained within this particular stretch of storm drain; therefore approximately 1,000-linear feet of “Zone A” is eliminated upstream of the dual 60-inch diameter RCP outlet headwall. A portion of the “Zone A” located upstream of the headwall is decreased in width and shifted northerly based hydraulic analysis results and topographic information.

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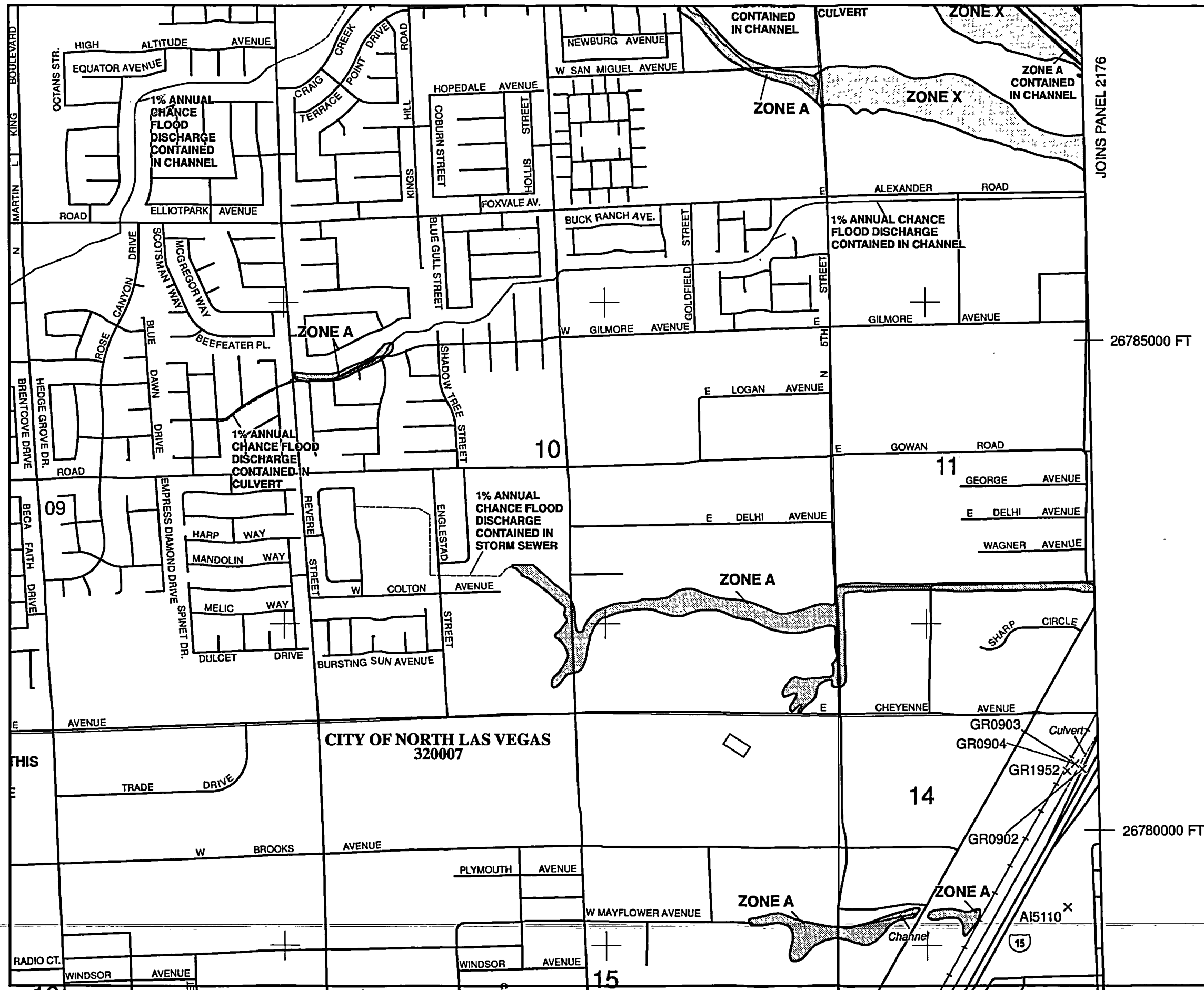
6.0 References

- Clark County Regional Flood Control District (CCRFCDD) *Hydrologic Criteria Drainage Design Manual* (HCCDM). 1999
- Clark County Regional Flood Control District (CCRFCDD) *Las Vegas Valley Master Plan Update* (MPU). 2008
- MWH Americas, Inc., *Draft Technical Memorandum No. 1 Central Freeway Channel Hydrologic/Hydraulic Analysis Memorandum*. June 2013
- National Resources Conservation Service (NRCS), *Soil Survey of the Las Vegas Valley Area* (Soil Survey No. 788). 1988

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Appendix A

Figures





MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

500 0 1000 2000 METERS

PANEL 2160F

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY,

NEVADA

AND INCORPORATED AREAS

PANEL 2160 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	320003	2160	F
LAS VEGAS, CITY OF	320278	2160	F
NORTH LAS VEGAS, CITY OF	320007	2160	F

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER
32003C2160F

MAP REVISED
NOVEMBER 16, 2011

Federal Emergency Management Agency

FIGURE 2A - FIRM MAP

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

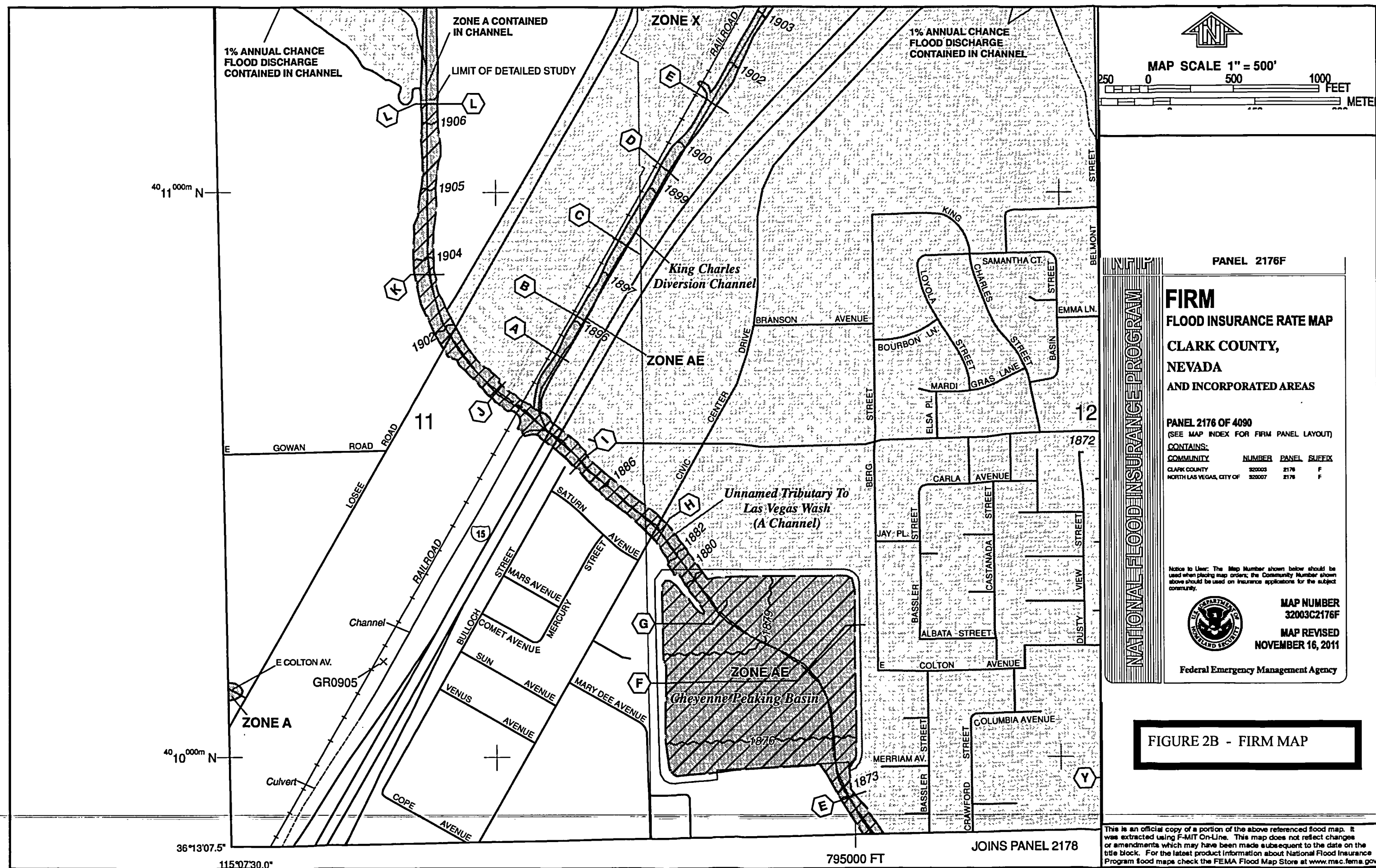
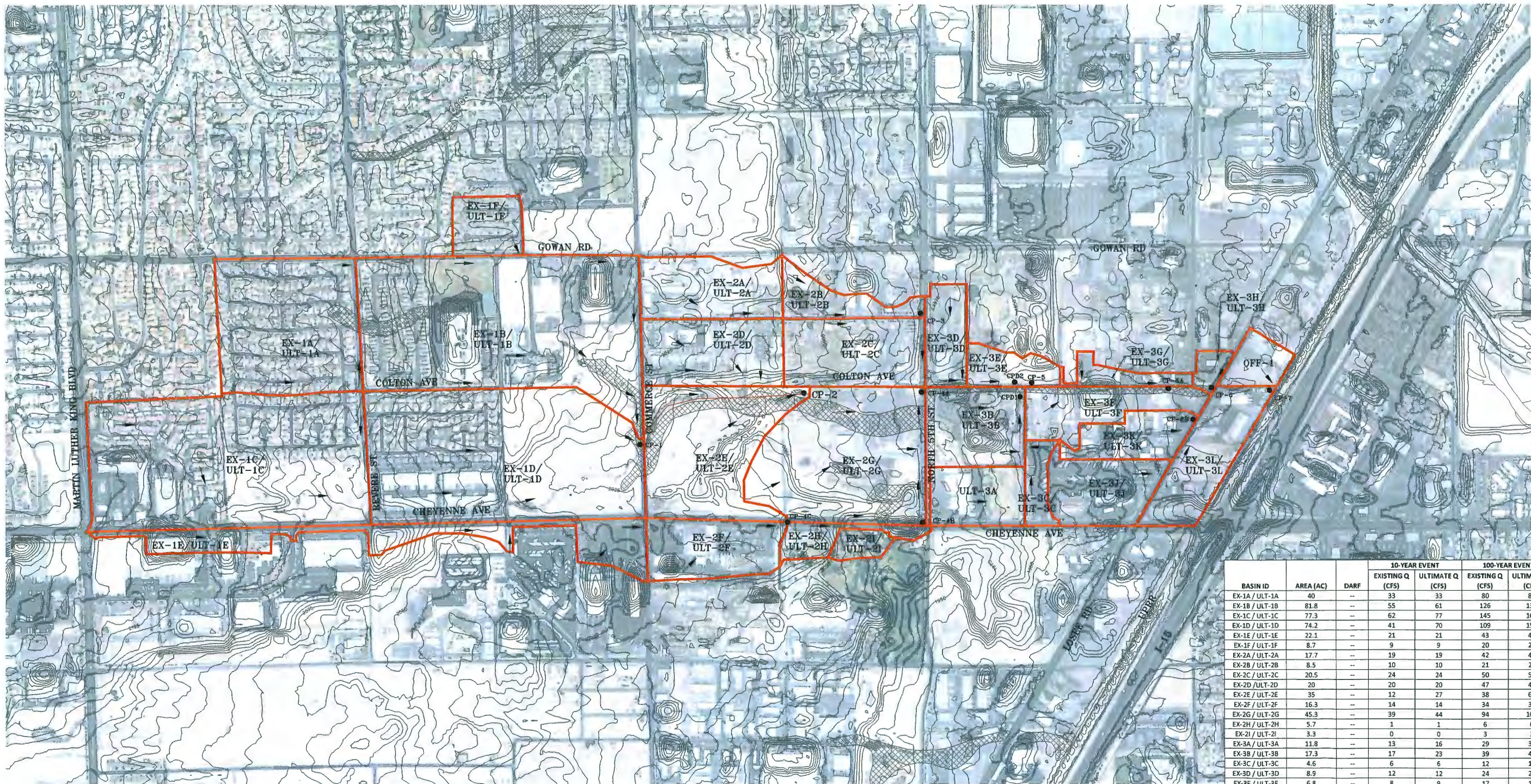
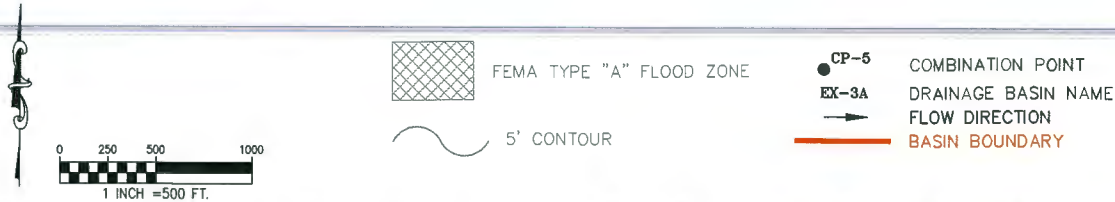
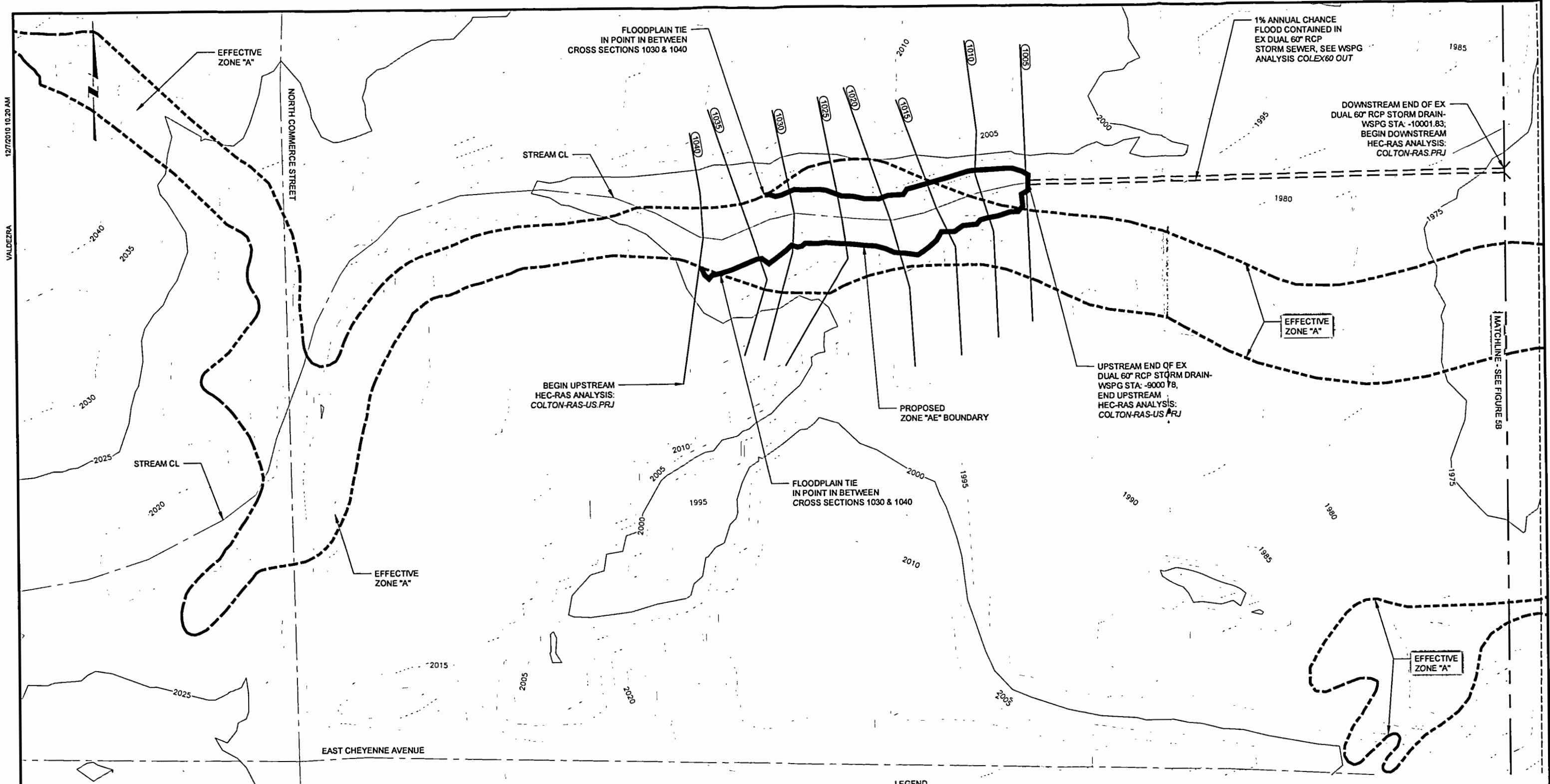


FIGURE 2B - FIRM MAP



BASIN ID	AREA (AC)	DARF	10-YEAR EVENT		100-YEAR EVENT	
			EXISTING Q (CFS)	ULTIMATE Q (CFS)	EXISTING Q (CFS)	ULTIMATE Q (CFS)
EX-1A / ULT-1A	40	--	33	33	80	80
EX-1B / ULT-1B	81.8	--	55	61	126	138
EX-1C / ULT-1C	77.3	--	62	77	145	163
EX-1D / ULT-1D	74.2	--	41	70	109	152
EX-1E / ULT-1E	22.1	--	21	21	43	43
EX-1F / ULT-1F	8.7	--	9	9	20	20
EX-2A / ULT-2A	17.7	--	19	19	42	42
EX-2B / ULT-2B	8.5	--	10	10	21	21
EX-2C / ULT-2C	20.5	--	24	24	50	50
EX-2D / ULT-2D	20	--	20	20	47	47
EX-2E / ULT-2E	35	--	12	27	38	61
EX-2F / ULT-2F	16.3	--	14	14	34	34
EX-2G / ULT-2G	45.3	--	39	44	94	102
EX-2H / ULT-2H	5.7	--	1	1	6	6
EX-2I / ULT-2I	3.3	--	0	0	3	3
EX-3A / ULT-3A	11.8	--	13	16	29	32
EX-3B / ULT-3B	17.3	--	17	23	39	45
EX-3C / ULT-3C	4.6	--	6	6	12	12
EX-3D / ULT-3D	8.9	--	12	12	24	24
EX-3E / ULT-3E	6.8	--	8	9	17	18
EX-3F / ULT-3F	14.1	--	18	18	35	35
EX-3G / ULT-3G	4.7	--	6	6	13	13
EX-3H / ULT-3H	2.5	--	3	3	6	6
EX-3J / ULT-3J	14.9	--	15	15	34	34
EX-3K / ULT-3K	10.4	--	11	11	24	24
EX-3L / ULT-3L	17.9	--	16	16	36	36
OFF-1	5.76	--	10	10	18	18
COLLECTION POINT ID			EXISTING Q (CFS)	ULTIMATE Q (CFS)	EXISTING Q (CFS)	ULTIMATE Q (CFS)
CP-1	0.44	0.990	178	219	445	495
CP-2	0.53	0.975	199	238	476	555
CP-3	0.04	0.990	28	28	62	62
CP-4A	0.74	0.975	254	307	620	740
CP-4B	0.07	0.990	37	37	80	80
CP-4C	0.06	0.990	36	36	74	74
CP-5	0.82	0.975	269	328	712	807
CP-6A	0.03	0.990	24	24	48	48
CP-6B	0.04	0.990	24	24	55	55
CP-6	0.89	0.975	279	349	760	877
CP-7	0.93	0.975	286	363	786	912
CPD1	0.05	0.990	29	38	66	77
CPD2	0.02	0.990	20	22	41	42





NOTES

- FLOODZONE "A" FROM MAP 32003C2160F DEPICTED
- TOPOGRAPHY (5 & 25-FOOT INTERVAL) OBTAINED FROM 2005 CLARK COUNTY GIS DEPARTMENT, INTERPOLATED TO 1 & 5-FOOT CONTOUR INTERVAL FOR CROSS SECTIONS
- DRAWING COORDINATES ARE IN CITY OF NORTH LAS VEGAS USER DEFINED TRANSVERSE MERCATOR PROJECTION PARAMETERS

CITY OF NORTH LAS VEGAS USER DEFINED
MERCATOR PROJECTION PARAMETERS:

CENTRAL MERIDIAN = 115°05'53.002040" WEST
LATITUDE OF ORIGIN = 36°15'00.000603" NORTH
ORIGIN NORTHING = 75000.0000 U.S. FEET
ORIGIN EASTING = 75000.0000 U.S. FEET
SCALE ALONG CENTRAL MERIDIAN = 1.000093468437
CONVERGENCE ANGLE = 0°17'13.033030" WEST
REFERENCE ELLIPSOID = GRS-80
SEMI-MAJOR AXIS = 20,925,604.474 U.S. FEET
FLATTENING (1/f) = 298.25722154
X TRANSLATION = 0.0000
Y TRANSLATION = 0.0000
Z TRANSLATION = 0.0000

NAVD88 BENCHMARK:
7C0111SE6 ELEVATION 1914.174
RIVET AND SQUARE ALUMINUM PLATE, STAMPED
BM 7C0111SE6, SET IN THE TOP OF CURB, LOCATED
ON THE EAST SIDE OF LOSEE RD APPROX 150 FEET
NORTH OF INTERSECTION OF COLTON AVE AND
LOSEE RD

PLAN

LEGEND



EFFECTIVE FEMA FLOODPLAIN AREA

EXISTING FLOODPLAIN AREA

800 — HEC-RAS CROSS SECTION

REV	DATE	BY	DESCRIPTION

SCALE
1" = 100'

WARNING
IF THIS BAR DOES
NOT MEASURE 1"
THEN DRAWING IS
NOT TO SCALE

DESIGNED R VALDEZ
DRAWN R VALDEZ
CHECKED J PARKE



CITY OF NORTH LAS VEGAS

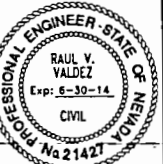
COLTON AVENUE FLOOD CONTROL IMPROVEMENTS PROJECT

CLOMR
EXISTING CONDITION 100-YEAR
FLOOD PLAIN EXHIBIT 1

SHEET

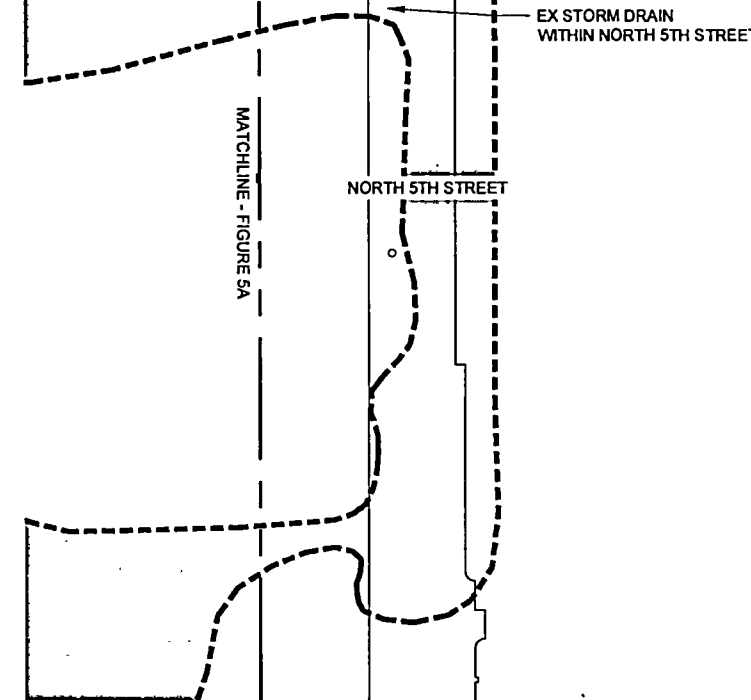
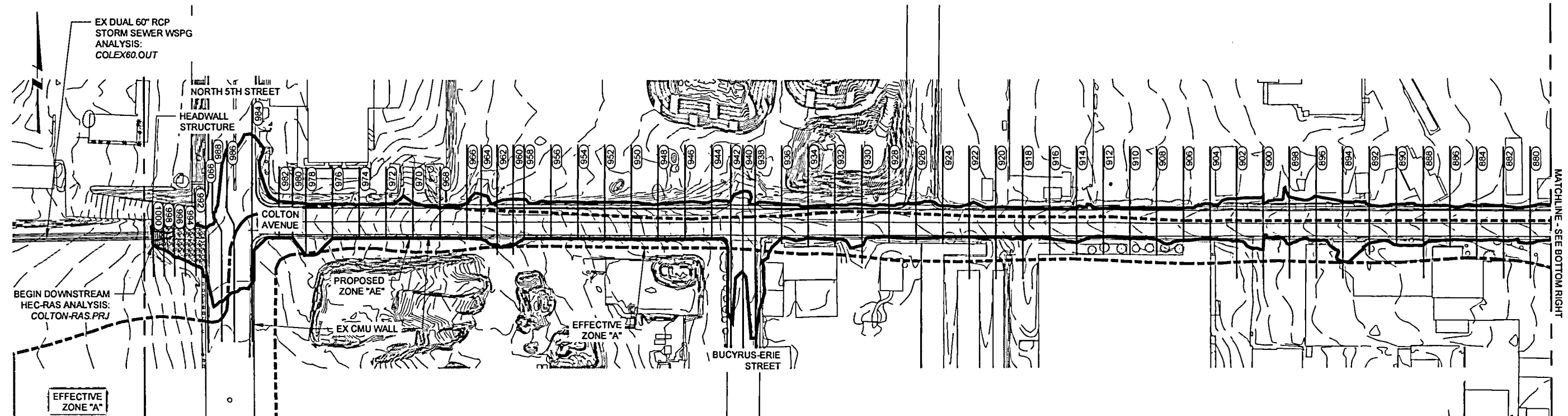
FIG 5A

DRAFT MAP
FOR REVIEW ONLY

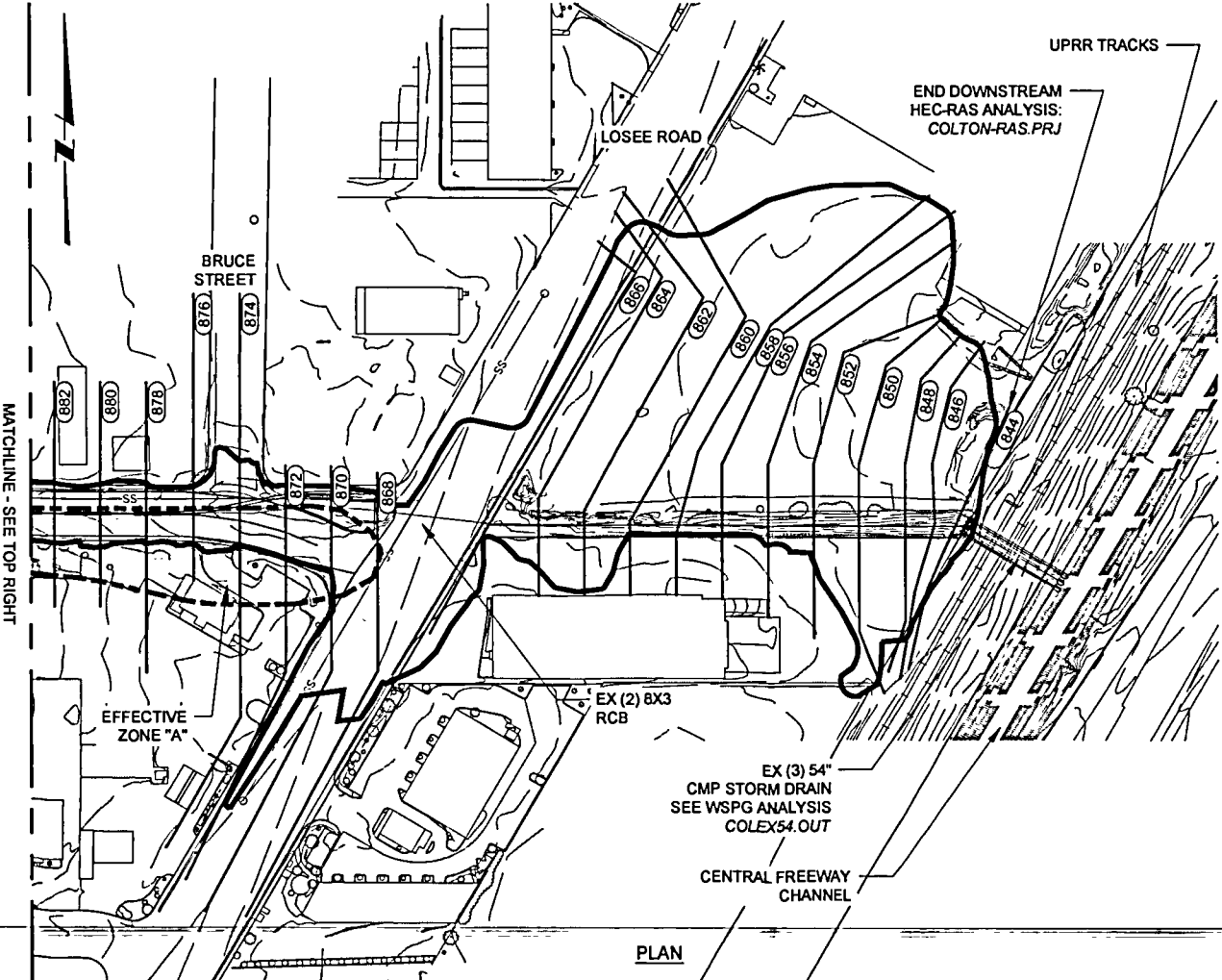
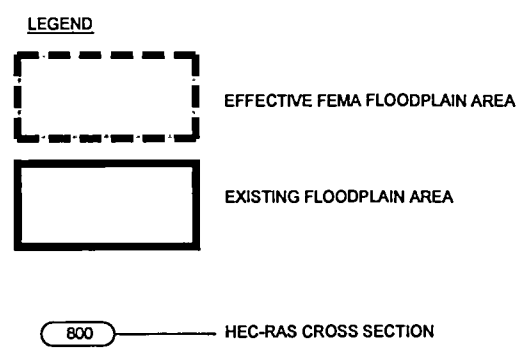


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VALDEZ



- NOTES:
- FLOODZONE "A" FROM MAP 32003C2160F DEPICTED
 - TOPOGRAPHY (5 & 25-FOOT INTERVAL) OBTAINED FROM 2005 CLARK COUNTY GIS DEPARTMENT, INTERPOLATED TO 1 & 5-FOOT CONTOUR INTERVAL FOR CROSS SECTIONS
 - DRAWING COORDINATES ARE IN CITY OF NORTH LAS VEGAS USER DEFINED TRANSVERSE MERCATOR PROJECTION PARAMETERS; REFER TO FIGURE 5A FOR TRANSFORMATION PARAMETERS



DRAFT MAP
FOR REVIEW ONLY

PROFESSIONAL ENGINEER - STATE OF NEVADA

RAUL V. VALDEZ

Exp: 6-30-14

CIVIL

No 21427

REV	DATE	BY	DESCRIPTION

SCALE	WARNING	DESIGNED
1" = 100'	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE	R VALDEZ
		DRAWN
		R VALDEZ
		CHECKED
		J PARKE



CITY OF NORTH LAS VEGAS

COLTON AVENUE FLOOD CONTROL IMPROVEMENTS PROJECT

CLOMR

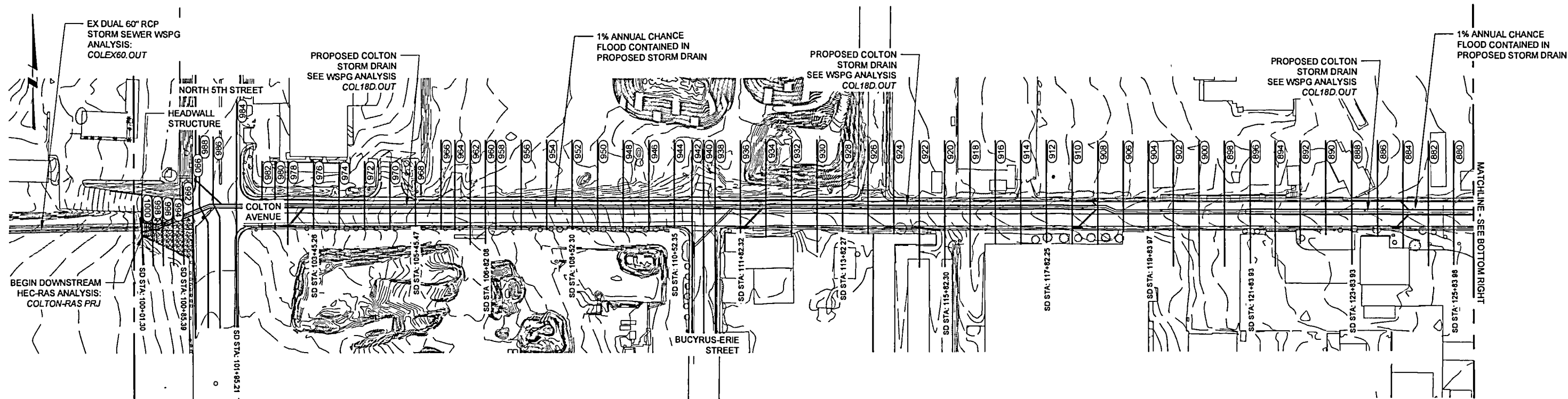
EXISTING CONDITION 100-YEAR

FLOOD PLAIN EXHIBIT 2

SHEET

FIG 5B

12/7/2010 10:20 AM
VALDEZ



MATCHLINE - FIGURE 5A

NORTH 5TH STREET

EX STORM DRAIN
WITHIN NORTH 5TH STREET

LEGEND

800

SD STA. 108+52.30

EQUIVALENT HEC RAS
CROSS SECTION FOR
EXISTING CONDITION

NOTE: REFER TO FIGURE 5D FOR COMPLETE WSPG STATION
AND EQUIVALENT HEC-RAS CROSS SECTIONS, ALONG WITH
WATER SURFACE ELEVATIONS.

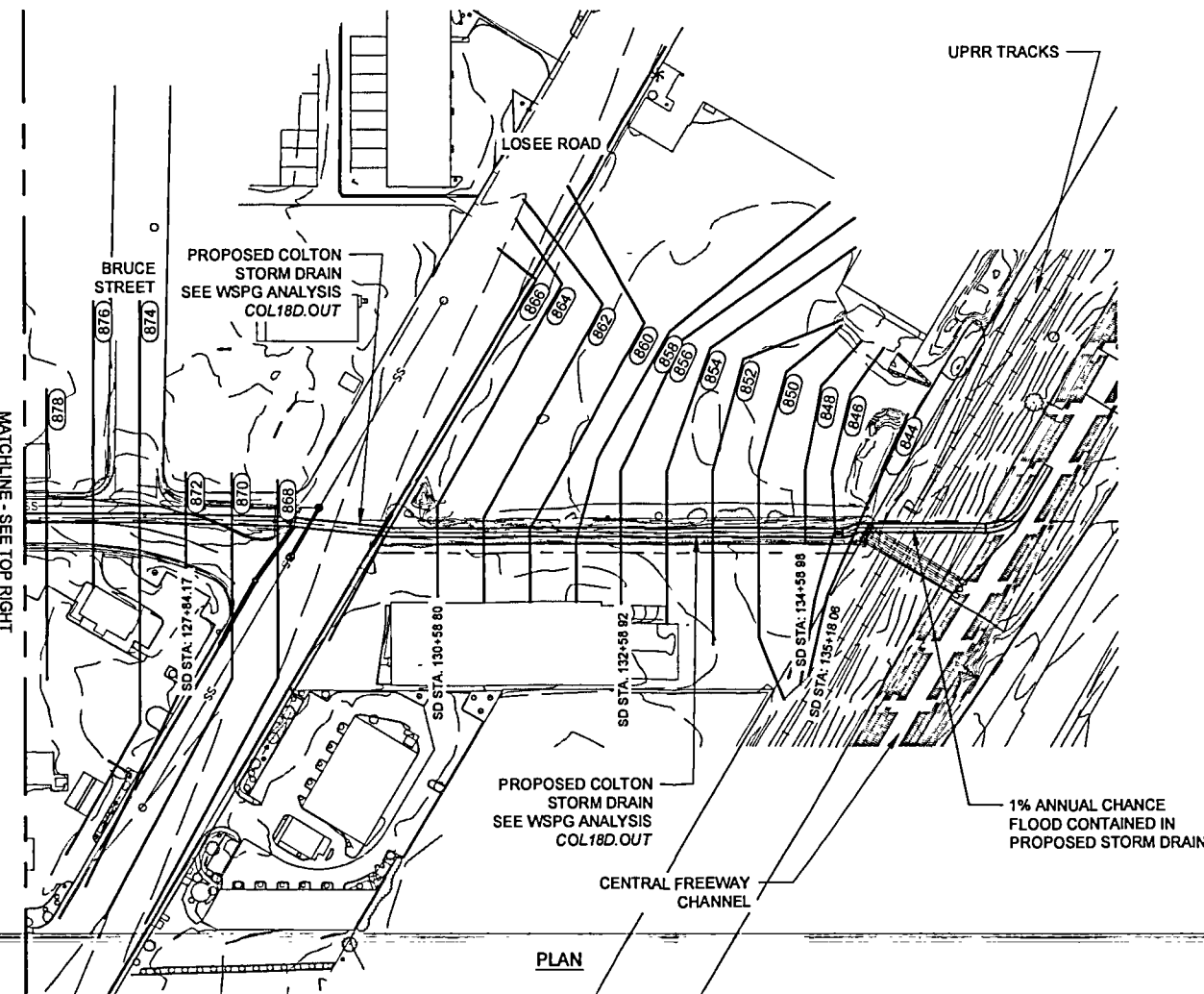
COLTON AVE STORM
DRAIN / WSPG STATION

NOTES:

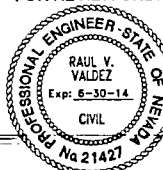
- FLOODZONE "A" FROM MAP 32003C2160F DEPICTED
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MATCHLINE - SEE TOP RIGHT



DRAFT MAP
FOR REVIEW ONLY



REV	DATE	BY	DESCRIPTION

SCALE
1" = 100'

WARNING
IF THIS BAR DOES
NOT MEASURE 1"
THEN DRAWING IS
NOT TO SCALE

DESIGNED R VALDEZ
DRAWN R VALDEZ
CHECKED J PARKE



CITY OF NORTH LAS VEGAS

COLTON AVENUE FLOOD CONTROL IMPROVEMENTS PROJECT
CLOMR
PROPOSED CONDITION 100-YEAR
FLOOD PLAIN EXHIBIT

SHEET
FIG 5C

12/7/2010 10:20 AM

VALDEZ

COLTON AVENUE STORM DRAIN STATION	HEC-RAS CROSS SECTION	100-YEAR FLOW RATE (CFS)	EXISTING BASE FLOOD ELEVATION	PROPOSED BASE FLOOD ELEVATION	DIFFERENCE (PROPOSED - EXISTING) (FEET)
			(FEET: NAVD 88)	(FEET: NAVD 88)	
HEC-RAS ANALYSIS: COLTON-RAS-US.P7	1040	555	1995 47	1995 47	0 00
	1035	555	1992 77	1992 77	0 00
	1030	555	1991 79	1991 79	0 00
	1025	555	1990 90	1990 90	0 00
	1020	555	1989 18	1989 18	0 00
	1015	555	1987 39	1987 39	0 00
	1010	555	1987 41	1987 41	0 00
	1005	555	1986 71	1986 71	0 00
EX 12.87 RCP WSP ANALYSIS: COLONEXout	90+00 78	--	1986 71	1986.71	0 00
	95+01 31	--	1977.71	1977.71	0 00
	100+01 83	--	1969 84	1969 84	0 00
HEC-RAS ANALYSIS: COLTON-RAS.P7	100+01 30	1000	1969 48	1968 96	-0 52
	100+21 91	998	1968 63	1958 98	-9 65
	100+42 57	996	1968 67	1953 58	-15 09
	100+63 99	994	1968 77	1952 92	-15 85
	100+85 39	992	1968 59	1952 27	-16 32
	101+06 86	990	1967 62	1951 61	-16 01
	101+24 24	988	1967 37	1951 08	-16 29
	101+51 44	986	1967 26	1950 45	-16 81
	101+95 21	984	1967 21	1950 44	-16 77
	102+45 27	982	1966 46	1949 72	-16 74
	102+70 24	980	1965 65	1949 17	-16 48
	102+95 27	978	1964 64	1948 64	-16 00
	103+45 26	976	1963 23	1947 54	-15 69
	103+95 24	974	1961 16	1946 37	-14 79
	104+45 30	972	1959 19	1945 20	-13 99
	104+95 28	970	1957 20	1944 04	-13 16
	105+45 47	968	1955 59	1942 87	-12 72
	105+95 42	966	1954 39	1941 70	-12 69
	106+22 30	964	1954 09	1941 07	-13 02
	106+52 31	962	1953 57	1940 37	-13 20
	106+82 08	960	1953 22	1939 68	-13 54
	107+02 26	958	1952 81	1939 21	-13 60
	107+52 29	956	1951 46	1938 04	-13 42
	108+02 23	954	1950 05	1936 88	-13 17
	108+52 30	952	1948 10	1935 71	-12 39
	109+02 29	950	1946 33	1934 54	-11 79
	109+52 37	948	1944 57	1933 38	-11 19
	110+02 28	946	1942 87	1932 21	-10 66
	110+52 35	944	1941 26	1931 04	-10 22
	110+87 27	942	1940 15	1930 23	-9 92
	111+09 83	940	1939 70	1929 70	-10 00
	111+32 31	938	1940 61	1929 18	-11 43
	111+82 32	936	1939 75	1928 11	-11 64
	112+32 41	934	1938 47	1927 28	-11 19
	112+82 40	932	1938 66	1926 74	-11 92
	113+32 25	930	1937 42	1926 20	-11 22
	113+82 27	928	1936 64	1925 67	-10 97
	114+32 28	926	1936 68	1925 13	-11 55
	114+82 31	924	1935 84	1924 59	-11 25
	115+32 33	922	1934 73	1924 05	-10 68
	115+82 30	920	1933 45	1923 51	-9 94
	116+32 35	918	1931 71	1922 97	-8 74
	116+82 24	916	1930 23	1922 44	-7 79
	117+32 32	914	1929 29	1921 90	-7 39
	117+82 25	912	1928 61	1921 36	-7 25
	118+32 35	910	1928 27	1920 82	-7 45
	118+82 32	908	1927 66	1920 20	-7 46
	119+34 06	906	1927 12	1918 45	-8 67
	119+83 97	904	1926 42	1917 66	-8 76
	120+34 15	902	1925 73	1916 85	-8 88
	120+83 97	900	1925 10	1916 05	-9 05
	121+33 93	898	1924 33	1915 25	-9 08
	121+83 93	896	1923 66	1916 08	-7 58
	122+33 92	894	1922 93	1915 85	-7 08
	122+83 96	892	1922 41	1915 48	-6 93
	123+33 96	890	1921 55	1915 11	-6 44
	123+83 93	888	1921 09	1914 74	-6 35
	124+33 87	886	1920 14	1914 37	-5 77
	124+83 91	884	1919 42	1914 00	-5 42
	125+33 88	882	1918 59	1913 58	-5 01
	125+83 98	880	1918 03	1913 14	-4 89
	126+33 98	878	1917 08	1912 71	-4 37
	126+84 09	876	1916 61	1912 28	-4 33
	127+33 87	874	1915 57	1911 84	-3 73
	127+84 17	872	1915 20	1911 41	-3 79
	128+34 10	870	1915 77	1910 98	-4 79
	128+84 10	868	1915 44	1910 49	-4 95
	130+05 05	866	1913 76	1908 40	-5 36
	130+58 80	864	1913 31	1907 69	-5 62
	131+08 82	862	1912 52	1907 20	-5 32
	131+58 75	860	1912 23	1906 70	-5 53
	132+11 49	858	1912 42	1906 18	-6 24
	132+58 92	856	1912 40	1905 70	-6 70
	133+08 78	854	1912 37	1905 21	-7 16
	133+58 76	852	1912 36	1904 71	-7 65
	134+08 62	850	1912 34	1904 22	-8 12
	134+58 98	848	1912 33	1903 72	-8 61
	134+90 91	846	1912 31	1903 40	-8 91
	135+18 06	844	1912 20	1903 09	-9 11

REV	DATE	BY	DESCRIPTION

SCALE

NO SCALE

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED R VALDEZ

DRAWN R VALDEZ

CHECKED J PARKE



CITY OF NORTH LAS VEGAS

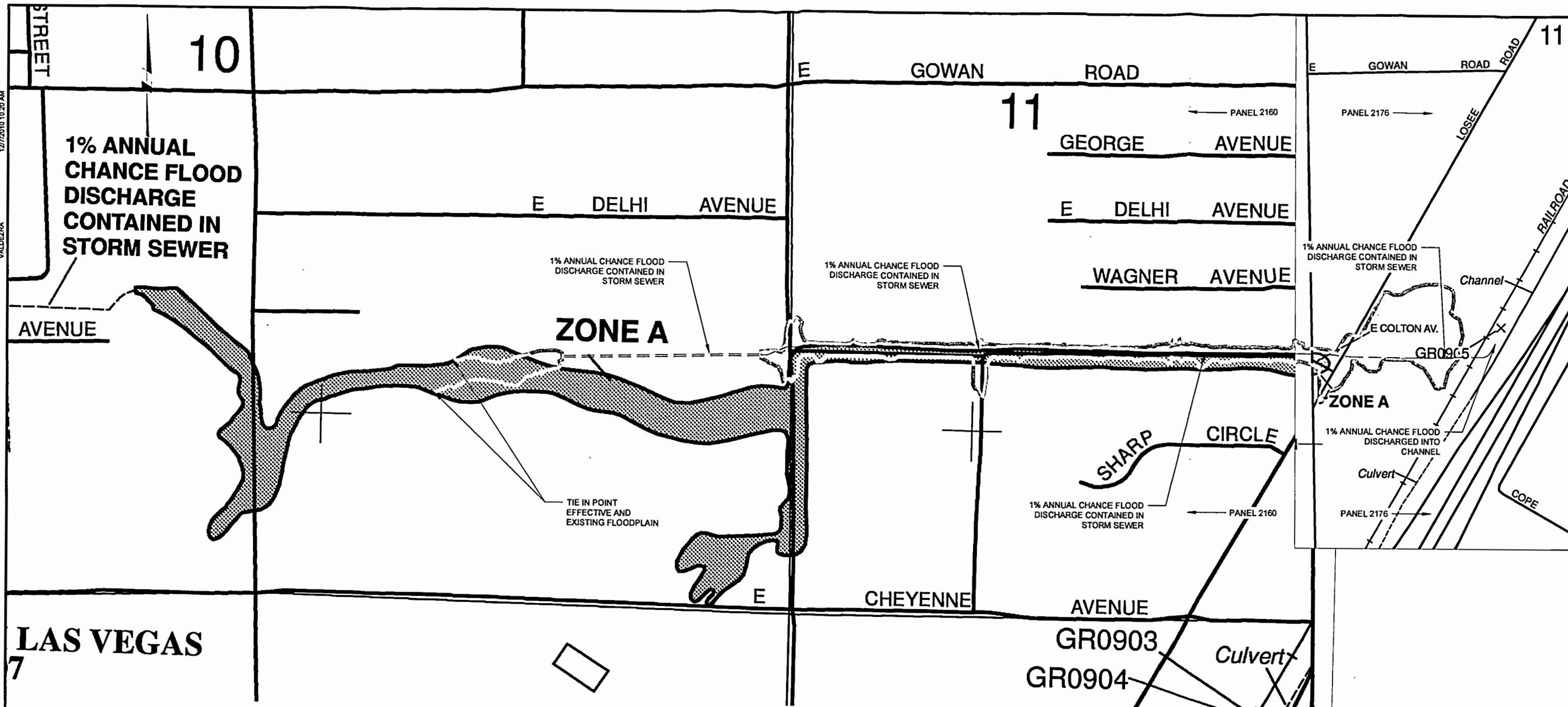
COLTON AVENUE FLOOD CONTROL IMPROVEMENTS PROJECT
CLOMR
COMPARISON SUMMARY TABLE
FLOOD PLAIN EXHIBIT

SHEET
FIG 5D

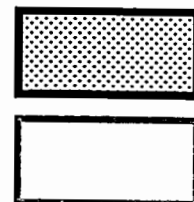
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VALDEZRA

C:\pwworking\131756\COLTON\CLMR-Ann\FIRM



LEGEND



EFFECTIVE FEMA FLOODPLAIN AREA

EXISTING FLOODPLAIN AREA

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY,
NEVADA
AND INCORPORATED AREAS

PANEL 2160 OF 4000
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
CLARK COUNTY
CLARK COUNTY
CLARK COUNTY
CLARK COUNTY

MAP NUMBER
3206C2160F
MAP REVISED
NOVEMBER 16, 2011

Federal Emergency Management Agency

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY,
NEVADA
AND INCORPORATED AREAS

PANEL 2176 OF 4000
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
CLARK COUNTY
CLARK COUNTY
CLARK COUNTY
CLARK COUNTY

MAP NUMBER
3206C2176F
MAP REVISED
NOVEMBER 16, 2011

Federal Emergency Management Agency

DRAFT MAP
FOR REVIEW ONLY



REV	DATE	BY	DESCRIPTION

SCALE	WARNING	DESIGNED	R VALDEZ
1" = 500'	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE	DRAWN	R VALDEZ
		CHECKED	J PARKE



CITY OF NORTH LAS VEGAS

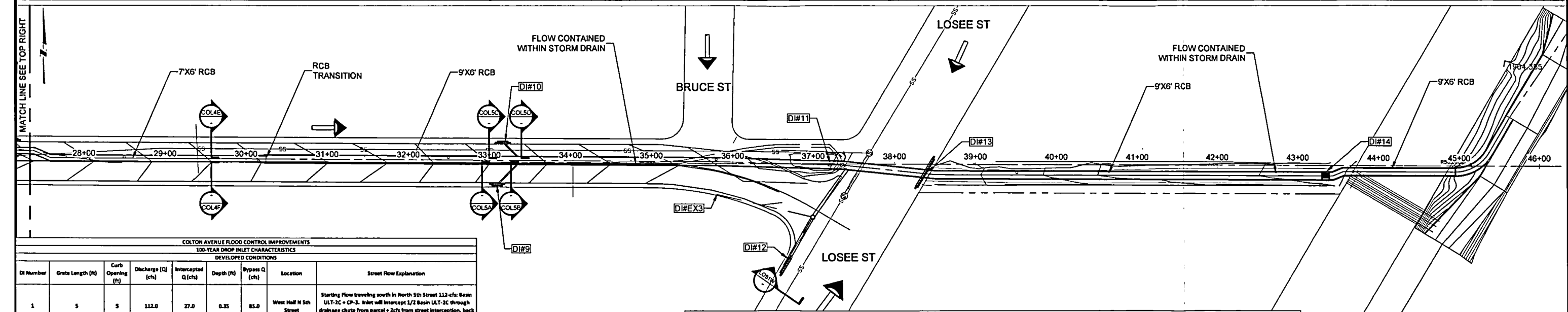
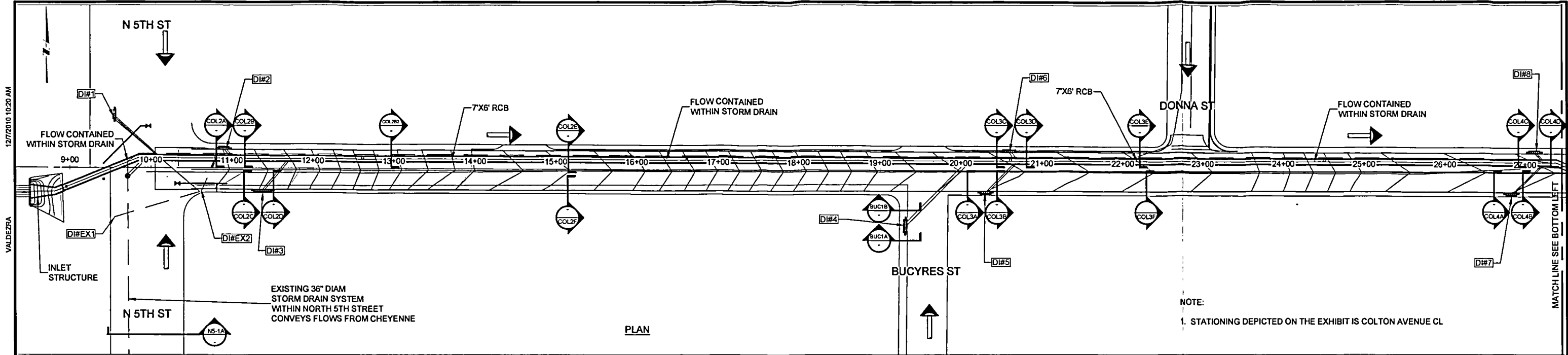
COLTON AVENUE FLOOD CONTROL IMPROVEMENTS PROJECT

CLOMR

ANNOTATED FIRM MAP

SHEET

FIG 6



COLTON AVENUE FLOOD CONTROL IMPROVEMENTS							
100-YEAR DROP INLET CHARACTERISTICS							
DEVELOPED CONDITIONS							
DI Number	Grate Length (ft)	Curb Opening (ft)	Discharge Q (cfs)	Intercepted Q (cfs)	Depth (ft)	Bypass Q (cfs)	Location
1	5	5	112.0	27.0	0.35	85.0	West Half N 5th Street
2	10	12.5	39.5	16.5	0.55	23.0	North Half Colton Street
3	20	20	39.5	26.0	0.54	13.5	South Half Colton Street
4	15	15	77.0	43.5	0.83	33.5	West Half Bucyres Street
5	10	12.5	59.0	23.0	0.66	36.0	South Half Colton Street
6	15	15	65.0	36.0	0.75	29.0	North Half Colton Street
7	10	12.5	53.5	24.0	0.69	29.5	South Half Colton Street
8	10	12.5	35.5	18.5	0.61	17.0	North Half Colton Street
9	15	15	47	21.0	0.53	26.0	South Half Colton Street
10	15	15	23.5	16.0	0.51	7.5	North Half Colton Street
11	6'x3' NDOT Type 2A Area Drain	N/A	39.5	39.5	1.67	0.0	North Half Colton Street within Concrete Drainage Swale
12	20	20	55.0	55.0	0.80	0.0	West Half of Losee Street
13	42.5	N/A	31	31.0	0.50	0.0	East Half of Losee Street
14	6'x3' NDOT Type 2A Area Drain	N/A	23	23.0	0.74	0.0	End of Overflow Channel

COLTON AVENUE FLOOD CONTROL IMPROVEMENTS						
100-YEAR FLOW STREET SECTION CALCULATIONS						
DEVELOPED CONDITIONS						
Section Label	100-Year Q (cfs)	Slope (%)	Flow Depth (ft)	Velocity (ft/s)	VXD	FLOW EXPLANATION
COL2A	39.5	1.60	0.63	4.98	3.1	Upstream of DI#2
COL2B	23	2.00	0.54	4.45	2.4	Bypass from DI#2
COL2B2	23	3.80	0.44	5.54	2.4	Bypass from DI#2
COL2C	39.5	2.30	0.55	5.70	3.1	Upstream of DI#3
COL2D	13.5	2.30	0.46	4.27	2.0	Bypass from DI#3
COL2E	65	1.80	0.78	6.67	5.2	Bypass from DI#2 + CPD2
COL2F	13.5	1.80	0.51	3.59	1.8	Bypass from DI#3
COL3A	59	1.30	0.75	5.81	4.4	Bypass from DI#3 & DI#4 + ULT-3C
COL3B	36.0	1.12	0.65	4.58	3.0	Bypass from DI#5
COL3C	65	1.20	0.86	5.90	5.1	Upstream of DI#6
COL3D	29	1.20	0.69	4.33	3.0	Downstream of DI#6
COL3E	35.5	1.20	0.69	4.65	3.2	Bypass from DI#6 + half of Basin ULT-3G
COL3F	53.5	1.20	0.74	6.05	4.5	Bypass from DI#5 + half of Basin ULT-3F
COL4A	53.5	1.30	0.73	6.20	4.5	Same as section COL3F
COL4B	29.5	1.15	0.66	4.27	2.8	Bypass from DI#7
COL4C	35.5	1.30	0.71	4.76	3.4	Upstream of DI#8
COL4D	17	1.10	0.58	3.65	2.1	Bypass from DI#8
COL4E	23.5	1.60	0.63	4.69	3.0	Bypass from DI#8 + half of Basin ULT-3G
COL4F	47	1.60	0.69	5.66	3.9	Bypass from DI#7 + half of Basin ULT-3F
COL5A	47	1.40	0.62	5.44	3.4	Upstream of DI#9
COL5B	26	1.40	0.52	4.30	2.2	Bypass from DI#9
COL5C	23.5	1.40	0.61	4.22	2.6	Bypass from DI#8 + half of Basin ULT-3G
COL5D	7.5	1.40	0.44	3.21	1.4	Downstream of DI#10
BUC1A	77	0.82	0.89	5.30	4.7	Upstream of DI#4
BUC1B	33.5	0.82	0.70	3.81	2.7	Bypass from DI#4
LOS1W	55	0.52	0.86	4.04	3.5	Upstream of DI#12
N5TH1A	112	0.80	0.83	4.13	3.4	Surface Flow from Basin ULT-2G

SYMBOL LEGEND

HYDRAULIC SECTION CALCULATION

FLOW DIRECTION

Appendix B-5:

*Ultimate Condition 100-Year
HEC-1 Model*

*Note: Refer to Data CD for Additional
Appendix Items*


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*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* JUN 1998 *
* VERSION 4.1 *
* RUN DATE 19NOV13 TIME 12:09:51 *
*****

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

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

```

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

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

1 HEC-1 INPUT PAGE 1

```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
*** FREE *** *DIAGRAM
1 ID COLTON AVE. IMPROVEMENTS ANALYSIS FROM N 5TH ST. TO THE CENTRAL FREEWAY CHAN
2 ID ULTIMATE CONDITIONS
3 ID INPUT FILE = ULC0100.DAT
4 ID INPUT FILE DATE = NOVEMBER 2013
5 ID MODELED BY MMH
6 ID
7 ID *****
8 ID *
9 ID * SDN3 STORM DISTRIBUTION *
10 ID *****
11 ID
12 ID REFERENCED HYDROLOGIC MODELS:
13 ID
14 ID *CENTRAL FREEWAY CHANNEL, OWENS AVE. TO MILLER AVE. (VTN NOV 2009)
15 ID
16 ID *BROOKS CHANNEL FLOOD CONTROL PROJECT (MMH 2012)
17 ID
18 ID *90% TECHNICAL DRAINAGE STUDY FOR NORTH 5TH STREET IMPROVEMENTS
19 ID LOSEE ROAD TO CHEYENNE AVE (LBG 2012)
20 ID
21 ID *DRAFT DRAINAGE STUDY FOR COLTON AVE FLOOD CONTROL IMPROVEMENTS
22 ID 5TH STREET TO I-15 CHANNEL(CNLV 2009)
23 ID
24 ID VEGAS DRIVE IMPROVEMENTS PDR, SHADOW MOUNTAIN PLACE TO RANCHO DRIVE (LBG JUL
25 ID
26 ID JD CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:
27 ID
28 ID -----
29 ID
30 ID Design Storm: 100-YR 6-Hr, SDN3 Distribution
31 ID
32 ID
33 ID DARF VALUES USED : CCRFCD HCDDM
34 ID
35 ID
36 ID AREA DARF
37 ID SQ.MI.
38 ID
39 ID 0 - 0.5 0.990
40 ID 0.5 - 1 0.975
41 ID
42 ID -----
43 ID
44 ID
45 ID IT 5 0 0 300
46 ID IO 5 0 0
47 ID IN 5 0 0
48 ID JR PREC 0.990 0.975
*

```

1 HEC-1 INPUT PAGE 2

```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
49 KK ULT-1A
50 KM *REF BASIN FROM COLTON AVE STUDY*
51 KM "BY CNLV, CN MODIFIED BY MMH"
52 KM RUNOFF PRODUCED BY ULT-1A
53 BA 0.0626
54 PB 2.77
55 PC 0.000 0.020 0.057 0.070 0.087 0.108 0.124 0.130 0.130 0.13
56 PC 0.130 0.130 0.130 0.133 0.140 0.142 0.148 0.158 0.172 0.18
57 PC 0.190 0.197 0.199 0.200 0.201 0.204 0.214 0.229 0.241 0.24
58 PC 0.251 0.256 0.270 0.278 0.281 0.283 0.295 0.322 0.352 0.40
59 PC 0.499 0.590 0.710 0.744 0.781 0.812 0.819 0.835 0.851 0.85
60 PC 0.860 0.868 0.876 0.888 0.910 0.926 0.937 0.950 0.970 0.97
61 PC 0.982 0.985 0.987 0.989 0.990 0.993 0.993 0.994 0.995 0.99
62 PC 0.998 0.999 1.000
63 LS 0 88.90 0
64 UD 0.191
*
65 KK RULT-1A
66 KM *REF BASIN FROM COLTON AVE STUDY*
67 KM *BY CNLV*
68 KM ROUTE ULT-1A IN ROADWAY THEN THROUGH NATURAL GROUND
69 KM A COMPOSIT SLOPE AND MANNINGS NUMBER WERE CALCULATED
70 KM 2590 FT W/ 0.0177 SLOPE AND 0.016 MANNINGS IN ROADWAY

```

71 KM 1386 FT W/ 0.0177 SLOPE AND 0.060 MANNINGS OVER NATURAL GROUND
 72 RD 3976 0.0177 0.031 0 TRAP 50 2
 *
 73 KK ULT-1B
 74 KM *REF BASIN FROM COLTON AVE STUDY*
 75 KM *BY CNLV, CN MODIFIED BY MWH*
 76 KM RUNOFF PRODUCED BY ULT-1B
 77 BA 0.1278
 78 LS 0 90.90
 79 UD 0.341
 *
 80 KK ULT-1C
 81 KM *REF BASIN FROM COLTON AVE STUDY*
 82 KM *BY CNLV, CN MODIFIED BY MWH*
 83 KM RUNOFF PRODUCED BY ULT-1C
 84 BA 0.1208
 85 LS 0 92.20
 86 UD 0.222
 *
 87 KK RULT-1C
 88 KM *REF ROUTE FROM COLTON AVE STUDY*
 89 KM *BY CNLV*
 90 KM ROUTE ULT-1C IN ROADWAY
 91 RD 3248 0.00169 0.016 0 TRAP 50 2
 *

1

HEC-1 INPUT

PAGE 3

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

92 KK ULT-1D
 93 KM *REF BASIN FROM COLTON AVE STUDY*
 94 KM *BY CNLV, CN MODIFIED BY MWH*
 95 KM RUNOFF PRODUCED BY ULT-1D
 96 BA 0.1160
 97 LS 0 91.80
 98 UD 0.238
 *
 99 KK ULT-1F
 100 KM *REF BASIN FROM COLTON AVE STUDY*
 101 KM *BY CNLV, BASIN ADDED BY MWH*
 102 KM RUNOFF PRODUCED BY ULT-1F
 103 BA 0.0136
 104 LS 0 89.20
 105 UD 0.122
 *
 106 KK RULT-1F
 107 KM *REF ROUTE FROM COLTON AVE STUDY*
 108 KM *BY CNLV, ROUTE ADDED BY MWH*
 109 KM ROUTE EX-1F IN ROADWAY AND OVER NATURAL GROUND
 110 KM A COMPOSIT SLOPE AND MANNINGS NUMBER WERE CALCULATED
 111 KM 1220 FT W/ 0.00820 SLOPE AND 0.016 MANNINGS IN ROADWAY
 112 KM 2850 FT W/ 0.03070 SLOPE AND 0.060 MANNINGS OVER NATURAL GROUND
 113 RD 4070 0.02395 0.047 0 TRAP 50 2
 *
 114 KK CP-1
 115 KM *REF POINT FROM COLTON AVE STUDY*
 116 KM *BY CNLV, MODIFIED BY MWH*
 117 KM COMBINE SUB-BASINS ULT-1A, ULT-1B, ULT-1C, ULT-1D, AND ULT-1F
 118 HC 5
 *
 119 KK RCP-1
 120 KM *REF ROUTE FROM COLTON AVE STUDY*
 121 KM *BY CNLV, MODIFIED BY MWH*
 122 KM ROUTE CP-1 OVER NATURAL GROUND
 123 RD 1600 0.02188 0.060 0 TRAP 50 2
 *

1

HEC-1 INPUT

PAGE 4

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

131 KK ULT-2E
 132 KM *REF BASIN FROM COLTON AVE STUDY*
 133 KM *BY CNLV, CN MODIFIED BY MWH*
 134 KM RUNOFF PRODUCED BY ULT-2E
 135 BA 0.0547
 136 LS 0 90.30
 137 UD 0.307
 *
 138 KK CP-2
 139 KM *REF POINT FROM COLTON AVE STUDY*
 140 KM *BY CNLV*
 141 KM COMBINE SUB-BASINS CP-1, ULT-2D, ULT-2E
 142 HC 3
 *
 143 KK RCP-2
 144 KM *REF ROUTE FROM COLTON AVE STUDY*
 145 KM *BY CNLV*
 146 KM ROUTE CP-2 TO CP-4A
 147 KM THRU 2-60" RCP
 148 RD 1000 0.010 0.013 2 CIRC 5 0
 *
 149 KK ULT-2A
 150 KM *REF BASIN FROM COLTON AVE STUDY*
 151 KM *BY CNLV, CN MODIFIED BY MWH*
 152 KM RUNOFF PRODUCED BY ULT-2A
 153 BA 0.0276
 154 LS 0 91.50

155 UD 0.151
 *
 156 KK RULT-2A
 157 KM *REF ROUTE FROM COLTON AVE STUDY*
 158 KM *BY CNLV*
 159 KM ROUTE ULT-2A IN ROADWAY
 160 RD 900 0.04118 0.016 0 TRAP 50 2
 *
 161 KK ULT-2B
 162 KM *REF BASIN FROM COLTON AVE STUDY*
 163 KM *BY CNLV, CN MODIFIED BY MMH*
 164 KM RUNOFF PRODUCED BY ULT-2B
 165 BA 0.0133
 166 LS 0 91.80
 167 UD 0.132
 *

ULC0100

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HEC-1 INPUT

PAGE 5

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

168 KK CP-3
 169 KM *REF POINT FROM COLTON AVE STUDY*
 170 KM *BY CNLV*
 171 KM COMBINE SUB-BASINS ULT-2A AND ULT-2B
 172 HC 2
 *
 173 KK RCP-3
 174 KM *REF ROUTE FROM COLTON AVE STUDY*
 175 KM *BY CNLV*
 176 KM ROUTE CP-3 IN ROADWAY
 177 RD 690 0.01449 0.016 0 TRAP 50 2
 *
 178 KK ULT-2C
 179 KM *REF BASIN FROM COLTON AVE STUDY*
 180 KM *BY CNLV, CN MODIFIED BY MMH*
 181 KM RUNOFF PRODUCED BY ULT-2C
 182 BA 0.0320
 183 LS 0 92.20
 184 UD 0.150
 *
 185 KK ULT-2G
 186 KM *REF BASIN FROM COLTON AVE STUDY*
 187 KM *BY CNLV, CN MODIFIED BY MMH*
 188 KM RUNOFF PRODUCED BY ULT-2G
 189 BA 0.0708
 190 LS 0 90.20
 191 UD 0.163
 *
 192 KK ULT-1E
 193 KM *REF BASIN FROM COLTON AVE STUDY*
 194 KM *BY CNLV, AREA & CN MODIFIED BY MMH*
 195 KM RUNOFF PRODUCED BY ULT-1E
 196 BA 0.0345
 197 LS 0 93.60
 198 UD 0.297
 *
 199 KK RULT-1E
 200 KM *REF ROUTE FROM COLTON AVE STUDY*
 201 KM *BY CNLV*
 202 KM ROUTE ULT-1E IN ROADWAY
 203 RD 2625 0.01442 0.016 0 TRAP 50 2
 *

204 KK ULT-2F
 205 KM *REF BASIN FROM COLTON AVE STUDY*
 206 KM *BY CNLV, AREA & CN MOD MODIFIED BY MMH*
 207 KM RUNOFF PRODUCED BY ULT-2F
 208 BA 0.0255
 209 LS 0 90.00
 *

1

HEC-1 INPUT

PAGE 6

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

210 UD 0.193
 *
 211 KK RULT-2F
 212 KM *REF ROUTE FROM COLTON AVE STUDY*
 213 KM *BY CNLV*
 214 KM ROUTE ULT-2F IN ROADWAY
 215 RD 2600 0.01442 0.016 0 TRAP 50 2
 *
 216 KK CP-4C
 217 KM COMBINE SUB-BASINS ULT-1E AND ULT-2F
 218 HC 2
 *
 219 KK ULT-2H
 220 KM *REF BASIN FROM COLTON AVE STUDY*
 221 KM *BY CNLV, AREA & CN MOD MODIFIED BY MMH*
 222 KM RUNOFF PRODUCED BY ULT-2H
 223 BA 0.0089
 224 LS 0 75.50
 225 UD 0.145
 *
 226 KK ULT-2I
 227 KM *NEW BASIN DELINEATED BY MMH*
 228 KM *FOR COLTON TDS*
 229 KM RUNOFF PRODUCED BY ULT-2I
 230 BA 0.0052
 231 LS 0 69.00
 232 UD 0.074
 *
 233 KK CP-4B
 234 KM *BY MMH*
 235 KM COMBINE CP-4C, ULT-2H, ULT-2I
 236 HC 3

*

237 KK RCP-4B
 238 KM *REF ROUTE FROM COLTON AVE STUDY*
 239 KM *BY CNLV*
 240 KM ROUTE ULT-2H IN EXISTING RCP
 241 RD 1338 0.030 0.013 0 CIRC 3 0
 *

242 KK CP-4A
 243 KM *BY MWH
 244 KM COMBINE CP-2, CP-3, ULT-2C, ULT-2G, CP-4B
 245 HC 5
 *

1

HEC-1 INPUT

PAGE 7

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

246 KK RCP-4A
 247 KM *BY MWH
 248 KM ROUTE CP-4A IN COLTON AVE STORM DRAIN SYSTEM
 249 KM TO BUCYRES-STREET
 250 KM 7X6 RCB @ AVG SLOPE = 0.0229 FT/FT, LENGHT = 1173.75 FT
 251 KM TO BUCYRES-STREET
 252 RD 1174 0.0229 0.013 0 TRAP 7 0
 *

253 KK ULT-3A
 254 KM *REF BASIN FROM COLTON AVE STUDY*
 255 KM *BY CNLV, CN MOD MODIFIED BY MWH*
 256 KM RUNOFF PRODUCED BY EX-3A
 257 BA 0.0184
 258 LS 0 94.30
 259 UD 0.115
 *

260 KK RULT-3A
 261 KM *BY MWH
 262 KM ROUTE ULT-3A IN ROADWAY
 263 RD 773 0.008 0.016 0 TRAP 50 2
 *

264 KK ULT-3B
 265 KM *REF BASIN FROM COLTON AVE STUDY*
 266 KM *BY CNLV, CN MODIFIED BY MWH*
 267 KM RUNOFF PRODUCED BY ULT-3B
 268 BA 0.0270
 269 LS 0 94.30
 270 UD 0.156
 *

271 KK CPD1
 272 KM COMBINE ULT-3A & ULT-3B
 273 KM DUMMY COMBINATION POINT FOR INLET SIZING
 274 KM WEST HALF BUCYRES STREET
 275 HC 2
 *

276 KK ULT-3D
 277 KM *REF BASIN FROM COLTON AVE STUDY*
 278 KM *BY CNLV, CN MODIFIED BY MWH*
 279 KM RUNOFF PRODUCED BY ULT-3D
 280 BA 0.0138
 281 LS 0 95.00
 282 UD 0.114
 *

1

HEC-1 INPUT

PAGE 8

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

283 KK RULT-3D
 284 KM *BY MWH
 285 KM ROUTE ULT-3D IN ROADWAY
 286 RD 594 0.030 0.016 0 TRAP 50 2
 *

287 KK ULT-3E
 288 KM *REF BASIN FROM COLTON AVE STUDY*
 289 KM *BY CNLV, CN MODIFIED BY MWH*
 290 KM RUNOFF PRODUCED BY ULT-3E
 291 BA 0.0106
 292 LS 0 94.60
 293 UD 0.120
 *

294 KK CPD2
 295 KM COMBINE ULT-3D & ULT-3E
 296 KM DUMMY COMBINATION POINT FOR INLET SIZING
 297 KM NORTH HALF COLTON
 298 HC 2
 *

299 KK ULT-3C
 300 KM *REF BASIN FROM COLTON AVE STUDY*
 301 KM *BY CNLV, CN MODIFIED BY MWH*
 302 KM RUNOFF PRODUCED BY ULT-3C
 303 BA 0.0072
 304 LS 0 92.20
 305 UD 0.110
 *

306 KK RULT-3C
 307 KM *REF ROUTE FROM COLTON AVE STUDY*
 308 KM *BY CNLV, MODIFIED BY MWH*
 309 KM ROUTE ULT-3C IN ROADWAY
 310 RD 514 0.009 0.016 0 TRAP 50 2
 *

311 KK CP-5
 312 KM *BY MWH
 313 KM COMBINE CP-4A, CPD1, CPD2, ULT-3C
 314 HC 4
 *

315 KK RCP-5
 316 KM *BY MWH

317 KM ROUTE CP-5 IN COLTON AVE STORM DRAIN SYSTEM ULCO100
 318 KM TO LOSEE STREET
 319 KM VIA 7X6 RCB TRANS TO 9X6 RCB, USE AVG WIDTH = 8 FT
 320 KM @ AVG SLOPE = 0.0168 FT/FT, LENGHT = 1687.09 FT
 321 RD 1687 0.0168 0.013 0 TRAP 8 0
 *

1 HEC-1 INPUT PAGE 9

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

322 KK ULT-3F
 323 KM *REF BASIN FROM COLTON AVE STUDY*
 324 KM *BY CNLV, CN MODIFIED BY MWH*
 325 KM RUNOFF PRODUCED BY ULT-3F
 326 BA 0.0220
 327 LS 0 94.00
 328 UD 0.171
 *

329 KK ULT-3G
 330 KM *REF BASIN FROM COLTON AVE STUDY*
 331 KM *BY CNLV, CN MODIFIED BY MWH*
 332 KM RUNOFF PRODUCED BY ULT-3G
 333 BA 0.0073
 334 LS 0 94.00
 335 UD 0.115
 *

336 KK CP-6A
 337 KM *DUMMY COMBINE POINT BY MWH
 338 KM COMBINE SUB-BASINS ULT-3F, ULT-3G
 339 HC 2
 *

340 KK ULT-3H
 341 KM *REF BASIN FROM COLTON AVE STUDY*
 342 KM *BY CNLV, CN MODIFIED BY MWH*
 343 KM RUNOFF PRODUCED BY ULT-3H
 344 BA 0.0040
 345 LS 0 91.00
 346 UD 0.103
 *

347 KK ULT-3J
 348 KM *REF BASIN FROM COLTON AVE STUDY*
 349 KM *BY CNLV, CN MODIFIED BY MWH*
 350 KM RUNOFF PRODUCED BY ULT-3J
 351 BA 0.0233
 352 LS 0 89.90
 353 UD 0.152
 *

354 KK RULT-3J
 355 KM *REF ROUTE FROM COLTON AVE STUDY*
 356 KM ROUTE ULT-3J IN ROADWAY
 357 RD 817 0.008 0.016 0 TRAP 50 2
 *

358 KK ULT-3K
 359 KM *REF BASIN FROM COLTON AVE STUDY*
 360 KM *BY CNLV, CN MODIFIED BY MWH*
 361 KM RUNOFF PRODUCED BY ULT-3K
 362 BA 0.0162
 363 LS 0 90.30
 *

1 HEC-1 INPUT PAGE 10

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

364 UD 0.141
 *

365 KK RULT-3K
 366 KM *REF ROUTE FROM COLTON AVE STUDY*
 367 KM ROUTE ULT-3K IN ROADWAY
 368 RD 318 0.004 0.016 0 TRAP 50 2
 *

369 KK CP-6B
 370 KM DUMMY COMBINATION POINT FOR INLET SIZING
 371 KM COMBINE: ULT-3J, ULT-3K
 372 HC 2
 *

373 KK CP-6
 374 KM *BY MWH
 375 KM COMBINE: CP-5, CP-6A, CP-6B, ULT-3H
 376 HC 4
 *

377 KK RCP-6
 378 KM *BY MWH
 379 KM ROUTE CP-6 IN COLTON AVE STORM DRAIN SYSTEM
 380 KM TO FREEWAY CHANNEL PARALLEL TO I-15
 381 KM VIA 9X6 RCB TRANS TO 102" PIPE, USE AVG WIDTH = 9 FT
 382 KM @ AVG SLOPE = 0.0073 FT/FT, LENGHT = 816.61 FT
 383 RD 817 0.0073 0.013 0 TRAP 9 0
 *

384 KK ULT-3L
 385 KM *REF BASIN FROM COLTON AVE STUDY*
 386 KM *BY CNLV, CN MODIFIED BY MWH*
 387 KM RUNOFF PRODUCED BY ULT-3L
 388 BA 0.0280
 389 LS 0 90.10
 390 UD 0.209
 *

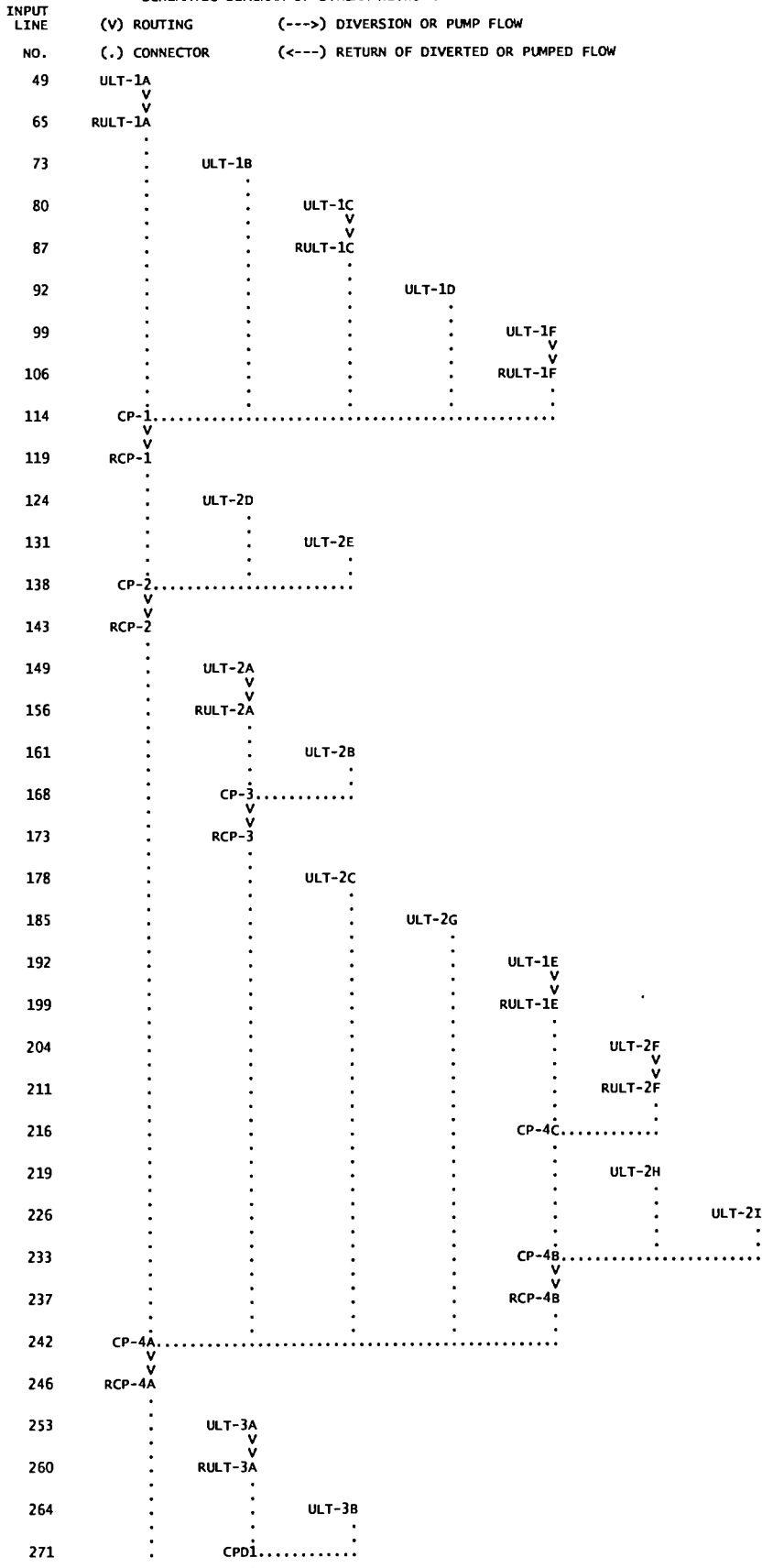
391 KK OFF-1
 392 KM DELIN. BY MWH
 393 KM RUNOFF PRODUCED BY OFF1
 394 BA 0.0090
 395 LS 0 98.00
 396 UD 0.088
 *

397 KK CP-7
 398 KM *REF POINT FROM COLTON AVE STUDY*

399 KM COMBINE ULT-3L, OFF-1 AND CP-6
 400 HC 3
 401 ZZ

1

SCHEMATIC DIAGRAM OF STREAM NETWORK



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*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* JUN 1998 *
* VERSION 4.1 *
* RUN DATE 19NOV13 TIME 12:09:51 *
*****
```

