Wickenburg Downtown Flooding Hazard Mitigation Project
(FCD #2006C018)

Letter of Map Revision (LOMR)

FEMA Case No. 11-09-3523P

Prepared by:

Flood Control District of Maricopa County
Engineering Division
Hydrology & Hydraulics Branch
2801 W Durango Street
Phoenix, AZ 85009
Phone: (602) 506-1501
Fax: (602) 506-4601

September 2011

Federal Emergency Management Agency

Washington, D.C. 20472

DEC 20 2011

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Don Stapley
District 2 Supervisor
301 W. Jefferson, 10th Floor
Phoenix, AZ 85003

IN REPLY REFER TO:
Case No.: 11-09-3523P
Follows Conditional
Case No.: 07-09-0738R
Community Name: Maricopa County, AZ
Community No.: 040037
Effective Date of
This Revision: May 4, 2012

Dear Mr. Stapley:

The Flood Insurance Study Report and Flood Insurance Rate Map for your community have been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Oakland, California, at (510) 627-7175, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

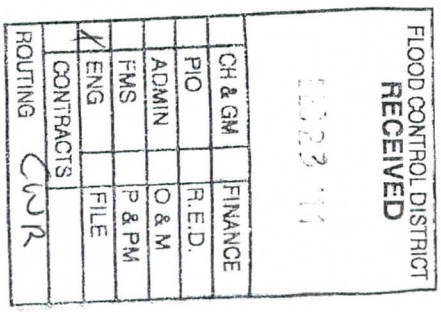
Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

For: Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Insurance Study Report



cc: Mr. Timothy S. Phillips, P.E.,
Chief Engineer and General Manager
Flood Control District, Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

Mr. Scott Vogel
Flood Control District, Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

Mr. Brian Cosson, CFM,
AZ Dept. of Water Resources
3550 N. Central Ave.
Phoenix, AZ 85012-2105

Mr. Lyle Murdock, Floodplain Administrator
Town of Wickenburg
155 N Tegner Street, Suite A
Wickenburg, AZ 85390

Mr. Rick Destefano, Floodplain Administrator
Town of Wickenburg
155 N Tegner Street, Suite A
Wickenburg, AZ 85390

Ms. Catherine W. Regester, P.E., CFM
Flood Control District, Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

The Honorable Kelly Blunt
Mayor, Town of Wickenburg
155 N Tegner St., Suite A
Wickenburg, AZ 85390

Follows Conditional Case No.: 07-09-0738R

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	Maricopa County Arizona (Unincorporated Areas)	CHANNELIZATION DETENTION BASIN LEVEE BRIDGE FILL CULVERT	HYDRAULIC ANALYSIS HYDROLOGIC ANALYSIS NEW TOPOGRAPHIC DATA FLOODWAY LEVEE CERTIFICATION
	COMMUNITY NO.: 040037		
IDENTIFIER	Downtown Wickenburg Flooding Hazard Mitigation Project	APPROXIMATE LATITUDE & LONGITUDE: 33.973, -112.734 SOURCE: Other DATUM: NAD 83	

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 04013C0251H DATE: September 30, 2005	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: September 30, 2005 PROFILE(S): 37P, 210P, 327P, 328P, 329P, 330P, 331P, 332P,and 333P FLOODWAY DATA TABLE: 5 SUMMARY OF DISCHARGES TABLE: 3

Enclosures reflect changes to flooding sources affected by this revision.
* FIRM - Flood Insurance Rate Map

FLOODING SOURCE(S) & REVISED REACH(ES) See Page 2 for Additional Flooding Sources

Sols Wash - From approximately 500 feet upstream of the confluence with the Hassayampa River to approximately 4,900 feet upstream of US 89 (Tegner Street)

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Sols Wash	Zone AE	Zone AE	NONE	YES
	Zone X (shaded)	Zone X (shaded)	YES	NONE
	Zone AE	Zone AO	YES	NONE
	Floodway	Floodway	YES	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the FEMA Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

OTHER FLOODING SOURCES AFFECTED BY THIS REVISION

FLOODING SOURCE(S) & REVISED REACH(ES)

Sols Wash - From approximately 500 feet upstream of the confluence with the Hassayampa River to approximately 4,900 feet upstream of US 89 (Tegner Street)
Hospital Wash - From the confluence with Sols Wash to 3,300 feet upstream of Cavaness Ave
Casandro Wash - From confluence with Sols Wash to just downstream of Burlington Northern Santa Fe Railroad
Hassayampa River – Just west of US 93 Bypass, Approximately 700 feet east of US 89 (Tegner Street)

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Sols Wash	BFEs	BFEs	YES	YES
Hospital Wash	Zone AE	Zone AE	YES	YES
	Zone X (shaded)	Zone X (shaded)	YES	YES
	BFEs	BFEs	NONE	YES
	Floodway	Floodway	YES	YES
Casandro Wash	Floodway	Floodway	NONE	YES
	BFEs	BFEs	YES	YES
Hassayampa Wash	Zone AE	Zone AH	YES	NONE
	Zone AE	Zone X (shaded)	YES	NONE

* BFEs - Base Flood Elevations

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

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Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

OTHER COMMUNITIES AFFECTED BY THIS REVISION

CID Number: 040056 **Name:** Town of Wickenburg, Arizona

AFFECTED MAP PANELS	AFFECTED PORTIONS OF THE FLOOD INSURANCE STUDY REPORT
TYPE: FIRM* NO.: 04013C0251H DATE: September 30, 2005	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: September 30, 2005 PROFILE(S): 37P, 210P. 327P, 328P, 329P, 330P, 331P, 332P, and 333P FLOODWAY DATA TABLE: 5 SUMMARY OF DISCHARGES TABLE: 3

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

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Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

We provide the floodway designation to your community as a tool to regulate floodplain development. Therefore, the floodway revision we have described in this letter, while acceptable to us, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Sally M. Ziolkowski
Director, Mitigation Division
Federal Emergency Management Agency, Region IX
1111 Broadway Street, Suite 1200
Oakland, CA 94607-4052
(510) 627-7175

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

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Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

PUBLIC NOTIFICATION

FLOODING SOURCE	LOCATION OF REFERENCED ELEVATION	BFE (FEET NGVD29)		MAP PANEL NUMBER(S)
		EFFECTIVE	REVISED	
Sols Wash	Just upstream of US 89 (Tegner St)	2060	2064	04013C0251H
	Approximately 1,500 feet upstream of US 89 (Tegner St)	2072	2067	04013C0251H
Hospital Wash	Approximately 1,060 feet upstream of the confluence with Sols Wash	2085	2071	04013C0251H
Casandro Wash	Just at the confluence with Sols Wash	2059	2064	04013C0251H
	Approximately 600 feet downstream of Railroad	2065	2064	04013C0251H
Hassayampa River	Approximately 2,300 feet north of Sols Wash, approximately 800 feet east of US 89 (Tegner St), and just west of US 93 Bypass	2057	2048	04013C0251H

A notice of changes will be published in the *Federal Register*. This information also will be published in your local newspaper on or about the dates listed below and through FEMA's Flood Hazard Mapping Website at https://www.floodmaps.fema.gov/fhm/Scripts/bfe_main.asp.

LOCAL NEWSPAPER Name: *Arizona Business Gazette*
Dates: December 29, 2011 and January 5, 2012

Within 90-days of the second publication in the local newspaper, a citizen may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. Therefore, this letter will be effective only after the 90-day appeal period has elapsed and we have resolved any appeals that we receive during this appeal period. Until this LOMR is effective, the revised flood hazard determination information presented in this LOMR may be changed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

DEC 2 0 2011

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Kelly Blunt
Mayor, Town of Wickenburg
155 N Tegner St., Suite A
Wickenburg, AZ 85390

IN REPLY REFER TO:
Case No.: 11-09-3523P
Follows Conditional
Case No.: 07-09-0738R
Community Name: Town of Wickenburg, AZ
Community No.: 040056
Effective Date of
This Revision: May 4, 2012

Dear Mayor Blunt:

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Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Oakland, California, at (510) 627-7175, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

For: Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Insurance Study Report

cc: Mr. Timothy S. Phillips, P.E.,
Chief Engineer and General Manager
Flood Control District, Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

Mr. Scott Vogel
Flood Control District, Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

Mr. Brian Cosson, CFM,
AZ Dept. of Water Resources
3550 N. Central Ave.
Phoenix, AZ 85012-2105

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Town of Wickenburg
155 N Tegner Street, Suite A
Wickenburg, AZ 85390

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Flood Control District, Maricopa County
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Phoenix, AZ 85009

Mr. Don Stapley
District 2 Supervisor
301 W. Jefferson, 10th Floor
Phoenix, AZ 85003

Follows Conditional Case No.: 07-09-0738R

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	Town of Wickenburg Maricopa County Arizona	CHANNELIZATION DETENTION BASIN LEVEE BRIDGE FILL CULVERT	HYDRAULIC ANALYSIS HYDROLOGIC ANALYSIS NEW TOPOGRAPHIC DATA FLOODWAY LEVEE CERTIFICATION
	COMMUNITY NO.: 040056		
IDENTIFIER	Downtown Wickenburg Flooding Hazard Mitigation Project	APPROXIMATE LATITUDE & LONGITUDE: 33.973, -112.734 SOURCE: Other DATUM: NAD 83	

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 04013C0251H DATE: September 30, 2005	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: September 30, 2005 PROFILE(S): 37P, 210P, 327P, 328P, 329P, 330P, 331P, 332P,and 333P FLOODWAY DATA TABLE: 5 SUMMARY OF DISCHARGES TABLE: 3

Enclosures reflect changes to flooding sources affected by this revision.
* FIRM - Flood Insurance Rate Map;

FLOODING SOURCE(S) & REVISED REACH(ES) See Page 2 for Additional Flooding Sources

Sols Wash - From approximately 500 feet upstream of the confluence with the Hassayampa River to approximately 4,900 feet upstream of US 89 (Tegner Street)

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Sols Wash	Zone AE	Zone AE	NONE	YES
	Zone X (shaded)	Zone X (shaded)	YES	NONE
	Zone AE	Zone AO	YES	NONE
	Floodway	Floodway	YES	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

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Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

OTHER FLOODING SOURCES AFFECTED BY THIS REVISION

FLOODING SOURCE(S) & REVISED REACH(ES)

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Hospital Wash - From the confluence with Sols Wash to 3,300 feet upstream of Cavaness Ave
Casandro Wash - From confluence with Sols Wash to just downstream of Burlington Northern Santa Fe Railroad
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SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Sols Wash	BFEs	BFEs	YES	YES
Hospital Wash	Zone AE	Zone AE	YES	YES
	Zone X (shaded)	Zone X (shaded)	YES	YES
	BFEs	BFEs	NONE	YES
	Floodway	Floodway	YES	YES
Casandro Wash	Floodway	Floodway	NONE	YES
	BFEs	BFEs	YES	YES
Hassayampa Wash	Zone AE	Zone AH	YES	NONE
	Zone AE	Zone X (shaded)	YES	NONE

* BFEs - Base Flood Elevations

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Federal Insurance and Mitigation Administration

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LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

OTHER COMMUNITIES AFFECTED BY THIS REVISION

CID Number: 040037 **Name:** Maricopa County, Arizona

AFFECTED MAP PANELS	AFFECTED PORTIONS OF THE FLOOD INSURANCE STUDY REPORT
TYPE: FIRM* NO.: 04013C0251H DATE: September 30, 2005	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: September 30, 2005 PROFILE(S): 37P, 210P, 327P, 328P, 329P, 330P, 331P, 332P, and 333P FLOODWAY DATA TABLE: 5 SUMMARY OF DISCHARGES TABLE: 3

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LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

We provide the floodway designation to your community as a tool to regulate floodplain development. Therefore, the floodway revision we have described in this letter, while acceptable to us, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

COMMUNITY REMINDERS

We based the determination for Sols Wash and Casandro Wash on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. We based the determination for Hospital Wash on the 1% annual chance discharges computed in the submitted hydrologic model. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

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LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

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Ms. Sally M. Ziolkowski
Director, Mitigation Division
Federal Emergency Management Agency, Region IX
1111 Broadway Street, Suite 1200
Oakland, CA 94607-4052
(510) 627-7175

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

PUBLIC NOTIFICATION

FLOODING SOURCE	LOCATION OF REFERENCED ELEVATION	BFE (FEET NGVD29)		MAP PANEL NUMBER(S)
		EFFECTIVE	REVISED	
Sols Wash	Just upstream of US 89 (Tegner St)	2060	2064	04013C0251H
	Approximately 1,500 feet upstream of US 89 (Tegner St)	2072	2067	04013C0251H
Hospital Wash	Approximately 1,060 feet upstream of the confluence with Sols Wash	2085	2071	04013C0251H
Casandro Wash	Just at the confluence with Sols Wash	2059	2064	04013C0251H
	Approximately 600 feet downstream of Railroad	2065	2064	04013C0251H
Hassayampa River	Approximately 2,300 feet north of Sols Wash, approximately 800 feet east of US 89 (Tegner St), and just west of US 93 Bypass	2057	2048	04013C0251H

A notice of changes will be published in the *Federal Register*. This information also will be published in your local newspaper on or about the dates listed below and through FEMA's Flood Hazard Mapping Website at https://www.floodmaps.fema.gov/fhm/Scripts/bfe_main.asp.

LOCAL NEWSPAPER Name: *Arizona Business Gazette*
Dates: December 29, 2011 and January 5, 2012

Within 90-days of the second publication in the local newspaper, a citizen may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. Therefore, this letter will be effective only after the 90-day appeal period has elapsed and we have resolved any appeals that we receive during this appeal period. Until this LOMR is effective, the revised flood hazard determination information presented in this LOMR may be changed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

Table 3. Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Year	50-Year	100-Year	500-Year
Sols Wash					
At confluence with Hassayampa River	147.2	7,019	12,453	15,045	20,836
Above confluence of Casandro Wash	145.5	6,758	11,964	14,459	20,005
Above confluence of Hospital Wash	145.1	6,725	11,927	14,413	19,986
Above confluence of Flying E Wash	134.8	5,784	10,433	12,945	18,691
At Railroad Bridge at Railroad Milepost 36	119.3	4,795	9,767	12,244	17,749
At Maricopa - Yavapai County Boundary	86.7	3,696	7,504	9,419	13,760
Casandro Wash					
At Sols Wash (including flow in outfall pipe, flow in outfall pipe of 274 cfs is diverted from Casandro Wash at the intersection of Mohave Street and Jackson Street and returns at Sols Wash)	1.58	--[1]	--[1]	406	--[1]
At Atchison, Topeka & Santa Fe Railway	1.57	--[1]	--[1]	281	--[1]
At intersection of Mohave Street and Jackson Street	1.44	--[1]	--[1]	63	--[1]
At Navajo Street	1.42	--[1]	--[1]	305	--[1]
Downstream of Casandro Wash Dam	1.24	--[1]	--[1]	30	--[1]
Upstream of Casandro Wash Dam	1.24	--[1]	--[1]	1,265	--[1]
At U.S. Highway 60 and 70	0.68	--[1]	--[1]	714	--[1]
South Branch Casandro Wash					
Above Yaqui Drive	0.2	50	250	400	1,000
Hospital Wash					
At Confluence with Sols Wash	0.4	170	250	500	845

REVISED TO REFLECT LOMR EFFECTIVE: May 4, 2012

--[1] Not Computed

REVISED AREA

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Hospital Wash								
A	509	51	127	3.9	2,068.2	2,068.2	2,068.2	0.0
B	1,510	38	112	4.5	2,075.1	2,075.1	2,075.6	0.5
C	3,090	52	103	4.9	2,095.9	2,095.9	2,096.4	0.5

REVISED AREA

[1]Feet above Confluence with Sols Wash

REVISED TO
REFLECT LOMR
EFFECTIVE: May 4, 2012

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

FLOODWAY DATA

HOSPITAL WASH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Sols Wash								
A	1,210	134	1,305	11.4	2,055.8	2,055.8	2,055.8	0.0
B	1,907	162	1377	10.9	2,057.9	2,057.9	2,057.9	0.0
C	2,472	161	1,697	8.9	2,063.6	2,063.6	2,063.6	0.0
D	2,802	234	2,069	7.0	2,064.6	2,064.6	2,064.6	0.0
E	3,252	231	1,414	10.2	2,065.1	2,065.1	2,065.1	0.0
F	3,752	396	1,492	9.7	2,067.0	2,067.0	2,067.0	0.0
G	4,152	479	1,260	11.4	2,070.7	2,070.7	2,070.7	0.0
H	4,688	561	1,520	9.5	2,074.6	2,074.6	2,074.6	0.0
I	5,054	682	1,270	11.4	2,077.7	2,077.7	2,077.7	0.0
J	5,405	796	1,261	11.4	2,080.9	2,080.9	2,080.9	0.0
K	6,036	881	1,758	8.2	2,086.9	2,086.9	2,086.9	0.0
L	6,474	1250	2,153	6.7	2,090.7	2,090.7	2,090.7	0.0
M	6,978	1,144/749[3]	1,666	8.7	2,096.6	2,096.6	2,096.6	0.0
N	7,483	1,120/630[3]	2,103	6.9	2,101.1	2,101.1	2,101.1	0.0
O	7,983	1,084	2,184	6.6	2,105.9	2,105.9	2,106.4	0.5
P	8,473	1,003	2,192	6.6	2,111.0	2,111.0	2,111.0	0.0
Q	8,963	1,090	2,166	6.7	2,115.9	2,115.9	2,115.9	0.0
R	9,658	740	1,811	8.0	2,122.5	2,122.5	2,122.5	0.0
S	9,963	670	1,925	7.5	2,126.4	2,126.4	2,126.6	0.2
T	10,458	597	1,832	7.9	2,130.5	2,130.5	2,130.8	0.3
U	10,958	730	1,924	6.7	2,135.1	2,135.1	2,135.2	0.1
V	11,533	534	1,795	7.2	2,140.7	2,140.7	2,141.1	0.4

[1]Feet above Confluence with Hassayampa River [2]Width includes floodway width from Hospital Wash

[3]Total Width/Width within corporate limits of Town of Wickenburg

REVISED AREA

REVISED TO REFLECT LOMR

EFFECTIVE: May 4, 2012

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ AND INCORPORATED AREAS

FLOODWAY DATA

SOLS WASH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Sols Wash								
W	11,963	289	1,367	9.5	2,145.5	2,145.5	2,145.6	0.1
X	12,578	305	1,371	9.4	2,149.9	2,149.9	2,150.3	0.4
Y	13,048	402	1,604	8.1	2,153.3	2,153.3	2,153.7	0.4
Z	13,703	508	1,747	7.4	2,158.7	2,158.7	2,158.8	0.1
AA	14,253	490	1,582	8.2	2,163.0	2,163.0	2,163.0	0.0
AB	14,493	470	1,341	9.7	2,166.2	2,166.2	2,166.3	0.1
AC	14,753	635	2,037	6.3	2,168.2	2,168.2	2,168.3	0.1
AD	15,248	790	1,594	8.0	2,171.7	2,171.7	2,172.0	0.3
AE	15,748	870/ 780[2]	1,523	8.4	2,175.9	2,175.9	2,176.0	0.1
AF	16,248	870/ 780[2]	1,354	9.5	2,180.5	2,180.5	2,180.5	0.0
AG	16,868	480	1,608	8.0	2,183.8	2,183.8	2,184.4	0.6
AH	17,328	602	1,783	7.0	2,186.9	2,186.9	2,187.4	0.5
AI	17,758	540	2,163	5.8	2,189.8	2,189.8	2,190.2	0.4
AJ	18,303	380	1,249	10.0	2,194.5	2,194.5	2,195.0	0.5
AK	18,828	403	1,646	7.6	2,199.5	2,199.5	2,199.5	0.0
AL	19,398	564	1,869	6.7	2,204.5	2,204.5	2,204.5	0.0
AM	20,073	447	1,467	8.5	2,209.6	2,209.6	2,209.6	0.0
AN	20,793	331	1,435	8.7	2,215.8	2,215.8	2,216.1	0.3

REVISED AREA

[1]Feet above Confluence with Hassayampa River [2]Total Width/Width within corporate limits of Town of Wickenburg

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

FLOODWAY DATA REVISED TO REFLECT LOMR

SOLS WASH EFFECTIVE: May 4, 2012

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Sols Wash								
AO	21,563	398	1,465	8.5	2,222.4	2,222.4	2,222.4	0.0
AP	21,993	444	1,545	8.1	2,224.5	2,224.5	2,225.2	0.7
AQ	22,243	350	1,209	10.3	2,227.3	2,227.3	2,227.6	0.3
AR	22,803	200	1,490	8.2	2,233.3	2,233.3	2,233.3	0.0
AS	22,973	281	1,271	9.6	2,234.0	2,234.0	2,234.4	0.4
AT	23,013	290	1,384	8.8	2,235.1	2,235.1	2,235.1	0.0
AU	23,383	345	1,443	8.5	2,239.2	2,239.2	2,239.5	0.3
AV	23,993	750	2,095	5.8	2,241.7	2,241.7	2,242.6	0.9
AW	24,383	425	1,545	7.9	2,245.2	2,245.2	2,245.2	0.0
AX	24,918	309	1,128	10.9	2,248.8	2,248.8	2,249.0	0.2
AY	25,388	214	1,012	12.1	2,253.5	2,253.5	2,253.5	0.0
AZ	25,803	306	1,385	8.8	2,255.9	2,255.9	2,256.3	0.4
BA	26,383	304	1,151	10.5	2,259.8	2,259.8	2,259.9	0.1
BB	26,888	321	1,209	10.0	2,263.1	2,263.1	2,263.3	0.2
BC	27,383	344	1,162	10.4	2,267.4	2,267.4	2,267.6	0.2
BD	27,888	446	1,499	8.1	2,273.0	2,273.0	2,273.0	0.0
BE	28,323	601	1,958	5.3	2,275.3	2,275.3	2,275.7	0.4
BF	28,943	646	1,710	6.1	2,279.2	2,279.2	2,279.4	0.2
BG	29,448	497	1,531	6.8	2,282.8	2,282.8	2,283.0	0.2

REVISED AREA

[1]Feet above Confluence with Hassayampa River

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

FLOODWAY DATA — REVISED TO REFLECT LOMR

SOLS WASH — EFFECTIVE: May 4, 2012

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Sols Wash								
BH	29,783	527	1,539	6.7	2,284.7	2,284.7	2,284.8	0.1
BI	30,283	450	1,248	8.3	2,287.8	2,287.8	2,288.0	0.2
BJ	30,853	390	927	11.2	2,291.3	2,291.3	2,291.3	0.0
BK	31,253	442	1,201	8.6	2,295.5	2,295.5	2,295.5	0.0
BL	31,733	381	1,461	7.1	2,298.1	2,298.1	2,298.2	0.1
BM	32,163	278	1,100	9.4	2,300.8	2,300.8	2,301.3	0.5
BN	32,693	295	1,186	8.7	2,305.4	2,305.4	2,305.6	0.2
BO	33,193	231	1,050	9.9	2,307.6	2,307.6	2,307.6	0.0
BP	33,693	287	1,252	8.3	2,310.1	2,310.1	2,310.2	0.1
BQ	34,193	287	1,097	9.5	2,315.4	2,315.4	2,315.5	0.1
BR	34,763	409	1,413	7.3	2,318.2	2,318.2	2,318.5	0.3
BS	35,188	308	1,027	10.1	2,320.4	2,320.4	2,320.4	0.0
BT	35,558	304	1,234	8.4	2,322.7	2,322.7	2,322.8	0.1
BU	36,178	396	1,394	7.4	2,326.9	2,326.9	2,327.0	0.1
BV	36,788	305	1,275	8.1	2,330.2	2,330.2	2,330.8	0.6
BW	37,513	236	1,124	9.2	2,335.8	2,335.8	2,336.0	0.2
BX	37,933	150	907	11.4	2,337.8	2,337.8	2,338.4	0.6
BY	38,413	201	1,025	10.1	2,341.1	2,341.1	2,341.1	0.0
BZ	39,158	415	1,309	7.9	2,345.5	2,345.5	2,345.5	0.0