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

```

*****
*
* SDN3 STORM DISTRIBUTION
*
*****

```

- *CENTRAL FREEWAY CHANNEL, OWENS AVE. TO MILLER AVE. (VTN NOV 2009)
- *BROOKS CHANNEL FLOOD CONTROL PROJECT (MWH 2012)
- *90% TECHNICAL DRAINAGE STUDY FOR NORTH 5TH STREET IMPROVEMENTS
LOSSEE ROAD TO CHEYENNE AVE (LBG 2012)
- *DRAFT DRAINAGE STUDY FOR COLTON AVE FLOOD CONTROL IMPROVEMENTS
5TH STREET TO I-15 CHANNEL(CNLY 2009)

AREA SQ. MI.	DARF
-----------------	------

0 - 0.5 0.990
0.5 - 1 0.975

```

46 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         300 NUMBER OF HYDROGRAPH ORDINATES
           NDDATE      2  0  ENDING DATE
           NOTIME      0055 ENDING TIME
           ICENT      19  CENTURY MARK

           COMPUTATION INTERVAL .08 HOURS
           TOTAL TIME BASE 24.92 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
           .99      .98

```

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 .99	RATIO 2 .98
HYDROGRAPH AT	ULT-1A	.06	1	FLOW	80.	78.
ROUTED TO	RULT-1A	.06	1	FLOW	3.58	3.58
HYDROGRAPH AT	ULT-1B	.13	1	FLOW	78.	76.
ROUTED TO	RULT-1B	.13	1	FLOW	3.83	3.83
HYDROGRAPH AT	ULT-1C	.12	1	FLOW	138.	135.
ROUTED TO	RULT-1C	.12	1	FLOW	3.75	3.75
HYDROGRAPH AT	ULT-1D	.12	1	FLOW	163.	160.
ROUTED TO	RULT-1D	.12	1	FLOW	3.67	3.67
HYDROGRAPH AT	ULT-1F	.01	1	FLOW	152.	149.
ROUTED TO	RULT-1F	.01	1	FLOW	3.67	3.67
5 COMBINED AT	CP-1	.44	1	FLOW	20.	19.
ROUTED TO	RCP-1	.44	1	FLOW	3.58	3.58
HYDROGRAPH AT	ULT-1F	.01	1	FLOW	23.	23.
ROUTED TO	RULT-1F	.01	1	FLOW	4.00	4.00
5 COMBINED AT	CP-1	.44	1	FLOW	495.	490.
ROUTED TO	RCP-1	.44	1	FLOW	3.75	3.75
HYDROGRAPH AT	ULT-2D	.03	1	FLOW	488.	480.
ROUTED TO	RCP-1	.44	1	FLOW	3.83	3.83
HYDROGRAPH AT	ULT-2E	.05	1	FLOW	47.	46.
ROUTED TO	RCP-2	.53	1	FLOW	3.58	3.58
3 COMBINED AT	CP-2	.53	1	FLOW	61.	59.
ROUTED TO	RCP-2	.53	1	FLOW	3.75	3.75
HYDROGRAPH AT	ULT-2A	.03	1	FLOW	564.	555.
ROUTED TO	RCP-2	.53	1	FLOW	3.83	3.83
HYDROGRAPH AT	ULT-2A	.03	1	FLOW	560.	551.
ROUTED TO	RULT-2A	.03	1	FLOW	3.83	3.83
HYDROGRAPH AT	ULT-2B	.01	1	FLOW	42.	42.
ROUTED TO	RULT-2A	.03	1	FLOW	3.58	3.58
HYDROGRAPH AT	ULT-2B	.01	1	FLOW	41.	40.
ROUTED TO	RULT-2A	.03	1	FLOW	3.58	3.58
HYDROGRAPH AT	ULT-2B	.01	1	FLOW	21.	21.
ROUTED TO	RULT-2A	.03	1	FLOW	3.58	3.58

2 COMBINED AT	CP-3	.04	1	FLOW TIME	62. 3.58	61. 3.58
+ ROUTED TO	RCP-3	.04	1	FLOW TIME	59. 3.58	58. 3.58
+ HYDROGRAPH AT	ULT-2C	.03	1	FLOW TIME	50. 3.58	49. 3.58
+ HYDROGRAPH AT	ULT-2G	.07	1	FLOW TIME	102. 3.58	100. 3.58
+ HYDROGRAPH AT	ULT-1E	.03	1	FLOW TIME	43. 3.75	42. 3.75
+ ROUTED TO	RULT-1E	.03	1	FLOW TIME	44. 3.83	43. 3.83
+ HYDROGRAPH AT	ULT-2F	.03	1	FLOW TIME	34. 3.58	33. 3.58
+ ROUTED TO	RULT-2F	.03	1	FLOW TIME	33. 3.75	32. 3.75
2 COMBINED AT	CP-4C	.06	1	FLOW TIME	74. 3.75	73. 3.75
+ HYDROGRAPH AT	ULT-2H	.01	1	FLOW TIME	6. 3.58	6. 3.58
+ HYDROGRAPH AT	ULT-2I	.01	1	FLOW TIME	3. 3.50	3. 3.50
3 COMBINED AT	CP-4B	.07	1	FLOW TIME	80. 3.75	79. 3.75
+ ROUTED TO	RCP-4B	.07	1	FLOW TIME	79. 3.83	77. 3.83
5 COMBINED AT	CP-4A	.74	1	FLOW TIME	752. 3.83	740. 3.83
+ ROUTED TO	RCP-4A	.74	1	FLOW TIME	752. 3.83	739. 3.83
+ HYDROGRAPH AT	ULT-3A	.02	1	FLOW TIME	32. 3.50	31. 3.50
+ ROUTED TO	RULT-3A	.02	1	FLOW TIME	32. 3.58	31. 3.58
+ HYDROGRAPH AT	ULT-3B	.03	1	FLOW TIME	45. 3.58	44. 3.58
2 COMBINED AT	CPD1	.05	1	FLOW TIME	77. 3.58	75. 3.58
+ HYDROGRAPH AT	ULT-3D	.01	1	FLOW TIME	24. 3.50	24. 3.50
+ ROUTED TO	RULT-3D	.01	1	FLOW TIME	24. 3.58	24. 3.58
+ HYDROGRAPH AT	ULT-3E	.01	1	FLOW TIME	18. 3.58	18. 3.58
2 COMBINED AT	CPD2	.02	1	FLOW TIME	42. 3.58	42. 3.58
+ HYDROGRAPH AT	ULT-3C	.01	1	FLOW TIME	12. 3.50	12. 3.50
+ ROUTED TO	RULT-3C	.01	1	FLOW TIME	12. 3.58	11. 3.58
4 COMBINED AT	CP-5	.82	1	FLOW TIME	822. 3.75	807. 3.75
+ ROUTED TO	RCP-5	.82	1	FLOW TIME	817. 3.75	801. 3.75
+ HYDROGRAPH AT	ULT-3F	.02	1	FLOW TIME	35. 3.58	35. 3.58
+ HYDROGRAPH AT	ULT-3G	.01	1	FLOW TIME	13. 3.50	12. 3.50
2 COMBINED AT						

								ULCO100
+	CP-6A	.03	1	FLOW TIME	48. 3.58	47. 3.58		
+	HYDROGRAPH AT ULT-3H	.00	1	FLOW TIME	6. 3.50	6. 3.50		
+	HYDROGRAPH AT ULT-3J	.02	1	FLOW TIME	34. 3.58	33. 3.58		
+	ROUTED TO RULT-3J	.02	1	FLOW TIME	32. 3.67	31. 3.67		
+	HYDROGRAPH AT ULT-3K	.02	1	FLOW TIME	24. 3.58	24. 3.58		
+	ROUTED TO RULT-3K	.02	1	FLOW TIME	23. 3.58	23. 3.58		
+	2 COMBINED AT CP-6B	.04	1	FLOW TIME	55. 3.58	54. 3.58		
+	4 COMBINED AT CP-6	.89	1	FLOW TIME	894. 3.75	877. 3.75		
+	ROUTED TO RCP-6	.89	1	FLOW TIME	892. 3.75	874. 3.75		
+	HYDROGRAPH AT ULT-3L	.03	1	FLOW TIME	36. 3.58	35. 3.58		
+	HYDROGRAPH AT OFF-1	.01	1	FLOW TIME	18. 3.50	18. 3.50		
+	3 COMBINED AT CP-7	.93	1	FLOW TIME	930. 3.75	912. 3.75		

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	INTERPOLATED TO COMPUTATION INTERVAL PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RULT-1A	RATIO= .00 MANE 4.75		79.81	228.00	1.68	5.00	77.84	230.00	1.68
CONTINUITY SUMMARY (AC-FT) - INFLOW= .5597E+01 EXCESS= .0000E+00 OUTFLOW= .5621E+01 BASIN STORAGE= .9354E-02 PERCENT ERROR= -.6									
FOR PLAN = 1 RULT-1A	RATIO= .00 MANE 4.75		78.05	228.00	1.65	5.00	76.25	230.00	1.64
CONTINUITY SUMMARY (AC-FT) - INFLOW= .5473E+01 EXCESS= .0000E+00 OUTFLOW= .5497E+01 BASIN STORAGE= .9288E-02 PERCENT ERROR= -.6									
FOR PLAN = 1 RULT-1C	RATIO= .00 MANE 4.75		157.54	228.00	1.95	5.00	155.37	230.00	1.95
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1258E+02 EXCESS= .0000E+00 OUTFLOW= .1258E+02 BASIN STORAGE= .8229E-02 PERCENT ERROR= -.1									
FOR PLAN = 1 RULT-1C	RATIO= .00 MANE 5.00		157.29	230.00	1.92	5.00	157.29	230.00	1.92
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1234E+02 EXCESS= .0000E+00 OUTFLOW= .1234E+02 BASIN STORAGE= .1073E-01 PERCENT ERROR= -.1									
FOR PLAN = 1 RULT-1F	RATIO= .00 MANE 4.50		26.30	238.50	1.73	5.00	22.82	240.00	1.73
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1233E+01 EXCESS= .0000E+00 OUTFLOW= .1257E+01 BASIN STORAGE= .9449E-02 PERCENT ERROR= -2.7									
FOR PLAN = 1 RULT-1F	RATIO= .00 MANE 4.50		25.65	238.50	1.70	5.00	22.52	240.00	1.69
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1206E+01 EXCESS= .0000E+00 OUTFLOW= .1230E+01 BASIN STORAGE= .9348E-02 PERCENT ERROR= -2.7									
FOR PLAN = 1 RCP-1	RATIO= .00 MANE 4.36		492.19	231.06	1.86	5.00	487.61	230.00	1.86
CONTINUITY SUMMARY (AC-FT) - INFLOW= .4383E+02 EXCESS= .0000E+00 OUTFLOW= .4384E+02 BASIN STORAGE= .4051E-02 PERCENT ERROR= .0									
FOR PLAN = 1 RCP-1	RATIO= .00 MANE 4.38		483.35	231.98	1.83	5.00	480.08	230.00	1.82
CONTINUITY SUMMARY (AC-FT) - INFLOW= .4294E+02 EXCESS= .0000E+00 OUTFLOW= .4295E+02 BASIN STORAGE= .4404E-02 PERCENT ERROR= .0									
FOR PLAN = 1 RCP-2	RATIO= .00 MANE .81		561.73	230.91	1.85	5.00	559.57	230.00	1.85
CONTINUITY SUMMARY (AC-FT) - INFLOW= .5200E+02 EXCESS= .0000E+00 OUTFLOW= .5199E+02 BASIN STORAGE= .1215E-03 PERCENT ERROR= .0									

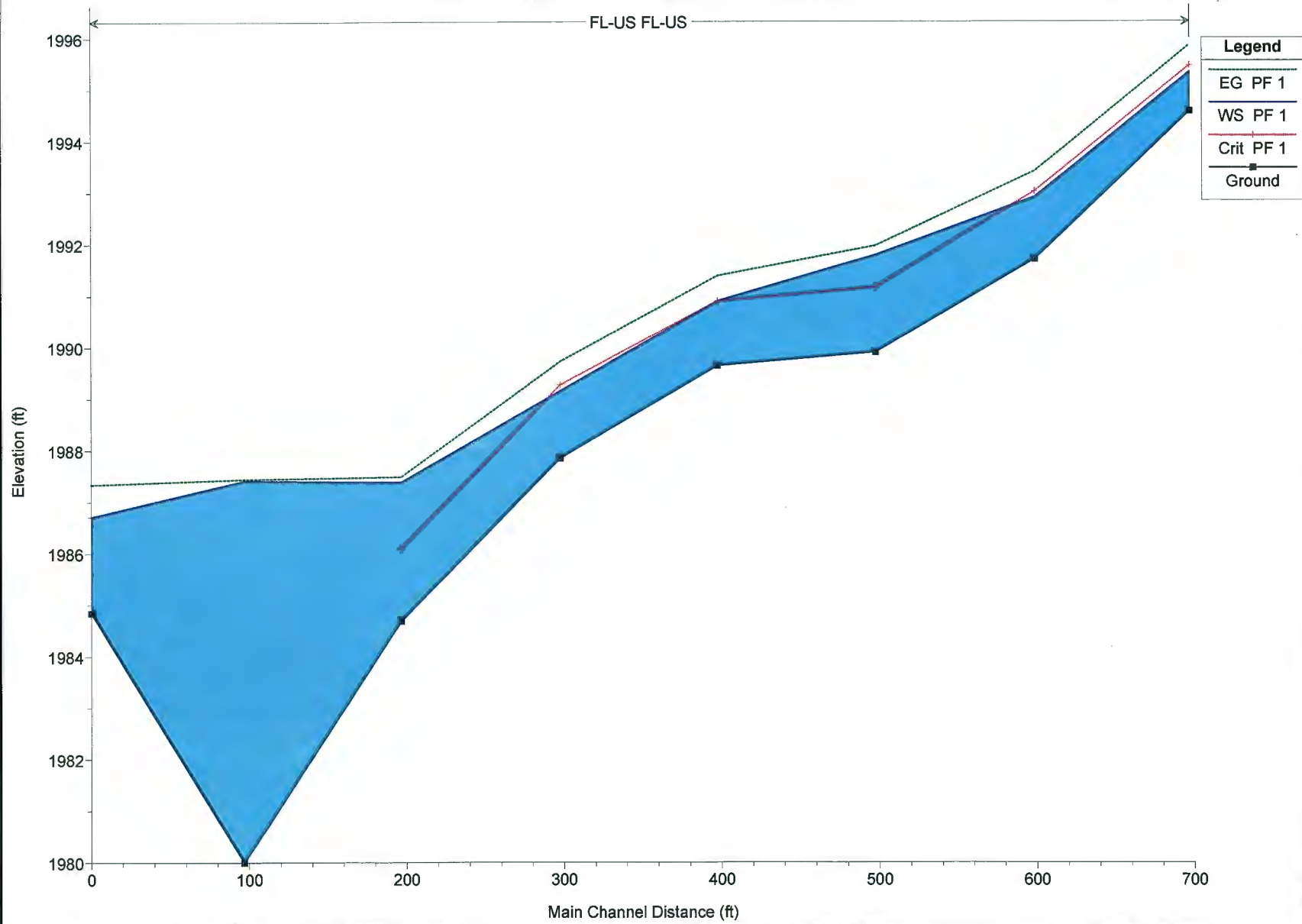
Appendix C-1:

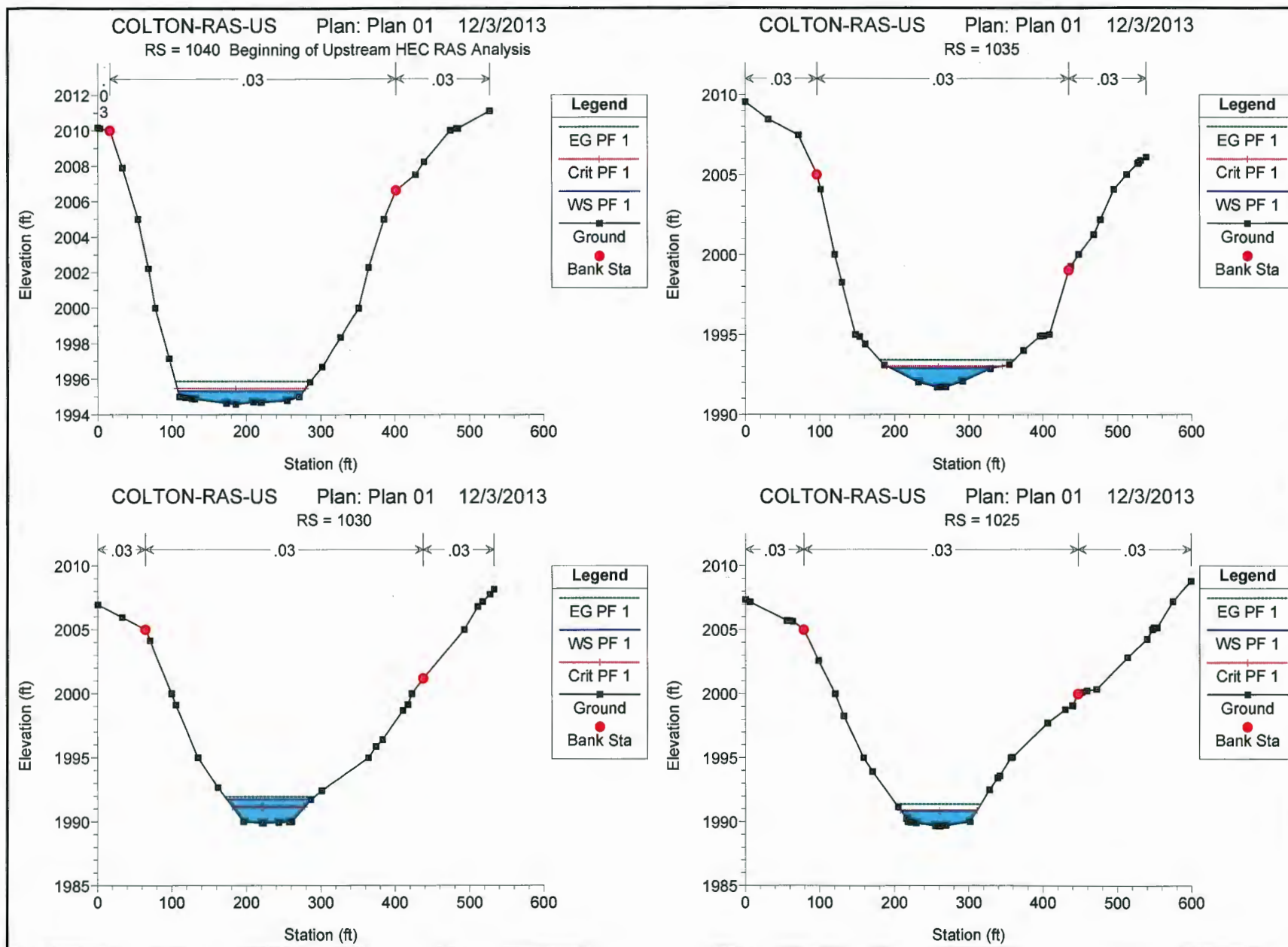
*Existing & Proposed Upstream
HEC-RAS Analysis (COLTON-RAS-US.prj)*

HEC-RAS Plan: 01 River: FL-US Reach: FL-US Profile: PF 1												
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crt W S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/m)	(ft/s)	(sq ft)	(ft)	
FL-US	1040	PF 1	555.00	1994.57	1995.34	1995.47	1995.86	0.029200	5.80	95.74	168.84	1.36
FL-US	1035	PF 1	555.00	1991.71	1992.91	1993.02	1993.41	0.021371	5.68	97.72	140.64	1.20
FL-US	1030	PF 1	555.00	1989.90	1991.79	1991.17	1991.97	0.002975	3.42	162.48	114.15	0.50
FL-US	1025	PF 1	555.00	1989.64	1990.90	1990.90	1991.39	0.013545	5.61	99.00	103.14	1.01
FL-US	1020	PF 1	555.00	1987.85	1989.16	1989.27	1989.72	0.020960	6.05	91.66	118.10	1.21
FL-US	1015	PF 1	555.00	1984.69	1987.39	1988.10	1987.49	0.001080	2.56	217.03	106.34	0.32
FL-US	1010	PF 1	555.00	1980.00	1987.41		1987.44	0.000130	1.39	400.39	102.66	0.12
FL-US	1005	PF 1	555.00	1984.84	1986.71	1986.71	1987.34	0.012448	6.35	87.35	70.70	1.01

COLTON-RAS-US Plan: Plan 01 12/3/2013

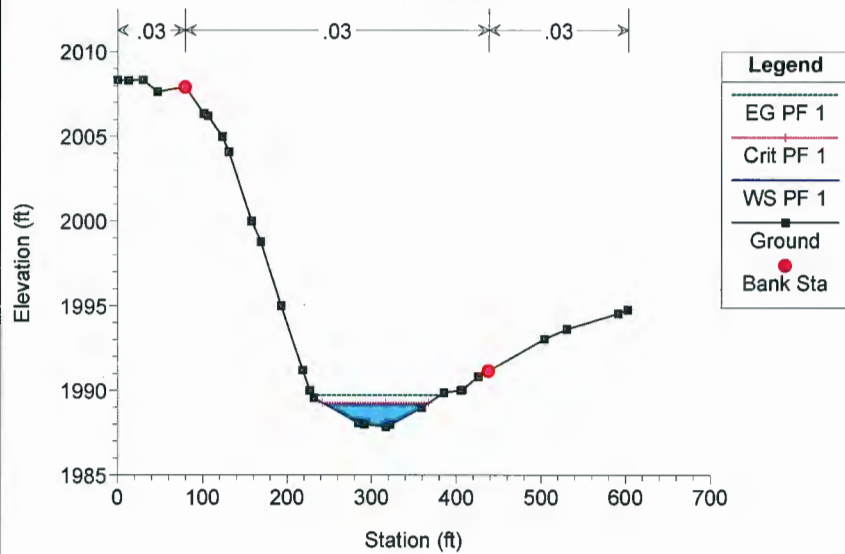
FL-US FL-US





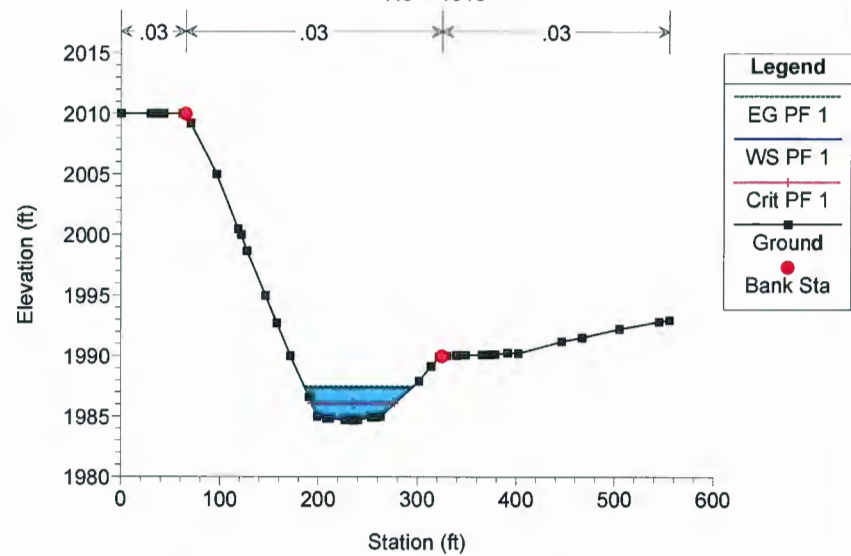
COLTON-RAS-US Plan: Plan 01 12/3/2013

RS = 1020



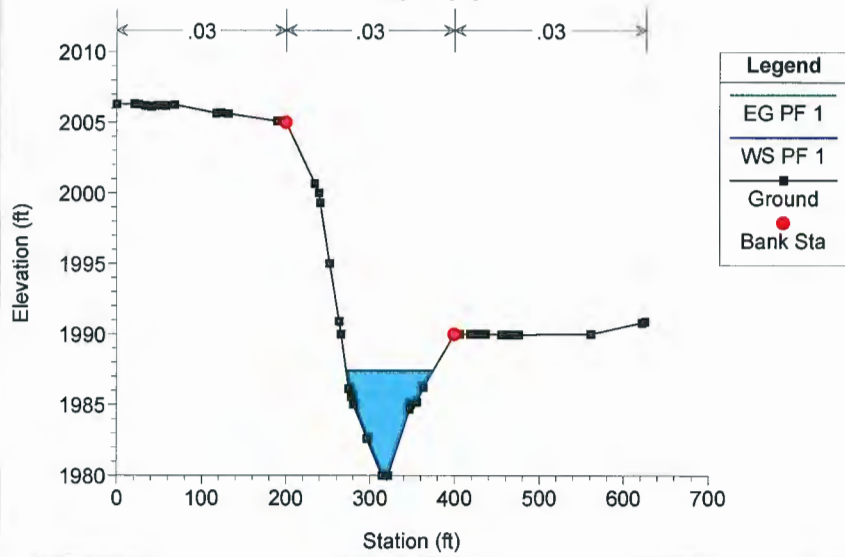
COLTON-RAS-US Plan: Plan 01 12/3/2013

RS = 1015



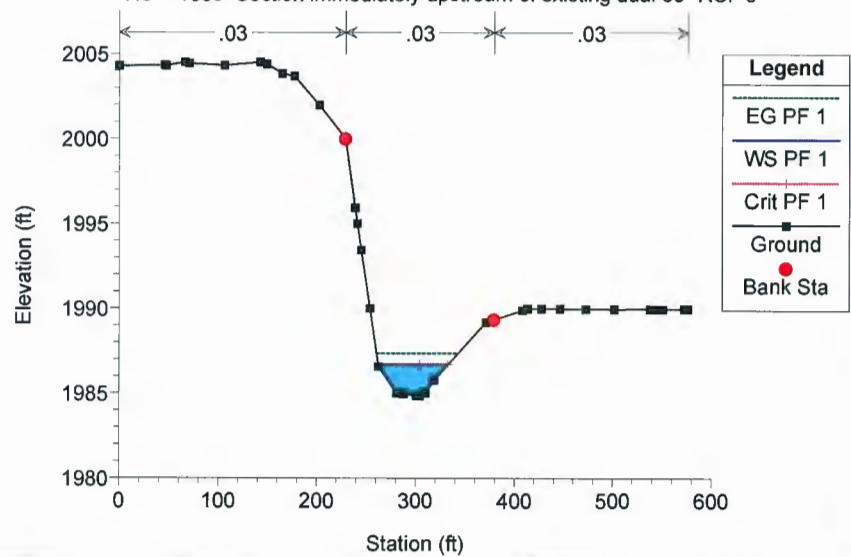
COLTON-RAS-US Plan: Plan 01 12/3/2013

RS = 1010



COLTON-RAS-US Plan: Plan 01 12/3/2013

RS = 1005 Section immediately upstream of existing dual 60" RCP's



HEC-RAS Version 4.1.0 Jan 2010
 U.S. Army Corps of Engineers
 Hydrologic Engineering Center
 609 Second Street
 Davis, California

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X   X   XXXXXX   XXXX   XXXX   XX   XXXX
X   X   X       X   X   X   X   X   X
X   X   X       X   X   X   X   X   X
XXXXXXX XXXX   X   XXX XXXX   XXXXXX XXXX
X   X   X       X   X   X   X   X   X
X   X   X       X   X   X   X   X   X
X   X   XXXXXX   XXXX   X   X   X   X   XXXXX
  
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PROJECT DATA

Project Title: COLTON-RAS-US
 Project File : COLTON-RAS-US.prj
 Run Date and Time: 12/3/2013 11:00:18 AM

Project in English units

Project Description:

HEC-RAS MODEL FOR PORTION OF FLOODPLAIN UPSTREAM OF DUAL 60" RCP

PLAN DATA

Plan Title: Plan 01

Plan File : w:\North Las Vegas - City of\10502901 Colton Ave FC\06 Studies and Reports\6.5 Report Calculations\Colton CLOMR Models\COLTON RAS\COLTON RAS\COLTON-RAS-US.p01

Geometry Title: Colton-EG-USV2

Geometry File : w:\North Las Vegas - City of\10502901 Colton Ave FC\06 Studies and Reports\6.5 Report Calculations\Colton CLOMR Models\COLTON RAS\COLTON RAS\COLTON-RAS-US.g02

Flow Title : 100-Year Ultimate-US

Flow File : w:\North Las Vegas - City of\10502901 Colton Ave FC\06 Studies and Reports\6.5 Report Calculations\Colton CLOMR Models\COLTON RAS\COLTON RAS\COLTON-RAS-US.f01

Plan Summary Information:

Number of:	Cross Sections =	8	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
 Conveyance Calculation Method: At breaks in n values only
 Friction Slope Method: Average Conveyance
 Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: 100-Year Ultimate-US

Flow File : w:\North Las Vegas - City of\10502901 Colton Ave FC\06 Studies and Reports\6.5 Report Calculations\Colton CLOMR Models\COLTON RAS\COLTON RAS\COLTON-RAS-US.f01

Flow Data (cfs)

River	Reach	RS	PF 1
FL-US	FL-US	1040	555

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
FL-US	FL-US	PF 1	Normal S = 0.0292	Critical

GEOMETRY DATA

Geometry Title: Colton-EG-USV2

Geometry File : w:\North Las Vegas - City of\10502901 Colton Ave FC\06 Studies and Reports\6.5 Report Calculations\Colton CLOMR Models\COLTON RAS\COLTON RAS\COLTON-RAS-US.g02

CROSS SECTION

RIVER: FL-US

REACH: FL-US RS: 1040

INPUT

Description: Beginning of Upstream HEC RAS Analysis

Station	Elevation	Data	num=	32
Sta	Elev	Sta	Elev	Sta
0	2010.15	2.9	2010.12	16.41
68.46	2002.22	77.89	2000	96.38
126.79	1994.9	130.77	1994.87	173.16
219.51	1994.68	220.16	1994.68	254.77
302.14	1996.68	326.97	1998.35	351.33
402.12	2006.63	428.05	2007.51	439.49
484.92	2010.11	527.37	2011.1	474.71

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	16.41	.03	402.12	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
16.41	402.12	98.45	98.45	98.45	.1	.3	

CROSS SECTION

RIVER: FL-US
 REACH: FL-US RS: 1035

INPUT

Description:

Station	Elevation	Data	num=	36	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2009.55	31.04	2008.46	71.3	2007.47	96.23	2005	101.15	2004.07			
119.83	2000	129.53	1998.26	147.55	1995	153.2	1994.86	160.8	1994.4			
186.29	1993.09	232.1	1992.01	257.49	1991.71	259.69	1991.71	262.19	1991.72			
268.98	1991.73	291.67	1992.07	329.15	1992.86	354.76	1993.12	373.8	1994.01			
396.11	1994.9	396.74	1994.9	399.61	1994.93	401.83	1994.94	408.83	1995			
434.71	1999.04	437.59	1999.27	447.95	2000	468.14	2001.24	476.79	2002.17			
494.95	2004.07	512.48	2005	527.07	2005.68	528.78	2005.76	530.98	2005.87			
538.55	2006.08											

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	96.23	.03	434.71	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 96.23 434.71 101.17 101.17 101.17 .1 .3

CROSS SECTION

RIVER: FL-US
 REACH: FL-US RS: 1030

INPUT

Description:

Station	Elevation	Data	num=	31	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2006.95	33.02	2005.95	64.43	2005	64.85	2005	70.52	2004.14			
99.6	2000	105.44	1999.12	135.2	1995	162.08	1992.68	196.43	1990			
220.73	1989.9	221.38	1989.9	221.77	1989.9	222.58	1989.9	243.29	1989.95			
257.59	1989.98	260.65	1990	286.32	1991.72	300.91	1992.43	363.96	1995			
374.45	1995.89	383.44	1996.42	410.55	1998.7	417.17	1999.15	422.35	2000			
437.84	2001.2	492.69	2005	510.92	2006.82	517.48	2007.21	527.49	2007.78			
532.67	2008.16											

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	64.43	.03	437.84	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 64.43 437.84 99.95 99.95 99.95 .1 .3

CROSS SECTION

RIVER: FL-US
 REACH: FL-US RS: 1025

INPUT

Description:

Station	Elevation	Data	num=	42	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2007.35	5.77	2007.17	55.86	2005.7	59.91	2005.67	63.7	2005.65			
78.59	2005	98.45	2002.57	120.28	2000	132.33	1998.26	158.55	1995			
170.29	1993.94	204.74	1991.16	215.57	1990.28	217.73	1990	221.18	1989.97			
228.76	1989.91	254.72	1989.69	257.07	1989.67	260.62	1989.64	268.96	1989.7			
301.71	1990	327.83	1992.5	339.07	1993.43	341.63	1993.59	356.93	1995			
359.25	1995.05	406.08	1997.71	429.77	1998.76	439.63	1999.05	447.17	2000			
452.01	2000.11	459	2000.22	471.92	2000.35	513.37	2002.82	539.57	2004.24			
546.71	2005	548.48	2005.13	549.06	2005.15	553.27	2005.14	574.28	2007.21			
598.77	2008.79	598.94	2008.79									

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	78.59	.03	447.17	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 78.59 447.17 99.89 99.89 99.89 .1 .3

CROSS SECTION

RIVER: FL-US
 REACH: FL-US RS: 1020

INPUT

Description:

Station	Elevation	Data	num=	30	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2008.33	12.8	2008.3	30	2008.33	46.54	2007.64	79.23	2007.92			
100.94	2006.34	105.97	2006.22	122.82	2005	130.45	2004.09	157.3	2000			
168.35	1998.77	192.59	1995	218.52	1991.21	226.74	1990	231.55	1989.57			
284.24	1988.08	291.16	1988.02	291.8	1988.01	316.97	1987.85	322.38	1987.98			
359.18	1988.98	385.57	1989.88	405.27	1990	407.02	1990.04	425.78	1990.82			
437.84	1991.15	503.65	1993.04	530.09	1993.62	591.06	1994.55	602.25	1994.76			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	79.23	.03	437.84	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 79.23 437.84 100.97 100.97 100.97 .1 .3

CROSS SECTION

RIVER: FL-US
 REACH: FL-US RS: 1015

INPUT

Description:

Station	Elevation	Data	num=	44	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2010	30.3	2010.01	35.59	2010	43.3	2010	62.07	2010			
65.47	2010	70.29	2009.19	96.53	2005	118.25	2000.47	121.63	2000			
127.19	1998.66	146.28	1995	157.63	1992.72	171.85	1990	190.69	1986.6			
198.87	1985	208.78	1984.83	211.44	1984.83	226.86	1984.74	235.86	1984.69			
237.95	1984.71	240.06	1984.74	253.96	1984.91	258.19	1984.94	261.92	1984.97			

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
263.07	1985	301.85	1987.93	314.11	1989.15	321.93	1989.94	324.96	1990
329.73	1990.02	339.72	1990.08	346.05	1990.1	348.34	1990.1	365.4	1990.12
372.89	1990.14	378.52	1990.15	391.23	1990.27	402.1	1990.22	446.42	1991.21
467.02	1991.53	505.36	1992.25	545.56	1992.84	556.01	1992.98		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	65.47	.03	324.96	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff	Contr.	Expan.
65.47	324.96	100.2	100.2	100.2	.1	.3	

CROSS SECTION

RIVER: FL-US

REACH: FL-US

RS: 1010

INPUT

Description:

Station	Elevation	Data	num=	48	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2006.3	20.82	2006.31	25.9	2006.27	33.77	2006.18	40.76	2006.13			
47.78	2006.19	57.61	2006.2	67.87	2006.25	117.14	2005.65	122.29	2005.68			
131.24	2005.62	189.39	2005.09	199.8	2005	233.89	2000.67	238.9	2000			
240.63	1999.3	251.52	1995	263	1990.91	265.47	1990	274.74	1986.15			
277.76	1985.55	280.4	1985	296.15	1982.62	314.08	1980	318.64	1980			
321.41	1980	346.55	1984.69	348.23	1985	355.5	1985.19	362.89	1986.23			
399.57	1990	405.63	1990	418.44	1990	421.86	1990	431.65	1990			
433.21	1989.99	434.07	1989.99	434.94	1990	436.15	1990	454.79	1989.96			
462.97	1989.95	466.09	1989.96	475.34	1989.96	560.31	1990	560.55	1990			
561.3	1990.01	621.77	1990.82	625.29	1990.88							

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	199.8	.03	399.57	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff	Contr.	Expan.
199.8	399.57	96.75	96.75	96.75	.1	.3	

CROSS SECTION

RIVER: FL-US

REACH: FL-US

RS: 1005

INPUT

Description: Section immediately upstream of existing dual 60" RCP's

Station	Elevation	Data	num=	36	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2004.29	45.66	2004.35	47.07	2004.32	66	2004.52	70.5	2004.44			
106.04	2004.33	142.25	2004.52	148.84	2004.4	164.62	2003.85	176.91	2003.7			
202.48	2001.98	229.15	2000	238.63	1995.94	241.08	1995	244.93	1993.44			
253.98	1990	262.61	1986.57	280.87	1985	287.92	1984.95	301.02	1984.85			
304.33	1984.84	310.02	1985	318.53	1985.77	370.78	1989.18	379.02	1989.33			
408.07	1989.89	413.25	1989.99	427.39	1989.99	446.23	1989.98	472.66	1989.97			
501.61	1989.98	537.97	1989.97	545.68	1989.97	550.93	1989.97	572.63	1989.98			
576.19	1989.98											

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	229.15	.03	379.02	.03

Bank Sta: Left Right Coeff Contr. Expan.

Left	Right	Coeff	Contr.	Expan.
229.15	379.02	.1	.3	

SUMMARY OF MANNING'S N VALUES

River: FL-US

Reach	River Sta.	n1	n2	n3
FL-US	1040	.03	.03	.03
FL-US	1035	.03	.03	.03
FL-US	1030	.03	.03	.03
FL-US	1025	.03	.03	.03
FL-US	1020	.03	.03	.03
FL-US	1015	.03	.03	.03
FL-US	1010	.03	.03	.03
FL-US	1005	.03	.03	.03

SUMMARY OF REACH LENGTHS

River: FL-US

Reach	River Sta.	Left	Channel	Right
FL-US	1040	98.45	98.45	98.45
FL-US	1035	101.17	101.17	101.17
FL-US	1030	99.95	99.95	99.95
FL-US	1025	99.89	99.89	99.89
FL-US	1020	100.97	100.97	100.97
FL-US	1015	100.2	100.2	100.2
FL-US	1010	96.75	96.75	96.75
FL-US	1005			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: FL-US

Reach	River Sta.	Contr.	Expan.
FL-US	1040	.1	.3
FL-US	1035	.1	.3
FL-US	1030	.1	.3
FL-US	1025	.1	.3
FL-US	1020	.1	.3
FL-US	1015	.1	.3
FL-US	1010	.1	.3
FL-US	1005	.1	.3

Appendix C-2:

*Existing Downstream
HEC-RAS Analysis (COLTON-RAS.prj)*

HEC-RAS Plan: Plan 04 River: FL Reach: FL Profile: PF 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
FL	1000	PF 1	555.00	1967.00	1969.48	1970.04	1971.43	0.023309	11.19	49.58	29.26	1.52
FL	998	PF 1	555.00	1967.00	1968.63	1969.29	1970.79	0.045425	11.81	46.98	43.74	2.01
FL	996	PF 1	555.00	1967.00	1968.67	1969.01	1969.87	0.023318	8.78	63.22	55.75	1.45
FL	994	PF 1	555.00	1967.00	1968.77	1968.85	1969.49	0.013161	6.83	81.26	68.07	1.10
FL	992	PF 1	555.00	1967.00	1968.59	1968.66	1969.22	0.019885	6.38	86.93	78.73	1.07
FL	990	PF 1	555.00	1966.94	1967.62	1967.95	1968.77	0.019465	8.61	64.44	162.43	2.41
FL	988	PF 1	555.00	1966.63	1967.37	1967.61	1968.13	0.014411	6.98	79.55	160.66	1.75
FL	986	PF 1	635.00	1966.38	1967.26	1967.39	1967.74	0.010376	5.55	114.49	255.01	1.46
FL	984	PF 1	635.00	1965.71	1967.21	1966.79	1967.33	0.001010	2.76	230.03	273.45	0.53
FL	982	PF 1	653.50	1964.77	1966.46	1966.46	1967.19	0.003024	6.99	96.07	66.63	0.98
FL	980	PF 1	653.50	1964.14	1965.65	1966.05	1967.00	0.007825	9.48	71.38	67.48	1.51
FL	978	PF 1	653.50	1963.43	1964.64	1965.21	1966.66	0.016156	11.50	59.90	90.27	2.12
FL	976	PF 1	665.00	1961.92	1963.23	1963.93	1965.74	0.019040	12.74	53.09	64.38	2.27
FL	974	PF 1	665.00	1959.98	1961.16	1961.98	1964.47	0.030185	14.60	46.04	60.65	2.78
FL	972	PF 1	665.00	1958.16	1959.19	1960.05	1962.81	0.035179	15.33	44.33	58.55	3.00
FL	970	PF 1	665.00	1956.07	1957.20	1958.06	1960.94	0.038800	15.63	43.93	63.21	3.10
FL	968	PF 1	665.00	1954.37	1955.59	1956.46	1959.14	0.031571	15.17	44.76	54.94	2.85
FL	966	PF 1	665.00	1953.26	1954.39	1955.16	1957.46	0.030052	14.05	47.48	63.72	2.78
FL	964	PF 1	665.00	1952.98	1954.09	1954.77	1956.57	0.022773	12.98	56.19	73.28	2.44
FL	962	PF 1	665.00	1952.43	1953.57	1954.20	1955.77	0.025706	11.88	55.97	77.11	2.46
FL	960	PF 1	665.00	1951.86	1953.22	1953.72	1954.96	0.019722	10.58	62.88	80.17	2.10
FL	958	PF 1	665.00	1951.43	1952.81	1953.35	1954.60	0.015362	10.79	62.50	70.37	1.96
FL	956	PF 1	665.00	1950.15	1951.46	1952.08	1953.60	0.025365	11.76	56.56	62.79	2.18
FL	954	PF 1	665.00	1948.06	1950.05	1950.69	1952.26	0.028216	11.95	55.67	62.45	2.23
FL	952	PF 1	665.00	1946.27	1948.10	1948.78	1950.64	0.036072	12.79	52.00	62.62	2.47
FL	950	PF 1	665.00	1944.16	1946.33	1947.02	1948.84	0.035679	12.69	52.39	62.61	2.45
FL	948	PF 1	665.00	1942.72	1944.57	1945.26	1947.12	0.032797	12.81	52.25	65.17	2.42
FL	946	PF 1	665.00	1940.92	1942.67	1943.37	1945.31	0.039632	13.05	51.35	68.61	2.56
FL	944	PF 1	665.00	1939.95	1941.26	1941.89	1943.49	0.029365	11.98	55.64	68.01	2.27
FL	942	PF 1	665.00	1939.20	1940.15	1940.55	1942.28	0.038876	12.28	63.76	215.93	2.95
FL	940	PF 1	665.00	1938.65	1939.70	1940.23	1941.53	0.023365	11.38	65.41	129.06	2.43
FL	938	PF 1	665.00	1938.11	1940.61	1939.87	1940.68	0.000320	2.45	327.21	245.08	0.31
FL	936	PF 1	683.50	1937.41	1939.75	1939.75	1940.56	0.004973	7.24	95.61	61.13	0.99
FL	934	PF 1	713.50	1936.73	1938.47	1938.95	1940.10	0.012628	10.26	69.69	57.27	1.61
FL	932	PF 1	713.50	1936.41	1938.66	1938.68	1939.57	0.004341	8.69	99.11	62.67	1.18
FL	930	PF 1	713.50	1935.78	1937.42	1937.95	1939.12	0.015755	10.62	68.81	73.21	1.78
FL	928	PF 1	713.50	1934.97	1936.64	1937.19	1938.40	0.013029	10.69	67.69	61.58	1.75
FL	926	PF 1	713.50	1934.65	1936.68	1936.93	1937.84	0.005064	8.80	86.04	61.25	1.26
FL	924	PF 1	713.50	1934.20	1935.84	1936.36	1937.46	0.008837	10.24	69.73	57.15	1.62
FL	922	PF 1	713.50	1933.40	1934.73	1935.51	1936.82	0.017244	11.60	61.50	59.53	2.01
FL	920	PF 1	713.50	1931.98	1933.45	1934.17	1935.93	0.016723	12.64	56.45	52.51	2.15
FL	918	PF 1	713.50	1930.43	1931.71	1932.18	1934.86	0.024391	14.23	50.15	53.38	2.59
FL	916	PF 1	713.50	1928.75	1930.23	1931.21	1933.56	0.027350	14.63	48.78	53.00	2.69
FL	914	PF 1	713.50	1928.10	1929.29	1930.11	1932.17	0.022855	13.64	52.91	62.70	2.46
FL	912	PF 1	713.50	1927.32	1928.61	1929.36	1931.07	0.016986	12.58	56.73	54.61	2.15
FL	910	PF 1	713.50	1926.97	1928.27	1928.87	1930.22	0.011691	11.19	63.96	56.14	1.82
FL	908	PF 1	753.00	1926.18	1927.66	1928.30	1929.64	0.011181	11.30	66.96	57.49	1.79
FL	906	PF 1	782.00	1925.58	1927.12	1927.72	1929.10	0.010558	11.29	69.82	59.71	1.76
FL	904	PF 1	782.00	1924.99	1926.42	1927.08	1928.49	0.013793	11.52	67.87	61.59	1.93
FL	902	PF 1	782.00	1924.34	1925.73	1926.31	1927.81	0.013048	11.60	68.50	69.30	1.96
FL	900	PF 1	782.00	1923.73	1925.10	1925.79	1927.15	0.012867	11.54	68.44	67.89	1.95
FL	898	PF 1	782.00	1923.07	1924.33	1924.93	1926.47	0.014106	11.82	69.00	79.62	2.03
FL	896	PF 1	782.00	1922.44	1923.66	1924.33	1925.76	0.013831	11.71	68.65	75.70	2.01
FL	894	PF 1	782.00	1921.79	1922.93	1923.53	1925.04	0.015293	11.83	71.35	109.55	2.12
FL	892	PF 1	782.00	1920.94	1922.41	1923.13	1924.36	0.010619	11.30	72.26	74.10	1.76
FL	890	PF 1	782.00	1920.28	1921.55	1922.25	1923.72	0.014432	11.84	66.75	73.27	2.05
FL	888	PF 1	782.00	1919.59	1921.09	1921.72	1923.00	0.011466	11.14	72.67	71.37	1.81
FL	886	PF 1	782.00	1918.77	1920.14	1920.87	1922.37	0.012790	11.98	65.87	60.48	1.92
FL	884	PF 1	782.00	1918.10	1919.42	1920.15	1921.70	0.013398	12.12	65.30	61.27	1.95
FL	882	PF 1	808.50	1917.22	1918.59	1919.34	1920.98	0.014976	12.42	66.38	68.56	2.09
FL	880	PF 1	808.50	1916.61	1918.03	1918.72	1920.20	0.013422	11.83	69.63	63.78	1.86
FL	878	PF 1	808.50	1915.70	1917.08	1917.86	1919.45	0.015702	12.35	65.48	63.15	2.12
FL	876	PF 1	808.50	1915.10	1916.61	1917.23	1918.65	0.012644	11.46	70.84	64.84	1.88
FL	874	PF 1	808.50	1914.35	1915.57	1916.19	1917.79	0.023368	11.95	67.65	90.31	2.43
FL	872	PF 1	808.50	1913.84	1916.20	1916.27	1917.06	0.002995	7.45	108.51	70.27	1.06
FL	870	PF 1	808.50	1913.00	1915.77	1916.13	1916.88	0.003147	8.48	95.37	97.98	1.51
FL	868	PF 1	836.00	1912.33	1915.44	1915.82	1916.74	0.002212	9.87	138.33	268.85	1.06
FL	867		Culvert									
FL	866	PF 1	874.50	1909.59	1913.76	1913.76	1914.04	0.002529	5.10	225.75	303.94	0.45
FL	864	PF 1	896.00	1909.06	1913.31	1913.31	1913.62	0.003023	5.50	228.81	346.47	0.52
FL	862	PF 1	896.00	1908.85	1912.52	1912.77	1913.34	0.007606	8.26	148.32	261.62	0.84
FL	860	PF 1	896.00	1908.84	1912.23	1912.44	1912.89	0.008474	7.84	156.20	288.81	0.87
FL	858	PF 1	896.00	1908.59	1912.42	1912.17	1912.56	0.001367	3.51	318.27	391.37	0.36
FL	856	PF 1	896.00	1907.77	1912.40		1912.50	0.000857	3.00	365.15	380.18	0.29
FL	854	PF 1	896.00	1907.00	1912.37		1912.48	0.000525	2.83	397.94	337.20	0.23
FL	852	PF 1	896.00	1906.98	1912.36		1912.44	0.000363	2.84	412.66	313.25	0.24
FL	850	PF 1	896.00	1906.55	1912.34		1912.42	0.000338	2.80	431.47	357.84	0.23
FL	848	PF 1	896.00	1906.51	1912.33		1912.40	0.000292	2.74	450.78	345.06	0.22

HEC-RAS Plan: Plan 04 River: FL Reach: FL Profile: PF 1 (Continued)

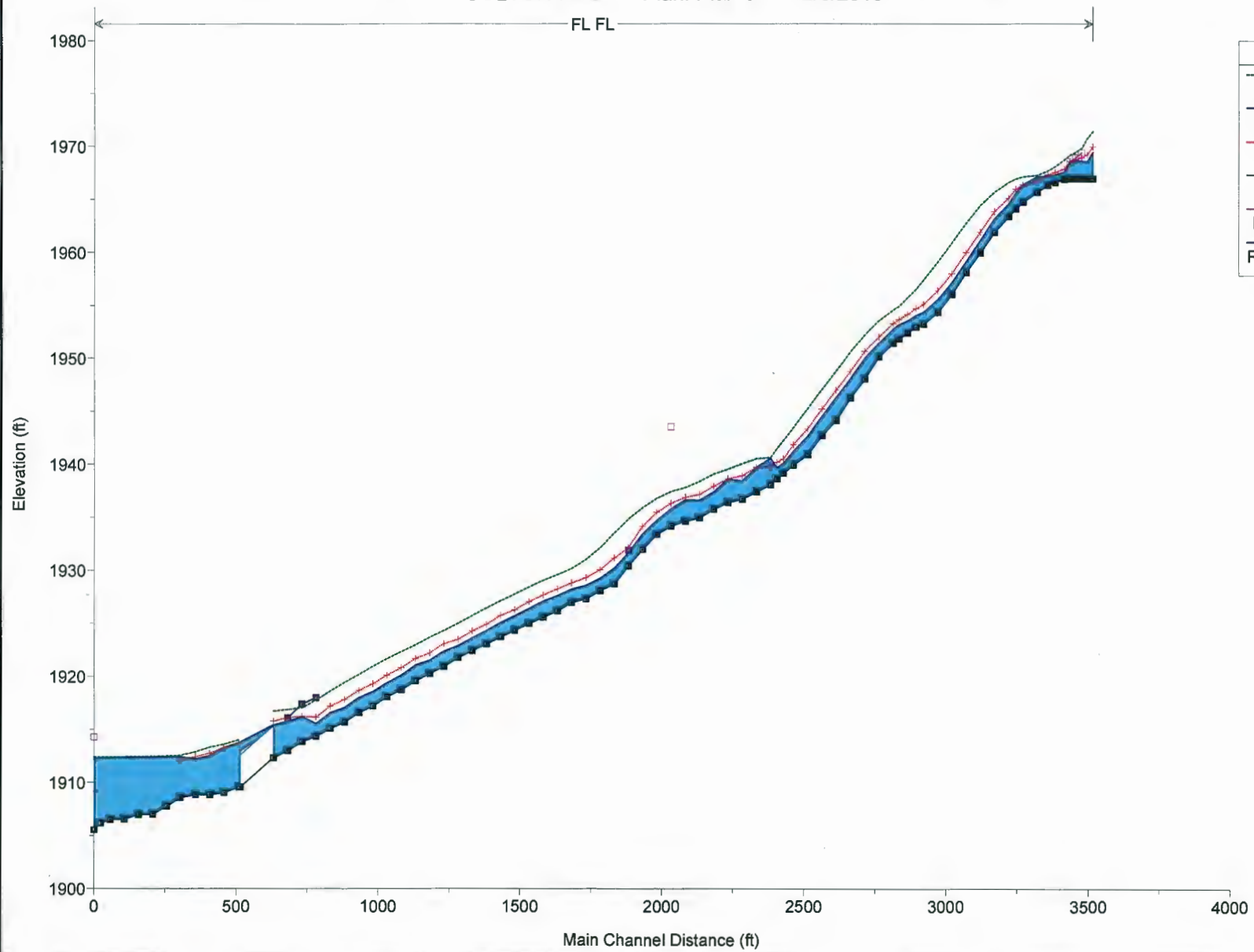
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
FL	846	PF 1	896.00	1906.19	1912.31		1912.39	0.000294	2.83	428.94	308.12	0.22
FL	844	PF 1	912.00	1905.55	1912.20	1909.16	1912.37	0.000443	3.68	320.92	216.12	0.27

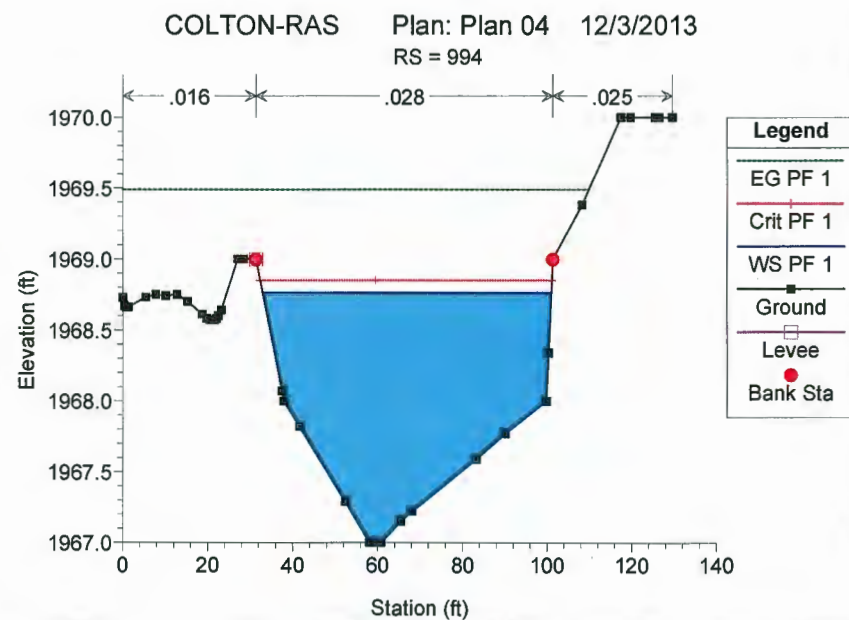
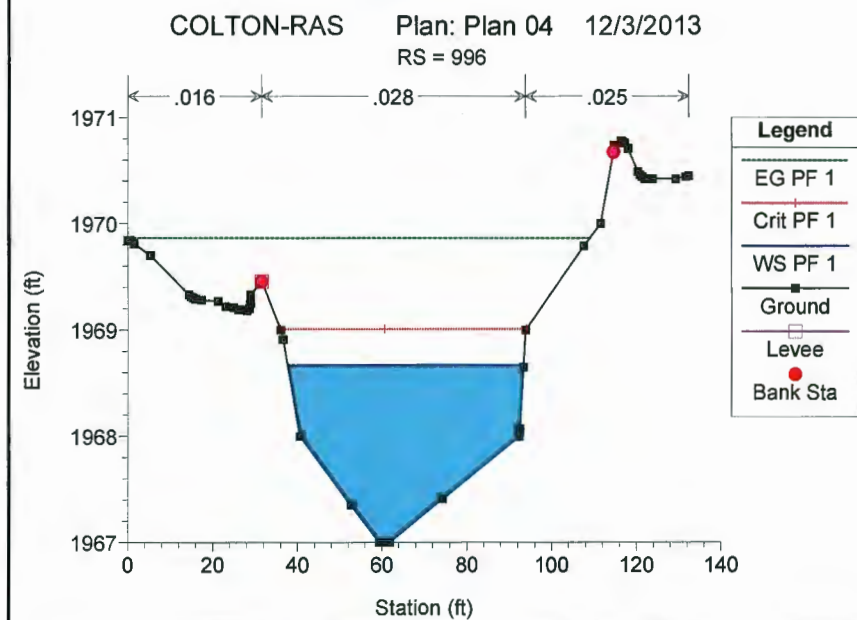
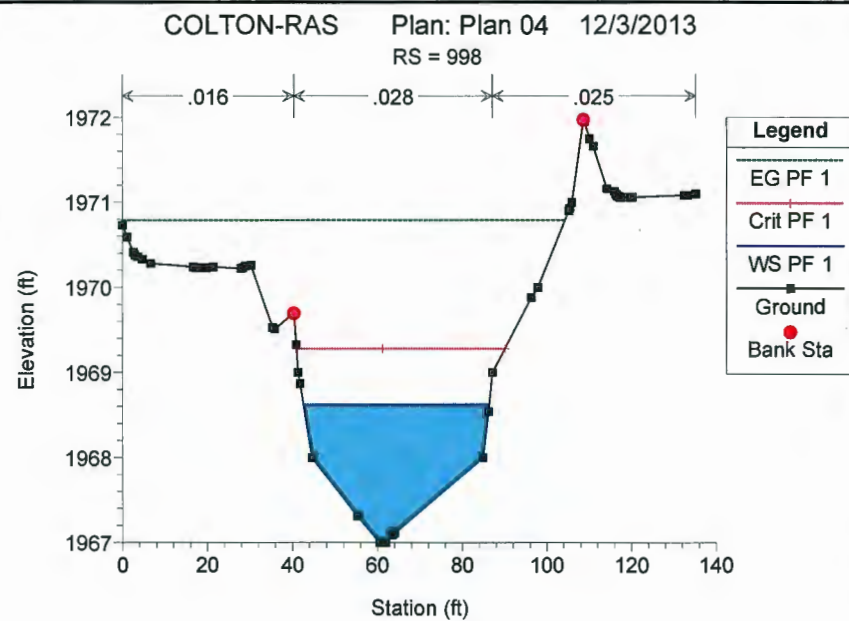
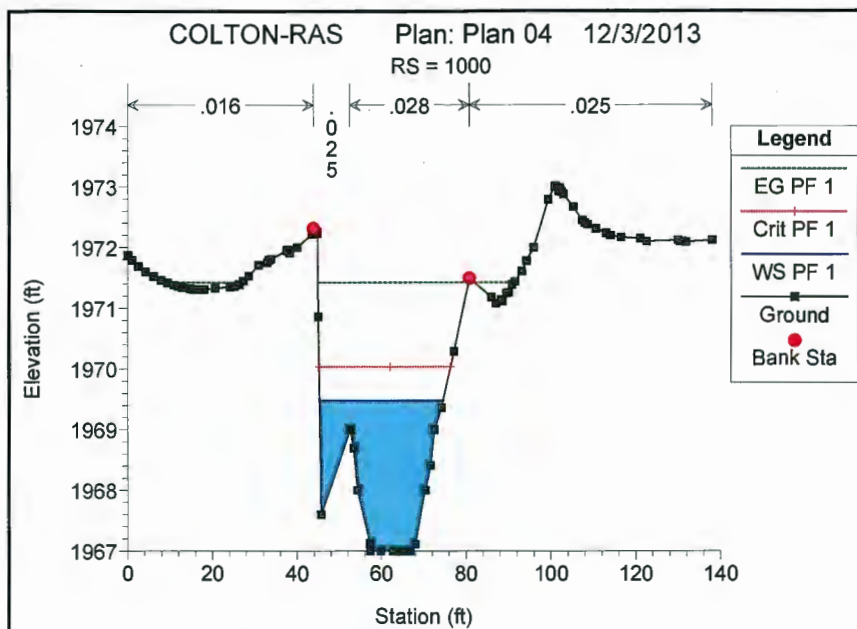
COLTON-RAS Plan: Plan 04 12/3/2013

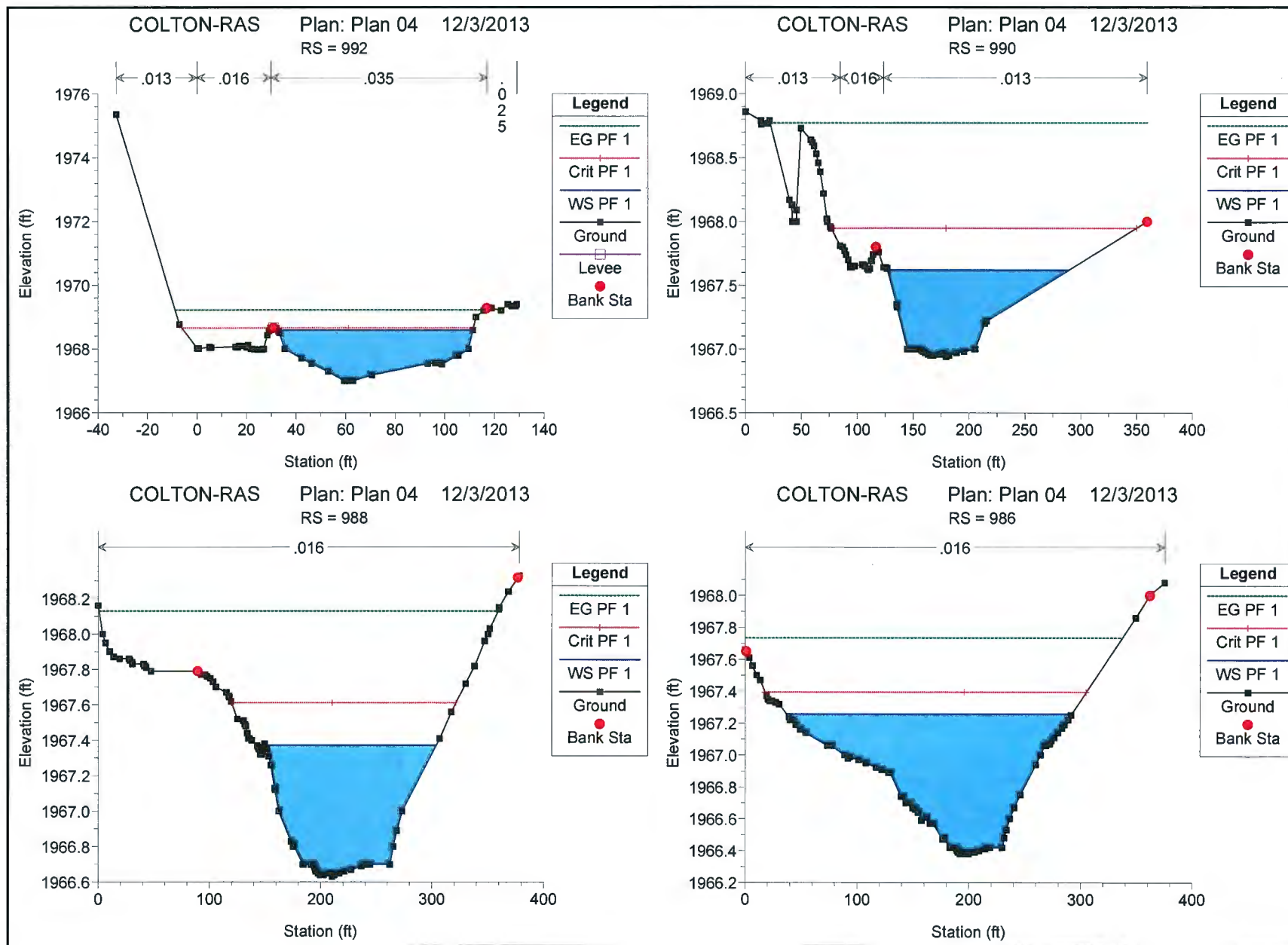
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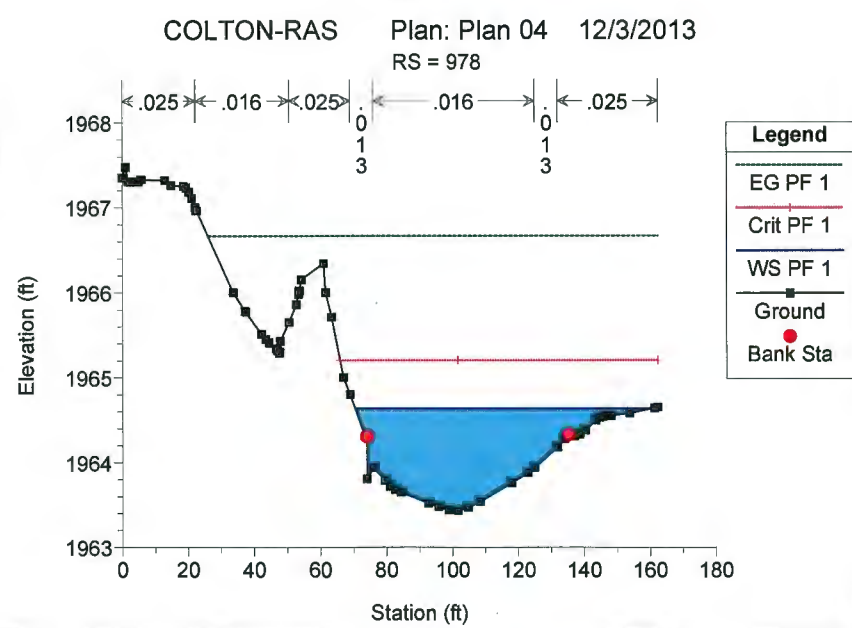
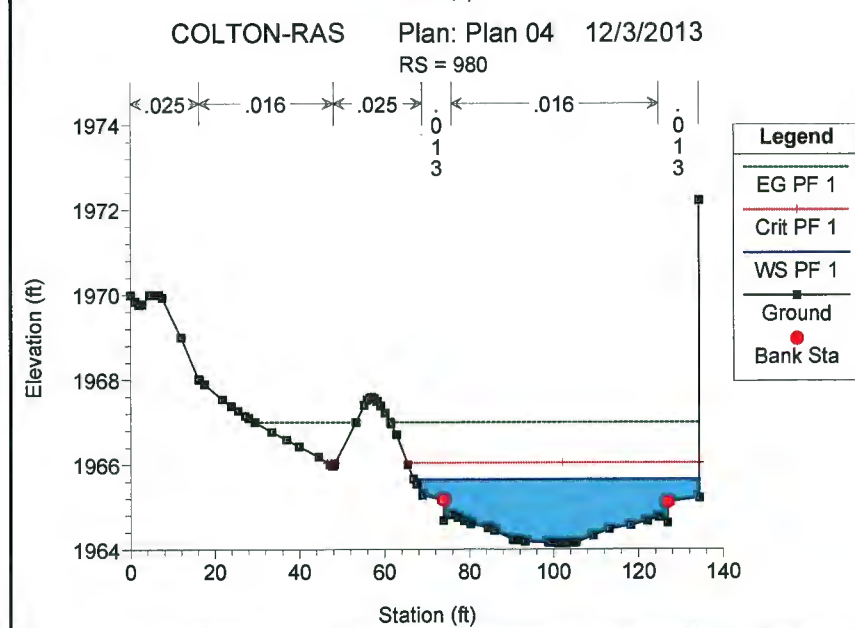
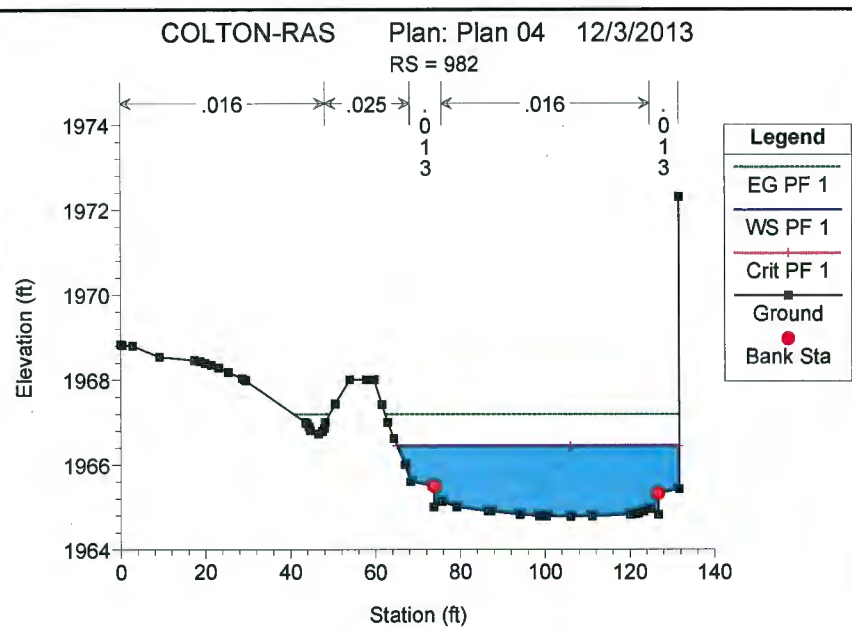
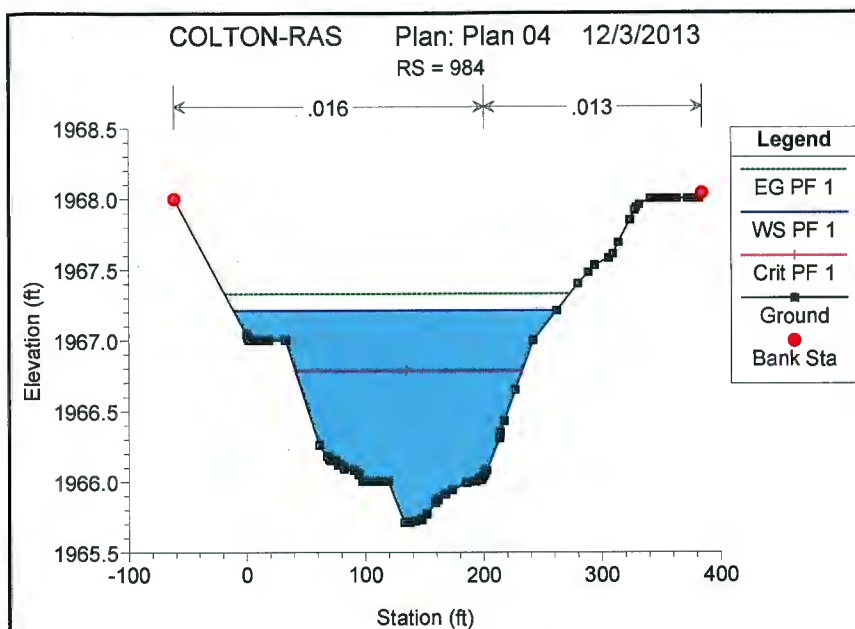
Legend

- EG PF 1
- WS PF 1
- Crit PF 1
- Ground
- Left Levee
- Right Levee

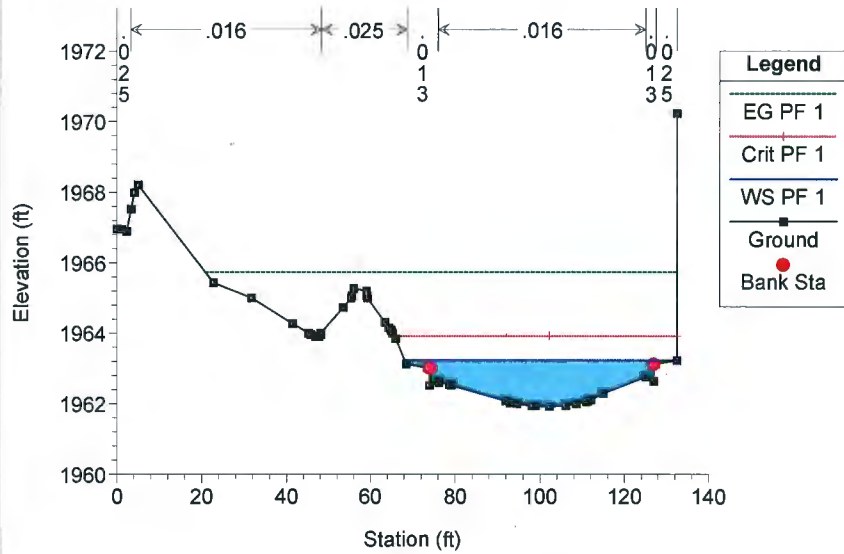




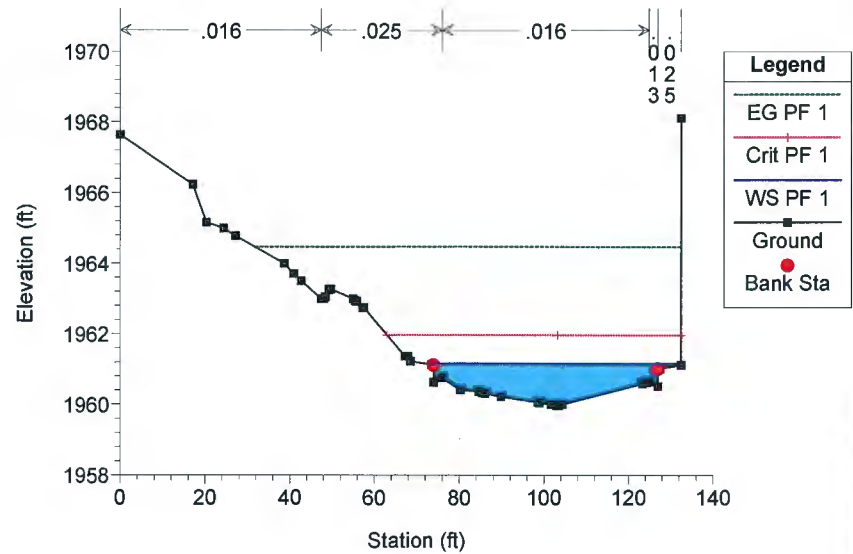




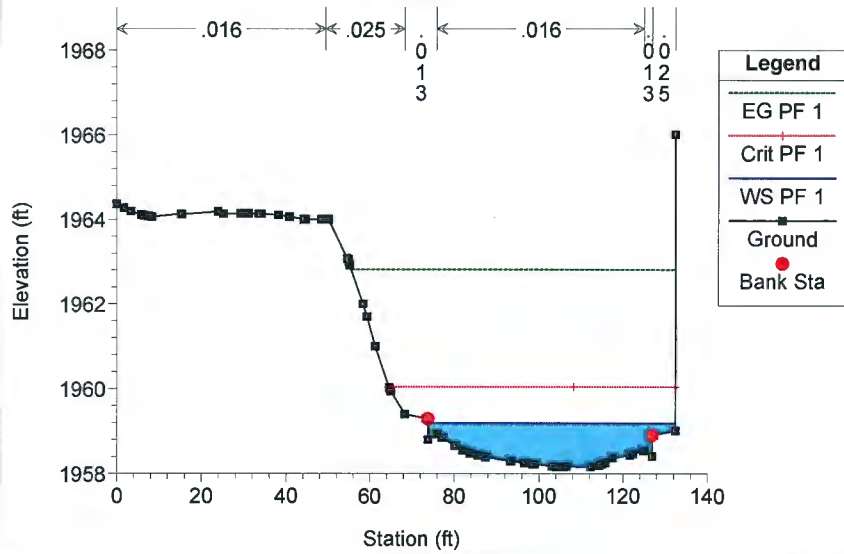
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RS = 976



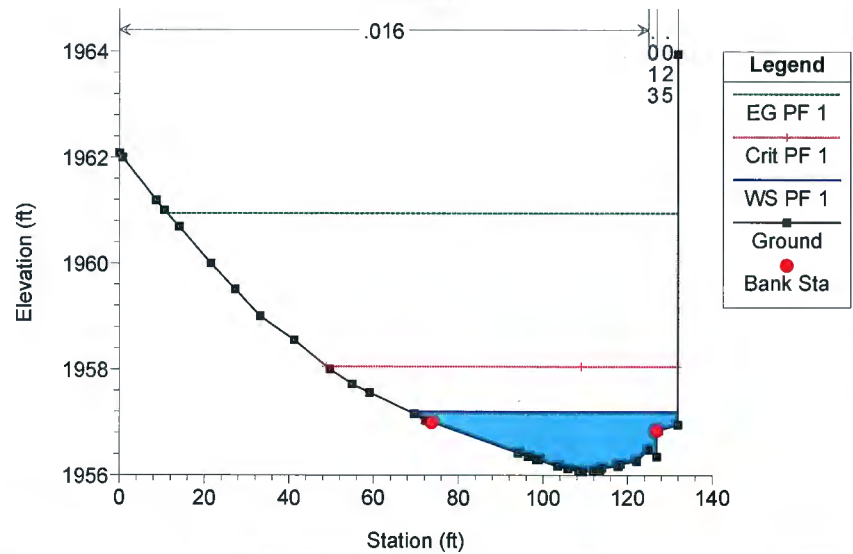
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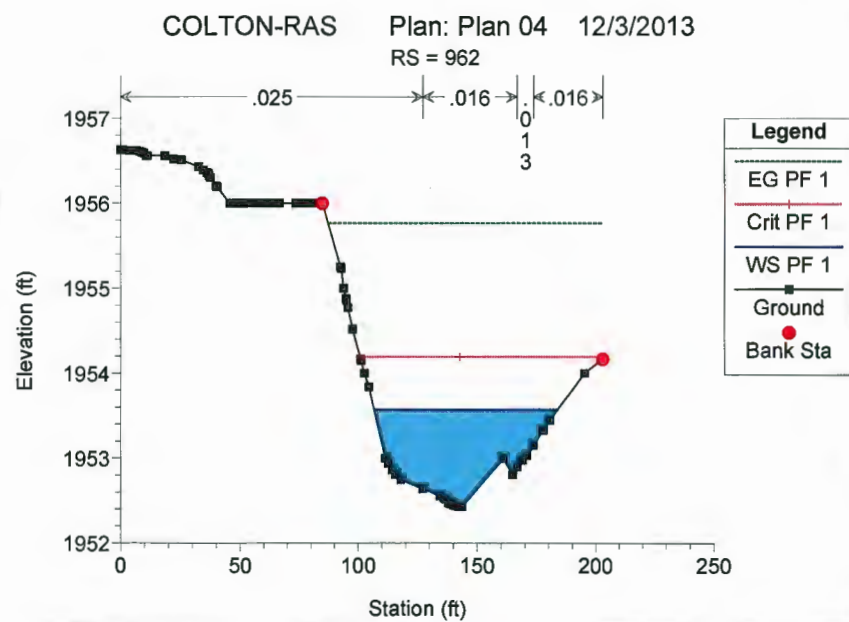
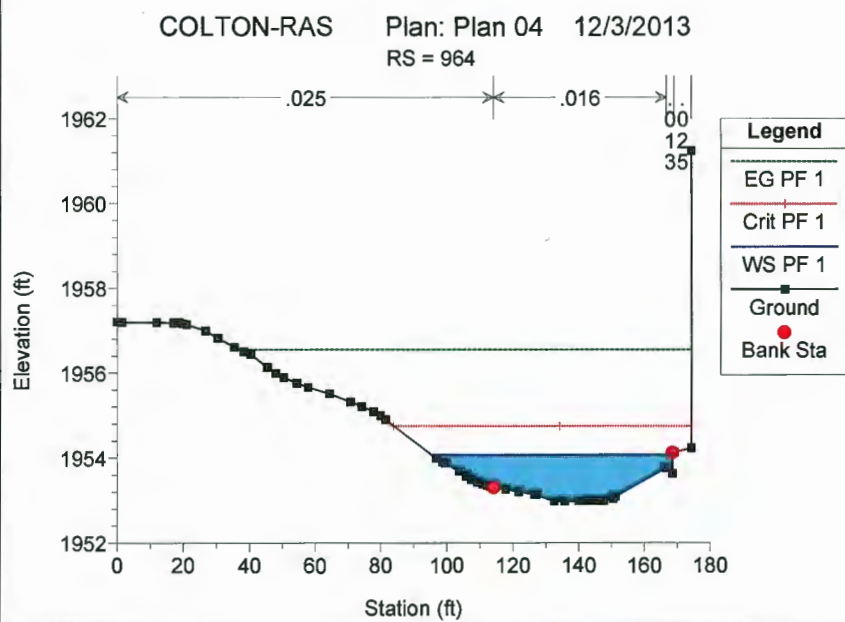
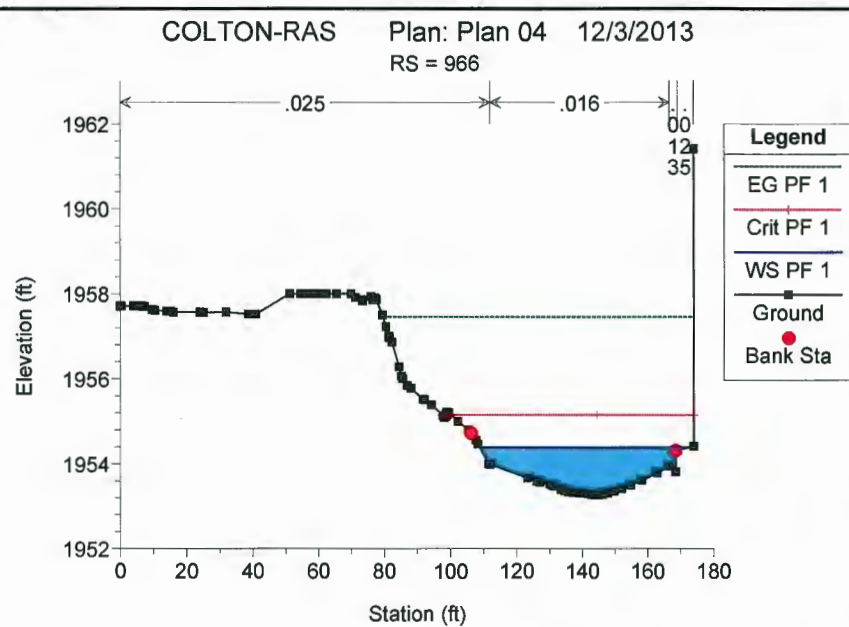
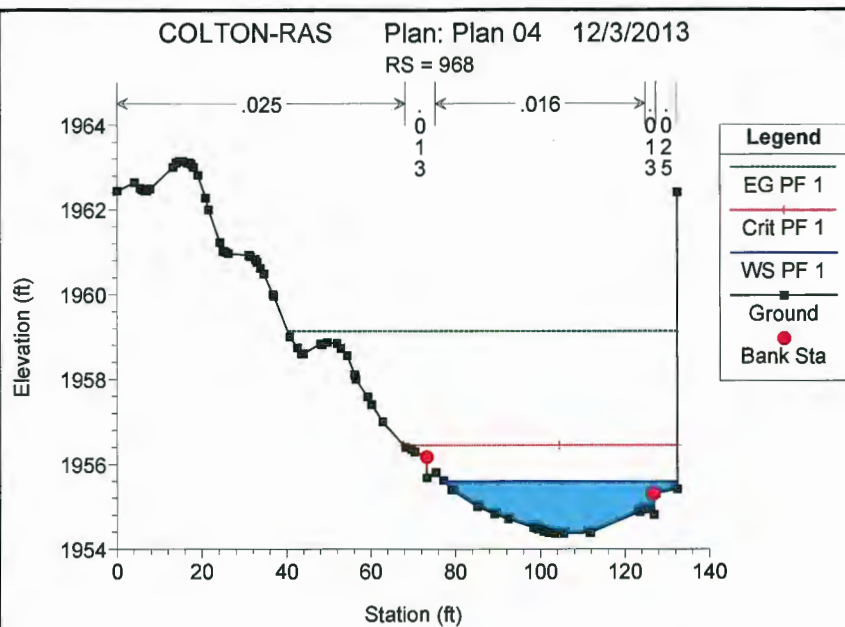


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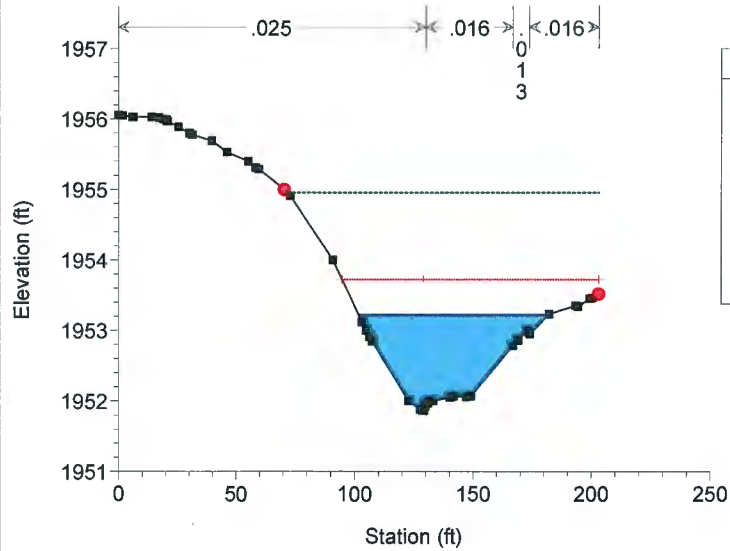


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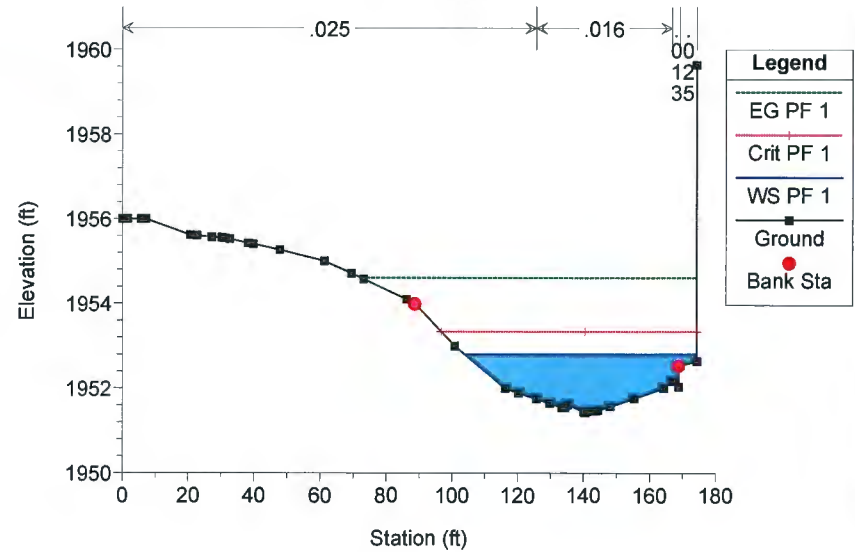




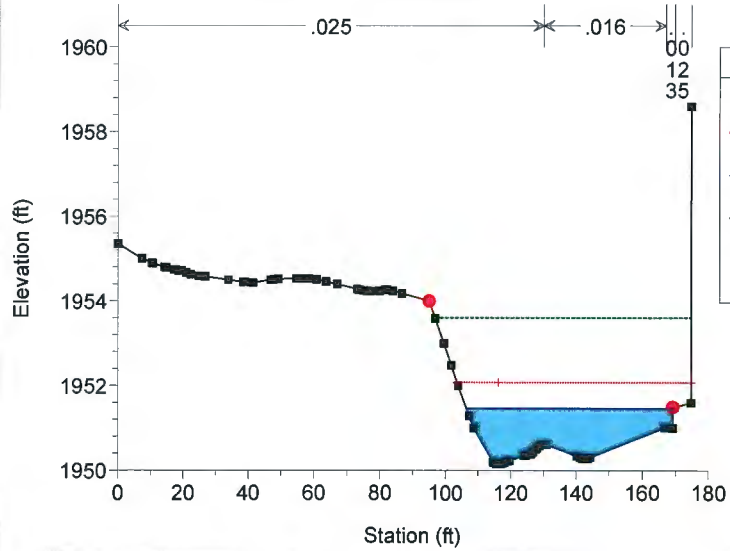
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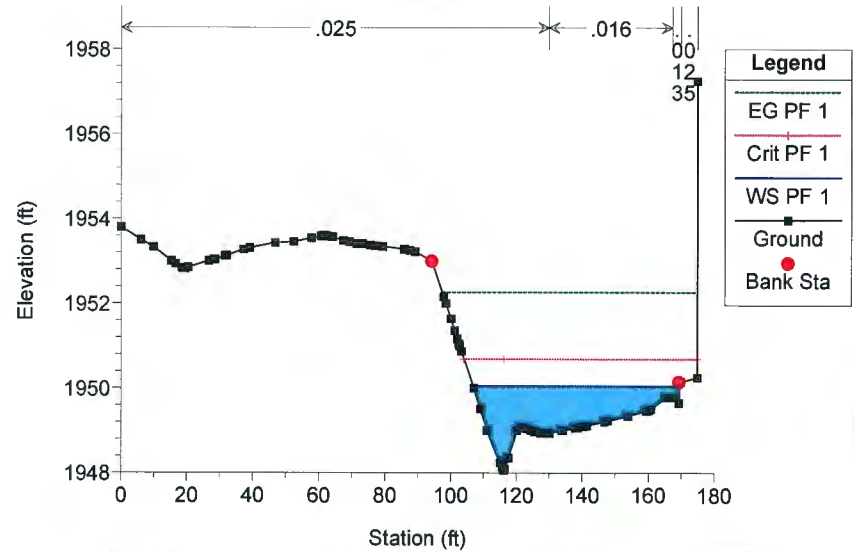
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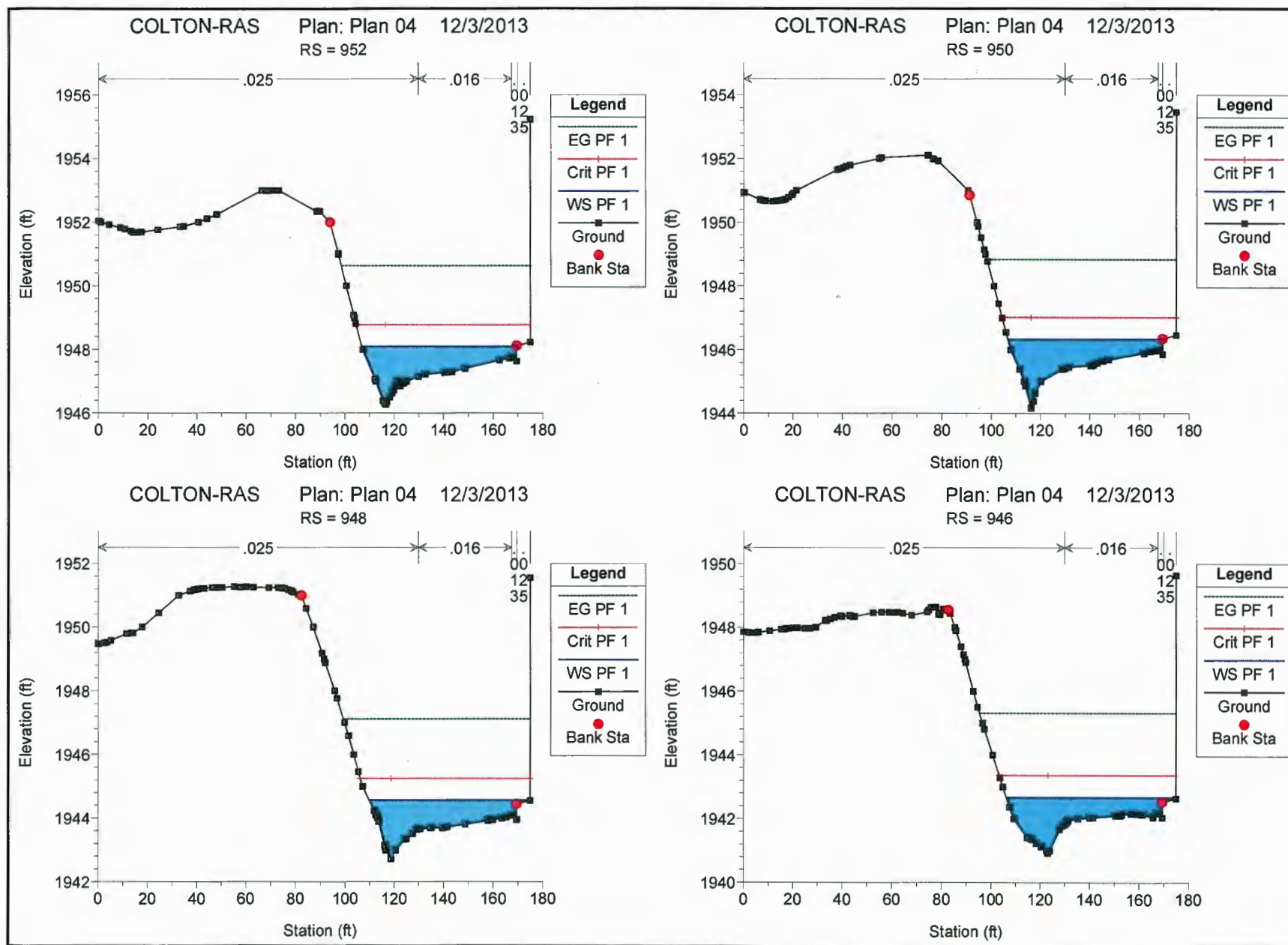


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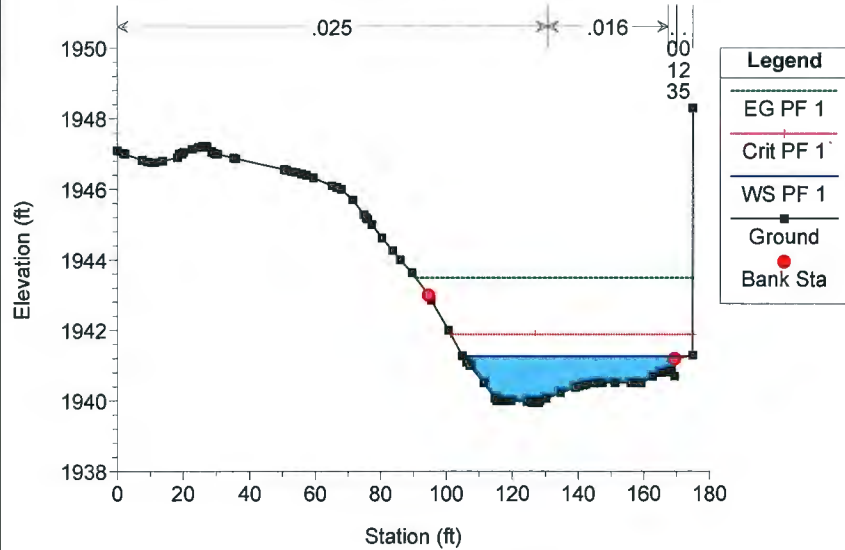


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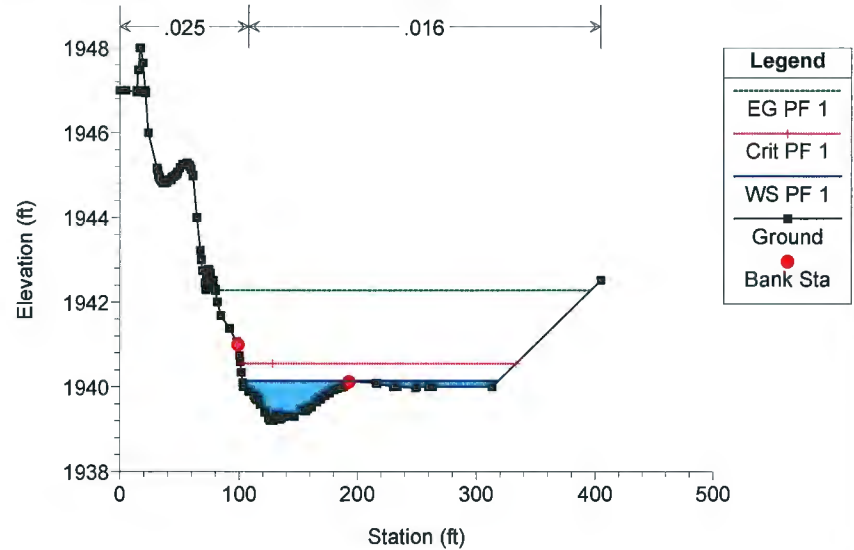




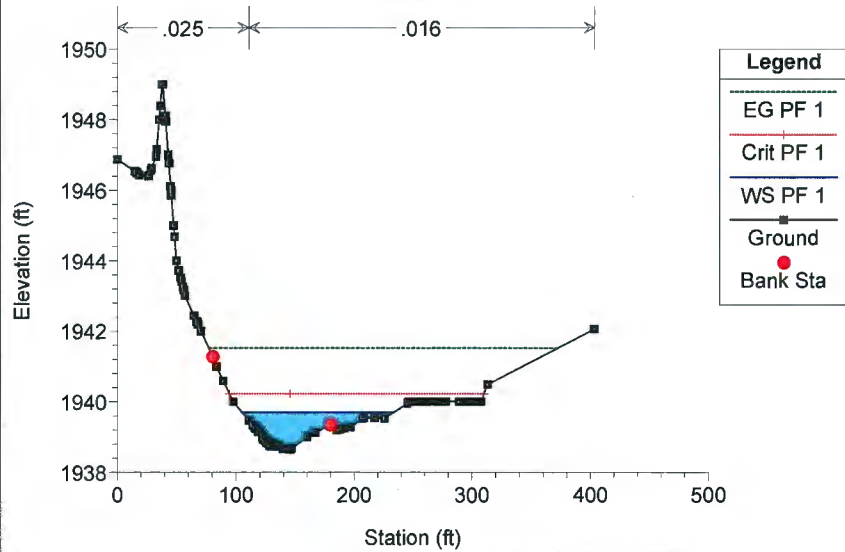
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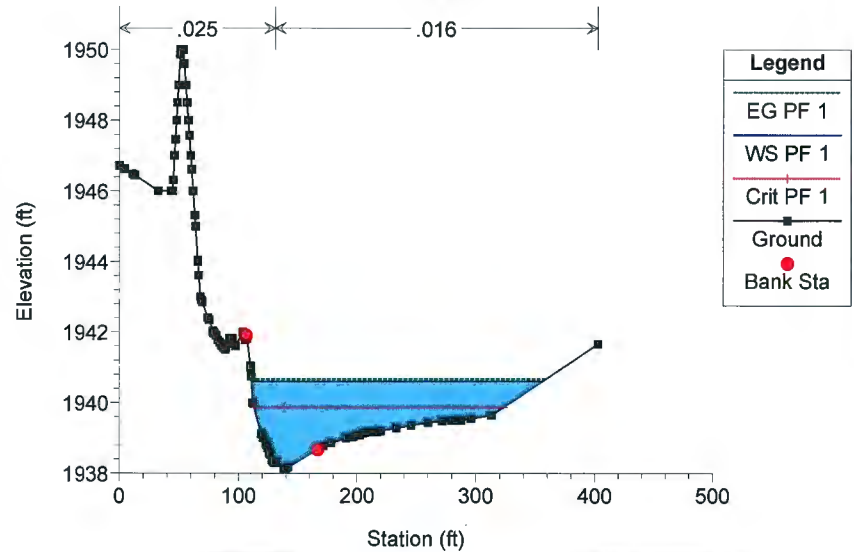
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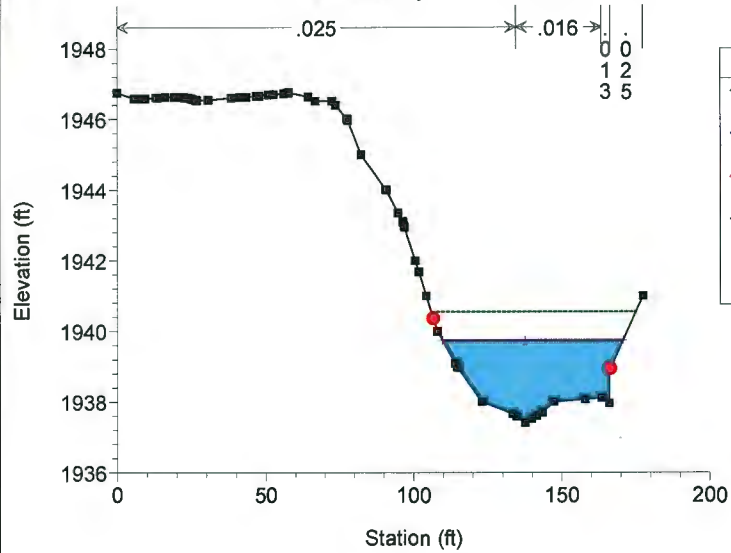


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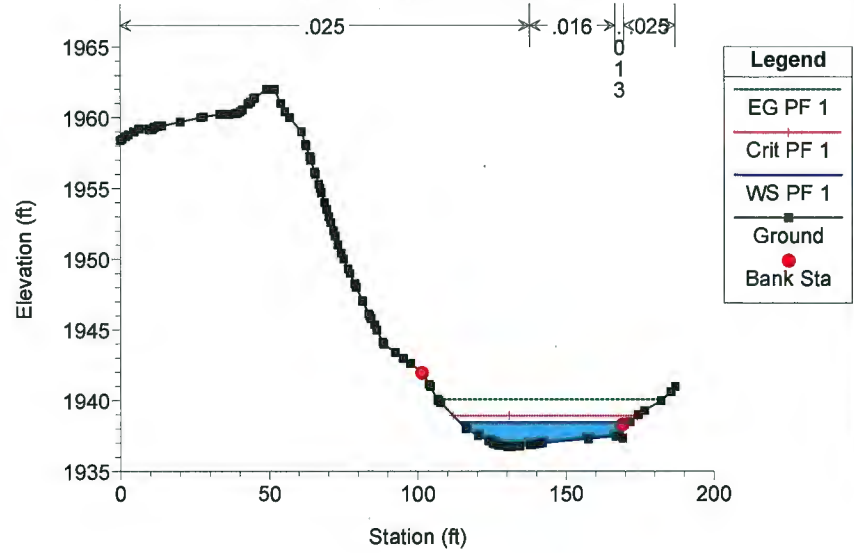
COLTON-RAS Plan: Plan 04 12/3/2013

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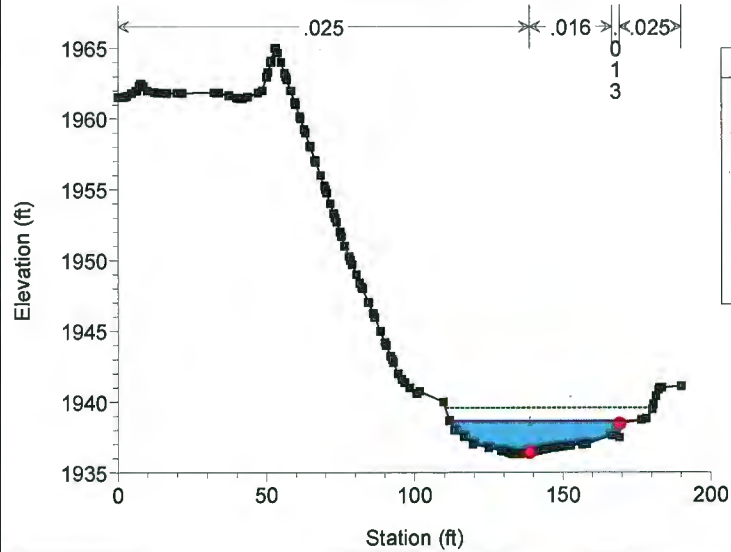
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 934 adjacent to building



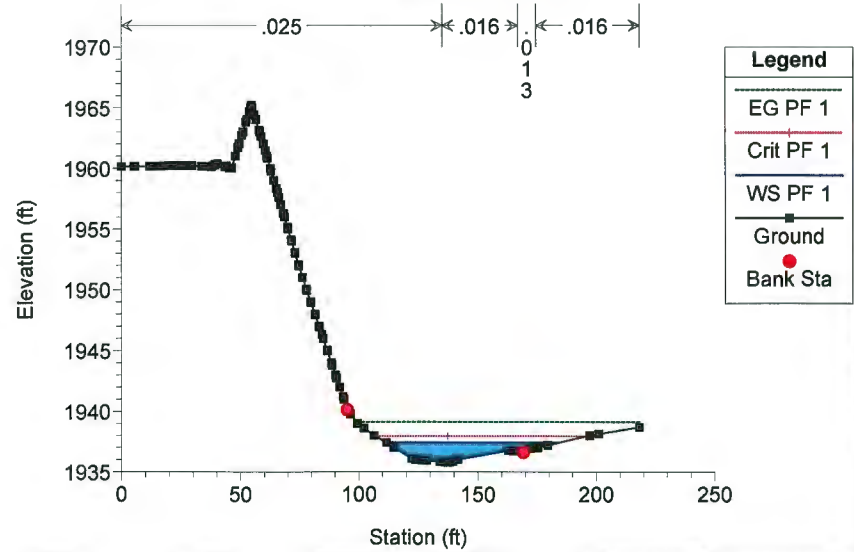
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 932 adjacent to building



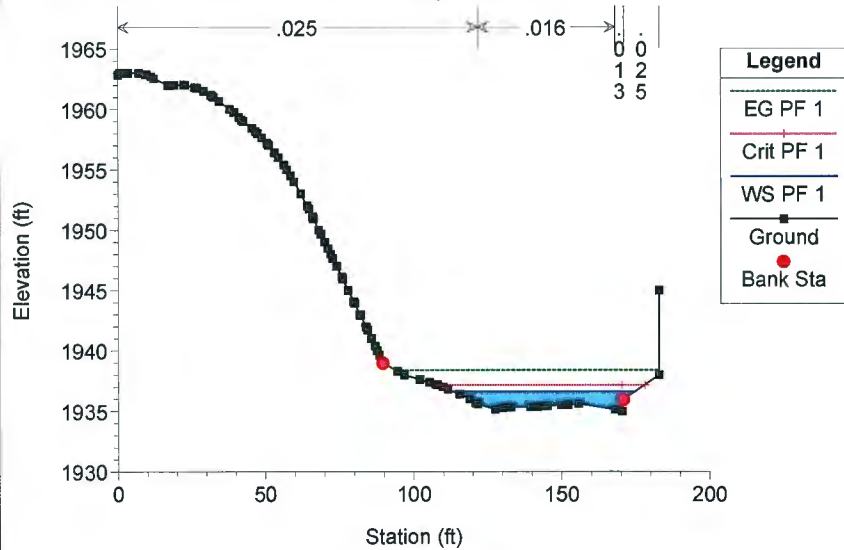
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 930 adjacent to driveway



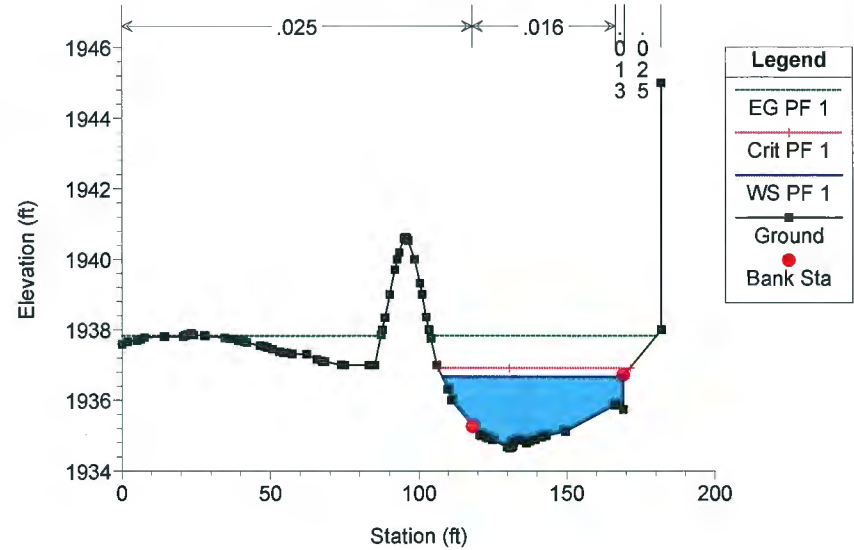
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 928 adjacent to wall



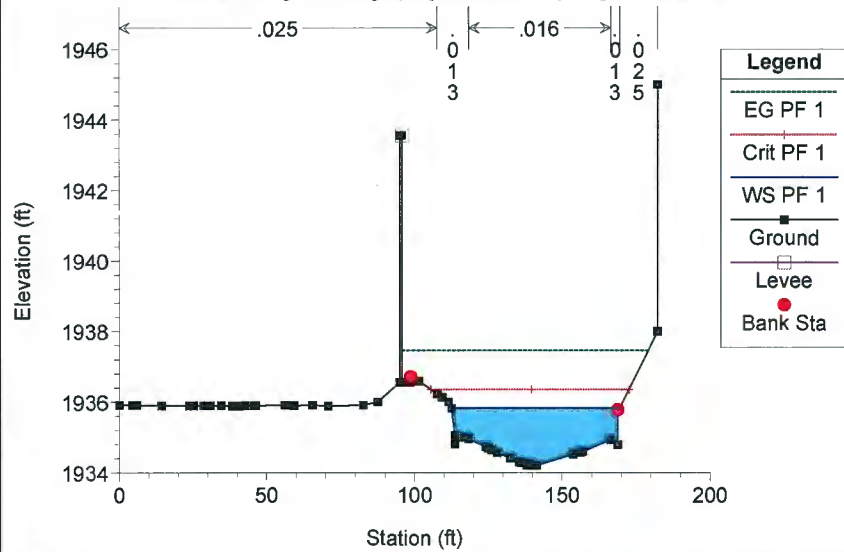
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 926 adjacent to wall



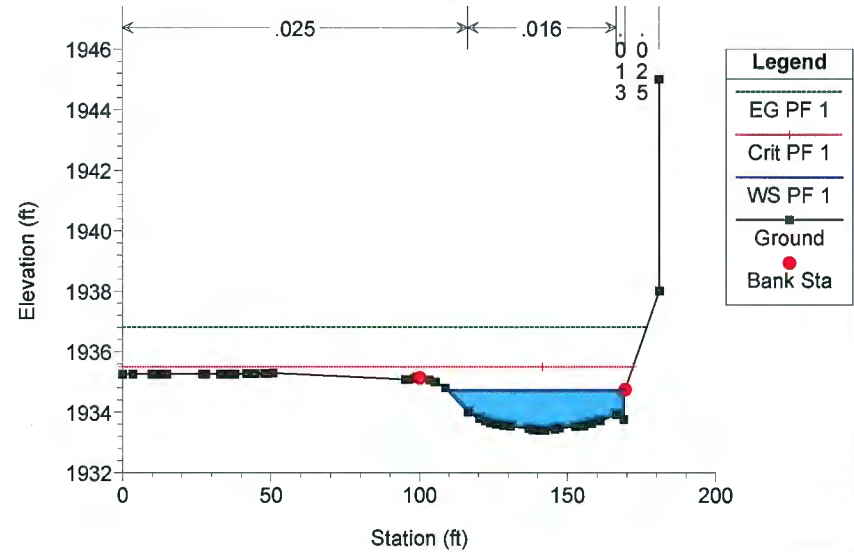
COLTON-RAS Plan: Plan 04 12/3/2013

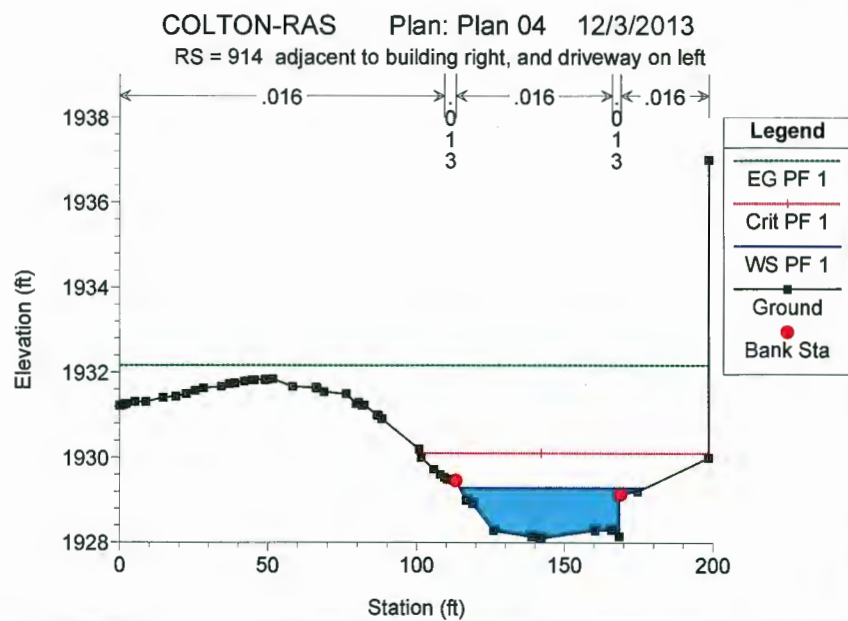
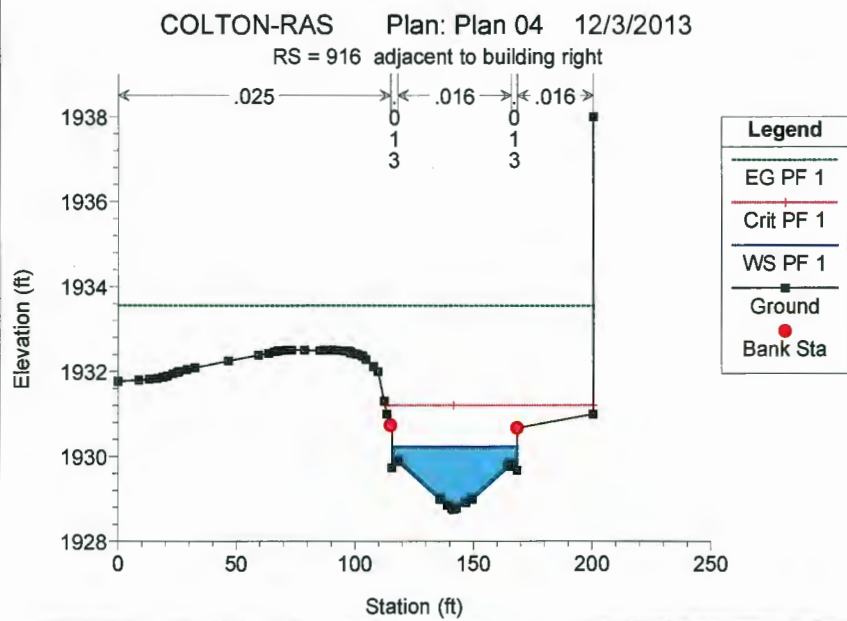
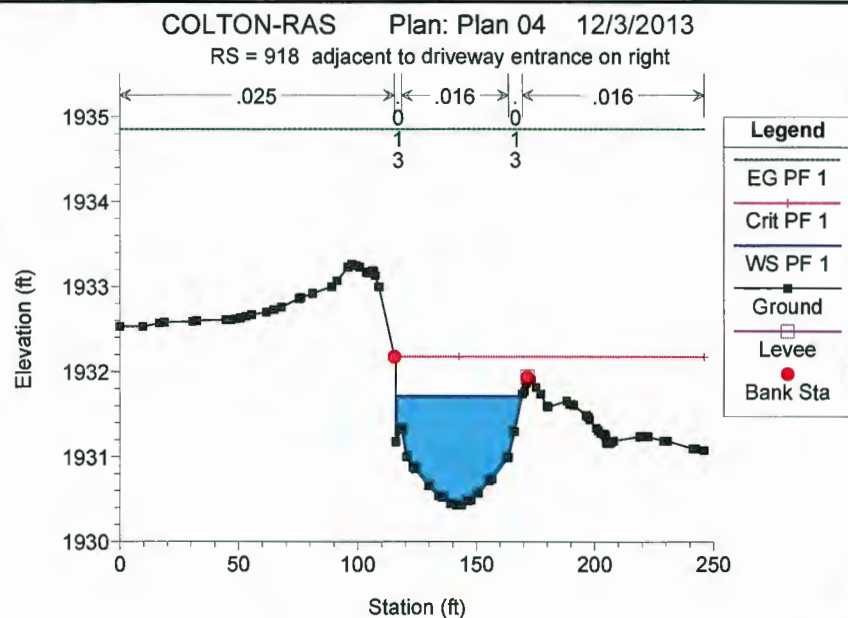
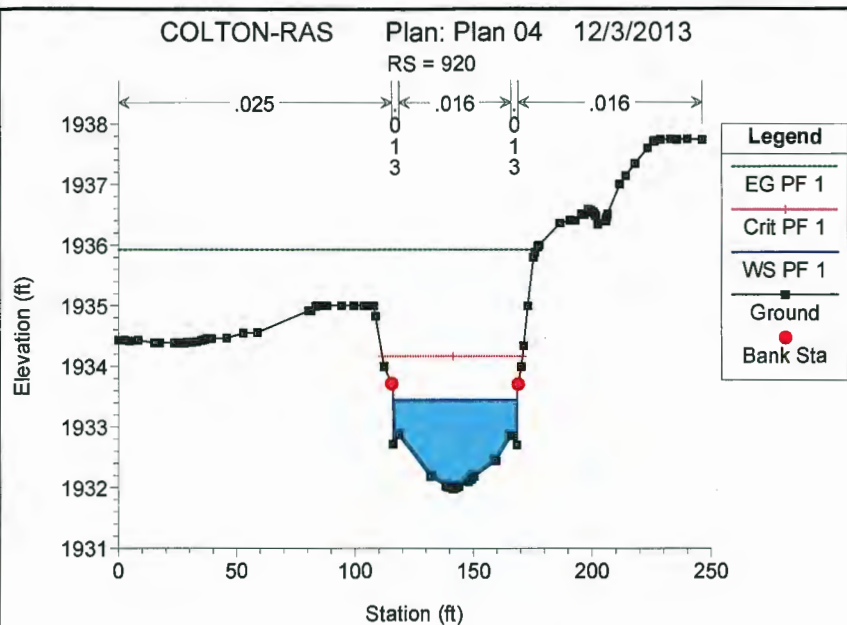
RS = 924 storage building up against landscape right, wall on left



COLTON-RAS Plan: Plan 04 12/3/2013

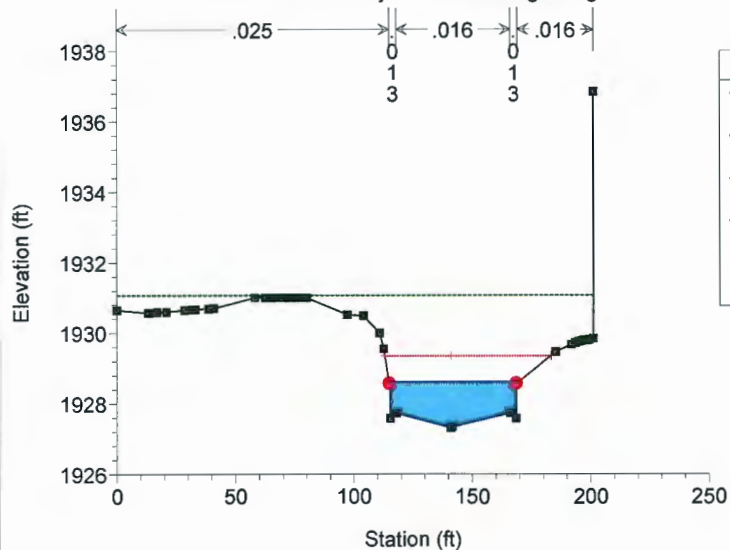
RS = 922





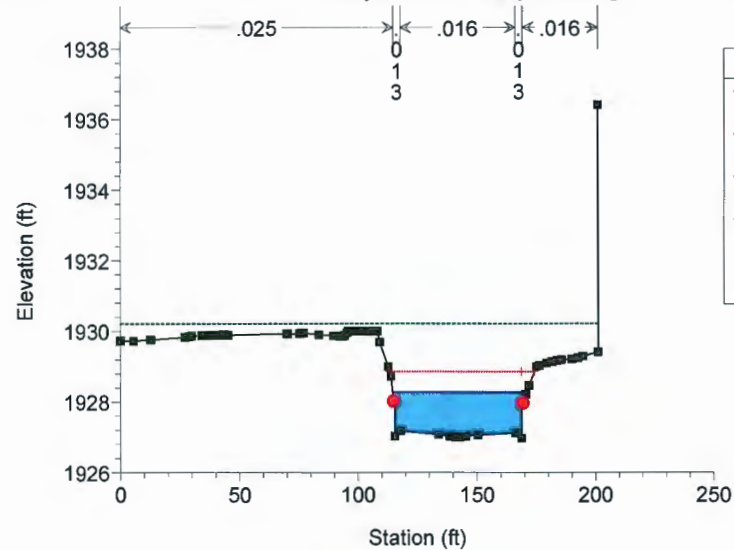
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 912 adjacent to building on right



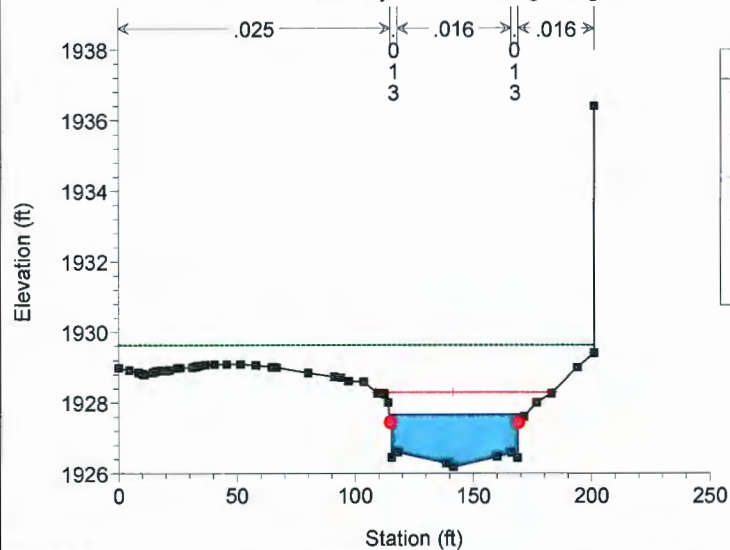
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 910 adjacent to building on the right



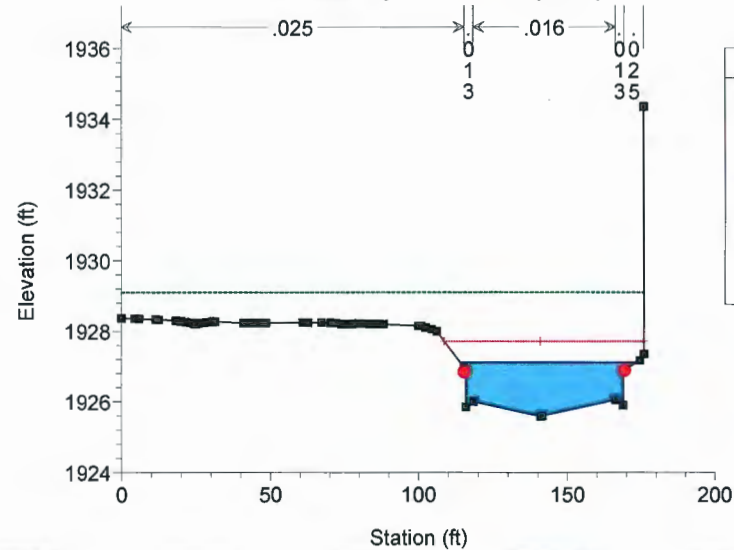
COLTON-RAS Plan: Plan 04 12/3/2013

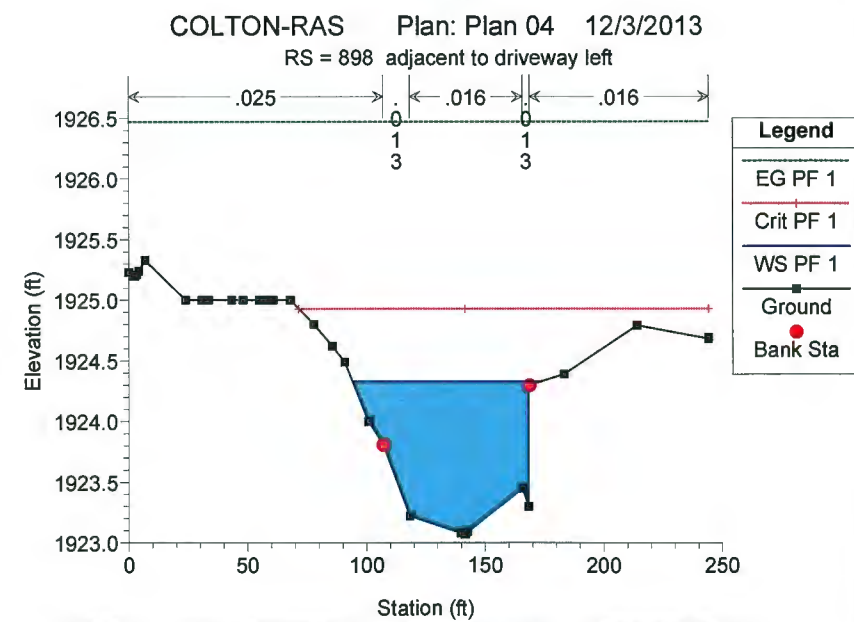
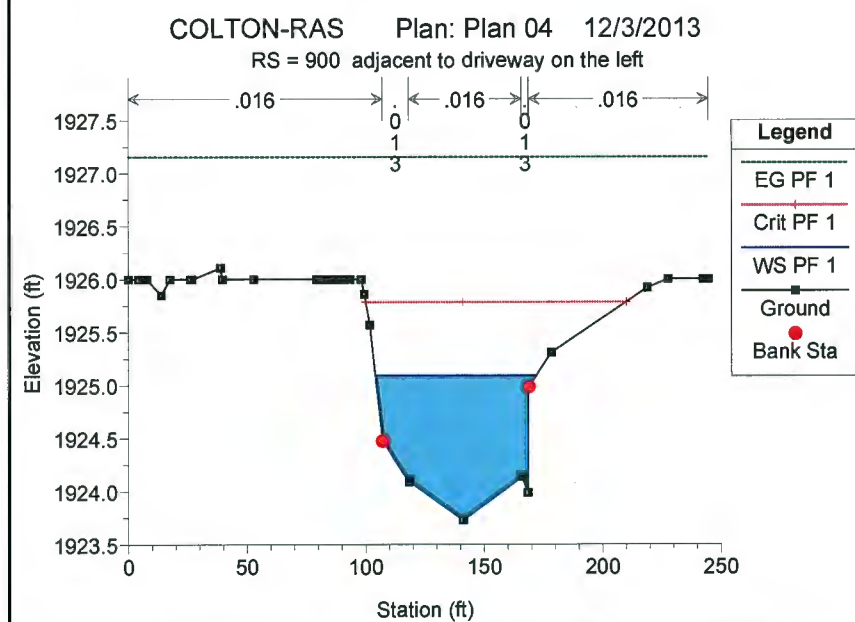
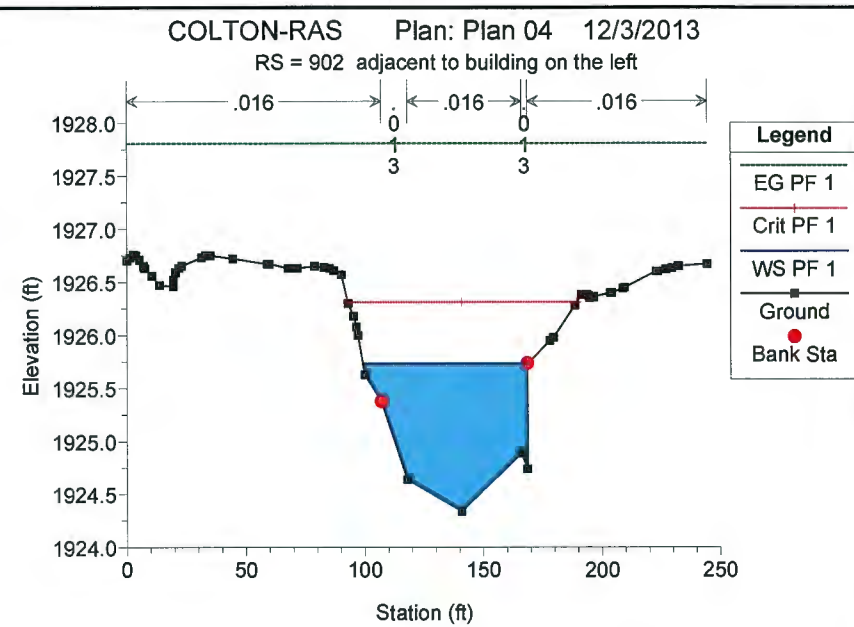
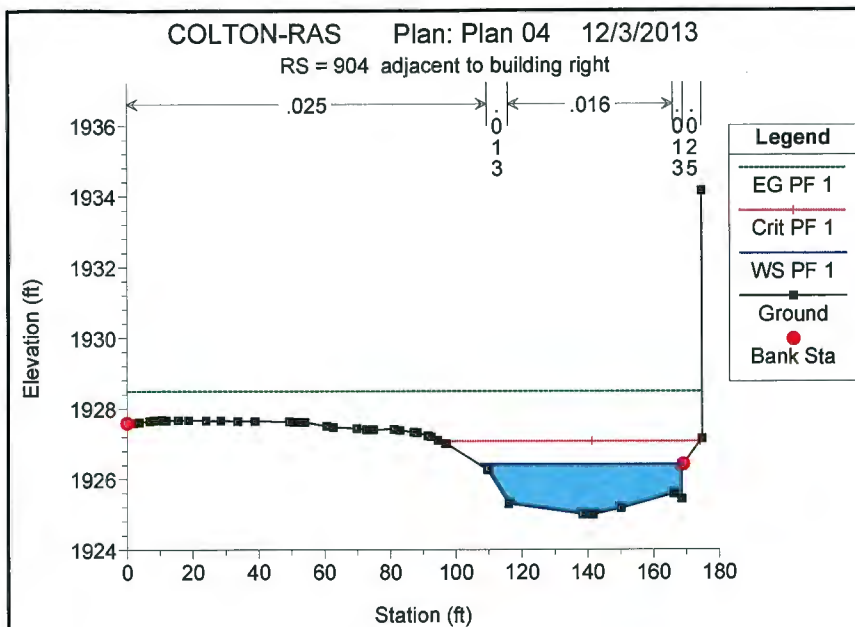
RS = 908 adjacent to building on right



COLTON-RAS Plan: Plan 04 12/3/2013

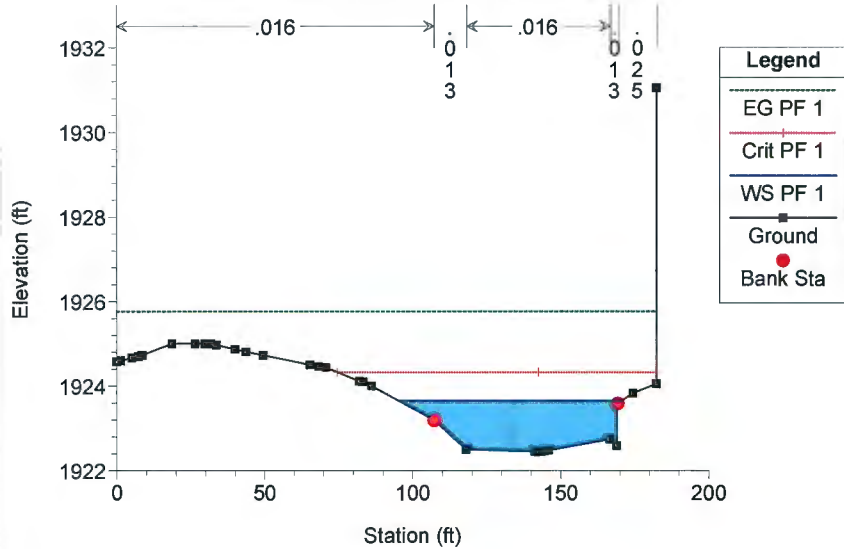
RS = 906 adjacent to building on right





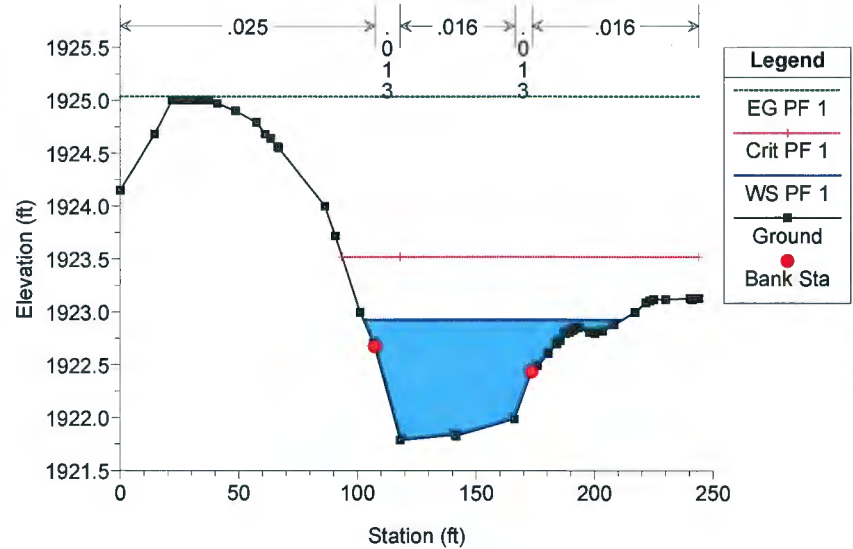
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 896 adjacent to wall right and driveway on left



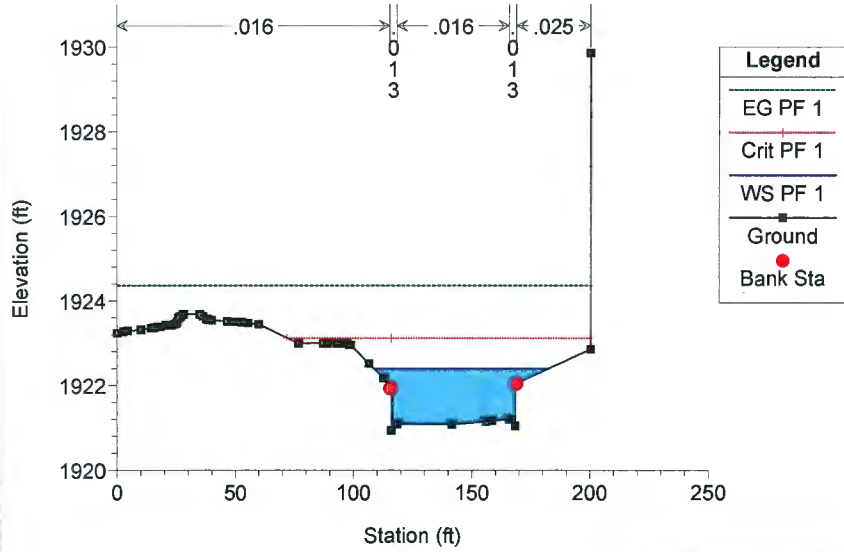
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 894 adjacent to driveway entrances, both left & right



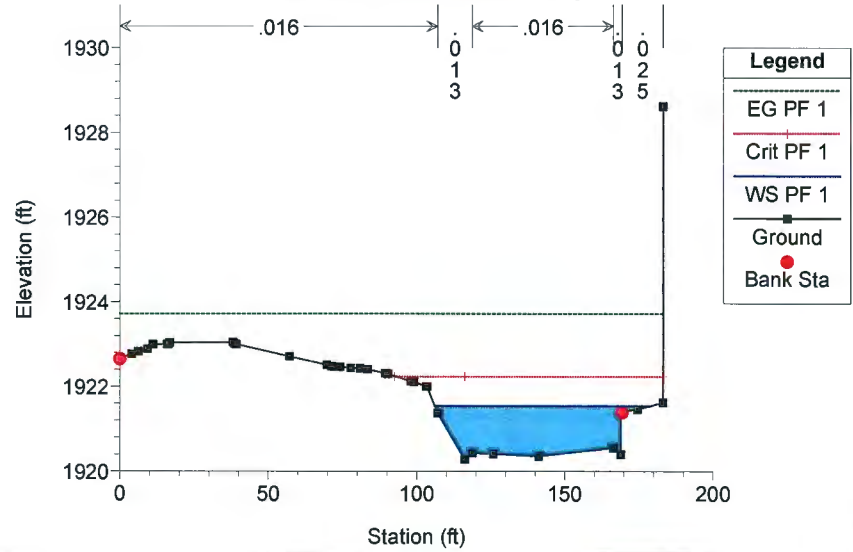
COLTON-RAS Plan: Plan 04 12/3/2013

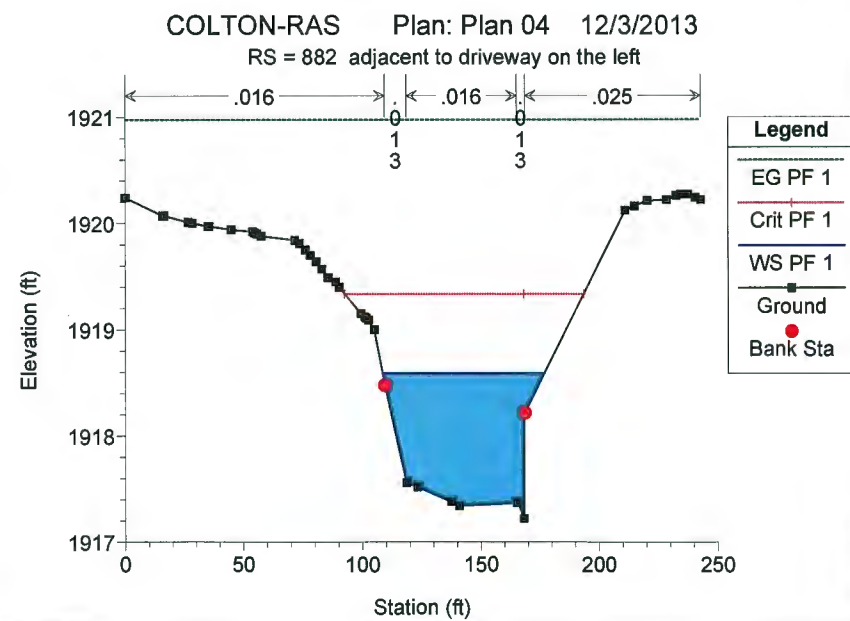
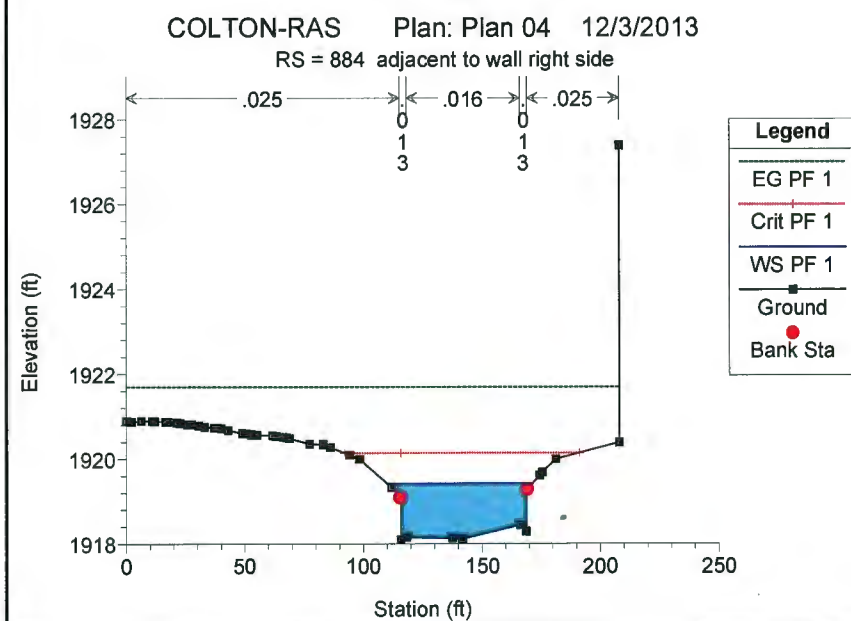
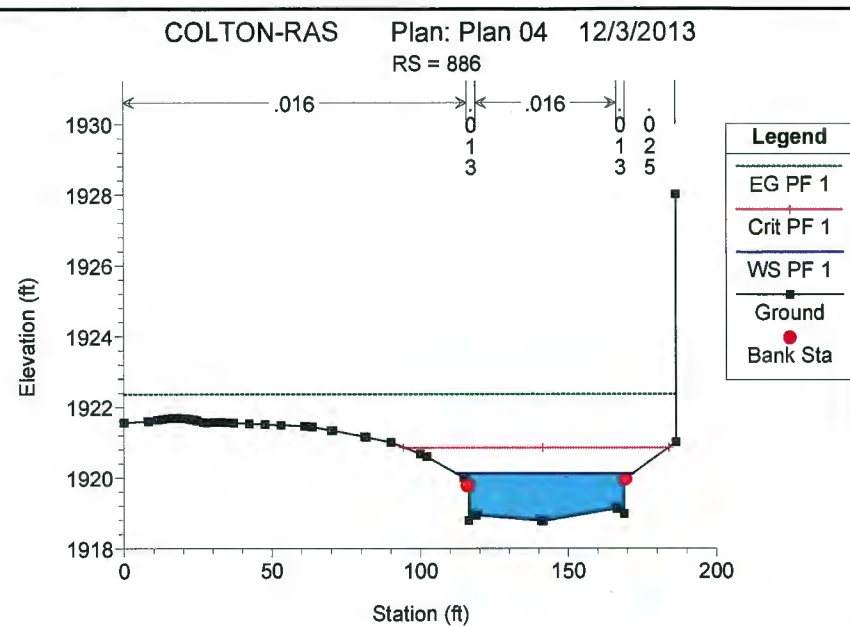
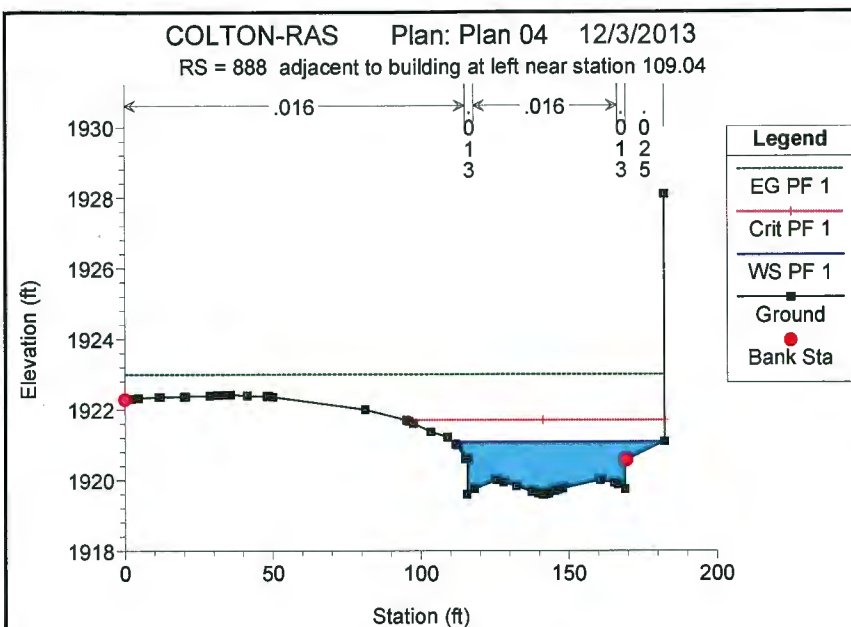
RS = 892

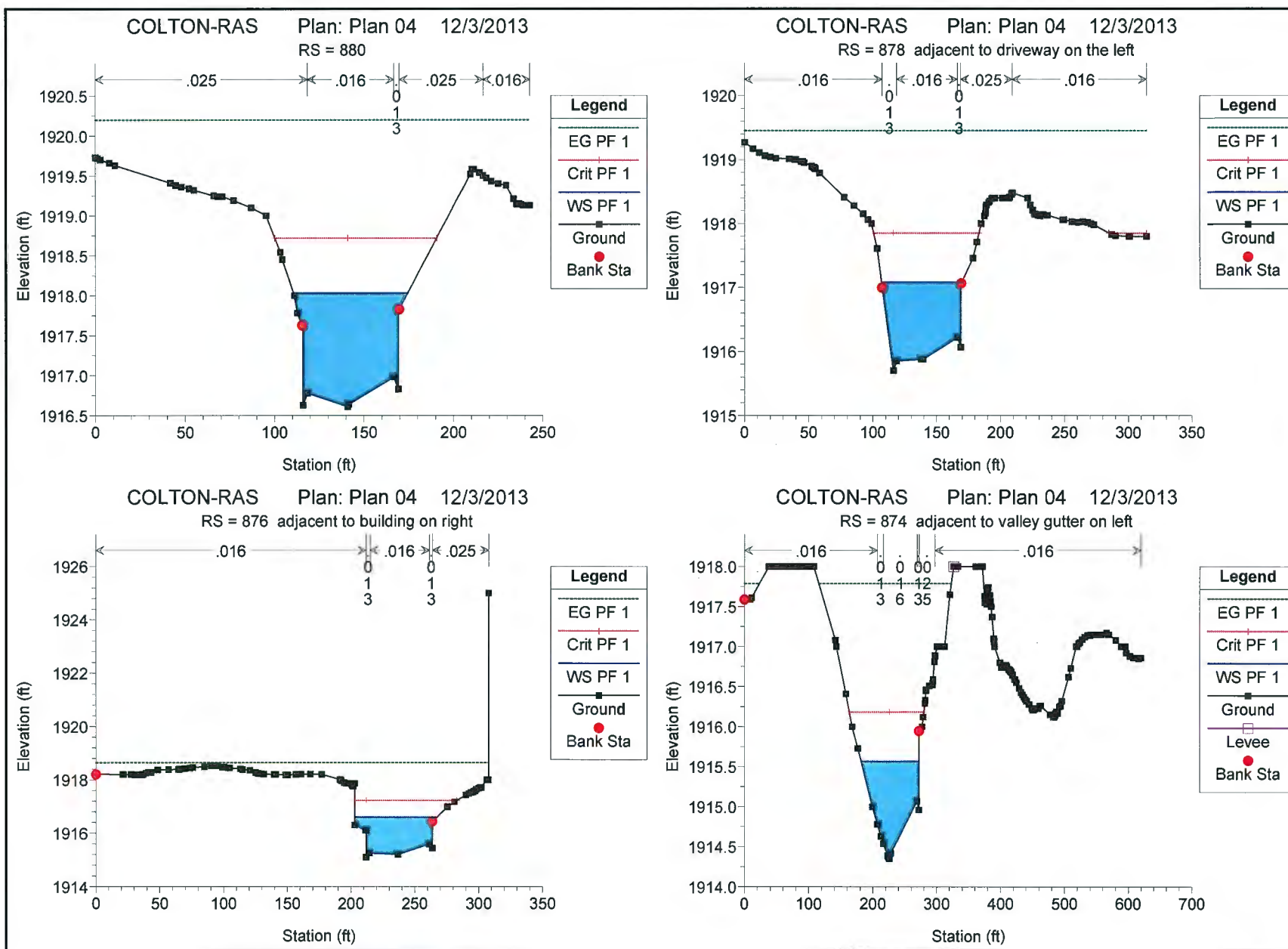


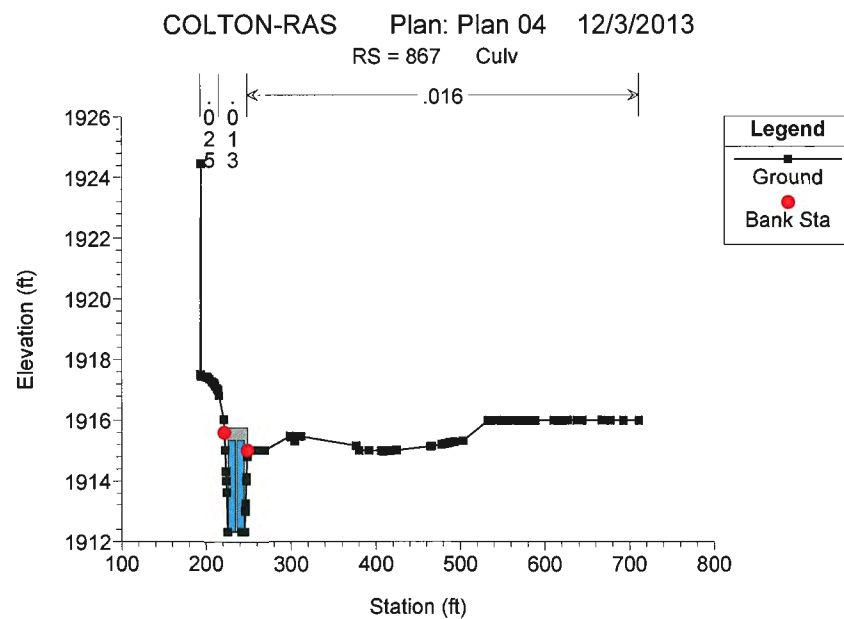
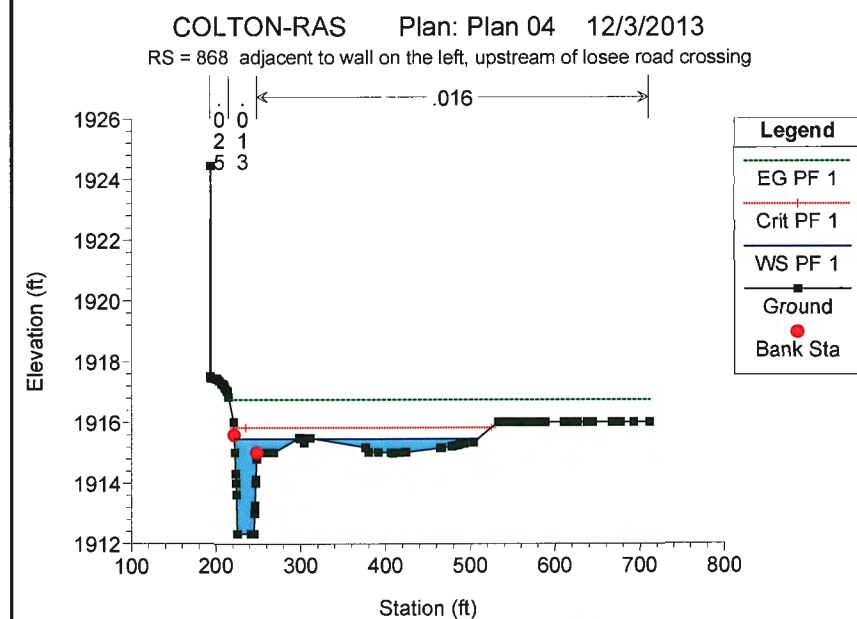
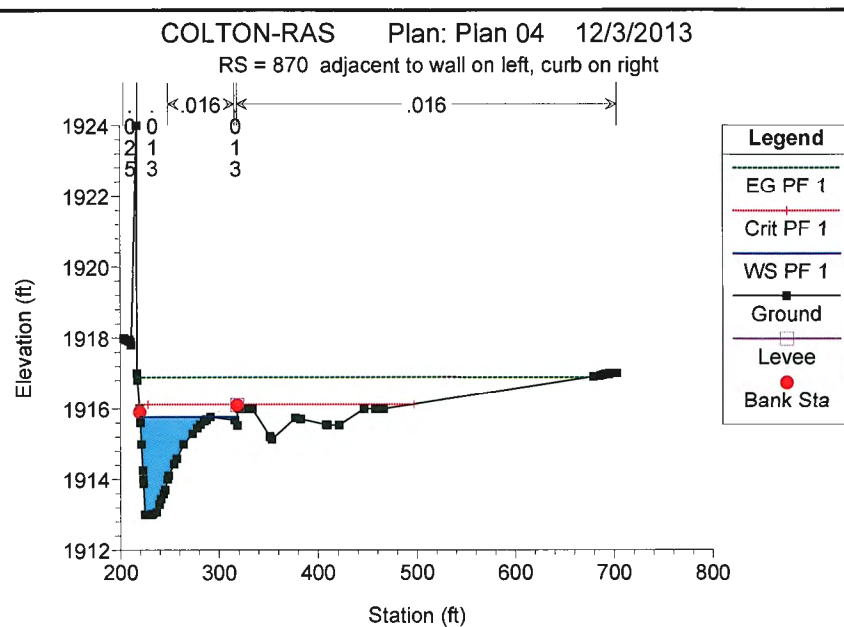
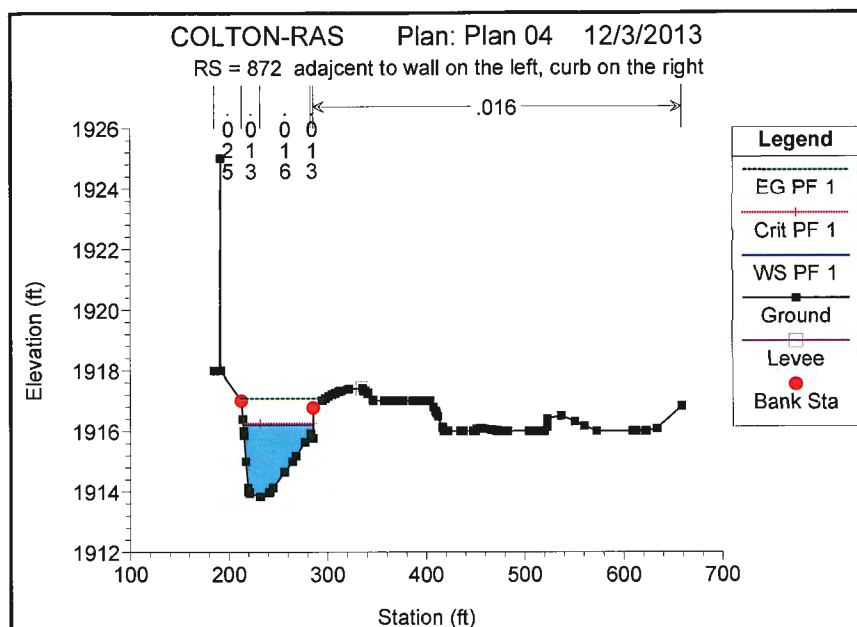
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 890 adjacent to wall on right



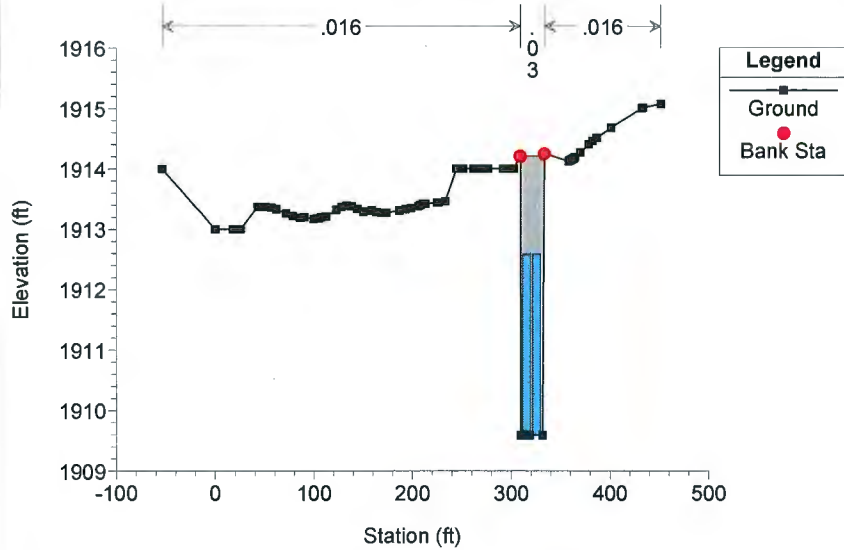






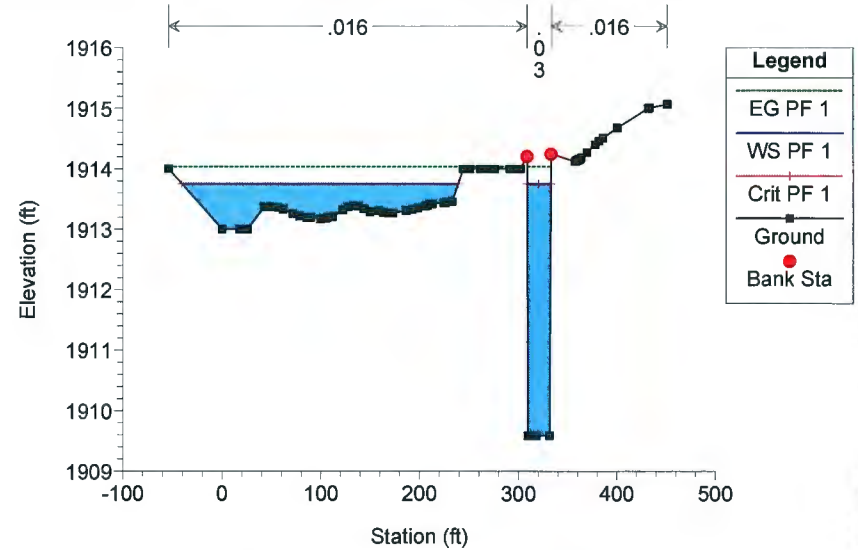
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 867 Culv



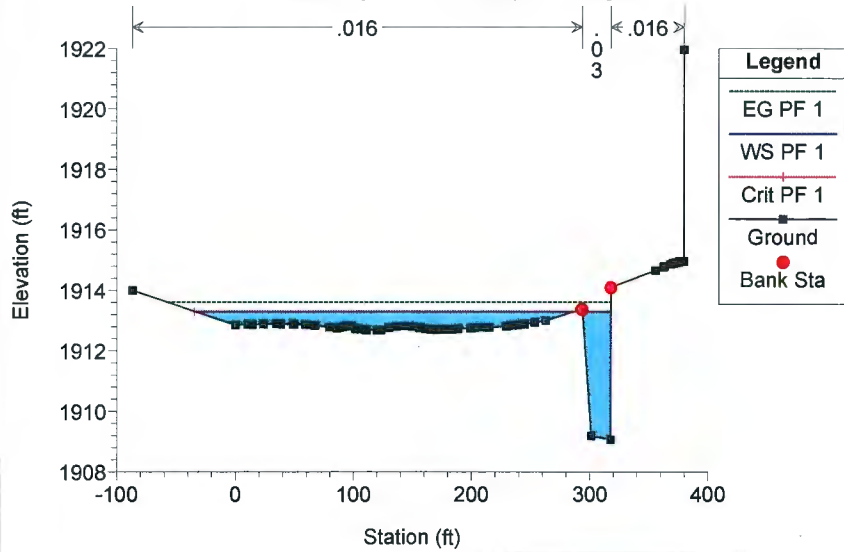
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 866 downstream of losee road existing culvert crossing