REVISED AREA

[1]Feet above Confluence with Hassayampa River

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

FLOODWAY DATA REVISED TO REFLECT LOMR

SOLS WASH EFFECTIVE: May 4, 2012

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Sols Wash								
CA	39,658	270	1,000	10.4	2,348.7	2,348.7	2,349.4	0.7
CB	39,893	300[2]	608	17.1	2,352.7	2,352.7	2,352.7	0.0
CC	39,943	300[2]	707	14.7	2,353.7	2,353.7	2,354.2	0.5
CD	42,613	781[2]	4,340	2.4	2,369.0	2,369.0	2,369.1	0.1
CE	43,113	657[2]	2,457	4.2	2,369.1	2,369.1	2,369.2	0.1
CF	43,613	476[2]	1,560	6.6	2,370.0	2,370.0	2,370.0	0.0
CG	44,228	300[2]	1,215	8.5	2,372.4	2,372.4	2,372.5	0.1
CH	44,618	259[2]	1,050	9.4	2,376.2	2,376.2	2,376.2	0.0
CI	45,118	270/576[3]	1,922	5.1	2,379.3	2,379.3	2,379.6	0.3
CJ	45,618	400/681[3]	1,503	6.6	2,380.8	2,380.8	2,380.9	0.1
CK	46,118	870/780[3]	1,503	6.3	2,383.3	2,383.3	2,383.4	0.1
CL	46,628	400/638[3]	1,476	5.6	2,386.2	2,386.2	2,386.5	0.3

REVISED AREA

[1]Feet above Confluence with Hassayampa River [2]Floodway lies entirely outside Maricopa County limits

[3]Width/Width within county

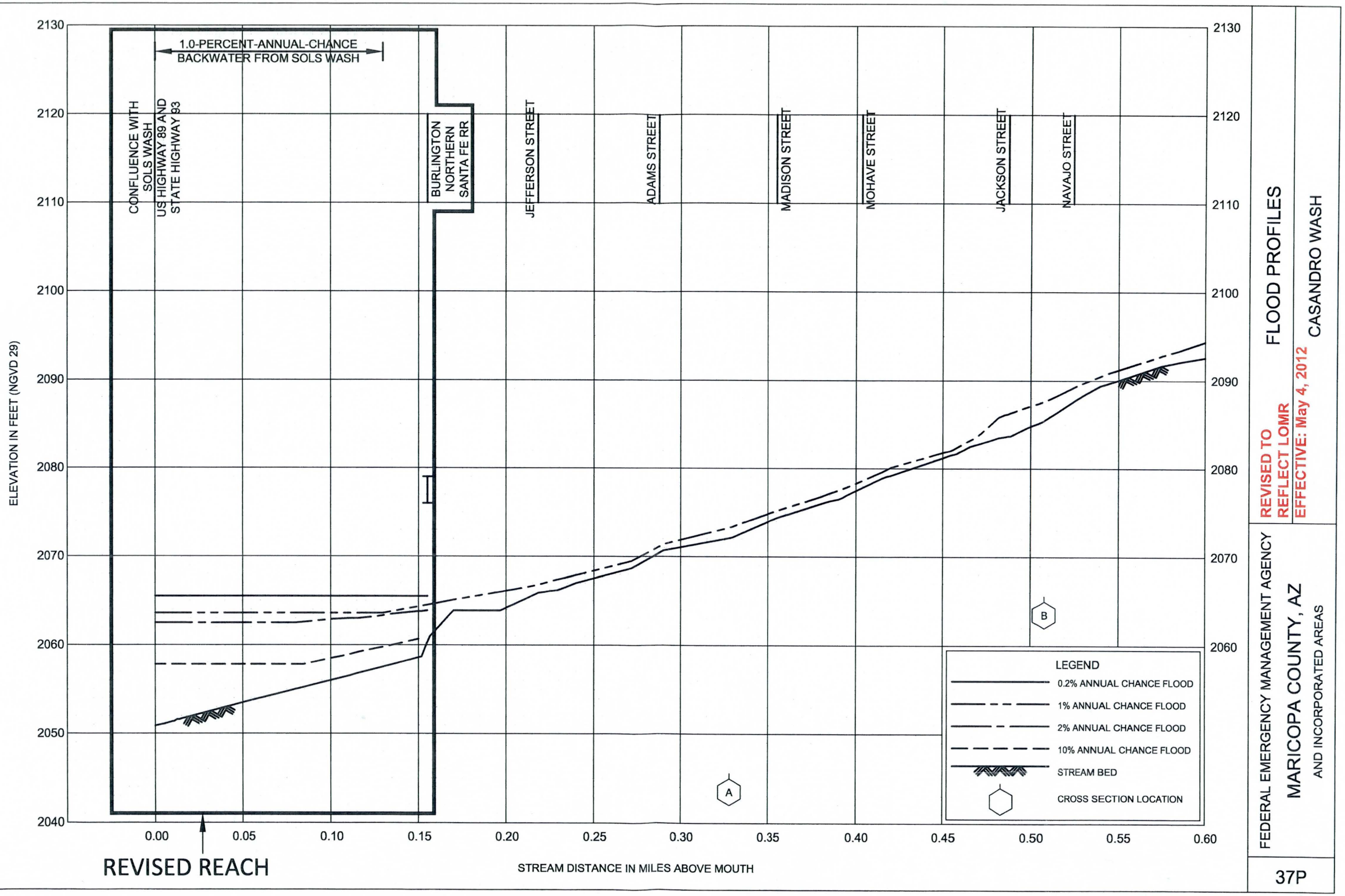
TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

FLOODWAY DATA REVISED TO REFLECT LOMR

SOLS WASH EFFECTIVE: May 4, 2012



FLOOD PROFILES

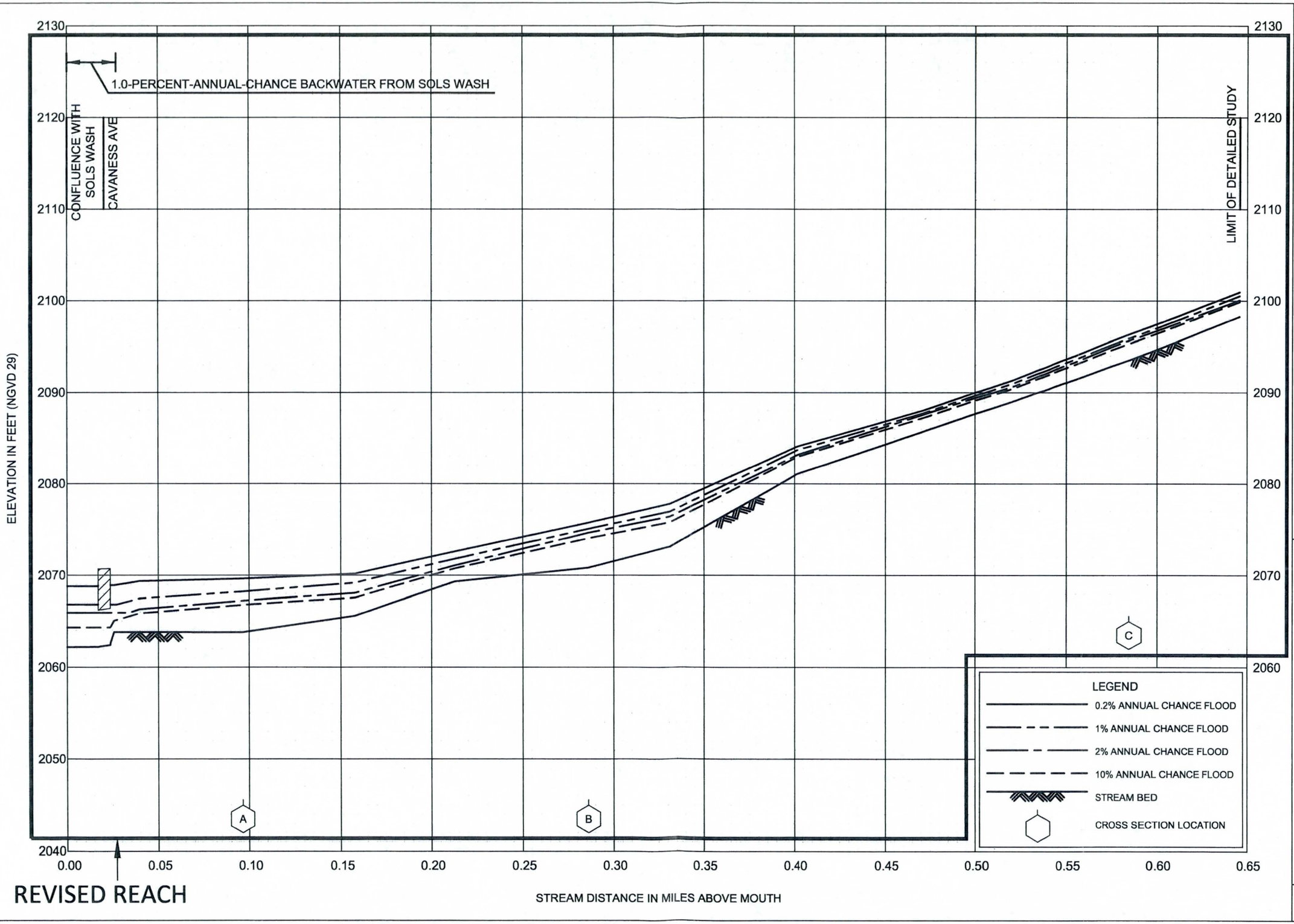
CASANDRO WASH

REVISED TO REFLECT LOMR
EFFECTIVE: May 4, 2012

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

37P



FLOOD PROFILES

HOSPITAL WASH

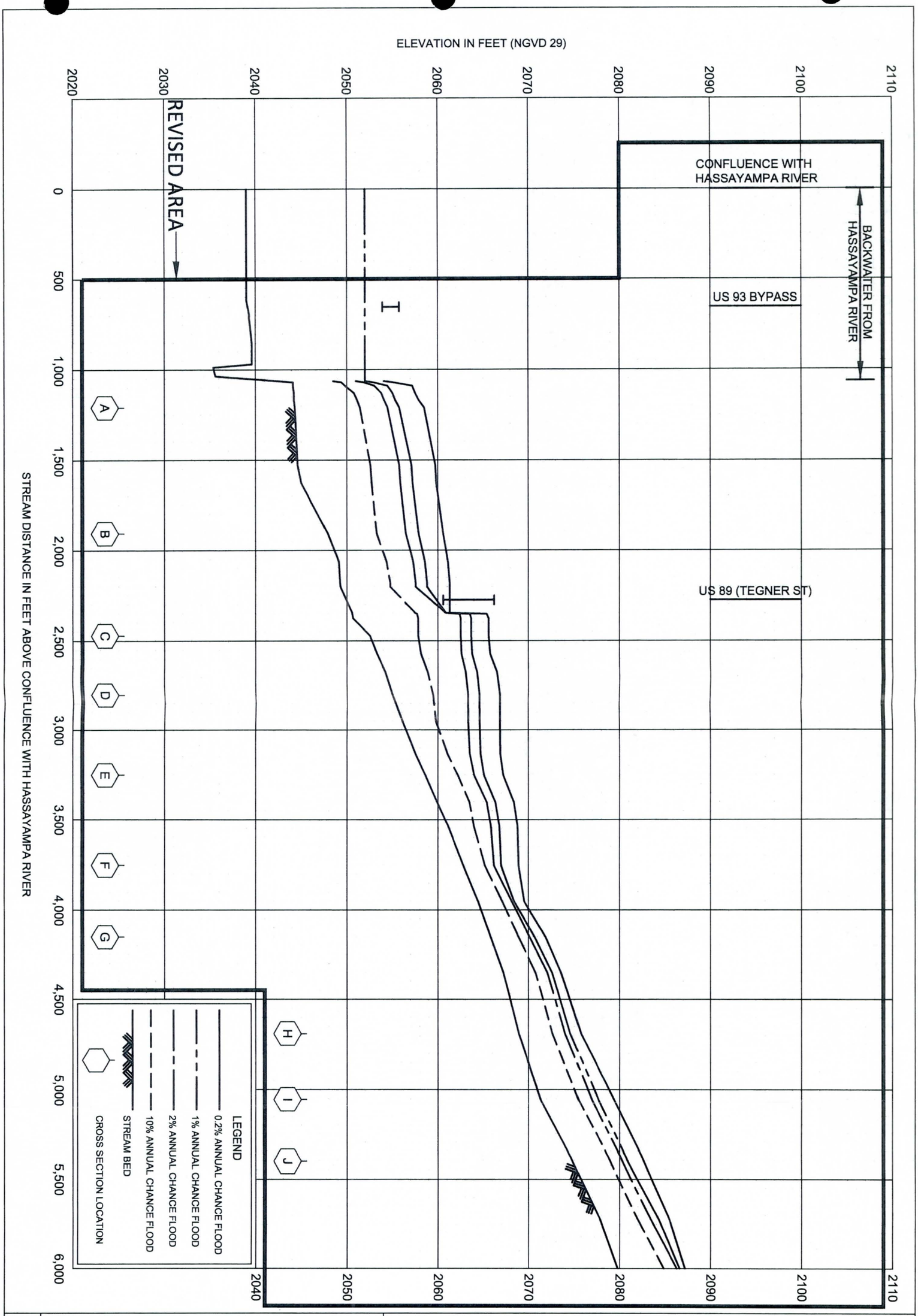
REVISED TO REFLECT LOMR EFFECTIVE: May 4, 2012

FEDERAL EMERGENCY MANAGEMENT AGENCY

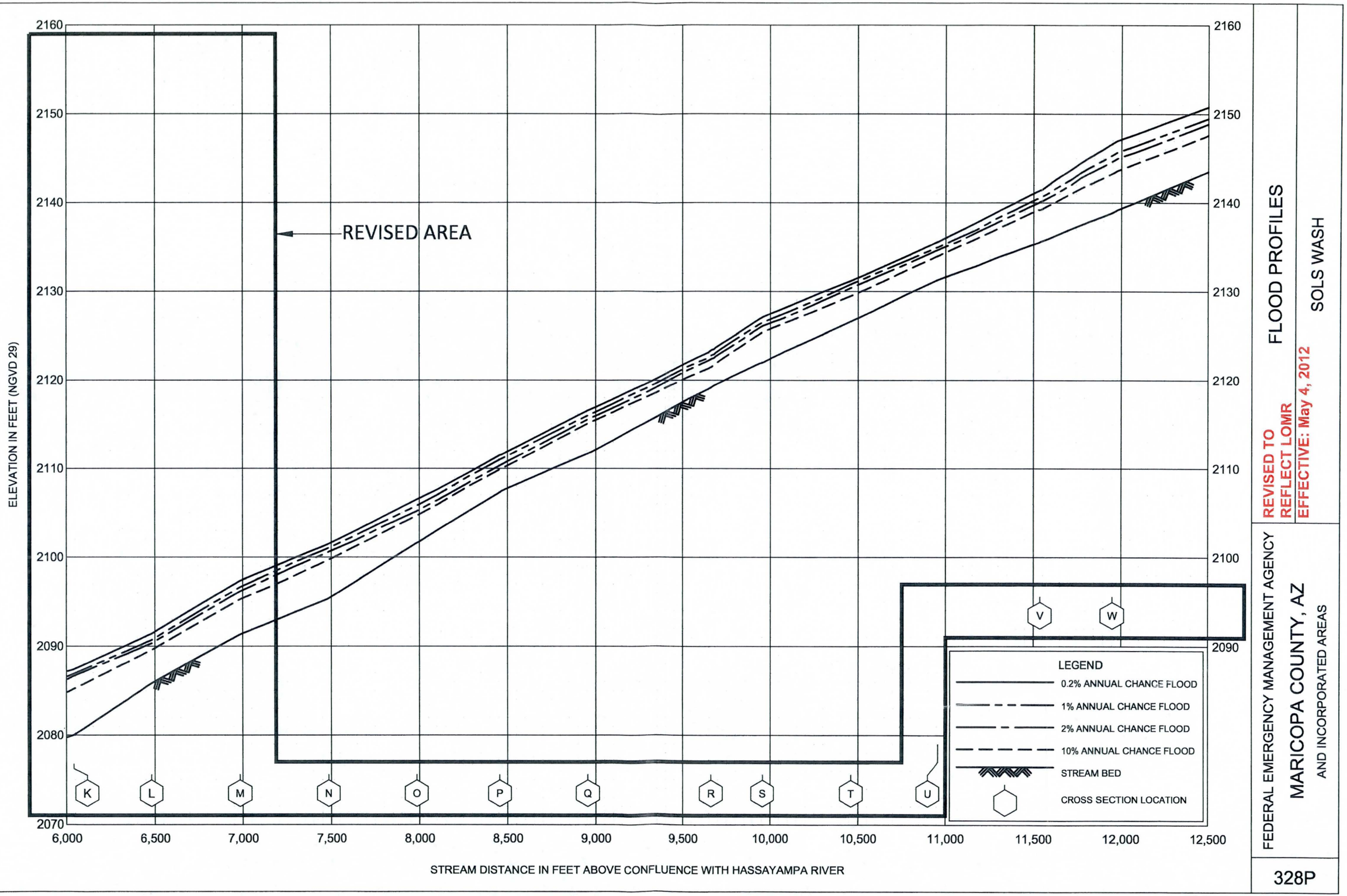
MARICOPA COUNTY, AZ

AND INCORPORATED AREAS

210P



327P	FEDERAL EMERGENCY MANAGEMENT AGENCY MARICOPA COUNTY, AZ AND INCORPORATED AREAS	REVISED TO REFLECT LOMR EFFECTIVE: May 4, 2012	FLOOD PROFILES SOLS WASH



FLOOD PROFILES

SOLS WASH

REVISED TO REFLECT LOMR EFFECTIVE: May 4, 2012

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ

AND INCORPORATED AREAS

328P

ELEVATION IN FEET (NGVD 29)

2220
2210
2200
2190
2180
2170
2160
2150
2140
2130

TOWN OF WICKENBURG
MARICOPA COUNTY

MARICOPA COUNTY
TOWN OF WICKENBURG

VULTURE MINE ROAD

TOWN OF WICKENBURG
CORPORATE LIMITS

REVISED AREA

X Y Z AA AB AC AD AE AF AG AH AI AJ AK

LEGEND
- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

12,500 13,000 13,500 14,000 14,500 15,000 15,500 16,000 16,500 17,000 17,500 18,000 18,500 19,000

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH HASSAYAMPA RIVER

FLOOD PROFILES

REVISED TO REFLECT LOMR
EFFECTIVE: May 4, 2012

SOLS WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY
MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

329P

ELEVATION IN FEET (NGVD 29)

2280
2270
2260
2250
2240
2230
2220
2210
2200
2190

RAILROAD BRIDGE

REVISED AREA

AL AM AN AO AP AQ AR AS AT AU AV AW AX AY

LEGEND
- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

19,000 19,500 20,000 20,500 21,000 21,500 22,000 22,500 23,000 23,500 24,000 24,500 25,000 25,500

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH HASSAYAMPA RIVER

FLOOD PROFILES

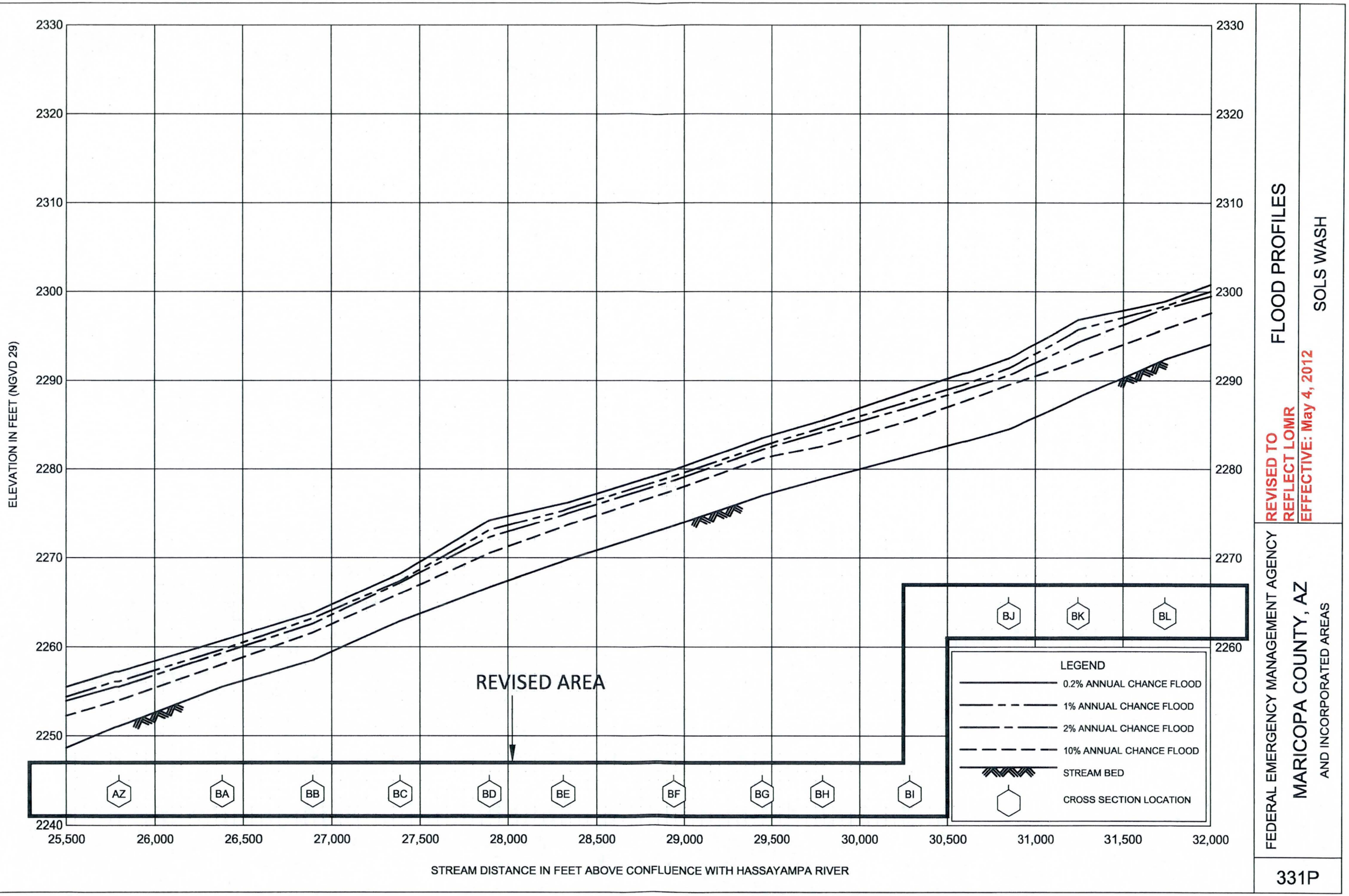
SOLS WASH

REVISED TO REFLECT LOMR EFFECTIVE: May 4, 2012

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ

AND INCORPORATED AREAS



FLOOD PROFILES

SOLS WASH

REVISED TO REFLECT LOMR EFFECTIVE: May 4, 2012

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ

AND INCORPORATED AREAS

331P

ELEVATION IN FEET (NGVD 29)

2370
2360
2350
2340
2330
2320
2310
2300
2290
2280

32,000 32,500 33,000 33,500 34,000 34,500 35,000 35,500 36,000 36,500 37,000 37,500 38,000 38,500

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH HASSAYAMPA RIVER

REVISED AREA

BM BN BO BP BQ BR BS BT BU BV BW BX BY

LEGEND
- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

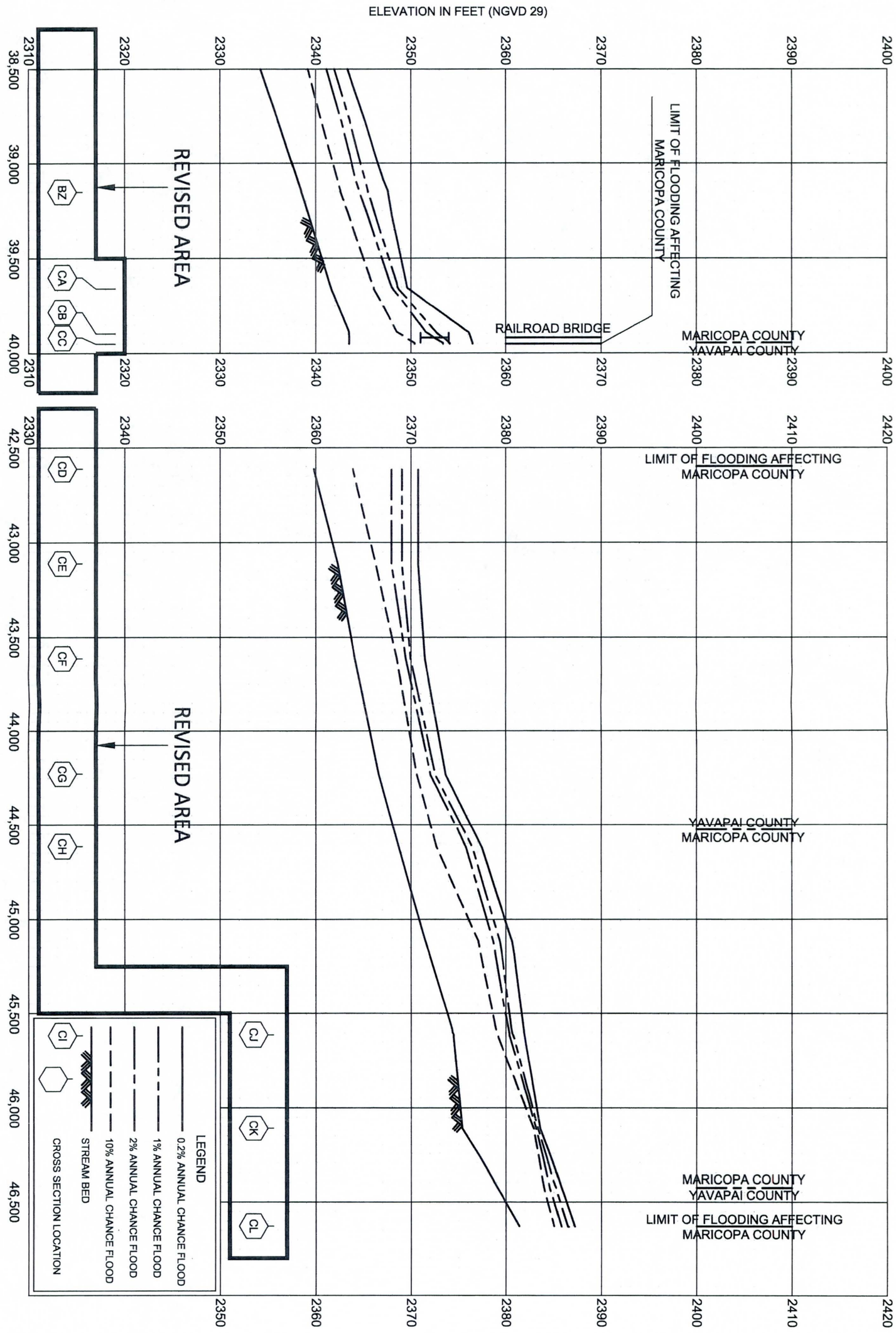
FLOOD PROFILES

REVISED TO REFLECT LOMR
EFFECTIVE: May 4, 2012

SOLS WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY
MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

332P



333P	FEDERAL EMERGENCY MANAGEMENT AGENCY MARICOPA COUNTY, AZ AND INCORPORATED AREAS	REVISED TO REFLECT LOMR EFFECTIVE: May 4, 2012 FLOOD PROFILES SOLS WASH

REVISED AREA TO REFLECT LOMR (NO. 11-09-3216P) EFFECTIVE: ??????? ??, 2012

Maricopa County Unincorporated Areas 040037

REVISED AREA

LIMIT OF DETAILED STUDY

Town Of Wickenburg 040056

PENN LN

TEGNER ST

89

HF

PROFILE BASELINE

NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1-PERCENT-ANNUAL CHANCE OR GREATER FLOOD HAZARD BY A LEVEE SYSTEM. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "ACCREDITED LEVEE NOTE" IN NOTES TO USERS.