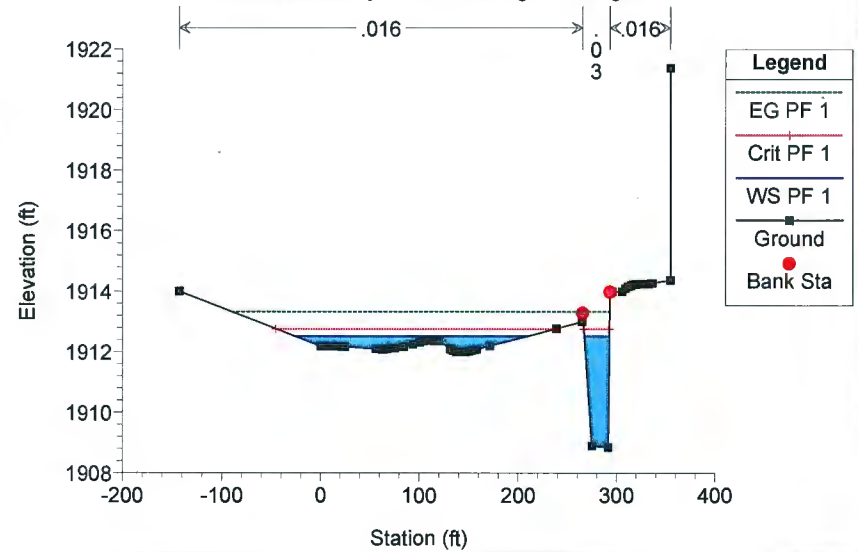
COLTON-RAS Plan: Plan 04 12/3/2013

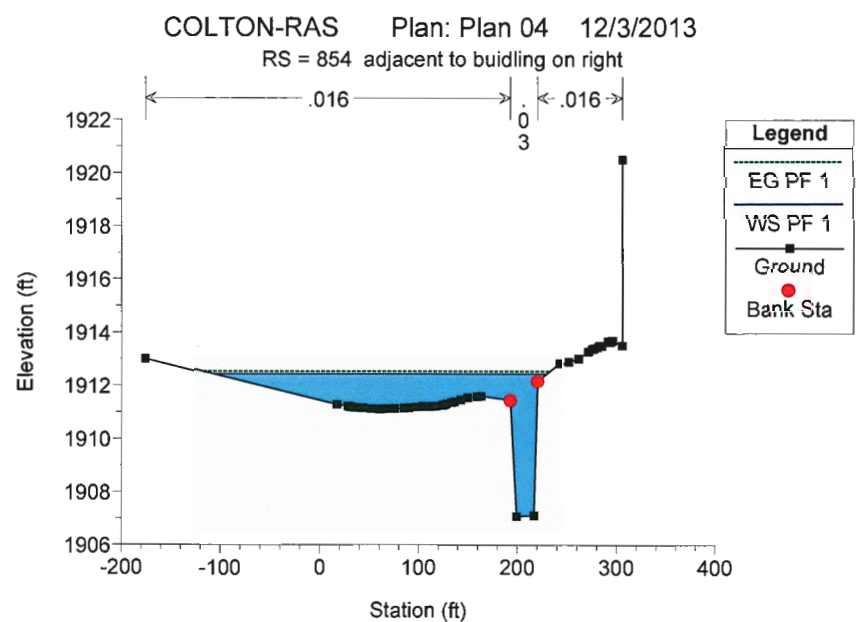
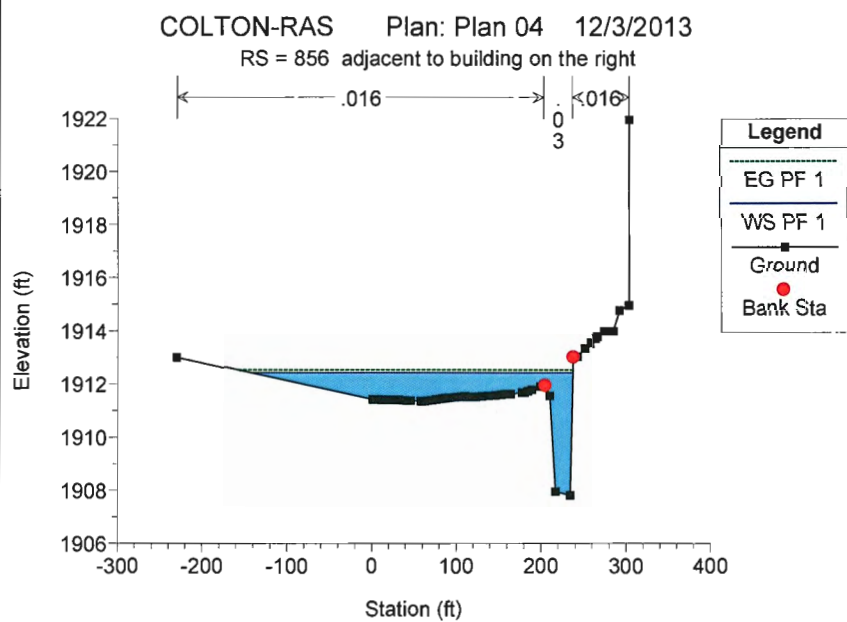
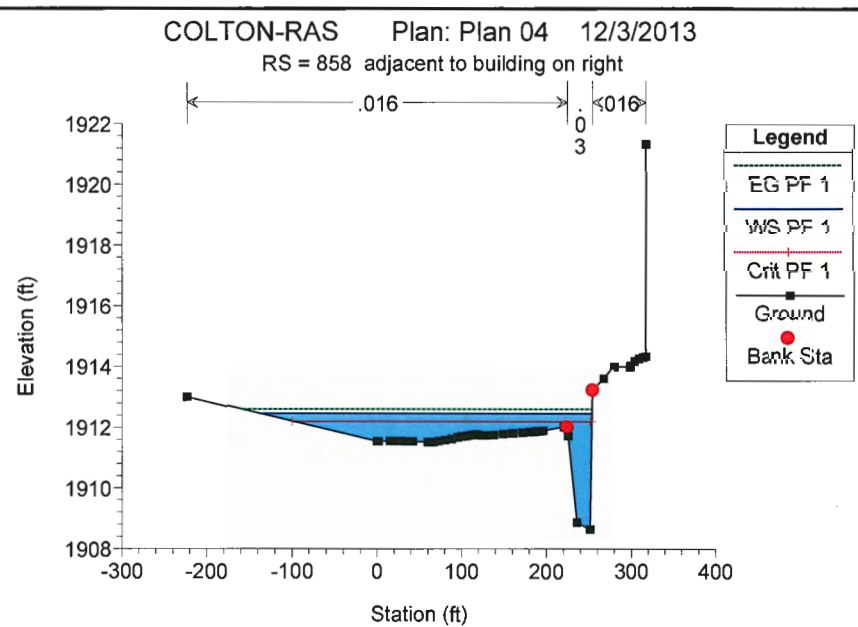
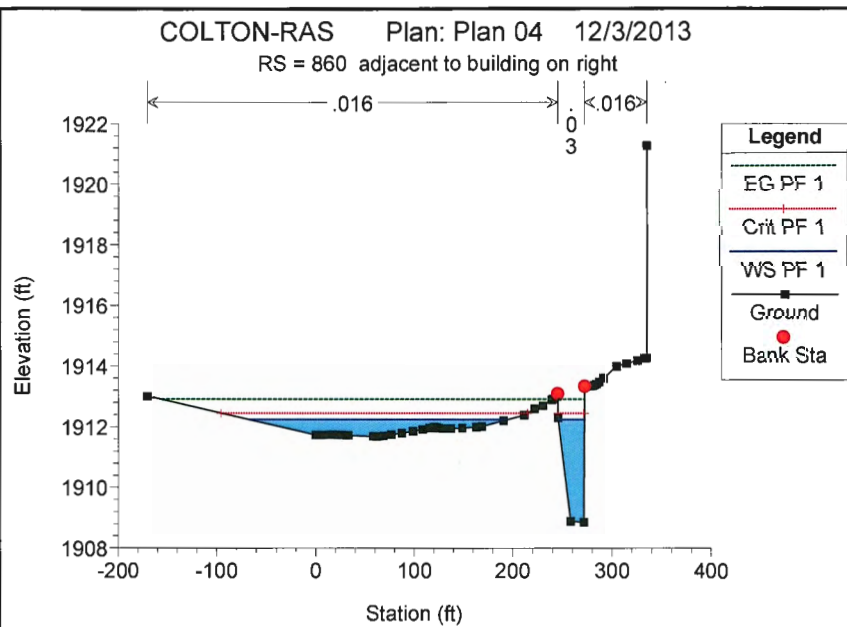
RS = 864 adjacent to building on the right



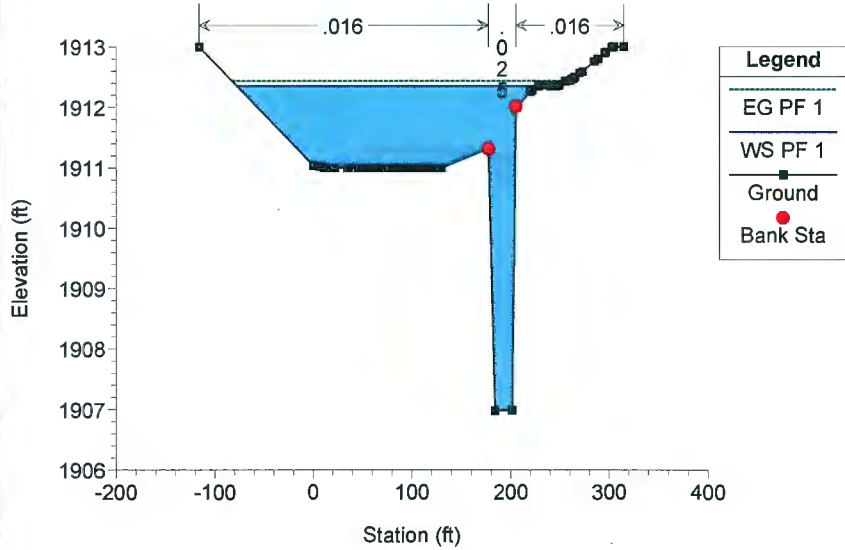
COLTON-RAS Plan: Plan 04 12/3/2013

RS = 862 adjacent to building on the right

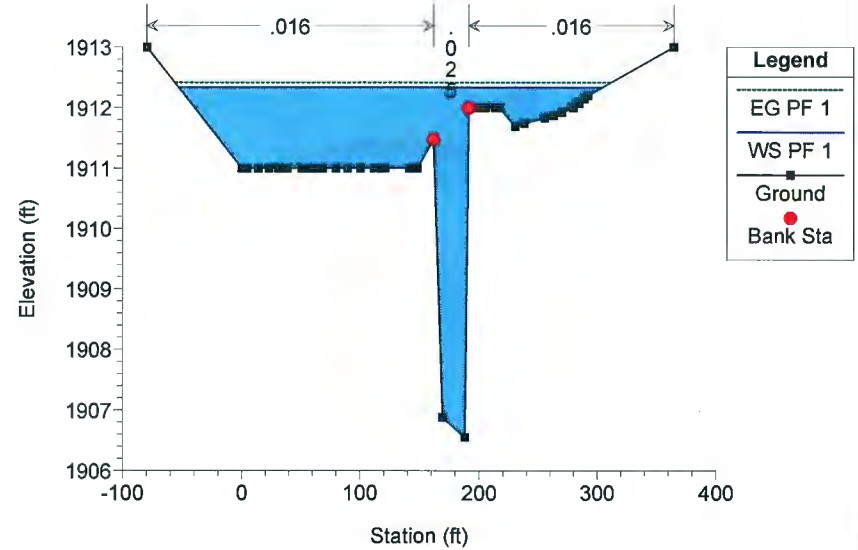




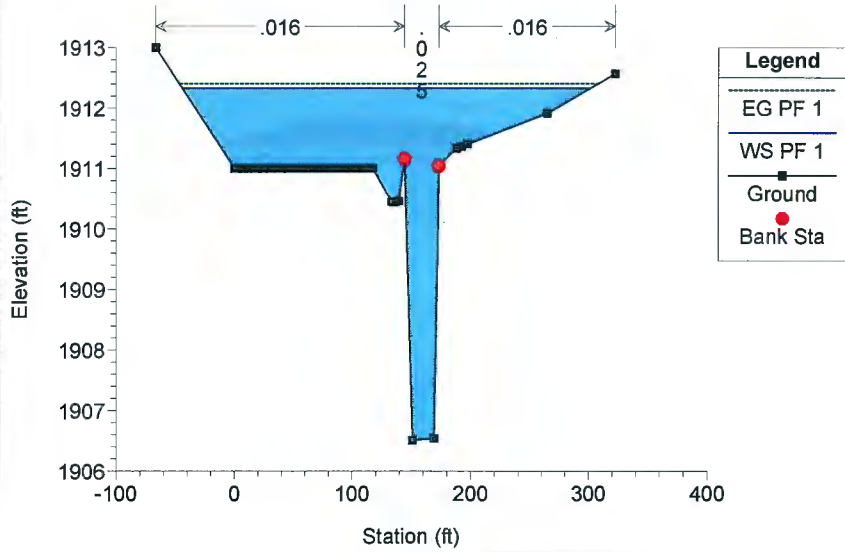
COLTON-RAS Plan: Plan 04 12/3/2013
RS = 852



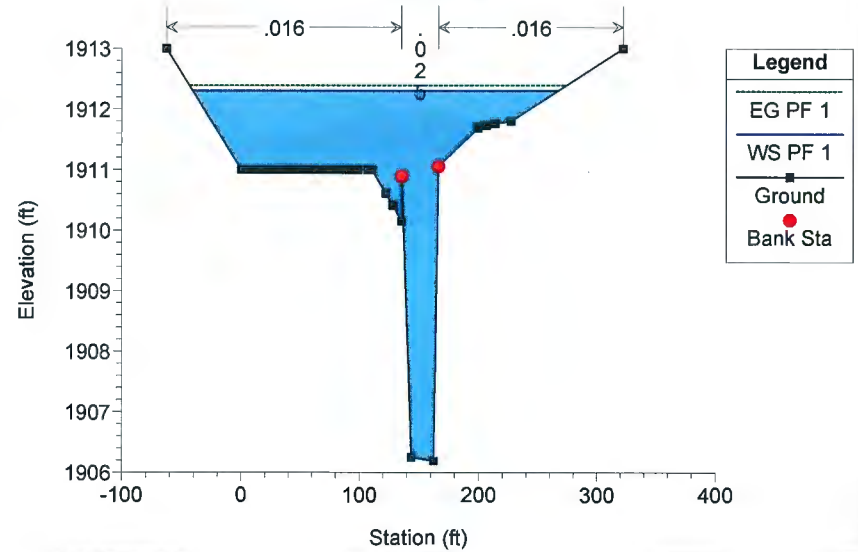
COLTON-RAS Plan: Plan 04 12/3/2013
RS = 850



COLTON-RAS Plan: Plan 04 12/3/2013
RS = 848

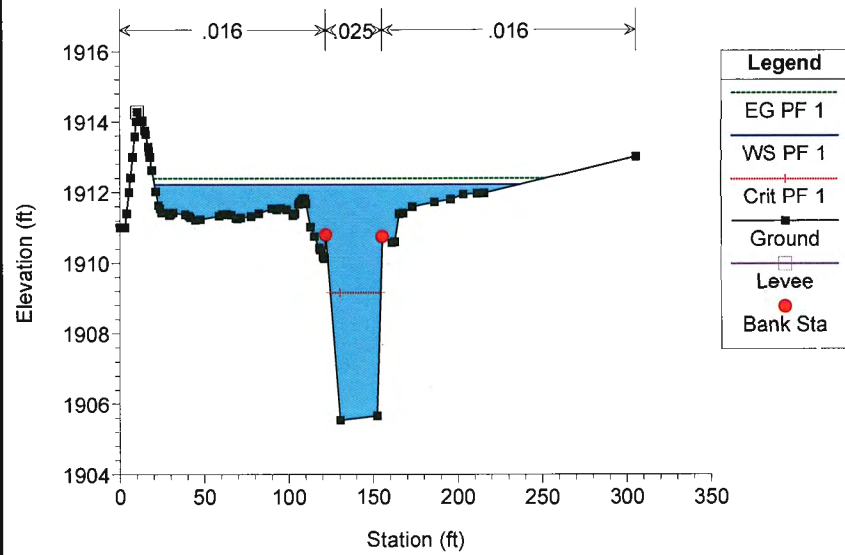


COLTON-RAS Plan: Plan 04 12/3/2013
RS = 846



COLTON-RAS Plan: Plan 04 12/3/2013

RS = 844



HEC-RAS Version 4.1.0 Jan 2010
 U.S. Army Corps of Engineers
 Hydrologic Engineering Center
 609 Second Street
 Davis, California

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X   X XXXXXX XXXX XXXX XX XXXX
X   X X X X X X X X X
X   X X X X X X X X X
XXXXXXX XXXX X XXX XXXX XXXXXX XXXX
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PROJECT DATA

Project Title: COLTON-RAS
 Project File : COLTON-RAS.prj
 Run Date and Time: 12/3/2013 11:41:31 AM

Project in English units

Project Description:

HEC-RAS MODEL FOR PORTION OF FLOODPLAIN DOWNSTREAM OF DUAL 60" RCP

PLAN DATA

Plan Title: Plan 04

Plan File : w:\North Las Vegas - City of\10502901 Colton Ave FC\06 Studies and Reports\6.5 Report Calculations\Colton CLOMR Models\COLTON
 RAS\COLTON RAS\COLTON-RAS.p04

Geometry Title: COLTON-EG-v4

Geometry File : w:\North Las Vegas - City of\10502901 Colton Ave FC\06 Studies and Reports\6.5 Report Calculations\Colton CLOMR
 Models\COLTON RAS\COLTON RAS\COLTON-RAS.g05

Flow Title : 100-yr Ultimate

Flow File : w:\North Las Vegas - City of\10502901 Colton Ave FC\06 Studies and Reports\6.5 Report Calculations\Colton CLOMR
 Models\COLTON RAS\COLTON RAS\COLTON-RAS.f01

Plan Summary Information:

Number of:	Cross Sections = 79	Multiple Openings = 0
	Culverts = 1	Inline Structures = 0
	Bridges = 0	Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
 Conveyance Calculation Method: At breaks in n values only
 Friction Slope Method: Average Conveyance
 Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: 100-yr Ultimate

Flow File : w:\North Las Vegas - City of\10502901 Colton Ave FC\06 Studies and Reports\6.5 Report Calculations\Colton CLOMR Models\COLTON
 RAS\COLTON RAS\COLTON-RAS.f01

Flow Data (cfs)

River	Reach	RS	PF 1
FL	FL	1000	555
FL	FL	986	635
FL	FL	982	653.5
FL	FL	976	665
FL	FL	936	683.5
FL	FL	934	713.5
FL	FL	908	753
FL	FL	906	782
FL	FL	882	808.5
FL	FL	868	836
FL	FL	866	874.5
FL	FL	864	896
FL	FL	844	912

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
FL	FL	PF 1	Normal S = 0.0233	Known WS = 1912.2

GEOMETRY DATA

Geometry Title: COLTON-EG-v4

Geometry File : w:\North Las Vegas - City of\10502901 Colton Ave FC\06 Studies and Reports\6.5 Report Calculations\Colton CLOMR Models\COLTON
 RAS\COLTON RAS\COLTON-RAS.g05

CROSS SECTION

RIVER: FL
 REACH: FL RS: 1000

INPUT

Description:

Station	Elevation	Data	num=	97	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1971.87				2.47	1971.69	4.18	1971.6	6.09	1971.52		
7.88	1971.46	9.36	1971.42	10.87	1971.38	11.98	1971.36	12.88	1971.34			

COLTON-RAS.rep											
14.79	1971.32	15.56	1971.31	16.31	1971.31	17.98	1971.31	20.62	1971.33		
24.17	1971.35	25.21	1971.36	26.25	1971.39	27.34	1971.45	28.55	1971.53		
30.88	1971.71	32.92	1971.75	33.36	1971.79	33.83	1971.81	37.62	1971.95		
37.78	1971.96	37.8	1971.96	37.88	1971.95	37.93	1971.95	38.23	1971.91		
39.99	1972	43.5	1972.22	43.61	1972.27	43.89	1972.32	44.72	1972.26		
44.83	1972.23	45.02	1970.86	45.67	1967.6	52.53	1969	53.41	1968.7		
54.3	1968	57.29	1967.13	57.34	1967	59.79	1967	62.69	1967		
63.37	1967	65.19	1967	66.73	1967	66.81	1967	68.01	1967.11		
70.26	1968	70.37	1968	71.6	1968.41	72.53	1969	74.16	1969.36		
77.19	1970.29	80.88	1971.5	85.98	1971.18	87.13	1971.08	88.3	1971.14		
88.63	1971.12	89.59	1971.25	90.09	1971.26	90.9	1971.39	91.56	1971.44		
93.17	1971.61	94.31	1971.78	96	1972	99.44	1972.79	100.96	1973		
101.1	1973.01	101.25	1973	101.87	1972.93	102.02	1972.96	102.08	1972.98		
102.09	1972.98	102.1	1972.98	102.17	1972.96	102.26	1972.95	102.5	1972.92		
103.01	1972.88	105.29	1972.67	107.4	1972.45	107.96	1972.41	108.63	1972.38		
110.66	1972.31	113.03	1972.24	114.04	1972.2	116.56	1972.17	121.08	1972.15		
122.58	1972.1	129.94	1972.12	130.52	1972.1	130.84	1972.1	131.05	1972.1		
131.78	1972.09	138.04	1972.12								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	43.89	.025	52.53	.028	80.88	.025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

43.89	80.88	19.638	19.638	19.638	.1	.3
-------	-------	--------	--------	--------	----	----

CROSS SECTION

RIVER: FL
REACH: FL RS: 998

INPUT											
Description:											
Station Elevation Data num= 62											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1970.73	1.1	1970.59	2.55	1970.41	2.91	1970.38	3.61	1970.36		
4.66	1970.33	6.62	1970.28	16.64	1970.24	17.27	1970.23	17.96	1970.23		
18.52	1970.23	19.71	1970.23	21.34	1970.24	27.87	1970.22	28.35	1970.23		
28.99	1970.25	30.25	1970.26	35.37	1969.53	35.88	1969.51	40.38	1969.7		
40.92	1969.33	41.34	1969	41.83	1968.87	44.6	1968	55.33	1967.31		
60.53	1967	60.69	1967	61.53	1967	61.96	1967	63.41	1967.09		
63.65	1967.1	63.98	1967.11	84.85	1968	86.17	1968.54	87.12	1969		
96.3	1969.88	97.88	1970	105.2	1970.9	105.47	1970.93	105.93	1971		
108.69	1971.98	108.71	1971.99	108.72	1971.99	108.73	1971.99	108.78	1971.98		
108.84	1971.97	108.96	1971.95	110.12	1971.75	111.01	1971.66	114.21	1971.16		
116.04	1971.13	116.36	1971.1	116.59	1971.08	116.81	1971.07	117.03	1971.07		
117.23	1971.06	117.57	1971.06	119.75	1971.06	120.25	1971.06	132.43	1971.08		
133.27	1971.08	135.19	1971.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	40.38	.028	87.12	.025		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

40.38	108.69	20.08	20.08	20.08	.1	.3
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CROSS SECTION

RIVER: FL
REACH: FL RS: 996

INPUT											
Description:											
Station Elevation Data num= 53											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1969.84	.45	1969.84	1.42	1969.81	5.33	1969.7	14.43	1969.33		
14.91	1969.31	15.39	1969.3	15.94	1969.29	17.36	1969.28	21.24	1969.27		
23.08	1969.22	24.94	1969.21	26.1	1969.19	26.42	1969.19	26.54	1969.19		
28.11	1969.18	28.62	1969.2	28.9	1969.25	28.94	1969.33	31.54	1969.46		
36.09	1969	36.59	1968.91	40.61	1968	52.64	1967.35	59.42	1967		
60.05	1967	61.8	1967	61.82	1967	74.28	1967.41	92.37	1968		
92.44	1968.04	92.49	1968.07	93.36	1968.65	93.91	1969	107.59	1969.79		
111.59	1970	114.6	1970.68	114.73	1970.74	116.45	1970.78	116.55	1970.77		
116.66	1970.77	116.83	1970.76	117.19	1970.76	118.03	1970.71	120.32	1970.49		
120.81	1970.46	121.34	1970.44	122.01	1970.42	122.83	1970.42	123.82	1970.42		
129.28	1970.42	131.59	1970.44	132.36	1970.45						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	31.54	.028	93.91	.025		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

31.54	114.6	20.12	20.12	20.12	.1	.3
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Left Levee Station= 31.54 Elevation= 1969.46

CROSS SECTION

RIVER: FL
REACH: FL RS: 994

INPUT											
Description:											
Station Elevation Data num= 40											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1968.73	.35	1968.67	.71	1968.66	1.3	1968.66	5.4	1968.73		
7.7	1968.75	10.1	1968.74	12.77	1968.75	15.24	1968.7	18.71	1968.61		
19.75	1968.58	20.53	1968.57	21.6	1968.57	22.03	1968.58	22.51	1968.6		
23.17	1968.64	27.05	1969	28.47	1969	31.39	1969	37.47	1968.07		
37.92	1968	41.6	1967.82	52.37	1967.29	58.11	1967	58.51	1967		
59.4	1967	60.85	1967	65.5	1967.15	68.15	1967.22	83.23	1967.59		
90.11	1967.77	99.8	1968	100.34	1968.34	101.35	1969	108.24	1969.38		
117.41	1970	119.63	1970	125.43	1970	126.38	1970	129.54	1970		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	31.39	.028	101.35	.025		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

31.39	101.35	20.11	20.11	20.11	.1	.3
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Left Levee Station= 31.39 Elevation= 1969

CROSS SECTION

RIVER: FL

REACH: FL RS: 992

INPUT

Description:

Station	Elevation	Data	num=	76	Sta	Elev	Sta	Elev	Sta	Elev
-32.63	1975.36	-7.08	1968.77	0	1968.02	65	1968.02	73	1968.02	
5.13	1968.01	5.27	1968.03	5.27	1968.03	5.3	1968.03	5.51	1968.04	
5.62	1968.05	5.74	1968.04	15.59	1968.07	15.82	1968.06	16.13	1968.06	
16.23	1968.05	16.3	1968.05	16.4	1968.05	16.44	1968.05	16.48	1968.05	
16.54	1968.06	17.03	1968.1	18.55	1968.09	20.09	1968.05	20.63	1968.12	
21.79	1968	23.34	1967.99	24.6	1967.98	26.11	1967.98	26.6	1967.99	
26.85	1968	28.35	1968.43	29.03	1968.56	29.67	1968.66	29.81	1968.66	
30.91	1968.66	31.62	1968.66	31.79	1968.65	31.9	1968.65	32.94	1968.55	
33.3	1968.5	35.32	1968	42.1	1967.71	46.22	1967.54	52.87	1967.29	
59.38	1967	60	1967	60.96	1967	62.92	1967	70.62	1967.18	
93.21	1967.54	96.21	1967.56	97.22	1967.56	98.03	1967.56	98.53	1967.55	
98.77	1967.55	98.8	1967.52	104.87	1967.79	105.52	1967.8	109.57	1968	
111.29	1968.59	112.52	1969	115.6	1969.2	116.92	1969.28	117.78	1969.3	
118.83	1969.28	122.67	1969.21	125.37	1969.4	126.89	1969.35	128.37	1969.35	
128.93	1969.4									

Manning's n	Values	num=	4	Sta	n Val	Sta	n Val	Sta	n Val
-32.63	.013	0	.016	29.81	.035	116.92	.025		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
30.91	116.92		30.91	20.12	20.12	.1	.3	
Left Levee	Station=			Elevation=	1968.66			

CROSS SECTION

RIVER: FL

REACH: FL RS: 990

INPUT

Description:

Station	Elevation	Data	num=	91	Sta	Elev	Sta	Elev	Sta	Elev
0	1968.86	13.72	1968.79	14.1	1968.76	19.98	1968.77	21.55	1968.79	
39.28	1968.17	41.52	1968.13	41.88	1968	43.05	1968	43.21	1968	
43.7	1968	45.4	1968	45.48	1968	45.63	1968.09	49.57	1968.73	
58.54	1968.64	59.9	1968.62	61.38	1968.59	63.33	1968.53	65.1	1968.46	
66.92	1968.39	69.85	1968.22	72.92	1968.02	72.97	1968.01	73.12	1968	
75.96	1967.96	76.74	1967.947	84.66	1967.81	87.01	1967.8	88.66	1967.77	
90.01	1967.74	91.98	1967.7	93.63	1967.65	93.96	1967.64	94.32	1967.64	
94.86	1967.64	97.7	1967.65	104.39	1967.66	105.63	1967.66	106.93	1967.65	
109.23	1967.63	110.03	1967.62	110.99	1967.63	111.31	1967.63	112.68	1967.69	
114.05	1967.74	116.25	1967.8	116.86	1967.8	117.35	1967.79	117.91	1967.78	
118.82	1967.76	119.17	1967.76	123.53	1967.64	125.61	1967.64	126.92	1967.63	
135.15	1967.35	135.39	1967.34	135.57	1967.33	144.93	1967	145.11	1967	
145.52	1967	147.4	1967	148.1	1967	149.74	1967	150.72	1967	
151.69	1967	152.61	1967	153.61	1967	154.52	1967	157.03	1967	
157.06	1967	157.63	1966.99	158.85	1966.98	160.91	1966.97	163.41	1966.96	
165.86	1966.95	167.92	1966.95	173.9	1966.96	176.07	1966.97	177.83	1966.97	
178.92	1966.96	179.43	1966.96	179.45	1966.94	182.22	1966.95	188.78	1966.97	
195.64	1966.98	204.85	1967	205.6	1967	213.84	1967.2	215.65	1967.22	
359.56	1968									

Manning's n	Values	num=	3	Sta	n Val	Sta	n Val
0	.013	84.66	.016	123.53	.013		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
116.86	359.56		13.51	31.92	27.6	.1	.3	

CROSS SECTION

RIVER: FL

REACH: FL RS: 988

INPUT

Description:

Station	Elevation	Data	num=	105	Sta	Elev	Sta	Elev	Sta	Elev
0	1968.16	3.93	1968	6.53	1967.95	10.22	1967.9	13.81	1967.87	
19.25	1967.86	27.73	1967.86	28.4	1967.85	30.27	1967.84	30.49	1967.83	
40.64	1967.83	41.21	1967.82	42.08	1967.82	43.14	1967.81	47.43	1967.79	
89.55	1967.79	92.87	1967.77	95.78	1967.77	95.88	1967.77	96.18	1967.77	
97.98	1967.76	100.79	1967.75	103.26	1967.73	106	1967.7	115.31	1967.67	
117.52	1967.65	117.89	1967.644	119.43	1967.62	125.02	1967.52	130.77	1967.51	
131.82	1967.49	132.68	1967.48	133.93	1967.44	134.97	1967.41	135.19	1967.41	
135.41	1967.41	135.76	1967.41	135.94	1967.41	138.06	1967.4	142.87	1967.37	
143.66	1967.36	144.45	1967.35	145.79	1967.32	146.24	1967.32	146.77	1967.32	
146.93	1967.32	147.65	1967.34	148.35	1967.36	149.41	1967.38	151.35	1967.35	
153.01	1967.31	155.01	1967.26	158.55	1967.13	158.62	1967.13	158.86	1967.121	
162.22	1967	173.21	1966.83	175.12	1966.8	175.69	1966.81	184.1	1966.7	
184.64	1966.7	191.18	1966.7	192.98	1966.7	194.11	1966.69	194.7	1966.68	
195.19	1966.67	195.58	1966.66	196.4	1966.66	197.78	1966.65	199.45	1966.64	
201.09	1966.64	202.48	1966.64	206.5	1966.65	207.96	1966.65	209.15	1966.65	
209.88	1966.65	210.22	1966.64	210.24	1966.63	212.11	1966.64	216.54	1966.65	
221.19	1966.66	227.45	1966.67	236.53	1966.69	238.75	1966.7	244.27	1966.7	
262.01	1966.7	262.43	1966.7	265.31	1966.8	268.48	1966.89	273.19	1967	
306.95	1967.41	317.33	1967.56	330.16	1967.72	338.19	1967.82	347.13	1967.96	
350.14	1968	351.76	1968.03	351.77	1968.03	359.86	1968.14	359.96	1968.15	
368.35	1968.24	368.54	1968.24	376.93	1968.32	377.23	1968.32	378.06	1968.33	

Manning's n	Values	num=	1	Sta	n Val	Sta	n Val
0	.016						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
89.55	376.93		26.25	26.25	26.25	.1	.3	

CROSS SECTION

RIVER: FL

REACH: FL RS: 986

INPUT

Description:

Station	Elevation	Data	num=	109	Sta	Elev	Sta	Elev	Sta	Elev
0	1967.66		1	1967.65	3.51	1967.61	6.68	1967.56	10.23	1967.5

13.52	1967.47	19	1967.37	20.44	1967.35	21.84	1967.34	23.97	1967.34
27.28	1967.33	30.35	1967.32	38.99	1967.24	38.99	1967.22	42.7	1967.22
45.28	1967.19	49.24	1967.16	54.07	1967.14	73.59	1967.06	76.98	1967.06
88.89	1967	91.97	1966.98	92.31	1966.99	93.55	1966.99	101.2	1966.97
101.23	1966.97	101.35	1966.97	101.53	1966.97	107.91	1966.951	117	1966.923
122.15	1966.908	128.03	1966.89	128.88	1966.89	129.46	1966.89	129.75	1966.89
139.4	1966.74	141.27	1966.74	143.55	1966.7	147.56	1966.7	149.64	1966.67
150.44	1966.66	152.13	1966.66	154.49	1966.642	154.78	1966.64	157.48	1966.59
157.91	1966.59	162.12	1966.61	165.33	1966.57	167.63	1966.57	168.42	1966.57
176.66	1966.47	178.18	1966.48	183.2	1966.42	183.53	1966.42	187.43	1966.42
188.5	1966.42	189.18	1966.43	189.53	1966.41	189.83	1966.4	190.08	1966.4
190.53	1966.39	191.37	1966.39	192.37	1966.38	193.35	1966.38	194.18	1966.38
196.58	1966.39	197.45	1966.39	198.16	1966.39	198.6	1966.39	198.8	1966.38
198.81	1966.38	199.93	1966.38	202.57	1966.39	203.35	1966.39	209.08	1966.4
214.51	1966.41	215.83	1966.42	219.13	1966.42	229.72	1966.42	229.97	1966.42
231.69	1966.48	233.58	1966.53	236.53	1966.6	240.67	1966.67	245.98	1966.75
259.85	1966.94	264.15	1967	267.54	1967.06	267.7	1967.06	268.33	1967.06
268.56	1967.06	268.75	1967.06	268.99	1967.06	269.35	1967.07	270.19	1967.07
271.21	1967.07	271.6	1967.07	272.37	1967.07	273.89	1967.09	276.41	1967.11
279.93	1967.14	283.31	1967.17	285.6	1967.19	288.93	1967.22	291.38	1967.25
349.42	1967.86	362.25	1968	363.19	1968.01	375.43	1968.08		

Manning's n values num= 1
Sta n Val
0 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1 362.25 36.41 36.41 36.41 .1 .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 984

INPUT
Description:

Station	Elevation	Data	num=	130	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-61.42	1968	0	1967.04	.64	1967.02	5.45	1967	1.09	1967.02	1.09	1967.02	
1.65	1967	2.72	1967	4.03	1967	5.45	1967	6.06	1967	6.06	1967	
6.94	1967	7.49	1967	8.21	1967	11.35	1967	13.64	1967	13.64	1967	
18.08	1967	19.22	1967	32.43	1967	33.17	1967	61.23	1966.26	61.23	1966.26	
67.89	1966.18	69.79	1966.16	70.91	1966.15	71.7	1966.15	74.75	1966.15	74.75	1966.15	
76.93	1966.12	78.31	1966.12	81.55	1966.1	82.23	1966.09	90.59	1966.08	90.59	1966.08	
94.39	1966.05	97.38	1966	97.58	1966	104.42	1966	106.71	1966	106.71	1966	
108.55	1966	113.33	1966	115.43	1966	116.07	1966	116.92	1966	116.92	1966	
117.39	1966	119.19	1966	132.77	1965.71	137.1	1965.71	142.24	1965.72	142.24	1965.72	
147.3	1965.73	151.75	1965.77	158.97	1965.85	161.04	1965.87	166.94	1965.91	166.94	1965.91	
167.59	1965.91	173.55	1965.94	185.66	1965.99	191.29	1966	192.18	1966	192.18	1966	
193.29	1966	193.34	1966	196.21	1966.02	196.38	1966.01	196.39	1966.01	196.39	1966.01	
196.52	1966.01	196.56	1966.01	196.58	1966.01	196.6	1966.01	196.61	1966.01	196.61	1966.01	
196.63	1966.01	196.66	1966.01	196.69	1966.01	196.72	1966.01	196.75	1966.01	196.75	1966.01	
196.83	1966.01	196.86	1966.01	196.89	1966.01	196.9	1966.01	196.91	1966.01	196.91	1966.01	
196.95	1966.01	197.03	1966.01	197.13	1966.01	197.25	1966.01	197.44	1966.01	197.44	1966.01	
197.48	1966.01	197.59	1966.01	197.95	1966.01	197.96	1966.01	198.02	1966.02	198.02	1966.02	
198.08	1966.02	198.18	1966.02	198.32	1966.02	198.5	1966.03	198.96	1966.03	198.96	1966.03	
199.85	1966.04	201.08	1966.057	202.74	1966.08	213.75	1966.31	214.41	1966.35	214.41	1966.35	
217.5	1966.43	226.96	1966.65	242.31	1967	262.4	1967.21	280.25	1967.4	280.25	1967.4	
288.94	1967.48	294.41	1967.53	306.16	1967.58	309.49	1967.61	314.22	1967.69	314.22	1967.69	
323.94	1967.85	327.9	1967.92	329.23	1967.94	331.88	1967.96	341.12	1968	341.12	1968	
341.61	1968	342.36	1968	344.57	1968	345.52	1968	346.81	1968	346.81	1968	
349.13	1968	353.4	1968	360.02	1968	361.61	1968	362.69	1968	362.69	1968	
363.25	1968	372.33	1968	373.19	1968	374.51	1968	375.24	1968	375.24	1968	
376.92	1968	379.8	1968	380.06	1968	382.22	1968	384.53	1968.04	384.53	1968.04	

Manning's n values num= 2
Sta n Val
-61.42 .016 201.08 .013

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
-61.42 384.53 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 982

INPUT
Description:

Station	Elevation	Data	num=	52	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1968.84	.38	1968.82	2.81	1968.8	9.15	1968.54	17.42	1968.46	17.42	1968.46	
18.77	1968.43	19.95	1968.39	21.43	1968.35	23.18	1968.28	25.43	1968.18	25.43	1968.18	
28.67	1968.03	29.22	1968	29.57	1967.98	43.55	1967	43.9	1966.97	43.9	1966.97	
44.42	1966.89	44.69	1966.81	46.6	1966.73	47.51	1966.79	47.96	1966.86	47.96	1966.86	
48.16	1967	50.5	1967.43	53.93	1968	57.85	1968	59.67	1968	59.67	1968	
61.54	1967.42	62.89	1967	64.32	1966.62	66.96	1966	68.25	1965.6	68.25	1965.6	
73.25	1965.5	73.75	1965.5	73.75	1965	75.73	1965.13	79.17	1965	79.17	1965	
86.56	1964.9	87.24	1964.9	94.1	1964.82	98.68	1964.79	98.77	1964.79	98.77	1964.79	
100.37	1964.78	106	1964.77	111.15	1964.78	120.12	1964.82	121.14	1964.83	121.14	1964.83	
122.02	1964.85	123.24	1964.89	124.86	1964.95	126.74	1964.82	126.74	1965.32	126.74	1965.32	
131.65	1965.42	131.65	1972.3									

Manning's n values num= 6
Sta n Val Sta n Val Sta n Val Sta n Val
0 .016 48.16 .025 68.25 .013 75.73 .016 124.86 .013
131.65 .025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
73.75 126.74 25 25 25 .1 .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 980

INPUT
Description:

Station	Elevation	Data	num=	80	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1969.99	1.01	1969.84	1.94	1969.76	2.75	1969.78	4.49	1970	4.49	1970	
5.94	1970	6.5	1970	6.63	1970	7.43	1969.94	11.91	1969	11.91	1969	
16.11	1968.02	16.26	1968	17.45	1967.9	21.76	1967.54	23.86	1967.38	23.86	1967.38	
25.47	1967.27	27.21	1967.15	28.02	1967.1	29.5	1967	33.48	1966.77	33.48	1966.77	
36.96	1966.59	39.93	1966.43	44.54	1966.19	47.2	1966	47.69	1965.97	47.69	1965.97	

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48	1965.97	48.13	1966	48.14	1966	48.25	1966.02	48.3	1966.03
53.29	1967	55.2	1967.41	55.91	1967.53	56.48	1967.58	57.04	1967.59
57.6	1967.56	58.24	1967.5	59.05	1967.39	60.13	1967.22	61.34	1967
61.51	1966.97	62.84	1966.71	65.43	1966	66.79	1965.67	67.5	1965.54
68.89	1965.28	73.36	1965.18	73.86	1965.18	73.86	1964.68	75.86	1964.81
77.17	1964.75	78.86	1964.67	80.23	1964.6	84.39	1964.51	85.96	1964.44
90.31	1964.23	90.67	1964.22	91.18	1964.21	93.24	1964.18	98.72	1964.16
98.74	1964.16	98.85	1964.16	100	1964.15	101.15	1964.14	102.18	1964.14
103.13	1964.14	104.77	1964.15	104.96	1964.15	105.12	1964.16	105.35	1964.16
109.31	1964.32	113.15	1964.47	118.16	1964.56	122.08	1964.66	124.86	1964.75
126.86	1964.62	126.86	1965.12	127.36	1965.12	134.36	1965.22	134.36	1972.22

Manning's n Values		num= 7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	16.26	.016	48.13	.025	68.89	.013	75.86	.016
124.86	.013	134.36	.025						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	73.86	126.86		25	25		.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 978

INPUT

Description:

Station	Elevation	Data	num= 77						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1967.35	.99	1967.48	1.74	1967.31	2.38	1967.3	2.83	1967.3
3.33	1967.31	4.83	1967.3	5.54	1967.33	5.78	1967.33	12.86	1967.32
14.76	1967.26	18.53	1967.25	19.3	1967.23	20.11	1967.18	21.06	1967.11
22.09	1967	22.31	1966.96	22.49	1966.96	22.56	1966.96	33.67	1966
37.23	1965.78	37.5	1965.77	42.21	1965.51	43.48	1965.45	44.46	1965.41
46.65	1965.34	47.09	1965.32	47.56	1965.29	47.65	1965.29	47.7	1965.3
47.84	1965.43	50.51	1965.65	52.72	1965.86	53.38	1965.98	53.51	1966
53.59	1966.02	54.21	1966.15	60.94	1966.34	61.53	1966	63.37	1965.71
66.86	1965	68.92	1964.8	73.46	1964.31	73.96	1964.31	73.96	1963.81
75.97	1963.94	79.45	1963.79	81.01	1963.72	82.55	1963.68	84.29	1963.65
92.62	1963.52	95.72	1963.48	98.77	1963.44	98.82	1963.44	98.94	1963.44
101.67	1963.43	104.69	1963.47	108.41	1963.54	118	1963.76	122.96	1963.88
124.97	1963.94	131.94	1964.18	134.04	1964.28	135.22	1964.33	135.76	1964.33
136.19	1964.31	137.04	1964.31	138.7	1964.33	140.32	1964.38	143.55	1964.5
144.67	1964.53	145.56	1964.54	146.25	1964.55	148.14	1964.55	153.73	1964.58
161.32	1964.64	162.36	1964.65						

Manning's n Values		num= 7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	22.09	.016	50.51	.025	68.92	.013	75.97	.016
124.97	.013	131.94	.025						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	73.96	135.22		50	50		.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 976

INPUT

Description:

Station	Elevation	Data	num= 59						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1966.96	.09	1966.96	1.12	1966.95	2.34	1966.89	3.37	1967.52
4.14	1967.99	5.04	1968.21	22.78	1965.43	31.71	1965	41.39	1964.27
45.24	1964	45.75	1963.96	46.85	1963.91	47.63	1963.9	48.08	1963.95
48.15	1964	53.45	1964.73	55.36	1965	55.59	1965.06	56.02	1965.27
59.03	1965.2	59.14	1965.07	59.29	1965	63.4	1964.31	64.37	1964.15
64.83	1964.09	64.95	1964.07	65.21	1964	66	1963.84	68.48	1963.12
73.48	1963.02	73.98	1963.02	73.98	1962.52	75.98	1962.65	76.22	1962.6
78.63	1962.55	79.09	1962.52	91.87	1962.08	92.95	1962.03	93.04	1962.02
93.15	1962.02	93.29	1962.02	94.53	1962	98.15	1961.94	98.68	1961.94
98.94	1961.94	102.16	1961.92	106.05	1961.95	108.54	1962	110.89	1962.06
111.37	1962.08	112.04	1962.11	114.95	1962.29	124.98	1962.76	126.97	1962.63
126.97	1963.13	127.47	1963.13	132.47	1963.23	132.47	1970.23		

Manning's n Values		num= 7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	3.37	.016	48.15	.025	68.48	.013	75.98	.016
124.98	.013	127.47	.025						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	73.98	126.97		50.01	50.01		.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 974

INPUT

Description:

Station	Elevation	Data	num= 52						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1967.64	17.09	1966.23	20.27	1965.16	24.34	1965	27.14	1964.78
38.67	1964	40.87	1963.71	42.67	1963.51	47.42	1963	47.45	1963
48.06	1963	48.4	1963.05	49.22	1963.26	49.41	1963.28	49.55	1963.28
49.7	1963.27	54.98	1963	55.43	1962.95	55.66	1962.94	55.68	1962.94
55.69	1962.94	55.74	1962.93	55.81	1962.93	55.89	1962.92	57.28	1962.75
57.56	1962.75	67.27	1961.37	67.94	1961.37	68.49	1961.23	73.49	1961.13
73.99	1961.13	73.99	1960.63	75.96	1960.76	80.23	1960.41	84.67	1960.37
85.41	1960.33	86.08	1960.31	89.83	1960.22	98.59	1960.06	98.94	1960.05
101.67	1960	102.94	1959.98	103.51	1959.98	104.26	1960	123.33	1960.59
124.26	1960.63	124.9	1960.65	126.99	1960.52	126.99	1961.02	127.49	1961.02
132.49	1961.12	132.49	1968.12						

Manning's n Values		num= 5							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	47.42	.025	75.96	.016	124.9	.013	126.99	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	73.99	126.99		50	50		.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 972

INPUT

Description:

Station	Elevation	Data	num=	69	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1964.36	1.76	1964.27	3.39	1964.19	5.87	1964.11	6.47	1964.09			
7.52	1964.08	8.31	1964.06	15.23	1964.13	15.37	1964.12	23.9	1964.18			
25.22	1964.13	29.27	1964.14	31.15	1964.14	33.52	1964.13	34.14	1964.13			
38.16	1964.1	40.8	1964.06	44.18	1964	44.37	1964	44.58	1964			
48.39	1964	49.48	1964	50.13	1964	54.54	1963.08	54.68	1963.06			
54.73	1963.06	54.76	1963.06	54.79	1963.06	54.96	1963	55.19	1962.92			
58.33	1962	59.33	1961.7	61.26	1961	64.57	1960.03	64.7	1960			
64.96	1959.94	68.33	1959.4	73.33	1959.3	73.83	1959.3	73.83	1958.8			
75.83	1958.93	77.06	1958.85	80.13	1958.66	81.99	1958.55	83.77	1958.48			
85.55	1958.43	87.38	1958.39	93.34	1958.29	96.45	1958.25	98.5	1958.22			
98.94	1958.22	103.13	1958.17	104.16	1958.16	105.03	1958.16	105.78	1958.16			
106.53	1958.17	112.21	1958.16	114.28	1958.2	114.98	1958.23	115.71	1958.26			
117.5	1958.37	121.61	1958.43	122.33	1958.47	124.86	1958.54	126.88	1958.41			
126.88	1958.91	127.38	1958.91	132.38	1959.01	132.38	1966.01					

Manning's n Values		num=	6	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	49.48	.025	68.33	.013	75.83	.016	124.86	.013		
126.88	.025										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
73.83	126.88		50	50			.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 970

INPUT

Description:

Station	Elevation	Data	num=	49	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1962.08	.77	1962	8.67	1961.19	10.54	1961	14.09	1960.69			
21.53	1960	27.28	1959.51	33.16	1959	41.21	1958.55	49.68	1958			
54.95	1957.72	59.03	1957.56	69.63	1957.16	72.25	1957.04	72.44	1957.04			
72.53	1957.03	72.61	1957.03	72.65	1957.03	72.8	1957.03	72.89	1957.03			
73.71	1957.003	73.78	1957	94.07	1956.42	96.5	1956.35	98.4	1956.3			
98.42	1956.3	98.94	1956.29	103.46	1956.17	105.83	1956.12	108.46	1956.08			
108.8	1956.07	109.06	1956.07	109.28	1956.07	111.82	1956.08	112.9	1956.09			
113.17	1956.09	113.4	1956.1	113.6	1956.11	114	1956.14	117.72	1956.17			
117.87	1956.18	118.33	1956.21	122.18	1956.27	124.89	1956.48	126.9	1956.35			
126.9	1956.85	127.4	1956.85	131.86	1956.95	131.86	1963.95					

Manning's n Values		num=	3	Sta	n Val	Sta	n Val
0	.016	124.89	.013	126.9	.025		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
73.7	126.9		50	50			.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 968

INPUT

Description:

Station	Elevation	Data	num=	82	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1962.44	4.15	1962.64	5.49	1962.51	5.99	1962.47	6.51	1962.45			
7	1962.45	7.79	1962.49	13.24	1963	13.95	1963.1	14.68	1963.14			
15.55	1963.14	16.59	1963.11	17.08	1963.1	17.56	1963.07	18.05	1963			
19.08	1962.81	20.85	1962.28	21.57	1962	24.29	1961.23	24.96	1961.03			
24.99	1961.02	25.01	1961.02	25.03	1961.02	25.11	1961.02	25.17	1961.02			
25.58	1961	26.22	1960.97	31.07	1960.93	31.16	1960.92	31.25	1960.91			
31.39	1960.9	32.6	1960.83	32.95	1960.77	33.75	1960.62	34.64	1960.49			
36.78	1960	37.01	1959.96	40.74	1959	42.52	1958.74	43.52	1958.6			
43.94	1958.6	48.01	1958.84	48.38	1958.81	49.68	1958.87	51.96	1958.85			
52.86	1958.73	54.4	1958.56	56.16	1958.11	56.27	1958.08	56.46	1958			
59.22	1957.59	60.16	1957.41	62.84	1957	68.22	1956.4	68.28	1956.4			
69.67	1956.36	70.48	1956.3	73.3	1956.18	73.3	1955.68	75.4	1955.81			
75.42	1955.81	77.24	1955.62	79.17	1955.39	85.2	1955	89.19	1954.83			
92.4	1954.71	98.33	1954.51	98.94	1954.49	99.52	1954.47	100.79	1954.42			
101.93	1954.39	103.39	1954.37	105.48	1954.37	111.62	1954.39	111.78	1954.39			
123.53	1954.88	124.88	1954.94	126.91	1954.81	126.91	1955.31	127.41	1955.31			
132.41	1955.41	132.41	1962.41									

Manning's n Values		num=	5	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	68.28	.013	75.4	.016	124.88	.013	127.41	.025		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
73.3	126.91		50	50			.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 966

INPUT

Description:

Station	Elevation	Data	num=	100	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1957.72	.3	1957.71	4.07	1957.71	5.93	1957.71	6.5	1957.71			
6.91	1957.7	7.3	1957.7	9.68	1957.63	10.47	1957.61	13.99	1957.59			
15.07	1957.59	16.02	1957.57	24	1957.57	25.11	1957.56	31.85	1957.57			
38.6	1957.52	40.9	1957.52	51.19	1958	54.52	1958	57	1958			
58.83	1958	60.3	1958	60.88	1958	62.04	1958	62.31	1958			
65.47	1958	69.86	1958	71.23	1957.91	73.29	1957.86	73.36	1957.83			
73.52	1957.83	75.99	1957.93	76.53	1957.85	77.17	1957.9	77.29	1957.89			
77.47	1957.87	77.59	1957.85	79.45	1957.5	80.45	1957.22	81.3	1957			
81.39	1956.98	81.42	1956.97	81.57	1956.96	82.29	1956.86	84.49	1956.28			
85.22	1956.06	85.57	1956	86.99	1955.84	88.09	1955.78	91.77	1955.52			
92.16	1955.51	94.26	1955.39	97.73	1955.14	97.9	1955.12	97.97	1955.11			
98.11	1955.09	98.63	1955.12	98.7	1955.18	98.89	1955.22	99.38	1955.21			
99.53	1955.21	102.22	1955	105.41	1954.8	106.27	1954.725	106.79	1954.68			
107.73	1954.56	108.24	1954.47	111.48	1954	111.97	1953.99	123.17	1953.67			
126.1	1953.59	126.98	1953.56	129.91	1953.51	130.72	1953.49	131.51	1953.47			

133.38	1953.39	134.48	1953.36	135.74	1953.33	137.24	1953.32	138.9	1953.31
139.94	1953.31	140.5	1953.3	140.64	1953.3	141.81	1953.29	142.86	1953.27
143.82	1953.26	144.91	1953.26	146.22	1953.28	147.82	1953.31	149.76	1953.35
152.06	1953.41	154.8	1953.49	158.21	1953.61	162.83	1953.79	166.61	1953.95
168.46	1953.82	168.46	1954.32	168.96	1954.32	173.96	1954.42	173.96	1961.42

Manning's n Values		num=	4
Sta	n Val	Sta	n Val
0	.025	111.97	.016
		166.61	.013
		168.96	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	106.27	168.46		27.2	27.2		.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 964

INPUT

Description:

Station	Elevation	Data	num=	55	
Sta	Elev	Sta	Elev	Sta	Elev
0	1957.21	1.46	1957.2	11.95	1957.2
19.86	1957.17	20.94	1957.15	26.71	1957
38.21	1956.51	40.34	1956.45	45.38	1956.14
54.39	1955.77	57.84	1955.67	64.37	1955.52
77.8	1955.1	80	1955	81.48	1954.91
99.55	1953.89	103.7	1953.69	105.83	1953.58
110.9	1953.39	112.2	1953.36	113.14	1953.34
117.83	1953.27	121.68	1953.21	126.58	1953.15
135.78	1952.98	139.99	1952.99	140.74	1952.99
146.71	1952.99	147.7	1953	150.55	1953.04
168.58	1953.64	168.58	1954.14	169.08	1954.14

Manning's n Values		num=	4
Sta	n Val	Sta	n Val
0	.025	114.17	.016
		166.68	.013
		169.08	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	114.17	168.58		29.824	29.824		.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 962

INPUT

Description:

Station	Elevation	Data	num=	94	
Sta	Elev	Sta	Elev	Sta	Elev
0	1956.63	.83	1956.63	3.63	1956.62
8.93	1956.6	9.77	1956.59	10.78	1956.56
22.12	1956.52	25.42	1956.51	32.51	1956.43
36.71	1956.35	37.05	1956.32	37.47	1956.3
45.6	1956	47.71	1956	48.5	1956
52.19	1956	53.09	1956	54.73	1956
59.42	1956	62.06	1956	64.1	1956
73.49	1956	74.29	1956	74.32	1956
78.17	1956	78.72	1956	79.43	1956
82.64	1956	83.18	1956	83.51	1956
92.78	1955.23	93.8	1955	94.82	1954.88
97.58	1954.52	100.99	1954.17	101.19	1954.15
111.45	1953	112.63	1952.94	114.33	1952.86
127.21	1952.643	134.4	1952.56	135.97	1952.54
137.99	1952.48	138.57	1952.47	139.01	1952.46
140.27	1952.45	140.84	1952.44	140.94	1952.44
142.92	1952.43	143.26	1952.43	143.52	1952.43
166.75	1952.9	168.76	1952.98	168.99	1952.98
177.66	1953.33	180.5	1953.45	195.27	1954

Manning's n Values		num=	4
Sta	n Val	Sta	n Val
0	.025	127.2	.016
		166.75	.013
		173.71	.016

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	84.83	203.01		30	30		.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 960

INPUT

Description:

Station	Elevation	Data	num=	55	
Sta	Elev	Sta	Elev	Sta	Elev
0	1956.06	1.5	1956.05	1.61	1956.05
6.28	1956.03	13.99	1956.03	17.15	1956.02
20.29	1955.98	20.68	1955.97	25.32	1955.89
39.72	1955.69	46.13	1955.53	55.17	1955.4
70.53	1955	72.91	1954.91	90.83	1954
106.13	1952.91	107.29	1952.85	122.74	1952
129.14	1951.86	129.74	1951.926	129.96	1951.95
131.15	1952	131.38	1952	133.11	1952
141.75	1952.07	147.14	1952.06	149.14	1952.07
169.08	1952.87	173.18	1953	173.82	1952.965
193.43	1953.35	194.42	1953.34	199.36	1953.45

Manning's n Values		num=	4
Sta	n Val	Sta	n Val
0	.025	129.74	.016
		166.82	.013
		173.82	.016

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	70.53	203.01		20.244	20.244		.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 958

INPUT

Description:

Station	Elevation	Data	num=	48	
Sta	Elev	Sta	Elev	Sta	Elev

COLTON-RAS.rep

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1956	1.59	1956	5.72	1956	7.06	1956	20.68	1955.62
22.67	1955.61	27.31	1955.57	30.34	1955.56	31.22	1955.55	32.64	1955.53
38.32	1955.43	39.83	1955.41	47.85	1955.27	61.3	1955	69.47	1954.71
73.13	1954.58	86.17	1954.1	88.65	1954	100.89	1953	100.9	1953
116.34	1952	120.29	1951.89	125.74	1951.75	129.75	1951.647	133.53	1951.55
134.21	1951.54	134.49	1951.54	135	1951.6	135.35	1951.62	140.13	1951.45
140.5	1951.43	140.69	1951.45	140.95	1951.46	141.02	1951.46	141.39	1951.47
142.02	1951.47	143.24	1951.47	143.78	1951.47	144.45	1951.48	148.15	1951.57
155.32	1951.76	164.28	1952	166.86	1952.17	168.78	1952.04	168.78	1952.54
169.28	1952.54	174.28	1952.64	174.28	1959.64				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	125.74	.016	166.86	.013	169.28	.025

Bank Sta: Left 88.65 Right 168.78 Lengths: Left Channel 49.71 Right 49.71 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 956

INPUT Description:

Station	Elevation	Data	num=	87	Sta	Elev	Sta	Elev	Sta	Elev
0	1955.35	7.29	1955	10.34	1954.9	10.7	1954.89	14.17	1954.8	
14.71	1954.79	17.18	1954.74	17.7	1954.74	18.43	1954.72	19.51	1954.72	
20.91	1954.67	22.32	1954.63	24.74	1954.59	26.75	1954.58	33.8	1954.5	
38.45	1954.45	38.89	1954.45	41.41	1954.43	46.81	1954.5	47.82	1954.51	
49.08	1954.52	54.62	1954.53	56.52	1954.53	58.45	1954.53	60.69	1954.51	
63.57	1954.46	67.04	1954.4	73.05	1954.28	73.66	1954.27	75.09	1954.25	
75.94	1954.24	76.99	1954.23	79.74	1954.24	81.46	1954.26	81.67	1954.27	
82.04	1954.27	83.85	1954.24	86.65	1954.18	95	1954	96.78	1953.59	
99.43	1953	101.69	1952.48	103.8	1952	107.18	1951.29	108.63	1951	
114.64	1950.2	114.77	1950.18	114.94	1950.18	115.52	1950.16	115.93	1950.15	
116.4	1950.15	116.93	1950.16	117.52	1950.17	118.12	1950.19	118.98	1950.22	
119.6	1950.23	124.02	1950.35	124.55	1950.36	125.4	1950.39	126.16	1950.38	
126.34	1950.4	126.8	1950.44	127.51	1950.5	127.59	1950.5	128.05	1950.53	
128.73	1950.58	129.44	1950.61	129.68	1950.62	129.85	1950.62	129.99	1950.62	
130.24	1950.62	130.99	1950.61	140.22	1950.34	141.19	1950.31	141.82	1950.29	
142.55	1950.28	142.79	1950.28	143.09	1950.28	143.55	1950.29	144.3	1950.31	
166.68	1951.01	166.97	1951.01	169.18	1951	169.18	1951.5	169.68	1951.5	
174.68	1951.6	174.68	1958.6							

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	129.99	.016	166.97	.013	169.68	.025

Bank Sta: Left 95 Right 169.18 Lengths: Left Channel 50 Right 50 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 954

INPUT Description:

Station	Elevation	Data	num=	85	Sta	Elev	Sta	Elev	Sta	Elev
0	1953.8	6.04	1953.5	9.83	1953.33	15.28	1953	16.49	1952.93	
18.47	1952.84	18.91	1952.83	19.49	1952.83	20.32	1952.85	26.76	1953	
28.47	1953.04	28.58	1953.04	31.65	1953.12	32.05	1953.13	37.29	1953.27	
39.14	1953.31	46.81	1953.43	52.47	1953.45	57.79	1953.54	60.7	1953.59	
61.39	1953.6	61.93	1953.6	62.55	1953.59	63.26	1953.58	64.05	1953.57	
67.34	1953.48	69.18	1953.45	71.44	1953.41	73.1	1953.41	75.47	1953.37	
76.96	1953.36	79.27	1953.34	85.86	1953.28	87.54	1953.25	89.02	1953.22	
94.2	1953	97.84	1952.16	98.52	1952	100.06	1951.64	101.16	1951.36	
101.96	1951.16	102.46	1951.05	102.7	1951	103.25	1950.87	107.07	1950	
109	1949.51	111.19	1949	115.14	1948.24	115.7	1948.14	116.17	1948.07	
116.22	1948.06	116.23	1948.06	116.25	1948.07	116.46	1948.1	117.61	1948.35	
120.25	1949	121.25	1949.06	121.64	1949.08	122.89	1949.06	123.29	1949.04	
124.33	1949.01	124.8	1949	125.62	1948.97	127.48	1948.94	129.88	1948.94	
130.09	1948.94	133.3	1949	134.15	1949	137.93	1949.06	138.59	1949.07	
140.3	1949.1	141.37	1949.11	146.75	1949.21	147.78	1949.23	153.89	1949.34	
159.43	1949.46	160.18	1949.48	160.81	1949.51	165.49	1949.78	167.25	1949.78	
169.32	1949.65	169.32	1950.15	169.82	1950.15	174.82	1950.25	174.82	1957.25	

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	129.88	.016	167.25	.013	169.82	.025

Bank Sta: Left 94.2 Right 169.32 Lengths: Left Channel 50 Right 50 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 952

INPUT Description:

Station	Elevation	Data	num=	73	Sta	Elev	Sta	Elev	Sta	Elev
0	1952.04	.88	1952	4.21	1951.92	8.74	1951.83	10.62	1951.79	
13.04	1951.72	14.12	1951.68	14.57	1951.68	15.48	1951.68	17.24	1951.69	
23.98	1951.76	33.15	1951.85	34.61	1951.87	40.55	1952	44.07	1952.11	
44.25	1952.11	48.1	1952.24	66.38	1953	68.6	1953	69.26	1953	
71.16	1953	71.94	1953	73.22	1953	88.52	1952.34	89.01	1952.35	
89.7	1952.34	93.95	1952	97.25	1951.02	97.3	1951	97.34	1950.99	
100.54	1950	103.48	1949.09	103.77	1949	104.3	1948.82	107.16	1948	
112.13	1947.07	112.5	1947	115.53	1946.39	115.73	1946.38	116.11	1946.33	
116.32	1946.29	116.54	1946.27	116.63	1946.28	116.73	1946.3	116.78	1946.34	
116.99	1946.36	118.16	1946.49	119.19	1946.62	119.87	1946.73	120.44	1946.85	
121.45	1947	121.49	1947	121.85	1947	121.87	1947	122.32	1946.86	
122.52	1946.85	123.99	1946.93	125.14	1947	129.91	1947.139	132.67	1947.22	
140.39	1947.27	141.54	1947.28	143.45	1947.29	148.66	1947.4	162.55	1947.66	
166.47	1947.73	167.29	1947.75	167.5	1947.76	169.43	1947.63	169.43	1948.13	
169.93	1948.13	174.93	1948.23	174.93	1955.23					

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	129.91	.016	167.29	.013	169.93	.025

Bank Sta: Left 93.95 Right 169.43 Lengths: Left 50 Channel 50 Right 50 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 950

INPUT

Description:

Station	Elevation	Data	num=	74	Sta	Elev	Sta	Elev	Sta	Elev
0	1950.94	13.33	1950.93	6.61	1950.71	7.77	1950.68	8.85	1950.67	
11.66	1950.66	13.33	1950.67	14.84	1950.68	16.01	1950.7	16.9	1950.72	
18.09	1950.78	19.56	1950.86	19.96	1950.91	21.33	1951	37.94	1951.65	
38.74	1951.67	40.09	1951.71	41.42	1951.75	43.08	1951.79	54.93	1952	
55.66	1952.03	55.71	1952.03	55.77	1952.03	74.34	1952.11	74.54	1952.11	
76.42	1952	76.8	1951.98	78.54	1951.93	90.65	1951	91.14	1950.86	
94.17	1950	94.61	1949.87	95.87	1949.52	97.11	1949.15	97.61	1949	
98.38	1948.78	101.07	1948	102.94	1947.45	104.4	1947	105.98	1946.55	
107.83	1946	111.44	1945.39	113.42	1945	113.84	1944.86	116.08	1944.18	
116.17	1944.16	116.2	1944.16	116.27	1944.17	117.09	1944.38	117.69	1944.61	
117.9	1944.63	120.23	1945	128.89	1945.38	129.94	1945.408	131.54	1945.45	
140.3	1945.3	140.87	1945.3	141.54	1945.53	143.08	1945.58	145.35	1945.64	
147.58	1945.69	161.86	1945.89	164.35	1945.94	166.24	1945.97	167.38	1945.99	
167.6	1946	167.75	1946.01	167.77	1946.01	167.84	1946.01	169.32	1945.86	
169.32	1946.36	169.82	1946.36	174.82	1946.46	174.82	1953.46			

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val
0 .025 129.94 .016 167.6 .013 169.32 .025

Bank Sta: Left 91.14 Right 169.32 Lengths: Left 50 Channel 50 Right 50 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 948

INPUT

Description:

Station	Elevation	Data	num=	84	Sta	Elev	Sta	Elev	Sta	Elev
0	1949.47	2.45	1949.5	3.48	1949.52	5.06	1949.58	11.4	1949.79	
13.4	1949.81	13.93	1949.81	17.75	1950	24.47	1950.44	32.6	1951	
37.27	1951.13	38.85	1951.17	39.73	1951.19	40.63	1951.2	42.37	1951.22	
43.12	1951.22	46.33	1951.24	48.02	1951.24	50.37	1951.25	55.2	1951.27	
57.82	1951.26	60.21	1951.27	63	1951.26	69.24	1951.24	72.92	1951.24	
74.6	1951.23	75.62	1951.22	77.06	1951.18	78.31	1951.14	79.04	1951.1	
81.04	1951.03	82.38	1951	84.26	1950.59	87.08	1950	90.69	1949.18	
91.47	1949	91.93	1948.88	95.77	1948	96.69	1947.77	99.77	1947	
101.41	1946.59	103.43	1946	105.4	1945.46	107.12	1945	111.82	1944.24	
112.44	1944.13	112.76	1944.08	113.25	1944	113.64	1943.9	116.08	1943.16	
116.33	1943.08	116.63	1943	116.66	1942.99	118.62	1942.72	118.75	1942.72	
120.54	1942.99	120.56	1943	124.39	1943.34	125.1	1943.35	127.57	1943.52	
129.18	1943.65	129.91	1943.67	129.94	1943.67	129.97	1943.67	130.2	1943.66	
130.57	1943.66	134.63	1943.69	135.08	1943.7	139.51	1943.69	140.22	1943.7	
141.54	1943.72	148.68	1943.81	157.85	1943.92	158.72	1943.95	159.85	1943.96	
163.44	1944	165.26	1944.03	165.34	1944.04	167.44	1944.09	169.43	1943.96	
169.43	1944.46	169.93	1944.46	174.93	1944.56	174.93	1951.56			

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val
0 .025 129.94 .016 167.44 .013 169.43 .025

Bank Sta: Left 82.38 Right 169.43 Lengths: Left 50 Channel 50 Right 50 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 946

INPUT

Description:

Station	Elevation	Data	num=	111	Sta	Elev	Sta	Elev	Sta	Elev
0	1947.86	13	1947.86	1.87	1947.84	3.29	1947.83	4.26	1947.83	
4.87	1947.83	5.9	1947.85	10.54	1947.89	15.31	1947.94	16.3	1947.94	
16.65	1947.95	17.16	1947.96	18.27	1947.97	20.02	1947.98	20.04	1947.98	
21.75	1947.98	24.74	1947.97	25.85	1947.97	26.97	1947.97	29.16	1948	
29.3	1948	33.05	1948.22	33.46	1948.21	33.72	1948.21	35.08	1948.26	
36.92	1948.31	39.31	1948.36	39.87	1948.34	42.97	1948.38	43.26	1948.36	
43.88	1948.35	44.33	1948.34	44.53	1948.33	44.65	1948.34	45	1948.34	
52.46	1948.46	55.82	1948.48	58.78	1948.48	61.26	1948.47	62.37	1948.48	
64.38	1948.45	67.9	1948.38	74.19	1948.49	74.74	1948.55	75.7	1948.63	
76.44	1948.64	77.41	1948.65	77.59	1948.64	78.79	1948.41	79.03	1948.45	
79.42	1948.4	80.58	1948.58	81.36	1948.55	81.79	1948.56	82.7	1948.56	
83.18	1948.48	83.44	1948.44	85.27	1948	85.72	1947.9	87.8	1947.4	
88.81	1947.15	89.37	1947	89.69	1946.9	92.77	1946	94.49	1945.5	
96.56	1945	97.33	1944.81	100.65	1944	103.65	1943.29	104.85	1943	
107.53	1942.37	109.32	1942	114.78	1941.41	116.01	1941.38	116.75	1941.35	
118.41	1941.23	120.39	1941.13	122.55	1941	122.76	1940.99	123.21	1940.92	
123.91	1941	128	1941.67	129.16	1941.78	129.88	1941.818	130.67	1941.86	
131	1941.91	131.13	1941.92	131.49	1941.95	135.41	1942	140.13	1942.03	
140.83	1942.04	141.3	1942.04	141.54	1942.04	150.46	1942.1	151.78	1942.1	
152.18	1942.1	152.47	1942.11	152.68	1942.12	152.97	1942.13	153.16	1942.14	
156.69	1942.16	159.3	1942.15	161.47	1942.13	165.65	1942.05	167.03	1942.17	
167.4	1942.17	169.36	1942.04	169.36	1942.54	169.86	1942.54	174.86	1942.64	
174.86	1949.64									

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val
0 .025 129.88 .016 167.4 .013 169.86 .025

Bank Sta: Left 82.7 Right 169.36 Lengths: Left 50 Channel 50 Right 50 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 944

INPUT

Description:

Station Elevation Data				num=	95							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1947.09	1.85	1947.02	2.3	1947	7.55	1946.83	9.19	1946.78			
10.33	1946.76	10.81	1946.76	11.46	1946.76	13.73	1946.8	18.18	1946.9			
18.74	1947	19.07	1947	19.3	1947	19.51	1947	19.63	1947			
19.69	1947.02	20.1	1947.05	22.76	1947.14	24.51	1947.19	25.89	1947.22			
26.73	1947.22	27.2	1947.2	28.5	1947.08	28.56	1947.04	29.57	1947.01			
30.29	1947	35.16	1946.89	35.82	1946.87	50.45	1946.56	50.94	1946.54			
51.26	1946.54	52.74	1946.5	54.04	1946.48	55.73	1946.44	57.26	1946.4			
59.39	1946.32	65.05	1946.1	66.48	1946.06	67.94	1946	71.41	1945.7			
74.82	1945.28	75.53	1945.19	75.92	1945.15	77.22	1945	80.33	1944.62			
83.59	1944.26	85.95	1944	89.56	1943.63	94.6	1943	95.46	1942.85			
100.7	1942	104.9	1941.28	106.11	1941.1	107.08	1941.02	107.19	1941			
111.33	1940.51	114.71	1940.09	115.35	1940	116.2	1940	116.47	1940			
117.11	1940	119.63	1940	124.38	1939.98	124.56	1939.99	124.87	1940			
125.23	1939.99	125.91	1939.96	126.19	1939.95	126.93	1940	127.15	1939.99			
127.75	1939.95	128	1939.96	128.25	1940	130.19	1940.07	134.58	1940.23			
139.07	1940.38	140.04	1940.41	141.54	1940.45	142.33	1940.47	144.91	1940.5			
147.26	1940.51	151.16	1940.51	153.96	1940.51	158.52	1940.51	159.08	1940.5			
162.71	1940.69	165.28	1940.8	166.84	1940.81	167.31	1940.83	167.89	1940.86			
169.38	1940.7	169.38	1941.2	169.88	1941.2	174.88	1941.3	174.88	1948.3			

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	130.19	.016	167.31	.013	169.88	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	94.6	169.38		35	35		.1	.3

CROSS SECTION

RIVER: FL

REACH: FL

RS: 942

INPUT

Description:

Station	Elevation	Data	num=	157	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1947	3.19	1947	5.09	1947	14.07	1946.96	14.2	1947				
15.51	1947.48	16.92	1948	17.64	1948	19.33	1947.65	21.26	1947				
21.49	1946.93	23.73	1946	31.24	1945.17	31.73	1945.12	32.56	1945				
33.01	1944.93	33.74	1944.9	34.91	1944.86	36.33	1944.81	37.8	1944.81				
39.45	1944.83	41.4	1944.89	42.69	1944.89	43.18	1944.91	43.69	1944.96				
45.24	1944.97	46.55	1945	47.79	1945.03	47.85	1945.03	48.71	1945.08				
48.78	1945.08	50.35	1945.18	50.45	1945.17	52.63	1945.26	53.9	1945.25				
55.39	1945.24	56.43	1945.29	58.13	1945.24	58.84	1945.2	59.79	1945.14				
61.28	1945	61.29	1945	61.35	1944.98	64.58	1944	67.49	1943.22				
68.31	1943	69.3	1942.74	71.51	1942.45	72.11	1942.32	72.37	1942.29				
72.65	1942.35	72.75	1942.57	73.12	1942.7	73.27	1942.7	73.76	1942.77				
74.44	1942.77	76	1942.69	78.36	1942.51	80.06	1942.31	80.27	1942.27				
81.7	1942	81.74	1942	81.75	1942	84.74	1941.68	91.92	1941.38				
97.98	1941.07	99.23	1941	100.39	1940.74	100.99	1940.59	101.84	1940.34				
102.88	1940.1	103.47	1940	108.2	1939.892	112.26	1939.8	112.37	1939.8				
112.54	1939.8	112.76	1939.79	113.77	1939.74	114.18	1939.73	114.69	1939.71				
114.93	1939.7	115.12	1939.7	115.37	1939.69	117.64	1939.59	121.8	1939.4				
124.62	1939.27	125.92	1939.21	127.87	1939.21	127.91	1939.21	127.97	1939.21				
128.05	1939.21	128.9	1939.2	128.25	1939.2	128.41	1939.21	128.45	1939.21				
128.58	1939.2	128.63	1939.2	128.85	1939.23	129.2	1939.27	130.01	1939.3				
131.34	1939.32	131.74	1939.35	131.81	1939.34	131.82	1939.33	134.53	1939.23				
135.73	1939.27	136.79	1939.29	138.36	1939.3	139.98	1939.31	140.56	1939.31				
141.54	1939.33	146.66	1939.3	153.09	1939.45	154.03	1939.45	154.82	1939.44				
155.88	1939.43	156.25	1939.43	156.62	1939.44	157.5	1939.48	157.91	1939.49				
159.02	1939.52	159.78	1939.52	160.28	1939.53	160.7	1939.53	161.12	1939.53				
161.42	1939.53	165.62	1939.64	168.58	1939.71	169.14	1939.72	172.58	1939.79				
176.72	1939.86	180.4	1939.93	183.14	1939.96	186.28	1939.99	188.38	1940				
188.47	1940.04	189.46	1940.05	189.62	1940.06	192.98	1940.12	193.28	1940.13				
216.02	1940.09	216.33	1940.08	216.66	1940.08	230.56	1940	233.95	1940				
249	1939.98	249.74	1940	249.97	1940	260.07	1940	260.25	1940				
260.42	1940	260.96	1940	261.37	1940	262.08	1940	263.57	1940				
313.24	1940	405.01	1942.52										

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	108.2	.016				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	99.23	192.98		22.5	22.5		.1	.3

CROSS SECTION

RIVER: FL

REACH: FL

RS: 940

INPUT

Description:

Station	Elevation	Data	num=	128	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1946.87	14.83	1946.54	15.94	1946.52	16.37	1946.5	16.96	1946.48				
18.52	1946.43	26.41	1946.4	26.47	1946.42	28.07	1946.56	28.86	1946.62				
32.6	1946.96	32.7	1946.96	32.73	1946.95	32.75	1946.95	32.9	1947				
33.29	1947.16	35.47	1948	36.38	1948.39	37.88	1949	38.25	1949				
38.48	1949	40.46	1948.11	40.7	1948	40.8	1947.95	42.93	1947				
43.49	1946.76	44.84	1946.11	45.11	1946	45.45	1945.86	47.35	1945				
48.2	1944.68	49.68	1944	51.66	1943.72	53.48	1943.51	54.2	1943.41				
55.27	1943.26	55.94	1943.17	57.12	1943	64.58	1942.44	66.96	1942.27				
67.89	1942.2	70.24	1942	80.57	1941.28	83.41	1941	89.06	1940.59				
97.44	1940	110.58	1939.467	113.95	1939.33	115.59	1939.27	116.23	1939.25				
116.71	1939.23	118.41	1939.17	118.69	1939.16	118.87	1939.15	119.01	1939.15				
119.28	1939.16	119.64	1939.16	119.72	1939.16	120.19	1939.15	122.28	1939				
122.78	1938.93	123.17	1938.93	124.04	1938.93	124.37	1938.92	124.77	1938.9				
125.21	1938.86	125.44	1938.85	125.75	1938.84	126.39	1938.84	126.8	1938.82				
127.86	1938.77	128.27	1938.75	128.63	1938.75	129.16	1938.75	129.55	1938.74				
129.78	1938.75	129.92	1938.75	130.05	1938.74	130.45	1938.78	131.3	1938.82				
133.81	1938.74	135.35	1938.77	139.37	1938.66	139.94	1938.66	140.91	1938.66				
141.54	1938.66	145.3	1938.65	145.89	1938.65	146.58	1938.68	159.95	1939				
167.02	1939.129	178.62	1939.34	179.61	1939.35	180.77	1939.36	181.98	1939.37				
185.12	1939.2	187.37	1939.22	189.44	1939.24	191.28	1939.25	196.6	1939.28				
206.84	1939.53	208.16	1939.54	217.54	1939.54	225.65	1939.53	245.25	1939.95				
245.31	1939.97	246.07	1940	246.65	1940	247.53	1940	248.18	1940				
251.92	1940	254.29	1940	255.6	1940	260.35	1940	263.39	1940				
266.31	1940	271.08	1940	277.8	1940	289.27	1940	292.31	1940				
296.51	1940	298.88	1940	302.27	1940	305.36	1940	307.72	1940				
313.06	1940.49	313.16	1940.49	402.89	1942.06								

Manning's n Values num= 2
Sta n Val Sta n Val
0 .025 110.58 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
80.57 179.61 22.5 22.5 22.5 .1 .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 938

INPUT

Description:

Station	Elevation	Data	num=	141	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1946.72	4.27	1946.63	11.27	1946.48	12.84	1946.45	32.57	1946			
43.31	1946	44.5	1946	45.11	1946.31	46.25	1947	47.09	1947.46			
47.99	1948	48.82	1948.5	49.75	1949	51.1	1949.86	51.37	1950			
52.96	1950	53.58	1950	54.4	1949.6	55.72	1949	56.72	1948.5			
57.79	1948	58.7	1947.57	59.81	1947	60.65	1946.61	61.86	1946			
63.19	1945.31	63.8	1945	65.67	1944.04	65.76	1944	66.52	1943.61			
67.86	1943	68.87	1942.91	68.99	1942.91	69.53	1942.86	74.02	1942.41			
75.21	1942.35	78.33	1942.04	78.53	1942.02	78.82	1942	79.31	1941.97			
80.78	1941.91	80.86	1941.91	82.43	1941.78	84.05	1941.71	85.51	1941.63			
87.01	1941.59	87.53	1941.56	88.54	1941.53	88.59	1941.51	89.13	1941.55			
89.43	1941.59	90.3	1941.68	92.36	1941.83	92.55	1941.83	92.96	1941.83			
93.56	1941.79	93.93	1941.83	94.2	1941.82	94.55	1941.82	94.75	1941.83			
97.33	1941.61	103.65	1942	105.44	1941.78	106.27	1941.92	106.35	1941.91			
106.54	1941.87	106.95	1941.83	109.8	1941.05	109.88	1941.03	109.9	1941.03			
109.98	1941	110.59	1940.75	111.89	1940	118.89	1939.12	120.52	1939			
122.87	1938.85	122.99	1938.85	123.35	1938.81	123.53	1938.82	123.63	1938.83			
124.48	1938.72	125.82	1938.59	126.54	1938.54	128.15	1938.38	128.31	1938.37			
128.65	1938.37	128.78	1938.37	128.94	1938.36	129.11	1938.34	129.2	1938.33			
129.33	1938.33	129.58	1938.33	129.74	1938.33	130.16	1938.3	130.32	1938.3			
130.46	1938.3	130.67	1938.3	130.83	1938.29	130.89	1938.297	130.92	1938.3			
130.97	1938.3	131.03	1938.29	131.19	1938.31	131.52	1938.32	138.33	1938.11			
138.42	1938.11	139.9	1938.14	141.54	1938.17	166.88	1938.686	171.51	1938.78			
178.42	1938.86	190.78	1939	196.13	1939.03	197.13	1939.05	199.78	1939.08			
201.13	1939.08	202.3	1939.08	205.11	1939.14	205.12	1939.14	205.29	1939.15			
205.62	1939.15	206.07	1939.16	206.66	1939.16	208.23	1939.18	209.29	1939.18			
210.58	1939.18	212.05	1939.18	214.73	1939.17	215.83	1939.17	217.28	1939.18			
219.89	1939.2	233.39	1939.28	245.87	1939.36	259.95	1939.43	272.06	1939.48			
279.7	1939.5	284.44	1939.5	287.74	1939.51	296.02	1939.55	313.08	1939.64			
402.78	1941.67											

Manning's n Values num= 2
Sta n Val Sta n Val
0 .025 130.89 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
106.27 166.88 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 936

INPUT

Description: adjacent to building

Station	Elevation	Data	num=	70	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1946.75	5.73	1946.59	6.77	1946.59	8.5	1946.58	9.36	1946.59			
13.12	1946.62	13.59	1946.61	16.17	1946.63	19.35	1946.63	19.82	1946.63			
20.91	1946.63	22.28	1946.63	22.7	1946.61	23.46	1946.61	23.63	1946.61			
23.88	1946.61	24.34	1946.6	24.95	1946.59	25.52	1946.57	26.39	1946.55			
26.79	1946.54	30.65	1946.55	38.37	1946.61	41.22	1946.63	43.34	1946.63			
46.7	1946.66	48.01	1946.67	51.05	1946.7	52.57	1946.71	56.2	1946.73			
57.27	1946.75	57.79	1946.76	64.44	1946.64	66.82	1946.52	72.47	1946.52			
73.79	1946.4	77.57	1946.02	77.66	1946.02	77.78	1946	77.93	1945.97			
82.42	1945	90.76	1944.02	90.96	1944	94.84	1943.35	96.45	1943.11			
96.59	1943.08	96.89	1943	97.12	1942.94	100.62	1942	101.81	1941.68			
104.36	1941	106.69	1940.37	108.08	1940	114.08	1939.09	114.68	1939			
114.91	1938.97	123.1	1938	133.39	1937.66	134.67	1937.585	137.64	1937.41			
139.81	1937.52	141.54	1937.61	143.32	1937.7	147.32	1938	157.9	1938.08			
163.56	1938.12	166.06	1937.96	166.06	1938.96	166.56	1938.96	177.56	1941			

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val Sta n Val
0 .025 134.67 .016 163.56 .013 166.56 .025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
106.69 166.56 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 934

INPUT

Description: adjacent to building

Station	Elevation	Data	num=	128	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1958.39	5.8	1958.49	1.71	1958.67	2.61	1958.78	4.53	1959			
6.13	1959.19	6.35	1959.2	9.48	1959.21	9.69	1959.18	9.92	1959.12			
10.54	1959.15	10.62	1959.14	11.14	1959.27	11.52	1959.34	12.49	1959.38			
12.83	1959.43	13.9	1959.4	20.07	1959.69	26.99	1960	27.59	1960.03			
27.91	1960.04	33.32	1960.23	34.49	1960.26	36	1960.24	36.53	1960.22			
38.59	1960.29	39.25	1960.31	40.16	1960.43	40.96	1960.54	42.9	1960.97			
42.95	1960.98	42.97	1960.99	43.09	1961	43.76	1961.08	43.79	1961.09			
43.88	1961.12	44.71	1961.35	45.15	1961.4	49.09	1962	49.13	1962			
49.14	1962	50.31	1962	50.59	1962	50.95	1962	51.75	1962			
51.81	1961.98	53.99	1961	55.3	1960.42	56.89	1960	60.94	1959			
60.95	1959	60.96	1958.99	62.33	1958.13	62.53	1958	63.75	1957.23			
64.09	1957	65.4	1956.15	65.63	1956	66.75	1955.29	67.18	1955			
67.65	1954.69	68.71	1954	69.45	1953.52	70.23	1953	70.88	1952.58			
71.75	1952	72.34	1951.62	73.24	1951	74.31	1950.42	75.09	1950			
76.61	1949.31	77.26	1949	78.92	1948.26	79.46	1948	81.47	1947.07			
81.63	1947	83.59	1946.14	83.92	1946	84.41	1945.8	85.57	1945.37			
86.36	1945	88.36	1944.15	88.65	1944	92.51	1943.42	95.09	1943			
95.28	1942.97	97.61	1942.63	101.52	1942	103.87	1941.16	104.32	1941			
106.73	1940.11	106.99	1940.01	107.01	1940	107.1	1939.98	107.76	1939.84			
116.18	1938	120.29	1937.52	123.89	1937.15	125.25	1937	125.61	1936.99			
125.64	1936.94	127.11	1936.83	127.8	1936.81	130.17	1936.76	130.59	1936.73			

130.82	1936.73	131.07	1936.73	131.17	1936.74	131.4	1936.75	133.26	1936.78
134.3	1936.79	137.78	1936.862	138.15	1936.87	139.72	1936.92	140.91	1936.96
141.54	1936.99	141.91	1937	157.48	1937.3	166.7	1937.48	169.18	1937.34
169.18	1938.34	169.68	1938.34	171.63	1938.49	174.39	1939	176.57	1939.28
182.19	1940	185.47	1940.63	187.04	1941				

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val
 0 .025 137.78 .016 166.7 .013 169.68 .025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 101.52 169.18 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 932

INPUT

Description: adjacent to building

Station Elevation Data		num= 149		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1961.53	1.07	1961.54	1.89	1961.55	2.25	1961.57	2.55	1961.59
2.96	1961.63	4.51	1961.82	6.04	1961.98	6.33	1962	7.1	1962.33
7.51	1962.48	7.77	1962.46	8.54	1962.3	9.82	1962	12.25	1961.89
13.41	1961.85	14.38	1961.84	16.42	1961.83	19.83	1961.84	21.52	1961.83
32.31	1961.86	33.24	1961.85	33.58	1961.84	33.86	1961.84	37.24	1961.85
39.73	1961.5	40.34	1961.48	40.9	1961.46	41.19	1961.44	41.42	1961.43
41.76	1961.43	41.9	1961.43	43.54	1961.56	47.02	1961.85	48.56	1962
50.02	1962.98	50.06	1963	50.46	1963.29	51.41	1964	51.56	1964.13
52.65	1965	52.85	1965	53.16	1965	53.71	1964.67	54.83	1964
56.09	1963.23	56.45	1963	56.83	1962.78	58.15	1962	59.49	1961.18
59.77	1961	61.19	1960.15	61.43	1960	62.71	1959.25	63.11	1959
64.63	1958.08	64.76	1958	66.33	1957.06	66.43	1957	66.52	1956.94
68.27	1956	69.49	1955.25	69.91	1955	70.34	1954.75	71.55	1954
72.69	1953.3	73.19	1953	73.7	1952.69	74.83	1952	75.34	1951.69
76.39	1951	77.9	1950.27	78.39	1950	78.96	1949.7	80.36	1949
81.47	1948.4	82.21	1948.13	82.48	1948	84.4	1947.05	84.51	1947
86.03	1946.25	86.53	1946	86.59	1945.97	88.47	1945	90.07	1944.21
90.48	1944	92.01	1943.23	92.5	1943	92.84	1942.8	94.41	1942
95.69	1941.6	96.69	1941.38	98.32	1941	100.58	1940.61	100.62	1940.61
101.66	1940.75	109.61	1940	111.71	1938.68	113.37	1938	116.53	1937.53
119.64	1937	124.88	1936.74	129.13	1936.55	129.84	1936.52	129.87	1936.51
131.6	1936.42	131.88	1936.41	132.07	1936.41	132.08	1936.39	132.68	1936.34
132.97	1936.33	133.94	1936.31	134.11	1936.3	134.21	1936.3	134.31	1936.3
134.35	1936.3	134.44	1936.31	134.91	1936.316	135.21	1936.32	135.63	1936.33
137.22	1936.36	138.35	1936.39	138.79	1936.411	139.64	1936.45	140.26	1936.47
141.54	1936.53	143.24	1936.61	144.41	1936.65	147.16	1936.73	148.69	1936.79
150.04	1936.83	152.49	1936.89	156.52	1936.97	158.05	1937	166.67	1937.609
166.68	1937.61	169.12	1937.474	169.2	1937.47	169.2	1938.47	169.7	1938.47
176.63	1938.74	178.25	1938.82	180.25	1939.48	180.71	1939.84	181.5	1940.41
182.32	1940.87	182.61	1941	183.44	1941.01	190.08	1941.12		

Manning's n Values num= 5
 Sta n Val Sta n Val Sta n Val Sta n Val
 0 .025 138.79 .016 166.67 .013 169.2 .025 190.08 .013

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 138.79 169.2 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 930

INPUT

Description: adjacent to driveway

Station Elevation Data		num= 126		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1960.16	5.17	1960.16	5.71	1960.17	11.75	1960.17	12.29	1960.17
14.37	1960.18	15.46	1960.18	17.62	1960.2	20.14	1960.22	22.94	1960.24
26.04	1960.24	29.65	1960.22	33.6	1960.17	35.28	1960.16	36.31	1960.16
37.52	1960.15	37.62	1960.15	37.68	1960.15	38.15	1960.19	39.22	1960.3
40.28	1960.4	43.44	1960.1	43.93	1960.21	45.21	1960	45.51	1960
46.2	1960	46.28	1960.05	47.78	1961	48.81	1961.73	49.34	1962
50.39	1962.72	50.96	1963	52.17	1963.79	52.59	1964	53.66	1964.59
53.77	1964.7	54.22	1965	54.46	1965.14	54.67	1965.21	54.95	1965
55.87	1964.41	56.53	1964	57.83	1963.14	58.03	1963	58.62	1962.61
59.55	1962	60.36	1961.45	61.02	1961	61.28	1960.82	62.52	1960
62.86	1959.76	63.99	1959	65.07	1958.33	65.56	1958	66.16	1957.6
66.95	1957	68.15	1956.27	68.56	1956	69.82	1955.16	70.05	1955
71.39	1954.11	71.55	1954	72.96	1953.06	73.05	1953	74.46	1952.06
74.56	1952	74.64	1951.94	76.15	1951	77.82	1950.05	77.9	1950
77.99	1949.95	79.66	1949	79.77	1948.94	81.41	1948	81.54	1947.93
83.17	1947	83.31	1946.92	84.36	1946.33	84.92	1946	86.61	1945.04
86.67	1945	86.73	1944.97	88.37	1944	88.7	1943.81	90.14	1943
90.58	1942.76	91.92	1942	93.27	1941.24	93.69	1941	95.12	1940.17
95.42	1940	96.5	1939.76	99.33	1939	102.17	1938.62	106.32	1938
111.65	1937.4	114.62	1937	122.34	1936.08	123.93	1936	123.99	1936
126.32	1935.95	128.37	1935.92	134.16	1935.83	134.91	1935.818	136.06	1935.8
136.48	1935.79	137.06	1935.78	137.44	1935.78	137.84	1935.79	138.25	1935.8
139.27	1935.86	139.55	1935.87	141.52	1936	141.54	1936	162.7	1936.75
163.51	1936.77	164.66	1936.73	166.67	1936.77	169.12	1936.63	171.97	1936.91
174.41	1936.975	175.33	1937	179.42	1937.18	197.16	1938	201.01	1938.14
218.24	1938.7								

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val
 0 .025 134.91 .016 166.67 .013 174.41 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 95.12 169.12 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 928

INPUT

Description: adjacent to wall

Station Elevation Data		num= 110		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1962.85	.04	1962.85	.46	1962.99	.48	1963	.49	1963
1.3	1963	2.21	1963	3.43	1963	7.07	1963	9.34	1962.89
9.71	1962.87	11.25	1962.71	12.19	1962.56	17.01	1962	17.07	1961.99

17.12	1961.99	19.17	1962	22.38	1962.02	22.4	1962.02	22.46	1962.02
22.73	1962	26.03	1961.82	26.85	1961.75	29.1	1961.51	31.49	1961.17
32.06	1961.07	32.44	1961	34.31	1960.66	37.88	1960	39.34	1959.75
41.02	1959.33	41.83	1959.11	42.46	1959	45.5	1958.44	46.61	1958.17
47.31	1958	48.78	1957.64	50.49	1957.21	50.89	1957.09	51.18	1957
53.14	1956.41	54.39	1956	56.29	1955.38	57.23	1955	58.42	1954.5
59.63	1954	61.95	1953.01	61.98	1953	61.99	1952.99	64.14	1952
64.66	1951.76	65.9	1951.1	66.09	1951	66.23	1950.93	67.97	1950
68.71	1949.67	70	1949	71.07	1948.47	71.98	1948	72.66	1947.65
73.96	1947	75.76	1946.1	75.94	1946	76.04	1945.95	77.81	1945
79.69	1944.08	79.85	1944	80.02	1943.92	81.83	1943	81.95	1942.94
83.78	1942	83.9	1941.94	84.38	1941.72	85.72	1941	86.91	1940.39
87.64	1940	88.32	1939.63	89.49	1939	94.4	1938.28	96.76	1938
101.92	1937.63	105.25	1937.39	107.42	1937.22	108.01	1937.18	109.91	1937
111.57	1936.81	115.49	1936.39	118.84	1936	120.92	1935.66	120.95	1935.66
121.42	1935.603	121.69	1935.57	127.49	1935.14	129.99	1935.26	131.4	1935.3
132.91	1935.33	139.46	1935.34	141.53	1935.35	141.54	1935.35	143.07	1935.39
145.16	1935.43	149.9	1935.49	152.11	1935.53	155.61	1935.62	167.82	1935.13
170.32	1934.97	170.32	1935.97	170.82	1935.97	182.82	1938	182.82	1945

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 0 .025 121.42 .016 167.82 .013 170.82 .025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 89.49 170.82 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 926

INPUT

Description: adjacent to wall

Station Elevation Data

num=97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1937.59	.05	1937.59	1.86	1937.66	5.05	1937.7	6.29	1937.73
7.59	1937.78	14.17	1937.8	14.5	1937.81	20.68	1937.81	21.35	1937.84
21.54	1937.85	21.83	1937.85	22.11	1937.86	22.43	1937.87	23.19	1937.89
23.36	1937.89	23.44	1937.89	23.55	1937.88	24.22	1937.85	27.8	1937.84
28.01	1937.83	28.19	1937.83	34.74	1937.77	36.39	1937.74	39.25	1937.7
39.83	1937.69	40	1937.7	40.16	1937.7	41.25	1937.66	42.08	1937.64
46.6	1937.55	47.99	1937.53	49.11	1937.5	50.64	1937.45	53.04	1937.38
54.54	1937.35	55.26	1937.35	57.29	1937.32	62.14	1937.31	65.61	1937.16
67.29	1937.11	67.74	1937.1	68.28	1937.1	73.74	1937.01	73.89	1937.01
74.98	1937	83.08	1937	85.09	1937	87.28	1937.86	87.64	1938
88.5	1938.35	90.15	1939	91.88	1939.71	92.71	1940	93.38	1940.19
94.99	1940.59	95.43	1940.62	95.6	1940.62	95.94	1940.59	96.39	1940.53
98.49	1940	100.36	1939.32	101.05	1939	102.47	1938.36	103.43	1938
104.11	1937.75	106.07	1937	109.78	1936.31	111.01	1936	118.18	1935.279
120.66	1935.03	120.98	1935	121.07	1935	122.66	1934.95	123.38	1934.93
124.87	1934.88	129.88	1934.68	130.68	1934.65	130.75	1934.65	131.36	1934.67
131.69	1934.69	131.87	1934.71	132.15	1934.81	133.47	1934.87	136.37	1934.79
137.78	1934.85	139.37	1934.89	141.54	1934.96	143.06	1935	149.56	1935.12
166.13	1935.86	166.5	1935.88	169.04	1935.74	169.04	1936.74	169.54	1936.74
181.84	1938	181.84	1945						

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 0 .025 118.18 .016 166.5 .013 169.54 .025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 118.18 169.04 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 924

INPUT													
Description: storage building up against landscape right, wall on left													
Station Elevation Data				num=76									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1935.91	4.42	1935.91	5.18	1935.91	5.98	1935.91	14.35	1935.9	30.87	1935.9	30.87	1935.9
23.74	1935.9	25.31	1935.9	28.66	1935.9	29.32	1935.9	30.87	1935.9	30.87	1935.9	30.87	1935.9
34.65	1935.9	38.4	1935.89	40.62	1935.89	42.83	1935.9	45.86	1935.9	45.86	1935.9	45.86	1935.9
46.37	1935.9	56.16	1935.91	56.58	1935.91	59.37	1935.9	65.61	1935.91	65.61	1935.91	65.61	1935.91
70.94	1935.89	82.61	1935.91	87.51	1936	94.97	1936.56	94.97	1936.56	94.97	1936.56	94.97	1936.56
95.64	1943.56	95.64	1936.56	96.46	1936.56	97.64	1936.56	98.5	1936.56	98.5	1936.56	98.5	1936.56
98.6	1936.71	98.63	1936.72	98.81	1936.73	98.89	1936.73	99	1936.73	99	1936.73	99	1936.73
99.16	1936.72	101.49	1936.59	107.65	1936.233	109.25	1936.14	109.41	1936.13	109.41	1936.13	109.41	1936.13
111.54	1936	112.53	1935.82	113.71	1935.06	113.71	1934.81	116.87	1935	116.87	1935	116.87	1935
118.33	1934.95	124.21	1934.73	125	1934.69	126.11	1934.64	128.08	1934.56	128.08	1934.56	128.08	1934.56
132.58	1934.41	135.6	1934.3	136.05	1934.29	136.25	1934.28	136.66	1934.27	136.66	1934.27	136.66	1934.27
138.06	1934.21	138.28	1934.2	138.3	1934.2	138.47	1934.21	138.56	1934.21	138.56	1934.21	138.56	1934.21
138.62	1934.22	138.7	1934.25	139.06	1934.26	139.29	1934.26	141.21	1934.2	141.21	1934.2	141.21	1934.2
141.54	1934.21	153.7	1934.52	155.93	1934.57	156.28	1934.58	156.98	1934.6	156.98	1934.6	156.98	1934.6
166.31	1934.93	168.82	1934.79	168.82	1935.79	169.32	1935.79	182.25	1938	182.25	1938	182.25	1938
182.25	1945												

Manning's n Values num= 5
 Sta n Val Sta n Val Sta n Val Sta n Val
 0 .025 107.65 .013 118.33 .016 166.31 .013 169.32 .025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 98.63 168.82 50 50 50 .1 .3
 Left Levee Station= 95.64 Elevation= 1943.56

CROSS SECTION

RIVER: FL
 REACH: FL RS: 922

INPUT													
Description:													
Station	Elevation	Data	num=	55	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1935.25	3.51	1935.26	9.82	1935.26	12.23	1935.26	14.93	1935.26				
27.08	1935.26	28.05	1935.26	33.05	1935.26	33.5	1935.26	34.6	1935.26				
35.7	1935.26	36.35	1935.26	36.99	1935.26	37.87	1935.26	41.8	1935.27				
44.74	1935.27	47.96	1935.28	48.84	1935.28	50.78	1935.29	95.27	1935.08				
96.33	1935.08	98.2	1935.12	99.02	1935.17	99.76	1935.14	99.85	1935.14				
100.05	1935.15	103.41	1935.06	105.28	1935	105.38	1935	108.74	1934.8				
116.41	1934	120.25	1933.79	122.3	1933.7	124.05	1933.64	126.03	1933.6				
128.6	1933.56	130.89	1933.54	137.09	1933.46	138.38	1933.42	139.2	1933.41				

COLTON-RAS.rep
140.8 1933.4 141.54 1933.4 142.49 1933.4 145.78 1933.43 147.32 1933.48
152.64 1933.52 155.47 1933.55 158.18 1933.62 161.14 1933.72 166.48 1933.92
168.98 1933.76 168.98 1934.76 169.48 1934.76 180.98 1938 180.98 1945

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val Sta n Val
0 .025 116.41 .016 166.48 .013 169.48 .025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
100.05 169.48 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 920

INPUT
Description: Station Elevation Data num= 94
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 1934.43 2.74 1934.43 4.62 1934.42 8.24 1934.43 15.16 1934.39
17.26 1934.39 23.62 1934.39 25.22 1934.39 27.88 1934.39 29.06 1934.4
31.24 1934.4 33.15 1934.41 35.1 1934.43 35.96 1934.44 36.61 1934.45
37.53 1934.46 39.26 1934.46 45.74 1934.47 52.84 1934.55 58.81 1934.56
80.45 1934.92 81.52 1934.92 83.45 1934.99 83.92 1935 85.43 1935
88.15 1935 94.33 1935 99.63 1935 103.67 1935 105.86 1935
107.88 1935 108.66 1934.83 112.2 1934 115.49 1933.72 115.99 1933.72
115.99 1932.72 118.49 1932.87 131.77 1932.19 138.18 1932.03 138.39 1932.03
138.54 1932.02 138.66 1932.02 138.76 1932.02 139.11 1932.01 140.25 1932
141.39 1931.98 141.54 1931.98 142.62 1932 143.88 1932.02 147.83 1932.1
148.89 1932.13 149.39 1932.15 150.34 1932.19 159.55 1932.45 166 1932.86
168.5 1932.71 168.5 1933.71 169 1933.71 170.29 1934 171.37 1934.34
173.15 1935 175.53 1935.8 176.14 1935.88 177.3 1935.97 177.32 1935.97
177.35 1935.98 177.89 1936 186.7 1936.36 190.85 1936.41 193.02 1936.4
195.69 1936.51 196.81 1936.5 198.45 1936.59 199.61 1936.57 200.52 1936.54
201.17 1936.51 201.58 1936.48 202.53 1936.36 202.55 1936.34 206.01 1936.39
206.03 1936.42 206.22 1936.46 206.65 1936.51 211.66 1937 214.21 1937.14
218.03 1937.34 223.35 1937.6 225.78 1937.71 226.09 1937.72 228.7 1937.74
232.88 1937.75 235.64 1937.74 239.97 1937.75 246.21 1937.74

Manning's n Values num= 5
Sta n Val Sta n Val Sta n Val Sta n Val
0 .025 115.49 .013 118.49 .016 166 .013 169 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
115.49 169 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 918

INPUT
Description: adjacent to driveway entrance on right
Station Elevation Data num= 102
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 1932.53 9.68 1932.53 16.54 1932.57 18.7 1932.58 30.71 1932.59
32.39 1932.6 44.75 1932.61 46.75 1932.61 48.83 1932.62 50.89 1932.63
53.1 1932.65 55.64 1932.67 61.77 1932.7 64.95 1932.73 68.07 1932.76
75.51 1932.86 76.26 1932.87 81.09 1932.92 89.09 1933 91.4 1933.07
95.97 1933.23 97.61 1933.26 99.21 1933.25 100.84 1933.23 103.62 1933.17
104.51 1933.16 105.15 1933.17 106.1 1933.19 106.61 1933.18 107.3 1933.13
108.87 1933 115.4 1932.18 115.9 1932.18 115.9 1931.18 118.4 1931.33
120.39 1931 123.19 1930.88 123.96 1930.86 129.74 1930.66 134.01 1930.54
135.6 1930.52 138.93 1930.45 139.02 1930.45 141.5 1930.43 141.54 1930.43
143.76 1930.43 146.26 1930.48 147.75 1930.49 150.87 1930.57 155.44 1930.72
156.66 1930.74 163.15 1930.99 163.49 1931 166.16 1931.3 169.47 1931.74
170.34 1931.77 171.13 1931.87 171.5 1931.94 171.55 1931.95 171.59 1931.95
171.65 1931.94 171.87 1931.93 171.93 1931.92 172 1931.92 172.21 1931.92
172.36 1931.92 172.57 1931.92 173.33 1931.9 175.22 1931.82 177.12 1931.74
179.93 1931.6 180.3 1931.59 188.27 1931.66 189.53 1931.62 190.41 1931.62
191.2 1931.61 196.53 1931.49 197.25 1931.47 197.94 1931.44 200.74 1931.34
201.53 1931.31 202.65 1931.28 204.03 1931.27 204.39 1931.26 204.62 1931.24
204.76 1931.23 205.14 1931.17 205.24 1931.16 205.29 1931.16 205.96 1931.16
206.21 1931.16 206.69 1931.17 207.14 1931.18 207.9 1931.19 218.95 1931.24
220.34 1931.24 222.45 1931.24 229.06 1931.19 230.58 1931.19 241.37 1931.1
242.45 1931.1 246.03 1931.08

Manning's n Values num= 5
Sta n Val Sta n Val Sta n Val Sta n Val
0 .025 115.4 .013 118.4 .016 163.49 .013 169.47 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
115.4 171.5 50 50 50 .1 .3
Right Levee Station= 171.55 Elevation= 1931.95

CROSS SECTION

RIVER: FL
REACH: FL RS: 916

INPUT
Description: adjacent to building right
Station Elevation Data num= 61
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 1931.77 8.67 1931.8 13.08 1931.82 16.49 1931.84 18.98 1931.87
20.76 1931.9 23.04 1931.95 25.06 1931.98 25.63 1932 28.98 1932.05
32.39 1932.09 46.63 1932.25 59.39 1932.39 63.69 1932.43 65.97 1932.47
67.52 1932.49 69.28 1932.5 71.23 1932.51 73.44 1932.51 78.74 1932.51
85.18 1932.5 87.21 1932.51 88.75 1932.51 90.77 1932.51 93.19 1932.5
95.61 1932.49 97.42 1932.48 98.17 1932.47 98.2 1932.44 98.64 1932.43
100.37 1932.42 101.19 1932.41 102.79 1932.38 103.37 1932.36 104.66 1932.29
107.7 1932.12 107.89 1932.12 109.76 1932 112.3 1931.31 113.42 1931
115 1930.74 115.5 1930.74 115.5 1929.74 118 1929.89 135.71 1929
138.9 1928.85 138.93 1928.85 140.89 1928.77 141.42 1928.76 141.54 1928.75
141.62 1928.75 142.83 1928.78 146.96 1928.91 149.66 1929 165.21 1929.77
166 1929.83 168.5 1929.68 168.5 1930.68 169 1930.68 200.55 1931
200.55 1938

Manning's n Values num= 5
Sta n Val Sta n Val Sta n Val Sta n Val
0 .025 115 .013 118 .016 166 .013 168.5 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
115 168.5 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 914

INPUT

Description: adjacent to building right, and driveway on left

Station Elevation Data		num= 58									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1931.22	31	1931.22	87	1931.23	137	1931.24	187	1931.26		
2.2	1931.26	5.18	1931.31	8.86	1931.31	14.62	1931.41	18.94	1931.43		
22.48	1931.5	25.54	1931.57	28.29	1931.63	34.34	1931.67	37.04	1931.73		
38.84	1931.75	41.97	1931.79	44.68	1931.82	45.46	1931.82	49.1	1931.83		
49.44	1931.84	49.93	1931.84	51.67	1931.85	58.4	1931.67	66.12	1931.65		
66.5	1931.63	68.88	1931.55	76.31	1931.5	79.52	1931.27	80.51	1931.3		
81.6	1931.23	82.31	1931.24	86.6	1931	86.99	1930.99	88.16	1930.91		
100.79	1930.2	101.48	1930	105.81	1929.73	107.91	1929.61	109.32	1929.54		
110.34	1929.5	111.11	1929.49	112.37	1929.48	113.18	1929.47	116.64	1929		
118.87	1928.92	125.95	1928.28	138.85	1928.14	141.54	1928.11	142.11	1928.1		
160.37	1928.29	166	1928.3	168.5	1928.15	168.5	1929.15	169	1929.15		
174.67	1929.21	198.5	1930	198.5	1937						

Manning's n Values		num= 5									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	109.32	.013	113.18	.016	166	.013	169	.016		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	113.18	169		50	50		.1	.3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 912

INPUT

Description: adjacent to building on right

Station Elevation Data		num= 53									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1930.65	13.46	1930.57	16.97	1930.59	20.89	1930.6	28.6	1930.65		
31.56	1930.66	33.04	1930.67	38.71	1930.69	40.83	1930.7	58.14	1931		
62.64	1931	62.81	1931	63.3	1931	64.01	1931	67.61	1931		
68.35	1931	70.9	1931	73.09	1931	73.6	1931	74.67	1931		
75.25	1931	78.18	1931	78.69	1931	79.71	1931	79.9	1931		
80.07	1931	97.16	1930.52	104.14	1930.49	110.86	1930	112.69	1929.55		
115	1928.58	115.5	1928.58	115.5	1927.58	118	1927.73	140.99	1927.32		
141.54	1927.34	166	1927.73	168.5	1927.58	168.5	1928.58	169	1928.58		
185.18	1929.46	191.78	1929.67	193.49	1929.72	194.6	1929.75	195.39	1929.76		
196.01	1929.78	196.53	1929.78	197.03	1929.79	198.19	1929.79	198.84	1929.8		
199.42	1929.81	201	1929.84	201	1936.84						

Manning's n Values		num= 5									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	115	.013	118	.016	166	.013	169	.016		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	115	168.5		50	50		.1	.3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 910

INPUT

Description: adjacent to building on the right

Station Elevation Data		num= 79									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1929.73	5.47	1929.73	12.52	1929.76	12.74	1929.76	27.01	1929.83		
28.61	1929.85	29.81	1929.87	34.06	1929.88	34.27	1929.88	36.5	1929.88		
37.11	1929.89	37.24	1929.89	37.81	1929.89	39.02	1929.89	41.36	1929.89		
41.48	1929.89	41.54	1929.89	41.62	1929.89	41.74	1929.89	42	1929.89		
42.45	1929.89	43.03	1929.9	43.7	1929.9	44.44	1929.89	45.23	1929.89		
69.66	1929.93	70.36	1929.92	75.28	1929.93	75.6	1929.93	75.95	1929.95		
76.31	1929.96	76.72	1929.95	76.89	1929.95	83.38	1929.9	89.67	1929.87		
92.2	1929.86	93.67	1929.86	94.34	1929.88	95.36	1929.96	95.92	1930		
96.56	1930	98.05	1930	98.97	1930	101.24	1930	104.1	1930		
107.1	1930	108.12	1930	109.15	1929.69	112.73	1929	113.94	1928.73		
115	1928.03	115.5	1928.03	115.5	1927.03	118	1927.18	133.84	1927.08		
138.5	1927.04	138.67	1927.03	140.9	1927	141.54	1927	142.95	1927		
145.53	1927.03	150.38	1927.06	166.26	1927.12	168.76	1926.97	168.76	1927.97		
169.26	1927.97	170.43	1928.21	171.75	1928.46	174.92	1929	176.22	1929.03		
179.25	1929.1	181.61	1929.14	183.61	1929.17	185.52	1929.19	189.95	1929.21		
192.44	1929.24	194.65	1929.29	201	1929.41	201	1936.41				

Manning's n Values		num= 5									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	115	.013	118	.016	166.26	.013	169.26	.016		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	115	169.26		50	50		.1	.3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 908

INPUT

Description: adjacent to building on right

Station Elevation Data		num= 57									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1928.99	4.48	1928.92	8.41	1928.86	10.11	1928.82	10.44	1928.8		
10.97	1928.79	14.5	1928.86	15.5	1928.89	15.97	1928.9	16.7	1928.91		
18.97	1928.91	20.25	1928.91	21.49	1928.92	24.88	1928.98	25.92	1928.99		
30.97	1929	31.05	1929	32.02	1929.01	32.58	1929.02	33.28	1929.04		
34.31	1929.05	36.61	1929.07	40.52	1929.08	45.6	1929.09	51.45	1929.09		
57.92	1929.06	64.75	1929.01	65.09	1929.01	66.5	1929	80.02	1928.84		
91.05	1928.73	93.99	1928.71	97.15	1928.61	103.64	1928.59	109.5	1928.26		
111.93	1928.27	112.26	1928.26	112.58	1928.23	114.01	1928	115	1927.45		
115.5	1927.45	115.5	1926.45	118	1926.6	138.58	1926.29	141.52	1926.18		
141.54	1926.18	160.05	1926.47	166.09	1926.59	168.59	1926.44	168.59	1927.44		
169.09	1927.44	171.46	1927.61	176.72	1928	183.02	1928.26	193.87	1929		
201	1929.4	201	1936.4								

Manning's n values		num= 5									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	115	.013	118	.016	166.26	.013	169.26	.016		

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	115	.013	118	.016	166.09	.013	169.09	.016

Bank Sta: Left 115 Right 169.09 Lengths: Left 50 Channel 50 Right 50 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 906

INPUT
 Description: adjacent to building on right
 Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1928.37	4.49	1928.36	4.92	1928.36	5.91	1928.35	11.47	1928.33
12.54	1928.32	18.38	1928.3	19.89	1928.28	21.65	1928.26	23.17	1928.24
24.17	1928.22	24.6	1928.21	24.69	1928.2	24.82	1928.2	25.72	1928.22
25.98	1928.23	26.1	1928.23	26.28	1928.23	26.86	1928.23	27.19	1928.23
27.51	1928.23	28.37	1928.25	28.64	1928.25	29.93	1928.26	30.18	1928.26
30.3	1928.26	30.45	1928.26	30.71	1928.27	31.36	1928.27	40.96	1928.23
41.9	1928.23	44.17	1928.23	45.44	1928.23	47.02	1928.23	48.48	1928.23
60.99	1928.25	62.68	1928.24	67.24	1928.25	70.33	1928.24	72.2	1928.23
74.07	1928.21	75.52	1928.2	76.05	1928.2	77.71	1928.21	79.02	1928.22
80.09	1928.22	80.77	1928.22	83.64	1928.21	85.9	1928.21	88.27	1928.2
100.01	1928.15	100.88	1928.15	102.37	1928.11	104.48	1928.06	106.19	1928
115.26	1926.97	115.43	1926.85	115.93	1926.85	115.93	1925.85	118.43	1926
140.94	1925.58	141.54	1925.6	166.35	1926.05	168.85	1925.9	168.85	1926.9
169.35	1926.9	174.55	1927.17	176	1927.35	176	1934.35		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	115.43	.013	118.43	.016	166.35	.013	169.35	.025

Bank Sta: Left 115.43 Right 169.35 Lengths: Left 50 Channel 50 Right 50 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 904

INPUT
 Description: adjacent to building right
 Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1927.59	1.87	1927.59	3.68	1927.61	6.82	1927.64	8.12	1927.66
10.53	1927.68	10.62	1927.68	10.79	1927.67	11.12	1927.66	11.89	1927.66
15.46	1927.67	18.69	1927.67	23.97	1927.66	28.51	1927.66	33.56	1927.64
38.82	1927.64	49.27	1927.63	50.68	1927.62	51.71	1927.62	53.01	1927.61
53.52	1927.61	53.96	1927.61	60.7	1927.5	62.63	1927.47	69.83	1927.44
72.77	1927.4	74.11	1927.4	74.92	1927.4	81.19	1927.41	82.99	1927.38
87.16	1927.33	88.27	1927.31	91.53	1927.23	92.41	1927.2	94.5	1927.1
96.85	1927.01	96.9	1927.01	97.19	1927	109.62	1926.27	116	1925.3
138.41	1925	141.12	1924.99	141.54	1924.99	141.57	1924.99	150.12	1925.17
166.09	1925.58	168.59	1925.43	168.59	1926.43	169.09	1926.43	174.71	1927.15
174.71	1934.15								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	109.62	.013	116	.016	166.09	.013	169.09	.025

Bank Sta: Left 0 Right 169.09 Lengths: Left 50.01 Channel 50.01 Right 50.01 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 902

INPUT
 Description: adjacent to building on the left
 Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1926.7	1.41	1926.73	2.75	1926.76	3.85	1926.75	5.28	1926.71
7.09	1926.65	7.52	1926.63	10.48	1926.56	13.7	1926.47	19.54	1926.46
19.58	1926.52	20.43	1926.59	21.86	1926.63	23.03	1926.65	31.37	1926.73
32.98	1926.75	33.62	1926.75	35.15	1926.75	44.55	1926.72	59.08	1926.67
59.66	1926.67	67.68	1926.63	68.68	1926.63	70.06	1926.63	70.2	1926.63
71.5	1926.63	78.9	1926.65	82.88	1926.64	85.27	1926.63	86.99	1926.61
90.18	1926.57	93.04	1926.3	95.27	1926.18	96.42	1926.08	97.15	1926
100.08	1925.63	107.01	1925.38	117.9	1924.64	140.83	1924.34	166.07	1924.89
168.57	1924.74	168.57	1925.74	169.07	1925.74	178.05	1925.95	179.57	1925.98
188.56	1926.28	191.28	1926.38	191.53	1926.38	191.77	1926.38	193.75	1926.38
194.41	1926.37	194.7	1926.36	194.84	1926.35	195.11	1926.36	196.02	1926.36
196.54	1926.36	203.59	1926.4	204.22	1926.4	208.81	1926.44	209.63	1926.45
222.93	1926.6	223.14	1926.6	223.35	1926.6	223.53	1926.6	223.69	1926.6
226.95	1926.62	227.03	1926.62	229.5	1926.63	232.16	1926.65	232.22	1926.65
232.38	1926.65	244.46	1926.67						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	107.01	.013	117.9	.016	166.07	.013	168.57	.016

Bank Sta: Left 107.01 Right 168.57 Lengths: Left 50 Channel 50 Right 50 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 900

INPUT
 Description: adjacent to driveway on the left
 Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1926	4.25	1926	4.5	1926	4.94	1926	5.83	1926
7.89	1926	13.92	1925.85	17.44	1926	26.09	1926	26.98	1926
38.83	1926.11	39.64	1926	52.89	1926	79.24	1926	82.78	1926
85.4	1926	88.67	1926	89.96	1926	91.06	1926	91.43	1926
92.14	1926	93.62	1926	98.11	1926	99.41	1925.86	101.76	1925.57
107.15	1924.48	118.19	1924.09	118.31	1924.1	141.1	1923.73	165.898	1924.14
168.398	1923.99	168.398	1924.99	168.898	1924.99	178.37	1925.31	218.97	1925.92
227.68	1926	242.41	1926	242.54	1926	244.63	1926		

Manning's n Values num= 5
 Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val
 0 .016 107.15 .013 118.31 .016 165.898 .013 168.898 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 107.15 168.898 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 898

INPUT
 Description: adjacent to driveway left
 Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1925.23	1.71	1925.2	2.01	1925.2	2.6	1925.2	3.26	1925.21
4.23	1925.24	6.9	1925.33	23.9	1925	30.68	1925	33.64	1925
43.35	1925	48.14	1925	54.97	1925	55.25	1925	57.71	1925
58.19	1925	60.42	1925	60.74	1925	67.84	1925	68.01	1925
77.8	1924.8	85.64	1924.62	90.79	1924.49	100.78	1924	106.98	1923.81
118.18	1923.22	139.8	1923.08	141.34	1923.07	141.48	1923.07	141.54	1923.07
141.58	1923.07	141.68	1923.07	141.83	1923.07	142.7	1923.09	165.79	1923.45
168.28	1923.3	168.28	1924.3	168.78	1924.3	183.24	1924.39	214	1924.79
244.14	1924.68	244.18	1924.69	244.28	1924.69				

Manning's n Values num= 5
 Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val
 0 .025 106.98 .013 118.18 .016 165.79 .013 168.78 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 106.98 168.78 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 896

INPUT
 Description: adjacent to wall right and driveway on left
 Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1924.58	1.35	1924.6	5.06	1924.67	7.29	1924.7	8.5	1924.73
18.54	1925	26.41	1925	29.74	1925	31.63	1925	33.56	1924.97
39.89	1924.87	43.68	1924.81	49.39	1924.73	65.25	1924.5	68.22	1924.46
70.62	1924.44	81.97	1924.11	83.23	1924.1	86.07	1924	107.26	1923.19
117.96	1922.5	141.25	1922.45	141.54	1922.44	142.26	1922.44	143.28	1922.44
144.45	1922.46	145.97	1922.48	166.38	1922.74	168.88	1922.59	168.88	1923.59
169.38	1923.59	174.34	1923.83	182.27	1924.05	182.27	1931.05		

Manning's n Values num= 5
 Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val
 0 .016 107.26 .013 117.96 .016 166.38 .013 169.38 .025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 107.26 169.38 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 894

INPUT
 Description: adjacent to driveway entrances, both left & right
 Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1924.15	14.46	1924.68	21.68	1925	22.28	1925	24.09	1925
24.8	1925	25.03	1925	27.37	1925	27.44	1925	27.49	1925
30.57	1925	30.72	1925	34.54	1925	37.16	1925	40.84	1924.97
48.53	1924.9	57.49	1924.79	61.18	1924.68	63.52	1924.64	66.39	1924.56
66.9	1924.55	86.35	1924	90.66	1923.72	101.14	1923	106.65	1922.71
107.25	1922.68	118.09	1921.79	141.12	1921.84	141.54	1921.83	166.05	1921.99
173.4	1922.44	174.04	1922.45	175.85	1922.49	180.5	1922.61	184.03	1922.7
185.5	1922.73	187.79	1922.8	189.21	1922.82	189.22	1922.81	189.42	1922.81
189.69	1922.82	190.85	1922.83	191.44	1922.84	191.99	1922.86	193.19	1922.85
197.83	1922.81	200.19	1922.8	203.49	1922.82	208.28	1922.88	217.1	1923
221.67	1923.09	223.37	1923.11	224.96	1923.12	229.97	1923.12	240.26	1923.13
240.43	1923.13	241.14	1923.12	243.93	1923.13				

Manning's n Values num= 5
 Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val
 0 .025 107.25 .013 118.09 .016 166.05 .013 173.4 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 107.25 173.4 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 892

INPUT
 Description:
 Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1923.24	2.65	1923.28	4.51	1923.29	9.99	1923.32	14.24	1923.36
15.71	1923.37	16.99	1923.39	18.07	1923.39	20.5	1923.43	21.67	1923.43
22.99	1923.43	24.14	1923.45	24.95	1923.47	25.34	1923.5	25.84	1923.59
26.2	1923.62	26.72	1923.64	27.84	1923.68	27.98	1923.69	34.9	1923.69
35.04	1923.68	36.2	1923.64	37.63	1923.58	38.04	1923.57	38.52	1923.56
39.09	1923.55	39.78	1923.55	46.42	1923.52	49.71	1923.51	52.67	1923.5
55.34	1923.48	59.87	1923.45	76.62	1923	76.72	1923	76.81	1923
76.96	1923	87.13	1923	87.51	1923	89.01	1923	92.86	1923
93.45	1923	97.3	1923	98.4	1922.96	98.8	1922.96	106.5	1922.52
112.64	1922.18	115.41	1921.94	115.91	1921.94	115.91	1920.94	118.41	1921.09
141.54	1921.08	155.97	1921.15	158.53	1921.17	165.89	1921.2	168.38	1921.05
168.38	1922.05	168.88	1922.05	200.35	1922.86	200.35	1929.86		

Manning's n Values num= 5
 Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val
 0 .016 115.41 .013 118.41 .016 165.89 .013 168.88 .025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 115.41 168.88 50 50 50 .1 .3

115.41 168.88 50 50 50

CROSS SECTION

RIVER: FL
REACH: FL RS: 890

INPUT

Description: adjacent to wall on right

Station	Elevation	Data	num=	Sta	Elev	Sta	Elev	Sta	Elev
0	1922.66	.26	1922.66	3.95	1922.77	6.19	1922.83	9.27	1922.89
11.05	1923	15.89	1923	16.35	1923.01	16.76	1923.04	38.08	1923.05
38.5	1923.02	39.17	1923	57.16	1922.71	69.73	1922.51	71.23	1922.48
72.41	1922.47	73.35	1922.46	74.23	1922.46	77.82	1922.44	80.91	1922.43
83.46	1922.41	89.48	1922.31	90.32	1922.3	97.89	1922.12	99.1	1922.11
103.2	1922	103.43	1922	107.02	1921.37	116.2	1920.28	118.7	1920.43
125.8	1920.41	141.15	1920.36	166.43	1920.55	168.93	1920.4	168.93	1921.4
169.43	1921.4	174.57	1921.46	183.16	1921.62	183.16	1928.62		

Manning's n	Values	num=	Sta	n Val	Sta	n Val	Sta	n Val	
0	.016	107.02	.013	118.7	.016	166.43	.013	169.43	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
0	169.43		50	50	50		.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 888

INPUT

Description: adjacent to building at left near station 109.04

Station	Elevation	Data	num=	Sta	Elev	Sta	Elev	Sta	Elev
0	1922.3	2.02	1922.31	4.49	1922.33	11.48	1922.36	11.96	1922.36
20	1922.36	20.29	1922.37	20.5	1922.37	28.75	1922.4	31.46	1922.41
33.57	1922.42	35.74	1922.42	41.4	1922.4	48.06	1922.38	48.76	1922.38
50.1	1922.36	81.26	1922	95.19	1921.7	96.05	1921.67	97.54	1921.61
103.43	1921.37	109.04	1921.22	111.79	1921.02	111.83	1921.02	112.29	1921
115.05	1920.6	115.55	1920.6	115.55	1919.6	118.05	1919.75	125.59	1920
127.92	1919.94	132.18	1919.83	137.55	1919.67	137.71	1919.67	139.66	1919.62
141.16	1919.59	141.54	1919.59	142.27	1919.6	143.27	1919.62	145.18	1919.69
146.25	1919.72	147.9	1919.76	160.66	1920	160.69	1920	165.34	1919.92
166.48	1919.88	168.98	1919.74	168.98	1920.58	169.48	1920.58	182.28	1921.1
182.28	1928.1								

Manning's n	Values	num=	Sta	n Val	Sta	n Val	Sta	n Val	
0	.016	115.05	.013	118.05	.016	166.48	.013	169.48	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
0	169.48		50	50	50		.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 886

INPUT

Description:

Station	Elevation	Data	num=	Sta	Elev	Sta	Elev	Sta	Elev
0	1921.56	8.19	1921.6	11.27	1921.64	13.08	1921.66	14.9	1921.68
16.67	1921.69	18.33	1921.69	19.8	1921.68	21.01	1921.68	22.01	1921.67
22.91	1921.65	23.77	1921.64	24.6	1921.62	26.9	1921.57	27.88	1921.56
30.19	1921.57	32.19	1921.58	33.37	1921.57	35.5	1921.56	37.14	1921.55
42.4	1921.53	47.75	1921.51	53.14	1921.49	61.06	1921.46	62.27	1921.45
63.73	1921.44	69.95	1921.34	70.43	1921.34	81.18	1921.16	81.74	1921.15
90.12	1921	99.97	1920.68	102.13	1920.6	114.61	1920	115.78	1919.79
116.28	1919.79	116.28	1918.79	118.78	1918.94	140.82	1918.78	141.28	1918.77
141.54	1918.77	141.58	1918.77	166.38	1919.13	168.88	1918.98	168.88	1919.98
169.38	1919.98	186.42	1921.01	186.42	1928.01				

Manning's n	Values	num=	Sta	n Val	Sta	n Val	Sta	n Val	
0	.016	115.78	.013	118.78	.016	166.38	.013	169.38	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
115.78	169.38		50	50	50		.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 884

INPUT

Description: adjacent to wall right side

Station	Elevation	Data	num=	Sta	Elev	Sta	Elev	Sta	Elev
0	1920.9	2.06	1920.88	6.28	1920.9	10.97	1920.9	12.04	1920.89
16.45	1920.88	17.43	1920.88	21.15	1920.86	22.55	1920.85	25.74	1920.82
27.52	1920.82	30.46	1920.79	33.03	1920.76	37.05	1920.74	38.3	1920.74
40.1	1920.72	42.98	1920.68	49.04	1920.61	50.77	1920.6	52.75	1920.58
55.15	1920.57	61.79	1920.56	63.15	1920.54	66.31	1920.52	67.57	1920.51
68.84	1920.49	77.37	1920.36	83.04	1920.35	86.14	1920.28	94.12	1920.1
94.36	1920.1	98.4	1920	111.95	1919.33	115.31	1919.1	115.81	1919.1
115.81	1918.1	118.31	1918.15	137.53	1918.13	141.54	1918.11	166.18	1918.44
168.68	1918.29	168.68	1919.29	169.18	1919.29	174.43	1919.62	175.44	1919.69
181.26	1920	208	1920.39	208	1927.39				

Manning's n	Values	num=	Sta	n Val	Sta	n Val	Sta	n Val	
0	.025	115.31	.013	118.31	.016	166.18	.013	169.18	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
115.31	169.18		50	50	50		.1	.3

CROSS SECTION

RIVER: FL
REACH: FL RS: 882

INPUT

Description: adjacent to driveway on the left

Station Elevation Data				num=	48	Station Elevation Data				num=	48
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1920.24	15.7	1920.07	16.05	1920.07	16.44	1920.07	26.42	1920.01		
26.48	1920.01	28.34	1920	34.89	1919.97	35.32	1919.97	44.87	1919.94		
53.91	1919.92	54.61	1919.91	55.71	1919.9	57.38	1919.88	71.56	1919.84		
73.61	1919.81	76.04	1919.75	78.09	1919.7	80.54	1919.64	82.99	1919.57		
85.63	1919.49	88.81	1919.45	90.33	1919.4	99.42	1919.15	101.01	1919.12		
101.6	1919.11	102.54	1919.09	105	1919	109.33	1918.48	118.48	1917.56		
123.11	1917.52	137.44	1917.38	140.81	1917.34	165.1	1917.37	165.68	1917.37		
168.18	1917.22	168.18	1918.22	168.68	1918.22	211	1920.12	214.97	1920.16		
220.32	1920.21	228.5	1920.22	232.56	1920.26	234.47	1920.27	236.01	1920.27		
237.46	1920.27	240.57	1920.24	242.88	1920.22						

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	109.33	.013	118.48	.016	165.1	.013	168.68	.025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 109.33 168.68 50 50 50 .1 .3

CROSS SECTION

RIVER: FL

REACH: FL

RS: 880

INPUT

Description:

Station Elevation Data				num=	50							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1919.73	1.09	1919.72	2.83	1919.7	7.87	1919.66	10.98	1919.63			
41.77	1919.41	44.76	1919.38	47.91	1919.36	52.05	1919.34	54.93	1919.32			
65.93	1919.25	68.39	1919.24	70.72	1919.24	77.02	1919.19	86.96	1919.1			
95.29	1919	103.2	1918.54	104.39	1918.45	111.09	1918	112.76	1917.78			
115.48	1917.63	115.98	1917.63	115.98	1916.63	118.48	1916.78	140.96	1916.61			
141.54	1916.64	166.7	1916.98	169.2	1916.83	169.2	1917.83	169.7	1917.83			
209.19	1919.52	210.02	1919.58	211.24	1919.58	214.37	1919.54	216.31	1919.5			
218.19	1919.47	221.06	1919.43	224.89	1919.4	229.24	1919.38	233.49	1919.21			
235.21	1919.15	235.56	1919.14	235.69	1919.14	235.77	1919.15	235.94	1919.15			
236.24	1919.15	236.65	1919.15	237.61	1919.14	238.97	1919.13	242.7	1919.13			

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	118.48	.016	166.7	.013	169.7	.025	216.31	.016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 115.48 169.7 50 50 50 .1 .3

CROSS SECTION

RIVER: FL

REACH: FL

RS: 878

INPUT

Description: adjacent to driveway on the left

Station	Elevation	Data	num=	101	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1919.27	6.6	1919.17	11.48	1919.11	16.03	1919.06	20.22	1919.04				
24.54	1919.02	34.8	1919.01	39.09	1919	39.97	1919	39.99	1919				
44	1918.97	44.03	1918.97	44.23	1918.97	44.36	1918.97	44.6	1918.97				
44.88	1918.97	45.33	1918.97	45.37	1918.97	45.47	1918.97	46.29	1918.95				
52.25	1918.9	52.43	1918.89	53.65	1918.88	53.9	1918.88	54.05	1918.88				
54.15	1918.88	54.41	1918.87	54.59	1918.87	54.95	1918.86	55.24	1918.85				
58.48	1918.79	77.66	1918.41	85.23	1918.28	92.37	1918.15	96.2	1918.06				
98.89	1918	103.27	1917.61	107.12	1917	116.12	1915.7	118.62	1915.85				
137.95	1915.88	139.53	1915.88	166.44	1916.22	168.94	1916.07	168.94	1917.07				
169.44	1917.07	178.61	1917.46	181.63	1917.71	184.94	1918	185.05	1918				
187.4	1918.12	188.26	1918.16	188.33	1918.16	188.44	1918.26	189.11	1918.29				
190.72	1918.33	191.56	1918.35	193.13	1918.39	193.92	1918.4	194.62	1918.4				
195.51	1918.4	201.47	1918.4	204.92	1918.4	206.39	1918.4	206.96	1918.41				
207.21	1918.41	208.67	1918.46	209.21	1918.48	221.21	1918.4	223.23	1918.29				
225.01	1918.21	226.57	1918.15	227.04	1918.15	227.5	1918.14	228.62	1918.14				
229.17	1918.13	229.61	1918.13	230.2	1918.13	230.89	1918.12	231.92	1918.14				
233.42	1918.14	236.52	1918.13	248.6	1918.06	248.99	1918.06	249.39	1918.06				
255.64	1918.03	255.99	1918.03	260.6	1918.02	260.77	1918.02	264.4	1918.03				
268	1918.02	270.68	1918	272.93	1917.98	272.95	1917.98	286.91	1917.83				
287.03	1917.83	289.97	1917.81	300.53	1917.8	300.82	1917.8	301.18	1917.8				
314.24	1917.8												

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	107.12	.013	118.62	.016	166.44	.013	168.94	.025
209.21	.016								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 107.12 169.44 50 50 50 .1 .3

CROSS SECTION

RIVER: FL

REACH: FL

RS: 876

INPUT

Description: adjacent to building on right

Station	Elevation	Data	num=	90	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1918.21	21.15	1918.2	21.56	1918.2	27.43	1918.2	30.3	1918.19				
31.86	1918.19	33.53	1918.19	34.96	1918.19	35.91	1918.19	36.5	1918.2				
36.87	1918.2	39.03	1918.25	41.11	1918.28	43.39	1918.28	48.4	1918.37				
56.88	1918.38	64.74	1918.39	65.45	1918.4	68.27	1918.41	69.66	1918.42				
73.56	1918.44	75.91	1918.46	84.78	1918.48	90.1	1918.52	92.66	1918.53				
93.12	1918.53	93.76	1918.52	98.99	1918.47	100.39	1918.47	103.71	1918.45				
104.72	1918.44	113.13	1918.41	114.68	1918.38	120.48	1918.36	124.93	1918.27				
126.5	1918.24	127.58	1918.23	128.45	1918.22	129.35	1918.22	131.47	1918.21				
139.79	1918.2	140.73	1918.2	148.65	1918.18	149.36	1918.17	150.3	1918.17				
156.55	1918.2	160.68	1918.21	168.14	1918.21	177.01	1918.2	191.23	1918.01				
191.59	1918	192.42	1917.96	194.46	1917.89	196.19	1917.87	197.77	1917.86				
200.49	1917.82	201.07	1917.78	201.52	1917.75	202.71	1917.86	202.71	1916.3				
211.38	1916.1	211.88	1916.1	211.88	1915.1	214.38	1915.25	236.75	1915.2				
236.76	1915.2	261.17	1915.59	263.67	1915.44	263.67	1916.44	264.17	1916.44				
275.25	1916.98	275.29	1916.98	275.3	1916.98	275.33	1916.98	275.35	1916.98				
275.55	1917	281.04	1917.17	289.81	1917.43	292.13	1917.49	293.79	1917.52				
295.56	1917.54	296.12	1917.57	296.89	1917.58	298.06	1917.64	299.71	1917.68				

COLTON-RAS.rep
1925

300.76	1917.7	301.81	1917.71	306.07	1918	307.58	1918	307.58	1918
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Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	211.38	.013	214.38	.016	261.17	.013
0	.016	211.38	.013	214.38	.016	261.17	.013

Bank Sta: Left 0 Right 263.67 Lengths: Left 50 Channel 50 Right 50 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 874

INPUT
Description: adjacent to valley gutter on left

Station	Elevation	Data	num=	213			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1917.59	8.41	1917.59	11.01	1917.61	37.96	1918
44.23	1918	51.66	1918	52.27	1918	53.62	1918
54.32	1918	54.54	1918	57.15	1918	57.31	1918
64.63	1918	65.72	1918	71.52	1918	73.59	1918
77.11	1918	85.01	1918	85.75	1918	88.41	1918
92.23	1918	92.73	1918	93.84	1918	94.53	1918
97.48	1918	98.1	1918	98.69	1918	99.75	1918
101.16	1918	101.86	1918	103.77	1918	104.75	1918
107	1918	108.09	1918	141.46	1917.08	143.12	1917
167.69	1916	176.51	1915.73	199.35	1915	206.97	1914.78
216.37	1914.54	222.98	1914.39	223.62	1914.38	224.05	1914.37
225.3	1914.35	225.63	1914.35	225.94	1914.35	226.18	1914.35
227.51	1914.42	228.32	1914.42	269.36	1915.07	271.85	1914.96
272.35	1915.95	277.1	1916	278.76	1916.12	281.63	1916.29
283.09	1916.45	283.31	1916.46	288.18	1916.51	288.75	1916.51
293.48	1916.52	293.93	1916.54	294.5	1916.59	296.74	1916.81
297.76	1916.89	301.02	1917	303.09	1917	309.62	1917
312.75	1917	321.09	1917.65	326.96	1918	331.96	1918
332.72	1918	333.25	1918	333.61	1918	361.51	1918
369.35	1918	371.82	1918	374.99	1917.63	375.7	1917.56
376.88	1917.55	378.45	1917.53	379.08	1917.53	379.45	1917.59
380.16	1917.73	380.9	1917.74	383.39	1917.64	384.49	1917.57
386.88	1917.37	389.53	1917.1	389.84	1917.08	390.11	1917.06
398.98	1916.8	399.18	1916.8	401.48	1916.74	402.49	1916.74
405.48	1916.76	405.99	1916.75	406.03	1916.75	406.56	1916.77
408.22	1916.77	408.53	1916.77	409.82	1916.75	412.61	1916.72
413.64	1916.71	413.97	1916.71	415.03	1916.7	415.68	1916.69
416.82	1916.68	418.59	1916.65	418.89	1916.64	422.34	1916.59
429.23	1916.48	431.79	1916.43	434.34	1916.4	436.76	1916.37
440.67	1916.32	444.75	1916.28	449	1916.23	450.4	1916.21
450.76	1916.21	451.1	1916.21	451.44	1916.21	452.9	1916.22
455.49	1916.23	457.43	1916.23	458.39	1916.23	459.36	1916.23
462.1	1916.26	463.04	1916.26	477.55	1916.15	482.56	1916.12
483.84	1916.12	483.94	1916.13	484.29	1916.13	484.92	1916.14
485.95	1916.16	486.3	1916.17	487.16	1916.19	489.35	1916.17
493.93	1916.26	495.87	1916.32	506.22	1916.62	509.71	1916.73
519.02	1917	519.68	1917	522.06	1917.04	524	1917.05
531.82	1917.12	536.03	1917.14	540.11	1917.14	541.31	1917.15
541.36	1917.15	551.15	1917.15	551.25	1917.15	557.08	1917.15
565.87	1917.17	568.5	1917.15	568.76	1917.15	569.16	1917.15
580.53	1917.08	589.09	1917	592.34	1917	592.53	1917
595.05	1917	595.26	1917	596.74	1916.92	602.56	1916.88
616.18	1916.85	616.54	1916.86	620.1	1916.86	608.08	1916.86

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	206.97	.013	216.37	.016	269.36	.013
0	.016	206.97	.013	216.37	.016	269.36	.013

Bank Sta: Left 0 Right 272.35 Lengths: Left 50 Channel 50 Right 50 Coeff Contr. .1 Expan. .3

Right Levee Station= 326.96 Elevation= 1918

CROSS SECTION

RIVER: FL
REACH: FL RS: 872

INPUT
Description: adjacent to wall on the left, curb on the right

Station	Elevation	Data	num=	120			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
185.36	1918	186.42	1918	190.77	1918	191.96	1925
213.77	1917	215.23	1916.39	216.19	1916	216.48	1915.86
220.41	1914.13	220.69	1914	221.52	1914	221.62	1914
232.58	1913.84	233	1913.84	241.61	1913.97	242.77	1914
257.15	1914.66	265.18	1915	268.66	1915.18	277.72	1915.64
285.97	1915.77	285.97	1916.77	286.47	1916.77	294.85	1917
301.5	1917.14	304.88	1917.2	308.08	1917.25	311.64	1917.3
314.43	1917.33	320.59	1917.37	322	1917.39	335.63	1917.41
337.49	1917.31	337.9	1917.32	341.11	1917.24	341.52	1917.27
346.67	1917	357.77	1917	363.51	1917	366.28	1917
371.37	1917	376.76	1917	386.48	1917	391.72	1917
400.76	1917	403.22	1917	404.02	1917	407.52	1916.79
409.45	1916.67	409.78	1916.66	410.19	1916.64	410.9	1916.59
416.59	1916.13	416.9	1916.11	418.19	1916	418.26	1916
418.48	1916	419.03	1916	422.17	1916	435.07	1916
447.82	1916	447.97	1916	448.58	1916	449.71	1916
450.03	1916	451.37	1916.08	454.75	1916.1	455.73	1916.1
459.58	1916.08	465.59	1916.05	467.32	1916.04	467.6	1916.04
470.16	1916.03	471.3	1916.02	472.3	1916.01	472.96	1916
474.95	1916	475.4	1916	475.46	1916	476.33	1916
478.54	1916	483.25	1916	504.77	1916	508.82	1916
511.97	1916	514.09	1916	520.25	1916	523.04	1916.15
537.18	1916.51	551.13	1916.31	560.42	1916.17	573.11	1916
612.94	1916	622.24	1916	622.85	1916	633.87	1916.08

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
185.36	.025	213.77	.013	232.58	.016	283.47	.013
185.36	.025	213.77	.013	232.58	.016	283.47	.013

Bank Sta: Left 213.77 Right 285.97 Lengths: Left 50.27 Channel 50.27 Right 50.27 Coeff Contr. .1 Expan. .3

Right Levee Station= 335.63 Elevation= 1917.41

CROSS SECTION

RIVER: FL
 REACH: FL RS: 870

INPUT
 Description: adjacent to wall on left, curb on right

Station Elevation Data		num= 85									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
203.62	1918	203.91	1917.99	205.44	1917.95	208.05	1917.92	209.03	1917.95		
209.22	1917.92	210.03	1917.9	210.89	1917.8	216.73	1924	216.73	1917		
217.23	1916.8	219.56	1916	219.71	1915.92	220.29	1915.61	221.36	1915		
222.7	1914.26	223.12	1914	223.33	1913.88	224.84	1913	226.74	1913		
227.86	1913	229.89	1913	230.38	1913	230.88	1913	232.66	1913.02		
236.47	1913.07	239.3	1913.29	240.96	1913.44	243.77	1913.59	245.22	1913.7		
247.69	1914	248.66	1914.11	254.42	1914.44	257.02	1914.59	264.01	1915		
273.38	1915.3	278.02	1915.45	281.22	1915.55	285.12	1915.65	287.36	1915.69		
291.53	1915.77	316.19	1915.68	318.69	1915.53	318.69	1916.11	319.19	1916.11		
320.89	1916	322	1916	324.83	1916	331.18	1916	331.24	1916		
332.08	1916	333.86	1916	351.62	1915.22	352.04	1915.2	353.67	1915.14		
353.71	1915.14	353.77	1915.14	377.38	1915.74	382.56	1915.71	408.36	1915.55		
409.29	1915.54	421.17	1915.54	421.47	1915.54	446.42	1916	457.84	1916		
457.86	1916	459.04	1916	459.1	1916	459.19	1916	459.41	1916		
459.47	1916	466.27	1916	678.83	1916.91	686.47	1916.94	689.21	1916.96		
691.37	1916.97	693.92	1916.98	694.6	1916.98	695.01	1916.98	695.2	1916.98		
695.74	1917	696.7	1917	697.25	1917	699.38	1917	703.13	1917		

Manning's n Values		num= 5									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
203.62	.025	217.23	.013	248.66	.016	316.19	.013	318.69	.016		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	219.71	318.69		50.29	50.29		.1	.3
Right Levee	Station=		318.69	Elevation=		1916.11		

CROSS SECTION

RIVER: FL
 REACH: FL RS: 868

INPUT
 Description: adjacent to wall on the left, upstream of lose road crossing

Station Elevation Data		num= 96									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
193.32	1917.5	194.01	1924.45	194.01	1917.45	199.39	1917.43	200.97	1917.42		
201.36	1917.41	202.27	1917.39	204.04	1917.35	206.71	1917.27	208.7	1917.23		
209.52	1917.2	210.89	1917.12	212.97	1917.04	214	1917	215.17	1916.82		
221.37	1916	221.94	1915.58	222.81	1915	223.78	1914.31	224.21	1914		
224.76	1913.62	225.61	1912.33	241.79	1912.33	245.66	1912.33	246.04	1913		
246.36	1913	246.66	1913.27	247.57	1914	247.71	1914.12	248.57	1914.79		
248.79	1915	251.14	1915	259.31	1915	260.27	1915	262.19	1915		
262.66	1915	263.82	1915	266.07	1915	268.76	1915	298.77	1915.49		
298.96	1915.48	299.66	1915.46	299.94	1915.46	300.93	1915.46	304.28	1915.32		
308.1	1915.48	309.94	1915.48	311.6	1915.48	376.64	1915.17	376.76	1915.16		
380.22	1915.02	391.69	1915.01	406.39	1915	406.82	1915	408.76	1914.98		
416.61	1915	423	1915.01	423.34	1915.01	423.57	1915.01	424.12	1915.02		
424.13	1915.02	464.71	1915.15	466.19	1915.16	477.81	1915.21	481.39	1915.23		
485.5	1915.25	488.09	1915.28	492.91	1915.3	503.36	1915.33	533.03	1916		
534.32	1916	537.38	1916	544.54	1916	554.66	1916	558	1916		
559.71	1916	561.51	1916	569.13	1916	578.75	1916	580.74	1916		
583.11	1916	586.25	1916	587.98	1916	588.45	1916	610.52	1916		
612.32	1916	620.62	1916	624.93	1916	626.45	1916	637.74	1916		
644.32	1916	667.06	1916	671.19	1916	676.95	1916	692.54	1916		
710.95	1916										

Manning's n Values		num= 3									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
193.32	.025	215.17	.013	248.79	.016						
Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.			
	221.94	248.79		126.58	121.96	114.38	.1	.3			

CULVERT

RIVER: FL
 REACH: FL RS: 867

INPUT
 Description:
 Distance from Upstream XS = 1
 Deck/Roadway Width = 115
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates
 num= 2
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 221.94 1915.73 1912 248.79 1915.73 1912

Upstream Bridge Cross Section Data		num= 96									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
193.32	1917.5	194.01	1924.45	194.01	1917.45	199.39	1917.43	200.97	1917.42		
201.36	1917.41	202.27	1917.39	204.04	1917.35	206.71	1917.27	208.7	1917.23		
209.52	1917.2	210.89	1917.12	212.97	1917.04	214	1917	215.17	1916.82		
221.37	1916	221.94	1915.58	222.81	1915	223.78	1914.31	224.21	1914		
224.76	1913.62	225.61	1912.33	241.79	1912.33	245.66	1912.33	246.04	1913		
246.36	1913	246.66	1913.27	247.57	1914	247.71	1914.12	248.57	1914.79		
248.79	1915	251.14	1915	259.31	1915	260.27	1915	262.19	1915		
262.66	1915	263.82	1915	266.07	1915	268.76	1915	298.77	1915.49		
298.96	1915.48	299.66	1915.46	299.94	1915.46	300.93	1915.46	304.28	1915.32		
308.1	1915.48	309.94	1915.48	311.6	1915.48	376.64	1915.17	376.76	1915.16		
380.22	1915.02	391.69	1915.01	406.39	1915	406.82	1915	408.76	1914.98		
416.61	1915	423	1915.01	423.34	1915.01	423.57	1915.01	424.12	1915.02		
424.13	1915.02	464.71	1915.15	466.19	1915.16	477.81	1915.21	481.39	1915.23		
485.5	1915.25	488.09	1915.28	492.91	1915.3	503.36	1915.33	533.03	1916		
534.32	1916	537.38	1916	544.54	1916	554.66	1916	558	1916		
559.71	1916	561.51	1916	569.13	1916	578.75	1916	580.74	1916		
583.11	1916	586.25	1916	587.98	1916	588.45	1916	610.52	1916		
612.32	1916	620.62	1916	624.93	1916	626.45	1916	637.74	1916		
644.32	1916	667.06	1916	671.19	1916	676.95	1916	692.54	1916		
710.95	1916										

Manning's n Values		num= 3									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
193.32	.025	215.17	.013	248.79	.016						

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	221.94	248.79		.1	.3

Downstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
308.9 1914.21 1909 333.19 1914.21 1909

Downstream Bridge Cross Section Data

Station Elevation Data num= 80
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-53.89 1914 0 1913 17.62 1913 19.29 1913 20.93 1913
25.44 1913 42.61 1913.37 50.1 1913.37 56.54 1913.36 61.6 1913.33
71.44 1913.26 78.29 1913.22 85.79 1913.19 89.71 1913.2 99.74 1913.17
102.92 1913.18 105.04 1913.18 107.25 1913.2 112.06 1913.21 122.57 1913.32
127.88 1913.37 133.02 1913.39 138.21 1913.38 143.91 1913.34 150.03 1913.29
158.74 1913.31 163.57 1913.28 168.53 1913.27 173.76 1913.27 186.78 1913.31
192.78 1913.33 198.55 1913.35 206.25 1913.38 208.07 1913.4 210.6 1913.42
211.24 1913.42 213.13 1913.42 224.77 1913.44 226.26 1913.44 233.03 1913.46
244.27 1914 250.95 1914 261.62 1914 264.52 1914 266.38 1914
269.48 1914 270.04 1914 272.08 1914 276.08 1914 291.2 1914
291.47 1914 291.76 1914 292.01 1914 299.34 1914 301.24 1914
302.27 1914 308.9 1914.21 309.48 1909.59 318.08 1909.59 331.45 1909.59
333.19 1914.25 357.58 1914.12 358.21 1914.13 358.97 1914.14 359.89 1914.14
360.62 1914.15 361.09 1914.15 361.66 1914.16 362.1 1914.16 362.83 1914.17
364.08 1914.19 369.44 1914.27 378.09 1914.4 381.92 1914.46 385.9 1914.51
400.58 1914.68 432.04 1915 433.29 1915.01 433.32 1915.01 451.25 1915.07

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
-53.89 .016 308.9 .03 333.19 .016

Bank Sta: Left Right Coeff Contr. Expan.
308.9 333.19 .1 .3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 1915.73
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span
Culvert #1 Box 3 8
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
1 115 .013 .013 0 .5 1
Upstream Elevation = 1912.33
Centerline Station = 230.62
Downstream Elevation = 1909.59
Centerline Station = 315.19

Culvert Name Shape Rise Span
Culvert #2 Box 3 8
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
1 115 .013 .013 0 .5 1
Upstream Elevation = 1912.33
Centerline Station = 240.62
Downstream Elevation = 1909.59
Centerline Station = 325.19

CROSS SECTION

RIVER: FL
REACH: FL RS: 866

INPUT

Description: downstream of losee road existing culvert crossing

Station Elevation Data num= 80
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-53.89 1914 0 1913 17.62 1913 19.29 1913 20.93 1913
25.44 1913 42.61 1913.37 50.1 1913.37 56.54 1913.36 61.6 1913.33
71.44 1913.26 78.29 1913.22 85.79 1913.19 89.71 1913.2 99.74 1913.17
102.92 1913.18 105.04 1913.18 107.25 1913.2 112.06 1913.21 122.57 1913.32
127.88 1913.37 133.02 1913.39 138.21 1913.38 143.91 1913.34 150.03 1913.29
158.74 1913.31 163.57 1913.28 168.53 1913.27 173.76 1913.27 186.78 1913.31
192.78 1913.33 198.55 1913.35 206.25 1913.38 208.07 1913.4 210.6 1913.42
211.24 1913.42 213.13 1913.42 224.77 1913.44 226.26 1913.44 233.03 1913.46
244.27 1914 250.95 1914 261.62 1914 264.52 1914 266.38 1914
269.48 1914 270.04 1914 272.08 1914 276.08 1914 291.2 1914
291.47 1914 291.76 1914 292.01 1914 299.34 1914 301.24 1914
302.27 1914 308.9 1914.21 309.48 1909.59 318.08 1909.59 331.45 1909.59
333.19 1914.25 357.58 1914.12 358.21 1914.13 358.97 1914.14 359.89 1914.14
360.62 1914.15 361.09 1914.15 361.66 1914.16 362.1 1914.16 362.83 1914.17
364.08 1914.19 369.44 1914.27 378.09 1914.4 381.92 1914.46 385.9 1914.51
400.58 1914.68 432.04 1915 433.29 1915.01 433.32 1915.01 451.25 1915.07

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
-53.89 .016 308.9 .03 333.19 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
308.9 333.19 49.01 52.94 60.67 .1 .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 864

INPUT

Description: adjacent to building on the right

Station Elevation Data num= 98
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-86.5 1914 0 1912.85 10.51 1912.88 11.97 1912.88 12.7 1912.88
13.4 1912.88 14.19 1912.87 23.63 1912.89 34.39 1912.9 38.21 1912.89
48.97 1912.88 49.58 1912.88 59.08 1912.86 59.62 1912.86 66.85 1912.83
67.8 1912.84 79.46 1912.78 85.82 1912.75 88.37 1912.77 90.95 1912.79
92.88 1912.81 93.93 1912.82 94.43 1912.83 94.74 1912.83 95.14 1912.83
95.8 1912.83 96.88 1912.82 98.41 1912.82 101.55 1912.75 101.71 1912.74
102.4 1912.73 103.29 1912.72 110.43 1912.7 111.19 1912.69 120.07 1912.68
121.8 1912.68 123.43 1912.68 130.44 1912.76 135.93 1912.8 136.27 1912.8

142.9	1912.82	143.19	1912.82	143.48	1912.82	150.08	1912.8	150.37	1912.8
156.14	1912.76	156.45	1912.77	161.35	1912.73	165.75	1912.71	170.31	1912.7
175.56	1912.71	181.76	1912.71	188.25	1912.72	188.81	1912.73	199	1912.75
201.99	1912.76	207.07	1912.78	208.05	1912.78	209.91	1912.78	211.88	1912.78
215.16	1912.78	229	1912.81	230.38	1912.82	233.64	1912.84	234.97	1912.84
237.7	1912.85	239.15	1912.86	244.67	1912.89	253.29	1912.94	262.51	1913
293.14	1913.378	293.27	1913.38	301.35	1909.19	317.68	1909.06	317.68	1914.1
355.61	1914.66	362.22	1914.77	363.23	1914.79	368.31	1914.86	370.01	1914.88
370.64	1914.89	371.24	1914.9	371.84	1914.91	372.41	1914.91	372.87	1914.92
375.09	1914.93	375.36	1914.94	375.7	1914.95	375.84	1914.95	375.99	1914.96
376.14	1914.96	376.29	1914.96	376.44	1914.96	376.8	1914.96	376.99	1914.96
377.14	1914.96	379.54	1914.96	379.54	1921.96				

Manning's n Values num= 3
Sta n Val Sta n Val
-86.5 .016 293.27 .03 317.68 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
293.27 317.68 55.28 49.71 55.28 .1 .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 862

INPUT
Description: adjacent to building on the right

Station Elevation Data		num= 91		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
-142.84	1914	0	1912.19	6.33	1912.19	11.13	1912.19	15.77	1912.19		
20.95	1912.18	22.87	1912.18	25.07	1912.18	56.19	1912.1	57.36	1912.1		
62.11	1912.09	63.04	1912.08	66.64	1912.1	67.44	1912.09	72.59	1912.13		
74.45	1912.12	75.46	1912.12	84.53	1912.18	93.71	1912.25	100.59	1912.31		
104.32	1912.36	106.09	1912.39	107.2	1912.4	108.61	1912.4	110.97	1912.39		
114.81	1912.37	120.24	1912.37	131.43	1912.11	132.01	1912.08	134.44	1912.04		
137.63	1912	137.65	1912	137.77	1912	137.86	1912	143.17	1912		
144.01	1912	145.12	1912	145.7	1912	146.57	1912	148.34	1912.02		
148.67	1912.02	148.76	1912.02	148.93	1912.03	148.96	1912.03	149.02	1912.02		
149.08	1912.02	149.18	1912.02	149.63	1912.03	149.67	1912.03	149.78	1912.03		
149.82	1912.03	149.91	1912.03	149.95	1912.03	150.13	1912.03	150.4	1912.03		
151.32	1912.04	151.38	1912.04	153.18	1912.05	153.25	1912.05	153.47	1912.05		
156.23	1912.07	156.66	1912.08	157.48	1912.08	158.24	1912.09	171.22	1912.2		
238.69	1912.77	264.75	1913	265.03	1913	265.42	1913.3	275.08	1908.9		
291.59	1908.85	293.391	1914	293.98	1914	294.02	1914	294.11	1914		
294.33	1914	294.47	1914	295.8	1914	305.97	1914	309.25	1914.1		
311.95	1914.16	314.67	1914.2	317.36	1914.23	320.07	1914.24	322.95	1914.25		
329.49	1914.25	332.84	1914.26	335.71	1914.28	336.42	1914.28	355	1914.38		
355	1921.38										

Manning's n Values num= 3
Sta n Val Sta n Val
-142.84 .016 265.42 .03 293.391 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
265.42 293.391 50.01 50.01 50.01 .1 .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 860

INPUT
Description: adjacent to building on right

Station Elevation Data		num= 62		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
-170.65	1913	0	1911.72	7.32	1911.72	15.59	1911.73	19.89	1911.73		
22.02	1911.72	26.22	1911.72	30.84	1911.71	32.81	1911.71	57.92	1911.68		
61.31	1911.67	64.13	1911.68	68.58	1911.69	76.57	1911.73	87.3	1911.78		
98.75	1911.84	108.42	1911.9	115.47	1911.95	115.83	1911.95	116.17	1911.95		
119.9	1911.97	120.2	1911.97	120.36	1911.97	120.57	1911.97	120.77	1911.98		
122.57	1911.97	124.79	1911.95	129.22	1911.93	137.33	1911.93	148.86	1911.95		
163.3	1911.98	168.81	1912	190.85	1912.19	211.68	1912.37	222.14	1912.58		
230.51	1912.68	239.17	1912.88	240.58	1912.9	244.43	1912.99	244.98	1913		
245.1	1913.03	245.26	1913.09	245.62	1912.28	258.25	1908.87	271.41	1908.84		
272.4	1913.33	272.83	1913.31	273.61	1913.32	274.65	1913.33	275.88	1913.33		
278.76	1913.33	280.35	1913.34	282.08	1913.36	284.12	1913.39	286.89	1913.46		
291.23	1913.59	304.45	1914	314.58	1914.09	325.63	1914.19	332.65	1914.25		
335.03	1914.27	335.03	1921.27								

Manning's n Values num= 3
Sta n Val Sta n Val
-170.65 .016 245.26 .03 272.4 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
245.26 272.4 53.5 53.5 53.5 .1 .3

CROSS SECTION

RIVER: FL
REACH: FL RS: 858

INPUT
Description: adjacent to building on right

Station Elevation Data		num= 64		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
-223.18	1913	0	1911.5	1.96	1911.5	15.14	1911.51	20.52	1911.51		
26.32	1911.51	29.35	1911.51	33.16	1911.5	36.08	1911.5	39.28	1911.5		
42.74	1911.5	60.21	1911.47	62.57	1911.47	64.54	1911.47	67.65	1911.48		
73.23	1911.51	80.74	1911.54	88.77	1911.58	95.57	1911.63	100.52	1911.66		
102.86	1911.67	104.97	1911.67	107.64	1911.69	110.93	1911.7	112.82	1911.71		
115.08	1911.72	117.36	1911.73	118.72	1911.73	120.38	1911.71	123.71	1911.7		
129.81	1911.7	138.5	1911.71	149.39	1911.74	159.89	1911.77	161.67	1911.77		
172.25	1911.79	180.88	1911.81	186.11	1911.82	188.61	1911.83	189.76	1911.84		
190.76	1911.84	191.71	1911.84	192.81	1911.84	193.55	1911.84	196.62	1911.86		
220.73	1911.98	224.3	1912	224.76	1912	225.71	1912	225.76	1911.68		
236.17	1908.82	251.71	1908.59	254.44	1913.21	267.8	1913.57	279.96	1914		
279.97	1914	280.09	1914	298.34	1914	299.1	1914.04	303.92	1914.19		
309.07	1914.27	314.1	1914.31	317.26	1914.34	317.26	1921.34				