ZONE AH

US 93 BYPASS

Levee

ZONE A

Wash N

ZONE AE

ZONE AE

Hospital Wash

SOMBRERO RD

HE

1

HASSAYAMPA RIVER

1085000 FT

JOINS PANEL 0235

SUNFLOWER AVE

POPPY LN

OLEANDER ST

ROSE LN

Maricopa County Unincorporated Areas 040037

HD

GENUNG AVE

HC

ZONE AO (DEPTH 1')

ZONE AH (EL 2048)

PROFILE BASELINE

BURLINGTON NORTHERN SANTA FE RR

Sols Wash

ZONE AE

CAVANESS AVE

HASSAYAMPA RIVER

ZONE AE

SANTA FE CR

MCLEAN DR

RIVER RD

Levee

Powder House Wash

PROFILE BASELINE

LIMIT OF FLOODWAY

MADISON ST

SIERRA VISTA

JEFFERSON ST

DIVISION ST

Levee

ZONE AE

HERMOSA DR

EL TECALOTE DR

11

Town Of Wickenburg 040056

PROFILE BASELINE

Cassandro Wash

WASHINGTON ST

12

FRONTIER ST

89

APACHE ST

HB

ZONE AE

HA

WICKENBURG WAY

GZ

Legend

- 1% annual chance (100-Year) Floodplain
- 1% annual chance (100-Year) Floodway
- 0.2% annual chance (500-Year) Floodplain

MAP SCALE 1" = 500'

250 0 500 FEET

150 0 150 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0251H

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 251 OF 4350

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	0251	H
WICKENBURG, TOWN OF	040056	0251	H

REVISED TO REFLECT LOMR EFFECTIVE: May 4, 2012

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 04013C0251H

MAP REVISED SEPTEMBER 30, 2005

Federal Emergency Management Agency

Flood Control District
of Maricopa County

Board of Directors
Fulton Brock, District 1
Don Stapley, District 2
Andrew Kunasek, District 3
Max Wilson, District 4
Mary Rose Wilcox, District 5

www.fcd.maricopa.gov

2801 West Durango Street
Phoenix, Arizona 85009
Phone: 602-506-1501
Fax: 602-506-4601
TT: 602-505-5897

September 26, 2011

LOMC Clearinghouse
7390 Coca Cola Drive, Suite 204
Hanover, MD 21076

ATTN: Mr. David Miller, STARR

RE: **FEMA Case No. 11-09-3523P**
Wickenburg Downtown Flooding Hazard Mitigation Project, LOMR
Town of Wickenburg and Unincorporated County, Maricopa County, Arizona

Dear Mr. Miller:

Please find enclosed a revised HEC-RAS analysis addressing your review comment of September 19, 2011 pertaining to the tie-in of the post-project model to the effective study. In our previous submittal, the elevation data of effective cross section "M" (cross section 1.319 of the post-project model) had only been adjusted by +2.0 ft to account for the conversion from the NGVD 1929 datum to the NAVD 1988 datum. The HEC-RAS model attached to this submittal, however, shows this section adjusted +2.2 ft from the effective NGVD 1929 elevations to account for the +2.2 ft conversion factor to NAVD 1988 reflected in the VERTCON.

The results of the HEC-RAS analysis show a computed 100-yr WSEL of 2098.82 (NAVD 1988) at cross section 1.319 as compared to the effective 2099.2 ft (NAVD 1988) elevation. The post-project model, therefore, ties into the effective in approximately 0.4 ft.

The following items are included for your review:

- Hard copy print-out of revised HEC-RAS analysis (Sols_Chan_LOMR-Se.prj) report file, cross sections, and profile;
- CD containing the digital HEC-RAS model (Sols_Chan_LOMR-Se.prj) and the HEC-RAS report file.

If you have any questions or require additional information, please feel free to call me at 602-506-4001 or contact me by e-mail at cwr@mail.maricopa.gov.

Yours truly,

Catherine W. Regester

Catherine W. Regester, P.E., CFM
Senior Engineer

Enclosures: Listed above

Copies to (w/o enclosures):

Robert Bezek
Federal Emergency Management Agency
Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607

Brian Cosson
NFIP Coordinator
Arizona Department of Water Resources
Office of Dam Safety and Flood Mitigation
500 North Third Street
Phoenix, AZ 85004

Rick DeStefano
Floodplain Administrator
Town of Wickenburg
155 N Tegner St., Suite A
Wickenburg, AZ 85390

Lloyd Vick, P.E.
TY-LIN
60 East Rio Salado Parkway
Suite 501
Tempe, AZ 85281

Berwyn S. Wilbrink, P.E.
Jacobs
101 North First Ave, Suite 3100
Phoenix, AZ 85003-1902

Wickenburg Downtown Flooding Hazard Mitigation Project
(FCD #2006C018)

Letter of Map Revision (LOMR)

FEMA Case No. 11-09-3523P

Prepared by:

Flood Control District of Maricopa County
Engineering Division
Hydrology & Hydraulics Branch
2801 W Durango Street
Phoenix, AZ 85009
Phone: (602) 506-1501
Fax: (602) 506-4601

September 2011

Flood Control District
of Maricopa County

www.fcd.maricopa.gov

2801 West Durango Street
Phoenix, Arizona 85009
Phone: 602-506-1501
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September 26, 2011

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Wickenburg Downtown Flooding Hazard Mitigation Project, LOMR
Town of Wickenburg and Unincorporated County, Maricopa County, Arizona

Dear Mr. Miller:

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- CD containing the digital HEC-RAS model (Sols_Chan_LOMR-Se.prj) and the HEC-RAS report file.

If you have any questions or require additional information, please feel free to call me at 602-506-4001 or contact me by e-mail at cwr@mail.maricopa.gov.

Yours truly,

Catherine W. Regester

Catherine W. Regester, P.E., CFM
Senior Engineer

Enclosures: Listed above

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101 North First Ave, Suite 3100
Phoenix, AZ 85003-1902

NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

September 19, 2011

Ms. Catherine W. Regester, P.E., CFM
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

IN REPLY REFER TO:
Case No.: 11-09-3523P
Community: Town of Wickenburg & Maricopa County, Arizona
Community No.: 040037 & 040056

316-AD

Dear Ms. Regester

This responds to your request dated June 27, 2011 that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	Downtown Wickenburg Flooding Hazard Mitigation Project
Flooding Source:	Sols Wash & Hospital Wash
FIRM Panel(s) Affected:	04013C0251H

The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed on the enclosed summary.

If we do not receive the required data within 90 days, we will suspend our processing of your request. Any data submitted after 90 days will be treated as an original submittal and will be subject to all submittal/payment procedures, including the flat review and processing fee for requests of this type established by the current fee schedule. A copy of the notice summarizing the current fee schedule, which was published in the *Federal Register,* is enclosed for your information.

FEMA receives a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, we are unable to grant extensions for the submission of required data/fee for revision requests. If a requester is informed by letter that additional data are required to complete our review of a request, the data/fee **must** be submitted within 90 days of the date of the letter. Any fees already paid will be forfeited for any request for which the requested data are not received within 90 days.

If you have general questions about your request, FEMA policy, or the National Flood Insurance Program, please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please contact your case reviewer, Mr. David Miller, by e-mail at david.miller@starr-team.com or by telephone at 240-542-3115, or the Revisions Coordinator for your request, Mr. Sudhanshu Mishra, P.E., CFM, at Sudhanshu.Mishra@starr-team.com or at (240) 542-3085.

Sincerely,

Alex Haptemariam, P.E., CFM
MT-2 Process Manager
STARR

cc: Mr. Lyle Murdock
Floodplain Administrator
Town of Wickenburg

Mr. Tim S. Phillips, P.E.
Chief Engineer and General Manager
Flood Control District of Maricopa County

Mr. Scott Vogel
Flood Control District of Maricopa County

Mr. Brian Cosson, CFM
NFIP Coordinator
Office of Dam Safety and Flood Mitigation
Arizona Department of Water Resources

NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

Summary of Additional Data Required to Support a
Letter of Map Revision (LOMR)

Case No.: 11-09-3523P

Requester: Ms. Catherine W. Regester, P.E.

Community: Town of Wickenburg, and
Maricopa County, Arizona

Community No.: 040037 and 040056

The issues listed below must be addressed before we can continue the review of your request.

1. Paragraph 65.6(a)(2) of the National Flood Insurance Program (NFIP) regulations states that to avoid discontinuities between revised and unrevised flood data, hydraulic analyses must have a logical transition between revised elevations of the base (1-percent-annual-chance) flood and those developed previously for areas not affected by the revision. Our review revealed that the post-project conditions hydraulic analyses along Sols Wash do not tie into the effective hydraulic analysis within 0.5 foot at the upstream end of the revised reach. Please provide a revised post project conditions analyses for Sols Wash that ties into the effective hydraulic analysis within 0.5 foot, or within 0.0 feet if practical.

Please send the required data directly to us at the address shown at the bottom of the first page attention to Mr. David Miller, STARR. For identification purposes, please include the case number referenced above on all correspondence.

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

```
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
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     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Sols_Chan_LOMR - September 2011
Project File : Sols_Chan_LOMR-Se.prj
Run Date and Time: 9/23/2011 11:24:44 AM

Project in English units

Project Description:
Sols Wash Channelization LOMR
Wickenburg Downtown Flooding Hazard Mitigation
Project Final Design
Contract # FCD2006C018
As-Built Model

This is the
same model that was reviewed and approved by FEMA for CLOMR Case # 07-09-0738R
except as described here: Changes have been made to the titles of the project,
plan, geometry, and flow files to indicate that this is the LOMR model; and,
the elevations for cross section 1.319 (effective cross section M) have been
adjusted +2.2 ft above the effective elevations to account for the 2.2 ft datum
adjustment from NGVD 1929 to NAVD 1988 datum. (Previous models had adjusted
cross section M by +2.0
ft.)

****
****

Sols Wash CLOMR
Future
Conditions with 4.5' Weir (modeled with cross sections)
Prepared
by:
Engineering and Environmental Consultants, Inc.
3003 N. Central Avenue,
Suite 600
Phoenix, Arizona 85012
Phone: 602-248-7702 FAX:
602-248-7851

For: Flood Control District of Maricopa County
Wickenburg
Downtown Flooding Hazard Mitigation Project Final Design
Contract #

FCD2005C006

Discharge information obtained from FEMA
Starting water surface
from West Consultants Model
US 93 Bypass Project - Hassayampa
River

Profile 1: Sols Wash (100-year)
Profile 2: Sols Wash (100-year)
with Floodway
Profile 3: Sols Wash (10-year)
Profile 4: Sols Wash
(50-year)
Profile 5: Sols Wash (500-year)

Compared with starting water
surface from FEMA Firm Panel 04013C2055 G.
Elev = 2051.3 (NGVD 29),
converted to Elev=2053.5 (NAVD 88) by adding 2.2 ft. +/-

The Tegner Street
Bridge was adjusted by using the datum difference at the bridge which was
detetmined by comparing common monuments and the bridge plans/as-builts with
a
resulting difference of 1.51 ft.

Future Conditions Model, with modified
bank stations & bank protection.
Island trimmed/removed to contain 100-yr Q to
Sols Wash by trimming North Wash.
Goldmine Village also trimmed to reduce WSEL
at the breakout point adjacent to the mobile home park.

Study Limits: Sols
Wash
Final Model Run Date: October 2006
Model: Sols_CLOMR

PLAN DATA

Plan Title: Sols_Chan_LOMR - September 2011
Plan File : w:\Hydrology-Hydraulics\cwr\Wickenburg LOMR\CD for FEMA\LOMR\Sub 2011 0926\Sols_Chan_LOMR-Se.p01

Geometry Title: Sols_Chan_LOMR - September 2011
Geometry File : w:\Hydrology-Hydraulics\cwr\Wickenburg LOMR\CD for FEMA\LOMR\Sub 2011 0926\Sols_Chan_LOMR-Se.g01

Flow Title : Sols_Chan_LOMR - September 2011
Flow File : w:\Hydrology-Hydraulics\cwr\Wickenburg LOMR\CD for FEMA\LOMR\Sub 2011 0926\Sols_Chan_LOMR-Se.f01

Plan Summary Information:

Number of:	Cross Sections	= 46	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 2	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: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = Sols Wash Reach = Sols Wash Main

RS	Profile	Method	Value1	Value2
1.319	100-Sols FW	1	9250	10370
1.224	100-Sols FW	1	9054.32	10304.49
1.141	100-Sols FW	1	9247.97	10129.14
1.081	100-Sols FW	1	9183.67	10080.56
1.021	100-Sols FW	1	9269.21	10065.72
0.955	100-Sols FW	1	9365.88	10047.62
0.886	100-Sols FW	1	9496.48	10057.44
0.822	100-Sols FW	1	9533.23	10067.99
0.785	100-Sols FW	1	9589.66	10068.51
0.746	100-Sols FW	1	9643.27	10068.47
0.708	100-Sols FW	1	9681.63	10077.03
0.668	100-Sols FW	1	9718	10101.67
0.642	100-Sols FW	1	9799.51	10113.55
0.614	100-Sols FW	1	9889.25	10119.42
0.592	100-Sols FW	1	9909	10122.49
0.557	100-Sols FW	1	9902	10122.47
0.529	100-Sols FW	1	9884.19	10117.46
0.505	100-Sols FW	1	9899.41	10110
0.485	100-Sols FW	1	9910.88	10081.3
0.467	100-Sols FW	1	9923	10084
0.447	100-Sols FW	1	9930.5	10091.2
0.442	100-Sols FW	1	9944.5	10100
0.412	100-Sols FW	1	9929	10084
0.389	100-Sols FW	1	9923.5	10081.77
0.359	100-Sols FW	1	9926	10088
0.306	100-Sols FW	1	9954	10089.5
0.288	100-Sols FW	1	9940.5	10077
0.227	100-Sols FW	1	9927.5	10061.95
0.220	100-Sols FW	1	9929.5	10049.5
0.212	100-Sols FW	1	9932.5	10050.5
0.204	100-Sols FW	1	9929	10052
0.201	100-Sols FW	1	9944.5	10052
0.198	100-Sols FW	1	9943	10051.4
0.195	100-Sols FW	1	9941	10053
0.192	100-Sols FW	1	9939	10053
0.189	100-Sols FW	1	9939	10056.5
0.187	100-Sols FW	1	9932	10057.5
0.184	100-Sols FW	1	9929.5	10057.5
0.182	100-Sols FW	1	9926.5	10060.5
0.180	100-Sols FW	1	9924	10062.5
0.169	100-Sols FW	1	9891.75	10075.63
0.159	100-Sols FW	1	9878.66	10083.15
0.150	100-Sols FW	1	9861	10088.97
0.140	100-Sols FW	1	9857	10103.84
0.132	100-Sols FW	1	9866.5	10110.5
0.111	100-Sols FW	1	9805.57	10095

FLOW DATA

Flow Title: Sols_Chan_LOMR - September 2011
Flow File : w:\Hydrology-Hydraulics\cwr\Wickenburg LOMR\CD for FEMA\LOMR\Sub 2011 0926\Sols_Chan_LOMR-Se.f01

Flow Data (cfs)

River	Reach	RS	100-Sols	100-Sols FW	10-yr	50-yr	500-yr
Sols Wash	Sols Wash Main	1.319	14413	14413	6725	11927	19986
Sols Wash	Sols Wash Main	0.668	14459	14459	6758	11964	20005
Sols Wash	Sols Wash Main	0.485	15045	15045	7019	12453	20836

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Sols Wash	Sols Wash Main	100-Sols		Normal S = 0.006
Sols Wash	Sols Wash Main	100-Sols FW		Normal S = 0.006

GEOMETRY DATA

Geometry Title: Sols_Chan_LOMR - September 2011
Geometry File : w:\Hydrology-Hydraulics\cwr\Wickenburg LOMR\CD for FEMA\LOMR\Sub 2011 0926\Sols_Chan_LOMR-Se.g01

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 1.319

INPUT
Description: Note: Cross Section taken from FIS Study, X-sect M.
Elevations
adjusted +2.2 ft from original study to account for the NGVD 1929
datum to the NAVD 1988 datum difference.

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9183	2114.7	9217	2100.8	9236.1	2098.8	9250	2097.35	9260	2096.3
9272	2093.5	9303	2093.5	9322	2096.4	9341	2097.6	9398	2100
9458	2098.9	9543	2097.9	9550	2098.35	9565	2099.3	9593	2098.6
9614	2099.6	9653	2099	9723	2099	9777	2099.3	9816	2098.7
9882	2098.9	9923	2099.1	9930	2094.4	9967	2094.4	10000	2095.1
10055	2095.6	10079	2097.5	10098	2098	10116	2096.8	10161	2096.4
10175	2097.2	10228	2096.2	10268	2094.8	10311	2094.5	10324	2097.2
10338	2097.4	10355	2096.4	10370	2097.84	10379.94	2098.8	10382	2099
10424	2100.5	10493	2100.3	10511	2103.3	10521	2103.5	10530	2103.5

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9183	.06	9272	.025	9303	.045	9550	.065	9923	.025
10079	.05								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9250	10370	504	504	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2099.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.14	Wt. n-Val.	0.060	0.033	0.050
W.S. Elev (ft)	2098.82	Reach Len. (ft)	504.00	504.00	504.00
Crit W.S. (ft)	2098.82	Flow Area (sq ft)	10.29	1675.62	4.93
E.G. Slope (ft/ft)	0.008638	Area (sq ft)	10.29	1675.62	4.93
Q Total (cfs)	14413.00	Flow (cfs)	19.18	14385.41	8.40
Top Width (ft)	741.51	Top Width (ft)	14.05	717.37	10.10
Vel Total (ft/s)	8.52	Avg. Vel. (ft/s)	1.86	8.59	1.71
Max Chl Dpth (ft)	5.32	Hydr. Depth (ft)	0.73	2.34	0.49
Conv. Total (cfs)	155080.7	Conv. (cfs)	206.4	154783.9	90.4
Length Wtd. (ft)	504.00	Wetted Per. (ft)	14.12	719.98	10.15
Min Ch El (ft)	2093.50	Shear (lb/sq ft)	0.39	1.25	0.26
Alpha	1.01	Stream Power (lb/ft s)	10530.00	0.00	0.00
Frctn Loss (ft)	3.73	Cum Volume (acre-ft)	0.66	236.41	0.05
C & E Loss (ft)	0.13	Cum SA (acres)	0.80	56.23	0.08

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2099.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.16	Wt. n-Val.		0.033	
W.S. Elev (ft)	2098.80	Reach Len. (ft)	504.00	504.00	504.00
Crit W.S. (ft)	2098.80	Flow Area (sq ft)		1665.52	
E.G. Slope (ft/ft)	0.008823	Area (sq ft)		1665.52	
Q Total (cfs)	14413.00	Flow (cfs)		14413.00	
Top Width (ft)	709.13	Top Width (ft)		709.13	
Vel Total (ft/s)	8.65	Avg. Vel. (ft/s)		8.65	
Max Chl Dpth (ft)	5.30	Hydr. Depth (ft)		2.35	
Conv. Total (cfs)	153441.6	Conv. (cfs)		153441.6	
Length Wtd. (ft)	504.00	Wetted Per. (ft)		714.15	
Min Ch El (ft)	2093.50	Shear (lb/sq ft)		1.28	
Alpha	1.00	Stream Power (lb/ft s)	10530.00	0.00	0.00
Frctn Loss (ft)	3.76	Cum Volume (acre-ft)	0.51	236.34	0.02
C & E Loss (ft)	0.14	Cum SA (acres)	0.14	56.18	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
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CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2098.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.	0.060	0.030	
W.S. Elev (ft)	2097.45	Reach Len. (ft)	504.00	504.00	504.00

Crit W.S. (ft)	2097.45	Flow Area (sq ft)	0.04	886.57	
E.G. Slope (ft/ft)	0.009668	Area (sq ft)	0.04	886.57	
Q Total (cfs)	6725.00	Flow (cfs)	0.01	6724.99	
Top Width (ft)	501.97	Top Width (ft)	0.93	501.04	
Vel Total (ft/s)	7.59	Avg. Vel. (ft/s)	0.32	7.59	
Max Chl Dpth (ft)	3.95	Hydr. Depth (ft)	0.05	1.77	
Conv. Total (cfs)	68394.9	Conv. (cfs)	0.1	68394.8	
Length Wtd. (ft)	504.00	Wetted Per. (ft)	0.93	503.12	
Min Ch El (ft)	2093.50	Shear (lb/sq ft)	0.03	1.06	
Alpha	1.00	Stream Power (lb/ft s)	10530.00	0.00	0.00
Frctn Loss (ft)	4.01	Cum Volume (acre-ft)	0.28	129.39	
C & E Loss (ft)	0.12	Cum SA (acres)	0.10	41.53	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
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CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2099.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.16	Wt. n-Val.	0.060	0.032	0.050
W.S. Elev (ft)	2098.35	Reach Len. (ft)	504.00	504.00	504.00
Crit W.S. (ft)	2098.35	Flow Area (sq ft)	4.80	1379.04	1.35
E.G. Slope (ft/ft)	0.009785	Area (sq ft)	4.80	1379.04	1.35
Q Total (cfs)	11927.00	Flow (cfs)	7.38	11918.03	1.59
Top Width (ft)	614.90	Top Width (ft)	9.59	600.03	5.29
Vel Total (ft/s)	8.61	Avg. Vel. (ft/s)	1.54	8.64	1.18
Max Chl Dpth (ft)	4.85	Hydr. Depth (ft)	0.50	2.30	0.26
Conv. Total (cfs)	120576.0	Conv. (cfs)	74.6	120485.3	16.1
Length Wtd. (ft)	504.00	Wetted Per. (ft)	9.64	602.47	5.31
Min Ch El (ft)	2093.50	Shear (lb/sq ft)	0.30	1.40	0.16
Alpha	1.01	Stream Power (lb/ft s)	10530.00	0.00	0.00
Frctn Loss (ft)	4.13	Cum Volume (acre-ft)	0.47	202.81	0.01
C & E Loss (ft)	0.14	Cum SA (acres)	0.15	50.39	0.06

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
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CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2100.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.10	Wt. n-Val.	0.060	0.034	0.050
W.S. Elev (ft)	2099.54	Reach Len. (ft)	504.00	504.00	504.00
Crit W.S. (ft)	2099.54	Flow Area (sq ft)	22.94	2359.40	17.48
E.G. Slope (ft/ft)	0.008104	Area (sq ft)	22.94	2359.40	17.48
Q Total (cfs)	19986.00	Flow (cfs)	54.15	19896.97	34.89
Top Width (ft)	1126.57	Top Width (ft)	20.95	1078.54	27.07
Vel Total (ft/s)	8.33	Avg. Vel. (ft/s)	2.36	8.43	2.00
Max Chl Dpth (ft)	6.04	Hydr. Depth (ft)	1.10	2.19	0.65

Conv. Total (cfs)	222005.5	Conv. (cfs)	601.5	221016.6	387.5
Length Wtd. (ft)	504.00	Wetted Per. (ft)	21.07	1081.32	27.14
Min Ch El (ft)	2093.50	Shear (lb/sq ft)	0.55	1.10	0.33
Alpha	1.02	Stream Power (lb/ft s)	10530.00	0.00	0.00
Frctn Loss (ft)	3.41	Cum Volume (acre-ft)	5.84	316.80	0.16
C & E Loss (ft)	0.12	Cum SA (acres)	6.38	69.87	0.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
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Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9232.13	9236.60	0.00	0.02	0.65	0.00	0.03	0.20	0.02	0.00
2	LOB	9236.60	9241.07	1.18	1.34	4.49	0.01	0.30	0.88	0.16	0.14
3	LOB	9241.07	9245.53	5.61	3.42	4.49	0.04	0.77	1.64	0.41	0.67
4	LOB	9245.53	9250.00	12.39	5.50	4.49	0.09	1.23	2.25	0.66	1.49
5	Chan	9250.00	9324.67	3541.28	311.33	75.27	24.57	4.17	11.37	2.23	25.37
6	Chan	9324.67	9399.33	136.78	45.82	45.26	0.95	1.01	2.99	0.55	1.63
7	Chan	9399.33	9474.00	0.19	0.46	8.82	0.00	0.05	0.41	0.03	0.01
8	Chan	9474.00	9548.67	75.92	39.32	74.68	0.53	0.53	1.93	0.28	0.55
9	Chan	9548.67	9623.33	3.10	3.80	21.84	0.02	0.17	0.82	0.09	0.08
10	Chan	9623.33	9698.00							0.00	0.00
11	Chan	9698.00	9772.67							0.00	0.00
12	Chan	9772.67	9847.33	0.86	2.56	38.84	0.01	0.07	0.33	0.04	0.01
13	Chan	9847.33	9922.00	0.01	0.07	6.78	0.00	0.01	0.10	0.01	0.00
14	Chan	9922.00	9996.67	4033.76	299.55	74.59	27.99	4.09	13.47	2.17	29.16
15	Chan	9996.67	10071.33	2883.13	245.05	74.72	20.00	3.28	11.77	1.77	20.81
16	Chan	10071.33	10146.00	499.95	122.60	74.74	3.47	1.64	4.08	0.88	3.61
17	Chan	10146.00	10220.67	685.77	156.90	74.70	4.76	2.10	4.37	1.13	4.95
18	Chan	10220.67	10295.33	1628.87	263.65	74.69	11.30	3.53	6.18	1.90	11.76
19	Chan	10295.33	10370.00	895.80	184.52	75.04	6.22	2.47	4.85	1.33	6.44
20	ROB	10370.00	10380.67	8.40	4.93	10.15	0.06	0.49	1.71	0.26	0.45

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Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9250.00	9324.67	3547.63	310.27	76.72	24.61	4.16	11.43	2.23	25.47
2	Chan	9324.67	9399.33	135.70	45.18	44.92	0.94	1.01	3.00	0.55	1.66
3	Chan	9399.33	9474.00	0.13	0.34	7.62	0.00	0.04	0.38	0.02	0.01
4	Chan	9474.00	9548.67	73.31	38.26	74.68	0.51	0.51	1.92	0.28	0.54
5	Chan	9548.67	9623.33	2.86	3.50	20.75	0.02	0.17	0.82	0.09	0.08
6	Chan	9623.33	9698.00							0.00	0.00

7	Chan	9698.00	9772.67							0.00	0.00
8	Chan	9772.67	9847.33	0.59	2.02	37.92	0.00	0.05	0.29	0.03	0.01
9	Chan	9847.33	9922.00	0.00	0.01	2.11	0.00	0.00	0.04	0.00	0.00
10	Chan	9922.00	9996.67	4053.41	298.52	74.57	28.12	4.08	13.58	2.21	29.94
11	Chan	9996.67	10071.33	2892.38	243.99	74.72	20.07	3.27	11.85	1.80	21.32
12	Chan	10071.33	10146.00	497.93	121.54	74.74	3.45	1.63	4.10	0.90	3.67
13	Chan	10146.00	10220.67	685.18	155.84	74.70	4.75	2.09	4.40	1.15	5.05
14	Chan	10220.67	10295.33	1634.92	262.59	74.69	11.34	3.52	6.23	1.94	12.06
15	Chan	10295.33	10370.00	888.97	183.46	76.01	6.17	2.46	4.85	1.33	6.44

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
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Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9245.53	9250.00	0.01	0.04	0.93	0.00	0.05	0.32	0.03	0.01
2	Chan	9250.00	9324.67	2087.31	209.14	75.27	31.04	2.80	9.98	1.68	16.74
3	Chan	9324.67	9399.33	10.90	6.11	13.93	0.16	0.44	1.78	0.26	0.47
4	Chan	9399.33	9474.00							0.00	0.00
5	Chan	9474.00	9548.67							0.00	0.00
6	Chan	9548.67	9623.33							0.00	0.00
7	Chan	9623.33	9698.00							0.00	0.00
8	Chan	9698.00	9772.67							0.00	0.00
9	Chan	9772.67	9847.33							0.00	0.00
10	Chan	9847.33	9922.00							0.00	0.00
11	Chan	9922.00	9996.67	2209.32	200.70	72.14	32.85	2.82	11.01	1.68	18.48
12	Chan	9996.67	10071.33	1224.64	142.86	74.72	18.21	1.91	8.57	1.15	9.89
13	Chan	10071.33	10146.00	61.01	28.48	46.74	0.91	0.61	2.14	0.37	0.79
14	Chan	10146.00	10220.67	123.66	54.70	74.70	1.84	0.73	2.26	0.44	1.00
15	Chan	10220.67	10295.33	751.03	161.46	74.69	11.17	2.16	4.65	1.30	6.07
16	Chan	10295.33	10370.00	257.11	83.13	70.93	3.82	1.18	3.09	0.71	2.19

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Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
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Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9236.60	9241.07	0.01	0.02	0.66	0.00	0.03	0.22	0.02	0.00
2	LOB	9241.07	9245.53	1.28	1.35	4.49	0.01	0.30	0.95	0.18	0.17
3	LOB	9245.53	9250.00	6.09	3.43	4.49	0.05	0.77	1.78	0.47	0.83
4	Chan	9250.00	9324.67	3144.53	276.62	75.27	26.36	3.70	11.37	2.24	25.52
5	Chan	9324.67	9399.33	73.82	27.37	34.21	0.62	0.80	2.70	0.49	1.32
6	Chan	9399.33	9474.00							0.00	0.00
7	Chan	9474.00	9548.67	11.95	10.15	43.99	0.10	0.23	1.18	0.14	0.17

8	Chan	9548.67	9623.33	0.02	0.06	1.34	0.00	0.04	0.39	0.03	0.01
9	Chan	9623.33	9698.00							0.00	0.00
10	Chan	9698.00	9772.67							0.00	0.00
11	Chan	9772.67	9847.33							0.00	0.00
12	Chan	9847.33	9922.00							0.00	0.00
13	Chan	9922.00	9996.67	3515.76	265.67	73.76	29.48	3.66	13.23	2.20	29.12
14	Chan	9996.67	10071.33	2361.92	210.34	74.72	19.80	2.82	11.23	1.72	19.31
15	Chan	10071.33	10146.00	303.10	87.89	74.74	2.54	1.18	3.45	0.72	2.48
16	Chan	10146.00	10220.67	477.70	122.19	74.70	4.01	1.64	3.91	1.00	3.91
17	Chan	10220.67	10295.33	1360.38	228.94	74.69	11.41	3.07	5.94	1.87	11.13
18	Chan	10295.33	10370.00	668.84	149.81	75.04	5.61	2.01	4.46	1.22	5.44
19	ROB	10370.00	10380.67	1.59	1.35	5.31	0.01	0.26	1.18	0.16	0.18

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Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9227.67	9232.13	0.28	0.50	3.10	0.00	0.16	0.56	0.08	0.05
2	LOB	9232.13	9236.60	3.16	2.49	4.49	0.02	0.56	1.27	0.28	0.36
3	LOB	9236.60	9241.07	8.73	4.57	4.49	0.04	1.02	1.91	0.52	0.98
4	LOB	9241.07	9245.53	16.31	6.65	4.49	0.08	1.49	2.45	0.75	1.84
5	LOB	9245.53	9250.00	25.67	8.73	4.49	0.13	1.96	2.94	0.98	2.89
6	Chan	9250.00	9324.67	4396.53	365.31	75.27	22.00	4.89	12.04	2.46	29.55
7	Chan	9324.67	9399.33	300.19	84.70	62.44	1.50	1.36	3.54	0.69	2.43
8	Chan	9399.33	9474.00	38.75	22.84	50.83	0.19	0.45	1.70	0.23	0.39
9	Chan	9474.00	9548.67	313.02	93.30	74.68	1.57	1.25	3.36	0.63	2.12
10	Chan	9548.67	9623.33	53.97	38.27	69.42	0.27	0.55	1.41	0.28	0.39
11	Chan	9623.33	9698.00	39.16	33.42	74.67	0.20	0.45	1.17	0.23	0.27
12	Chan	9698.00	9772.67	39.01	33.34	74.67	0.20	0.45	1.17	0.23	0.26
13	Chan	9772.67	9847.33	68.78	46.86	74.67	0.34	0.63	1.47	0.32	0.47
14	Chan	9847.33	9922.00	65.69	45.58	74.67	0.33	0.61	1.44	0.31	0.45
15	Chan	9922.00	9996.67	5151.15	353.19	76.11	25.77	4.73	14.58	2.35	34.25
16	Chan	9996.67	10071.33	3924.33	299.03	74.72	19.64	4.00	13.12	2.02	26.57
17	Chan	10071.33	10146.00	897.63	176.57	74.74	4.49	2.36	5.08	1.20	6.08
18	Chan	10146.00	10220.67	1096.49	210.87	74.70	5.49	2.82	5.20	1.43	7.43
19	Chan	10220.67	10295.33	2170.26	317.62	74.69	10.86	4.25	6.83	2.15	14.70
20	Chan	10295.33	10370.00	1342.01	238.49	75.04	6.71	3.19	5.63	1.61	9.05
21	ROB	10370.00	10380.67	29.72	12.62	10.72	0.15	1.18	2.35	0.60	1.40
22	ROB	10380.67	10391.33	4.90	4.27	10.68	0.02	0.40	1.15	0.20	0.23
23	ROB	10391.33	10402.00	0.27	0.59	5.74	0.00	0.10	0.46	0.05	0.02

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Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 1.224

INPUT
Description:
Station Elevation Data num= 292

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9042.63	2096.83	9046.97	2095.27	9049.88	2094.07	9052.32	2093.41	9057.01	2092.18
9065.4	2089.68	9067.83	2089.34	9072.16	2089.38	9074.69	2089.4	9078.83	2089.45
9081.21	2089.49	9088.35	2089.61	9097.31	2089.75	9101.27	2089.9	9105.02	2089.87