Manning's n Values num= 3
Sta n Val Sta n Val
-223.18 .016 224.76 .03 254.44 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
224.3 254.44 43.63 47.1 50.73 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 856

INPUT

Description: adjacent to building on the right

Station Elevation Data		num= 75									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-229.84	1913	0	1911.39	.98	1911.38	3.87	1911.38	6.89	1911.38		
10.55	1911.37	20.61	1911.37	24.63	1911.37	28.9	1911.37	31.11	1911.37		
36.14	1911.35	38.21	1911.35	40.46	1911.34	45.03	1911.34	56.92	1911.32		
58.49	1911.31	59.79	1911.32	61.83	1911.32	65.45	1911.34	70.25	1911.35		
75.29	1911.38	79.47	1911.4	82.48	1911.42	86.29	1911.43	89.75	1911.44		
91.4	1911.45	97.08	1911.46	100.38	1911.47	104.37	1911.48	108.43	1911.51		
109.35	1911.5	110.47	1911.49	112.7	1911.48	116.75	1911.48	122.44	1911.48		
129.44	1911.5	137.38	1911.52	145.43	1911.54	152.27	1911.56	156.54	1911.58		
158.43	1911.59	158.56	1911.59	159.25	1911.59	159.85	1911.59	160.42	1911.59		
161.07	1911.59	161.51	1911.59	163.31	1911.59	176.61	1911.65	178.65	1911.65		
179.4	1911.65	182.93	1911.69	183.09	1911.69	183.82	1911.7	188.03	1911.75		
198.01	1911.87	203.47	1911.93	209.19	1911.52	216.01	1907.91	233.07	1907.77		
236.67	1913	236.84	1913	237.05	1913	240.64	1913	241.64	1913		
250.63	1913.31	257.59	1913.52	263.87	1913.72	266.02	1913.79	274.25	1914		
275.89	1914	284.87	1914	292.11	1914.77	303.18	1914.96	303.18	1921.96		

Manning's n Values num= 3
 Sta n Val Sta n Val
 -229.84 .016 203.47 .03 236.67 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 203.47 236.67 50.179 49.6 50.667 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 854

INPUT

Description: adjacent to building on right

Station Elevation Data		num= 90									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-175.9	1913	16.77	1911.22	27.67	1911.16	28.83	1911.15	29.51	1911.14		
29.74	1911.13	31.18	1911.12	32.69	1911.11	34.09	1911.11	35.13	1911.1		
35.97	1911.1	36.85	1911.1	37.89	1911.1	40.67	1911.1	41.75	1911.09		
42.88	1911.09	43.45	1911.09	50.9	1911.06	51.28	1911.06	51.69	1911.06		
58.42	1911.05	60.15	1911.04	60.37	1911.04	60.56	1911.04	60.84	1911.05		
61.34	1911.05	61.99	1911.05	62.66	1911.05	63.2	1911.05	63.58	1911.06		
69.51	1911.06	74.95	1911.07	75.19	1911.07	84.38	1911.08	89.8	1911.09		
96.43	1911.12	103.28	1911.15	103.54	1911.14	103.85	1911.14	104.48	1911.14		
105.59	1911.14	107.14	1911.14	109.01	1911.14	111.08	1911.14	113.12	1911.15		
114.82	1911.15	115.86	1911.15	116.36	1911.16	116.59	1911.16	116.79	1911.16		
116.98	1911.16	117.21	1911.16	117.35	1911.16	117.98	1911.16	123	1911.19		
123.84	1911.19	124.15	1911.2	125.67	1911.21	125.74	1911.21	126.06	1911.22		
127.98	1911.24	132.95	1911.29	135.96	1911.32	142.2	1911.39	142.33	1911.4		
148.96	1911.47	149.54	1911.48	158.75	1911.51	159.66	1911.52	163.12	1911.53		
192.4	1911.38	198.95	1907	216.28	1907.03	219.79	1912.1	241.98	1912.76		
251.6	1912.88	261.59	1913	271.61	1913.26	275.24	1913.35	277.21	1913.38		
280.53	1913.42	282.65	1913.47	285.06	1913.47	291.26	1913.65	293.58	1913.63		
294.71	1913.65	295.49	1913.67	296.04	1913.68	305.71	1913.49	305.71	1920.49		

Manning's n Values num= 3
 Sta n Val Sta n Val
 -175.9 .016 192.4 .03 219.79 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 192.4 219.79 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 852

INPUT

Description:

Station Elevation Data		num= 68									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-116.26	1913	0	1911.04	6.25	1911.02	6.38	1911.02	10.76	1911		
19.91	1911	21.03	1911	21.62	1911	34.33	1911	36	1911		
45.5	1911	51.06	1911	58.47	1911	67	1911	75.92	1911		
77	1911	77.67	1911	78.24	1911	79.98	1911	87.43	1911		
93.34	1911	95.62	1911	96.06	1911	104.51	1911	105.16	1911		
111.88	1911	112.5	1911	113.42	1911	115.16	1911	117.61	1911		
126.31	1911	126.59	1911	129.36	1911	176.64	1911.32	183.63	1906.98		
201.14	1906.99	204.49	1912.02	204.76	1912	205.44	1912	219.16	1912.26		
221.27	1912.28	227.68	1912.35	229.5	1912.37	230.48	1912.37	233.09	1912.37		
239.78	1912.35	244.89	1912.35	245.7	1912.36	247.46	1912.36	248.72	1912.37		
254.7	1912.43	259.19	1912.44	260.87	1912.46	262.19	1912.47	263.32	1912.48		
264.53	1912.5	269.27	1912.57	272.48	1912.59	284.13	1912.76	287.73	1912.8		
294.88	1912.9	295.76	1912.91	302.26	1912.99	302.43	1912.99	303.35	1913		
303.54	1913	303.82	1913	314.25	1913						

Manning's n Values num= 3
 Sta n Val Sta n Val
 -116.26 .016 176.64 .025 204.49 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 176.64 204.49 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 850

INPUT

Description:

Station Elevation Data		num= 64									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-79.75	1913	0	1911	4.62	1911	13.99	1911	22.92	1911		
30.93	1911	38.39	1911	50.85	1911	55.34	1911	56.53	1911		
60.17	1911	60.39	1911	60.69	1911	61.03	1911	61.29	1911		
61.52	1911	62.09	1911	62.53	1911	63.03	1911	63.27	1911		
63.96	1911	64.15	1911	67.61	1911	67.93	1911	68.02	1911		
68.29	1911	79.71	1911	89.32	1911	100.47	1911	111.69	1911		

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
111.9	1911	118.24	1911	120.06	1911	121.1	1911	141.26	1911
142.07	1911	143.64	1911	144.32	1911	145.62	1911	147.96	1911
161.72	1911.48	169.3	1906.88	188.05	1906.55	191.12	1912	193.56	1912
193.99	1912	195.2	1912	198.08	1912	200.23	1912	205.27	1912
213.39	1912	216.95	1912	230.29	1911.69	238.07	1911.74	255.24	1911.83
262.67	1911.87	269.93	1911.92	279.11	1912	279.64	1912	283.49	1912.07
284.48	1912.07	289.14	1912.15	291.99	1912.2	364.49	1913		

Manning's n Values num= 3
 Sta n Val Sta n Val
 -79.75 .016 161.72 .025 191.12 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 161.72 191.12 50 50 50 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 848

INPUT
 Description:
 Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-66.63	1913	0	1911	1.08	1911	3.02	1911	6.35	1911
11.41	1911	17.03	1911	22.32	1911	27.01	1911	31.32	1911
38.41	1911	40.94	1911	44.81	1911	46.83	1911	47.61	1911
48.67	1911	49.88	1911	50.83	1911	51.65	1911	53.7	1911
55.29	1911	57.1	1911	57.99	1911	60.52	1911	61.2	1911
63.05	1911	64.25	1911	64.62	1911	65.63	1911	71.62	1911
76.58	1911	82.24	1911	87.95	1911	93.49	1911	94.89	1911
98.76	1911	103.51	1911	108.74	1911	109.42	1911	109.66	1911
110.26	1911	110.84	1911	111.95	1911	113.29	1911	113.69	1911
116.14	1911	116.2	1911	116.54	1911	116.73	1911	116.95	1911
117.33	1911	133.23	1910.45	134.04	1910.45	135.01	1910.44	135.23	1910.45
135.45	1910.45	135.95	1910.45	136.56	1910.45	139.32	1910.46	144.15	1911.16
150.9	1906.51	169.07	1906.54	173.13	1911.04	187.95	1911.33	192.17	1911.36
197.24	1911.4	264.65	1911.91	322.26	1912.57				

Manning's n Values num= 3
 Sta n Val Sta n Val
 -66.63 .016 144.15 .025 173.13 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 144.15 173.13 32.84 32.84 32.84 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 846

INPUT
 Description:
 Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-62.62	1913	0	1911	1.79	1911	2.69	1911	3.94	1911
5.66	1911	7.7	1911	9.78	1911	11.64	1911	13.09	1911
14.8	1911	15.65	1911	17.11	1911	19.34	1911	21.85	1911
24.23	1911	26.35	1911	28.32	1911	31.6	1911	32.78	1911
38.61	1911	39.53	1911	40.71	1911	42.32	1911	44.15	1911
45.57	1911	46.82	1911	49.91	1911	52.28	1911	54.99	1911
56.31	1911	60.08	1911	61.1	1911	61.86	1911	63.65	1911
64.19	1911	65.68	1911	68.13	1911	70.18	1911	72.54	1911
74.96	1911	77.32	1911	79.76	1911	82.1	1911	84.82	1911
85.18	1911	86.94	1911	87.7	1911	89.52	1911	91.31	1911
94.74	1911	98.88	1911	99.02	1911	106.81	1911	107.01	1911
108.09	1911	108.69	1911	109.42	1911	110.65	1911	122.14	1910.61
127.57	1910.42	128.56	1910.41	135.3	1910.15	135.6	1910.9	143.69	1906.25
162.31	1906.19	166.39	1911.06	199.65	1911.69	206.46	1911.73	213.69	1911.76
227.14	1911.8	322.34	1913						

Manning's n Values num= 3
 Sta n Val Sta n Val
 -62.62 .016 135.6 .025 166.39 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 135.6 166.39 31.35 24.24 21.8 .1 .3

CROSS SECTION

RIVER: FL
 REACH: FL RS: 844

INPUT
 Description:
 Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1911	.45	1911	1	1911	1.25	1911	3.12	1911
3.94	1911.4	5.34	1912	6.18	1912.41	7.51	1913	8.72	1913.58
9.72	1914	10.33	1914.28	10.39	1914.28	10.44	1914.28	13.34	1914.04
13.37	1914.04	13.45	1914.02	13.58	1914	14.91	1913.75	15.46	1913.64
16.85	1913.28	17.22	1913.16	17.82	1913	19.39	1912.6	21.68	1912
23.28	1911.61	24.17	1911.52	25.02	1911.4	26.53	1911.4	29.74	1911.33
30.52	1911.37	31.9	1911.4	39.06	1911.35	41.19	1911.31	42.04	1911.27
45.03	1911.2	48.12	1911.21	59.07	1911.31	60.9	1911.35	63.72	1911.36
66.21	1911.34	69.03	1911.25	69.92	1911.23	71.93	1911.26	77.97	1911.3
82.51	1911.38	90.23	1911.52	93.19	1911.49	95.57	1911.53	99	1911.49
102.78	1911.32	103.6	1911.36	103.89	1911.38	106.09	1911.64	106.86	1911.71
107.88	1911.76	108.74	1911.81	109.44	1911.76	109.61	1911.78	109.76	1911.79
109.98	1911.77	110.44	1911.66	113.11	1911	115.39	1910.73	118.22	1910.41
118.71	1910.35	120.35	1910.18	120.44	1910.17	120.82	1910.14	121.11	1910.12
121.38	1910.11	122.15	1910.8	130.46	1905.55	152.287	1905.67	155.51	1910.75
161.09	1910.56	162.8	1910.58	165.37	1911.37	167.72	1911.39	173.14	1911.57
186.24	1911.7	195.7	1911.78	203.21	1911.92	211.52	1911.94	215.58	1911.95
305.72	1913								

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .016 122.15 .025 155.51 .016

Bank Sta: Left Right Coeff Contr. Expan.
 122.15 155.51 .1 .3
 Left Levee Station= 10.33 Elevation= 1914.28

SUMMARY OF MANNING'S N VALUES

River: FL

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7
FL	1000	.016	.025	.028	.025			
FL	998	.016	.028	.025				
FL	996	.016	.028	.025				
FL	994	.016	.028	.025				
FL	992	.013	.016	.035	.025			
FL	990	.013	.016	.013				
FL	988	.016						
FL	986	.016						
FL	984	.016	.013					
FL	982	.016	.025	.013	.016	.013	.025	
FL	980	.025	.016	.025	.013	.016	.013	.025
FL	978	.025	.016	.025	.013	.016	.013	.025
FL	976	.025	.016	.025	.013	.016	.013	.025
FL	974	.016	.025	.016	.013	.025		
FL	972	.016	.025	.013	.016	.013	.025	
FL	970	.016	.013	.025				
FL	968	.025	.013	.016	.013	.025		
FL	966	.025	.016	.013	.025			
FL	964	.025	.016	.013	.025			
FL	962	.025	.016	.013	.016			
FL	960	.025	.016	.013	.025			
FL	958	.025	.016	.013	.025			
FL	956	.025	.016	.013	.025			
FL	954	.025	.016	.013	.025			
FL	952	.025	.016	.013	.025			
FL	950	.025	.016	.013	.025			
FL	948	.025	.016	.013	.025			
FL	946	.025	.016	.013	.025			
FL	944	.025	.016	.013	.025			
FL	942	.025	.016					
FL	940	.025	.016					
FL	938	.025	.016					
FL	936	.025	.016	.013	.025			
FL	934	.025	.016	.013	.025			
FL	932	.025	.016	.013	.025	.013		
FL	930	.025	.016	.013	.016			
FL	928	.025	.016	.013	.025			
FL	926	.025	.016	.013	.025			
FL	924	.025	.013	.016	.013	.025		
FL	922	.025	.016	.013	.025			
FL	920	.025	.013	.016	.013	.016		
FL	918	.025	.013	.016	.013	.016		
FL	916	.025	.013	.016	.013	.016		
FL	914	.016	.013	.016	.013	.016		
FL	912	.025	.013	.016	.013	.016		
FL	910	.025	.013	.016	.013	.016		
FL	908	.025	.013	.016	.013	.016		
FL	906	.025	.013	.016	.013	.025		
FL	904	.025	.013	.016	.013	.025		
FL	902	.016	.013	.016	.013	.016		
FL	900	.016	.013	.016	.013	.016		
FL	898	.025	.013	.016	.013	.016		
FL	896	.016	.013	.016	.013	.025		
FL	894	.025	.013	.016	.013	.016		
FL	892	.016	.013	.016	.013	.025		
FL	890	.016	.013	.016	.013	.025		
FL	888	.016	.013	.016	.013	.025		
FL	886	.016	.013	.016	.013	.025		
FL	884	.025	.013	.016	.013	.025		
FL	882	.016	.013	.016	.013	.025		
FL	880	.025	.016	.013	.025	.016		
FL	878	.016	.013	.016	.013	.025	.016	
FL	876	.016	.013	.016	.013	.025		
FL	874	.016	.013	.016	.013	.025	.016	
FL	872	.025	.013	.016	.013	.016		
FL	870	.025	.013	.016	.013	.016		
FL	868	.025	.013	.016				
FL	867	culvert						
FL	866	.016	.03	.016				
FL	864	.016	.03	.016				
FL	862	.016	.03	.016				
FL	860	.016	.03	.016				
FL	858	.016	.03	.016				
FL	856	.016	.03	.016				
FL	854	.016	.03	.016				
FL	852	.016	.025	.016				
FL	850	.016	.025	.016				
FL	848	.016	.025	.016				
FL	846	.016	.025	.016				
FL	844	.016	.025	.016				

SUMMARY OF REACH LENGTHS

River: FL

Reach	River Sta.	Left	Channel	Right
FL	1000	19.638	19.638	19.638
FL	998	20.08	20.08	20.08
FL	996	20.12	20.12	20.12
FL	994	20.11	20.11	20.11
FL	992	20.12	20.12	20.12
FL	990	13.51	31.92	27.6
FL	988	26.25	26.25	26.25
FL	986	36.41	36.41	36.41
FL	984	50	50	50
FL	982	25	25	25
FL	980	25	25	25
FL	978	50	50	50
FL	976	50.01	50.01	50.01
FL	974	50	50	50
FL	972	50	50	50
FL	970	50	50	50
FL	968	50	50	50
FL	966	27.2	27.2	27.2
FL	964	29.824	29.824	29.824
FL	962	30	30	30
FL	960	20.244	20.244	29.74

FL	958	49.71	49.71	49.71
FL	956	50	50	50
FL	954	50	50	50
FL	952	50	50	50
FL	950	50	50	50
FL	948	50	50	50
FL	946	50	50	50
FL	944	35	35	35
FL	942	22.5	22.5	22.5
FL	940	22.5	22.5	22.5
FL	938	50	50	50
FL	936	50	50	50
FL	934	50	50	50
FL	932	50	50	50
FL	930	50	50	50
FL	928	50	50	50
FL	926	50	50	50
FL	924	50	50	50
FL	922	50	50	50
FL	920	50	50	50
FL	918	50	50	50
FL	916	50	50	50
FL	914	50	50	50
FL	912	50	50	50
FL	910	50	50	50
FL	908	50	50	50
FL	906	50	50	50
FL	904	50.01	50.01	50.01
FL	902	50	50	50
FL	900	50	50	50
FL	898	50	50	50
FL	896	50	50	50
FL	894	50	50	50
FL	892	50	50	50
FL	890	50	50	50
FL	888	50	50	50
FL	886	50	50	50
FL	884	50	50	50
FL	882	50	50	50
FL	880	50	50	50
FL	878	50	50	50
FL	876	50	50	50
FL	874	50	50	50
FL	872	50.27	50.27	50.27
FL	870	50.29	50.29	50.29
FL	868	126.58	121.96	114.38
FL	867	culvert		
FL	866	49.01	52.94	60.67
FL	864	55.28	49.71	55.28
FL	862	50.01	50.01	50.01
FL	860	53.5	53.5	53.5
FL	858	43.63	47.1	50.73
FL	856	50.179	49.6	50.667
FL	854	50	50	50
FL	852	50	50	50
FL	850	50	50	50
FL	848	32.84	32.84	32.84
FL	846	31.35	24.24	21.8
FL	844			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: FL

Reach	River Sta.	Contr.	Expan.
FL	1000	.1	.3
FL	998	.1	.3
FL	996	.1	.3
FL	994	.1	.3
FL	992	.1	.3
FL	990	.1	.3
FL	988	.1	.3
FL	986	.1	.3
FL	984	.1	.3
FL	982	.1	.3
FL	980	.1	.3
FL	978	.1	.3
FL	976	.1	.3
FL	974	.1	.3
FL	972	.1	.3
FL	970	.1	.3
FL	968	.1	.3
FL	966	.1	.3
FL	964	.1	.3
FL	962	.1	.3
FL	960	.1	.3
FL	958	.1	.3
FL	956	.1	.3
FL	954	.1	.3
FL	952	.1	.3
FL	950	.1	.3
FL	948	.1	.3
FL	946	.1	.3
FL	944	.1	.3
FL	942	.1	.3
FL	940	.1	.3
FL	938	.1	.3
FL	936	.1	.3
FL	934	.1	.3
FL	932	.1	.3
FL	930	.1	.3
FL	928	.1	.3
FL	926	.1	.3
FL	924	.1	.3
FL	922	.1	.3
FL	920	.1	.3
FL	918	.1	.3
FL	916	.1	.3
FL	914	.1	.3
FL	912	.1	.3
FL	910	.1	.3
FL	908	.1	.3
FL	906	.1	.3
FL	904	.1	.3

FL	902	.1	.3
FL	900	.1	.3
FL	898	.1	.3
FL	896	.1	.3
FL	894	.1	.3
FL	892	.1	.3
FL	890	.1	.3
FL	888	.1	.3
FL	886	.1	.3
FL	884	.1	.3
FL	882	.1	.3
FL	880	.1	.3
FL	878	.1	.3
FL	876	.1	.3
FL	874	.1	.3
FL	872	.1	.3
FL	870	.1	.3
FL	868	.1	.3
FL	867	Culvert	.3
FL	866	.1	.3
FL	864	.1	.3
FL	862	.1	.3
FL	860	.1	.3
FL	858	.1	.3
FL	856	.1	.3
FL	854	.1	.3
FL	852	.1	.3
FL	850	.1	.3
FL	848	.1	.3
FL	846	.1	.3
FL	844	.1	.3

Appendix C-3:

*Existing Dual 60" RCP WSPG
Analysis (COLEX60.out)*

Version 1.20
Serial Number 07010220

Nov 11, 2013 16:32:44

```
Input file : colex60.txt
Output file: colex60.out
```

INPUT FILE LISTING

```

T1 DUAL 60-INCH RCP STORM DRAIN DISCHARGING
T2 FLOW INTO N 5TH STREET & COLTON AVE INTER. 1/2 FLOW IN ONE PIPE
T3 100-YR ULTIMATE Q, TIES INTO U/S & D/S HEC-RAS ANALYSES
SX -10001.831966.84 1 .013 1970.04
WQ -10001.831966.84 1 .013
R -9501.311975.84 1 .013
SH -9000.781984.84 1 .013 1986.71

```

[illegible]

CD 1 4 5.00 PAGE NO 1

0 WATER SURFACE PROFILE - TITLE CARD LISTING

0 HEADING LINE NO 1 IS -
0 DUAL 60-INCH RCP STORM DRAIN DISCHARGING

0 DUAL 60-INCH RCP STORM DRAIN DISCHARGING
0 HEADING LINE NO 2 IS -
0 FLOW INTO N 5TH STREET & COLTON AVE INTER. 1/2 FLOW IN ONE PIPE

0 HEADING LINE NO 3 IS -
0 100-YR ULTIMATE Q. TIES INTO U/S & D/S HEC-RAS ANALYSES

100-YR ULTIMATE Q, TIES INTO U/S & D/S HEC-RAS ANALYSES

0 WATER SURFACE PROFILE - ELEMENT CARD LISTING

0	ELEMENT NO	1	IS A SYSTEM OUTLET	STATION	INVERT	SECT	W S ELEV
			U/S DATA	-10001.83	1966.84	1	1970.04

```

0 ELEMENT NO 2 IS A WALL EXIT
                U/S DATA STATION INVERT SECT
                -10003.83 1865.84 1

```

0	ELEMENT NO	3	IS A REACH	-10001.83	1966.84	1	*
			U/S DATA	STATION	INVERT	SECT	N
				-9501.31	1975.84	1	.013
							RADIUS
							ANGLE
							ANG PT
							MAN H
							0

0 ELEMENT NO	4 IS A SYSTEM HEADWORKS	STATION	INVERT	SECT	W S ELEV
	U/S DATA	-9000.78	1984.84	1	1986.71

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

1 PAGE 1

WATER SURFACE PROFILE LISTING

DUAL 60-INCH RCP STORM DRAIN DISCHARGING
FLOW INTO N 5TH STREET & COLTON AVE INTER. 1/2 FLOW IN ONE PIPE
100-YR ULTIMATE O. TIES INTO U/S & D/S HEC-RAS ANALYSES

0 STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD. EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
0 L/ELEM	SO					SF AVE				NORM DEPTH		ZR		
0-10001.83	1966.84	3.00	1969.84	277.5	22.55	7.90	1977.74	.00	4.57	5.00	.00	.00	0	.00
0 WALL EXIT												.00		
0-10001.83	1966.84	3.00	1969.84	277.5	22.57	7.91	1977.75	.00	4.57	5.00	.00	.00	0	.00
0 WALL EXIT												.00		
0-10001.83	1966.84	3.00	1969.84	277.5	22.57	7.91	1977.75	.00	4.57	5.00	.00	.00	0	.00
0 58.76	.01798					.02636	1.55			3.37		.00		
0-9943.07	1967.90	2.91	1970.81	277.5	23.38	8.49	1979.30	.00	4.57	5.00	.00	.00	0	.00
0 64.80	.01798					.02937	1.90			3.37		.00		
0-9878.27	1969.06	2.80	1971.86	277.5	24.52	9.34	1981.20	.00	4.57	5.00	.00	.00	0	.00
0 54.18	.01798					.03326	1.80			3.37		.00		
0-9824.09	1970.04	2.70	1972.73	277.5	25.71	10.27	1983.01	.00	4.57	5.00	.00	.00	0	.00
0 46.97	.01798					.03770	1.77			3.37		.00		
0-9777.12	1970.88	2.59	1973.47	277.5	26.97	11.30	1984.78	.00	4.57	5.00	.00	.00	0	.00
0 41.71	.01798					.04278	1.78			3.37		.00		
0-9735.40	1971.63	2.50	1974.13	277.5	28.28	12.43	1986.56	.00	4.57	5.00	.00	.00	0	.00
0 37.66	.01798					.04857	1.83			3.37		.00		
0-9697.74	1972.31	2.41	1974.72	277.5	29.66	13.68	1988.39	.00	4.57	5.00	.00	.00	0	.00
0 34.40	.01798					.05520	1.90			3.37		.00		
0-9663.34	1972.93	2.32	1975.25	277.5	31.11	15.04	1990.29	.00	4.57	5.00	.00	.00	0	.00
0 31.72	.01798					.06276	1.99			3.37		.00		
0-9631.62	1973.50	2.24	1975.73	277.5	32.63	16.55	1992.28	.00	4.57	5.00	.00	.00	0	.00
0 29.49	.01798					.07141	2.11			3.37		.00		

1 PAGE 2

WATER SURFACE PROFILE LISTING

DUAL 60-INCH RCP STORM DRAIN DISCHARGING
FLOW INTO N 5TH STREET & COLTON AVE INTER. 1/2 FLOW IN ONE PIPE
100-YR ULTIMATE Q. TIES INTO U/S & D/S HEC-RAS ANALYSES

O STATION	INVERT ELEV SO	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD SF AVE	ENERGY GRD. EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
O L/ELEM	SO						HF			NORM DEPTH			ZR		
0 -9602.13	1974.03	2.16	1976.18	277.5	34.22	18.20	1994.39	.00	4.57		5.00	.00	.00	0	.00
0 27.54	.01798					.08128	2.24			3.37		.00	.00		
0 -9574.59	1974.52	2.08	1976.60	277.5	35.89	20.02	1996.63	.00	4.57		5.00	.00	.00	0	.00
0 25.87	.01798					.09256	2.39			3.37		.00	.00		
0 -9548.72	1974.99	2.01	1976.99	277.5	37.65	22.02	1999.02	.00	4.57		5.00	.00	.00	0	.00
0 24.37	.01798					.10547	2.57			3.37		.00	.00		
0 -9524.35	1975.43	1.94	1977.36	277.5	39.48	24.23	2001.59	.00	4.57		5.00	.00	.00	0	.00
0 23.04	.01798					.12023	2.77			3.37		.00	.00		
0 -9501.31	1975.84	1.87	1977.71	277.5	41.41	26.65	2004.36	.00	4.57		5.00	.00	.00	0	.00
0 -9000.78	1984.84	1.87	1986.71	277.5	41.41	26.65	2013.36	.00	4.57		5.00	.00	.00	0	.00

Appendix C-4:

*Proposed Condition Colton Avenue Storm
Drain WSPG Analysis (COL18D.out)*

Version 1.20
Serial Number 07010220

Nov 25, 2013 14:50:23

```
Input file : col18d.txt
Output file: col18d.out
```

INPUT FILE LISTING

T1	COLTON AVE SD SYSTEM HYDRAULICS								
T2	ULTIMATE CONDITION 100-YEAR PEAK FLOWS								
T3	INTERIM-ASSUMES CHANN SEGMENT EXISTING GEOMETRY D/S OF COLTON AVE								
SO	-13759.351889.90	10	.013			1901.790			
R	-13709.991890.21	10	.013						
R	-13657.391890.54	10	.013					50.00	
WX	-13657.391890.54	11	.013						
R	-13518.561891.40	11	.013						22.50
R	-13504.471891.49	11	.013						22.50
R	-13500.981891.51	11	.013						
JX	-13494.801891.55	1 2	.013	16.0		1900.050		00.10	
TS	-13490.981891.57	1	.013						
R	-13401.691894.56	1	.013						5.50
JX	-12999.291894.63	1 2	.013	21.5		1900.630		00.10	
JX	-12902.591895.23	112	.013	38.5		1897.830		60.00	
X	-12895.941895.27	1	.013						5.00
JX	-12880.891895.45	1 3	.013	27.5		1901.45		00.10	
JX	-12495.411900.13	1 3	3.013	15.0		11.51903.301903.30		45.00	45.00
R	-12184.791903.90	1	.013						
TS	-12174.791904.02	5	.013						
R	-11918.121907.13	5	.013						25.00
R	-11897.191907.38	5	.013						22.00
JX	-11879.771907.79	5 3	3.013	15.0		12.51910.341910.34		45.00	45.00
JX	-11224.841923.19	5 2	3.013	24.0		15.51924.271925.09		45.00	45.00
JX	-11165.271924.59	512	.013	30.0		1925.32			45.00
JX	-10327.101944.29	5 3	.013	18.5		1947.47			45.00
JX	-10257.151945.94	5 3	.013	11.5		1949.23			45.00
R	-10231.631946.54	5	.013						
JX	-10166.121947.62	5 3	.013	18.5		1951.12			45.00
R	-10149.321947.89	5 6	.013	80.0		1949.26			45.00
R	-10142.841948.00	5	.013						22.00
R	-10039.911951.31	5	.013						
R	-10032.411951.55	5	.013						21.00
TS	-10001.831966.84	8	.013						
JX	-10001.831966.84	8 9	.013	277.0		1966.26		0.10	
WK	-10001.831966.84	9	.013						
R	-9873.071969.16	9	.013						
SH	-9873.071969.16	9	.013						

[illegible]

PAGE NO 1

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1 CD      12      4      1990
0          WATER SURFACE PROFILE - TITLE CARD LISTING
0 OHEADING LINE NO 1 IS -      COLTON AVE SD SYSTEM HYDRAULICS
0 OHEADING LINE NO 2 IS -      ULTIMATE CONDITION 100-YEAR PEAK FLOWS
0 OHEADING LINE NO 3 IS -      INTERIM-ASSUMES CHANN SEGMENT EXISTING GEOMETRY D/S OF COLTON AVE
0

```

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING															PAGE NO	
0	ELEMENT NO	1	IS A	SYSTEM OUTLET	STATION	INVERT	SECT									
0	ELEMENT NO	2	IS A	REACH	STATION	INVERT	SECT									
0	ELEMENT NO	3	IS A	REACH	STATION	INVERT	SECT	N								
0	ELEMENT NO	4	IS A	WALL EXIT	STATION	INVERT	SECT	N								
0	ELEMENT NO	5	IS A	REACH	STATION	INVERT	SECT	N								
0	ELEMENT NO	6	IS A	REACH	STATION	INVERT	SECT	N								
0	ELEMENT NO	7	IS A	REACH	STATION	INVERT	SECT	N								
0	ELEMENT NO	8	IS A	JUNCTION	STATION	INVERT	SECT	N								
0	ELEMENT NO	9	IS A	TRANSITION	STATION	INVERT	SECT	N								
0	ELEMENT NO	10	IS A	REACH	STATION	INVERT	SECT	N								
0	ELEMENT NO	11	IS A	JUNCTION	STATION	INVERT	SECT	N								
0	ELEMENT NO	12	IS A	JUNCTION	STATION	INVERT	SECT	N								

WATER SURFACE PROFILE - ELEMENT CARD LISTING																			PAGE NO		3
0	ELEMENT NO	13	IS A REACH	STATION	INVERT	SECT				N				RADIUS	ANGLE	ANG	PT	MAN	H		
			U/S DATA	-12895.94	1895.27	1				.013				.00	.00	5.00		0			
0	ELEMENT NO	14	IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4						
			U/S DATA	-12880.89	1895.45	1	3	0	.013	27.5	.0	1901.45	1901.45	.10	.00						
0	ELEMENT NO	15	IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4						
			U/S DATA	-12495.41	1900.13	1	3	3	.013	15.0	11.5	1903.30	1903.30	45.00	45.00						
0	ELEMENT NO	16	IS A REACH	STATION	INVERT	SECT				N				RADIUS	ANGLE	ANG	PT	MAN	H		
			U/S DATA	-12184.79	1903.90	1				.013				.00	.00	.00		0			
0	ELEMENT NO	17	IS A TRANSITION	STATION	INVERT	SECT				N											
			U/S DATA	-12174.79	1904.02	5				.013											
0	ELEMENT NO	18	IS A REACH	STATION	INVERT	SECT				N				RADIUS	ANGLE	ANG	PT	MAN	H		
			U/S DATA	-11918.12	1907.13	5				.013				.00	.00	25.00		0			
0	ELEMENT NO	19	IS A REACH	STATION	INVERT	SECT				N				RADIUS	ANGLE	ANG	PT	MAN	H		
			U/S DATA	-11897.19	1907.38	5				.013				.00	.00	22.00		0			
0	ELEMENT NO	20	IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4						
			U/S DATA	-11879.77	1907.79	5	3	3	.013	15.0	12.5	1910.34	1910.34	45.00	45.00						
0	ELEMENT NO	21	IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4						
			U/S DATA	-11224.84	1923.19	5	2	3	.013	24.0	15.5	1924.27	1925.09	45.00	45.00						
0	ELEMENT NO	22	IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4						
			U/S DATA	-11165.27	1924.59	5	12	0	.013	30.0	.0	1925.32	1925.32	45.00	45.00						

WATER SURFACE PROFILE - ELEMENT CARD LISTING															PAGE NO	4
0	ELEMENT NO	23	IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	
			U/S DATA	-10327.10	1944.29	5	3	0	.013	18.5	.0	1947.47	.00	45.00	.00	
0	ELEMENT NO	24	IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	
			U/S DATA	-10257.15	1945.94	5	3	0	.013	11.5	.0	1949.23	.00	45.00	.00	
0	ELEMENT NO	25	IS A REACH	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	
			U/S DATA	-10231.63	1946.54	5			.013				.00	.00	.00	
0	ELEMENT NO	26	IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	
			U/S DATA	-10166.12	1947.62	5	3	0	.013	18.5	.0	1951.12	.00	45.00	.00	
0	ELEMENT NO	27	IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	
			U/S DATA	-10149.32	1947.89	5	6	0	.013	80.0	.0	1949.26	.00	45.00	.00	
0	ELEMENT NO	28	IS A REACH	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	
			U/S DATA	-10142.84	1948.00	5			.013				.00	.00	22.00	
0	ELEMENT NO	29	IS A REACH	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	
			U/S DATA	-10039.91	1951.31	5			.013				.00	.00	.00	
0	ELEMENT NO	30	IS A REACH	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	
			U/S DATA	-10032.41	1951.55	5			.013				.00	.00	21.00	
0	ELEMENT NO	31	IS A TRANSITION	STATION	INVERT	SECT			N							
			U/S DATA	-10001.83	1966.84	8			.013							
0	ELEMENT NO	32	IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	
			U/S DATA	-10001.83	1966.84	8	9	0	.013	277.0	.0	1966.26	.00	.10	.00	
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING																
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING																

WATER SURFACE PROFILE - ELEMENT CARD LISTING															
0	ELEMENT NO	33	IS A WALL EXIT												
			U/S DATA	STATION	-10001.83	INVERT	1966.84	SECT	9						
0	ELEMENT NO	34	IS A REACH												
			U/S DATA	STATION	-9873.07	INVERT	1969.16	SECT	9	N .013	RADIUS .00	ANGLE .00	ANG PT .00	MAN H 0	
0	ELEMENT NO	35	IS A SYSTEM HEADWORKS							*					
			U/S DATA	STATION	-9873.07	INVERT	1969.16	SECT	9						
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING															
										W S ELEV .00					

1 ** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC PAGE 1

WATER SURFACE PROFILE LISTING															
COLTON AVE SD SYSTEM HYDRAULICS															
ULTIMATE CONDITION 100-YEAR PEAK FLOWS															
INTERIM-ASSUMES CHANN SEGMENT EXISTING GEOMETRY D/S OF COLTON AVE															
0 STATION	INVERT ELEV SO	DEPTH DF FLOW	W.S. ELEV	Q	VEL	VEL HEAD SF AVE	ENERGY GRD.EL. HF	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL ZR	NO PIER	AVBPR
0+13759.35	1889.90	11.89	1901.79	910.5	8.51	1.13	1902.92	.00	6.83		12.00	9.00	.00	0	.00
0+49.36	.00628					.00118	.06			5.96			.00		
0+13709.99	1890.21	11.58	1901.79	910.5	8.74	1.19	1902.97	.00	6.83		12.00	9.00	.00	0	.00
0+.00	.00628					.00122	.00			5.96			.00		
0+13709.99	1890.21	11.58	1901.79	910.5	8.74	1.19	1902.97	.43	6.83		12.00	9.00	.00	0	.00
0+52.60	.00628					.00126	.07			5.96			.00		
0+13657.39	1890.54	11.24	1901.78	910.5	9.00	1.26	1903.04	.45	6.83		12.00	9.00	.00	0	.00
0+.00	.00628					.00065	.00			5.96			.00		
0+13657.39	1890.54	11.24	1901.78	910.5	9.00	1.26	1903.04	.00	6.83		12.00	9.00	.00	0	.00
0+WALL EXIT													.00		
0+13657.39	1890.54	11.24	1901.78	910.5	16.05	4.00	1905.78	.00	7.43		8.50	.00	.00	0	.00
0+138.83	.00619					.00721	1.00			8.50			.00		
0+13518.56	1891.40	11.68	1903.08	910.5	16.05	4.00	1907.08	.00	7.43		8.50	.00	.00	0	.00
0+14.09	.00638					.00721	.10			7.60			.00		
0+13504.47	1891.49	11.99	1903.48	910.5	16.05	4.00	1907.48	.00	7.43		8.50	.00	.00	0	.00
0+3.49	.00574					.00721	.03			8.50			.00		
0+13500.98	1891.51	11.99	1903.50	910.5	16.05	4.00	1907.51	.00	7.43		8.50	.00	.00	0	.00
0+JUNCT STR	.00648					.00848	.05						.00		
0+13494.80	1891.55	11.80	1903.35	894.5	16.64	4.30	1907.66	.00	6.00		6.00	9.00	.00	0	.00
0+TRANS STR	.00521					.00974	.04						.00		
0+13490.98	1891.57	11.82	1903.39	894.5	16.64	4.30	1907.70	.00	6.00		6.00	9.00	.00	0	.00
0+479.29	.00624					.00974	4.67			5.89			.00		

1 WATER SURFACE PROFILE LISTING
 COLTON AVE SD SYSTEM HYDRAULICS
 ULTIMATE CONDITION 100-YEAR PEAK FLOWS
 INTERIM-ASSUMES CHANN SEGMENT EXISTING GEOMETRY D/S OF COLTON AVE
 0 STATION INVERT DEPTH W.S. Q VEL VEL ENERGY SUPER CRITICAL HGT/ BASE/ ZL NO AVBPR
 Page 2

COL18D														
0 L/ELEM	ELEV SO	OF FLOW	ELEV	HEAD SF AVE	GRD. EL. HF	ELEV	DEPTH	NORM DEPTH	DIA	ID NO.	PIER	ZR		
0-13011.69	1894.56	13.58	1908.14	894.5	16.64	4.30	1912.44	.00	6.00	6.00	9.00	.00	0	.00
0JUNCT STR	.00564			.00951	.12							.00		
0-12999.29	1894.63	13.95	1908.58	873.0	16.24	4.10	1912.68	.00	6.00	6.00	9.00	.00	0	.00
0JUNCT STR	.00620			.00888	.86							.00		
0-12902.59	1895.23	14.83	1910.06	834.5	15.53	3.75	1913.80	.00	6.00	6.00	9.00	.00	0	.00
0	6.65			.00848	.06				5.66			.00		
0-12895.94	1895.27	14.91	1910.18	834.5	15.53	3.75	1913.92	.00	6.00	6.00	9.00	.00	0	.00
0JUNCT STR	.01196			.00820	.12							.00		
0-12880.89	1895.45	15.09	1910.54	807.0	15.01	3.50	1914.04	.00	6.00	6.00	9.00	.00	0	.00
0JUNCT STR	.01214			.00767	2.96							.00		
0-12495.41	1900.13	13.74	1913.87	780.5	14.52	3.28	1917.14	.00	6.00	6.00	9.00	.00	0	.00
0	310.62			.00742	2.30				4.13			.00		
0-12184.79	1903.90	12.27	1916.17	780.5	14.52	3.28	1919.45	.00	6.00	6.00	9.00	.00	0	.00
0TRANS STR	.01200			.01082	.11							.00		
0-12174.67	1904.02	10.53	1914.55	780.5	18.69	5.43	1919.99	.00	6.00	6.00	7.00	.00	0	.00
0	256.67			.01422	3.65				5.37			.00		
0-11918.12	1907.13	11.52	1918.65	780.5	18.69	5.43	1924.08	.00	6.00	6.00	7.00	.00	0	.00
0	20.93			.01422	.30				5.40			.00		
0-11897.19	1907.38	11.97	1919.35	780.5	18.69	5.43	1924.78	.00	6.00	6.00	7.00	.00	0	.00
0JUNCT STR	.02354			.01373	.24							.00		
0-11879.77	1907.79	12.43	1920.22	753.0	18.04	5.06	1925.28	.00	6.00	6.00	7.00	.00	0	.00
0JUNCT STR	.02351											.00		

PAGE 3

WATER SURFACE PROFILE LISTING															PAGE	5
COLTON AVE SD SYSTEM HYDRAULICS																
ULTIMATE CONDITION 100-YEAR PEAK FLOWS																
INTERIM-ASSUMES CHANN SEGMENT EXISTING GEOMETRY D/S OF COLTON AVE																
0 STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD SF AVE	ENERGY GRD. EL. HF	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR	
0 L/ELEM	SO												ZR			
0-11224.84	1923.19	4.17	1927.36	713.5	24.42	9.27	1936.63	.00	6.00		6.00	7.00	.00	0	.00	
0JUNCT STR	.02350					.02086	1.24						.00			
0-11165.27	1924.59	3.82	1928.41	683.5	25.56	10.15	1938.56	.00	6.00		6.00	7.00	.00	0	.00	
0JUNCT STR	.02350					.02295	19.24						.00			
0-10327.10	1944.29	3.67	1947.96	665.0	25.87	10.40	1958.36	.00	6.00		6.00	7.00	.00	0	.00	
0JUNCT STR	.02359					.02459	1.72						.00			
0-10257.15	1945.94	3.51	1949.45	653.5	26.61	11.01	1960.45	.00	6.00		6.00	7.00	.00	0	.00	
0JUNCT STR	.02359					.02566	.00						.00			
0-10257.15	1945.94	3.51	1949.45	653.5	26.61	11.01	1960.45	.00	6.00		6.00	7.00	.00	0	.00	
0	25.52					.02577	.66			3.63			.00			
0-10231.63	1946.54	3.50	1950.04	653.5	26.69	11.07	1961.11	.00	6.00		6.00	7.00	.00	0	.00	
0JUNCT STR	.01649					.02922	1.91						.00			
0-10166.12	1947.62	3.14	1950.76	635.0	28.87	12.95	1963.72	.00	6.00		6.00	7.00	.00	0	.00	
0JUNCT STR	.01607					.03909	.66						.00			
0-10149.32	1947.89	2.52	1950.41	555.0	31.48	15.40	1965.81	.00	5.80		6.00	7.00	.00	0	.00	
0	6.48					.04603	.30			3.62			.00			
0-10142.84	1948.00	2.50	1950.50	555.0	31.69	15.61	1966.11	.00	5.80		6.00	7.00	.00	0	.00	
0	26.82					.04738	1.27			2.86			.00			
0-10116.02	1948.86	2.47	1951.33	555.0	32.14	16.05	1967.38	.00	5.80		6.00	7.00	.00	0	.00	
0	76.11					.05174	3.94			2.86			.00			
0-10039.91	1951.31	2.35	1953.66	555.0	33.71	17.66	1971.32	.00	5.80		6.00	7.00	.00	0	.00	
0	7.50					.05559	.42			2.86			.00			
1																
															PAGE	4

PAGE 4

WATER SURFACE PROFILE LISTING															PAGE	4
COLTON AVE SD SYSTEM HYDRAULICS																
ULTIMATE CONDITION 100-YEAR PEAK FLOWS																
INTERIM-ASSUMES CHANN SEGMENT EXISTING GEOMETRY D/S OF COLTON AVE																
0 STATION	INVERT ELEV SO	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD SF AVE	ENERGY GRD.EL. HF	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR		
0 L/ELEM										NORM DEPTH		ZR				
0-10032.41	1951.55	2.34	1953.89	555.0	33.89	17.85	1971.74	.00	5.80	6.00	7.00	.00	0	.00		
0TRANS STR	.50000					.03564	1.09					.00				
0-10001.83	1966.84	1.86	1968.70	555.0	18.61	5.38	1974.08	.00	3.34	6.00	16.00	.00	0	.00		
0JUNCT STR	.00000					.02977	.00					.00				
0-10001.83	1966.84	.86	1967.70	278.0	20.28	6.39	1974.09	.00	2.11	6.00	16.00	.00	0	.00		
0 WALL EXIT												.00				
0-10001.83	1966.84	3.69	1970.53	278.0	17.91	4.98	1975.51	.00	4.58	5.00	.00	.00	0	.00		
0	4.21	.01802				.01421	.06			3.37		.00				
0-9997.62	1966.92	3.70	1970.61	278.0	17.86	4.96	1975.57	.00	4.58	5.00	.00	.00	0	.00		
0	59.73	.01802				.01345	.80			3.37		.00				
0-9937.89	1967.99	3.87	1971.87	278.0	17.03	4.51	1976.37	.00	4.58	5.00	.00	.00	0	.00		
0	36.15	.01802				.01213	.44			3.37		.00				
0-9901.74	1968.64	4.07	1972.71	278.0	16.24	4.10	1976.81	.00	4.58	5.00	.00	.00	0	.00		
0	21.00	.01802				.01104	.23			3.37		.00				
0-9880.74	1969.02	4.30	1973.32	278.0	15.48	3.72	1977.04	.00	4.58	5.00	.00	.00	0	.00		
0	7.67	.01802				.01024	.08			3.37		.00				
0-9873.07	1969.16	4.58	1973.74	278.0	14.76	3.39	1977.12	.00	4.58	5.00	.00	.00	0	.00		
1																


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1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 06NOV13 TIME 08:53:58
*
*****
UFC2
*****
*
* U.S. ARMY CORPS OF ENGINEERS
* HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
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X X XXXXXXX XXXXX X
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X X X X X X
X X X X X
X X XXXXXXX XXXXX XXX

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

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

1 HEC-1 INPUT PAGE 1

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
*** FREE ***
*DIAGRAM
1 ID FREEWAY CHANNEL ANALYSIS FROM CAREY AVE. TO LAS VEGAS WASH CONFLUENCE
2 ID ULTIMATE CONDITIONS
3 ID INPUT FILE = UFC2.DAT
4 ID INPUT FILE DATE = NOVEMBER 2013 (VERSION 2 WITH CCRFCD COMMENTS INCORPORATED)
5 ID MODELED BY MWH
6 ID
7 ID *****
8 ID *
9 ID * SDN4 STORM DISTRIBUTION
10 ID *
11 ID *****
12 ID
13 ID REFERENCED HYDROLOGIC MODELS:
14 ID
15 ID *CENTRAL FREEWAY CHANNEL, OWENS AVE. TO MILLER AVE. (VTN NOV 2009)
16 ID
17 ID *BROOKS CHANNEL FLOOD CONTROL PROJECT (MWH 2012)
18 ID
19 ID *90% TECHNICAL DRAINAGE STUDY FOR NORTH 5TH STREET IMPROVEMENTS
20 ID LOSEE ROAD TO CHEYENNE AVE (LBG 2012)
21 ID
22 ID *DRAFT DRAINAGE STUDY FOR COLTON AVE FLOOD CONTROL IMPROVEMENTS
23 ID 5TH STREET TO I-15 CHANNEL(CNLV 2009)
24 ID
25 ID VEGAS DRIVE IMPROVEMENTS PDR, SHADOW MOUNTAIN PLACE TO RANCHO DRIVE (LBG JUL
26 ID
27 ID JD CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:
28 ID
29 ID -----
30 ID
31 ID DARF VALUES USED : CCRFCD HCDDM
32 ID
33 ID
34 ID AREA DARF
35 ID SQ.MI.
36 ID
37 ID 8-9 0.875
38 ID 9-10 0.865
39 ID 10-11 0.857
40 ID 11-12 0.850
41 ID
42 ID -----
43 ID
44 ID
45 ID 5 0 0 300
46 ID 5 0 0
47 ID 5 0 0
48 ID JR PREC 0.875 0.865 0.857 0.850
*

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1 HEC-1 INPUT PAGE 2

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
49 KK OG04-C*
50 KM *REF BASIN FROM VTN STUDY*
51 KM *CENTRAL FREEWAY CHANNEL REPORT*
52 BA 0.288
53 PB 2.77
54 PC 0.000 0.020 0.058 0.075 0.099 0.126 0.137 0.145 0.149 0.151
55 PC 0.155 0.156 0.159 0.162 0.169 0.172 0.179 0.189 0.201 0.211
56 PC 0.220 0.228 0.232 0.240 0.246 0.252 0.260 0.269 0.276 0.283
57 PC 0.286 0.292 0.302 0.312 0.321 0.332 0.352 0.376 0.415 0.462
58 PC 0.530 0.610 0.710 0.732 0.756 0.782 0.799 0.813 0.823 0.830
59 PC 0.835 0.844 0.851 0.864 0.885 0.908 0.924 0.944 0.968 0.973
60 PC 0.978 0.982 0.984 0.986 0.988 0.991 0.992 0.993 0.994 0.997
61 PC 0.998 0.999 1.000
62 LS 0 90.2
63 UD 0.320
*
64 KKDOG04-C*
65 KM *REF FROM VTN STUDY*
66 KM *CENTRAL FREEWAY CHANNEL REPORT*
67 KM FLOW SPLIT TO PD01-C
68 KM COMBINED CAPACITY = 124 CFS
69 DT DPD01
70 DI 0 51 125 500 1000

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UFC2

71 DQ 0 50 124 124 124

* *

72 KKRDOG04-C*

73 KM *REF ROUTE FROM VTN STUDY*

74 KM *CENTRAL FREEWAY CHANNEL REPORT*

75 KM ROUTE DOG04-C TO COG05-C

76 KM US95 TO CHEYENNE

77 RD 4100 0.0007 0.016 0 TRAP 0 50

* *

78 KK OG05-C*

79 KM *REF BASIN FROM VTN STUDY*

80 KM *CENTRAL FREEWAY CHANNEL REPORT*

81 BA 0.266

82 PB 2.77

83 LS 0 90.7

84 UD 0.392

* *

85 KKC0G05-C*

86 KM *REF POINT FROM VTN STUDY*

87 KM *CENTRAL FREEWAY CHANNEL REPORT*

88 KM COMBINE RDOG04-C AND OG05-C

89 KM RAINBOW AND CHEYENNE

90 HC 2

* *

1

HEC-1 INPUT

PAGE 3

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

91 KKRCCG05-C*

92 KM *REF ROUTE FROM VTN STUDY*

93 KM *CENTRAL FREEWAY CHANNEL REPORT*

94 KM ROUTE RCOG05-C TO CCY06B-C

95 KM CHEYENNE

96 RD 7500 0.0097 0.016 0 TRAP 0 50

* *

97 KKCY06B-C*

98 KM *REF BASIN FROM VTN STUDY*

99 KM *CENTRAL FREEWAY CHANNEL REPORT*

100 BA 0.498

101 PB 2.77

102 LS 0 86.2

103 UD 0.697

* *

104 KKCCY06B-C*

105 KM *REF POINT FROM VTN STUDY*

106 KM *CENTRAL FREEWAY CHANNEL REPORT*

107 KM COMBINE RCOG05-C AND CY06B-C

108 KM MICHAEL AND CHEYENNE

109 HC 2

* *

110 KKRCCY06B*

111 KM *REF ROUTE FROM VTN STUDY*

112 KM *CENTRAL FREEWAY CHANNEL REPORT*

113 KM ROUTE CCY06B TO CRGOWAN

114 KM CHEYENNE

115 RD 1400 0.01 0.016 0 TRAP 0 50

* *****

* BEGIN FLOW SPLIT FROM GOWAN WATERSHED

* *****

* *

116 KKGD17BG-C*

117 KM *REF BASIN FROM VTN STUDY*

118 KM *CENTRAL FREEWAY CHANNEL REPORT*

119 BA 0.364

120 PB 2.77

121 LS 0 88.7

122 UD 0.478

* *

123 KKRGD17BG*

124 KM *REF ROUTE FROM VTN STUDY*

125 KM *CENTRAL FREEWAY CHANNEL REPORT*

126 KM ROUTE RGD17BG TO CGD11B-C

127 KM FACILITY = GOWAN OUTFALL - U.S. 95 CHANNEL

128 KM FACILITY # = G095 0000

129 KM LINING = CONCRETE

130 RD 2640 0.003 0.015 0 TRAP 12 2

* *

1

HEC-1 INPUT

PAGE 4

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

131 KKGD11B-C*

132 KM *REF BASIN FROM VTN STUDY*

133 KM *CENTRAL FREEWAY CHANNEL REPORT*

134 BA 0.262

135 PB 2.77

136 LS 0 91.4

137 UD 0.278

* *

138 KKCGD11B-C*

139 KM *REF POINT FROM VTN STUDY*

140 KM *CENTRAL FREEWAY CHANNEL REPORT*

141 KM COMBINE GD11B-C AND RGD17BG

142 KM GOWAN AND US 95

143 HC 2

* *

144 KKRCD11B*

145 KM *REF ROUTE FROM VTN STUDY*

146 KM *CENTRAL FREEWAY CHANNEL REPORT*

147 KM ROUTE CGD11B-C TO CPT6B-C

148 KM FACILITY = GOWAN OUTFALL FACILITIES

149 KM FACILITY # = G00F 0511

150 KM LINING = RCB

151 RD 8390 0.005 0.015 0 TRAP 8 0

* *

152 KK PT6B-C*
 153 KM *REF BASIN FROM VTN STUDY*
 154 KM *CENTRAL FREEWAY CHANNEL REPORT*
 155 BA 0.454
 156 PB 2.77
 157 LS 0 86.1
 158 UD 0.756
 *

159 KKCP6B-C*
 160 KM *REF POINT FROM VTN STUDY*
 161 KM *CENTRAL FREEWAY CHANNEL REPORT*
 162 KM COMBINE PT6B-C AND RCGD11B
 163 KM GOWAN AND RANCHO
 164 HC 2
 *

165 KKDP6B-C1*
 166 KM *REF SPLIT FROM VTN STUDY*
 167 KM *CENTRAL FREEWAY CHANNEL REPORT*
 168 KM FLOW SPLIT TO GOWAN OUTFALL
 169 KM DGOW1A
 170 KM FROM CWH
 171 DT DGOW1A
 172 DI 0 31 51 71 101 301 561 600 3000 5000
 173 DQ 0 30 50 70 100 300 560 560 560 560
 *

HEC-1 INPUT

PAGE 5

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

174 KKDP6B-C2*
 175 KM *REF SPLIT FROM VTN STUDY*
 176 KM *CENTRAL FREEWAY CHANNEL REPORT*
 177 KM FLOW SPLIT TO TRILOGY CHANNEL
 178 KM DTRILGY
 179 KM FROM CWH
 180 DT DTRILGY
 181 DI 0 31 91 202 349 625 1214 1944 2801
 182 DQ 0 3 33 55 95 173 267 374 491
 *

183 KKRCPT6B-C*
 184 KM *REF ROUTE FROM VTN STUDY*
 185 KM *CENTRAL FREEWAY CHANNEL REPORT*
 186 KM ROUTE DPT6B-C2 TO CCPT6B-C
 187 KM GOWAN
 188 RD 3300 0.006 0.016 0 TRAP 0 50
 *

189 KK DGOW1A*
 190 KM *REF RETRIEVE FROM VTN STUDY*
 191 KM *CENTRAL FREEWAY CHANNEL REPORT*
 192 KM RETRIEVE DGOW1A
 193 DR DGOW1A
 *

194 KKRDGOW1A*
 195 KM *REF ROUTE FROM VTN STUDY*
 196 KM *CENTRAL FREEWAY CHANNEL REPORT*
 197 KM ROUTE PT6B-C TO CCPT6B-C
 198 KM FACILITY = GOWAN OUTFALL FACILITIES
 199 KM FACILITY # = G00F 0486
 200 KM LINING = RCB
 201 RD 3300 0.006 0.015 0 TRAP 8 0
 *

202 KKCCPT6B-C*
 203 KM *REF POINT FROM VTN STUDY*
 204 KM *CENTRAL FREEWAY CHANNEL REPORT*
 205 KM COMBINE RCPT6B-C AND RDGOW1A
 206 KM GOWAN AND DECATUR
 207 HC 2
 *

208 KKDTRILGY*
 209 KM *REF RETRIEVE FROM VTN STUDY*
 210 KM *CENTRAL FREEWAY CHANNEL REPORT*
 211 KM RETRIEVE DTRILGY
 212 DR DTRILGY
 *

HEC-1 INPUT

PAGE 6

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

213 KK CY07B*
 214 KM *REF BASIN FROM VTN STUDY*
 215 KM *CENTRAL FREEWAY CHANNEL REPORT*
 216 BA 0.203
 217 PB 2.77
 218 LS 0 89.1
 219 UD 0.461
 *

220 KK CCY07B*
 221 KM *REF POINT FROM VTN STUDY*
 222 KM *CENTRAL FREEWAY CHANNEL REPORT*
 223 KM COMBINE DTRILGY AND CY07B
 224 KM NEAR RANCHO AND MICHAEL
 225 HC 2
 *

226 KK DCY07B*
 227 KM *REF SPLIT FROM VTN STUDY*
 228 KM *CENTRAL FREEWAY CHANNEL REPORT*
 229 KM FLOW SPLIT TO CENTRAL BASIN
 230 KM DIVERT FLOW EAST IN RAN 190
 231 KM OPPOSITE OF D9RCHO
 232 KM FROM CWH
 233 DT DCENT1
 234 DI 0 19 73 100 1000 2000
 235 DQ 0 1 1 28 928 1928
 *

236 KKRDY07B*
 237 KM *REF ROUTE FROM VTN STUDY*

UFC2

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238 KM *CENTRAL FREEWAY CHANNEL REPORT*
239 KM ROUTE DCY07B TO CCY08-C
240 KM DECATUR AND GOWAN
241 RD 3150 0.007 0.016 0 TRAP 0 50
*

242 KK CY08-C*
243 KM *REF BASIN FROM VTN STUDY*
244 KM *CENTRAL FREEWAY CHANNEL REPORT*
245 BA 0.094
246 PB 2.77
247 LS 0 88.5
248 UD 0.306
*

249 KKCCY08-C*
250 KM *REF POINT FROM VTN STUDY*
251 KM *CENTRAL FREEWAY CHANNEL REPORT*
252 KM COMBINE CY08-C, CCPT6B-C, AND RDCY07B
253 KM GOWAN AND DECATUR
254 HC 3
*

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255 KK DGOW2A*
256 KM *REF SPLIT FROM VTN STUDY*
257 KM *CENTRAL FREEWAY CHANNEL REPORT*
258 KM DIVERT FLOW TO GOWAN OUTFALL
259 KM DIVERSION BASED ON GOWAN ROAD DRAINAGE STUDY BY POGGEMEYER
260 KM 8' X 5' RCB, CAPACITY = 630 CFS (G00F 0486)
261 KM REMAINING FLOW CONTINUES EAST IN GOWAN RD. AND ENTERS THE CENTRAL BASIN
262 KM OPPOSITE OF DGOW2A IN CWH
263 DTDCENTRAL
264 DI 0 31 51 71 101 301 601 631 3000 5000
265 DQ 0 1 1 1 1 1 1 1 2370 4370
*

266 KK D3ALL*
267 KM *REF SPLIT FROM VTN STUDY*
268 KM *CENTRAL FREEWAY CHANNEL REPORT*
269 KM DIVERT OUT ALL FLOW (GOWAN WATERSHED)
270 DT D3ALL
271 DI 0 100 500 1000 5000
272 DQ 0 100 500 1000 5000
*
* *****
* END OF FLOW SPLIT FROM GOWAN WATERSHED
* *****
*

273 KK DCENT1*
274 KM *REF ROUTE FROM VTN STUDY*
275 KM *CENTRAL FREEWAY CHANNEL REPORT*
276 KM RETRIEVE DCENT1
277 DR DCENT1
*

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278 KKRDCE1*
279 KM *REF ROUTE FROM VTN STUDY*
280 KM *CENTRAL FREEWAY CHANNEL REPORT*
281 KM ROUTE DCENT1
282 KM RANCHO
283 RD 2100 0.0076 0.016 0 TRAP 0 50
*

284 KKRCRGOWAN*
285 KM *REF POINT FROM VTN STUDY*
286 KM *CENTRAL FREEWAY CHANNEL REPORT*
287 KM COMBINE RDCE1, D3ALL, AND RCCY06B
288 KM RANCHO AND CHEYENNE
289 HC 3
*

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290 KKRCRGOWAN*
291 KM *REF ROUTE FROM VTN STUDY*
292 KM *CENTRAL FREEWAY CHANNEL REPORT*
293 KM ROUTE CRGOWAN TO CPD05A-C
294 KM RANCHO
295 RD 1700 0.0088 0.016 0 TRAP 0 50
*

296 KKPD05A-C*
297 KM *REF BASIN FROM VTN STUDY*
298 KM *CENTRAL FREEWAY CHANNEL REPORT*
299 BA 0.135
300 PB 2.77
301 LS 0 93.5
302 UD 0.406
*

303 KKCPD05A-C*
304 KM *REF POINT FROM VTN STUDY*
305 KM *CENTRAL FREEWAY CHANNEL REPORT*
306 KM COMBINE PD05A-C AND RCRGOWAN
307 KM RANCHO AND DECATUR
308 HC 2
*

309 KKDCPD05A*
310 KM *REF SPLIT FROM VTN STUDY*
311 KM *CENTRAL FREEWAY CHANNEL REPORT*
312 KM FLOW SPLIT TO A1-C1
313 KM OPPOSITE OF DA2 FLOW SPLIT IN CWH
314 KM CAPACITY RAN 170 = 210 CFS
315 KM REMAINING FLOW GOES DOWN WEST SIDE OF RANCHO
316 DT DA1-C
317 DI 0 51 101 211 500 1000 5000
318 DQ 0 51 101 211 211 211 211
*

319 KK RCPD05*

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UFC2

320 KM *REF ROUTE FROM VTN STUDY*

321 KM *CENTRAL FREEWAY CHANNEL REPORT*

322 KM ROUTE CPD05A-C TO CPD04B-C

323 KM RANCHO

324 RD 1500 0.006 0.016 0 TRAP 0 50

*

325 KK DPD01*

326 KM *REF RETRIEVE FROM VTN STUDY*

327 KM *CENTRAL FREEWAY CHANNEL REPORT*

328 KM RETRIEVE DPD01

329 DR DPD01

*

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

330 KK RDPD01*

331 KM *REF ROUTE FROM VTN STUDY*

332 KM *CENTRAL FREEWAY CHANNEL REPORT*

333 KM ROUTE DPD01 TO CPD01-C

334 KM PEAK DRIVE

335 RD 3500 0.0103 0.016 0 TRAP 0 50

*

336 KK PD01-C*

337 KM *REF BASIN FROM VTN STUDY*

338 KM *CENTRAL FREEWAY CHANNEL REPORT*

339 BA 0.377

340 PB 2.77

341 LS 0 85.3

342 UD 0.436

*

343 KKCPD01-C*

344 KM *REF POINT FROM VTN STUDY*

345 KM *CENTRAL FREEWAY CHANNEL REPORT*

346 KM COMBINE RDPD01 AND PD01-C

347 KM TORREY PINES AND PEAK DRIVE

348 HC 2

*

349 KK RCPD01*

350 KM *REF ROUTE FROM VTN STUDY*

351 KM *CENTRAL FREEWAY CHANNEL REPORT*

352 KM ROUTE CPD01-C TO CCY04A-C

353 KM FACILITY = LAS VEGAS WASH - PEAK DRIVE SYSTEM

354 KM FACILITY # = LVPK 0106,0130

355 KM LINING = RCB

356 RD 2670 0.0061 0.015 0 TRAP 7 0

*

357 KK CY04A-C

358 KM *REF BASIN FROM VTN STUDY*

359 KM *CENTRAL FREEWAY CHANNEL REPORT*

360 BA 0.457

361 PB 2.77

362 LS 0 86.6

363 UD 0.489

*

364 KKCCY04A-C*

365 KM *REF POINT FROM VTN STUDY*

366 KM *CENTRAL FREEWAY CHANNEL REPORT*

367 KM COMBINE RCPD01 AND CY04A-C

368 KM JONES AND PEAK DRIVE

369 HC 2

*

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

370 KKRCY04A*

371 KM *REF ROUTE FROM VTN STUDY*

372 KM *CENTRAL FREEWAY CHANNEL REPORT*

373 KM ROUTE CCY04A TO CPD04B-C

374 KM FACILITY = LAS VEGAS WASH - PEAK DRIVE SYSTEM

375 KM FACILITY # = LVPK 0000,0019,0056,0058,0104

376 KM LINING = RCB

377 RD 5517 0.0095 0.015 0 TRAP 9 0

*

378 KKPD04B-C*

379 KM *REF BASIN FROM VTN STUDY*

380 KM *CENTRAL FREEWAY CHANNEL REPORT*

381 BA 0.468

382 PB 2.77

383 LS 0 88.0

384 UD 0.539

*

385 KKCPD04B-C*

386 KM *REF POINT FROM VTN STUDY*

387 KM *CENTRAL FREEWAY CHANNEL REPORT*

388 KM COMBINE RCCY04A AND PD04B-C

389 KM RANCHO AND PEAK DRIVE

390 HC 2

*

391 KKCCPD04BC*

392 KM *REF POINT FROM VTN STUDY*

393 KM *CENTRAL FREEWAY CHANNEL REPORT*

394 KM COMBINE RCPD05 AND CPD04B-C

395 KM RANCHO AND PEAK DRIVE

396 HC 2

*

397 KKRCPD04B*

398 KM *REF ROUTE FROM VTN STUDY*

399 KM *CENTRAL FREEWAY CHANNEL REPORT*

400 KM ROUTE CCPD04BC TO CSR05B

401 KM FACILITY = LAS VEGAS WASH - RANCHO

402 KM FACILITY # = LVRA 0012,0000

403 KM LINING = RCB

404 RD 3450 0.0078 0.015 0 TRAP 12 0

*

405 KK OG03-C*
 406 KM *REF BASIN FROM VTN STUDY*
 407 KM *CENTRAL FREEWAY CHANNEL REPORT*
 408 BA 0.325
 409 PB 2.77
 410 LS 0 87.3
 411 UD 0.388
 *

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

412 KKROG03-C*
 413 KM *REF ROUTE FROM VTN STUDY*
 414 KM *CENTRAL FREEWAY CHANNEL REPORT*
 415 KM ROUTE OG03-C TO CCSR00A
 416 KM SMOKE RANCH
 417 RD 3400 0.0121 0.016 0 TRAP 0 50
 *

418 KK OG02-C*
 419 KM *REF BASIN FROM VTN STUDY*
 420 KM *CENTRAL FREEWAY CHANNEL REPORT*
 421 BA 0.318
 422 PB 2.77
 423 LS 0 90.3
 424 UD 0.351
 *

425 KKROG02-C*
 426 KM *REF ROUTE FROM VTN STUDY*
 427 KM *CENTRAL FREEWAY CHANNEL REPORT*
 428 KM ROUTE OG02-C TO CLM01-C
 429 KM FACILITY = LAS VEGAS WASH - LAKE MEAD
 430 KM FACILITY # = LVLM 0525
 431 KM LINING = RCP
 432 RD 3400 0.0124 0.013 0 CIRC 4 0
 *

433 KK LM01-C*
 434 KM *REF BASIN FROM VTN STUDY*
 435 KM *CENTRAL FREEWAY CHANNEL REPORT*
 436 BA 0.327
 437 PB 2.77
 438 LS 0 83.1
 439 UD 0.402
 *

440 KKCLM01-C*
 441 KM *REF POINT FROM VTN STUDY*
 442 KM *CENTRAL FREEWAY CHANNEL REPORT*
 443 KM COMBINE ROG02-C AND LM01-C
 444 KM TORREY PINES AND LAKE MEAD
 445 HC 2
 *

446 KKRCCLM01-C*
 447 KM *REF ROUTE FROM VTN STUDY*
 448 KM *CENTRAL FREEWAY CHANNEL REPORT*
 449 KM ROUTE CLM01-C TO CSR00A
 450 KM FACILITY = LAS VEGAS WASH - SMOKE RANCH
 451 KM FACILITY # = LVSR 0546
 452 KM LINING = RCB
 453 RD 2640 0.0057 0.015 0 TRAP 8 0
 *

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

454 KKSRO0A-C*
 455 KM *REF BASIN FROM VTN STUDY*
 456 KM *CENTRAL FREEWAY CHANNEL REPORT*
 457 BA 0.367
 458 PB 2.77
 459 LS 0 85.0
 460 UD 0.444
 *

461 KK CSR00A*
 462 KM *REF POINT FROM VTN STUDY*
 463 KM *CENTRAL FREEWAY CHANNEL REPORT*
 464 KM COMBINE RCLM01-C AND SR00A-C
 465 KM TORREY PINES AND SMOKE RANCH
 466 HC 2
 *

467 KKCCSR00A*
 468 KM *REF POINT FROM VTN STUDY*
 469 KM *CENTRAL FREEWAY CHANNEL REPORT*
 470 KM COMBINE ROG03-C AND CSR00A
 471 KM TORREY PINES AND SMOKE RANCH
 472 HC 2
 *

473 KKRCR00A*
 474 KM *REF ROUTE FROM VTN STUDY*
 475 KM *CENTRAL FREEWAY CHANNEL REPORT*
 476 KM ROUTE CSR00A TO CSR02E
 477 KM FACILITY = LAS VEGAS WASH - SMOKE RANCH
 478 KM FACILITY # = LVSR 0496
 479 KM LINING = RCB
 480 RD 2855 0.0127 0.015 0 TRAP 10 0
 *

481 KKSRO2E-C*
 482 KM *REF BASIN FROM VTN STUDY*
 483 KM *CENTRAL FREEWAY CHANNEL REPORT*
 484 BA 0.302
 485 PB 2.77
 486 LS 0 86.5
 487 UD 0.373
 *

488 KK CSR02E*
 489 KM *REF POINT FROM VTN STUDY*

490 KM *CENTRAL FREEWAY CHANNEL REPORT*
 491 KM COMBINE SR02E-C AND RCSR00A
 492 KM JONES AND SMOKE RANCH
 493 HC 2
 *

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

494 KKRCR02E*
 495 KM *REF ROUTE FROM VTN STUDY*
 496 KM *CENTRAL FREEWAY CHANNEL REPORT*
 497 KM ROUTE CSR02E TO CSR05D
 498 KM FACILITY = LAS VEGAS WASH - SMOKE RANCH
 499 KM FACILITY # = LVSR 0397,0447
 500 KM LINING = RCB
 501 RD 5170 0.0125 0.015 0 TRAP 10 0
 *

502 KKS05D-C*
 503 KM *REF BASIN FROM VTN STUDY*
 504 KM *CENTRAL FREEWAY CHANNEL REPORT*
 505 BA 0.303
 506 PB 2.77
 507 LS 0 89.5
 508 UD 0.533
 *

509 KK CSR05D*
 510 KM *REF COMBINE FROM VTN STUDY*
 511 KM *CENTRAL FREEWAY CHANNEL REPORT*
 512 KM COMBINE RCSR02E AND SR05D-C
 513 KM SMOKE RANCH AND DECATUR
 514 HC 2
 *

515 KKRCR05D*
 516 KM *REF ROUTE FROM VTN STUDY*
 517 KM *CENTRAL FREEWAY CHANNEL REPORT*
 518 KM ROUTE CSR05D TO CSR05B
 519 KM FACILITY = LAS VEGAS WASH - SMOKE RANCH
 520 KM FACILITY # = LVSR 0312,0360
 521 KM LINING = RCB
 522 RD 2150 0.0075 0.015 0 TRAP 10 0
 *

523 KKS05B-C*
 524 KM *REF BASIN FROM VTN STUDY*
 525 KM *CENTRAL FREEWAY CHANNEL REPORT*
 526 BA 0.357
 527 PB 2.77
 528 LS 0 89.9
 529 UD 0.662
 *

530 KK CSR05B*
 531 KM *REF POINT FROM VTN STUDY*
 532 KM *CENTRAL FREEWAY CHANNEL REPORT*
 533 KM COMBINE RCSR05D AND SR05B-C
 534 KM SMOKE RANCH AND RANCHO
 535 HC 2
 *

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

536 KKCCSR05B*
 537 KM *REF POINT FROM VTN STUDY*
 538 KM *CENTRAL FREEWAY CHANNEL REPORT*
 539 KM COMBINE RPD04B AND CSR05B
 540 KM SMOKE RANCH AND RANCHO
 541 HC 2
 *

542 KKRCR05B*
 543 KM *REF ROUTE FROM VTN STUDY*
 544 KM *CENTRAL FREEWAY CHANNEL REPORT*
 545 KM ROUTE CCSR05B TO CB1-C
 546 KM FACILITY = LAS VEGAS WASH - SMOKE RANCH
 547 KM FACILITY # = LVSR 0263,0273,0295
 548 KM LINING = RCB
 549 RD 2357 0.0092 0.015 0 TRAP 11 0
 *

550 KK B1-C*
 551 KM *REF BASIN FROM VTN STUDY*
 552 KM *CENTRAL FREEWAY CHANNEL REPORT*
 553 BA 0.274
 554 PB 2.77
 555 LS 0 93.6
 556 UD 0.473
 *

557 KK CB1-C*
 558 KM *REF POINT FROM VTN STUDY*
 559 KM *CENTRAL FREEWAY CHANNEL REPORT*
 560 KM COMBINE B1-C AND RCCSR05B
 561 KM AIRPORT AND CAREY
 562 HC 2
 *

563 KK RCB1-C*
 564 KM *REF ROUTE FROM VTN STUDY*
 565 KM *CENTRAL FREEWAY CHANNEL REPORT*
 566 KM ROUTE CB1-C TO CB3-1
 567 KM FACILITY = LAS VEGAS WASH - SMOKE RANCH
 568 KM FACILITY # = LVSR 0210,0221,0223
 569 KM LINING = CONCRETE
 570 RD 3050 0.0096 0.015 0 TRAP 14 1.5
 *

571 KK A1-C1*
 572 KM *REF BASIN FROM VTN STUDY*
 573 KM *CENTRAL FREEWAY CHANNEL REPORT*
 574 BA 0.311
 575 PB 2.77

576 LS 0 91.5
577 UD 0.449
*

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

578 KK DA1-C*
579 KM *REF ROUTE FROM VTN STUDY*
580 KM *CENTRAL FREEWAY CHANNEL REPORT*
581 KM RETRIEVE DA1-C
582 DR DA1-C
*

583 KK RDA1-C*
584 KM *REF ROUTE FROM VTN STUDY*
585 KM *CENTRAL FREEWAY CHANNEL REPORT*
586 KM ROUTE DA1-C TO CA1-C
587 KM FACILITY = NORTH LAS VEGAS AIR TERMINAL
588 KM FACILITY # = LAAT 0146,0172,0182 AND OVERLAND FLOW (LAAT GEOMETRY ASSUMED)
589 KM LINING = CONCRETE
590 RD 2090 0.0082 0.015 0 TRAP 6 1.5
*

591 KK CA1-C*
592 KM *REF POINT FROM VTN STUDY*
593 KM *CENTRAL FREEWAY CHANNEL REPORT*
594 KM COMBINE RDA1-C AND A1-C
595 HC 2
*

596 KK FN2-C*
597 KM *REF BASIN FROM VTN STUDY*
598 KM *CENTRAL FREEWAY CHANNEL REPORT*
599 BA 0.212
600 PB 2.77
601 LS 0 91.9
602 UD 0.381
*

603 KK RFN2-C*
604 KM *REF ROUTE FROM VTN STUDY*
605 KM *CENTRAL FREEWAY CHANNEL REPORT*
606 KM ROUTE FN2-C TO CCA1-C
607 KM VALLEY DRIVE AND AIRPORT ROAD
608 RD 2400 0.0036 0.016 0 TRAP 0 50
*

609 KK CCA1-C*
610 KM *REF POINT FROM VTN STUDY*
611 KM *CENTRAL FREEWAY CHANNEL REPORT*
612 KM COMBINE RCFN2-C AND CA1-C
613 KM COMBINE AT LAAT 0146
614 HC 2
*

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

615 KK RCCA-1C*
616 KM *REF ROUTE FROM VTN STUDY*
617 KM *CENTRAL FREEWAY CHANNEL REPORT*
618 KM ROUTE CCA1-C TO CB3-2
619 KM FACILITY = NORTH LAS VEGAS AIR TERMINAL
620 KM FACILITY # = LAAT 0031,0062,0078,0098,0140,0146
621 KM LINING = RCB
622 RD 5800 0.006 0.015 0 TRAP 10 0
*

623 KKDCENTRAL*
624 KM *REF RETRIEVE FROM VTN STUDY
625 KM *CENTRAL FREEWAY CHANNEL REPORT*
626 KM RETRIEVE DCENTRAL
627 DRDCENTRAL
*

628 KK RDCENTRAL*
629 KM *REF ROUTE FROM VTN STUDY*
630 KM *CENTRAL FREEWAY CHANNEL REPORT*
631 KM ROUTE DCENTRAL TO ALLEN AND CHEYENNE
632 KM GOWAN AND ALLEN
633 RD 7920 0.004 0.016 0 TRAP 0 50
*

634 KK FN5-C*
635 KM *REF BASIN FROM VTN STUDY
636 KM *CENTRAL FREEWAY CHANNEL REPORT*
637 BA 0.477
638 PB 2.77
639 LS 0 89.8
640 UD 0.572
*

641 KK CFN5-C*
642 KM *REF COMBINE FROM VTN STUDY
643 KM *CENTRAL FREEWAY CHANNEL REPORT*
644 KM COMBINE FN5-C AND RDCENTRA
645 KM ALLEN AND CHEYENNE
646 HC 2
*

647 KK DFN5-C*
648 KM *REF SPLIT FROM VTN STUDY*
649 KM *CENTRAL FREEWAY CHANNEL REPORT*
650 KM FLOW SPLIT REFERENCED FROM SIMMONS ST IMPROVEMENT PROJECT
651 KM 140 CFS FLOW FROM ALLEN/CHEYENNE GOES INTO AIRPORT 48" EQUIV HERCP
652 KM 140 CFS BASED ON FLOWMASTER CAPACITY OF FACILITY
653 KM EXCESS FLOW CONTINUES EAST IN CHEYENNE
654 DT DR-C
655 DI 0 140 500 1000
656 DQ 0 0 360 860
*

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

657 KK RDN5-C*
 658 KM *REF BASIN FROM VTN STUDY*
 659 KM *CENTRAL FREEWAY CHANNEL REPORT*
 660 KM ROUTE DFN5-C TO CB3-2
 661 KM FACILITY = NORTH LAS VEGAS AIR TERMINAL
 662 KM FACILITY # = LAAT 0031,0062,0078
 663 KM LINING = RCB
 664 RD 3500 0.005 0.015 0 TRAP 10 0
 *

665 KK B3-2*
 666 KM *REF BASIN FROM VTN STUDY*
 667 KM *CENTRAL FREEWAY CHANNEL REPORT*
 668 BA 0.306
 669 PB 2.77
 670 LS 0 92.0
 671 UD 0.408
 *

672 KK CB3-2*
 673 KM *REF COMBINE FROM VTN STUDY*
 674 KM *CENTRAL FREEWAY CHANNEL REPORT*
 675 KM COMBINE RDN5-C, B3-2, AND RCCA-1C
 676 KM COMBINE AT LAAT 0031
 677 HC 3
 *

678 KK RCB3-2*
 679 KM *REF BASIN FROM VTN STUDY*
 680 KM *CENTRAL FREEWAY CHANNEL REPORT*
 681 KM ROUTE CB3-2 TO CB3-1
 682 KM FACILITY = NORTH LAS VEGAS AIR TERMINAL
 683 KM FACILITY # = LAAT 0000,0006,0014,0031
 684 KM LINING = RCB
 685 RD 2770 0.0105 0.015 0 TRAP 10 0
 *

686 KK B3-1*
 687 KM *REF BASIN FROM VTN STUDY*
 688 KM *CENTRAL FREEWAY CHANNEL REPORT*
 689 BA 0.306
 690 PB 2.77
 691 LS 0 92.1
 692 UD 0.447
 *

693 KK CB3-1*
 694 KM *REF POINT FROM VTN STUDY*
 695 KM *CENTRAL FREEWAY CHANNEL REPORT*
 696 KM COMBINE RCB3-2 AND B3-1
 697 KM COMBINE AT LAAT 0000
 698 HC 2
 *

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

699 KK CCB3-1*
 700 KM *REF POINT FROM VTN STUDY*
 701 KM *CENTRAL FREEWAY CHANNEL REPORT*
 702 KM COMBINE CB3-1 AND RCB1-C
 703 KM COMBINATION NEAR CAREY-LAKE MEAD DETENTION BASIN
 704 HC 2
 *

705 KK DR-C*
 706 KM *REF RETRIEVE FROM VTN STUDY*
 707 KM *CENTRAL FREEWAY CHANNEL REPORT*
 708 KM RETRIEVE DR-C
 709 DR DR-C
 *

710 KK RDR-C*
 711 KM *REF ROUTE FROM VTN STUDY*
 712 KM *CENTRAL FREEWAY CHANNEL REPORT*
 713 KM ROUTE DR-C TO CR-C
 714 KM ROUTE AND CHEYENNE AND THROUGH NORTHEAST PORTION OF R2-CA
 715 KM FLOW WILL ENTER LAAS SYSTEM 1500 FT SOUTH OF CHEYENNE ON SIMMONS
 716 RD 3300 0.007 0.016 0 TRAP 0 50
 *

717 KK R-C*
 718 KM *REF BASIN FROM VTN STUDY*
 719 KM *CENTRAL FREEWAY CHANNEL REPORT*
 720 BA 0.266
 721 PB 2.77
 722 LS 0 90.3
 723 UD 0.328
 *

724 KK RR-C*
 725 KM *REF ROUTE FROM VTN STUDY*
 726 KM *CENTRAL FREEWAY CHANNEL REPORT*
 727 KM ROUTE R-C TO CR-C
 728 KM FACILITY = NORTH LAS VEGAS AIR TERMINAL - SIMMONS
 729 KM FACILITY # = LAAS 0080,0083,0095,0103
 730 KM LINING = RCP
 731 RD 1582 0.014 0.013 0 CIRC 5
 *

732 KK CR-C*
 733 KM *REF POINT FROM VTN STUDY*
 734 KM *CENTRAL FREEWAY CHANNEL REPORT*
 735 KM COMBINE RR-C AND RDR-C
 736 KM COMBINATION AT SIMMONS ST, 1500 FT SOUTH OF CHEYENNE
 737 HC 2
 *

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

738 KK RCR-C*
 739 KM *REF ROUTE FROM VTN STUDY*
 740 KM *CENTRAL FREEWAY CHANNEL REPORT*
 741 KM ROUTE CR-C TO CR2-CA

UFC2

742 KM FACILITY = NORTH LAS VEGAS AIR TERMINAL - SIMMONS
 743 KM FACILITY # = LAAS 0000,0014,0040
 744 KM LINING = RCB
 745 RD 4215 0.0112 0.015 0 TRAP 12 0
 *

746 KK R2-CA*
 747 KM *REF BASIN FROM VTN STUDY*
 748 KM *CENTRAL FREEWAY CHANNEL REPORT*
 749 BA 0.447
 750 PB 2.77
 751 LS 0 91.8
 752 UD 0.345
 *

753 KK CR2-CA*
 754 KM *REF POINT FROM VTN STUDY*
 755 KM *CENTRAL FREEWAY CHANNEL REPORT*
 756 KM COMBINE R2-CA AND RCR-C
 757 KM CAREY AND SIMMONS
 758 HC 2
 *

759 KK LM02-C*
 760 KM *REF BASIN FROM VTN STUDY*
 761 KM *CENTRAL FREEWAY CHANNEL REPORT*
 762 BA 0.293
 763 PB 2.77
 764 LS 0 85.0
 765 UD 0.367
 *

766 KKRLM02-C*
 767 KM *REF ROUTE FROM VTN STUDY*
 768 KM *CENTRAL FREEWAY CHANNEL REPORT*
 769 KM ROUTE LM02-C TO CLM03-C
 770 KM FACILITY = LAS VEGAS WASH - LAKE MEAD
 771 KM FACILITY # = LVLM 0442,0453,0460
 772 KM LINING = RCP
 773 RD 2778 0.0205 0.013 0 CIRC 4.5
 *

774 KK LM03-C*
 775 KM *REF BASIN FROM VTN STUDY*
 776 KM *CENTRAL FREEWAY CHANNEL REPORT*
 777 BA 0.336
 778 PB 2.77
 779 LS 0 91.0
 780 UD 0.376
 *

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

781 KKCLM03-C*
 782 KM *REF POINT FROM VTN STUDY
 783 KM *CENTRAL FREEWAY CHANNEL REPORT*
 784 KM COMBINE RCLM02-C AND LM03-C
 785 KM MICHAEL AND LAKE MEAD
 786 HC 2
 *

787 KKRCCLM03-C*
 788 KM *REF ROUTE FROM VTN STUDY*
 789 KM *CENTRAL FREEWAY CHANNEL REPORT*
 790 KM ROUTE CLM03-C TO CLM05-C
 791 KM FACILITY = LAS VEGAS WASH - LAKE MEAD
 792 KM FACILITY # = LVLM 0388,0399,0416
 793 KM LINING = RCP
 794 RD 2640 0.01 0.013 0 CIRC 6
 *

795 KK LM05-C*
 796 KM *REF BASIN FROM VTN STUDY*
 797 KM *CENTRAL FREEWAY CHANNEL REPORT*
 798 BA 0.368
 799 PB 2.77
 800 LS 0 88.2
 801 UD 0.387
 *

802 KKCLM05-C*
 803 KM *REF POINT FROM VTN STUDY*
 804 KM *CENTRAL FREEWAY CHANNEL REPORT*
 805 KM COMBINE RCLM03-C AND LM05-C
 806 KM DECATUR AND LAKE MEAD
 807 HC 2
 *

808 KKOG011AC2*
 809 KM *REF BASIN FROM VTN STUDY*
 810 KM *CENTRAL FREEWAY CHANNEL REPORT*
 811 BA 0.120
 812 PB 2.77
 813 LS 0 92.0
 814 UD 0.219
 *

815 KK OG011D*
 816 KM *REF SPLIT FROM VTN STUDY*
 817 KM *CENTRAL FREEWAY CHANNEL REPORT*
 818 KM DIVERT 45 CFS EAST TOWARD RAINBOW IN SD
 819 KM BASED ON FINAL OVERALL PROJECT DRAINAGE DESIGN REPORT
 820 KM FOR US 95 WIDENING BY VTN (MAY 2003)
 821 DT OG011AD
 822 DI 0 45 100 50099410000
 823 DQ 0 45 45 45 4545
 *

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

824 KKROG011D*
 825 KM *REF ROUTE FROM VTN STUDY*
 826 KM *CENTRAL FREEWAY CHANNEL REPORT*
 827 KM ROUTE OG011D TO CVG02-C

828 KM US95 TO VEGAS DRIVE UFC2
829 RD 5900 0.011 0.016 0 TRAP 0 50
*
830 KKOG011A-C*
831 KM *REF BASIN FROM VTN STUDY*
832 KM *CENTRAL FREEWAY CHANNEL REPORT*
833 BA 0.313
834 PB 2.77
835 LS 0 81.4
836 UD 0.413
*
837 KKROG011A*
838 KM *REF ROUTE FROM VTN STUDY*
839 KM *CENTRAL FREEWAY CHANNEL REPORT*
840 KM ROUTE OG011A-C TO CVG02-C
841 KM VEGAS DRIVE
842 RD 3200 0.0172 0.016 0 TRAP 0 50
*
843 KK VG02-C*
844 KM *REF BASIN FROM VTN STUDY*
845 KM *CENTRAL FREEWAY CHANNEL REPORT*
846 BA 0.242
847 PB 2.77
848 LS 0 83.0
849 UD 0.383
*
850 KKC VG02-C*
851 KM *REF POINT FROM VTN STUDY*
852 KM *CENTRAL FREEWAY CHANNEL REPORT*
853 KM COMBINE ROG011A, RDOG011A, AND VG02-C
854 KM TORREY PINES AND VEGAS DRIVE
855 HC 3
*
856 KK RCVG02*
857 KM *REF ROUTE FROM VTN STUDY*
858 KM *CENTRAL FREEWAY CHANNEL REPORT*
859 KM ROUTE CVG02-C TO CVG03-C
860 KM FACILITY = OWENS AVENUE SYSTEM
861 KM FACILITY # = LVOW 0460
862 KM LINING = RCB
863 RD 2700 0.0148 0.015 0 TRAP 7 0
*

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

864 KK VG03-C*
865 KM *REF BASIN FROM VTN STUDY*
866 KM *CENTRAL FREEWAY CHANNEL REPORT*
867 BA 0.279
868 PB 2.77
869 LS 0 80.2
870 UD 0.400
*
871 KKC VG03-C*
872 KM *REF POINT FROM VTN STUDY*
873 KM *CENTRAL FREEWAY CHANNEL REPORT*
874 KM COMBINE RCVG02 AND VG03-C
875 KM JONES AND VEGAS DRIVE
876 HC 2
*
877 KK RCVG03*
878 KM *REF ROUTE FROM VTN STUDY*
879 KM *CENTRAL FREEWAY CHANNEL REPORT*
880 KM ROUTE CVG03-C TO CVG04-C
881 KM FACILITY = OWENS AVENUE SYSTEM
882 KM FACILITY # = LVOW 0351,0360
883 KM LINING = RCB
884 RD 5300 0.0148 0.015 0 TRAP 8 0
*
885 KK VG04-C*
886 KM *REF BASIN FROM VTN STUDY*
887 KM *CENTRAL FREEWAY CHANNEL REPORT*
888 BA 0.305
889 PB 2.77
890 LS 0 91.0
891 UD 0.506
*
892 KKC VG04-C*
893 KM *REF POINT FROM VTN STUDY*
894 KM *CENTRAL FREEWAY CHANNEL REPORT*
895 KM COMBINE RCVG03 AND VG04-C
896 KM DECATUR AND VEGAS DRIVE
897 HC 2
*
898 KKDCVG04-C*
899 KM *REF SPLIT FROM VTN STUDY*
900 KM *CENTRAL FREEWAY CHANNEL REPORT*
901 KM DIVERT 164 CFS EAST ON VEGAS
902 KM REMAINING FLOW CONTINUES NORTH IN LMDE 0000 ON DECATUR
903 DT DVG20C
904 DI 0 164 1000 2000
905 DQ 0 164 164 164
*

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

906 KK RDCVG04C*
907 KM *REF ROUTE FROM VTN STUDY*
908 KM *CENTRAL FREEWAY CHANNEL REPORT*
909 KM ROUTE DCVG04-C TO CCLM05-C
910 KM FACILITY = LAKE MEAD - DECATUR
911 KM FACILITY # = LMDE 0000
912 KM LINING = RCB
913 RD 2640 0.009 0.015 0 TRAP 10 0

*
 914 KKCLM05-C*
 915 KM *REF POINT FROM VTN STUDY*
 916 KM *CENTRAL FREEWAY CHANNEL REPORT*
 917 KM COMBINE RDCVG04C AND CLM05-C
 918 KM DECATUR AND LAKE MEAD
 919 HC 2
 *

920 KKRCLM05C*
 921 KM *REF ROUTE FROM VTN STUDY*
 922 KM *CENTRAL FREEWAY CHANNEL REPORT*
 923 KM ROUTE CCLM05-C TO CLM06-C
 924 KM FACILITY = LAS VEGAS WASH - LAKE MEAD
 925 KM FACILITY # = LVLM 0337,0356
 926 KM LINING = RCB
 927 RD 2890 0.0116 0.015 0 TRAP 12 0
 *

928 KKL06B-C*
 929 KM *REF BASIN FROM VTN STUDY*
 930 KM *CENTRAL FREEWAY CHANNEL REPORT*
 931 BA 0.355
 932 PB 2.77
 933 LS 0 89.7
 934 UD 0.468
 *

935 KKCLM06-C*
 936 KM *REF POINT FROM VTN STUDY*
 937 KM *CENTRAL FREEWAY CHANNEL REPORT*
 938 KM COMBINE RCCLM05C AND LM06B-C
 939 KM RANCHO AND LAKE MEAD
 940 HC 2
 *

941 KK RCLM06*
 942 KM *REF ROUTE FROM VTN STUDY*
 943 KM *CENTRAL FREEWAY CHANNEL REPORT*
 944 KM ROUTE CLM06-C TO CLM10-C
 945 KM FACILITY = LAS VEGAS WASH - LAKE MEAD
 946 KM FACILITY # = LVLM 0226,0271
 947 KM LINING = RCB
 948 RD 4114 0.0135 0.015 0 TRAP 12 0
 *

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

949 KK LM10-C*
 950 KM *REF BASIN FROM VTN STUDY*
 951 KM *CENTRAL FREEWAY CHANNEL REPORT*
 952 BA 0.409
 953 PB 2.77
 954 LS 0 90.6
 955 UD 0.368
 *

956 KKCLM10-C*
 957 KM *REF POINT FROM VTN STUDY*
 958 KM *CENTRAL FREEWAY CHANNEL REPORT*
 959 KM COMBINE RCLM06 AND LM10-C
 960 HC 2
 *

961 KKARYLMIN*
 962 KM *REF POINT FROM VTN STUDY*
 963 KM *CENTRAL FREEWAY CHANNEL REPORT*
 964 KM COMBINE CCB3-1,CR2-CA, AND CLM10-C
 965 KM CAREY-LAKE MEAD DETENTION BASIN TOTAL INFLOW
 966 HC 3
 *

967 KKARYLMDB*
 968 KM *REF BASIN FROM VTN STUDY*
 969 KM *CENTRAL FREEWAY CHANNEL REPORT*
 970 KM CAREY-LAKE MEAD DETENTION BASIN
 971 KM FACILITY = LAS VEGAS WASH - LAKE MEAD
 972 KM FACILITY # = LVLM 0228
 973 KM STORAGE VOLUME = 607 ACRE-FEET
 974 KM OUTLET = 2-48" RCP
 975 KM 100-YEAR DISCHARGE = 377 CFS
 976 KM SPILLWAY LENGTH =
 977 KM SPILLWAY HEIGHT =
 978 KM SPILLWAY CREST ELEVATION = 2118.5'
 979 KM SPILLWAY TYPE =
 980 KM PMF DISCHARGE =
 981 KM TOP OF EMBANKMENT ELEVATION = 2120.8'
 * FROM MONTGOMERY WATSON
 982 RS 1 FLOW -1
 983 SV 0 9 55 150 274 419 541 585 607 629
 984 SE 92 98 102 106 110 114 117 118 118.5 119
 985 SQ 0 60 90 135 150 215 350 375 380 1000
 *

986 KK DCAREY*
 987 KM *REF SPLIT FROM VTN STUDY*
 988 KM *CENTRAL FREEWAY CHANNEL REPORT*
 989 KM FLOW SPLIT TO SMOKE RANCH FACILITY
 990 KM DIBAS IN CWH
 991 DT DR2
 992 DI 0 41 92 160 206 300 373 500 1000 5000
 993 DQ 0 1 1 1 1 95 168 168 168 168
 *

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

994 KKRDCAREY*
 995 KM *REF ROUTE FROM VTN STUDY*
 996 KM *CENTRAL FREEWAY CHANNEL REPORT*
 997 KM ROUTE DCAREY TO CLM16A-C
 998 KM FACILITY = LAS VEGAS WASH - LAKE MEAD
 999 KM FACILITY # = LVLM 0170,0222
 1000 KM LINING = RCP

1001	RD	2921	0.0117	0.013	0	CIRC	UFC2
	*						6.5
1002	KK	DFLOW*					
1003	KM	*REF SPLIT FROM VTN STUDY*					
1004	KM	*CENTRAL FREEWAY CHANNEL REPORT*					
1005	KM	DIVERT ALL FLOW OUT					
1006	KM	FOR STORM CENTERING					
1007	DT	DFLOW					
1008	DI	0	100	500	994	10000	
1009	DQ	0	100	500	994	10000	
	*						
1010	KKLM16A-C*						
1011	KM	*REF BASIN FROM VTN STUDY*					
1012	KM	*CENTRAL FREEWAY CHANNEL REPORT*					
1013	BA	0.379					
1014	PB	2.77					
1015	LS	0	90.6				
1016	UD	0.383					
	*						
1017	KKCLM16A-C*						
1018	KM	*REF COMBINE FROM VTN STUDY*					
1019	KM	*CENTRAL FREEWAY CHANNEL REPORT*					
1020	KM	COMBINE RDCAREY AND LM16A-C					
1021	KM	TONOPAH AND LAKE MEAD					
1022	HC	2					
	*						
1023	KKRCLM16A*						
1024	KM	*REF ROUTE FROM VTN STUDY*					
1025	KM	*CENTRAL FREEWAY CHANNEL REPORT*					
1026	KM	ROUTE CLM16A-C TO CLM14-C					
1027	KM	FACILITY = LAS VEGAS WASH - LAKE MEAD					
1028	KM	FACILITY # = LVLM 0060					
1029	KM	LINING = RCB					
1030	RD	3000	0.0066	0.015	0	TRAP	12 0
	*						
1031	KK LM14-C*						
1032	KM	*REF BASIN FROM VTN STUDY*					
1033	KM	*CENTRAL FREEWAY CHANNEL REPORT*					
1034	BA	0.342					
1035	PB	2.77					
1036	LS	0	85.0				
1037	UD	0.392					
	*						

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

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1038	KKCLM14-C*						
1039	KM	*REF POINT FROM VTN STUDY*					
1040	KM	*CENTRAL FREEWAY CHANNEL REPORT*					
1041	KM	COMBINE RCLM16A AND LM14-C					
1042	KM	MARTIN LUTHER KING AND LAKE MEAD					
1043	HC	2					
	*						
1044	KK RCLM14						
1045	KM	*REF ROUTE FROM VTN STUDY*					
1046	KM	ROUTE CLM14-C TO CLM20-C					
1047	KM	FACILITY = LAS VEGAS WASH - LAKE MEAD					
1048	KM	FACILITY # = LVLM 0060					
1049	KM	LINING = RCB					
1050	RD	2950	0.0066	0.015	0	TRAP	12 0
	*						
1051	KK LM19*						
1052	KM	*REF BASIN FROM VTN STUDY*					
1053	KM	*CENTRAL FREEWAY CHANNEL REPORT*					
1054	BA	0.256					
1055	PB	2.77					
1056	LS	0	84.8				
1057	UD	0.483					
	*						
1058	KK RLM19						
1059	KM	*REF ROUTE FROM VTN STUDY*					
1060	KM	*CENTRAL FREEWAY CHANNEL REPORT*					
1061	KM	ROUTE LM19 TO CLM20-C					
1062	KM	BALZAR TO H STREET					
1063	RD	4100	0.0054	0.016	0	TRAP	0 50
	*						
1064	KK LM20-C*						
1065	KM	*REF BASIN FROM VTN STUDY*					
1066	KM	*CENTRAL FREEWAY CHANNEL REPORT*					
1067	BA	0.383					
1068	PB	2.77					
1069	LS	0	86.1				
1070	UD	0.403					
	*						
1071	KKCLM20-C*						
1072	KM	*REF POINT FROM VTN STUDY*					
1073	KM	COMBINE RLM19, RCLM14, AND LM20-C					
1074	KM	LAKE MEAD AND H STREET					
1075	HC	3					
	*						

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

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1076	KK RCLM20*						
1077	KM	*REF ROUTE FROM VTN STUDY*					
1078	KM	*CENTRAL FREEWAY CHANNEL REPORT*					
1079	KM	ROUTE CLM20-C TO CCVG24					
1080	KM	FACILITY = LAS VEGAS WASH - LAKE MEAD					
1081	KM	FACILITY # = LVLM 0001,0017,0034					
1082	KM	LINING = RCB					
1083	RD	2998	0.0162	0.015	0	TRAP	12 0
	*						
1084	KK DVG20C*						

UFC2

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1085      KM      *REF RETRIEVE FROM VTN STUDY*
1086      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1087      KM      RETRIEVE DVG20C
1088      DR      DVG20C
1089      *
1089      KKRDVG20C*
1090      KM      *REF ROUTE FROM VTN STUDY*
1091      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1092      KM      ROUTE DVG20C TO CVG20-C
1093      KM      FACILITY = OWENS AVENUE SYSTEM
1094      KM      FACILITY # = LVOW 0241
1095      KM      LINING = RCP
1096      RD      5800  0.014  0.013      0      CIRC      5.5
1097      *
1097      KK VG20-C*
1098      KM      *REF BASIN FROM VTN STUDY*
1099      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1100      BA      0.305
1101      PB      2.77
1102      LS      0      86.8
1103      UD      0.469
1104      *
1104      KKCVG20-C*
1105      KM      *REF COMBINE FROM VTN STUDY*
1106      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1107      KM      COMBINE RDVG20C AND VG20-C
1108      KM      RANCHO AND VEGAS DRIVE
1109      HC      2
1110      *
1110      KK LM09-C*
1111      KM      *REF BASIN FROM VTN STUDY*
1112      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1113      BA      0.455
1114      PB      2.77
1115      LS      0      90.9
1116      UD      0.317
1117      *

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

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1117      KKDLM09-C*
1118      KM      *REF SPLIT FROM VTN STUDY*
1119      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1120      KM      SAME AS DVG21 FROM CWH
1121      KM      DIVERSION AT RANCHO AND HOLLY
1122      KM      FLOW IS DIVERTED ACROSS RANCHO TO HOLLY
1123      KM      REMAINING FLOW CONTINUES SOUTHEAST IN RANCHO TO CVG20-C
1124      DT      DHOLLY
1125      DI      0      51      201      300      400      500      600      800      1000
1126      DQ      0      1      1      100      200      300      350      450      550
1127      *

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1127      KKRDLM09-C*
1128      KM      *REF ROUTE FROM VTN STUDY*
1129      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1130      KM      ROUTE DLM09-C TO CCVG20-C
1131      KM      RANCHO
1132      RD      2200  0.0136  0.016      0      TRAP      0      50
1133      *

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1133      KKCCVG20-C*
1134      KM      *REF POINT FROM VTN STUDY*
1135      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1136      KM      COMBINE RDLM09-C AND CVG20-C
1137      KM      RANCHO AND VEGAS DRIVE
1138      HC      2
1139      *

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1139      KKDCVG20-C*
1140      KM      *REF SPLIT FROM VTN STUDY*
1141      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1142      KM      CAPACITY OF PIPE IN VEGAS = 570 CFS
1143      DT      LV15
1144      DI      0      570      1000      2000
1145      DQ      0      0      430      1430
1146      *

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1146      KKRDVG20C*
1147      KM      *REF ROUTE FROM VTN STUDY*
1148      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1149      KM      ROUTE DVG20-C TO CLM16B-C
1150      KM      FACILITY = OWENS AVENUE SYSTEM
1151      KM      FACILITY # = LVOW 0003, 0146
1152      KM      LINING = RCP
1153      RD      7450  0.009  0.013      0      CIRC      7
1154      *

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1154      KK DHOLLY*
1155      KM      *REF RETRIEVE FROM VTN STUDY*
1156      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1157      KM      RETRIEVE DHOLLY
1158      DR      DHOLLY
1159      *