9108.66	2089.84	9113.17	2089.6	9125.7	2088.98	9131	2089.99	9135.3	2090.81
9139.61	2090.74	9155.96	2089.85	9158.44	2089.92	9164.58	2089.93	9173.72	2090.02
9178.67	2090.09	9189.76	2089.71	9198.01	2089.62	9204.76	2089.43	9210.26	2089.24
9232.67	2090	9235.4	2090.09	9241.63	2090.26	9246.74	2090.37	9249.01	2090.42
9253.26	2090.48	9256.4	2090.52	9258.09	2090.54	9263.79	2090.5	9266.01	2090.43
9273.98	2090.17	9290.1	2090.33	9300.73	2090.75	9303.46	2090.79	9308.11	2090.85
9314.81	2090.91	9315.5	2090.92	9316.79	2090.93	9322.89	2090.99	9326.15	2091.02
9330.27	2091.08	9337.5	2091.17	9337.66	2091.17	9337.97	2091.18	9345.05	2091.32
9348.84	2091.39	9352.43	2091.47	9359.14	2091.6	9359.82	2091.61	9360.19	2091.62
9367.21	2091.74	9371.53	2091.8	9374.6	2091.84	9380.32	2091.89	9381.98	2091.9
9382.88	2091.91	9389.37	2091.95	9394.22	2091.98	9396.76	2091.99	9401.5	2092
9404.15	2092.01	9405.56	2092.02	9411.53	2092.03	9416.91	2092.05	9418.92	2092.05
9422.67	2092.07	9426.31	2092.08	9428.25	2092.09	9433.69	2092.12	9439.6	2092.16
9441.08	2092.17	9443.85	2092.2	9448.47	2092.25	9450.94	2092.27	9455.86	2092.32
9462.29	2092.39	9463.24	2092.4	9465.02	2092.42	9470.63	2092.48	9473.63	2092.51
9478.02	2092.55	9484.98	2092.62	9485.4	2092.62	9486.2	2092.63	9492.79	2092.68
9496.32	2092.71	9500.18	2092.73	9507.38	2092.78	9507.56	2092.78	9507.67	2092.78
9514.95	2092.81	9519.01	2092.84	9522.34	2092.84	9528.55	2092.87	9529.73	2092.87
9530.35	2092.88	9537.11	2092.89	9541.7	2092.92	9544.5	2092.93	9549.73	2092.96
9551.89	2092.97	9553.04	2092.98	9559.28	2093.03	9564.39	2093.07	9566.66	2093.09
9570.91	2093.12	9574.05	2093.14	9575.73	2093.15	9581.44	2093.18	9587.08	2093.21
9588.82	2093.22	9592.08	2093.23	9596.21	2093.25	9598.42	2093.26	9603.6	2093.27
9609.77	2093.29	9610.99	2093.29	9613.26	2093.29	9618.37	2093.29	9621.11	2093.28
9625.76	2093.27	9632.46	2093.24	9633.15	2093.24	9634.44	2093.23	9640.53	2093.2
9643.8	2093.18	9647.92	2093.16	9655.14	2093.13	9655.31	2093.13	9655.61	2093.12
9662.7	2093.11	9666.49	2093.11	9670.08	2093.12	9676.79	2093.12	9677.47	2093.13
9677.83	2093.13	9684.86	2093.14	9689.18	2093.14	9692.24	2093.13	9697.97	2093.12
9699.63	2093.11	9700.52	2093.11	9707.02	2093.1	9711.87	2093.09	9714.41	2093.09
9719.14	2093.09	9721.79	2093.1	9723.21	2093.1	9729.18	2093.14	9734.56	2093.17
9736.57	2093.19	9740.32	2093.22	9743.95	2093.25	9745.9	2093.26	9751.34	2093.31
9757.25	2093.34	9758.73	2093.34	9761.5	2093.35	9766.12	2093.36	9768.59	2093.35
9773.5	2093.32	9779.93	2093.21	9780.89	2093.2	9782.67	2093.13	9788.28	2092.92
9793.99	2092.78	9807.15	2092.55	9815.23	2088.36	9815.83	2088.01	9817.17	2088.1
9819.64	2088.15	9839.99	2088.91	9846.2	2088.8	9847.37	2088.78	9848	2088.78
9854.76	2088.76	9859.35	2088.79	9862.15	2088.8	9867.38	2088.85	9869.54	2088.87
9870.69	2088.89	9876.92	2088.97	9882.04	2089.05	9884.31	2089.09	9888.56	2089.16
9891.7	2089.21	9893.38	2089.24	9899.08	2089.34	9904.73	2089.45	9906.47	2089.48
9909.73	2089.55	9913.86	2089.63	9916.07	2089.67	9921.25	2089.77	9927.41	2089.87
9928.63	2089.89	9930.91	2089.93	9936.02	2089.99	9938.76	2090.02	9943.41	2090.07
9950.1	2090.12	9950.79	2090.12	9952.08	2090.13	9958.18	2090.16	9961.45	2090.17
9965.57	2090.18	9972.79	2090.19	9972.96	2090.19	9973.26	2090.19	9980.34	2090.19
9984.14	2090.18	9987.73	2090.17	9994.44	2090.14	9995.12	2090.14	9995.48	2090.14
10000	2090.1	10002.51	2090.09	10006.8	2090.06	10009.92	2090.04	10015.86	2089.98
10017.32	2089.97	10018.09	2089.96	10024.73	2089.89	10029.39	2089.83	10032.13	2089.8
10037.37	2089.72	10039.54	2089.69	10040.68	2089.67	10046.95	2089.58	10051.98	2089.51
10054.35	2089.48	10058.88	2089.43	10061.76	2089.41	10063.27	2089.38	10069.16	2089.35
10074.56	2089.35	10076.57	2089.36	10080.39	2089.41	10083.98	2089.44	10087.37	2089.48
10091.82	2089.56	10100.76	2089.72	10106.09	2089.83	10109.27	2089.69	10110.89	2089.61
10117.28	2089.85	10122.37	2090.11	10143.98	2092.55	10150.32	2092.42	10158.04	2092.24
10164.92	2092.28	10165.44	2092.28	10193.07	2091.97	10200.1	2091.69	10202.47	2091.77

10209.45 2091.8410209.88 2091.85 10210.1 2091.8510217.28 2091.88 10221.4 2091.89
10224.69 2091.910230.96 2091.89 10232.1 2091.8910232.69 2091.89 10239.5 2091.84
10243.99 2091.7910246.91 2091.7610252.47 2091.7110254.31 2091.6910255.28 2091.68
10261.72 2091.6110266.58 2091.5810269.13 2091.5710273.98 2091.5710276.53 2091.58
10277.87 2091.5810283.94 2091.6310297.76 2091.7510300.86 2091.7910301.96 2091.79
10312.25 2096.2510313.54 2096.47

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9042.63	.067	9135.3	.031	9300.73	.067	9689.18	.067	9807.15	.03
10143.98	.05								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9042.63	10313.54	438	438	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2093.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.70	Wt. n-Val.		0.034	
W.S. Elev (ft)	2092.88	Reach Len. (ft)	438.00	438.00	438.00
Crit W.S. (ft)	2092.50	Flow Area (sq ft)		2152.34	
E.G. Slope (ft/ft)	0.006404	Area (sq ft)		2152.34	
Q Total (cfs)	14413.00	Flow (cfs)		14413.00	
Top Width (ft)	990.41	Top Width (ft)		990.41	
Vel Total (ft/s)	6.70	Avg. Vel. (ft/s)		6.70	
Max Chl Dpth (ft)	4.87	Hydr. Depth (ft)		2.17	
Conv. Total (cfs)	180105.0	Conv. (cfs)		180105.0	
Length Wtd. (ft)	438.00	Wetted Per. (ft)		992.72	
Min Ch El (ft)	2088.01	Shear (lb/sq ft)		0.87	
Alpha	1.00	Stream Power (lb/ft s)	10313.54	0.00	0.00
Frctn Loss (ft)	3.42	Cum Volume (acre-ft)	0.60	214.27	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.72	46.35	0.03

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2093.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.70	Wt. n-Val.		0.034	
W.S. Elev (ft)	2092.88	Reach Len. (ft)	438.00	438.00	438.00
Crit W.S. (ft)	2092.50	Flow Area (sq ft)		2152.83	
E.G. Slope (ft/ft)	0.006400	Area (sq ft)		2152.83	
Q Total (cfs)	14413.00	Flow (cfs)		14413.00	
Top Width (ft)	990.46	Top Width (ft)		990.46	
Vel Total (ft/s)	6.69	Avg. Vel. (ft/s)		6.69	
Max Chl Dpth (ft)	4.87	Hydr. Depth (ft)		2.17	
Conv. Total (cfs)	180157.5	Conv. (cfs)		180157.5	
Length Wtd. (ft)	438.00	Wetted Per. (ft)		992.78	
Min Ch El (ft)	2088.01	Shear (lb/sq ft)		0.87	
Alpha	1.00	Stream Power (lb/ft s)	10313.54	0.00	0.00
Frctn Loss (ft)	3.42	Cum Volume (acre-ft)	0.51	214.25	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.14	46.35	0.03

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2092.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.		0.033	
W.S. Elev (ft)	2091.75	Reach Len. (ft)	438.00	438.00	438.00
Crit W.S. (ft)	2091.39	Flow Area (sq ft)		1178.82	
E.G. Slope (ft/ft)	0.006655	Area (sq ft)		1178.82	
Q Total (cfs)	6725.00	Flow (cfs)		6725.00	
Top Width (ft)	690.34	Top Width (ft)		690.34	
Vel Total (ft/s)	5.70	Avg. Vel. (ft/s)		5.70	
Max Chl Dpth (ft)	3.74	Hydr. Depth (ft)		1.71	
Conv. Total (cfs)	82435.9	Conv. (cfs)		82435.9	
Length Wtd. (ft)	438.00	Wetted Per. (ft)		692.02	
Min Ch El (ft)	2088.01	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)	10313.54	0.00	0.00
Frctn Loss (ft)	3.77	Cum Volume (acre-ft)	0.28	117.45	
C & E Loss (ft)	0.05	Cum SA (acres)	0.09	34.63	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2093.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.		0.034	
W.S. Elev (ft)	2092.51	Reach Len. (ft)	438.00	438.00	438.00
Crit W.S. (ft)	2092.22	Flow Area (sq ft)		1801.03	
E.G. Slope (ft/ft)	0.006952	Area (sq ft)		1801.03	
Q Total (cfs)	11927.00	Flow (cfs)		11927.00	
Top Width (ft)	911.52	Top Width (ft)		911.52	
Vel Total (ft/s)	6.62	Avg. Vel. (ft/s)		6.62	
Max Chl Dpth (ft)	4.50	Hydr. Depth (ft)		1.98	
Conv. Total (cfs)	143049.8	Conv. (cfs)		143049.8	
Length Wtd. (ft)	438.00	Wetted Per. (ft)		913.70	
Min Ch El (ft)	2088.01	Shear (lb/sq ft)		0.86	
Alpha	1.00	Stream Power (lb/ft s)	10313.54	0.00	0.00
Frctn Loss (ft)	3.39	Cum Volume (acre-ft)	0.45	184.41	0.01
C & E Loss (ft)	0.02	Cum SA (acres)	0.09	41.64	0.03

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2094.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.		0.035	
W.S. Elev (ft)	2093.59	Reach Len. (ft)	438.00	438.00	438.00
Crit W.S. (ft)		Flow Area (sq ft)		2965.13	
E.G. Slope (ft/ft)	0.005727	Area (sq ft)		2965.13	
Q Total (cfs)	19986.00	Flow (cfs)		19986.00	
Top Width (ft)	1254.43	Top Width (ft)		1254.43	
Vel Total (ft/s)	6.74	Avg. Vel. (ft/s)		6.74	
Max Chl Dpth (ft)	5.58	Hydr. Depth (ft)		2.36	
Conv. Total (cfs)	264089.5	Conv. (cfs)		264089.5	
Length Wtd. (ft)	438.00	Wetted Per. (ft)		1257.00	
Min Ch El (ft)	2088.01	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)	10313.54	0.00	0.00
Frctn Loss (ft)	3.36	Cum Volume (acre-ft)	5.71	285.99	0.06

C & E Loss (ft)	0.06	Cum SA (acres)	6.25	56.37	0.03

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9042.63	9127.36	825.83	224.08	73.55	5.73	3.07	3.69	1.22	4.49
2	Chan	9127.36	9212.09	1831.33	248.07	84.91	12.71	2.93	7.38	1.17	8.62
3	Chan	9212.09	9296.81	1689.03	229.44	84.76	11.72	2.71	7.36	1.08	7.97
4	Chan	9296.81	9381.54	359.31	136.35	84.74	2.49	1.61	2.64	0.64	1.70
5	Chan	9381.54	9466.27	95.20	64.87	84.73	0.66	0.77	1.47	0.31	0.45
6	Chan	9466.27	9550.99	6.54	11.63	63.99	0.05	0.18	0.56	0.07	0.04
7	Chan	9550.99	9635.72							0.00	0.00
8	Chan	9635.72	9720.45							0.00	0.00
9	Chan	9720.45	9805.18	1.22	2.39	15.20	0.01	0.16	0.51	0.06	0.03
10	Chan	9805.18	9889.90	3187.54	328.56	85.87	22.12	3.88	9.70	1.53	14.84
11	Chan	9889.90	9974.63	2112.36	257.26	84.74	14.66	3.04	8.21	1.21	9.97
12	Chan	9974.63	10059.36	2034.11	251.49	84.73	14.11	2.97	8.09	1.19	9.60
13	Chan	10059.36	10144.08	1903.22	241.74	84.88	13.20	2.85	7.87	1.14	8.96
14	Chan	10144.08	10228.81	141.32	68.98	84.74	0.98	0.81	2.05	0.33	0.67
15	Chan	10228.81	10313.54	225.98	87.48	75.89	1.57	1.16	2.58	0.46	1.19

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9042.63	9127.36	825.79	224.12	73.55	5.73	3.07	3.68	1.22	4.49
2	Chan	9127.36	9212.09	1831.32	248.11	84.91	12.71	2.93	7.38	1.17	8.62
3	Chan	9212.09	9296.81	1689.05	229.48	84.76	11.72	2.71	7.36	1.08	7.96
4	Chan	9296.81	9381.54	359.38	136.40	84.74	2.49	1.61	2.63	0.64	1.69
5	Chan	9381.54	9466.27	95.28	64.91	84.73	0.66	0.77	1.47	0.31	0.45
6	Chan	9466.27	9550.99	6.57	11.66	64.02	0.05	0.18	0.56	0.07	0.04
7	Chan	9550.99	9635.72							0.00	0.00
8	Chan	9635.72	9720.45							0.00	0.00
9	Chan	9720.45	9805.18	1.23	2.40	15.22	0.01	0.16	0.51	0.06	0.03
10	Chan	9805.18	9889.90	3187.28	328.60	85.87	22.11	3.88	9.70	1.53	14.83
11	Chan	9889.90	9974.63	2112.32	257.30	84.74	14.66	3.04	8.21	1.21	9.96
12	Chan	9974.63	10059.36	2034.08	251.53	84.73	14.11	2.97	8.09	1.19	9.59
13	Chan	10059.36	10144.08	1903.21	241.78	84.88	13.20	2.85	7.87	1.14	8.96
14	Chan	10144.08	10228.81	141.42	69.03	84.74	0.98	0.81	2.05	0.33	0.67
15	Chan	10228.81	10313.54	226.07	87.51	75.89	1.57	1.16	2.58	0.46	1.19

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9042.63	9127.36	417.66	144.01	69.28	6.21	2.09	2.90	0.86	2.50

2	Chan	9127.36	9212.09	827.07	152.38	84.91	12.30	1.80	5.43	0.75	4.05
3	Chan	9212.09	9296.81	697.71	133.75	84.76	10.37	1.58	5.22	0.66	3.42
4	Chan	9296.81	9381.54	62.52	41.81	71.06	0.93	0.59	1.50	0.24	0.37
5	Chan	9381.54	9466.27							0.00	0.00
6	Chan	9466.27	9550.99							0.00	0.00
7	Chan	9550.99	9635.72							0.00	0.00
8	Chan	9635.72	9720.45							0.00	0.00
9	Chan	9720.45	9805.18							0.00	0.00
10	Chan	9805.18	9889.90	1884.54	235.10	82.15	28.02	2.90	8.02	1.19	9.53
11	Chan	9889.90	9974.63	987.93	161.56	84.74	14.69	1.91	6.11	0.79	4.84
12	Chan	9974.63	10059.36	929.90	155.80	84.73	13.83	1.84	5.97	0.76	4.56
13	Chan	10059.36	10144.08	914.77	148.97	77.64	13.60	1.92	6.14	0.80	4.90
14	Chan	10144.08	10228.81	0.02	0.10	3.23	0.00	0.03	0.23	0.01	0.00
15	Chan	10228.81	10313.54	2.88	5.33	49.52	0.04	0.11	0.54	0.04	0.02

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9042.63	9127.36	705.01	197.25	72.08	5.91	2.76	3.57	1.19	4.24
2	Chan	9127.36	9212.09	1522.90	216.62	84.91	12.77	2.56	7.03	1.11	7.78
3	Chan	9212.09	9296.81	1376.46	198.00	84.76	11.54	2.34	6.95	1.01	7.05
4	Chan	9296.81	9381.54	245.16	104.91	84.74	2.06	1.24	2.34	0.54	1.26
5	Chan	9381.54	9466.27	32.85	33.43	84.73	0.28	0.39	0.98	0.17	0.17
6	Chan	9466.27	9550.99	0.05	0.26	7.10	0.00	0.04	0.20	0.02	0.00
7	Chan	9550.99	9635.72							0.00	0.00
8	Chan	9635.72	9720.45							0.00	0.00
9	Chan	9720.45	9805.18							0.00	0.00
10	Chan	9805.18	9889.90	2820.66	297.24	83.80	23.65	3.60	9.49	1.54	14.61
11	Chan	9889.90	9974.63	1770.98	225.81	84.74	14.85	2.67	7.84	1.16	9.07
12	Chan	9974.63	10059.36	1696.32	220.05	84.73	14.22	2.60	7.71	1.13	8.69
13	Chan	10059.36	10144.08	1577.17	210.31	84.40	13.22	2.50	7.50	1.08	8.11
14	Chan	10144.08	10228.81	54.36	37.58	82.76	0.46	0.45	1.45	0.20	0.29
15	Chan	10228.81	10313.54	125.09	59.56	74.95	1.05	0.80	2.10	0.34	0.72

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9042.63	9127.36	1081.76	276.66	76.31	5.41	3.66	3.91	1.30	5.07
2	Chan	9127.36	9212.09	2480.01	307.97	84.91	12.41	3.63	8.05	1.30	10.44
3	Chan	9212.09	9296.81	2349.25	289.35	84.76	11.75	3.42	8.12	1.22	9.91
4	Chan	9296.81	9381.54	615.00	196.26	84.74	3.08	2.32	3.13	0.83	2.59
5	Chan	9381.54	9466.27	267.61	124.78	84.73	1.34	1.47	2.14	0.53	1.13
6	Chan	9466.27	9550.99	104.03	70.78	84.73	0.52	0.84	1.47	0.30	0.44
7	Chan	9550.99	9635.72	29.56	33.27	84.73	0.15	0.39	0.89	0.14	0.12
8	Chan	9635.72	9720.45	38.00	38.68	84.73	0.19	0.46	0.98	0.16	0.16
9	Chan	9720.45	9805.18	37.35	38.28	84.74	0.19	0.45	0.98	0.16	0.16
10	Chan	9805.18	9889.90	3962.51	388.46	85.87	19.83	4.58	10.20	1.62	16.50
11	Chan	9889.90	9974.63	2829.27	317.16	84.74	14.16	3.74	8.92	1.34	11.94
12	Chan	9974.63	10059.36	2744.16	311.40	84.73	13.73	3.68	8.81	1.31	11.58

13	Chan	10059.36	10144.08	2600.12	301.64	84.88	13.01	3.56	8.62	1.27	10.95
14	Chan	10144.08	10228.81	378.48	128.89	84.74	1.89	1.52	2.94	0.54	1.60
15	Chan	10228.81	10313.54	468.91	141.55	77.66	2.35	1.83	3.31	0.65	2.16

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 1.141

INPUT
Description:
Station Elevation Data num= 220

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9206.22	2093.39	9213.82	2093.34	9216.59	2093.34	9226.16	2093.22	9236.48	2092.95
9246.51	2089.61	9259.61	2085	9273.89	2085.36	9283.96	2085.62	9288.3	2084.47
9294.83	2083.04	9308.48	2083.13	9311.46	2083.14	9317.09	2083.13	9319.6	2083.13
9319.79	2083.13	9320.29	2083.13	9327.61	2083.06	9330.75	2083.06	9339.38	2082.74
9353.98	2082.21	9365.13	2085.55	9368.68	2086.51	9382.67	2088.04	9383.68	2088.14
9385.84	2088.27	9391.69	2088.61	9404.34	2088.88	9406.97	2088.92	9407.02	2088.92
9408.1	2088.94	9408.51	2088.92	9419.87	2088.58	9426.37	2088.62	9439.75	2088.71
9440.2	2088.7	9446.66	2088.67	9446.99	2088.67	9447.46	2088.66	9454.18	2088.64
9458.81	2088.63	9461.37	2088.62	9465.06	2088.62	9468.55	2088.62	9470.97	2088.62
9475.74	2088.62	9482.66	2088.64	9482.93	2088.64	9483.12	2088.64	9490.12	2088.64
9495.27	2088.66	9497.31	2088.66	9500.25	2088.67	9504.5	2088.67	9507.43	2088.68
9511.68	2088.68	9517.85	2088.69	9518.87	2088.69	9519.58	2088.69	9526.06	2088.69
9531.73	2088.69	9533.25	2088.69	9535.45	2088.69	9536.36	2088.69	9540.44	2088.68
9543.88	2088.68	9547.63	2088.68	9553.05	2088.69	9554.82	2088.69	9556.04	2088.69
9562	2088.7	9568.19	2088.71	9569.19	2088.72	9570.65	2088.72	9576.38	2088.73
9580.34	2088.73	9583.57	2088.73	9588.24	2088.73	9590.76	2088.73	9592.5	2088.73
9597.95	2088.73	9604.65	2088.72	9605.14	2088.72	9605.84	2088.72	9612.32	2088.7
9616.8	2088.7	9619.51	2088.69	9623.44	2088.69	9626.7	2088.69	9628.95	2088.69
9633.89	2088.68	9641.04	2088.69	9641.08	2088.69	9641.11	2088.69	9648.27	2088.68
9653.26	2088.69	9655.46	2088.69	9658.63	2088.69	9662.64	2088.69	9665.41	2088.69
9669.83	2088.69	9676.23	2088.69	9677.02	2088.69	9677.57	2088.69	9684.21	2088.68
9689.72	2088.67	9691.4	2088.67	9693.83	2088.66	9698.59	2088.64	9701.87	2088.62
9705.77	2088.6	9711.43	2088.57	9712.96	2088.56	9714.02	2088.55	9720.15	2088.52
9726.18	2088.5	9727.34	2088.49	9729.02	2088.49	9734.53	2088.47	9738.33	2088.46
9741.72	2088.45	9746.62	2088.43	9748.91	2088.43	9750.48	2088.42	9756.09	2088.39
9762.64	2088.35	9763.28	2088.35	9764.22	2088.34	9770.47	2088.3	9774.79	2088.27
9777.66	2088.25	9781.82	2088.22	9784.85	2088.2	9786.94	2088.18	9792.04	2088.15
9799.09	2088.11	9799.23	2088.11	9799.42	2088.11	9806.41	2088.07	9811.25	2088.04
9813.6	2088.03	9817.01	2088.02	9820.79	2088	9823.4	2087.98	9827.98	2087.97
9834.61	2087.98	9835.17	2087.98	9835.55	2087.98	9842.36	2087.99	9846.64	2087.99
9847.71	2087.99	9849.55	2087.98	9852.21	2087.96	9856.73	2087.92	9859.86	2087.85
9863.92	2087.77	9869.81	2087.58	9871.11	2087.54	9871.88	2087.54	9886.17	2087.48
9891.02	2086.81	9904.9	2084.5	9920.44	2085.09	9921.43	2085.14	9922.6	2085.12
9928.62	2085.01	9932.78	2084.96	9935.81	2084.92	9940.2	2084.89	9943	2084.87
9944.93	2084.86	9950.18	2084.82	9957.08	2084.78	9957.37	2084.78	9957.79	2084.78
9964.56	2084.74	9969.23	2084.71	9971.75	2084.7	9975.39	2084.68	9978.94	2084.67
9981.39	2084.67	9986.13	2084.68	9992.99	2084.74	9993.32	2084.74	9993.54	2084.75
10000	2084.87	10000.5	2084.88	10005.68	2085.02	10007.7	2085.08	10010.66	2085.18
10014.89	2085.32	10017.79	2085.42	10022.09	2085.57	10028.37	2085.76	10029.28	2085.79
10029.91	2085.81	10036.48	2085.97	10042.02	2086.07	10043.67	2086.11	10046.08	2086.13
10050.87	2086.21	10054.14	2086.23	10058.06	2086.27	10063.79	2086.32	10065.25	2086.33
10066.26	2086.34	10072.45	2086.41	10078.37	2086.47	10079.64	2086.48	10081.5	2086.5
10086.84	2086.58	10090.6	2086.61	10097.72	2086.66	10108.76	2086.76	10110.19	2086.8

10122.48 2087.3610135.77 2090.8210136.84 2091.1810137.46 2091.2210139.55 2091.41

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9206.22	.067	9319.79	.031	9440.2	.05	9886.17	.03	110110.19	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9236.48	10139.55	316	316	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

			Left OB	Channel	Right OB
E.G. Elev (ft)	2090.13	Element			
Vel Head (ft)	1.04	Wt. n-Val.		0.037	
W.S. Elev (ft)	2089.09	Reach Len. (ft)	316.00	316.00	316.00
Crit W.S. (ft)	2089.09	Flow Area (sq ft)		1758.60	
E.G. Slope (ft/ft)	0.009701	Area (sq ft)		1758.60	
Q Total (cfs)	14413.00	Flow (cfs)		14413.00	
Top Width (ft)	881.14	Top Width (ft)		881.14	
Vel Total (ft/s)	8.20	Avg. Vel. (ft/s)		8.20	
Max Chl Dpth (ft)	6.88	Hydr. Depth (ft)		2.00	
Conv. Total (cfs)	146335.2	Conv. (cfs)		146335.2	
Length Wtd. (ft)	316.00	Wetted Per. (ft)		883.41	
Min Ch El (ft)	2082.21	Shear (lb/sq ft)		1.21	
Alpha	1.00	Stream Power (lb/ft s)	10139.55	0.00	0.00
Frctn Loss (ft)	2.21	Cum Volume (acre-ft)	0.60	194.61	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.72	36.94	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #100-Sols FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	2090.13	Element			
Vel Head (ft)	1.04	Wt. n-Val.		0.037	
W.S. Elev (ft)	2089.09	Reach Len. (ft)	316.00	316.00	316.00
Crit W.S. (ft)	2089.09	Flow Area (sq ft)		1758.17	
E.G. Slope (ft/ft)	0.009706	Area (sq ft)		1758.17	
Q Total (cfs)	14413.00	Flow (cfs)		14413.00	
Top Width (ft)	881.13	Top Width (ft)		881.13	
Vel Total (ft/s)	8.20	Avg. Vel. (ft/s)		8.20	
Max Chl Dpth (ft)	6.88	Hydr. Depth (ft)		2.00	
Conv. Total (cfs)	146294.1	Conv. (cfs)		146294.1	
Length Wtd. (ft)	316.00	Wetted Per. (ft)		883.41	
Min Ch El (ft)	2082.21	Shear (lb/sq ft)		1.21	
Alpha	1.00	Stream Power (lb/ft s)	10139.55	0.00	0.00
Frctn Loss (ft)	2.21	Cum Volume (acre-ft)	0.51	194.59	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.14	36.94	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2088.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.03	Wt. n-Val.		0.036	
W.S. Elev (ft)	2087.40	Reach Len. (ft)	316.00	316.00	316.00
Crit W.S. (ft)	2087.30	Flow Area (sq ft)		827.57	
E.G. Slope (ft/ft)	0.011558	Area (sq ft)		827.57	
Q Total (cfs)	6725.00	Flow (cfs)		6725.00	
Top Width (ft)	360.00	Top Width (ft)		360.00	
Vel Total (ft/s)	8.13	Avg. Vel. (ft/s)		8.13	
Max Chl Dpth (ft)	5.19	Hydr. Depth (ft)		2.30	
Conv. Total (cfs)	62553.8	Conv. (cfs)		62553.8	
Length Wtd. (ft)	316.00	Wetted Per. (ft)		361.69	
Min Ch El (ft)	2082.21	Shear (lb/sq ft)		1.65	
Alpha	1.00	Stream Power (lb/ft s)	10139.55	0.00	0.00
Frctn Loss (ft)	3.13	Cum Volume (acre-ft)	0.28	107.36	
C & E Loss (ft)	0.01	Cum SA (acres)	0.09	29.35	

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2089.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.		0.036	
W.S. Elev (ft)	2088.85	Reach Len. (ft)	316.00	316.00	316.00
Crit W.S. (ft)	2088.85	Flow Area (sq ft)		1543.86	
E.G. Slope (ft/ft)	0.008680	Area (sq ft)		1543.86	
Q Total (cfs)	11927.00	Flow (cfs)		11927.00	
Top Width (ft)	871.25	Top Width (ft)		871.25	
Vel Total (ft/s)	7.73	Avg. Vel. (ft/s)		7.73	
Max Chl Dpth (ft)	6.64	Hydr. Depth (ft)		1.77	
Conv. Total (cfs)	128020.6	Conv. (cfs)		128020.6	
Length Wtd. (ft)	316.00	Wetted Per. (ft)		873.45	
Min Ch El (ft)	2082.21	Shear (lb/sq ft)		0.96	
Alpha	1.00	Stream Power (lb/ft s)	10139.55	0.00	0.00
Frctn Loss (ft)	2.41	Cum Volume (acre-ft)	0.45	167.59	0.01
C & E Loss (ft)	0.05	Cum SA (acres)	0.09	32.68	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2090.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.		0.037	
W.S. Elev (ft)	2089.59	Reach Len. (ft)	316.00	316.00	316.00
Crit W.S. (ft)	2089.59	Flow Area (sq ft)		2198.71	
E.G. Slope (ft/ft)	0.010823	Area (sq ft)		2198.71	
Q Total (cfs)	19986.00	Flow (cfs)		19986.00	
Top Width (ft)	884.47	Top Width (ft)		884.47	
Vel Total (ft/s)	9.09	Avg. Vel. (ft/s)		9.09	

Max Chl Dpth (ft)	7.38	Hydr. Depth (ft)		2.49		
Conv. Total (cfs)	192114.1	Conv. (cfs)		192114.1		
Length Wtd. (ft)	316.00	Wetted Per. (ft)		886.89		
Min Ch El (ft)	2082.21	Shear (lb/sq ft)		1.68		
Alpha	1.00	Stream Power (lb/ft s)	10139.55	0.00	0.00	
Frctn Loss (ft)	1.92	Cum Volume (acre-ft)	5.71	260.03	0.06	
C & E Loss (ft)	0.13	Cum SA (acres)	6.25	45.62	0.03	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9236.48	9296.69	830.28	179.46	49.71	5.76	3.69	4.63	2.19	10.12
2	Chan	9296.69	9356.89	4292.94	372.67	60.35	29.79	6.19	11.52	3.74	43.08
3	Chan	9356.89	9417.10	496.63	90.00	60.80	3.45	1.49	5.52	0.90	4.95
4	Chan	9417.10	9477.30	51.55	27.04	60.21	0.36	0.45	1.91	0.27	0.52
5	Chan	9477.30	9537.50	37.44	25.32	60.21	0.26	0.42	1.48	0.25	0.38
6	Chan	9537.50	9597.71	31.81	22.96	60.20	0.22	0.38	1.39	0.23	0.32
7	Chan	9597.71	9657.91	33.64	23.74	60.21	0.23	0.39	1.42	0.24	0.34
8	Chan	9657.91	9718.12	40.50	26.54	60.20	0.28	0.44	1.53	0.27	0.41
9	Chan	9718.12	9778.32	83.40	40.94	60.21	0.58	0.68	2.04	0.41	0.84
10	Chan	9778.32	9838.53	163.27	61.26	60.20	1.13	1.02	2.67	0.62	1.64
11	Chan	9838.53	9898.73	453.11	95.36	60.36	3.14	1.58	4.75	0.96	4.55
12	Chan	9898.73	9958.94	2788.40	252.58	60.30	19.35	4.20	11.04	2.54	28.00
13	Chan	9958.94	10019.14	2831.04	254.74	60.22	19.64	4.23	11.11	2.56	28.47
14	Chan	10019.14	10079.35	1584.36	179.82	60.22	10.99	2.99	8.81	1.81	15.93
15	Chan	10079.35	10139.55	694.62	106.17	50.02	4.82	2.13	6.54	1.29	8.41

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9236.48	9296.69	830.32	179.44	49.71	5.76	3.68	4.63	2.19	10.12
2	Chan	9296.69	9356.89	4293.44	372.64	60.35	29.79	6.19	11.52	3.74	43.11
3	Chan	9356.89	9417.10	496.48	89.97	60.80	3.44	1.49	5.52	0.90	4.95
4	Chan	9417.10	9477.30	51.47	27.01	60.21	0.36	0.45	1.91	0.27	0.52
5	Chan	9477.30	9537.50	37.37	25.29	60.21	0.26	0.42	1.48	0.25	0.38
6	Chan	9537.50	9597.71	31.75	22.93	60.20	0.22	0.38	1.38	0.23	0.32
7	Chan	9597.71	9657.91	33.58	23.71	60.21	0.23	0.39	1.42	0.24	0.34
8	Chan	9657.91	9718.12	40.43	26.51	60.20	0.28	0.44	1.53	0.27	0.41
9	Chan	9718.12	9778.32	83.32	40.91	60.21	0.58	0.68	2.04	0.41	0.84
10	Chan	9778.32	9838.53	163.18	61.23	60.20	1.13	1.02	2.66	0.62	1.64

11	Chan	9838.53	9898.73	453.02	95.33	60.36	3.14	1.58	4.75	0.96	4.55
12	Chan	9898.73	9958.94	2788.55	252.55	60.30	19.35	4.19	11.04	2.54	28.02
13	Chan	9958.94	10019.14	2831.20	254.71	60.22	19.64	4.23	11.12	2.56	28.49
14	Chan	10019.14	10079.35	1584.32	179.79	60.22	10.99	2.99	8.81	1.81	15.94
15	Chan	10079.35	10139.55	694.55	106.14	50.01	4.82	2.13	6.54	1.29	8.42

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9236.48	9296.69	385.21	101.39	44.63	5.73	2.31	3.80	1.64	6.23
2	Chan	9296.69	9356.89	2842.19	271.15	60.35	42.26	4.50	10.48	3.24	33.98
3	Chan	9356.89	9417.10	226.09	33.98	20.50	3.36	1.70	6.65	1.20	7.96
4	Chan	9417.10	9477.30							0.00	0.00
5	Chan	9477.30	9537.50							0.00	0.00
6	Chan	9537.50	9597.71							0.00	0.00
7	Chan	9597.71	9657.91							0.00	0.00
8	Chan	9657.91	9718.12							0.00	0.00
9	Chan	9718.12	9778.32							0.00	0.00
10	Chan	9778.32	9838.53							0.00	0.00
11	Chan	9838.53	9898.73	47.46	10.80	12.16	0.71	0.90	4.39	0.64	2.82
12	Chan	9898.73	9958.94	1323.90	151.05	60.30	19.69	2.51	8.76	1.81	15.84
13	Chan	9958.94	10019.14	1356.94	153.22	60.22	20.18	2.54	8.86	1.84	16.26
14	Chan	10019.14	10079.35	443.23	78.30	60.22	6.59	1.30	5.66	0.94	5.31
15	Chan	10079.35	10139.55	99.99	27.69	43.32	1.49	0.64	3.61	0.46	1.67

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9236.48	9296.69	699.75	167.65	48.97	5.87	3.49	4.17	1.85	7.74
2	Chan	9296.69	9356.89	3754.67	357.96	60.35	31.48	5.95	10.49	3.21	33.71
3	Chan	9356.89	9417.10	383.29	75.68	52.55	3.21	1.46	5.06	0.78	3.95
4	Chan	9417.10	9477.30	13.00	12.33	60.21	0.11	0.20	1.05	0.11	0.12
5	Chan	9477.30	9537.50	8.21	10.61	60.21	0.07	0.18	0.77	0.10	0.07
6	Chan	9537.50	9597.71	5.40	8.25	60.20	0.05	0.14	0.65	0.07	0.05
7	Chan	9597.71	9657.91	6.28	9.03	60.21	0.05	0.15	0.70	0.08	0.06
8	Chan	9657.91	9718.12	9.84	11.83	60.20	0.08	0.20	0.83	0.11	0.09
9	Chan	9718.12	9778.32	37.12	26.23	60.21	0.31	0.44	1.42	0.24	0.33
10	Chan	9778.32	9838.53	96.57	46.55	60.20	0.81	0.77	2.07	0.42	0.87
11	Chan	9838.53	9898.73	333.01	80.64	60.36	2.79	1.34	4.13	0.72	2.99
12	Chan	9898.73	9958.94	2358.38	237.86	60.30	19.77	3.95	9.91	2.14	21.19
13	Chan	9958.94	10019.14	2396.54	240.02	60.22	20.09	3.99	9.98	2.16	21.57
14	Chan	10019.14	10079.35	1284.60	165.11	60.22	10.77	2.74	7.78	1.49	11.56
15	Chan	10079.35	10139.55	540.36	94.12	49.05	4.53	1.93	5.74	1.04	5.97

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9236.48	9296.69	1095.68	204.09	51.21	5.48	4.07	5.37	2.69	14.46
2	Chan	9296.69	9356.89	5300.41	402.69	60.35	26.52	6.69	13.16	4.51	59.34
3	Chan	9356.89	9417.10	871.63	120.01	60.80	4.36	1.99	7.26	1.33	9.69
4	Chan	9417.10	9477.30	194.49	57.05	60.21	0.97	0.95	3.41	0.64	2.18
5	Chan	9477.30	9537.50	149.69	55.33	60.21	0.75	0.92	2.71	0.62	1.68
6	Chan	9537.50	9597.71	139.21	52.98	60.20	0.70	0.88	2.63	0.59	1.56
7	Chan	9597.71	9657.91	142.66	53.76	60.21	0.71	0.89	2.65	0.60	1.60
8	Chan	9657.91	9718.12	155.24	56.56	60.20	0.78	0.94	2.74	0.63	1.74
9	Chan	9718.12	9778.32	226.57	70.96	60.21	1.13	1.18	3.19	0.80	2.54
10	Chan	9778.32	9838.53	344.74	91.28	60.20	1.72	1.52	3.78	1.02	3.87
11	Chan	9838.53	9898.73	740.54	125.37	60.36	3.71	2.08	5.91	1.40	8.29
12	Chan	9898.73	9958.94	3652.67	282.59	60.30	18.28	4.69	12.93	3.17	40.93
13	Chan	9958.94	10019.14	3702.97	284.75	60.22	18.53	4.73	13.00	3.20	41.55
14	Chan	10019.14	10079.35	2226.21	209.83	60.22	11.14	3.49	10.61	2.35	24.98
15	Chan	10079.35	10139.55	1043.28	131.46	51.99	5.22	2.54	7.94	1.71	13.56

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 1.081

INPUT
Description:
Station Elevation Data num= 196

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9158.15	2086.71	9165.61	2086.74	9165.65	2086.74	9165.73	2086.74	9173.16	2086.7
9176.69	2086.66	9180.66	2086.58	9192.94	2086.15	9201.35	2085.94	9209.79	2083.25
9219.48	2080	9299.78	2080	9353.91	2082.88	9361.84	2083.6	9377.23	2085.24
9383.25	2085.92	9387.12	2086.14	9390.75	2086.25	9398.2	2086.41	9398.26	2086.41
9398.38	2086.42	9405.76	2086.49	9409.27	2086.52	9413.26	2086.53	9420.35	2086.56
9420.77	2086.56	9421.64	2086.56	9428.27	2086.57	9431.42	2086.57	9435.77	2086.57
9442.5	2086.56	9443.28	2086.55	9444.91	2086.55	9450.78	2086.52	9453.57	2086.51
9458.28	2086.48	9464.65	2086.45	9465.79	2086.45	9468.17	2086.43	9473.29	2086.4
9475.72	2086.39	9480.79	2086.36	9486.8	2086.33	9488.3	2086.32	9491.44	2086.31
9495.8	2086.29	9497.88	2086.28	9503.3	2086.26	9508.95	2086.25	9510.81	2086.25
9514.7	2086.25	9518.31	2086.24	9520.03	2086.24	9525.81	2086.24	9531.1	2086.25
9533.32	2086.25	9537.97	2086.25	9540.82	2086.25	9542.18	2086.26	9548.32	2086.27
9549.21	2086.27	9553.27	2086.28	9555.8	2086.28	9560.98	2086.29	9563.28	2086.3

9564.4	2086.3	9570.75	2086.32	9575.53	2086.34	9578.23	2086.34	9583.75	2086.36
9585.71	2086.37	9586.66	2086.37	9593.18	2086.39	9597.8	2086.41	9600.66	2086.42
9606.52	2086.43	9608.14	2086.44	9608.93	2086.44	9615.61	2086.46	9620.06	2086.47
9623.09	2086.48	9629.29	2086.5	9630.56	2086.5	9631.19	2086.5	9638.04	2086.52
9642.32	2086.52	9645.52	2086.53	9652.05	2086.53	9653.45	2086.53	9654.78	2086.54
9664.58	2086.54	9674.82	2086.54	9675.61	2086.52	9680.84	2086.39	9685.46	2086.27
9686.15	2086.25	9693.1	2086.24	9696.5	2086.22	9700.58	2086.22	9707.63	2086.19
9708.05	2086.19	9708.92	2086.19	9715.53	2086.17	9718.76	2086.16	9723.01	2086.15
9729.89	2086.13	9730.48	2086.13	9731.69	2086.13	9737.96	2086.12	9741.02	2086.12
9745.43	2086.12	9752.15	2086.13	9752.91	2086.13	9754.46	2086.14	9760.39	2086.15
9763.28	2086.16	9767.86	2086.18	9774.41	2086.21	9775.34	2086.21	9777.23	2086.22
9782.81	2086.25	9785.54	2086.26	9790.29	2086.27	9796.68	2086.3	9797.77	2086.3
9800	2086.3	9805.24	2086.32	9807.81	2086.32	9812.72	2086.34	9818.94	2086.34
9820.2	2086.34	9822.77	2086.34	9827.67	2086.34	9830.07	2086.33	9835.15	2086.33
9841.2	2086.3	9842.62	2086.3	9845.54	2086.28	9850.1	2086.25	9852.33	2086.23
9857.58	2086.17	9857.97	2086.16	9863.46	2086.09	9865.05	2086.06	9868.31	2086
9872.53	2085.93	9874.59	2085.88	9880.01	2085.75	9885.72	2085.59	9887.48	2085.53
9891.08	2085.39	9894.96	2085.24	9896.85	2085.16	9902.43	2085.2	9916.79	2086.01
9921.58	2086.29	9935.52	2082.66	9936.28	2082.44	9937.26	2082.48	9952.51	2082.96
9954.77	2082.98	9959.39	2083.03	9962.24	2083.09	9963.64	2083.08	9969.72	2083.01
9974.77	2082.94	9977.2	2082.91	9982.16	2082.84	9984.67	2082.8	9985.9	2082.78
9992.15	2082.67	9997.03	2082.58	9999.62	2082.52	10000	2082.51	10004.85	2082.4
10007.08	2082.34	10008.2	2082.31	10014.54	2082.12	10019.37	2081.96	10021.99	2081.86
10027.24	2081.69	10029.45	2081.61	10030.55	2081.57	10036.9	2081.41	10041.73	2081.47
10044.36	2081.48	10049.63	2081.47	10051.81	2081.41	10055.05	2081.42	10070.43	2081.09
10081.87	2087.17	10084.75	2088.8	10088.9	2089.06	10094.32	2089.2	10104	2089.65
10110.3	2089.48								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9158.15	.031	9377.23	.05	9921.58	.031

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9180.66	10104	315	315	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2087.63	Element	Left OB	Channel	Right OB	
Vel Head (ft)	1.18	Wt. n-Val.		0.031		
W.S. Elev (ft)	2086.45	Reach Len. (ft)	315.00	315.00	315.00	
Crit W.S. (ft)	2085.82	Flow Area (sq ft)		1653.81		
E.G. Slope (ft/ft)	0.005277	Area (sq ft)		1653.81		
Q Total (cfs)	14413.00	Flow (cfs)		14413.00		
Top Width (ft)	769.52	Top Width (ft)		769.52		
Vel Total (ft/s)	8.72	Avg. Vel. (ft/s)		8.72		
Max Chl Dpth (ft)	6.45	Hydr. Depth (ft)		2.15		
Conv. Total (cfs)	198417.8	Conv. (cfs)		198417.8		
Length Wtd. (ft)	315.00	Wetted Per. (ft)		772.64		
Min Ch El (ft)	2080.00	Shear (lb/sq ft)		0.71		
Alpha	1.00	Stream Power (lb/ft s)	10110.30	0.00	0.00	
Frctn Loss (ft)	2.44	Cum Volume (acre-ft)	0.60	182.23	0.02	
C & E Loss (ft)	0.08	Cum SA (acres)	0.72	30.95	0.03	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2087.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.18	Wt. n-Val.		0.031	
W.S. Elev (ft)	2086.45	Reach Len. (ft)	315.00	315.00	315.00
Crit W.S. (ft)	2085.82	Flow Area (sq ft)		1654.37	
E.G. Slope (ft/ft)	0.005274	Area (sq ft)		1654.37	
Q Total (cfs)	14413.00	Flow (cfs)		14413.00	
Top Width (ft)	770.05	Top Width (ft)		770.05	
Vel Total (ft/s)	8.71	Avg. Vel. (ft/s)		8.71	
Max Chl Dpth (ft)	6.45	Hydr. Depth (ft)		2.15	
Conv. Total (cfs)	198468.1	Conv. (cfs)		198468.1	
Length Wtd. (ft)	315.00	Wetted Per. (ft)		773.17	
Min Ch El (ft)	2080.00	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)	10110.30	0.00	0.00
Frctn Loss (ft)	2.44	Cum Volume (acre-ft)	0.51	182.21	0.02
C & E Loss (ft)	0.09	Cum SA (acres)	0.14	30.95	0.03

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2085.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.15	Wt. n-Val.		0.031	
W.S. Elev (ft)	2084.14	Reach Len. (ft)	315.00	315.00	315.00
Crit W.S. (ft)	2084.04	Flow Area (sq ft)		781.91	
E.G. Slope (ft/ft)	0.008600	Area (sq ft)		781.91	
Q Total (cfs)	6725.00	Flow (cfs)		6725.00	
Top Width (ft)	306.15	Top Width (ft)		306.15	
Vel Total (ft/s)	8.60	Avg. Vel. (ft/s)		8.60	
Max Chl Dpth (ft)	4.14	Hydr. Depth (ft)		2.55	
Conv. Total (cfs)	72515.5	Conv. (cfs)		72515.5	
Length Wtd. (ft)	315.00	Wetted Per. (ft)		307.97	
Min Ch El (ft)	2080.00	Shear (lb/sq ft)		1.36	
Alpha	1.00	Stream Power (lb/ft s)	10110.30	0.00	0.00
Frctn Loss (ft)	2.88	Cum Volume (acre-ft)	0.28	101.52	
C & E Loss (ft)	0.01	Cum SA (acres)	0.09	26.94	

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2086.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.42	Wt. n-Val.		0.031	
W.S. Elev (ft)	2085.57	Reach Len. (ft)	315.00	315.00	315.00
Crit W.S. (ft)	2085.25	Flow Area (sq ft)		1245.08	
E.G. Slope (ft/ft)	0.006768	Area (sq ft)		1245.08	
Q Total (cfs)	11927.00	Flow (cfs)		11927.00	
Top Width (ft)	354.76	Top Width (ft)		354.76	
Vel Total (ft/s)	9.58	Avg. Vel. (ft/s)		9.58	
Max Chl Dpth (ft)	5.57	Hydr. Depth (ft)		3.51	
Conv. Total (cfs)	144978.9	Conv. (cfs)		144978.9	
Length Wtd. (ft)	315.00	Wetted Per. (ft)		357.44	
Min Ch El (ft)	2080.00	Shear (lb/sq ft)		1.47	

Alpha	1.00	Stream Power (lb/ft s)	10110.30	0.00	0.00
Frctn Loss (ft)	2.63	Cum Volume (acre-ft)	0.45	157.48	0.01
C & E Loss (ft)	0.04	Cum SA (acres)	0.09	28.23	0.03

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2088.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.	0.031	0.033	
W.S. Elev (ft)	2087.64	Reach Len. (ft)	315.00	315.00	315.00
Crit W.S. (ft)		Flow Area (sq ft)	21.21	2713.61	
E.G. Slope (ft/ft)	0.003900	Area (sq ft)	21.21	2713.61	
Q Total (cfs)	19986.00	Flow (cfs)	59.37	19926.63	
Top Width (ft)	924.55	Top Width (ft)	22.51	902.04	
Vel Total (ft/s)	7.31	Avg. Vel. (ft/s)	2.80	7.34	
Max Chl Dpth (ft)	7.64	Hydr. Depth (ft)	0.94	3.01	
Conv. Total (cfs)	320052.1	Conv. (cfs)	950.8	319101.3	
Length Wtd. (ft)	315.00	Wetted Per. (ft)	23.44	905.47	
Min Ch El (ft)	2080.00	Shear (lb/sq ft)	0.22	0.73	
Alpha	1.01	Stream Power (lb/ft s)	10110.30	0.00	0.00
Frctn Loss (ft)	2.39	Cum Volume (acre-ft)	5.63	242.21	0.06
C & E Loss (ft)	0.04	Cum SA (acres)	6.17	39.14	0.03

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9180.66	9242.22	1700.59	213.96	58.90	11.80	3.69	7.95	1.20	9.51
2	Chan	9242.22	9303.77	4623.32	396.84	61.56	32.08	6.45	11.65	2.12	24.74
3	Chan	9303.77	9365.33	2595.03	280.84	61.68	18.00	4.56	9.24	1.50	13.86
4	Chan	9365.33	9426.88	120.23	30.82	36.72	0.83	0.84	3.90	0.28	1.08
5	Chan	9426.88	9488.44	0.56	1.64	24.57	0.00	0.07	0.34	0.02	0.01
6	Chan	9488.44	9550.00	8.29	11.90	61.56	0.06	0.19	0.70	0.06	0.04
7	Chan	9550.00	9611.55	2.75	6.14	61.56	0.02	0.10	0.45	0.03	0.01
8	Chan	9611.55	9673.11	0.00	0.01	1.94	0.00	0.00	0.04	0.00	0.00
9	Chan	9673.11	9734.66	11.21	13.77	56.39	0.08	0.24	0.81	0.08	0.07
10	Chan	9734.66	9796.22	14.39	16.56	61.56	0.10	0.27	0.87	0.09	0.08
11	Chan	9796.22	9857.78	5.35	9.15	61.56	0.04	0.15	0.59	0.05	0.03
12	Chan	9857.78	9919.33	82.25	47.14	61.60	0.57	0.77	1.74	0.25	0.44
13	Chan	9919.33	9980.89	1376.85	190.14	62.07	9.55	3.09	7.24	1.01	7.31
14	Chan	9980.89	10042.44	2356.06	264.85	61.58	16.35	4.30	8.90	1.42	12.60
15	Chan	10042.44	10104.00	1516.10	170.07	39.42	10.52	4.47	8.91	1.42	12.67

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9180.66	9242.22	1700.30	214.00	58.92	11.80	3.69	7.95	1.20	9.50
2	Chan	9242.22	9303.77	4622.99	396.88	61.56	32.08	6.45	11.65	2.12	24.72
3	Chan	9303.77	9365.33	2595.05	280.88	61.68	18.00	4.56	9.24	1.50	13.85
4	Chan	9365.33	9426.88	120.29	30.85	36.79	0.83	0.84	3.90	0.28	1.08
5	Chan	9426.88	9488.44	0.57	1.66	24.72	0.00	0.07	0.34	0.02	0.01
6	Chan	9488.44	9550.00	8.34	11.94	61.56	0.06	0.19	0.70	0.06	0.04
7	Chan	9550.00	9611.55	2.78	6.18	61.56	0.02	0.10	0.45	0.03	0.01
8	Chan	9611.55	9673.11	0.00	0.01	2.18	0.00	0.00	0.05	0.00	0.00
9	Chan	9673.11	9734.66	11.26	13.81	56.42	0.08	0.24	0.82	0.08	0.07
10	Chan	9734.66	9796.22	14.45	16.60	61.56	0.10	0.27	0.87	0.09	0.08
11	Chan	9796.22	9857.78	5.40	9.20	61.56	0.04	0.15	0.59	0.05	0.03
12	Chan	9857.78	9919.33	82.36	47.19	61.60	0.57	0.77	1.75	0.25	0.44
13	Chan	9919.33	9980.89	1377.02	190.19	62.07	9.55	3.09	7.24	1.01	7.30
14	Chan	9980.89	10042.44	2356.12	264.89	61.58	16.35	4.30	8.89	1.42	12.60
15	Chan	10042.44	10104.00	1516.08	170.10	39.42	10.52	4.47	8.91	1.42	12.66

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9180.66	9242.22	1136.12	119.56	35.87	16.89	3.40	9.50	1.79	17.01
2	Chan	9242.22	9303.77	2784.59	254.11	61.56	41.41	4.13	10.96	2.22	24.29