```

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

```

1159      KKRDHOLLY*
1160      KM      *REF ROUTE FROM VTN STUDY*
1161      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1162      KM      ROUTE DHOLLY TO CLM16B-C
1163      KM      THIS FLOW WILL COMBINE IN LVOW 0146 NEAR FERRELL ST
1164      RD      9600  0.0054  0.016      0      TRAP      0      50
1165      *

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1165      KKLM16B-C*
1166      KM      *REF BASIN FROM VTN STUDY*
1167      KM      *CENTRAL FREEWAY CHANNEL REPORT*
1168      BA      0.378
1169      PB      2.77
1170      LS      0      88.8

```

1171 UD 0.602
*
1172 KKCLM16B-C*
1173 KM *REF POINT FROM VTN STUDY*
1174 KM *CENTRAL FREEWAY CHANNEL REPORT*
1175 KM COMBINE RDCVG20C, RDHOLLY, AND LM16B-C
1176 KM MARTIN LUTHER KING AND VEGAS DRIVE
1177 HC 3
*

1178 KKRCLM16B*
1179 KM *REF ROUTE FROM VTN STUDY*
1180 KM *CENTRAL FREEWAY CHANNEL REPORT*
1181 KM ROUTE CLM16B-C TO CVG10-C
1182 KM FACILITY = OWENS AVENUE SYSTEM
1183 KM FACILITY # = LVOW 0000,0003
1184 KM LINING = RCP
1185 RD 4995 0.007 0.013 0 CIRC 8
*

1186 KKOG011AD*
1187 KM *REF RETRIEVE FROM VTN STUDY*
1188 KM *CENTRAL FREEWAY CHANNEL REPORT*
1189 KM RETRIEVE OG011AD
1190 DR OG011AD
*

1191 KKROG011AD*
1192 KM *REF ROUTE FROM VTN STUDY*
1193 KM *CENTRAL FREEWAY CHANNEL REPORT*
1194 KM ROUTE OG011AD TO CWA01-C
1195 KM WASHINGTON
1196 RD 3200 0.0171 0.016 0 TRAP 0 50
*

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

1197 KK WA01-C*
1198 KM *REF BASIN FROM VTN STUDY*
1199 KM *CENTRAL FREEWAY CHANNEL REPORT*
1200 BA 0.195
1201 PB 2.77
1202 LS 0 88.7
1203 UD 0.249
*

1204 KKCWA01-C*
1205 KM *REF POINT FROM VTN STUDY*
1206 KM *CENTRAL FREEWAY CHANNEL REPORT*
1207 KM COMBINE ROG011AD AND WA01-C
1208 KM TORREY PINES AND WASHINGTON
1209 HC 2
*

1210 KK RWA01*
1211 KM *REF ROUTE FROM VTN STUDY*
1212 KM *CENTRAL FREEWAY CHANNEL REPORT*
1213 KM ROUTE WA01-C TO CWA04-C
1214 KM WASHINGTON
1215 RD 5300 0.0142 0.016 0 TRAP 0 50
*

1216 KK WA04-C*
1217 KM *REF BASIN FROM VTN STUDY*
1218 KM *CENTRAL FREEWAY CHANNEL REPORT*
1219 BA 0.197
1220 PB 2.77
1221 LS 0 87.7
1222 UD 0.474
*

1223 KKCWA04-C*
1224 KM *REF POINT FROM VTN STUDY*
1225 KM *CENTRAL FREEWAY CHANNEL REPORT*
1226 KM COMBINE RWA01 AND WA04-C
1227 KM MICHAEL AND WASHINGTON
1228 HC 2
*

1229 KK RCWA04*
1230 KM *REF ROUTE FROM VTN STUDY*
1231 KM *CENTRAL FREEWAY CHANNEL REPORT*
1232 KM ROUTE CWA04-C TO CWA09-C
1233 KM FACILITY = FREEWAY CHANNEL
1234 KM FACILITY # = LV15 0602
1235 KM LINING = RCP
1236 RD 5980 0.0159 0.013 0 CIRC 8
*

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

1237 KK WA09-C*
1238 KM *REF BASIN FROM VTN STUDY*
1239 KM *CENTRAL FREEWAY CHANNEL REPORT*
1240 BA 0.101
1241 PB 2.77
1242 LS 0 91.3
1243 UD 0.363
*

1244 KKCWA09-C*
1245 KM *REF POINT FROM VTN STUDY*
1246 KM *CENTRAL FREEWAY CHANNEL REPORT*
1247 KM COMBINE RCWA04 AND WA09-C
1248 KM VALLEY VIEW AND WASHINGTON
1249 HC 2
*

1250 KK RCWA09*
1251 KM *REF ROUTE FROM VTN STUDY*
1252 KM *CENTRAL FREEWAY CHANNEL REPORT*
1253 KM ROUTE CWA09-C TO CWA10NW
1254 KM FACILITY = FREEWAY CHANNEL

UFC2

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1255 KM FACILITY # = LV15 0528
1256 KM LINING = RCB
1257 RD 700 0.0119 0.015 0 TRAP 8
*

1258 KK WA10-C*
1259 KM *REF BASIN FROM VTN STUDY*
1260 KM *CENTRAL FREEWAY CHANNEL REPORT*
1261 BA 0.447
1262 PB 2.77
1263 LS 0 87.8
1264 UD 0.367
*

1265 KK WA10D*
1266 KM *REF SPLIT FROM VTN STUDY*
1267 KM *CENTRAL FREEWAY CHANNEL REPORT*
1268 KM FLOW SPLIT TO SOUTHWEST CENTRAL BASIN
1269 KM OPPOSITE SPLIT OF WA10NW IN SOUTHWEST CENTRAL BASIN FLOW
1270 KM FROM FINAL OVERALL PROJECT DRAINAGE DESIGN REPORT BY VTN (MAY 2003)
1271 KM CAPACITY OF CHANNEL = 250 CFS IS DIVERTED
1272 KM EXCESS FLOW CONTINUES DOWN WASHINGTON
1273 DT WA10SE
1274 DI 0 10 250 275 300 800 1000 3000
1275 DQ 0 10 250 250 250 250 250
*

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

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1276 KKCWA10NW*
1277 KM *REF COMBINE FROM VTN STUDY*
1278 KM *CENTRAL FREEWAY CHANNEL REPORT*
1279 KM COMBINE RCWA09 AND WA10D
1280 KM VALLEY VIEW AND WASHINGTON
1281 HC 2
*

1282 KKRCWA10NW*
1283 KM *REF ROUTE FROM VTN STUDY*
1284 KM *CENTRAL FREEWAY CHANNEL REPORT*
1285 KM ROUTE CWA10NW TO CWA13-C
1286 KM FACILITY = FREEWAY CHANNEL
1287 KM FACILITY # = LV15 0528
1288 KM LINING = RCB
1289 RD 4420 0.0119 0.015 0 TRAP 8 0
*

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1290 KK WA13-C*
1291 KM *REF BASIN FROM VTN STUDY*
1292 KM *CENTRAL FREEWAY CHANNEL REPORT*
1293 BA 0.333
1294 PB 2.77
1295 LS 0 89.8
1296 UD 0.264
*

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1297 KKCWA13-C*
1298 KM *REF POINT FROM VTN STUDY*
1299 KM *CENTRAL FREEWAY CHANNEL REPORT*
1300 KM COMBINE RCWA10NW AND WA13-C
1301 KM RANCHO DRIVE AND WASHINGTON
1302 HC 2
*

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1303 KK DCWA13*
1304 KM *REF SPLIT FROM VTN STUDY*
1305 KM *CENTRAL FREEWAY CHANNEL REPORT*
1306 KM FLOW SPLIT TO SOUTHWEST CENTRAL BASIN
1307 KM RANCHO AND WASHINGTON
1308 KM REFERENCED FROM US-95 WIDENING PROJECT
1309 KM FINAL OVERALL PROJECT DRAINAGE DESIGN REPORT BY VTN (MAY 2003)
1310 DT WA13SE
1311 DI 0 500 812 1000 1200
1312 DQ 0 303 490 609 727
*

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1313 KK LV15*
1314 KM *REF RETRIEVE FROM VTN STUDY*
1315 KM *CENTRAL FREEWAY CHANNEL REPORT*
1316 KM RETRIEVE LV15
1317 DR LV15
*

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

```

1318 KK RLV15*
1319 KM *REF ROUTE FROM VTN STUDY*
1320 KM *CENTRAL FREEWAY CHANNEL REPORT*
1321 KM ROUTE LV15 TO CCWA13-C
1322 KM RANCHO
1323 RD 3300 0.0045 0.016 0 TRAP 0 50
*

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1324 KKCCWA13-C*
1325 KM *REF POINT FROM VTN STUDY*
1326 KM *CENTRAL FREEWAY CHANNEL REPORT*
1327 KM COMBINE RLV15 AND DCWA13
1328 KM TONOPAH AND WASHINGTON
1329 HC 2
*

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1330 KK RCWA13*
1331 KM *REF ROUTE FROM VTN STUDY*
1332 KM *CENTRAL FREEWAY CHANNEL REPORT*
1333 KM ROUTE CCWA13-C TO CWA15-C
1334 KM FACILITY = FREEWAY CHANNEL
1335 KM FACILITY # = LV15 0424,0474
1336 KM LINING = RCB
1337 RD 5380 0.0073 0.015 0 TRAP 8 0
*

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1338 KKWA15A-C*
1339 KM *REF BASIN FROM VTN STUDY*
1340 KM *CENTRAL FREEWAY CHANNEL REPORT*

```

1341 BA 0.374
 1342 PB 2.77
 1343 LS 0 88.2
 1344 UD 0.589
 *

1345 KKCWA15A-C*
 1346 KM *REF POINT FROM VTN STUDY*
 1347 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1348 KM COMBINE RCWA13 AND WA15A-C
 1349 KM MARTIN LUTHER KING AND WASHINGTON
 1350 HC 2
 *

1351 KK VG07*
 1352 KM *REF BASIN FROM VTN STUDY*
 1353 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1354 BA 0.261
 1355 PB 2.77
 1356 LS 0 81.4
 1357 UD 0.472
 *

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

1358 KK RVG07*
 1359 KM *REF ROUTE FROM VTN STUDY*
 1360 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1361 KM ROUTE VG07 TO CVG07
 1362 KM MARTIN LUTHER KING
 1363 RD 1320 0.005 0.016 0 TRAP 0 50
 *

1364 KK CVG07*
 1365 KM *REF POINT FROM VTN STUDY*
 1366 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1367 KM COMBINE RVG07 AND CWA15A-C
 1368 KM MARTIN LUTHER KING AND WASHINGTON
 1369 HC 2
 *

1370 KK RCVG07*
 1371 KM *REF ROUTE FROM VTN STUDY*
 1372 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1373 KM ROUTE CVG07 TO CWA20-C
 1374 KM FACILITY = FREEWAY CHANNEL
 1375 KM FACILITY # = LV15 0316,0372,0409
 1376 KM LINING = RCB
 1377 RD 5100 0.0066 0.015 0 TRAP 9 0
 *

1378 KK WA20-C*
 1379 KM *REF BASIN FROM VTN STUDY*
 1380 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1381 BA 0.527
 1382 PB 2.77
 1383 LS 0 88.9
 1384 UD 0.628
 *

1385 KKCWA20-C*
 1386 KM *REF POINT FROM VTN STUDY*
 1387 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1388 KM COMBINE RCVG07 AND WA20-C
 1389 KM FREEWAY CHANNEL AND WASHINGTON
 1390 HC 2
 *

1391 KKRCWA20-C*
 1392 KM *REF ROUTE FROM VTN STUDY*
 1393 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1394 KM ROUTE CWA20-C TO CCVG10
 1395 KM FACILITY = FREEWAY CHANNEL
 1396 KM FACILITY # = LV15 0284,0316
 1397 KM LINING = RCB
 1398 RD 2490 0.005 0.015 0 TRAP 14 0
 *

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

1399 KK VG10-C*
 1400 KM *REF BASIN FROM VTN STUDY*
 1401 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1402 BA 0.388
 1403 PB 2.77
 1404 LS 0 87.2
 1405 UD 0.517
 *

1406 KKCVG10-C*
 1407 KM *REF POINT FROM VTN STUDY*
 1408 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1409 KM COMBINE VG10-C AND RCWA20
 1410 HC 2
 *

1411 KK CCVG10*
 1412 KM *REF POINT FROM VTN STUDY*
 1413 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1414 KM COMBINE CVG10-C AND RCLM16B
 1415 KM FREEWAY CHANNEL AND OWENS
 1416 HC 2
 *

1417 KKDCCVG10*
 1418 KM *REF SPLIT FROM VTN STUDY*
 1419 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1420 KM DIVERT FLOW TO FREEWAY CHANNEL ALONG RAILROAD
 1421 KM VIA 50% SPLITTER STRUCTURE
 1422 KM BASED ON CENTRAL FREEWAY CHANNEL PROJECT BY VTN
 1423 DT DRAILRD
 1424 DI 0 1000 2040 10000
 1425 DQ 0 500 1020 5000
 *

1426 KKRDCCVG10*
 1427 KM *REF ROUTE FROM VTN STUDY*
 1428 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1429 KM ROUTE DCCVG10 TO CVG24
 1430 KM FACILITY = LAS VEGAS WASH - COMMERCE STREET
 1431 KM FACILITY # = LVCS 0000, 0015
 1432 KM LINING = RCB
 1433 RD 3125 0.0097 0.015 0 TRAP 12 0
 *

1434 KK VG24-C*
 1435 KM *REF BASIN FROM VTN STUDY*
 1436 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1437 BA 0.481
 1438 PB 2.77
 1439 LS 0 89.6
 1440 UD 0.491
 *

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

1441 KK CVG24*
 1442 KM *REF POINT FROM VTN STUDY*
 1443 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1444 KM COMBINE VG24-C AND RDCCVG10
 1445 KM FREEWAY CHANNEL AND LAKE MEAD
 1446 HC 2
 *

1447 KKRDRAILRD*
 1448 KM *REF RETRIEVE FROM VTN STUDY*
 1449 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1450 KM RETRIEVE DRAILRD
 1451 DR DRAILRD
 *

1452 KKRDRAILRD
 1453 KM *REF ROUTE FROM VTN STUDY*
 1454 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1455 KM ROUTE DRAILRD TO CCVG24
 1456 KM FACILITY = FREEWAY CHANNEL
 1457 KM FACILITY # = LV15 0231, 0248, 0255, 0280
 1458 KM LINING = CONCRETE
 1459 RD 2780 0.02 0.015 0 TRAP 8 0
 *

1460 KK CCVG24*
 1461 KM *REF POINT FROM VTN STUDY*
 1462 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1463 KM COMBINE CVG24, RDRAILRD, AND RCLM20
 1464 KM FREEWAY CHANNEL AND LAKE MEAD
 1465 HC 3
 *

1466 KKRCCVG24*
 1467 KM *REF ROUTE FROM VTN STUDY*
 1468 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1469 KM ROUTE CCVG24 TO CW1C2
 1470 KM FACILITY = FREEWAY CHANNEL
 1471 KM FACILITY # = LV15 0210
 1472 KM LINING = RCB
 1473 RD 900 0.0018 0.015 0 TRAP 36 0
 *

1474 KK DR2*
 1475 KM *REF RETRIEVE FROM VTN STUDY*
 1476 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1477 KM RETRIEVE DR2
 1478 DR DR2
 *

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

1479 KK DFLOW*
 1480 KM *REF SPLIT FROM VTN STUDY*
 1481 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1482 KM DIVERT ALL FLOW OUT
 1483 KM FOR STORM CENTERING
 1484 DT DFLOW
 1485 DI 0 100 500 994 10000
 1486 DQ 0 100 500 994 10000
 *

1487 KK RDR2*
 1488 KM *REF ROUTE FROM VTN STUDY*
 1489 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1490 KM ROUTE DR2 TO CR2-C
 1491 KM FACILITY = LAS VEGAS WASH - SMOKE RANCH
 1492 KM FACILITY # = LVSR 0198, 0209 AND LVLM 0221
 1493 KM LINING = RCB
 1494 RD 2911 0.0141 0.015 0 TRAP 7 0
 *

1495 KK R2-C*
 1496 KM *REF BASIN FROM VTN STUDY*
 1497 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1498 BA 0.380
 1499 PB 2.77
 1500 LS 0 92.4
 1501 UD 0.319
 *

1502 KK CR2-C*
 1503 KM *REF POINT FROM VTN STUDY*
 1504 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1505 KM COMBINE RDR2 AND R2-C
 1506 KM CLAYTON AND CAREY
 1507 HC 2
 *

1508 KK RCR2-C*
 1509 KM *REF ROUTE FROM VTN STUDY*
 1510 KM *CENTRAL FREEWAY CHANNEL REPORT*

1511 KM ROUTE CR2-C TO CS
 1512 KM FACILITY = LAS VEGAS WASH - SMOKE RANCH
 1513 KM FACILITY # = LVSR 0149
 1514 KM LINING = RCB
 1515 RD 2100 0.0058 0.015 0 TRAP 11 0
 *
 1516 KK S*
 1517 KM *REF BASIN FROM VTN STUDY*
 1518 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1519 BA 0.569
 1520 PB 2.77
 1521 LS 0 89.9
 1522 UD 0.395
 *

UFC2

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

1523 KK CS*
 1524 KM *REF POINT FROM VTN STUDY*
 1525 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1526 KM COMBINE S AND RCR2-C
 1527 KM NEAR MARTIN LUTHER KING AND CAREY
 1528 HC 2
 *
 1529 KK RCS*
 1530 KM *REF ROUTE FROM VTN STUDY*
 1531 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1532 KM ROUTE CS TO CS1-C
 1533 KM FACILITY = LAS VEGAS WASH - SMOKE RANCH
 1534 KM FACILITY # = LVSR 0046,0071,0149
 1535 KM LINING = RCB
 1536 RD 5785 0.0073 0.015 0 TRAP 10 0
 *
 1537 KK S1-C*
 1538 KM *REF BASIN FROM VTN STUDY*
 1539 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1540 BA 0.470
 1541 PB 2.77
 1542 LS 0 87.8
 1543 UD 0.498
 *

1544 KK CS1-C*
 1545 KM *REF POINT FROM VTN STUDY*
 1546 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1547 KM COMBINE RCS AND S1-C
 1548 KM COMMERCE AND CAREY
 1549 HC 2
 *

1550 KK RCS1-C*
 1551 KM *REF ROUTE FROM VTN STUDY*
 1552 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1553 KM ROUTE DS1-C TO CW1C2
 1554 KM FACILITY = LAS VEGAS WASH - SMOKE RANCH
 1555 KM FACILITY # = LVSR 0000,0001,0002,0010,0021
 1556 KM LINING = RCB
 1557 RD 2619 0.0232 0.015 0 TRAP 10 0
 *

1558 KK W1C2*
 1559 KM *REF BASIN FROM VTN STUDY*
 1560 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1561 BA 0.359
 1562 PB 2.77
 1563 LS 0 90.7
 1564 UD 0.297
 *
 *

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

1565 KK CW1C2*
 1566 KM *REF POINT FROM VTN STUDY*
 1567 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1568 KM COMBINE W1C2, RCS1-C, AND RCCV624
 1569 KM SMOKE RANCH FACILITY AND FREEWAY CHANNEL
 1570 HC 3
 *

1571 KK RCW1C2*
 1572 KM *REF ROUTE FROM VTN STUDY*
 1573 KM *CENTRAL FREEWAY CHANNEL REPORT*
 1574 KM ROUTE CW1C2 TO NORTHERN WATERSHED
 1575 KM FACILITY = FREEWAY CHANNEL
 1576 KM FACILITY # = LV15 0080,0190,0191,0193
 1577 KM LINING = CONCRETE
 1578 RD 2100 0.0018 0.015 0 TRAP 20 1
 1579 KM **SECTION OF OFF-SITE BASINS ADDED BY MWH**
 1580 KM **SMALL AREA BETWEEN THE VTN FW CHANNEL STUDY AND THE N 5TH ST STUDY**
 *

1581 KK OFF-7
 1582 KM BASIN DELIN. BY MWH
 1583 KM RUNOFF PRODUCED BY OFF7
 1584 BA 0.0452
 1585 LS 0 94.0
 1586 UD 0.149
 *

1587 KK ROFF7
 1588 KM ROUTE BY MWH
 1589 KM ROUTE OFF3 IN ROADWAY
 1590 RD 6914 0.01780 0.016 0 TRAP 50 2
 *

1591 KK OFF6UL
 1592 KM BASIN DELIN. BY MWH
 1593 KM RUNOFF PRODUCED BY OFF6UL
 1594 BA 0.1260
 1595 LS 0 85.6

1596 UD 0.358 UFC2
 *
 1597 KK CP20FF
 1598 KM *POINT BY MWH
 1599 KM COMBINE SUB-BASINS OFF7 AND OFF6UL
 1600 HC 2
 *
 1601 KK RCP20FF
 1602 KM *ROUTE BY MWH
 1603 KM ROUTE CP20FF IN ROADWAY
 1604 RD 3000 0.01930 0.016 0 TRAP 50 2
 *

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

1605 KK OFF-2
 1606 KM BASIN DELIN. BY MWH
 1607 KM RUNOFF PRODUCED BY OFF2
 1608 BA 0.0076
 1609 LS 0 94.00
 1610 UD 0.072
 *
 1611 KK ROFF2
 1612 KM ROUTE BY MWH
 1613 KM ROUTE OFF2 OVER NATURAL GROUND
 1614 KM THEN IN ROADWAY
 1615 RD 979 0.00950 0.060 0 TRAP 50 2
 1616 RD 1036 0.01350 0.016 0 TRAP 50 2
 *

1617 KK OFF3UL
 1618 KM BASIN DELIN. BY MWH
 1619 KM RUNOFF PRODUCED BY OFF3UL
 1620 BA 0.0529
 1621 LS 0 90.4
 1622 UD 0.158
 *
 1623 KK ROF3UL
 1624 KM *ROUTE BY MWH
 1625 KM ROUTE OFF3UL IN ROADWAY
 1626 RD 263 0.00950 0.016 0 TRAP 50 2
 *

1627 KK OFF5UL
 1628 KM BASIN DELIN. BY MWH
 1629 KM RUNOFF PRODUCED BY OFF5UL
 1630 BA 0.0064
 1631 LS 0 94.0
 1632 UD 0.114
 *
 1633 KK CP10FF
 1634 KM *POINT BY MWH
 1635 KM COMBINE SUB-BASINS OFF2, OFF3UL, OFF5UL, AND CP20FF
 1636 HC 4
 *

1637 KK RCP10FF
 1638 KM *ROUTE BY MWH
 1639 KM ROUTE OFF SITE CP-1 AND THE NORTHERN WATERSHED TO CPFWC1
 1640 KM FACILITY = FREEWAY CHANNEL
 1641 KM FACILITY # = LV15 0080,0190,0191,0193
 1642 KM LINING = CONCRETE
 1643 RD 2100 0.0018 0.015 0 TRAP 20 1
 *

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

1644 KK CPFWC1
 1645 KM *POINT BY MWH
 1646 KM COMBINE SUB-BASIN CP10FF AND CW1C2
 1647 HC 2
 *
 1648 KK RCPFWC1
 1649 KM *ROUTE BY MWH
 1650 KM ROUTE CPFWC1 DOWN THE FW CHANNEL
 1651 RD 2515 0.0010 0.013 0 TRAP 15 1.5
 *

1652 KK OFF-4
 1653 KM BASIN DELIN. BY MWH
 1654 KM RUNOFF PRODUCED BY OFF4
 1655 BA 0.0183
 1656 LS 0 93.8
 1657 UD 0.174
 *
 1658 KK ROFF4
 1659 KM *ROUTE BY MWH
 1660 KM ROUTE OFF-4 THROUGH EX EARTHEN DITCH ADJACENT TO RR
 1661 KM THEN THROUGH 3X30" CULVERT,
 1662 KM THEN DOWN THE FW CHANNEL
 1663 RD 1980 0.010 0.060 0 TRAP 0 2
 1664 RD 90 0.010 0.024 0 CIRC 4.33 0
 *
 1665 KM **START N 5TH ST BASINS**
 *

1666 KK LOSE1**
 1667 KM **REF BASIN FROM N 5TH STUDY**
 1668 KM **BY LBG**
 1669 KM Losee Basin LOSE1
 1670 BA 0.0314
 1671 LS 0.00 89.6
 1672 UD 0.134
 *

1673 KKR-LOSE1**
 1674 KM **REF BASIN FROM N 5TH STUDY**

1675 KM **BY LBG** UFC2
 1676 KM Route LOSE1 to LOSE2
 1677 RD 4100 0.02098 0.016 0 TRAP 50
 *

1678 KK LOSE2**
 1679 KM **REF BASIN FROM N 5TH STUDY**
 1680 KM **BY LBG**
 1681 KM Losee Basin LOSE2
 1682 BA 0.134
 1683 LS 0.00 90.3
 1684 UD 0.192
 *

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

1685 KK LOSE3**
 1686 KM **REF BASIN FROM N 5TH STUDY**
 1687 KM **BY LBG**
 1688 BA 0.0193
 1689 LS 0.00 94.0
 1690 UD 0.0500
 *

1691 KK LOSE4**
 1692 KM **REF BASIN FROM N 5TH STUDY**
 1693 KM **BY LBG**
 1694 KM Losee Basin LOSE4
 1695 KM Flows to 10' x 3' Concrete Channel
 1696 BA 0.057
 1697 LS 0.00 94.4
 1698 UD 0.170
 *

1699 KK3-LOSE**
 1700 KM **REF POINT FROM N 5TH STUDY**
 1701 KM **BY LBG**
 1702 KM Combine LOSE1 THROUGH LOSE4
 1703 HC 4
 *

1704 KKRC3-LOSE**
 1705 KM **REF ROUTE FROM N 5TH STUDY**
 1706 KM **BY LBG**
 1707 KM Route C3-LOSE THROUGH 10' X 3' CHANNEL
 1708 RD 455 0.0264 0.013 0 TRAP 10 0
 *

1709 KK UPRR1**
 1710 KM **REF BASIN FROM N 5TH STUDY**
 1711 KM **BY LBG**
 1712 KM FLOWS TO UPRR TRACKS
 1713 BA 0.010
 1714 LS 0.00 94.0
 1715 UD 0.066
 *

1716 KK UPRR2**
 1717 KM **REF BASIN FROM N 5TH STUDY**
 1718 KM **BY LBG**
 1719 KM FLOWS TO UPRR TRACKS
 1720 BA 0.006
 1721 LS 0.00 94.0
 1722 UD 0.052
 *

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

1723 KK EPC1**
 1724 KM **REF BASIN FROM N 5TH STUDY**
 1725 KM **BY LBG**
 1726 KM COMBINES C3-LOSE, UPRR1, AND UPRR2
 1727 KM FLOWS NORTH ALONG UPRR TRACKS TO CULVERT AND INTO FREEWAY CHANNEL
 1728 HC 3
 *

1729 KK RECP1
 1730 KM *BY MWH
 1731 KM ROUTE EPC1 OVER NATURAL GROUND,
 1732 RD 532 0.011 0.035 0 TRAP 5 2
 *

1733 KM **END N 5TH ST BASINS**
 *

1734 KK RR-7
 1735 KM *DELIN BY MWH
 1736 KM FLOWS TO FREEWAY CHANNEL
 1737 BA 0.0192
 1738 LS 0.00 92.5
 1739 UD 0.216
 *

1740 KK CPFWC2
 1741 KM *POINT BY MWH
 1742 KM COMBINE SUB-BASIN OFF4, CP-1, ECP2, AND RR-7
 1743 HC 4
 *

1744 KM **REFERENCED BROOKS CHANN STUDY BY MWH**
 1745 KM **REF BASIN FROM 5TH STRT TDS BY LBG**
 *

1746 KKPMAYF1**
 1747 KM **REF BASIN FROM 5TH STRT TDS BY LBG**
 1748 BA 0.3263
 1749 PB 2.77
 1750 LS 0.00 92.7
 1751 UD 0.385
 *

1752 KKRMAYF1-3**
 1753 KM **REF ROUTE FROM 5TH STRT TDS BY LBG**
 1754 KM Route MAYF1 to MAYF3
 1755 RD 1405.0 0.01281 0.016 0 TRAP 50
 *

1756 KKPMAYF3**
 1757 KM **REF BASIN FROM 5TH STRT TDS BY LBG**
 1758 BA 0.026
 1759 LS 0.00 94.2
 1760 UD 0.101
 *

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

1761 KKCPMAYF3**
 1762 KM **REF POINT FROM 5TH STRT TDS BY LBG**
 1763 KM COMBINE MAYF1, MAYF3
 1764 HC 2
 *

1765 KKRCPMAYF3**
 1766 KM ROUTE CPMAYF3 TO CPMAY4
 1767 RD 1275 0.04235 0.016 0 TRAP 50
 *

1768 KKPMAYF2**
 1769 KM **REF BASIN FROM 5TH STRT TDS BY LBG**
 1770 BA 0.060
 1771 LS 0.00 90.2
 1772 UD 0.107
 *

1773 KKRMAYF2-4**
 1774 KM **REF ROUTE FROM 5TH STRT TDS BY LBG**
 1775 KM Route PMAYF2 to PMAYF4A
 1776 RD 2016 0.02480 0.016 0 TRAP 50
 *

1777 KKMAYF4A**
 1778 KM DEVELOPED BASIN
 1779 KM BASIN DELIN. BY MWH
 1780 BA 0.0764
 1781 LS 0.00 94.5
 1782 UD 0.139
 *

1783 KK CP1A**
 1784 KM **REF POINT FROM BROOKS CHANN STUDY BY MWH**
 1785 KM COMBINE CPMAYF3, PMAYF2, MAYF4A
 1786 HC 3
 *

1787 KK RCP1A**
 1788 KM **REF POINT FROM BROOKS CHANN STUDY BY MWH**
 1789 KM ROUTE CP1A THROUGH BROOKS CHAN
 1790 RD 676 0.03700 0.035 3 TRAP 5
 *

1791 KKPMAY4B**
 1792 KM **REF BASIN FROM BROOKS CHANN STUDY BY MWH**
 1793 KM BASIN PMAY4B
 1794 KM BASIN DELIN. BY MWH
 1795 BA 0.0078
 1796 LS 0.00 93.9
 1797 UD 0.052
 *

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

1798 KKC4BMAYF**
 1799 KM **REF POINT FROM 5TH STRT TDS BY LBG**
 1800 KM COMBINE CP1A, PMAY4B, PMAY4C
 1801 HC 2
 *

1802 KKPMAYF6**
 1803 KM **REF BASIN FROM 5TH STRT TDS BY LBG**
 1804 BA 0.027
 1805 LS 0.00 94.7
 1806 UD 0.081
 *

1807 KKPMAYF7**
 1808 KM **REF BASIN FROM 5TH STRT TDS BY LBG**
 1809 BA 0.0027
 1810 LS 0.00 98.0
 1811 UD 0.050
 *

1812 KKCPMAY7**
 1813 KM **REF POINT FROM 5TH STRT TDS BY LBG**
 1814 KM COMBINE FLOWS AT DROP INLET NEAR CONCRETE DRAINAGE
 1815 HC 2
 *

1816 KKRCPMAY7**
 1817 KM **REF FROM 5TH STRT TDS BY LBG**
 1818 KM ROUTE TO BROOKS CHANNEL IN 36" STORM DRAIN
 1819 RD 540 0.006 0.013 0 CIRC 3
 *

1820 KKCRCPAY7**
 1821 KM **REF POINT FROM 5TH STRT TDS BY LBG
 1822 KM COMBINE FLOWS AT 12'X4' RCB
 1823 HC 2
 *

1824 KK PMAY5**
 1825 KM **REF BASIN FROM BROOKS CHANN STUDY BY MWH**
 1826 KM BASIN DELIN. BY MWH
 1827 BA 0.0186
 1828 LS 0.00 94.6
 1829 UD 0.069
 *

1830 KKPMAYF8**
 1831 KM **REF BASIN FROM 5TH STRT TDS BY LBG**
 1832 BA 0.0027

1833 LS 0.00 94.0 UFC2
1834 UD 0.050
*

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

1835 KKCPMAYF8**
1836 KM **REF POINT FROM 5TH STRT TDS BY LBG**
1837 KM COMBINE FLOWS IN DROP INLET
1838 HC 2
*

1839 KK PCP3A**
1840 KM **REF POINT FROM 5TH STRT TDS BY LBG**
1841 KM Combine FLOWS IN 12'X4' RCB
1842 KM Flows to 12'x 4' RCB, then to concrete channel
1843 HC 2
*

1844 KKPMAYF9**
1845 KM **REF BASIN FROM 5TH STRT TDS BY LBG**
1846 BA 0.0027
1847 LS 0.00 98.0
1848 UD 0.095
*

1849 KKPMAYF10**
1850 KM **REF BASIN FROM 5TH STRT TDS BY LBG**
1851 BA 0.0006
1852 LS 0.00 98.0
1853 UD 0.068
*

1854 KKCPMAYF10**
1855 KM **REF POINT FROM 5TH STRT TDS BY LBG**
1856 KM COMBINE FLOWS AT DROP INLET IN SAG
1857 HC 2
*

1858 KK PCP3B**
1859 KM **REF POINT FROM 5TH STRT TDS BY LBG**
1860 KM COMBINE FLOWS IN DROP INLET
1861 HC 2
*

1862 KKPBRS1**
1863 KM **REF BASIN FROM 5TH STRT TDS BY LBG**
1864 KM BASIN PBRKS1
1865 BA 0.048
1866 LS 0.00 82.3
1867 UD 0.115
*

1868 KKPBRS2**
1869 KM **REF BASIN FROM 5TH STRT TDS BY LBG**
1870 KM BASIN PBRKS2
1871 BA 0.016
1872 LS 0.00 82.4
1873 UD 0.101
*

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

1874 KKCPBRKS2**
1875 KM **REF POINT FROM 5TH STRT TDS BY LBG**
1876 KM COMBINE BRKS1 & BRKS2, EAST OF N5TH STRT
1877 HC 2
*

1878 KKPBRS3**
1879 KM **REF BASIN FROM 5TH STRT TDS BY LBG**
1880 KM BASIN PBRKS3
1881 BA 0.0011
1882 LS 0.00 98.0
1883 UD 0.053
*

1884 KKCPBRKS3**
1885 KM **REF POINT FROM 5TH STRT TDS BY LBG**
1886 KM COMBINE CPBRKS2, PBRKS3
1887 HC 2
*

1888 KKRCPBRS3**
1889 KM **REF ROUTE FROM BROOKS CHANN STUDY BY MWH**
1890 KM CPBRKS3 ROUTE THROUGH BROOKS AVE
1891 RD 1063 0.0141 0.016 0 TRAP 40 6
*

1892 KK POFF1**
1893 KM **REF BASIN FROM BROOKS CHANN STUDY BY MWH**
1894 KM BASIN POFF1
1895 KM BASIN DELIN. BY MWH
1896 BA 0.0617
1897 LS 0.00 94.6
1898 UD 0.241
*

1899 KK CP5**
1900 KM **REF POINT FROM BROOKS CHANN STUDY BY MWH**
1901 KM COMBINE CPBRK3, OFF1
1902 HC 2
*

1903 KK RCP5**
1904 KM **REF ROUTE FROM BROOKS CHANN STUDY BY MWH**
1905 KM CP5 ROUTE THROUGH LOSSEE AVE
1906 RD 791 0.0050 0.016 0 TRAP 80 6
*

1907 KK POFF2**
1908 KM **REF BASIN FROM BROOKS CHANN STUDY BY MWH**
1909 KM BASIN POFF2
1910 KM BASIN DELIN. BY MWH

1911 BA 0.0455
 1912 LS 0.00 94.5
 1913 UD 0.166
 *

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

1914 KK POFF3**
 1915 KM **REF BASIN FROM BROOKS CHANN STUDY BY MWH**
 1916 KM BASIN POFF3
 1917 KM BASIN DELIN. BY MWH
 1918 BA 0.0159
 1919 LS 0.00 94.4
 1920 UD 0.180
 *

1921 KK CP6**
 1922 KM **REF POINT FROM BROOKS CHANN STUDY BY MWH**
 1923 KM COMBINE ECP3B, CP5, OFF2, OFF3
 1924 HC 4
 *

1925 KK LOS1**
 1926 KM **REF BASIN FROM BROOKS CHANN STUDY BY MWH**
 1927 KM LOSSEE STRT BASIN
 1928 KM BASIN DELIN. BY MWH
 1929 BA 0.0021
 1930 LS 0.00 98.0
 1931 UD 0.094
 *

1932 KK LOS2**
 1933 KM **REF BASIN FROM BROOKS CHANN STUDY BY MWH**
 1934 KM LOSSEE STRT BASIN
 1935 KM BASIN DELIN. BY MWH
 1936 BA 0.0040
 1937 LS 0.00 98.0
 1938 UD 0.226
 *

1939 KK CP6A**
 1940 KM **REF POINT FROM BROOKS CHANN STUDY BY MWH**
 1941 KM COMBINE CP6, LOS1, LOS2
 1942 HC 3
 *

1943 KK RCP6A**
 1944 KM **REF ROUTE FROM BROOKS CHANN STUDY BY MWH**
 1945 KM ROUTE CP6A THROUGH BROOKS CHAN
 1946 RD 600 0.01667 0.025 0 TRAP 20 3
 *

1947 KK OFF4**
 1948 KM **REF BASIN FROM BROOKS CHANN STUDY BY MWH**
 1949 KM BASIN OFF4
 1950 KM BASIN DELIN. BY MWH
 1951 BA 0.0427
 1952 LS 0.00 92.5
 1953 UD 0.224
 *

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

1954 KK OFF5**
 1955 KM **REF BASIN FROM BROOKS CHANN STUDY BY MWH**
 1956 KM BASIN OFF5
 1957 KM BASIN DELIN. BY MWH
 1958 BA 0.0365
 1959 LS 0.00 93.0
 1960 UD 0.163
 *

1961 KK CP7**
 1962 KM **REF POINT FROM BROOKS CHANN STUDY BY MWH**
 1963 KM COMBINE CP6A, OFF4, OFF5
 1964 HC 3
 *

1965 KM **END OF THE BROOKS STUDY**
 *

1966 KK RR-6
 1967 KM *BY MWH
 1968 KM BASIN RR-6 BETWEEN I15 AND UPRR
 1969 KM DELIN BY MWH
 1970 BA 0.0134
 1971 LS 0.00 92.5
 1972 UD 0.191
 *

1973 KK CPFWC3
 1974 KM *BY MWH
 1975 KM COMBINE CPFWC2, BROOKS CP-7, AND RR-6
 1976 HC 3
 *

1977 KK RR-5
 1978 KM *BY MWH
 1979 KM BASIN RR-5 BETWEEN I15 AND UPRR
 1980 KM DELIN BY MWH
 1981 BA 0.0145
 1982 LS 0.00 92.5
 1983 UD 0.197
 *

1984 KK CPFWC4
 1985 KM *BY MWH
 1986 KM COMBINE CPFWC3 AND RR-5
 1987 HC 2
 *

1988 KK RR-4
 1989 KM *BY MWH
 1990 KM BASIN RR-4 BETWEEN I15 AND UPRR
 1991 KM DELIN BY MWH

1992 BA 0.0151
1993 LS 0.00 92.7
1994 UD 0.136
*

UFC2

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

1995 KK CPFWC5
1996 KM *BY MWH
1997 KM COMBINE CPFWC4 & RR-4
1998 HC 2
*

1999 KM **COLTON BASINS**
*

2000 KKULT-1A**
2001 KM *REF BASIN FROM COLTON AVE STUDY*
2002 KM "BY CNLV, CN MODIFIED BY MWH*
2003 KM RUNOFF PRODUCED BY ULT-1A
2004 BA 0.0626
2005 LS 0 88.90 0
2006 UD 0.191
*

2007 KKRULT-1A**
2008 KM *REF BASIN FROM COLTON AVE STUDY*
2009 KM *BY CNLV*
2010 KM ROUTE ULT-1A IN ROADWAY THEN THROUGH NATURAL GROUND
2011 KM A COMPOSIT SLOPE AND MANNINGS NUMBER WERE CALCULATED
2012 KM 2590 FT W/ 0.0177 SLOPE AND 0.016 MANNINGS IN ROADWAY
2013 KM 1386 FT W/ 0.0177 SLOPE AND 0.060 MANNINGS OVER NATURAL GROUND
2014 RD 3976 0.0177 0.031 0 TRAP 50 2
*

2015 KKULT-1B**
2016 KM *REF BASIN FROM COLTON AVE STUDY*
2017 KM "BY CNLV, CN MODIFIED BY MWH*
2018 KM RUNOFF PRODUCED BY ULT-1B
2019 BA 0.1278
2020 LS 0 90.90
2021 UD 0.341
*

2022 KKULT-1C**
2023 KM *REF BASIN FROM COLTON AVE STUDY*
2024 KM "BY CNLV, CN MODIFIED BY MWH*
2025 KM RUNOFF PRODUCED BY ULT-1C
2026 BA 0.1208
2027 LS 0 92.20
2028 UD 0.222
*

2029 KKRULT-1C**
2030 KM *REF ROUTE FROM COLTON AVE STUDY*
2031 KM *BY CNLV*
2032 KM ROUTE ULT-1C IN ROADWAY
2033 RD 3248 0.00169 0.016 0 TRAP 50 2
*

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

2034 KKULT-1D**
2035 KM *REF BASIN FROM COLTON AVE STUDY*
2036 KM *BY CNLV, CN MODIFIED BY MWH*
2037 KM RUNOFF PRODUCED BY ULT-1D
2038 BA 0.1160
2039 LS 0 91.80
2040 UD 0.238
*

2041 KKULT-1F**
2042 KM *REF BASIN FROM COLTON AVE STUDY*
2043 KM *BY CNLV, BASIN ADDED BY MWH*
2044 KM RUNOFF PRODUCED BY ULT-1F
2045 BA 0.0136
2046 LS 0 89.20
2047 UD 0.122
*

2048 KKRULT-1F*
2049 KM *REF ROUTE FROM COLTON AVE STUDY*
2050 KM *BY CNLV, ROUTE ADDED BY MWH*
2051 KM ROUTE EX-1F IN ROADWAY AND OVER NATURAL GROUND
2052 KM A COMPOSITE SLOPE AND MANNINGS NUMBER WERE CALCULATED
2053 KM 1220 FT W/ 0.00820 SLOPE AND 0.016 MANNINGS IN ROADWAY
2054 KM 2850 FT W/ 0.03070 SLOPE AND 0.060 MANNINGS OVER NATURAL GROUND
2055 RD 4070 0.02395 0.047 0 TRAP 50 2
*

2056 KK CP-1**
2057 KM *REF POINT FROM COLTON AVE STUDY*
2058 KM "BY CNLV, MODIFIED BY MWH*
2059 KM COMBINE SUB-BASINS ULT-1A, ULT-1B, ULT-1C, ULT-1D, AND ULT-1F
2060 HC 5
*

2061 KK RCP-1**
2062 KM *REF ROUTE FROM COLTON AVE STUDY*
2063 KM *BY CNLV, MODIFIED BY MWH*
2064 KM ROUTE CP-1 OVER NATURAL GROUND
2065 RD 1600 0.02188 0.060 0 TRAP 50 2
*

2066 KKULT-2D**
2067 KM *REF BASIN FROM COLTON AVE STUDY*
2068 KM *BY CNLV, CN MODIFIED BY MWH*
2069 KM RUNOFF PRODUCED BY ULT-2D
2070 BA 0.0313
2071 LS 0 90.00
2072 UD 0.133
*

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

2073 KKULT-2E**
 2074 KM *REF BASIN FROM COLTON AVE STUDY*
 2075 KM *BY CNLV, CN MODIFIED BY MWH*
 2076 KM RUNOFF PRODUCED BY ULT-2E
 2077 BA 0.0547
 2078 LS 0 90.30
 2079 UD 0.307
 *

 2080 KK CP-2**
 2081 KM *REF POINT FROM COLTON AVE STUDY*
 2082 KM *BY CNLV*
 2083 KM COMBINE SUB-BASINS EX-1F, EX-2D, AND CP-1
 2084 HC 3
 *

 2085 KK RCP-2*
 2086 KM *REF ROUTE FROM COLTON AVE STUDY*
 2087 KM *BY CNLV*
 2088 KM ROUTE CP-2 TO CP-2A
 2089 KM THRU 2-60" RCP
 2090 RD 1000 0.010 0.013 2 CIRC 5 0
 *

 2091 KKULT-2A**
 2092 KM *REF BASIN FROM COLTON AVE STUDY*
 2093 KM *BY CNLV, CN MODIFIED BY MWH*
 2094 KM RUNOFF PRODUCED BY ULT-2A
 2095 BA 0.0276
 2096 LS 0 91.50
 2097 UD 0.151
 *

 2098 KK RULT-2A
 2099 KM *REF ROUTE FROM COLTON AVE STUDY*
 2100 KM *BY CNLV*
 2101 KM ROUTE ULT-2A IN ROADWAY
 2102 RD 900 0.04118 0.016 0 TRAP 50 2
 *

 2103 KKULT-2B**
 2104 KM *REF BASIN FROM COLTON AVE STUDY*
 2105 KM *BY CNLV, CN MODIFIED BY MWH*
 2106 KM RUNOFF PRODUCED BY ULT-2B
 2107 BA 0.0133
 2108 LS 0 91.80
 2109 UD 0.132
 *

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

2110 KK CP-3**
 2111 KM *REF POINT FROM COLTON AVE STUDY*
 2112 KM *BY CNLV*
 2113 KM COMBINE SUB-BASINS EX-2A AND EX-2B
 2114 HC 2
 *

 2115 KK RCP-3
 2116 KM *REF ROUTE FROM COLTON AVE STUDY*
 2117 KM *BY CNLV*
 2118 KM ROUTE CP-3 IN ROADWAY
 2119 RD 690 0.01449 0.016 0 TRAP 50 2
 *

 2120 KKULT-2C**
 2121 KM *REF BASIN FROM COLTON AVE STUDY*
 2122 KM *BY CNLV, CN MODIFIED BY MWH*
 2123 KM RUNOFF PRODUCED BY ULT-2C
 2124 BA 0.0320
 2125 LS 0 92.20
 2126 UD 0.150
 *

 2127 KKULT-2G**
 2128 KM *REF BASIN FROM COLTON AVE STUDY*
 2129 KM *BY CNLV, CN MODIFIED BY MWH*
 2130 KM RUNOFF PRODUCED BY ULT-2G
 2131 BA 0.0708
 2132 LS 0 90.20
 2133 UD 0.163
 *

 2134 KKULT-1E**
 2135 KM *REF BASIN FROM COLTON AVE STUDY*
 2136 KM *BY CNLV, AREA & CN MODIFIED BY MWH*
 2137 KM RUNOFF PRODUCED BY ULT-1E
 2138 BA 0.0345
 2139 LS 0 93.60
 2140 UD 0.297
 *

 2141 KK RULT-1E
 2142 KM *REF ROUTE FROM COLTON AVE STUDY*
 2143 KM *BY CNLV*
 2144 KM ROUTE ULT-1E IN ROADWAY
 2145 RD 2625 0.01442 0.016 0 TRAP 50 2
 *

 2146 KKULT-2F**
 2147 KM *REF BASIN FROM COLTON AVE STUDY*
 2148 KM *BY CNLV, AREA & CN MOD MODIFIED BY MWH*
 2149 KM RUNOFF PRODUCED BY ULT-2F
 2150 BA 0.0255
 2151 LS 0 90.00

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

2152 UD 0.193
*

2153 KK RULT-2F
 2154 KM *REF ROUTE FROM COLTON AVE STUDY*

UFC2

2155	KM	*BY CNLV*					
2156	KM	ROUTE ULT-2F IN ROADWAY					
2157	RD	2600 0.01442 0.016	0	TRAP	50	2	
	*						
2158	KK	CP-4C					
2159	KM	COMBINE SUB-BASINS ULT-1E AND ULT-2F					
2160	HC	2					
	*						
2161		KKULT-2H**					
2162	KM	*REF BASIN FROM COLTON AVE STUDY*					
2163	KM	*BY CNLV, AREA & CN MOD MODIFIED BY MWH*					
2164	KM	RUNOFF PRODUCED BY ULT-2H					
2165	BA	0.0089					
2166	LS	0 75.50					
2167	UD	0.145					
	*						
2168		KKULT-2I**					
2169	KM	*NEW BASIN DELINEATED BY MWH*					
2170	KM	*FOR COLTON TDS*					
2171	KM	RUNOFF PRODUCED BY ULT-2I					
2172	BA	0.0052					
2173	LS	0 69.00					
2174	UD	0.074					
	*						
2175	KK	CP-4B					
2176	KM	*BY MWH					
2177	KM	COMBINE CP-4C, ULT-2H, ULT-2I					
2178	HC	3					
	*						
2179	KK	RCP-4B					
2180	KM	*REF ROUTE FROM COLTON AVE STUDY*					
2181	KM	*BY CNLV*					
2182	KM	ROUTE ULT-2H IN RCP					
2183	RD	1338 0.030 0.013	0	CIRC	3	0	
	*						
2184	KK	CP-4A					
2185	KM	*BY MWH					
2186	KM	COMBINE ULT-2C, ULT-2G, CP-2, CP-4A, CP-3					
2187	HC	5					
	*						

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

2188	KK	RCP-4A					
2189	KM	*BY MWH					
2190	KM	ROUTE CP-4A IN COLTON AVE STORM DRAIN SYSTEM					
2191	KM	TO BUCYRES-STREET					
2192	RD	1174 0.0229 0.013	0	TRAP	6	0	
	*						

2193		KKULT-3A**					
2194	KM	*REF BASIN FROM COLTON AVE STUDY*					
2195	KM	*BY CNLV, CN MOD MODIFIED BY MWH*					
2196	KM	RUNOFF PRODUCED BY EX-3A					
2197	BA	0.0184					
2198	LS	0 94.30					
2199	UD	0.115					
	*						

2200	KK	RULT-3A					
2201	KM	*BY MWH					
2202	KM	ROUTE ULT-3A IN ROADWAY					
2203	RD	773 0.008 0.016	0	TRAP	50	2	
	*						

2204		KKULT-3B**					
2205	KM	*REF BASIN FROM COLTON AVE STUDY*					
2206	KM	*BY CNLV, CN MODIFIED BY MWH*					
2207	KM	RUNOFF PRODUCED BY ULT-3B					
2208	BA	0.0270					
2209	LS	0 94.30					
2210	UD	0.156					
	*						

2211	KK	CPD1					
2212	KM	COMBINE ULT-3A & ULT-3B					
2213	KM	DUMMY COMBINATION POINT FOR INLET SIZING					
2214	HC	2					
	*						

2215		KKULT-3C**					
2216	KM	*REF BASIN FROM COLTON AVE STUDY*					
2217	KM	*BY CNLV, CN MODIFIED BY MWH*					
2218	KM	RUNOFF PRODUCED BY ULT-3C					
2219	BA	0.0072					
2220	LS	0 92.20					
2221	UD	0.110					
	*						

2222	KK	RULT-3C					
2223	KM	*REF ROUTE FROM COLTON AVE STUDY*					
2224	KM	*BY CNLV, MODIFIED BY MWH*					
2225	KM	ROUTE ULT-3C IN ROADWAY					
2226	RD	514 0.009 0.016	0	TRAP	50	2	
	*						

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

2227		KKULT-3D**					
2228	KM	*REF BASIN FROM COLTON AVE STUDY*					
2229	KM	*BY CNLV, CN MODIFIED BY MWH*					
2230	KM	RUNOFF PRODUCED BY ULT-3D					
2231	BA	0.0138					
2232	LS	0 95.00					
2233	UD	0.114					
	*						

2234 KK RULT-3D

UFC2

2235 KM *BY MWH
 2236 KM ROUTE ULT-3D IN ROADWAY
 2237 RD 594 0.030 0.016 0 TRAP 50 2
 *

2238 KKULT-3E**
 2239 KM *REF BASIN FROM COLTON AVE STUDY*
 2240 KM *BY CNLV, CN MODIFIED BY MWH*
 2241 KM RUNOFF PRODUCED BY ULT-3E
 2242 BA 0.0106
 2243 LS 0 94.60
 2244 UD 0.120
 *

2245 KK CP-5
 2246 KM *BY MWH
 2247 KM COMBINE CP-4A, CPD1, ULT-3C, ULT-3D, ULT-3E
 2248 HC 5
 *

2249 KK RCP-5
 2250 KM *BY MWH
 2251 KM ROUTE CP-5 IN COLTON AVE STORM DRAIN SYSTEM
 2252 KM TO LOSEE ROAD
 2253 KM VIA 7X6 RCB TRANS TO 9X6 RCB, USE AVE WIDTH = 8 FT
 2254 KM @ AVG SLOPE = 0.0168 FT/FT, LENGTH = 1687.09 FT
 2255 RD 1687 0.0168 0.013 0 TRAP 8 0
 *

2256 KKULT-3F**
 2257 KM *REF BASIN FROM COLTON AVE STUDY*
 2258 KM *BY CNLV, CN MODIFIED BY MWH*
 2259 KM RUNOFF PRODUCED BY ULT-3F
 2260 BA 0.0220
 2261 LS 0 94.00
 2262 UD 0.171
 *

2263 KKULT-3G**
 2264 KM *REF BASIN FROM COLTON AVE STUDY*
 2265 KM *BY CNLV, CN MODIFIED BY MWH*
 2266 KM RUNOFF PRODUCED BY ULT-3G
 2267 BA 0.0073
 2268 LS 0 94.00

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

2269 UD 0.115
 *

2270 KK CP-6A
 2271 KM *DUMMY COMBINE POINT BY MWH
 2272 KM COMBINE SUB-BASINS ULT-3F, ULT-3G
 2273 HC 2
 *

2274 KKULT-3H**
 2275 KM *REF BASIN FROM COLTON AVE STUDY*
 2276 KM *BY CNLV, CN MODIFIED BY MWH*
 2277 KM RUNOFF PRODUCED BY ULT-3H
 2278 BA 0.0040
 2279 LS 0 91.00
 2280 UD 0.103
 *

2281 KKULT-3J**
 2282 KM *REF BASIN FROM COLTON AVE STUDY*
 2283 KM *BY CNLV, CN MODIFIED BY MWH*
 2284 KM RUNOFF PRODUCED BY ULT-3J
 2285 BA 0.0233
 2286 LS 0 89.90
 2287 UD 0.152
 *

2288 KK RULT-3J
 2289 KM *REF ROUTE FROM COLTON AVE STUDY*
 2290 KM ROUTE ULT-3J IN ROADWAY
 2291 RD 817 0.008 0.016 0 TRAP 50 2
 *

2292 KKULT-3K**
 2293 KM *REF BASIN FROM COLTON AVE STUDY*
 2294 KM *BY CNLV, CN MODIFIED BY MWH*
 2295 KM RUNOFF PRODUCED BY ULT-3K
 2296 BA 0.0162
 2297 LS 0 90.30
 2298 UD 0.141
 *

2299 KK RULT-3K
 2300 KM *REF ROUTE FROM COLTON AVE STUDY*
 2301 KM ROUTE ULT-3K IN ROADWAY
 2302 RD 318 0.004 0.016 0 TRAP 50 2
 *

2303 KK CP-6
 2304 KM *BY MWH
 2305 KM COMBINE: CP-5, CP-6A, ULT-3H, ULT-3J, ULT-3K
 2306 HC 5
 *

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HEC-1 INPUT

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

2307 KK RCP-6
 2308 KM *BY MWH
 2309 KM ROUTE CP-6 IN COLTON AVE STORM DRAIN SYSTEM
 2310 KM TO FREEWAY CHANNEL PARALLEL TO I-15
 2311 KM VIA 9X6 RCB TRANS TO 102" PIPE, USE AVG WIDTH = 9 FT
 2312 KM @ AVG SLOPE = 0.0073 FT/FT, LENGTH = 816.61 FT
 2313 RD 817 0.0073 0.013 0 TRAP 9 1
 *

2314 KKULT-3L**
 2315 KM *REF BASIN FROM COLTON AVE STUDY*
 2316 KM *BY CNLV, CN MODIFIED BY MWH*

UFC2

```

2317      KM      RUNOFF PRODUCED BY ULT-3L
2318      BA      0.0280
2319      LS              0      90.10
2320      UD      0.209
          *

2321      KK      CP-7**
2322      KM      *REF POINT FROM COLTON AVE STUDY*
2323      KM      COMBINE ULT-3L AND CP-6
2324      HC              2
          *
2325      KM      **END OF COLTON STUDY**
          *

2326      KK      RR-3
2327      KM      *BY MWH
2328      KM      BASIN RR-3 BETWEEN I15 AND UPRR
2329      KM      DELIN BY MWH
2330      BA      0.0084
2331      LS              0.00      94.5
2332      UD      0.153
          *

2333      KK      CPFWC6
2334      KM      *BY MWH
2335      KM      COMBINE COMBINES COLTON CP-7, RR-3, AND CPFWC5
2336      HC              3
          *

2337      KK      RR-2
2338      KM      *BY MWH
2339      KM      BASIN RR-2 BETWEEN I15 AND UPRR
2340      KM      DELIN BY MWH
2341      BA      0.0037
2342      LS              0.00      94.5
2343      UD      0.088
          *