3	Chan	9303.77	9365.33	1006.70	138.11	61.68	14.97	2.24	7.29	1.20	8.76
4	Chan	9365.33	9426.88	0.10	0.13	1.54	0.00	0.08	0.80	0.04	0.03
5	Chan	9426.88	9488.44							0.00	0.00
6	Chan	9488.44	9550.00							0.00	0.00
7	Chan	9550.00	9611.55							0.00	0.00
8	Chan	9611.55	9673.11							0.00	0.00
9	Chan	9673.11	9734.66							0.00	0.00
10	Chan	9734.66	9796.22							0.00	0.00
11	Chan	9796.22	9857.78							0.00	0.00
12	Chan	9857.78	9919.33							0.00	0.00
13	Chan	9919.33	9980.89	291.94	61.03	51.26	4.34	1.20	4.78	0.64	3.06
14	Chan	9980.89	10042.44	820.92	122.12	61.58	12.21	1.98	6.72	1.06	7.16
15	Chan	10042.44	10104.00	684.63	86.84	34.48	10.18	2.58	7.88	1.35	10.66

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9180.66	9242.22	1735.21	173.26	40.59	14.55	4.36	10.01	1.80	18.06
2	Chan	9242.22	9303.77	4090.43	342.38	61.56	34.30	5.56	11.95	2.35	28.07
3	Chan	9303.77	9365.33	2050.06	226.38	61.68	17.19	3.68	9.06	1.55	14.04
4	Chan	9365.33	9426.88	42.72	11.94	14.90	0.36	0.81	3.58	0.34	1.21
5	Chan	9426.88	9488.44							0.00	0.00

6	Chan	9488.44	9550.00							0.00	0.00
7	Chan	9550.00	9611.55							0.00	0.00
8	Chan	9611.55	9673.11							0.00	0.00
9	Chan	9673.11	9734.66							0.00	0.00
10	Chan	9734.66	9796.22							0.00	0.00
11	Chan	9796.22	9857.78							0.00	0.00
12	Chan	9857.78	9919.33	5.01	5.47	22.65	0.04	0.24	0.92	0.10	0.09
13	Chan	9919.33	9980.89	949.25	138.15	56.95	7.96	2.44	6.87	1.02	7.04
14	Chan	9980.89	10042.44	1816.42	210.38	61.58	15.23	3.42	8.63	1.44	12.46
15	Chan	10042.44	10104.00	1237.92	137.12	37.53	10.38	3.77	9.03	1.54	13.94

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9158.15	9159.65	2.84	1.39	2.43	0.01	0.93	2.04	0.14	0.28
2	LOB	9159.65	9161.15	3.87	1.38	1.50	0.02	0.92	2.80	0.22	0.63
3	LOB	9161.15	9162.65	3.84	1.37	1.50	0.02	0.91	2.79	0.22	0.62
4	LOB	9162.65	9164.15	3.79	1.36	1.50	0.02	0.91	2.78	0.22	0.62
5	LOB	9164.15	9165.65	3.75	1.35	1.50	0.02	0.90	2.77	0.22	0.61
6	LOB	9165.65	9167.15	3.76	1.36	1.50	0.02	0.90	2.77	0.22	0.61
7	LOB	9167.15	9168.66	3.81	1.37	1.50	0.02	0.91	2.79	0.22	0.62
8	LOB	9168.66	9170.16	3.87	1.38	1.50	0.02	0.92	2.80	0.22	0.63
9	LOB	9170.16	9171.66	3.93	1.39	1.50	0.02	0.93	2.82	0.23	0.64
10	LOB	9171.66	9173.16	3.98	1.40	1.50	0.02	0.94	2.84	0.23	0.65
11	LOB	9173.16	9174.66	4.07	1.42	1.50	0.02	0.95	2.86	0.23	0.66
12	LOB	9174.66	9176.16	4.19	1.45	1.50	0.02	0.97	2.89	0.24	0.68
13	LOB	9176.16	9177.66	4.34	1.48	1.50	0.02	0.99	2.93	0.24	0.70
14	LOB	9177.66	9179.16	4.55	1.52	1.50	0.02	1.01	2.99	0.25	0.74
15	LOB	9179.16	9180.66	4.78	1.57	1.50	0.02	1.04	3.05	0.25	0.78
16	Chan	9180.66	9242.22	2319.49	286.75	62.51	11.61	4.66	8.09	1.12	9.03
17	Chan	9242.22	9303.77	5336.77	469.86	61.56	26.70	7.63	11.36	1.86	21.10
18	Chan	9303.77	9365.33	3322.76	353.86	61.68	16.63	5.75	9.39	1.40	13.11
19	Chan	9365.33	9426.88	365.15	101.94	61.67	1.83	1.66	3.58	0.40	1.44
20	Chan	9426.88	9488.44	144.28	71.73	61.56	0.72	1.17	2.01	0.28	0.57
21	Chan	9488.44	9550.00	191.17	84.92	61.56	0.96	1.38	2.25	0.34	0.76
22	Chan	9550.00	9611.55	170.05	79.16	61.56	0.85	1.29	2.15	0.31	0.67
23	Chan	9611.55	9673.11	136.55	69.40	61.56	0.68	1.13	1.97	0.27	0.54
24	Chan	9673.11	9734.66	197.10	86.49	61.56	0.99	1.41	2.28	0.34	0.78
25	Chan	9734.66	9796.22	208.99	89.58	61.56	1.05	1.46	2.33	0.35	0.83
26	Chan	9796.22	9857.78	180.98	82.17	61.56	0.91	1.33	2.20	0.32	0.72
27	Chan	9857.78	9919.33	340.80	120.16	61.60	1.71	1.95	2.84	0.47	1.35
28	Chan	9919.33	9980.89	2036.05	263.16	62.07	10.19	4.28	7.74	1.03	7.99
29	Chan	9980.89	10042.44	3079.71	337.87	61.58	15.41	5.49	9.12	1.34	12.18
30	Chan	10042.44	10104.00	1896.77	216.56	41.90	9.49	5.38	8.76	1.26	11.02

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Sols Wash

REACH: Sols Wash Main RS: 1.021

INPUT
Description:
Station Elevation Data num= 167

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9190	2084	9277	2083	9297	2077	9345	2077.1	9402	2077
9420	2083	9429.65	2083.8	9435.84	2083.85	9436.88	2083.86	9438.47	2083.87
9444.1	2083.89	9447.78	2083.9	9451.33	2083.9	9456.77	2083.9	9458.56	2083.9
9459.72	2083.9	9465.78	2083.91	9471.66	2083.91	9473.01	2083.91	9475.08	2083.91
9480.23	2083.91	9483.6	2083.91	9487.46	2083.9	9493.38	2083.89	9494.69	2083.89
9495.54	2083.88	9501.91	2083.86	9507.48	2083.84	9509.14	2083.83	9511.68	2083.83
9516.36	2083.81	9519.42	2083.81	9523.59	2083.81	9529.99	2083.82	9530.82	2083.82
9531.36	2083.82	9538.04	2083.85	9543.29	2083.87	9545.27	2083.88	9548.29	2083.9
9552.49	2083.92	9555.23	2083.93	9559.72	2083.95	9566.6	2083.98	9566.95	2083.98
9567.17	2083.99	9574.17	2084.01	9579.11	2084.03	9581.4	2084.04	9584.9	2084.06
9588.62	2084.07	9591.05	2084.08	9591.95	2084.08	9596.01	2084.09	9602.15	2084.11
9603.54	2084.11	9606.52	2084.12	9611.07	2084.13	9613.18	2084.13	9618.59	2084.14
9624.21	2084.14	9626.12	2084.13	9630.22	2084.12	9633.65	2084.12	9635.24	2084.11
9641.17	2084.09	9646.27	2084.07	9648.7	2084.05	9653.92	2084.01	9656.23	2084
9657.3	2084	9663.75	2083.96	9668.33	2083.93	9671.28	2083.91	9677.62	2083.88
9678.81	2083.88	9679.36	2083.87	9686.33	2083.86	9690.39	2083.85	9693.86	2083.85
9701.32	2083.86	9701.39	2083.86	9701.42	2083.86	9708.92	2083.88	9712.45	2083.89
9716.44	2083.91	9723.48	2083.94	9723.97	2083.95	9725.02	2083.95	9731.5	2083.98
9734.51	2084	9739.02	2084.01	9745.54	2084.03	9746.55	2084.03	9748.72	2084.04
9754.08	2084.05	9756.57	2084.05	9761.6	2084.05	9767.6	2084.06	9769.13	2084.05
9772.42	2084.05	9776.66	2084.05	9778.63	2084.05	9784.18	2084.04	9789.66	2084.04
9791.71	2084.03	9796.12	2084.04	9799.24	2084.04	9800.69	2084.05	9806.77	2084.07
9811.72	2084.11	9814.29	2084.14	9819.82	2084.21	9821.82	2084.23	9822.75	2084.24
9829.35	2084.33	9833.78	2084.4	9836.87	2084.44	9843.52	2084.5	9844.4	2084.51
9844.81	2084.51	9851.93	2084.54	9855.84	2084.53	9859.68	2084.51	9866.87	2084.45
9866.99	2084.45	9867.22	2084.44	9874.51	2084.33	9877.9	2084.28	9882.04	2084.21
9888.93	2084.09	9890.69	2084.03	9904.03	2083.61	9914.62	2083.27	9919.67	2083.09
9922.03	2082.99	9931.23	2082.79	9940.97	2082.36	9948.26	2080.74	9954.69	2078.77
9964.15	2079.2	9972.36	2079.51	9977.17	2079.62	9979.89	2079.65	9985.72	2079.64
9987.42	2079.64	9988.2	2079.63	9994.94	2079.49	9999.23	2079.36	10000	2079.33
10002.49	2079.23	10009.78	2078.91	10010.06	2078.88	10010.18	2078.88	10017.64	2078.54
10021.13	2078.41	10025.21	2078.31	10032.07	2078.21	10032.79	2078.21	10034.4	2078.13
10040.36	2077.95	10044.59	2077.76	10058.39	2077.05	10066.67	2083.87	10070.44	2087.42
10082.15	2088.32	10088.7	2088.59						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9190	.069	9297	.03	9402	.05	9859.68	.067	9940.97	.031
10070.44	.05								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
927	10066.67	351	351	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2085.11	Element	Left OB	Channel	Right OB	
Vel Head (ft)	2.03	Wt. n-Val.	0.069	0.038		
W.S. Elev (ft)	2083.08	Reach Len. (ft)	351.00	351.00	351.00	
Crit W.S. (ft)	2082.93	Flow Area (sq ft)	0.28	1261.31		
E.G. Slope (ft/ft)	0.012476	Area (sq ft)	0.28	1261.31		
Q Total (cfs)	14413.00	Flow (cfs)	0.08	14412.92		
Top Width (ft)	296.68	Top Width (ft)	6.92	289.75		
Vel Total (ft/s)	11.42	Avg. Vel. (ft/s)	0.28	11.43		
Max Chl Dpth (ft)	6.08	Hydr. Depth (ft)	0.04	4.35		
Conv. Total (cfs)	129036.7	Conv. (cfs)	0.7	129036.0		
Length Wtd. (ft)	351.00	Wetted Per. (ft)	6.92	294.33		

Min Ch El (ft)	2077.00	Shear (lb/sq ft)	0.03	3.34	
Alpha	1.00	Stream Power (lb/ft s)	10088.70	0.00	0.00
Frctn Loss (ft)	3.26	Cum Volume (acre-ft)	0.60	171.69	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.69	27.12	0.03

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2085.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.03	Wt. n-Val.	0.069	0.038	
W.S. Elev (ft)	2083.08	Reach Len. (ft)	351.00	351.00	351.00
Crit W.S. (ft)	2082.94	Flow Area (sq ft)	0.27	1260.96	
E.G. Slope (ft/ft)	0.012483	Area (sq ft)	0.27	1260.96	
Q Total (cfs)	14413.00	Flow (cfs)	0.07	14412.93	
Top Width (ft)	296.53	Top Width (ft)	6.82	289.71	
Vel Total (ft/s)	11.43	Avg. Vel. (ft/s)	0.28	11.43	
Max Chl Dpth (ft)	6.08	Hydr. Depth (ft)	0.04	4.35	
Conv. Total (cfs)	129002.8	Conv. (cfs)	0.7	129002.1	
Length Wtd. (ft)	351.00	Wetted Per. (ft)	6.82	294.29	
Min Ch El (ft)	2077.00	Shear (lb/sq ft)	0.03	3.34	
Alpha	1.00	Stream Power (lb/ft s)	10088.70	0.00	0.00
Frctn Loss (ft)	3.26	Cum Volume (acre-ft)	0.51	171.67	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.12	27.12	0.03

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2082.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.23	Wt. n-Val.		0.034	
W.S. Elev (ft)	2081.16	Reach Len. (ft)	351.00	351.00	351.00
Crit W.S. (ft)	2080.93	Flow Area (sq ft)		756.14	
E.G. Slope (ft/ft)	0.009762	Area (sq ft)		756.14	
Q Total (cfs)	6725.00	Flow (cfs)		6725.00	
Top Width (ft)	248.33	Top Width (ft)		248.33	
Vel Total (ft/s)	8.89	Avg. Vel. (ft/s)		8.89	
Max Chl Dpth (ft)	4.16	Hydr. Depth (ft)		3.04	
Conv. Total (cfs)	68064.0	Conv. (cfs)		68064.0	
Length Wtd. (ft)	351.00	Wetted Per. (ft)		251.50	
Min Ch El (ft)	2077.00	Shear (lb/sq ft)		1.83	
Alpha	1.00	Stream Power (lb/ft s)	10088.70	0.00	0.00
Frctn Loss (ft)	3.26	Cum Volume (acre-ft)	0.28	95.96	
C & E Loss (ft)	0.02	Cum SA (acres)	0.09	24.93	

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2084.32	Element	Left OB	Channel	Right OB

Vel Head (ft)	1.83	Wt. n-Val.		0.036	
W.S. Elev (ft)	2082.49	Reach Len. (ft)	351.00	351.00	351.00
Crit W.S. (ft)	2082.29	Flow Area (sq ft)		1098.28	
E.G. Slope (ft/ft)	0.010538	Area (sq ft)		1098.28	
Q Total (cfs)	11927.00	Flow (cfs)		11927.00	
Top Width (ft)	266.78	Top Width (ft)		266.78	
Vel Total (ft/s)	10.86	Avg. Vel. (ft/s)		10.86	
Max Chl Dpth (ft)	5.49	Hydr. Depth (ft)		4.12	
Conv. Total (cfs)	116182.9	Conv. (cfs)		116182.9	
Length Wtd. (ft)	351.00	Wetted Per. (ft)		270.98	
Min Ch El (ft)	2077.00	Shear (lb/sq ft)		2.67	
Alpha	1.00	Stream Power (lb/ft s)	10088.70	0.00	0.00
Frctn Loss (ft)	3.22	Cum Volume (acre-ft)	0.45	149.01	0.01
C & E Loss (ft)	0.02	Cum SA (acres)	0.09	25.99	0.03

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2086.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.21	Wt. n-Val.	0.069	0.047	0.031
W.S. Elev (ft)	2084.84	Reach Len. (ft)	351.00	351.00	351.00
Crit W.S. (ft)	2084.76	Flow Area (sq ft)	116.74	2195.99	0.50
E.G. Slope (ft/ft)	0.020671	Area (sq ft)	116.74	2195.99	0.50
Q Total (cfs)	19986.00	Flow (cfs)	436.87	19547.40	1.73
Top Width (ft)	877.70	Top Width (ft)	87.00	789.67	1.03
Vel Total (ft/s)	8.64	Avg. Vel. (ft/s)	3.74	8.90	3.45
Max Chl Dpth (ft)	7.84	Hydr. Depth (ft)	1.34	2.78	0.49
Conv. Total (cfs)	139008.2	Conv. (cfs)	3038.6	135957.6	12.0
Length Wtd. (ft)	351.00	Wetted Per. (ft)	87.85	794.59	1.42
Min Ch El (ft)	2077.00	Shear (lb/sq ft)	1.71	3.57	0.46
Alpha	1.04	Stream Power (lb/ft s)	10088.70	0.00	0.00
Frctn Loss (ft)	3.07	Cum Volume (acre-ft)	5.13	224.46	0.06
C & E Loss (ft)	0.02	Cum SA (acres)	5.78	33.02	0.03

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9265.40	9271.20	0.00	0.01	1.12	0.00	0.01	0.08	0.01	0.00
2	LOB	9271.20	9277.00	0.08	0.27	5.80	0.00	0.05	0.29	0.04	0.01
3	Chan	9277.00	9329.65	2959.21	258.95	53.53	20.53	4.92	11.43	3.77	43.06
4	Chan	9329.65	9382.29	4355.75	316.25	52.64	30.22	6.01	13.77	4.68	64.44
5	Chan	9382.29	9434.93	1930.19	174.96	39.65	13.39	4.52	11.03	3.44	37.92
6	Chan	9434.93	9487.58							0.00	0.00
7	Chan	9487.58	9540.22							0.00	0.00
8	Chan	9540.22	9592.87							0.00	0.00
9	Chan	9592.87	9645.51							0.00	0.00
10	Chan	9645.51	9698.16							0.00	0.00
11	Chan	9698.16	9750.80							0.00	0.00

12	Chan	9750.80	9803.45							0.00	0.00
13	Chan	9803.45	9856.09							0.00	0.00
14	Chan	9856.09	9908.74							0.00	0.00
15	Chan	9908.74	9961.38	499.58	67.10	41.96	3.47	1.62	7.45	1.25	9.27
16	Chan	9961.38	10014.03	1890.20	195.50	52.67	13.11	3.71	9.67	2.89	27.95
17	Chan	10014.03	10066.67	2777.99	248.55	53.88	19.27	4.81	11.18	3.59	40.16

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9265.40	9271.20	0.00	0.01	1.02	0.00	0.01	0.07	0.00	0.00
2	LOB	9271.20	9277.00	0.07	0.26	5.80	0.00	0.05	0.28	0.04	0.01
3	Chan	9277.00	9329.65	2959.31	258.88	53.53	20.53	4.92	11.43	3.77	43.09
4	Chan	9329.65	9382.29	4355.99	316.19	52.64	30.22	6.01	13.78	4.68	64.48
5	Chan	9382.29	9434.93	1930.35	174.92	39.63	13.39	4.52	11.04	3.44	37.96
6	Chan	9434.93	9487.58							0.00	0.00
7	Chan	9487.58	9540.22							0.00	0.00
8	Chan	9540.22	9592.87							0.00	0.00
9	Chan	9592.87	9645.51							0.00	0.00
10	Chan	9645.51	9698.16							0.00	0.00
11	Chan	9698.16	9750.80							0.00	0.00
12	Chan	9750.80	9803.45							0.00	0.00
13	Chan	9803.45	9856.09							0.00	0.00
14	Chan	9856.09	9908.74							0.00	0.00
15	Chan	9908.74	9961.38	499.40	67.05	41.93	3.46	1.62	7.45	1.25	9.28
16	Chan	9961.38	10014.03	1889.91	195.43	52.67	13.11	3.71	9.67	2.89	27.96
17	Chan	10014.03	10066.67	2777.96	248.49	53.88	19.27	4.81	11.18	3.59	40.18

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9277.00	9329.65	1518.74	163.41	47.11	22.58	3.51	9.29	2.11	19.65
2	Chan	9329.65	9382.29	2280.87	215.06	52.64	33.92	4.09	10.61	2.49	26.41
3	Chan	9382.29	9434.93	974.74	107.53	32.86	14.49	3.34	9.06	1.99	18.08
4	Chan	9434.93	9487.58							0.00	0.00
5	Chan	9487.58	9540.22							0.00	0.00
6	Chan	9540.22	9592.87							0.00	0.00
7	Chan	9592.87	9645.51							0.00	0.00
8	Chan	9645.51	9698.16							0.00	0.00
9	Chan	9698.16	9750.80							0.00	0.00
10	Chan	9750.80	9803.45							0.00	0.00
11	Chan	9803.45	9856.09							0.00	0.00
12	Chan	9856.09	9908.74							0.00	0.00
13	Chan	9908.74	9961.38	133.19	24.37	15.35	1.98	1.62	5.47	0.97	5.29
14	Chan	9961.38	10014.03	558.48	94.31	52.67	8.30	1.79	5.92	1.09	6.46
15	Chan	10014.03	10066.67	1258.98	151.45	50.86	18.72	3.07	8.31	1.81	15.09

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9277.00	9329.65	2506.31	228.41	51.76	21.01	4.48	10.97	2.90	31.86
2	Chan	9329.65	9382.29	3714.71	285.29	52.64	31.15	5.42	13.02	3.57	46.42
3	Chan	9382.29	9434.93	1631.27	153.13	37.08	13.68	4.23	10.65	2.72	28.95
4	Chan	9434.93	9487.58							0.00	0.00
5	Chan	9487.58	9540.22							0.00	0.00
6	Chan	9540.22	9592.87							0.00	0.00
7	Chan	9592.87	9645.51							0.00	0.00
8	Chan	9645.51	9698.16							0.00	0.00
9	Chan	9698.16	9750.80							0.00	0.00
10	Chan	9750.80	9803.45							0.00	0.00
11	Chan	9803.45	9856.09							0.00	0.00
12	Chan	9856.09	9908.74							0.00	0.00
13	Chan	9908.74	9961.38	345.47	48.54	23.87	2.90	2.08	7.12	1.34	9.52
14	Chan	9961.38	10014.03	1435.97	164.53	52.67	12.04	3.13	8.73	2.06	17.94
15	Chan	10014.03	10066.67	2293.28	218.37	52.96	19.23	4.28	10.50	2.71	28.49

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9190.00	9195.80	12.76	5.08	6.64	0.06	0.88	2.51	0.99	2.48
2	LOB	9195.80	9201.60	15.78	5.46	5.80	0.08	0.94	2.89	1.22	3.51
3	LOB	9201.60	9207.40	17.69	5.85	5.80	0.09	1.01	3.02	1.30	3.94
4	LOB	9207.40	9213.20	19.68	6.24	5.80	0.10	1.08	3.16	1.39	4.38
5	LOB	9213.20	9219.00	21.75	6.62	5.80	0.11	1.14	3.29	1.47	4.84
6	LOB	9219.00	9224.80	23.91	7.01	5.80	0.12	1.21	3.41	1.56	5.32
7	LOB	9224.80	9230.60	26.15	7.39	5.80	0.13	1.28	3.54	1.65	5.82
8	LOB	9230.60	9236.40	28.48	7.78	5.80	0.14	1.34	3.66	1.73	6.34
9	LOB	9236.40	9242.20	30.87	8.17	5.80	0.15	1.41	3.78	1.82	6.87
10	LOB	9242.20	9248.00	33.35	8.56	5.80	0.17	1.48	3.90	1.90	7.42
11	LOB	9248.00	9253.80	35.90	8.94	5.80	0.18	1.54	4.01	1.99	7.99
12	LOB	9253.80	9259.60	38.52	9.33	5.80	0.19	1.61	4.13	2.08	8.57
13	LOB	9259.60	9265.40	41.22	9.72	5.80	0.21	1.68	4.24	2.16	9.17
14	LOB	9265.40	9271.20	43.98	10.10	5.80	0.22	1.74	4.35	2.25	9.79
15	LOB	9271.20	9277.00	46.82	10.49	5.80	0.23	1.81	4.46	2.33	10.42
16	Chan	9277.00	9329.65	3679.90	351.72	53.53	18.41	6.68	10.46	8.48	88.72
17	Chan	9329.65	9382.29	5270.88	409.02	52.64	26.37	7.77	12.89	10.03	129.21
18	Chan	9382.29	9434.93	2446.42	260.68	53.65	12.24	4.95	9.38	6.27	58.85
19	Chan	9434.93	9487.58	94.08	49.64	52.65	0.47	0.94	1.90	1.22	2.31
20	Chan	9487.58	9540.22	103.62	52.60	52.64	0.52	1.00	1.97	1.29	2.54
21	Chan	9540.22	9592.87	81.35	45.49	52.65	0.41	0.86	1.79	1.12	1.99
22	Chan	9592.87	9645.51	60.97	38.26	52.64	0.31	0.73	1.59	0.94	1.49
23	Chan	9645.51	9698.16	89.34	48.12	52.65	0.45	0.91	1.86	1.18	2.19
24	Chan	9698.16	9750.80	86.13	47.08	52.64	0.43	0.89	1.83	1.15	2.11
25	Chan	9750.80	9803.45	70.81	41.86	52.64	0.35	0.80	1.69	1.03	1.74
26	Chan	9803.45	9856.09	34.46	27.17	52.65	0.17	0.52	1.27	0.67	0.84
27	Chan	9856.09	9908.74	44.71	37.44	52.66	0.22	0.71	1.19	0.92	1.10

28	Chan	9908.74	9961.38	986.77	157.68	53.14	4.94	3.00	6.26	3.83	23.96
29	Chan	9961.38	10014.03	2845.98	288.27	52.67	14.24	5.48	9.87	7.06	69.73
30	Chan	10014.03	10066.67	3651.98	340.95	55.13	18.27	6.48	10.71	7.98	85.49
31	ROB	10066.67	10068.14	1.73	0.50	1.42	0.01	0.49	3.45	0.46	1.57

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 0.955

INPUT
Description: Flow was split out to the north branch as it overtopped the island.
Station Elevation Data num= 136

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9179.26	2079.99	9182.53	2080.02	9185.9	2080.04	9189.61	2080.07	9193.21	2080.11
9196.68	2080.14	9200.24	2080.16	9203.75	2080.2	9207.17	2080.23	9210.82	2080.26
9214.58	2080.28	9217.89	2080.31	9221.12	2080.33	9224.96	2080.35	9228.91	2080.37
9232.04	2080.39	9235.08	2080.39	9239.11	2080.41	9243.25	2080.42	9246.18	2080.43
9249.03	2080.43	9253.25	2080.43	9257.59	2080.44	9260.32	2080.43	9262.99	2080.43
9267.4	2080.43	9271.73	2080.43	9271.93	2080.43	9274.47	2080.43	9276.94	2080.43
9281.54	2080.42	9286.26	2080.42	9288.61	2080.42	9290.9	2080.42	9295.68	2080.4
9300.6	2080.37	9302.75	2080.36	9304.85	2080.34	9309.83	2080.28	9314.94	2080.21
9316.9	2080.17	9318.81	2080.13	9323.97	2080.01	9329.27	2079.87	9331.04	2079.81
9336.98	2079.79	9340	2080.1	9365	2080	9400	2074	9482	2073.5
9519	2074	9530	2079	9592.69	2080.89	9597.9	2080.91	9599.76	2080.92
9601.68	2080.92	9606.84	2080.92	9611.86	2080.93	9613.91	2080.93	9616.02	2080.94
9620.98	2080.94	9625.81	2080.96	9628.05	2080.97	9630.35	2080.99	9635.12	2081.01
9639.77	2081.05	9642.2	2081.07	9644.69	2081.09	9649.27	2081.13	9653.72	2081.17
9656.34	2081.19	9659.03	2081.21	9663.41	2081.24	9667.68	2081.27	9670.48	2081.28
9673.37	2081.3	9677.55	2081.31	9681.63	2081.32	9684.63	2081.33	9687.7	2081.33
9689.11	2081.33	9692.16	2081.31	9698.37	2081.26	9700.5	2081.24	9708.63	2081.18
9708.83	2081.18	9709.7	2081.18	9717.17	2081.14	9718.9	2081.13	9725.51	2081.11
9729.16	2081.11	9733.84	2081.1	9739.42	2081.09	9742.18	2081.09	9749.69	2081.08