```

1

HEC-1 INPUT

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

```

2344      KK      OFF-1
2345      KM      DELIN. BY MWH
2346      KM      RUNOFF PRODUCED BY OFF1
2347      BA      0.0090
2348      LS              0      98.00
2349      UD      0.088
          *

2350      KK      ROFF1
2351      KM      ROUTE BY MWH
2352      KM      ROUTE OFF-1 IN ROADWAY THEN THROUGH NATURAL GROUND
2353      KM      A COMPOSIT SLOPE AND MANNINGS NUMBER WERE CALCULATED
2354      KM      2590 FT W/ 0.00177 SLOPE AND 0.016 MANNINGS IN ROADWAY
2355      KM      1386 FT W/ 0.00177 SLOPE AND 0.060 MANNINGS OVER NATURAL GROUND
2356      RD      3976 0.00177 0.031 0 TRAP 50 2
          *

2357      KK      CPFWC7
2358      KM      POINT BY MWH
2359      KM      COMBINE COMBINES COLTON OFF1, RR-2, AND CPFWC6
2360      HC              3
          *

2361      KK      RR-1
2362      KM      BASIN DELIN. MWH
2363      KM      BASIN RR-1 BETWEEN I15 AND UPRR
2364      KM      DELIN BY MWH
2365      BA      0.0149
2366      LS              0.00      94.5
2367      UD      0.191
          *

2368      KK      CPFWC8
2369      KM      *BY MWH
2370      KM      COMBINE COMBINES COLTON RR-1 AND CPFWC7 AT THE CONFLUENCE
2371      HC              2
          *
2372      KM      **END OF COLTON BASIN**
          *
2373      ZZ

```

PAGE 59

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW

NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

```

49      OG04-C*
      .
      .
69      .----->      DPD01
64      DOG04-C*
      V
      V
72      RDOG04-C
      .
      .
78      .      OG05-C*
      .
      .
85      COG05-C*.....
      V
      V
91      RCOG05-C
      .
      .
97      .      CY06B-C*
      .
      .
104     CCY06B-C*.....
      V
      V
110     RCCY06B*
      .
      .
116     .      GD17BG-C

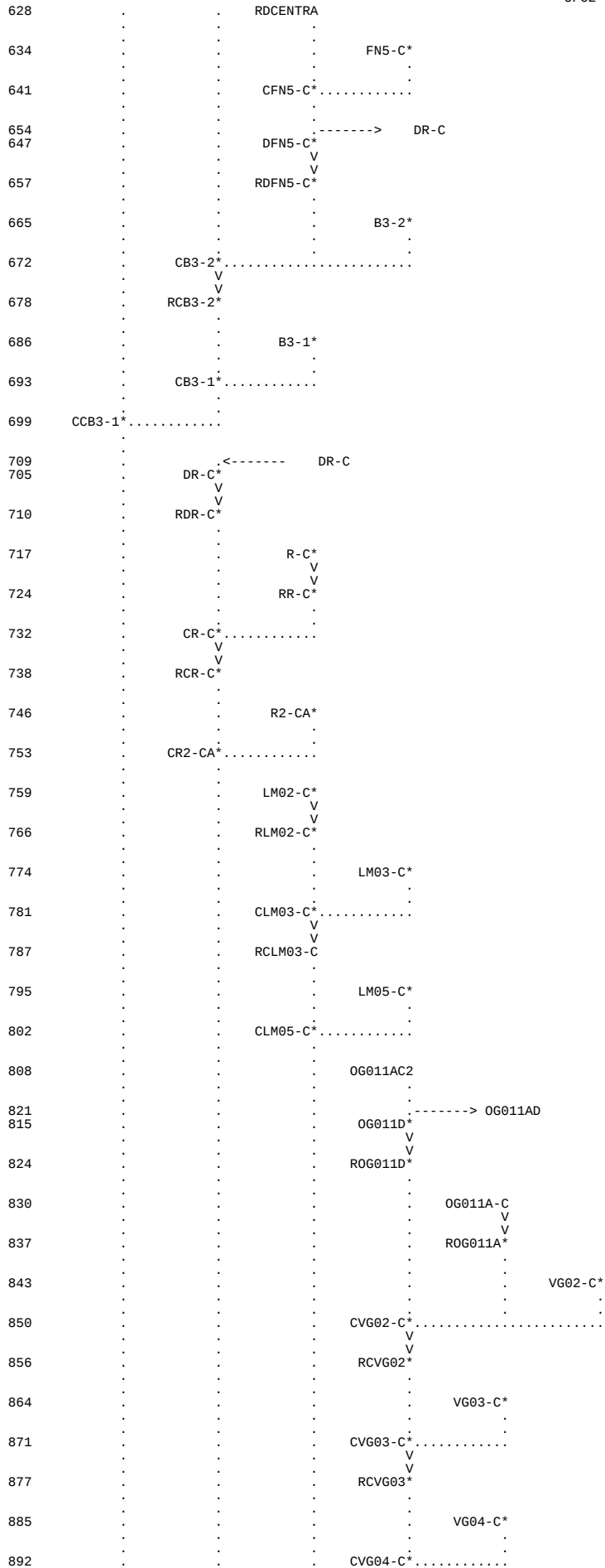
```

```

123      V
      RGD17BG*
131      GD11B-C*
138      CGD11B-C
      V
144      RCGD11B*
152      PT6B-C*
159      CPT6B-C*
171      DPT6B-C1-----> DGOW1A
165
180      DPT6B-C2-----> DTRILGY
174
183      RCPT6B-C
      V
193      DGOW1A* <----- DGOW1A
189      V
194      RDGOW1A*
      V
202      CCPT6B-C
212      DTRILGY* <----- DTRILGY
208
213      CY07B*
220      CCY07B*
233      DCY07B*-----> DCENT1
226      V
236      RDCY07B*
      V
242      CY08-C*
249      CCY08-C*
263      DGOW2A*----->DCENTRAL
255
270      D3ALL*-----> D3ALL
266
277      DCENT1* <----- DCENT1
273      V
278      RDCENT1*
284      CRGOWAN*
      V
290      RCRGOWAN
296      PD05A-C*
303      CPD05A-C
316      DCPD05A*-----> DA1-C
309      V
319      RCPD05*
329      DPD01* <----- DPD01
325      V
330      RDPD01*
336      PD01-C*
343      CPD01-C*
      V
349      RCPD01*
357      CY04A-C
364      CCY04A-C

```

370	.	V	
	.	V	
	.	V	
378	.		PD04B-C*
385	.		
	.		CPD04B-C
391	CCPD04BC		
	.	V	
397	RCPD04B*		
405	.		OG03-C*
	.	V	
412	.	V	
	.	V	
	.		ROG03-C*
418	.		
	.		OG02-C*
	.	V	
425	.	V	
	.	V	
	.		ROG02-C*
433	.		
	.		LM01-C*
440	.		
	.		CLM01-C*
	.	V	
446	.	V	
	.	V	
	.		RCLM01-C
454	.		
	.		SR00A-C*
461	.		
	.		CSR00A*
467	CCSR00A*		
	.	V	
473	RCSR00A*		
	.	V	
481	.		SR02E-C*
488	CSR02E*		
	.	V	
494	RCSR02E*		
	.	V	
502	.		SR05D-C*
509	CSR05D*		
	.	V	
515	RCSR05D*		
	.	V	
523	.		SR05B-C*
530	CSR05B*		
536	CCSR05B*		
	.	V	
542	RCCSR05B		
	.	V	
550	.		B1-C*
557	CB1-C*		
	.	V	
563	RCB1-C*		
	.	V	
571	.		A1-C1*
582	.		
578	.		DA1-C*
	.	V	
583	.	V	
	.	V	
	.		RDA1-C*
591	CA1-C*		
596	.		
	.		FN2-C*
	.	V	
603	.	V	
	.	V	
	.		RFN2-C*
609	CCA1-C*		
	.	V	
615	RCCA-1C*		
	.	V	
627	.		
623	.		DCENTRAL
	.	V	
	.	V	



```

903      . . . . .
898      . . . . . DCVG04-C -----> DVG20C
      . . . . . V
906      . . . . . RDCVG04C
      . . . . .
914      . . . . . CCLM05-C ----->
      . . . . . V
920      . . . . . RCCLM05C
      . . . . .
928      . . . . . LM06B-C*
      . . . . .
935      . . . . . CLM06-C* ----->
      . . . . . V
941      . . . . . RCLM06*
      . . . . .
949      . . . . . LM10-C*
      . . . . .
956      . . . . . CLM10-C* ----->
      . . . . .
961      CARYLMIN ----->
      . . . . . V
967      CARYLMDB
      . . . . .
991      . . . . . -----> DR2
986      DCAREY*
      . . . . . V
      . . . . . V
994      RDCAREY*
      . . . . .
1007      DFLOW -----> DFLOW
1002      DFLOW*
      . . . . .
1010      . . . . . LM16A-C*
      . . . . .
1017      CLM16A-C ----->
      . . . . . V
1023      RCLM16A*
      . . . . .
1031      . . . . . LM14-C*
      . . . . .
1038      CLM14-C* ----->
      . . . . . V
1044      RCLM14
      . . . . .
1051      . . . . . LM19*
      . . . . . V
1058      . . . . . RLM19
      . . . . .
1064      . . . . . LM20-C*
      . . . . .
1071      CLM20-C* ----->
      . . . . . V
1076      RCLM20*
      . . . . .
1088      . . . . . <----- DVG20C
1084      DVG20C*
      . . . . . V
1089      RDVG20C*
      . . . . .
1097      . . . . . VG20-C*
      . . . . .
1104      . . . . . CVG20-C* ----->
      . . . . .
1110      . . . . . LM09-C*
      . . . . .
1124      . . . . . -----> DHOLLY
1117      DLM09-C*
      . . . . . V
1127      RDLM09-C
      . . . . .
1133      . . . . . CCVG20-C ----->
      . . . . .
1143      . . . . . -----> LV15
1139      DCVG20-C
      . . . . . V
1146      RDCVG20C
      . . . . .
1158      . . . . . <----- DHOLLY
1154      DHOLLY*
      . . . . . V
1159      RDHOLLY*

```

1165	.	.	.	LM16B-C*	
1172	.	CLM16B-C	.	.	
1178	.	V	.	.	
	.	RCLM16B*	.	.	
1190	.	.	.	.	
1186	.	.	.	OG011AD*	<----- OG011AD
	.	.	.	V	
	.	.	.	V	
1191	.	.	.	ROG011AD	
1197	.	.	.	.	WA01-C*
1204	.	.	.	CWA01-C*	.
	.	.	.	V	
1210	.	.	.	RWA01*	
1216	.	.	.	.	WA04-C*
1223	.	.	.	CWA04-C*	.
	.	.	.	V	
1229	.	.	.	RCWA04*	
1237	.	.	.	.	WA09-C*
1244	.	.	.	CWA09-C*	.
	.	.	.	V	
1250	.	.	.	RCWA09*	
1258	.	.	.	.	WA10-C*
1273	.	.	.	.	.
1265	.	.	.	WA10D*	-----> WA10SE
1276	.	.	.	CWA10NW*	.
	.	.	.	V	
1282	.	.	.	RCWA10NW	
1290	.	.	.	.	WA13-C*
1297	.	.	.	CWA13-C*	.
1310	.	.	.	.	.
1303	.	.	.	DCWA13*	-----> WA13SE
1317	.	.	.	.	.
1313	.	.	.	LV15*	<----- LV15
	.	.	.	V	
1318	.	.	.	RLV15*	
1324	.	.	.	CCWA13-C	.
	.	.	.	V	
1330	.	.	.	RCWA13*	
1338	.	.	.	.	WA15A-C*
1345	.	.	.	CWA15A-C	.
1351	.	.	.	.	VG07*
	.	.	.	V	
1358	.	.	.	RVG07*	
1364	.	.	.	CVG07*	.
	.	.	.	V	
1370	.	.	.	RCVG07*	
1378	.	.	.	.	WA20-C*
1385	.	.	.	CWA20-C*	.
	.	.	.	V	
1391	.	.	.	RCWA20-C	
1399	.	.	.	.	VG10-C*
1406	.	.	.	CVG10-C*	.
1411	.	.	.	CCVG10*	
1423	.	.	.	.	-----> DRAILRD

```

1417      . DCCVG10*
          . V
1426      . RDCCVG10
          . V
1434      . VG24-C*
          .
1441      . CVG24*
          .
1451      . DRAILRD* <----- DRAILRD
1447      . V
          . V
1452      . RDRAILRD
          .
1460      . CCGVG24*
          . V
1466      . RCCVG24*
          .
1478      . DR2* <----- DR2
1474      .
          .
1484      . DFLOW* -----> DFLOW
1479      . V
          . V
1487      . RDR2*
          .
1495      . R2-C*
          .
1502      . CR2-C*
          . V
1508      . RCR2-C*
          . V
          .
1516      . S*
          .
1523      . CS*
          . V
1529      . RCS*
          . V
          .
1537      . S1-C*
          .
1544      . CS1-C*
          . V
1550      . RCS1-C*
          .
          .
1558      . W1C2*
          .
1565      . CW1C2*
          . V
1571      . RCW1C2*
          .
          .
1581      . OFF-7
          . V
1587      . ROFF7
          . V
          .
1591      . OFF6UL
          .
1597      . CP20FF
          . V
1601      . RCP20FF
          . V
          .
1605      . OFF-2
          . V
1611      . ROFF2
          . V
          .
1617      . OFF3UL
          . V
1623      . ROF3UL
          . V
          .
1627      . OFF5UL
          .
          .
1633      . CP10FF
          . V
1637      . RCP10FF
          . V
          .
1644      . CPFWC1
          . V
1648      . RCPFWC1
          .
          .
1652      . OFF-4
          . V
1658      . ROFF4
          .

```

UFC2

1666			LOSE1** V	
1673		R-LOSE1*	V	
1678				LOSE2**
1685				LOSE3**
1691				LOSE4**
1699		C3-LOSE	.	
1704		RC3-LOSE	V V	
1709				UPRR1**
1716				UPRR2**
1723		EPC1**	.	
1729		RECP1	V V	
1734				RR-7
1740	CPFWC2.			
1746		PMAYF1** V		
1752		RMAYF1-3	V	
1756				PMAYF3**
1761		CPMAYF3*	.	
1765		RCPMAYF3	V V	
1768				PMAYF2** V
1773				RMAYF2-4 V
1777				MAYF4A**
1783		CP1A**	.	
1787		RCP1A**	V V	
1791				PMAY4B**
1798		C4BMAYF*	.	
1802				PMAYF6**
1807				PMAYF7**
1812				CPMAY7** V
1816				RCPMAY7* V
1820		CRCPAY7*	.	
1824				PMAYS5**
1830				PMAYF8**
1835				CPMAYF8*
1839		PCP3A**	.	
1844				PMAYF9**
1849				PMAYF10*
1854				CPMAYF10.
1858		PCP3B**	.	
1862				PBRKS1**

1868	.	.	.	PBRKS2**	.
1874	.	.	CPBRKS2*	.	.
1878	.	.	.	PBRKS3**	.
1884	.	.	CPBRKS3*	.	.
1888	.	.	V	.	.
1892	.	.	RCPBRK3*	.	P0FF1**
1899	.	.	CP5**	.	.
1903	.	.	V	.	.
1907	.	.	RCP5**	.	P0FF2**
1914	.	.	.	.	P0FF3**
1921	.	CP6**	.	.	.
1925	.	.	LOS1**	.	.
1932	.	.	.	LOS2**	.
1939	.	CP6A**	.	.	.
1943	.	V	.	.	.
1947	.	RCP6A**	.	.	.
1954	.	.	OFF4**	.	OFF5**
1961	.	CP7**	.	.	.
1966	.	.	RR-6	.	.
1973	CPFwC3	.	.	.	.
1977	.	RR-5	.	.	.
1984	CPFwC4	.	.	.	.
1988	.	RR-4	.	.	.
1995	CPFwC5	.	.	.	.
2000	.	ULT-1A**	.	.	.
2007	.	V	.	.	.
2015	.	RULT-1A*	.	.	.
2022	.	.	ULT-1B**	.	.
2029	.	.	.	ULT-1C**	.
2034	.	.	.	V	.
2041	.	.	.	RULT-1C*	.
2048	.	.	.	.	ULT-1D**
2056	.	CP-1**	.	.	ULT-1F**
2061	.	V	.	.	V
2066	.	RCP-1**	.	.	RULT-1F*
2073	.	.	ULT-2D**	.	.
2080	.	.	.	ULT-2E**	.
2085	.	CP-2**	.	.	.
2091	.	V	.	.	.
	.	RCP-2*	.	.	.
	.	.	ULT-2A**	.	.
	.	.	V	.	.
	.	.	V	.	.

2098			RULT-2A		UFC2
2103				ULT-2B**	
2110			CP-3**		
2115			V		
			V		
2115			RCP-3		
2120				ULT-2C**	
2127					ULT-2G**
2134					ULT-1E**
					V
2141					V
					RULT-1E
2146					
					ULT-2F**
					V
2153					V
					RULT-2F
2158					
					CP-4C
2161					
					ULT-2H**
2168					
					ULT-2I**
2175					
					CP-4B
					V
2179					V
					RCP-4B
2184					
					CP-4A
					V
2188					V
					RCP-4A
2193					
					ULT-3A**
					V
2200					V
					RULT-3A
2204					
					ULT-3B**
2211					
					CPD1
2215					
					ULT-3C**
					V
2222					V
					RULT-3C
2227					
					ULT-3D**
					V
2234					V
					RULT-3D
2238					
					ULT-3E**
2245					
					CP-5
					V
2249					V
					RCP-5
2256					
					ULT-3F**
2263					
					ULT-3G**
2270					
					CP-6A
2274					
					ULT-3H**
2281					
					ULT-3J**
					V
2288					V
					RULT-3J
2292					
					ULT-3K**
					V
2299					V
					RULT-3K
2303					
					CP-6
					V
2307					V
					RCP-6
2314					
					ULT-3L**
2321					
					CP-7**

```

1  (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
  * ****
  *
  * FLOOD HYDROGRAPH PACKAGE (HEC-1)
  * JUN 1998
  * VERSION 4.1
  *
  * RUN DATE 06NOV13 TIME 08:53:58
  * ****
  * ****

```

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

```

FREEWAY CHANNEL ANALYSIS FROM CAREY AVE. TO LAS VEGAS WASH CONFLUENCE
ULTIMATE CONDITIONS
INPUT FILE = UFC2.DAT
INPUT FILE DATE = NOVEMBER 2013 (VERSION 2 WITH CCRFCO COMMENTS INCORPORATED)
MODELED BY MWH

```

```
*****
*
* SDN4 STORM DISTRIBUTION
*
*****
```

REFERENCED HYDROLOGIC MODELS:

*CENTRAL FREEWAY CHANNEL, OWENS AVE. TO MILLER AVE. (VTN NOV 2009)

*BROOKS CHANNEL FLOOD CONTROL PROJECT (MWH 2012)

*90% TECHNICAL DRAINAGE STUDY FOR NORTH 5TH STREET IMPROVEMENTS
LOSEE ROAD TO CHEYENNE AVE (LBG 2012)

*DRAFT DRAINAGE STUDY FOR COLTON AVE FLOOD CONTROL IMPROVEMENTS
5TH STREET TO I-15 CHANNEL(CNLV 2009)

VEGAS DRIVE IMPROVEMENTS PDR, SHADOW MOUNTAIN PLACE TO RANCHO DRIVE (LBG JUL

JD CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:

DARF VALUES USED : CCRFCD HCDDM

AREA SQ. MI.	DARF
8-9	0.875
9-10	0.865
10-11	0.857
11-12	0.850

```

46 IO      OUTPUT CONTROL VARIABLES
           IPRNT      5      PRINT CONTROL
           IPLOT      0      PLOT CONTROL
           QSCAL      0.    HYDROGRAPH PLOT SCALE

IT          HYDROGRAPH TIME DATA
           NMNIN      5      MINUTES IN COMPUTATION INTERVAL
           IDATE      1      0      STARTING DATE
           ITIME      0000      STARTING TIME
           NQ         300      NUMBER OF HYDROGRAPH ORDINATES
           NDDATE      2      0      ENDING DATE
           NDTIME      0055      ENDING TIME
           ICENT      19      CENTURY MARK

           COMPUTATION INTERVAL      .08 HOURS
           TOTAL TIME BASE      24.92 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
           .88      .87      .86      .85

```

UFC2

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 .88	RATIO 2 .87	RATIO 3 .86	RATIO 4 .85
HYDROGRAPH AT +	OG04-C*	.29	1	FLOW TIME	222. 3.75	218. 3.75	215. 3.75	213. 3.75
DIVERSION TO +	DPD01	.29	1	FLOW TIME	124. 3.50	124. 3.50	124. 3.50	124. 3.50
HYDROGRAPH AT +	DOG04-C*	.29	1	FLOW TIME	98. 3.75	94. 3.75	91. 3.75	89. 3.75
ROUTED TO +	RDOG04-C	.29	1	FLOW TIME	55. 4.33	52. 4.42	50. 4.42	49. 4.42
HYDROGRAPH AT +	OG05-C*	.27	1	FLOW TIME	190. 3.83	187. 3.83	184. 3.83	182. 3.83
2 COMBINED AT +	COG05-C*	.55	1	FLOW TIME	190. 3.83	187. 3.83	185. 3.83	183. 3.83
ROUTED TO +	RCOG05-C	.55	1	FLOW TIME	192. 4.08	189. 4.08	187. 4.08	185. 4.08
HYDROGRAPH AT +	CY06B-C*	.50	1	FLOW TIME	210. 4.17	207. 4.17	204. 4.17	201. 4.17
2 COMBINED AT +	CCY06B-C	1.05	1	FLOW TIME	402. 4.08	395. 4.08	389. 4.08	384. 4.08
ROUTED TO +	RCCY06B*	1.05	1	FLOW TIME	400. 4.17	393. 4.17	388. 4.17	384. 4.17
HYDROGRAPH AT +	GD17BG-C	.36	1	FLOW TIME	215. 3.92	212. 3.92	209. 3.92	206. 3.92
ROUTED TO +	RGD17BG*	.36	1	FLOW TIME	215. 4.00	211. 4.00	208. 4.00	206. 4.00
HYDROGRAPH AT +	GD11B-C*	.26	1	FLOW TIME	228. 3.67	224. 3.67	221. 3.67	219. 3.67
2 COMBINED AT +	CGD11B-C	.63	1	FLOW TIME	387. 3.83	381. 3.83	376. 3.83	371. 3.83
ROUTED TO +	RCGD11B*	.63	1	FLOW TIME	388. 3.92	381. 3.92	376. 3.92	372. 3.92
HYDROGRAPH AT +	PT6B-C*	.45	1	FLOW TIME	181. 4.17	178. 4.17	175. 4.17	173. 4.25
2 COMBINED AT +	CPT6B-C*	1.08	1	FLOW TIME	540. 4.00	531. 4.00	524. 4.00	518. 4.00
DIVERSION TO +	DGOW1A	1.08	1	FLOW TIME	539. 4.00	530. 4.00	523. 4.00	517. 4.00
HYDROGRAPH AT +	DPT6B-C1	1.08	1	FLOW TIME	1. 2.08	1. 2.17	1. 2.17	1. 2.17
DIVERSION TO +	DTRILGY	1.08	1	FLOW TIME	0. 2.08	0. 2.08	0. 2.17	0. 2.17
HYDROGRAPH AT +	DPT6B-C2	1.08	1	FLOW TIME	1. 2.08	1. 2.17	1. 2.17	1. 2.17
ROUTED TO +	RCPT6B-C	1.08	1	FLOW TIME	1. 2.75	1. 2.83	1. 2.83	1. 2.83
HYDROGRAPH AT +	DGOW1A*	.00	1	FLOW TIME	539. 4.00	530. 4.00	523. 4.00	517. 4.00
ROUTED TO +	RDGOW1A*	.00	1	FLOW TIME	540. 4.00	529. 4.00	522. 4.00	516. 4.00
2 COMBINED AT +	CCPT6B-C	1.08	1	FLOW TIME	541. 4.00	530. 4.00	523. 4.00	517. 4.00
HYDROGRAPH AT +	DTRILGY*	.00	1	FLOW TIME	0. 2.08	0. 2.08	0. 2.17	0. 2.17
HYDROGRAPH AT +	CY07B*	.20	1	FLOW TIME	124. 3.92	122. 3.92	120. 3.92	119. 3.92

UFC2								
2 COMBINED AT	CCY07B*	.20	1	FLOW	124.	122.	121.	119.
+				TIME	3.92	3.92	3.92	3.92
DIVERSION TO	DCENT1	.20	1	FLOW	52.	50.	49.	47.
+				TIME	3.92	3.92	3.92	3.92
HYDROGRAPH AT	DCY07B*	.20	1	FLOW	72.	72.	72.	72.
+				TIME	3.58	3.58	3.58	3.58
ROUTED TO	RDCY07B*	.20	1	FLOW	75.	76.	76.	76.
+				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	CY08-C*	.09	1	FLOW	68.	67.	66.	65.
+				TIME	3.75	3.75	3.75	3.75
3 COMBINED AT	CCY08-C*	1.38	1	FLOW	656.	646.	638.	631.
+				TIME	3.92	3.92	3.92	3.92
DIVERSION TO	DCENTRAL	1.38	1	FLOW	26.	16.	8.	1.
+				TIME	3.92	3.92	3.92	3.92
HYDROGRAPH AT	DGOW2A*	1.38	1	FLOW	630.	630.	630.	630.
+				TIME	3.92	3.92	3.92	3.92
DIVERSION TO	D3ALL	1.38	1	FLOW	630.	630.	630.	630.
+				TIME	3.92	3.92	3.92	3.92
HYDROGRAPH AT	D3ALL*	1.38	1	FLOW	0.	0.	0.	0.
+				TIME	.00	.00	.00	.00
HYDROGRAPH AT	DCENT1*	.00	1	FLOW	52.	50.	49.	47.
+				TIME	3.92	3.92	3.92	3.92
ROUTED TO	RDCENT1*	.00	1	FLOW	53.	51.	49.	48.
+				TIME	3.92	3.92	4.00	4.00
3 COMBINED AT	CRGOWAN*	2.43	1	FLOW	444.	435.	429.	424.
+				TIME	4.17	4.17	4.17	4.17
ROUTED TO	RCRGOWAN	2.43	1	FLOW	438.	432.	424.	417.
+				TIME	4.17	4.17	4.17	4.25
HYDROGRAPH AT	PD05A-C*	.14	1	FLOW	106.	105.	104.	103.
+				TIME	3.83	3.83	3.83	3.83
2 COMBINED AT	CPD05A-C	2.56	1	FLOW	505.	498.	489.	481.
+				TIME	4.17	4.17	4.17	4.17
DIVERSION TO	DA1-C	2.56	1	FLOW	211.	211.	211.	211.
+				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	DCPD05A*	2.56	1	FLOW	294.	287.	278.	270.
+				TIME	4.17	4.17	4.17	4.17
ROUTED TO	RCPD05*	2.56	1	FLOW	291.	284.	275.	268.
+				TIME	4.25	4.25	4.25	4.25
HYDROGRAPH AT	DPD01*	.00	1	FLOW	124.	124.	124.	124.
+				TIME	3.50	3.50	3.50	3.50
ROUTED TO	RDPD01*	.00	1	FLOW	128.	128.	129.	129.
+				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	PD01-C*	.38	1	FLOW	197.	193.	190.	188.
+				TIME	3.83	3.83	3.83	3.83
2 COMBINED AT	CPD01-C*	.38	1	FLOW	320.	316.	312.	310.
+				TIME	3.92	3.92	3.92	3.92
ROUTED TO	RCPD01*	.38	1	FLOW	320.	315.	313.	310.
+				TIME	3.92	3.92	3.92	3.92
HYDROGRAPH AT	CY04A-C	.46	1	FLOW	242.	237.	234.	231.
+				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT	CCY04A-C	.83	1	FLOW	561.	553.	546.	540.
+				TIME	3.92	3.92	3.92	3.92
ROUTED TO	RCCY04A*	.83	1	FLOW	556.	549.	544.	537.
+				TIME	4.00	3.92	3.92	4.00
HYDROGRAPH AT	PD04B-C*	.47	1	FLOW	251.	246.	243.	240.
+				TIME	4.00	4.00	4.00	4.00
2 COMBINED AT	CPD04B-C	1.30	1	FLOW	807.	794.	785.	776.
+				TIME	4.00	3.92	3.92	4.00
2 COMBINED AT	CCPD04BC	3.87	1	FLOW	1020.	997.	978.	964.
+								

				TIME	4.08	4.08	UFC2 4.08	4.08
ROUTED TO								
+	RCPD04B*	3.87	1	FLOW TIME	1011. 4.17	990. 4.17	971. 4.17	957. 4.17
HYDROGRAPH AT								
+	OG03-C*	.32	1	FLOW TIME	199. 3.83	196. 3.83	193. 3.83	190. 3.83
ROUTED TO								
+	ROG03-C*	.32	1	FLOW TIME	201. 3.92	197. 3.92	195. 3.92	192. 3.92
HYDROGRAPH AT								
+	OG02-C*	.32	1	FLOW TIME	237. 3.75	233. 3.75	230. 3.75	227. 3.75
ROUTED TO								
+	ROG02-C*	.32	1	FLOW TIME	232. 3.83	229. 3.83	226. 3.83	224. 3.83
HYDROGRAPH AT								
+	LM01-C*	.33	1	FLOW TIME	159. 3.83	156. 3.83	153. 3.83	151. 3.83
2 COMBINED AT								
+	CLM01-C*	.64	1	FLOW TIME	391. 3.83	385. 3.83	379. 3.83	375. 3.83
ROUTED TO								
+	RCLM01-C	.64	1	FLOW TIME	389. 3.83	383. 3.83	376. 3.83	373. 3.83
HYDROGRAPH AT								
+	SR00A-C*	.37	1	FLOW TIME	187. 3.83	183. 3.83	180. 3.83	178. 3.83
2 COMBINED AT								
+	CSR00A*	1.01	1	FLOW TIME	575. 3.83	566. 3.83	556. 3.83	551. 3.83
2 COMBINED AT								
+	CCSR00A*	1.34	1	FLOW TIME	767. 3.92	753. 3.92	742. 3.92	733. 3.92
ROUTED TO								
+	RCSR00A*	1.34	1	FLOW TIME	766. 3.92	752. 3.92	740. 3.92	731. 3.92
HYDROGRAPH AT								
+	SR02E-C*	.30	1	FLOW TIME	181. 3.75	178. 3.75	175. 3.75	173. 3.75
2 COMBINED AT								
+	CSR02E*	1.64	1	FLOW TIME	934. 3.92	918. 3.92	904. 3.92	892. 3.92
ROUTED TO								
+	RCSR02E*	1.64	1	FLOW TIME	933. 3.92	920. 3.92	901. 3.92	894. 3.92
HYDROGRAPH AT								
+	SR05D-C*	.30	1	FLOW TIME	175. 3.92	172. 3.92	170. 3.92	168. 3.92
2 COMBINED AT								
+	CSR05D*	1.94	1	FLOW TIME	1108. 3.92	1092. 3.92	1071. 3.92	1062. 3.92
ROUTED TO								
+	RCSR05D*	1.94	1	FLOW TIME	1101. 3.92	1083. 3.92	1062. 3.92	1052. 3.92
HYDROGRAPH AT								
+	SR05B-C*	.36	1	FLOW TIME	186. 4.08	183. 4.08	181. 4.08	179. 4.08
2 COMBINED AT								
+	CSR05B*	2.30	1	FLOW TIME	1273. 3.92	1253. 3.92	1230. 3.92	1218. 3.92
2 COMBINED AT								
+	CCSR05B*	6.16	1	FLOW TIME	2207. 4.00	2164. 4.08	2124. 4.08	2098. 4.08
ROUTED TO								
+	RCCSR05B	6.16	1	FLOW TIME	2205. 4.08	2163. 4.08	2123. 4.08	2097. 4.08
HYDROGRAPH AT								
+	B1-C*	.27	1	FLOW TIME	200. 3.83	197. 3.83	195. 3.83	193. 3.83
2 COMBINED AT								
+	CB1-C*	6.44	1	FLOW TIME	2383. 4.00	2337. 4.00	2293. 4.08	2265. 4.08
ROUTED TO								
+	RCB1-C*	6.44	1	FLOW TIME	2379. 4.08	2334. 4.08	2291. 4.08	2264. 4.08
HYDROGRAPH AT								
+	A1-C1*	.31	1	FLOW TIME	215. 3.83	212. 3.83	209. 3.83	207. 3.83
HYDROGRAPH AT								
+	DA1-C*	.00	1	FLOW TIME	211. 3.75	211. 3.75	211. 3.75	211. 3.75
ROUTED TO								
+	RDA1-C*	.00	1	FLOW TIME	212. 3.83	212. 3.83	213. 3.83	213. 3.83
2 COMBINED AT								
+	CA1-C*	.31	1	FLOW TIME	428. 3.83	424. 3.83	422. 3.83	420. 3.83

								UFC2
HYDROGRAPH AT	FN2-C*	.21	1	FLOW	162.	159.	157.	155.
+				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RFN2-C*	.21	1	FLOW	162.	160.	158.	156.
+				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT	CCA1-C*	.52	1	FLOW	585.	580.	575.	571.
+				TIME	3.92	3.92	3.92	3.92
ROUTED TO	RCCA-1C*	.52	1	FLOW	582.	579.	571.	565.
+				TIME	3.92	3.92	4.00	4.00
HYDROGRAPH AT	DCENTRAL	.00	1	FLOW	26.	16.	8.	1.
+				TIME	3.92	3.92	3.92	3.92
ROUTED TO	RDCENTRA	.00	1	FLOW	25.	13.	6.	1.
+				TIME	4.92	5.08	5.25	3.92
HYDROGRAPH AT	FN5-C*	.48	1	FLOW	270.	265.	262.	259.
+				TIME	4.00	4.00	4.00	4.00
2 COMBINED AT	CFN5-C*	.48	1	FLOW	271.	266.	263.	260.
+				TIME	4.00	4.00	4.00	4.00
DIVERSION TO	DR-C	.48	1	FLOW	131.	126.	123.	120.
+				TIME	4.00	4.00	4.00	4.00
HYDROGRAPH AT	DFN5-C*	.48	1	FLOW	140.	140.	140.	140.
+				TIME	3.58	3.67	3.67	3.67
ROUTED TO	RDFN5-C*	.48	1	FLOW	143.	143.	143.	143.
+				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	B3-2*	.31	1	FLOW	227.	224.	221.	219.
+				TIME	3.83	3.83	3.83	3.83
3 COMBINED AT	CB3-2*	1.31	1	FLOW	940.	934.	922.	913.
+				TIME	3.92	3.92	3.92	3.92
ROUTED TO	RCB3-2*	1.31	1	FLOW	933.	925.	914.	904.
+				TIME	3.92	3.92	3.92	3.92
HYDROGRAPH AT	B3-1*	.31	1	FLOW	218.	215.	212.	210.
+				TIME	3.83	3.83	3.83	3.83
2 COMBINED AT	CB3-1*	1.61	1	FLOW	1147.	1136.	1122.	1111.
+				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT	CCB3-1*	8.05	1	FLOW	3472.	3419.	3365.	3328.
+				TIME	4.00	4.00	4.00	4.00
HYDROGRAPH AT	DR-C*	.00	1	FLOW	131.	126.	123.	120.
+				TIME	4.00	4.00	4.00	4.00
ROUTED TO	RDR-C*	.00	1	FLOW	130.	125.	122.	119.
+				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT	R-C*	.27	1	FLOW	204.	201.	198.	196.
+				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RR-C*	.27	1	FLOW	203.	199.	197.	194.
+				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT	CR-C*	.27	1	FLOW	257.	248.	244.	241.
+				TIME	4.00	4.00	4.00	4.00
ROUTED TO	RCR-C*	.27	1	FLOW	253.	245.	243.	239.
+				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	R2-CA*	.45	1	FLOW	358.	353.	348.	344.
+				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT	CR2-CA*	.71	1	FLOW	551.	542.	537.	532.
+				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	LM02-C*	.29	1	FLOW	164.	161.	158.	156.
+				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RLM02-C*	.29	1	FLOW	164.	160.	158.	156.
+				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	LM03-C*	.34	1	FLOW	249.	245.	242.	239.
+				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT	CLM03-C*	.63	1	FLOW	409.	402.	397.	392.
+				TIME	3.83	3.83	3.83	3.83
ROUTED TO	RCLM03-C	.63	1	FLOW	409.	403.	396.	391.
+								

				TIME	3.83	3.83	UFC2 3.83	3.83
HYDROGRAPH AT								
+	LM05-C*	.37	1	FLOW TIME	236. 3.83	232. 3.83	228. 3.83	226. 3.83
2 COMBINED AT								
+	CLM05-C*	1.00	1	FLOW TIME	645. 3.83	634. 3.83	625. 3.83	617. 3.83
HYDROGRAPH AT								
+	OG011AC2	.12	1	FLOW TIME	115. 3.58	114. 3.58	112. 3.58	111. 3.58
DIVERSION TO								
+	OG011AD	.12	1	FLOW TIME	45. 3.33	45. 3.33	45. 3.33	45. 3.33
HYDROGRAPH AT								
+	OG011D*	.12	1	FLOW TIME	70. 3.58	69. 3.58	67. 3.58	66. 3.58
ROUTED TO								
+	ROG011D*	.12	1	FLOW TIME	75. 3.92	76. 3.92	77. 3.92	66. 3.92
HYDROGRAPH AT								
+	OG011A-C	.31	1	FLOW TIME	136. 3.83	133. 3.83	131. 3.83	129. 3.83
ROUTED TO								
+	ROG011A*	.31	1	FLOW TIME	136. 4.00	133. 4.00	130. 4.00	128. 4.00
HYDROGRAPH AT								
+	VG02-C*	.24	1	FLOW TIME	119. 3.83	117. 3.83	115. 3.83	113. 3.83
3 COMBINED AT								
+	CVG02-C*	.68	1	FLOW TIME	324. 3.92	320. 3.92	316. 3.92	302. 3.92
ROUTED TO								
+	RCVG02*	.68	1	FLOW TIME	320. 3.92	312. 3.92	306. 3.92	293. 4.00
HYDROGRAPH AT								
+	VG03-C*	.28	1	FLOW TIME	115. 3.83	112. 3.83	110. 3.83	108. 3.83
2 COMBINED AT								
+	CVG03-C*	.95	1	FLOW TIME	432. 3.92	422. 3.92	413. 3.92	396. 3.92
ROUTED TO								
+	RCVG03*	.95	1	FLOW TIME	421. 4.00	412. 4.00	404. 4.00	394. 4.00
HYDROGRAPH AT								
+	VG04-C*	.31	1	FLOW TIME	195. 3.92	192. 3.92	189. 3.92	187. 3.92
2 COMBINED AT								
+	CVG04-C*	1.26	1	FLOW TIME	613. 3.92	599. 4.00	589. 4.00	577. 4.00
DIVERSION TO								
+	DVG20C	1.26	1	FLOW TIME	164. 3.50	164. 3.50	164. 3.50	164. 3.58
HYDROGRAPH AT								
+	DCVG04-C	1.26	1	FLOW TIME	449. 3.92	435. 4.00	425. 4.00	413. 4.00
ROUTED TO								
+	RDCVG04C	1.26	1	FLOW TIME	448. 4.00	433. 4.00	421. 4.00	408. 4.00
2 COMBINED AT								
+	CCLM05-C	2.26	1	FLOW TIME	1043. 3.92	1017. 3.92	994. 3.92	970. 3.92
ROUTED TO								
+	RCCLM05C	2.26	1	FLOW TIME	1029. 3.92	1005. 3.92	982. 3.92	959. 3.92
HYDROGRAPH AT								
+	LM06B-C*	.35	1	FLOW TIME	222. 3.92	218. 3.92	215. 3.92	213. 3.92
2 COMBINED AT								
+	CLM06-C*	2.61	1	FLOW TIME	1251. 3.92	1223. 3.92	1197. 3.92	1172. 3.92
ROUTED TO								
+	RCLM06*	2.61	1	FLOW TIME	1233. 4.00	1205. 4.00	1182. 4.00	1158. 4.00
HYDROGRAPH AT								
+	LM10-C*	.41	1	FLOW TIME	301. 3.75	296. 3.75	292. 3.75	289. 3.75
2 COMBINED AT								
+	CLM10-C*	3.02	1	FLOW TIME	1502. 3.92	1470. 3.92	1442. 3.92	1415. 3.92
3 COMBINED AT								
+	CARYLMIN	11.78	1	FLOW TIME	5454. 4.00	5355. 4.00	5263. 4.00	5184. 4.00
ROUTED TO								
+	CARYLMDB	11.78	1	FLOW TIME	586. 6.08	415. 6.33	378. 6.33	376. 6.33
** PEAK STAGES IN FEET **								
1	STAGE TIME				118.67 6.08	118.53 6.33	118.32 6.33	118.14 6.33

								UFC2
DIVERSION TO								
+	DR2	11.78	1	FLOW TIME	168. 5.50	168. 5.58	168. 5.75	168. 5.83
HYDROGRAPH AT								
+	DCAREY*	11.78	1	FLOW TIME	418. 6.08	247. 6.33	210. 6.33	208. 6.33
ROUTED TO								
+	RDCAREY*	11.78	1	FLOW TIME	416. 6.17	247. 6.33	210. 6.42	208. 6.42
DIVERSION TO								
+	DFLOW	11.78	1	FLOW TIME	416. 6.17	247. 6.33	210. 6.42	208. 6.42
HYDROGRAPH AT								
+	DFLOW*	11.78	1	FLOW TIME	0. .00	0. .00	0. .00	0. .00
HYDROGRAPH AT								
+	LM16A-C*	.38	1	FLOW TIME	272. 3.75	268. 3.75	264. 3.75	261. 3.75
2 COMBINED AT								
+	CLM16A-C	12.16	1	FLOW TIME	272. 3.75	268. 3.75	264. 3.75	261. 3.75
ROUTED TO								
+	RCLM16A*	12.16	1	FLOW TIME	271. 3.83	267. 3.83	263. 3.83	260. 3.83
HYDROGRAPH AT								
+	LM14-C*	.34	1	FLOW TIME	186. 3.83	183. 3.83	180. 3.83	177. 3.83
2 COMBINED AT								
+	CLM14-C*	12.51	1	FLOW TIME	457. 3.83	450. 3.83	443. 3.83	438. 3.83
ROUTED TO								
+	RCLM14	12.51	1	FLOW TIME	452. 3.83	445. 3.83	438. 3.83	433. 3.83
HYDROGRAPH AT								
+	LM19*	.26	1	FLOW TIME	124. 3.92	122. 3.92	120. 3.92	118. 3.92
ROUTED TO								
+	RLM19	.26	1	FLOW TIME	124. 4.17	122. 4.17	120. 4.17	118. 4.17
HYDROGRAPH AT								
+	LM20-C*	.38	1	FLOW TIME	218. 3.83	214. 3.83	211. 3.83	208. 3.83
3 COMBINED AT								
+	CLM20-C*	13.14	1	FLOW TIME	749. 3.92	737. 3.92	725. 3.92	717. 3.92
ROUTED TO								
+	RCLM20*	13.14	1	FLOW TIME	745. 3.92	733. 3.92	720. 3.92	712. 3.92
HYDROGRAPH AT								
+	DVG20C*	.00	1	FLOW TIME	164. 3.50	164. 3.50	164. 3.50	164. 3.58
ROUTED TO								
+	RDVG20C*	.00	1	FLOW TIME	172. 3.67	173. 3.67	174. 3.67	174. 3.67
HYDROGRAPH AT								
+	VG20-C*	.31	1	FLOW TIME	166. 3.92	163. 3.92	161. 3.92	159. 3.92
2 COMBINED AT								
+	CVG20-C*	.31	1	FLOW TIME	331. 3.83	328. 3.83	326. 3.83	324. 3.83
HYDROGRAPH AT								
+	LM09-C*	.46	1	FLOW TIME	362. 3.75	356. 3.75	352. 3.75	348. 3.75
DIVERSION TO								
+	DHOLLY	.46	1	FLOW TIME	162. 3.75	156. 3.75	152. 3.75	148. 3.75
HYDROGRAPH AT								
+	DLM09-C*	.46	1	FLOW TIME	200. 3.50	200. 3.50	200. 3.50	200. 3.50
ROUTED TO								
+	RDLM09-C	.46	1	FLOW TIME	203. 3.58	203. 3.58	203. 3.67	204. 3.67
2 COMBINED AT								
+	CCVG20-C	.76	1	FLOW TIME	532. 3.83	530. 3.83	528. 3.83	526. 3.83
DIVERSION TO								
+	LV15	.76	1	FLOW TIME	0. .00	0. .00	0. .00	0. .00
HYDROGRAPH AT								
+	DCVG20-C	.76	1	FLOW TIME	532. 3.83	530. 3.83	528. 3.83	526. 3.83
ROUTED TO								
+	RDCVG20C	.76	1	FLOW TIME	534. 4.00	532. 4.00	531. 4.00	529. 4.00
HYDROGRAPH AT								
+	DHOLLY*	.00	1	FLOW TIME	162. 3.75	156. 3.75	152. 3.75	148. 3.75
ROUTED TO								
+	RDHOLLY*	.00	1	FLOW	206.	203.	199.	195.

				TIME	4.33	4.33	UFC2 4.33	4.33
HYDROGRAPH AT								
+	LM16B-C*	.38	1	FLOW TIME	198. 4.00	195. 4.00	192. 4.00	190. 4.00
3 COMBINED AT								
+	CLM16B-C	1.14	1	FLOW TIME	821. 4.33	812. 4.33	803. 4.33	793. 4.33
ROUTED TO								
+	RCLM16B*	1.14	1	FLOW TIME	807. 4.33	784. 4.33	766. 4.33	751. 4.33
HYDROGRAPH AT								
+	OG011AD*	.00	1	FLOW TIME	45. 3.33	45. 3.33	45. 3.33	45. 3.33
ROUTED TO								
+	ROG011AD	.00	1	FLOW TIME	46. 3.58	46. 3.58	46. 3.58	46. 3.58
HYDROGRAPH AT								
+	WA01-C*	.19	1	FLOW TIME	158. 3.67	155. 3.67	153. 3.67	151. 3.67
2 COMBINED AT								
+	CWA01-C*	.19	1	FLOW TIME	202. 3.67	200. 3.67	198. 3.67	196. 3.67
ROUTED TO								
+	RWA01*	.19	1	FLOW TIME	204. 3.83	202. 3.83	200. 3.83	198. 3.83
HYDROGRAPH AT								
+	WA04-C*	.20	1	FLOW TIME	112. 3.92	110. 3.92	108. 3.92	107. 3.92
2 COMBINED AT								
+	CWA04-C*	.39	1	FLOW TIME	314. 3.83	310. 3.83	306. 3.83	303. 3.83
ROUTED TO								
+	RCWA04*	.39	1	FLOW TIME	312. 3.92	309. 3.92	306. 3.92	301. 3.92
HYDROGRAPH AT								
+	WA09-C*	.10	1	FLOW TIME	77. 3.75	76. 3.75	75. 3.75	74. 3.75
2 COMBINED AT								
+	CWA09-C*	.49	1	FLOW TIME	381. 3.92	377. 3.92	373. 3.92	367. 3.92
ROUTED TO								
+	RCWA09*	.49	1	FLOW TIME	380. 3.92	376. 3.92	372. 3.92	366. 3.92
HYDROGRAPH AT								
+	WA10-C*	.45	1	FLOW TIME	289. 3.75	284. 3.75	280. 3.75	276. 3.75
DIVERSION TO								
+	WA10SE	.45	1	FLOW TIME	250. 3.67	250. 3.67	250. 3.67	250. 3.67
HYDROGRAPH AT								
+	WA10D*	.45	1	FLOW TIME	39. 3.75	34. 3.75	30. 3.75	26. 3.75
2 COMBINED AT								
+	CWA10NW*	.94	1	FLOW TIME	401. 3.83	391. 3.83	380. 3.83	371. 3.83
ROUTED TO								
+	RCWA10NW	.94	1	FLOW TIME	399. 3.92	390. 3.92	380. 3.92	371. 3.92
HYDROGRAPH AT								
+	WA13-C*	.33	1	FLOW TIME	277. 3.67	272. 3.67	269. 3.67	266. 3.67
2 COMBINED AT								
+	CWA13-C*	1.27	1	FLOW TIME	604. 3.83	590. 3.83	576. 3.83	564. 3.83
DIVERSION TO								
+	WA13SE	1.27	1	FLOW TIME	365. 3.83	357. 3.83	349. 3.83	341. 3.83
HYDROGRAPH AT								
+	DCWA13*	1.27	1	FLOW TIME	239. 3.83	233. 3.83	227. 3.83	222. 3.83
HYDROGRAPH AT								
+	LV15*	.00	1	FLOW TIME	0. .00	0. .00	0. .00	0. .00
ROUTED TO								
+	RLV15*	.00	1	FLOW TIME	0. .00	0. .00	0. .00	0. .00
2 COMBINED AT								
+	CCWA13-C	1.27	1	FLOW TIME	239. 3.83	233. 3.83	227. 3.83	222. 3.83
ROUTED TO								
+	RCWA13*	1.27	1	FLOW TIME	239. 3.92	233. 3.92	228. 3.92	222. 3.92
HYDROGRAPH AT								
+	WA15A-C*	.37	1	FLOW TIME	193. 4.00	190. 4.00	187. 4.00	185. 4.00
2 COMBINED AT								
+	CWA15A-C	1.65	1	FLOW TIME	426. 3.92	417. 3.92	409. 3.92	402. 3.92

								UFC2
HYDROGRAPH AT	VG07*	.26	1	FLOW	106.	103.	102.	100.
+				TIME	3.92	3.92	3.92	3.92
ROUTED TO	RVG07*	.26	1	FLOW	106.	103.	102.	100.
+				TIME	4.00	4.00	4.00	4.00
2 COMBINED AT	CVG07*	1.91	1	FLOW	529.	518.	508.	499.
+				TIME	3.92	3.92	3.92	3.92
ROUTED TO	RCVG07*	1.91	1	FLOW	525.	518.	505.	500.
+				TIME	4.00	4.00	4.00	4.00
HYDROGRAPH AT	WA20-C*	.53	1	FLOW	271.	266.	263.	259.
+				TIME	4.08	4.08	4.08	4.08
2 COMBINED AT	CWA20-C*	2.44	1	FLOW	794.	783.	766.	757.
+				TIME	4.00	4.00	4.00	4.00
ROUTED TO	RCWA20-C	2.44	1	FLOW	788.	774.	762.	751.
+				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	VG10-C*	.39	1	FLOW	205.	201.	198.	196.
+				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT	CVG10-C*	2.82	1	FLOW	988.	970.	952.	941.
+				TIME	4.00	4.00	4.00	4.00
2 COMBINED AT	CCVG10*	3.96	1	FLOW	1710.	1687.	1667.	1647.
+				TIME	4.08	4.08	4.08	4.08
DIVERSION TO	DRAILRD	3.96	1	FLOW	855.	844.	833.	824.
+				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	DCCVG10*	3.96	1	FLOW	855.	844.	833.	824.
+				TIME	4.08	4.08	4.08	4.08
ROUTED TO	RDCCVG10	3.96	1	FLOW	854.	842.	832.	822.
+				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	VG24-C*	.48	1	FLOW	293.	288.	284.	281.
+				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT	CVG24*	4.44	1	FLOW	1128.	1111.	1096.	1084.
+				TIME	4.00	4.00	4.00	4.00
HYDROGRAPH AT	DRAILRD*	.00	1	FLOW	855.	844.	833.	824.
+				TIME	4.08	4.08	4.08	4.08
ROUTED TO	RDRAILRD	.00	1	FLOW	855.	843.	833.	823.
+				TIME	4.08	4.08	4.08	4.08
3 COMBINED AT	CCVG24*	17.59	1	FLOW	2704.	2662.	2624.	2596.
+				TIME	4.00	4.00	4.00	4.00
ROUTED TO	RCCVG24*	17.59	1	FLOW	2693.	2652.	2613.	2586.
+				TIME	4.00	4.00	4.00	4.00
HYDROGRAPH AT	DR2*	.00	1	FLOW	168.	168.	168.	168.
+				TIME	5.50	5.58	5.75	5.83
DIVERSION TO	DFLOW	.00	1	FLOW	168.	168.	168.	168.
+				TIME	5.50	5.58	5.75	5.83
HYDROGRAPH AT	DFLOW*	.00	1	FLOW	0.	0.	0.	0.
+				TIME	.00	.00	.00	.00
ROUTED TO	RDR2*	.00	1	FLOW	0.	0.	0.	0.
+				TIME	.00	.00	.00	.00
HYDROGRAPH AT	R2-C*	.38	1	FLOW	320.	316.	312.	309.
+				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT	CR2-C*	.38	1	FLOW	320.	316.	312.	309.
+				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RCR2-C*	.38	1	FLOW	319.	314.	311.	307.
+				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	S*	.57	1	FLOW	391.	384.	379.	375.
+				TIME	3.83	3.83	3.83	3.83
2 COMBINED AT	CS*	.95	1	FLOW	706.	695.	687.	679.
+				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RCS*	.95	1	FLOW	697.	692.	685.	671.
+				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	S1-C*	.47	1	FLOW	261.	257.	253.	250.
+								

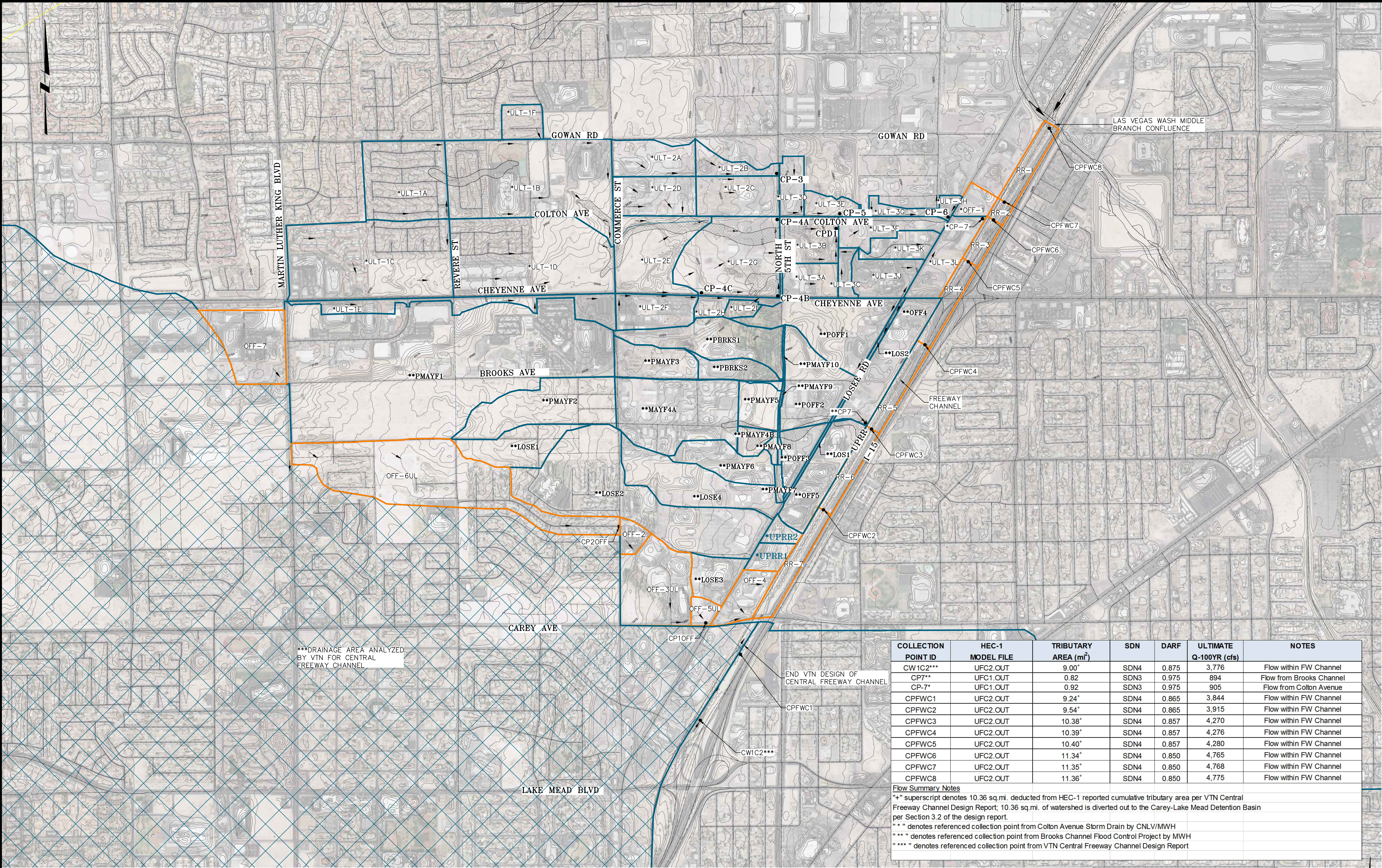
				TIME	3.92	3.92	UFC2 3.92	3.92
+ 2 COMBINED AT	CS1-C*	1.42	1	FLOW TIME	951. 3.83	942. 3.83	931. 3.83	913. 3.83
ROUTED TO								
+ ROUTED TO	RCS1-C*	1.42	1	FLOW TIME	943. 3.83	933. 3.83	921. 3.83	904. 3.83
HYDROGRAPH AT								
+ HYDROGRAPH AT	W1C2*	.36	1	FLOW TIME	292. 3.67	287. 3.67	283. 3.67	280. 3.67
+ 3 COMBINED AT	CW1C2*	19.36	1	FLOW TIME	3776. 3.92	3711. 3.92	3666. 3.92	3624. 3.92
ROUTED TO								
+ ROUTED TO	RCW1C2*	19.36	1	FLOW TIME	3755. 4.00	3695. 4.00	3648. 4.00	3606. 4.00
HYDROGRAPH AT								
+ HYDROGRAPH AT	OFF-7	.05	1	FLOW TIME	54. 3.58	54. 3.58	53. 3.58	53. 3.58
ROUTED TO								
+ ROUTED TO	ROFF7	.05	1	FLOW TIME	52. 3.83	51. 3.83	51. 3.83	50. 3.83
HYDROGRAPH AT								
+ HYDROGRAPH AT	OFF6UL	.13	1	FLOW TIME	74. 3.75	73. 3.75	71. 3.75	70. 3.75
+ 2 COMBINED AT	CP20FF	.17	1	FLOW TIME	125. 3.83	123. 3.83	121. 3.83	120. 3.83
ROUTED TO								
+ ROUTED TO	RCP20FF	.17	1	FLOW TIME	125. 3.92	123. 3.92	121. 3.92	119. 3.92
HYDROGRAPH AT								
+ HYDROGRAPH AT	OFF-2	.01	1	FLOW TIME	11. 3.50	11. 3.50	11. 3.50	11. 3.50
ROUTED TO								
+ ROUTED TO	ROFF2	.01	1	FLOW TIME	10. 3.58	10. 3.58	10. 3.58	10. 3.58
HYDROGRAPH AT								
+ HYDROGRAPH AT	OFF3UL	.05	1	FLOW TIME	55. 3.58	54. 3.58	53. 3.58	53. 3.58
ROUTED TO								
+ ROUTED TO	ROF3UL	.05	1	FLOW TIME	54. 3.58	53. 3.58	52. 3.58	52. 3.58
HYDROGRAPH AT								
+ HYDROGRAPH AT	OFF5UL	.01	1	FLOW TIME	8. 3.50	8. 3.50	8. 3.50	8. 3.50
+ 4 COMBINED AT	CP10FF	.24	1	FLOW TIME	155. 3.83	152. 3.83	150. 3.83	148. 3.83
ROUTED TO								
+ ROUTED TO	RCP10FF	.24	1	FLOW TIME	153. 3.92	150. 3.92	147. 3.92	146. 4.00
+ 2 COMBINED AT	CPFWC1	19.60	1	FLOW TIME	3907. 4.00	3844. 4.00	3796. 4.00	3752. 4.00
ROUTED TO								
+ ROUTED TO	RCPFWC1	19.60	1	FLOW TIME	3862. 4.00	3801. 4.00	3747. 4.00	3715. 4.00
HYDROGRAPH AT								
+ HYDROGRAPH AT	OFF-4	.02	1	FLOW TIME	21. 3.58	21. 3.58	21. 3.58	20. 3.58
ROUTED TO								
+ ROUTED TO	ROFF4	.02	1	FLOW TIME	21. 3.58	21. 3.58	20. 3.58	20. 3.58
HYDROGRAPH AT								
+ HYDROGRAPH AT	LOSE1**	.03	1	FLOW TIME	33. 3.58	32. 3.58	32. 3.58	31. 3.58
ROUTED TO								
+ ROUTED TO	R-LOSE1*	.03	1	FLOW TIME	33. 3.75	32. 3.75	32. 3.75	31. 3.75
HYDROGRAPH AT								
+ HYDROGRAPH AT	LOSE2**	.13	1	FLOW TIME	129. 3.58	127. 3.58	125. 3.58	124. 3.58
HYDROGRAPH AT								
+ HYDROGRAPH AT	LOSE3**	.02	1	FLOW TIME	30. 3.50	30. 3.50	29. 3.50	29. 3.50
HYDROGRAPH AT								
+ HYDROGRAPH AT	LOSE4**	.06	1	FLOW TIME	67. 3.58	66. 3.58	66. 3.58	65. 3.58
+ 4 COMBINED AT	C3-LOSE*	.24	1	FLOW TIME	231. 3.58	227. 3.58	224. 3.58	222. 3.58
ROUTED TO								
+ ROUTED TO	RC3-LOSE	.24	1	FLOW TIME	229. 3.58	226. 3.58	223. 3.58	220. 3.58
HYDROGRAPH AT								
+ HYDROGRAPH AT	UPRR1**	.01	1	FLOW TIME	15. 3.50	15. 3.50	14. 3.50	14. 3.50

UFC2								
HYDROGRAPH AT	UPRR2**	.01	1	FLOW	9.	9.	9.	9.
+				TIME	3.50	3.50	3.50	3.50
3 COMBINED AT	EPC1**	.26	1	FLOW	244.	240.	237.	234.
+				TIME	3.58	3.58	3.58	3.58
ROUTED TO	RECP1	.26	1	FLOW	241.	237.	234.	231.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	RR-7	.02	1	FLOW	19.	19.	19.	18.
+				TIME	3.58	3.58	3.58	3.58
4 COMBINED AT	CPFWC2	19.90	1	FLOW	3978.	3915.	3861.	3827.
+				TIME	4.00	4.00	4.00	4.00
HYDROGRAPH AT	PMAYF1**	.33	1	FLOW	255.	251.	248.	246.
+				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RMAYF1-3	.33	1	FLOW	254.	251.	248.	245.
+				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	PMAYF3**	.03	1	FLOW	34.	34.	33.	33.
+				TIME	3.50	3.50	3.50	3.50
2 COMBINED AT	CPMAYF3*	.35	1	FLOW	266.	262.	259.	256.
+				TIME	3.83	3.83	3.83	3.83
ROUTED TO	RCPMAYF3	.35	1	FLOW	265.	261.	258.	255.
+				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	PMAYF2**	.06	1	FLOW	67.	65.	65.	64.
+				TIME	3.50	3.50	3.50	3.50
ROUTED TO	RMAYF2-4	.06	1	FLOW	63.	63.	62.	60.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	MAYF4A**	.08	1	FLOW	94.	93.	92.	91.
+				TIME	3.58	3.58	3.58	3.58
3 COMBINED AT	CP1A**	.49	1	FLOW	359.	355.	350.	346.
+				TIME	3.67	3.67	3.67	3.67
ROUTED TO	RCP1A**	.49	1	FLOW	359.	354.	350.	346.
+				TIME	3.67	3.67	3.67	3.67
HYDROGRAPH AT	PMAY4B**	.01	1	FLOW	12.	12.	12.	12.
+				TIME	3.50	3.50	3.50	3.50
2 COMBINED AT	C4BMAYF*	.50	1	FLOW	363.	358.	354.	350.
+				TIME	3.67	3.67	3.67	3.67
HYDROGRAPH AT	PMAYF6**	.03	1	FLOW	39.	38.	38.	37.
+				TIME	3.50	3.50	3.50	3.50
HYDROGRAPH AT	PMAYF7**	.00	1	FLOW	5.	5.	5.	4.
+				TIME	3.50	3.50	3.50	3.50
2 COMBINED AT	CPMAY7**	.03	1	FLOW	43.	43.	42.	42.
+				TIME	3.50	3.50	3.50	3.50
ROUTED TO	RCPMAY7*	.03	1	FLOW	42.	41.	41.	40.
+				TIME	3.50	3.50	3.50	3.50
2 COMBINED AT	CRCPAY7*	.53	1	FLOW	389.	384.	380.	374.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	PMAY5**	.02	1	FLOW	28.	27.	27.	27.
+				TIME	3.50	3.50	3.50	3.50
HYDROGRAPH AT	PMAYF8**	.00	1	FLOW	4.	4.	4.	4.
+				TIME	3.50	3.50	3.50	3.50
2 COMBINED AT	CPMAYF8*	.02	1	FLOW	32.	31.	31.	31.
+				TIME	3.50	3.50	3.50	3.50
2 COMBINED AT	PCP3A**	.55	1	FLOW	410.	405.	400.	394.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	PMAYF9**	.00	1	FLOW	4.	4.	4.	4.
+				TIME	3.50	3.50	3.50	3.50
HYDROGRAPH AT	PMAYF10*	.00	1	FLOW	1.	1.	1.	1.
+				TIME	3.50	3.50	3.50	3.50
2 COMBINED AT	CPMAYF10	.00	1	FLOW	5.	5.	5.	5.
+				TIME	3.50	3.50	3.50	3.50
2 COMBINED AT	PCP3B**	.55	1	FLOW	414.	409.	404.	398.

				TIME	3.58	3.58	UFC2 3.58	3.58
HYDROGRAPH AT								
+	PBRKS1**	.05	1	FLOW TIME	36. 3.58	35. 3.58	34. 3.58	34. 3.58
HYDROGRAPH AT								
+	PBRKS2**	.02	1	FLOW TIME	12. 3.50	12. 3.50	12. 3.50	12. 3.50
2 COMBINED AT								
+	CPBRKS2*	.06	1	FLOW TIME	47. 3.58	46. 3.58	46. 3.58	45. 3.58
HYDROGRAPH AT								
+	PBRKS3**	.00	1	FLOW TIME	2. 3.50	2. 3.50	2. 3.50	2. 3.50
2 COMBINED AT								
+	CPBRKS3*	.07	1	FLOW TIME	49. 3.50	48. 3.50	47. 3.50	46. 3.50
ROUTED TO								
+	RCPBRK3*	.07	1	FLOW TIME	49. 3.58	48. 3.58	47. 3.58	46. 3.58
HYDROGRAPH AT								
+	POFF1**	.06	1	FLOW TIME	64. 3.67	63. 3.67	62. 3.67	61. 3.67
2 COMBINED AT								
+	CP5**	.13	1	FLOW TIME	110. 3.58	109. 3.58	107. 3.58	106. 3.58
ROUTED TO								
+	RCP5**	.13	1	FLOW TIME	108. 3.67	107. 3.67	105. 3.67	104. 3.67
HYDROGRAPH AT								
+	POFF2**	.05	1	FLOW TIME	54. 3.58	54. 3.58	53. 3.58	53. 3.58
HYDROGRAPH AT								
+	POFF3**	.02	1	FLOW TIME	18. 3.58	18. 3.58	18. 3.58	18. 3.58
4 COMBINED AT								
+	CP6**	.74	1	FLOW TIME	588. 3.58	580. 3.58	573. 3.58	565. 3.58
HYDROGRAPH AT								
+	LOS1**	.00	1	FLOW TIME	3. 3.50	3. 3.50	3. 3.50	3. 3.50
HYDROGRAPH AT								
+	LOS2**	.00	1	FLOW TIME	5. 3.58	5. 3.58	4. 3.58	4. 3.58
3 COMBINED AT								
+	CP6A**	.75	1	FLOW TIME	595. 3.58	587. 3.58	580. 3.58	572. 3.58
ROUTED TO								
+	RCP6A**	.75	1	FLOW TIME	586. 3.58	577. 3.58	571. 3.58	563. 3.58
HYDROGRAPH AT								
+	OFF4**	.04	1	FLOW TIME	41. 3.67	41. 3.67	40. 3.67	40. 3.67
HYDROGRAPH AT								
+	OFF5**	.04	1	FLOW TIME	42. 3.58	41. 3.58	41. 3.58	40. 3.58
3 COMBINED AT								
+	CP7**	.82	1	FLOW TIME	668. 3.58	659. 3.58	651. 3.58	643. 3.58
HYDROGRAPH AT								
+	RR-6	.01	1	FLOW TIME	14. 3.58	14. 3.58	14. 3.58	14. 3.58
3 COMBINED AT								
+	CPFWC3	20.74	1	FLOW TIME	4398. 4.00	4329. 4.00	4270. 4.00	4232. 4.00
HYDROGRAPH AT								
+	RR-5	.01	1	FLOW TIME	15. 3.58	15. 3.58	15. 3.58	15. 3.58
2 COMBINED AT								
+	CPFWC4	20.75	1	FLOW TIME	4404. 4.00	4334. 4.00	4276. 4.00	4237. 4.00
HYDROGRAPH AT								
+	RR-4	.02	1	FLOW TIME	18. 3.58	17. 3.58	17. 3.58	17. 3.58
2 COMBINED AT								
+	CPFWC5	20.76	1	FLOW TIME	4408. 4.00	4339. 4.00	4280. 4.00	4242. 4.00
HYDROGRAPH AT								
+	ULT-1A**	.06	1	FLOW TIME	57. 3.58	56. 3.58	55. 3.58	54. 3.58
ROUTED TO								
+	RULT-1A*	.06	1	FLOW TIME	57. 3.83	56. 3.83	55. 3.83	55. 3.83
HYDROGRAPH AT								
+	ULT-1B**	.13	1	FLOW TIME	99. 3.75	98. 3.75	96. 3.75	95. 3.75
HYDROGRAPH AT								
+	ULT-1C**	.12	1	FLOW TIME	116. 3.58	114. 3.58	113. 3.58	112. 3.58

UFC2								
ROUTED TO	RULT-1C*	.12	1	FLOW	115.	113.	112.	111.
+				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	ULT-1D**	.12	1	FLOW	108.	107.	106.	104.
+				TIME	3.67	3.67	3.67	3.67
HYDROGRAPH AT	ULT-1F**	.01	1	FLOW	14.	14.	14.	13.
+				TIME	3.58	3.58	3.58	3.58
ROUTED TO	RULT-1F*	.01	1	FLOW	16.	15.	15.	14.
+				TIME	4.00	4.00	4.00	4.00
5 COMBINED AT	CP-1**	.44	1	FLOW	349.	343.	338.	334.
+				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RCP-1**	.44	1	FLOW	343.	342.	341.	337.
+				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	ULT-2D**	.03	1	FLOW	33.	32.	32.	32.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	ULT-2E**	.05	1	FLOW	43.	42.	42.	41.
+				TIME	3.75	3.75	3.75	3.75
3 COMBINED AT	CP-2**	.53	1	FLOW	396.	395.	393.	389.
+				TIME	3.83	3.83	3.83	3.83
ROUTED TO	RCP-2*	.53	1	FLOW	393.	391.	390.	385.
+				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	ULT-2A**	.03	1	FLOW	30.	30.	29.	29.
+				TIME	3.58	3.58	3.58	3.58
ROUTED TO	RULT-2A	.03	1	FLOW	29.	29.	29.	28.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	ULT-2B**	.01	1	FLOW	15.	15.	15.	14.
+				TIME	3.58	3.58	3.58	3.58
2 COMBINED AT	CP-3**	.04	1	FLOW	44.	43.	43.	43.
+				TIME	3.58	3.58	3.58	3.58
ROUTED TO	RCP-3	.04	1	FLOW	42.	42.	41.	41.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	ULT-2C**	.03	1	FLOW	36.	36.	35.	35.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	ULT-2G**	.07	1	FLOW	72.	71.	70.	70.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	ULT-1E**	.03	1	FLOW	32.	31.	31.	30.
+				TIME	3.67	3.67	3.67	3.67
ROUTED TO	RULT-1E	.03	1	FLOW	32.	31.	31.	31.
+				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	ULT-2F**	.03	1	FLOW	24.	24.	23.	23.
+				TIME	3.58	3.58	3.58	3.58
ROUTED TO	RULT-2F	.03	1	FLOW	24.	24.	24.	23.
+				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT	CP-4C	.06	1	FLOW	54.	54.	53.	52.
+				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	ULT-2H**	.01	1	FLOW	4.	4.	4.	4.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	ULT-2I**	.01	1	FLOW	2.	2.	2.	2.
+				TIME	3.50	3.50	3.50	3.50
3 COMBINED AT	CP-4B	.07	1	FLOW	58.	57.	56.	56.
+				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RCP-4B	.07	1	FLOW	57.	56.	56.	55.
+				TIME	3.83	3.83	3.83	3.83
5 COMBINED AT	CP-4A	.74	1	FLOW	528.	524.	521.	515.
+				TIME	3.83	3.83	3.83	3.83
ROUTED TO	RCP-4A	.74	1	FLOW	527.	524.	520.	514.
+				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	ULT-3A**	.02	1	FLOW	23.	23.	23.	22.
+				TIME	3.50	3.50	3.50	3.50
ROUTED TO	RULT-3A	.02	1	FLOW	23.	23.	22.	22.
+								

				TIME	3.58	3.58	UFC2 3.58	3.58
HYDROGRAPH AT	ULT-3B**	.03	1	FLOW	32.	32.	32.	31.
+				TIME	3.58	3.58	3.58	3.58
2 COMBINED AT	CPD1	.05	1	FLOW	55.	55.	54.	54.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	ULT-3C**	.01	1	FLOW	9.	8.	8.	8.
+				TIME	3.50	3.50	3.50	3.50
ROUTED TO	RULT-3C	.01	1	FLOW	8.	8.	8.	8.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	ULT-3D**	.01	1	FLOW	18.	18.	17.	17.
+				TIME	3.50	3.50	3.50	3.50
ROUTED TO	RULT-3D	.01	1	FLOW	17.	17.	17.	17.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	ULT-3E**	.01	1	FLOW	13.	13.	13.	13.
+				TIME	3.50	3.50	3.50	3.50
5 COMBINED AT	CP-5	.82	1	FLOW	575.	568.	563.	556.
+				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RCP-5	.82	1	FLOW	573.	566.	562.	555.
+				TIME	3.75	3.75	3.83	3.83
HYDROGRAPH AT	ULT-3F**	.02	1	FLOW	26.	25.	25.	25.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	ULT-3G**	.01	1	FLOW	9.	9.	9.	9.
+				TIME	3.50	3.50	3.50	3.50
2 COMBINED AT	CP-6A	.03	1	FLOW	34.	34.	34.	33.
+				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	ULT-3H**	.00	1	FLOW	5.	5.	5.	4.
+				TIME	3.50	3.50	3.50	3.50
HYDROGRAPH AT	ULT-3J**	.02	1	FLOW	24.	24.	23.	23.
+				TIME	3.58	3.58	3.58	3.58
ROUTED TO	RULT-3J	.02	1	FLOW	22.	22.	22.	22.
+				TIME	3.67	3.58	3.67	3.67
HYDROGRAPH AT	ULT-3K**	.02	1	FLOW	17.	17.	17.	17.
+				TIME	3.58	3.58	3.58	3.58
ROUTED TO	RULT-3K	.02	1	FLOW	17.	17.	16.	16.
+				TIME	3.58	3.58	3.58	3.58
5 COMBINED AT	CP-6	.89	1	FLOW	625.	617.	612.	604.
+				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RCP-6	.89	1	FLOW	625.	617.	611.	603.
+				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	ULT-3L**	.03	1	FLOW	26.	25.	25.	25.
+				TIME	3.58	3.58	3.58	3.58
2 COMBINED AT	CP-7**	.92	1	FLOW	646.	637.	631.	623.
+				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	RR-3	.01	1	FLOW	10.	10.	10.	10.
+				TIME	3.58	3.58	3.58	3.58
3 COMBINED AT	CPFWC6	21.70	1	FLOW	4955.	4890.	4818.	4765.
+				TIME	3.92	3.92	3.92	3.92
HYDROGRAPH AT	RR-2	.00	1	FLOW	5.	5.	5.	5.
+				TIME	3.50	3.50	3.50	3.50
HYDROGRAPH AT	OFF-1	.01	1	FLOW	14.	13.	13.	13.
+				TIME	3.50	3.50	3.50	3.50
ROUTED TO	ROFF1	.01	1	FLOW	10.	10.	10.	10.
+				TIME	4.42	4.42	4.42	4.42
3 COMBINED AT	CPFWC7	21.71	1	FLOW	4957.	4892.	4820.	4768.
+				TIME	3.92	3.92	3.92	3.92
HYDROGRAPH AT	RR-1	.01	1	FLOW	17.	17.	17.	16.
+				TIME	3.58	3.58	3.58	3.58
2 COMBINED AT	CPFWC8	21.72	1	FLOW	4965.	4900.	4828.	4775.
+				TIME	3.92	3.92	3.92	3.92



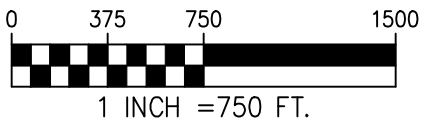
*REFERENCED FROM COLTON AVENUE TDS BY CNLV/MWH
**REFERENCED FROM BROOKS CHANNEL STUDY BY MWH
& NORTH 5TH STREET IMPROVEMENTS TDS BY LOUIS BERGER GROUP
***REFERENCED FROM CENTRAL FREEWAY CHANNEL-OWENS TO
MILLER AVENUE BY VTN NEVADA

REFER TO REFERENCED DRAINAGE MAPS FOR INTERMEDIATE COMBINATION
POINTS AND ROUTES.

FEMA TYPE "A" FLOOD ZONE

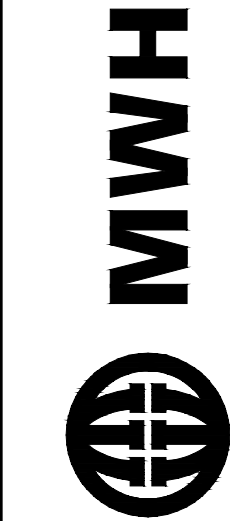
5' CONTOUR

CP-5 COMBINATION POINT
EX-3A DRAINAGE BASIN NAME
FLOW DIRECTION
BASIN BOUNDARY
REFERENCED BASINS



COLLECTION POINT ID	HEC-1 MODEL FILE	TRIBUTARY AREA (mi ²)	SDN	DARF	ULTIMATE Q-100YR (cfs)	NOTES
CW1C2***	UFC2.OUT	9.00*	SDN4	0.875	3,776	Flow within FW Channel
CP7**	UFC1.OUT	0.82	SDN3	0.975	894	Flow from Brooks Channel
CP-7*	UFC1.OUT	0.92	SDN3	0.975	905	Flow from Colton Avenue
CPFWC1	UFC2.OUT	9.24*	SDN4	0.865	3,844	Flow within FW Channel
CPFWC2	UFC2.OUT	9.54*	SDN4	0.865	3,915	Flow within FW Channel
CPFWC3	UFC2.OUT	10.38*	SDN4	0.857	4,270	Flow within FW Channel
CPFWC4	UFC2.OUT	10.39*	SDN4	0.857	4,276	Flow within FW Channel
CPFWC5	UFC2.OUT	10.40*	SDN4	0.857	4,280	Flow within FW Channel
CPFWC6	UFC2.OUT	11.34*	SDN4	0.850	4,765	Flow within FW Channel
CPFWC7	UFC2.OUT	11.35*	SDN4	0.850	4,768	Flow within FW Channel
CPFWC8	UFC2.OUT	11.36*	SDN4	0.850	4,775	Flow within FW Channel

Flow Summary Notes
*+ superscript denotes 10.36 sq.mi. deducted from HEC-1 reported cumulative tributary area per VTN Central
Freeway Channel Design Report; 10.36 sq.mi. of watershed is diverted out to the Carey-Lake Mead Detention Basin
per Section 3.2 of the design report.
** denotes referenced collection point from Colton Avenue Storm Drain by CNLV/MWH
*** denotes referenced collection point from Brooks Channel Flood Control Project by MWH
**** denotes referenced collection point from VTN Central Freeway Channel Design Report



SCALE: 1"=750'
DESIGN: SM
DRAWN: SM
CHECKED: RV
APPROVED: APPROVED
DATE: JUNE 2013

ULTIMATE CONDITION BASIN MAP

CENTRAL FREEWAY CHANNEL HYDROLOGIC & HYDRAULIC ANALYSIS

CITY OF NORTH LAS VEGAS

(DRAWING TITLE)
(PROJECT TITLE)
(LOCATION)

FIG 3A

FIGURE VERSION 2
DATE: NOVEMBER 2013