9750.51	2081.08	9754.09	2081.08	9758.85	2081.09	9759.95	2081.09	9767.19	2081.12
9770.21	2081.13	9775.52	2081.16	9780.48	2081.19	9783.86	2081.21	9790.74	2081.24
9792.2	2081.24	9798.48	2081.22	9800.53	2081.21	9801.01	2081.21	9813.82	2080.53
9838.26	2078.89	9856.78	2080.17	9862.59	2080.62	9867.22	2080.79	9872.85	2081.01
9875.56	2081.07	9883.12	2081.27	9883.9	2081.28	9887.27	2081.31	9892.23	2081.36
9893.38	2081.37	9900.57	2081.35	9903.64	2081.34	9905.03	2081.33	9908.9	2081.31
9913.91	2081.27	9917.24	2081.21	9924.17	2081.04	9935	2081	9946	2080
9957	2077	9965	2076	10000	2075.5	10039	2075	10055	2084
10070	2084								

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9179.26	.069	9340	.069	9400	.03	9519	.05	9935	.067
9946	.031	10055	.05						

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9365	10055	366	366	366	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2081.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.00	Wt. n-Val.	0.069	0.031	
W.S. Elev (ft)	2079.84	Reach Len. (ft)	366.00	366.00	366.00
Crit W.S. (ft)	2079.84	Flow Area (sq ft)	0.24	1269.46	
E.G. Slope (ft/ft)	0.007186	Area (sq ft)	0.24	1269.46	
Q Total (cfs)	14413.00	Flow (cfs)	0.05	14412.95	
Top Width (ft)	327.84	Top Width (ft)	7.20	320.64	
Vel Total (ft/s)	11.35	Avg. Vel. (ft/s)	0.19	11.35	
Max Chl Dpth (ft)	6.34	Hydr. Depth (ft)	0.03	3.96	
Conv. Total (cfs)	170027.3	Conv. (cfs)	0.5	170026.8	
Length Wtd. (ft)	366.00	Wetted Per. (ft)	7.20	324.02	
Min Ch El (ft)	2073.50	Shear (lb/sq ft)	0.02	1.76	
Alpha	1.00	Stream Power (lb/ft s)	10070.00	0.00	0.00
Frctn Loss (ft)	2.60	Cum Volume (acre-ft)	0.59	161.49	0.02
C & E Loss (ft)	0.18	Cum SA (acres)	0.63	24.67	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2081.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.00	Wt. n-Val.		0.031	
W.S. Elev (ft)	2079.84	Reach Len. (ft)	366.00	366.00	366.00
Crit W.S. (ft)	2079.84	Flow Area (sq ft)		1269.93	
E.G. Slope (ft/ft)	0.007179	Area (sq ft)		1269.93	
Q Total (cfs)	14413.00	Flow (cfs)		14413.00	
Top Width (ft)	320.75	Top Width (ft)		320.75	
Vel Total (ft/s)	11.35	Avg. Vel. (ft/s)		11.35	
Max Chl Dpth (ft)	6.34	Hydr. Depth (ft)		3.96	
Conv. Total (cfs)	170107.1	Conv. (cfs)		170107.1	
Length Wtd. (ft)	366.00	Wetted Per. (ft)		324.13	
Min Ch El (ft)	2073.50	Shear (lb/sq ft)		1.76	
Alpha	1.00	Stream Power (lb/ft s)	10070.00	0.00	0.00
Frctn Loss (ft)	2.61	Cum Volume (acre-ft)	0.51	161.47	0.02
C & E Loss (ft)	0.18	Cum SA (acres)	0.09	24.66	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2079.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.47	Wt. n-Val.		0.031	
W.S. Elev (ft)	2077.64	Reach Len. (ft)	366.00	366.00	366.00
Crit W.S. (ft)	2077.64	Flow Area (sq ft)		690.72	

E.G. Slope (ft/ft)	0.008834	Area (sq ft)		690.72	
Q Total (cfs)	6725.00	Flow (cfs)		6725.00	
Top Width (ft)	237.23	Top Width (ft)		237.23	
Vel Total (ft/s)	9.74	Avg. Vel. (ft/s)		9.74	
Max Chl Dpth (ft)	4.14	Hydr. Depth (ft)		2.91	
Conv. Total (cfs)	71549.3	Conv. (cfs)		71549.3	
Length Wtd. (ft)	366.00	Wetted Per. (ft)		239.18	
Min Ch El (ft)	2073.50	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)	10070.00	0.00	0.00
Frctn Loss (ft)	2.87	Cum Volume (acre-ft)	0.28	90.13	
C & E Loss (ft)	0.17	Cum SA (acres)	0.09	22.98	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2081.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.98	Wt. n-Val.		0.031	
W.S. Elev (ft)	2079.11	Reach Len. (ft)	366.00	366.00	366.00
Crit W.S. (ft)	2079.11	Flow Area (sq ft)		1055.20	
E.G. Slope (ft/ft)	0.008036	Area (sq ft)		1055.20	
Q Total (cfs)	11927.00	Flow (cfs)		11927.00	
Top Width (ft)	266.79	Top Width (ft)		266.79	
Vel Total (ft/s)	11.30	Avg. Vel. (ft/s)		11.30	
Max Chl Dpth (ft)	5.61	Hydr. Depth (ft)		3.96	
Conv. Total (cfs)	133046.7	Conv. (cfs)		133046.7	
Length Wtd. (ft)	366.00	Wetted Per. (ft)		269.76	
Min Ch El (ft)	2073.50	Shear (lb/sq ft)		1.96	
Alpha	1.00	Stream Power (lb/ft s)	10070.00	0.00	0.00
Frctn Loss (ft)	2.75	Cum Volume (acre-ft)	0.45	140.33	0.01
C & E Loss (ft)	0.22	Cum SA (acres)	0.09	23.84	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2082.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.41	Wt. n-Val.	0.069	0.032	
W.S. Elev (ft)	2081.55	Reach Len. (ft)	366.00	366.00	366.00
Crit W.S. (ft)	2081.55	Flow Area (sq ft)	244.38	2032.57	
E.G. Slope (ft/ft)	0.004804	Area (sq ft)	244.38	2032.57	
Q Total (cfs)	19986.00	Flow (cfs)	436.33	19549.67	
Top Width (ft)	871.39	Top Width (ft)	185.74	685.65	
Vel Total (ft/s)	8.78	Avg. Vel. (ft/s)	1.79	9.62	

Max Chl Dpth (ft)	8.05	Hydr. Depth (ft)	1.32	2.96	
Conv. Total (cfs)	288366.7	Conv. (cfs)	6295.5	282071.2	
Length Wtd. (ft)	366.00	Wetted Per. (ft)	187.33	689.66	
Min Ch El (ft)	2073.50	Shear (lb/sq ft)	0.39	0.88	
Alpha	1.18	Stream Power (lb/ft s)	10070.00	0.00	0.00
Frctn Loss (ft)	2.13	Cum Volume (acre-ft)	3.68	207.43	0.06
C & E Loss (ft)	0.02	Cum SA (acres)	4.68	27.08	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9327.85	9340.23	0.05	0.24	7.20	0.00	0.03	0.19	0.02	0.00
2	LOB	9340.23	9352.62							0.00	0.00
3	LOB	9352.62	9365.00							0.00	0.00
4	Chan	9365.00	9411.00	1238.43	163.96	45.55	8.59	3.64	7.55	1.61	12.20
5	Chan	9411.00	9457.00	3840.07	278.05	46.00	26.64	6.04	13.81	2.71	37.45
6	Chan	9457.00	9503.00	4039.42	286.63	46.00	28.03	6.23	14.09	2.80	39.39
7	Chan	9503.00	9549.00	1454.81	142.30	47.09	10.09	3.09	10.22	1.36	13.86
8	Chan	9549.00	9595.00	0.75	1.16	8.77	0.01	0.13	0.65	0.06	0.04
9	Chan	9595.00	9641.00							0.00	0.00
10	Chan	9641.00	9687.00							0.00	0.00
11	Chan	9687.00	9733.00							0.00	0.00
12	Chan	9733.00	9779.00							0.00	0.00
13	Chan	9779.00	9825.00	0.01	0.02	0.86	0.00	0.03	0.23	0.01	0.00
14	Chan	9825.00	9871.00	20.32	13.15	27.03	0.14	0.49	1.54	0.22	0.34
15	Chan	9871.00	9917.00							0.00	0.00
16	Chan	9917.00	9963.00	219.18	34.03	16.83	1.52	2.07	6.44	0.91	5.84
17	Chan	9963.00	10009.00	1970.04	190.03	46.02	13.67	4.13	10.37	1.85	19.20
18	Chan	10009.00	10055.00	1629.93	160.14	39.87	11.31	4.15	10.18	1.80	18.34

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9365.00	9411.00	1238.45	164.02	45.56	8.59	3.64	7.55	1.61	12.18
2	Chan	9411.00	9457.00	3839.80	278.12	46.00	26.64	6.05	13.81	2.71	37.41
3	Chan	9457.00	9503.00	4039.08	286.69	46.00	28.02	6.23	14.09	2.79	39.35
4	Chan	9503.00	9549.00	1454.90	142.37	47.09	10.09	3.09	10.22	1.35	13.85
5	Chan	9549.00	9595.00	0.76	1.17	8.82	0.01	0.13	0.65	0.06	0.04
6	Chan	9595.00	9641.00							0.00	0.00

7	Chan	9641.00	9687.00							0.00	0.00
8	Chan	9687.00	9733.00							0.00	0.00
9	Chan	9733.00	9779.00							0.00	0.00
10	Chan	9779.00	9825.00	0.01	0.03	0.88	0.00	0.03	0.24	0.01	0.00
11	Chan	9825.00	9871.00	20.40	13.19	27.05	0.14	0.49	1.55	0.22	0.34
12	Chan	9871.00	9917.00							0.00	0.00
13	Chan	9917.00	9963.00	219.28	34.05	16.84	1.52	2.08	6.44	0.91	5.84
14	Chan	9963.00	10009.00	1970.27	190.10	46.02	13.67	4.13	10.36	1.85	19.19
15	Chan	10009.00	10055.00	1630.06	160.20	39.87	11.31	4.15	10.18	1.80	18.32

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9365.00	9411.00	559.56	78.94	32.52	8.32	2.45	7.09	1.34	9.49
2	Chan	9411.00	9457.00	2009.87	176.82	46.00	29.89	3.84	11.37	2.12	24.10
3	Chan	9457.00	9503.00	2174.92	185.39	46.00	32.34	4.03	11.73	2.22	26.08
4	Chan	9503.00	9549.00	725.80	74.46	24.79	10.79	3.10	9.75	1.66	16.15
5	Chan	9549.00	9595.00							0.00	0.00
6	Chan	9595.00	9641.00							0.00	0.00
7	Chan	9641.00	9687.00							0.00	0.00
8	Chan	9687.00	9733.00							0.00	0.00
9	Chan	9733.00	9779.00							0.00	0.00
10	Chan	9779.00	9825.00							0.00	0.00
11	Chan	9825.00	9871.00							0.00	0.00
12	Chan	9871.00	9917.00							0.00	0.00
13	Chan	9917.00	9963.00	26.42	6.81	8.47	0.39	0.82	3.88	0.44	1.72
14	Chan	9963.00	10009.00	616.97	88.80	46.02	9.17	1.93	6.95	1.06	7.39
15	Chan	10009.00	10055.00	611.47	79.51	35.38	9.09	2.29	7.69	1.24	9.53

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9365.00	9411.00	1012.26	132.64	41.23	8.49	3.25	7.63	1.61	12.32
2	Chan	9411.00	9457.00	3281.74	244.49	46.00	27.52	5.32	13.42	2.67	35.79
3	Chan	9457.00	9503.00	3475.77	253.07	46.00	29.14	5.50	13.73	2.76	37.91
4	Chan	9503.00	9549.00	1220.97	112.33	31.66	10.24	3.67	10.87	1.78	19.35
5	Chan	9549.00	9595.00							0.00	0.00
6	Chan	9595.00	9641.00							0.00	0.00

7	Chan	9641.00	9687.00							0.00	0.00
8	Chan	9687.00	9733.00							0.00	0.00
9	Chan	9733.00	9779.00							0.00	0.00
10	Chan	9779.00	9825.00							0.00	0.00
11	Chan	9825.00	9871.00	0.42	0.70	6.41	0.00	0.11	0.60	0.05	0.03
12	Chan	9871.00	9917.00							0.00	0.00
13	Chan	9917.00	9963.00	136.61	23.04	14.06	1.15	1.68	5.93	0.82	4.88
14	Chan	9963.00	10009.00	1509.03	156.47	46.02	12.65	3.40	9.64	1.71	16.45
15	Chan	10009.00	10055.00	1290.20	132.46	38.38	10.82	3.55	9.74	1.73	16.86

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9179.26	9191.64	33.83	18.75	13.95	0.17	1.51	1.80	0.40	0.73
2	LOB	9191.64	9204.03	32.41	17.43	12.38	0.16	1.41	1.86	0.42	0.78
3	LOB	9204.03	9216.41	28.47	16.12	12.38	0.14	1.30	1.77	0.39	0.69
4	LOB	9216.41	9228.79	25.44	15.07	12.38	0.13	1.22	1.69	0.36	0.62
5	LOB	9228.79	9241.17	23.47	14.36	12.38	0.12	1.16	1.63	0.35	0.57
6	LOB	9241.17	9253.56	22.38	13.96	12.38	0.11	1.13	1.60	0.34	0.54
7	LOB	9253.56	9265.94	22.18	13.88	12.38	0.11	1.12	1.60	0.34	0.54
8	LOB	9265.94	9278.32	22.28	13.92	12.38	0.11	1.12	1.60	0.34	0.54
9	LOB	9278.32	9290.70	22.58	14.03	12.38	0.11	1.13	1.61	0.34	0.55
10	LOB	9290.70	9303.09	23.58	14.40	12.38	0.12	1.16	1.64	0.35	0.57
11	LOB	9303.09	9315.47	27.29	15.72	12.38	0.14	1.27	1.74	0.38	0.66
12	LOB	9315.47	9327.85	35.76	18.49	12.39	0.18	1.49	1.93	0.45	0.87
13	LOB	9327.85	9340.23	44.22	21.01	12.40	0.22	1.70	2.10	0.51	1.07
14	LOB	9340.23	9352.62	35.22	18.32	12.38	0.18	1.48	1.92	0.44	0.85
15	LOB	9352.62	9365.00	37.21	18.93	12.38	0.19	1.53	1.97	0.46	0.90
16	Chan	9365.00	9411.00	1722.23	242.84	46.51	8.62	5.28	7.09	1.57	11.10
17	Chan	9411.00	9457.00	4718.42	357.01	46.00	23.61	7.76	13.22	2.33	30.76
18	Chan	9457.00	9503.00	4908.75	365.59	46.00	24.56	7.95	13.43	2.38	32.00
19	Chan	9503.00	9549.00	2037.34	221.26	47.09	10.19	4.81	9.21	1.41	12.97
20	Chan	9549.00	9595.00	142.05	59.30	46.02	0.71	1.29	2.40	0.39	0.93
21	Chan	9595.00	9641.00	39.69	27.59	46.00	0.20	0.60	1.44	0.18	0.26
22	Chan	9641.00	9687.00	14.40	15.01	46.00	0.07	0.33	0.96	0.10	0.09
23	Chan	9687.00	9733.00	16.96	16.57	46.00	0.08	0.36	1.02	0.11	0.11
24	Chan	9733.00	9779.00	24.41	20.61	46.00	0.12	0.45	1.18	0.13	0.16
25	Chan	9779.00	9825.00	50.13	31.75	46.04	0.25	0.69	1.58	0.21	0.33
26	Chan	9825.00	9871.00	234.55	80.17	46.10	1.17	1.74	2.93	0.52	1.53
27	Chan	9871.00	9917.00	11.73	13.28	46.01	0.06	0.29	0.88	0.09	0.08
28	Chan	9917.00	9963.00	515.07	83.59	46.50	2.58	1.82	6.16	0.54	3.32
29	Chan	9963.00	10009.00	2847.93	268.99	46.02	14.25	5.85	10.59	1.75	18.56
30	Chan	10009.00	10055.00	2266.01	229.02	43.37	11.34	5.50	9.89	1.58	15.67

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 0.886

INPUT
Description:
Station Elevation Data num= 141

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9115.27	2077.53	9117.55	2077.56	9120.81	2077.57	9127.39	2077.59	9128.27	2077.59
9128.71	2077.59	9135.73	2077.56	9139.87	2077.52	9143.2	2077.45	9148.11	2077.28
9151.5	2076.63	9161.17	2076.6	9177.75	2077.46	9184.24	2077.63	9187.48	2077.72
9201.91	2077.72	9203.38	2077.72	9208.84	2077.66	9235.55	2077.55	9255.13	2077.65
9263.89	2077.69	9272.71	2077.63	9286.68	2077.86	9290.1	2077.95	9295.77	2078.09
9307.02	2078.37	9307.4	2078.38	9307.67	2078.39	9314.85	2078.44	9318.41	2078.46
9322.32	2078.49	9329.57	2078.51	9329.78	2078.51	9330.21	2078.51	9337.24	2078.48
9340.72	2078.47	9344.71	2078.46	9351.88	2078.45	9352.17	2078.45	9352.75	2078.45
9359.63	2078.44	9363.04	2078.44	9367.1	2078.45	9374.2	2078.48	9374.56	2078.48
9375.28	2078.48	9382.02	2078.48	9382.95	2078.48	9385.36	2078.48	9389.48	2078.47
9396.52	2078.46	9396.95	2078.46	9397.82	2078.46	9405.03	2078.38	9411.68	2078.22
9419.45	2078.08	9423.95	2077.99	9438.38	2077.95	9442.76	2077.97	9447.62	2077.9
9449.39	2077.86	9450.83	2077.83	9451.95	2077.81	9468.36	2077.59	9468.76	2077.58
9469.05	2077.57	9469.25	2077.56	9470.07	2077.56	9470.27	2077.54	9471.17	2077.42
9494.25	2077.65	9494.85	2077.58	9495.03	2077.65	9501.82	2073.49	9501.92	2073.44
9502.81	2073.42	9523.35	2073.12	9529.5	2071.52	9529.72	2071.46	9530.12	2071.45
9545.02	2071.14	9549.44	2071.14	9557.85	2071.1	9569.11	2071.11	9690	2071.4
9710	2078	9713.32	2078.96	9717.87	2078.97	9720.12	2078.98	9725.33	2079
9731.28	2079.01	9732.79	2079.02	9735.85	2079.03	9740.26	2079.04	9742.44	2079.04
9747.72	2079.01	9753.6	2078.98	9755.18	2078.96	9759.02	2078.9	9770.71	2078.64
9789.79	2076.89	9790.93	2076.76	9801.34	2074.89	9816.77	2077.32	9817.77	2077.48
9818.87	2077.59	9825.19	2078.24	9827.51	2078.48	9827.92	2078.51	9836.16	2078.9
9838.07	2078.98	9844.81	2079.1	9848.22	2079.14	9853.45	2079.13	9858.37	2079.12
9862.1	2079.09	9868.52	2079.05	9870.74	2079.04	9878.67	2079.05	9879.39	2079.06
9883.52	2079.09	9888.03	2079.13	9888.82	2079.14	9896.68	2079.2	9898.97	2079.21
9905.33	2079.22	9909.12	2079.22	9913.97	2079.18	9919.27	2079.15	9922.62	2079.08
9929.42	2078.94	9931.26	2078.87	9938	2077.5	9950	2072.5	9981.53	2072.5
10047.69	2072.51	10054.72	2075.34	10065.4	2080.94	10079.12	2080.92	10085.79	2081.04
10088.81	2081.04								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9115.27	.067	9382.95	.067	9501.82	.031	9690	.05	9950	.031

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9494.25	10088.81	336	336	336	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2078.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.40	Wt. n-Val.	0.067	0.035	
W.S. Elev (ft)	2076.76	Reach Len. (ft)	336.00	336.00	336.00
Crit W.S. (ft)		Flow Area (sq ft)	1.66	1520.51	
E.G. Slope (ft/ft)	0.007046	Area (sq ft)	1.66	1520.51	
Q Total (cfs)	14413.00	Flow (cfs)	0.77	14412.23	
Top Width (ft)	363.02	Top Width (ft)	13.37	349.64	
Vel Total (ft/s)	9.47	Avg. Vel. (ft/s)	0.46	9.48	
Max Chl Dpth (ft)	5.66	Hydr. Depth (ft)	0.12	4.35	

Conv. Total (cfs)	171701.1	Conv. (cfs)	9.2	171691.9	
Length Wtd. (ft)	336.00	Wetted Per. (ft)	13.39	353.72	
Min Ch El (ft)	2071.10	Shear (lb/sq ft)	0.05	1.89	
Alpha	1.00	Stream Power (lb/ft s)	10088.81	0.00	0.00
Frctn Loss (ft)	1.96	Cum Volume (acre-ft)	0.59	149.77	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.55	21.85	0.03

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2078.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.40	Wt. n-Val.		0.035	
W.S. Elev (ft)	2076.76	Reach Len. (ft)	336.00	336.00	336.00
Crit W.S. (ft)		Flow Area (sq ft)		1519.57	
E.G. Slope (ft/ft)	0.007059	Area (sq ft)		1519.57	
Q Total (cfs)	14413.00	Flow (cfs)		14413.00	
Top Width (ft)	349.59	Top Width (ft)		349.59	
Vel Total (ft/s)	9.48	Avg. Vel. (ft/s)		9.48	
Max Chl Dpth (ft)	5.65	Hydr. Depth (ft)		4.35	
Conv. Total (cfs)	171548.3	Conv. (cfs)		171548.3	
Length Wtd. (ft)	336.00	Wetted Per. (ft)		353.66	
Min Ch El (ft)	2071.10	Shear (lb/sq ft)		1.89	
Alpha	1.00	Stream Power (lb/ft s)	10088.81	0.00	0.00
Frctn Loss (ft)	1.96	Cum Volume (acre-ft)	0.51	149.76	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	21.84	0.03

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2075.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.		0.033	
W.S. Elev (ft)	2074.81	Reach Len. (ft)	336.00	336.00	336.00
Crit W.S. (ft)		Flow Area (sq ft)		879.83	
E.G. Slope (ft/ft)	0.007016	Area (sq ft)		879.83	
Q Total (cfs)	6725.00	Flow (cfs)		6725.00	
Top Width (ft)	309.64	Top Width (ft)		309.64	
Vel Total (ft/s)	7.64	Avg. Vel. (ft/s)		7.64	
Max Chl Dpth (ft)	3.71	Hydr. Depth (ft)		2.84	
Conv. Total (cfs)	80289.2	Conv. (cfs)		80289.2	
Length Wtd. (ft)	336.00	Wetted Per. (ft)		311.70	
Min Ch El (ft)	2071.10	Shear (lb/sq ft)		1.24	
Alpha	1.00	Stream Power (lb/ft s)	10088.81	0.00	0.00
Frctn Loss (ft)	1.93	Cum Volume (acre-ft)	0.28	83.53	
C & E Loss (ft)	0.03	Cum SA (acres)	0.09	20.68	

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2077.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.26	Wt. n-Val.		0.034	
W.S. Elev (ft)	2076.19	Reach Len. (ft)	336.00	336.00	336.00
Crit W.S. (ft)		Flow Area (sq ft)		1324.50	
E.G. Slope (ft/ft)	0.007031	Area (sq ft)		1324.50	
Q Total (cfs)	11927.00	Flow (cfs)		11927.00	
Top Width (ft)	337.73	Top Width (ft)		337.73	
Vel Total (ft/s)	9.00	Avg. Vel. (ft/s)		9.00	
Max Chl Dpth (ft)	5.09	Hydr. Depth (ft)		3.92	
Conv. Total (cfs)	142240.3	Conv. (cfs)		142240.3	
Length Wtd. (ft)	336.00	Wetted Per. (ft)		341.21	
Min Ch El (ft)	2071.10	Shear (lb/sq ft)		1.70	
Alpha	1.00	Stream Power (lb/ft s)	10088.81	0.00	0.00
Frctn Loss (ft)	1.95	Cum Volume (acre-ft)	0.45	130.33	0.01
C & E Loss (ft)	0.01	Cum SA (acres)	0.09	21.30	0.03

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2079.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.60	Wt. n-Val.	0.067	0.036	
W.S. Elev (ft)	2077.94	Reach Len. (ft)	336.00	336.00	336.00
Crit W.S. (ft)	2077.10	Flow Area (sq ft)	91.43	1953.18	
E.G. Slope (ft/ft)	0.007181	Area (sq ft)	91.43	1953.18	
Q Total (cfs)	19986.00	Flow (cfs)	95.44	19890.56	
Top Width (ft)	607.37	Top Width (ft)	223.99	383.38	
Vel Total (ft/s)	9.77	Avg. Vel. (ft/s)	1.04	10.18	
Max Chl Dpth (ft)	6.84	Hydr. Depth (ft)	0.41	5.09	
Conv. Total (cfs)	235853.3	Conv. (cfs)	1126.2	234727.1	
Length Wtd. (ft)	336.00	Wetted Per. (ft)	224.51	388.54	
Min Ch El (ft)	2071.10	Shear (lb/sq ft)	0.18	2.25	
Alpha	1.08	Stream Power (lb/ft s)	10088.81	0.00	0.00
Frctn Loss (ft)	2.03	Cum Volume (acre-ft)	2.27	190.68	0.06
C & E Loss (ft)	0.01	Cum SA (acres)	2.96	22.58	0.03

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9140.54	9165.80	0.77	1.66	13.39	0.01	0.12	0.46	0.05	0.03
2	LOB	9165.80	9191.07							0.00	0.00
3	LOB	9191.07	9216.33							0.00	0.00
4	LOB	9216.33	9241.60							0.00	0.00
5	LOB	9241.60	9266.86							0.00	0.00
6	LOB	9266.86	9292.13							0.00	0.00
7	LOB	9292.13	9317.39							0.00	0.00
8	LOB	9317.39	9342.66							0.00	0.00
9	LOB	9342.66	9367.92							0.00	0.00
10	LOB	9367.92	9393.19							0.00	0.00

11	LOB	9393.19	9418.45							0.00	0.00
12	LOB	9418.45	9443.72							0.00	0.00
13	LOB	9443.72	9468.98							0.00	0.00
14	LOB	9468.98	9494.25							0.00	0.00
15	Chan	9494.25	9533.89	1076.53	134.35	38.55	7.47	3.59	8.01	1.53	12.28
16	Chan	9533.89	9573.52	2387.35	222.04	39.64	16.56	5.60	10.75	2.46	26.49
17	Chan	9573.52	9613.16	2378.55	221.55	39.64	16.50	5.59	10.74	2.46	26.40
18	Chan	9613.16	9652.80	2311.43	217.77	39.64	16.04	5.49	10.61	2.42	25.65
19	Chan	9652.80	9692.44	2180.83	213.04	39.77	15.13	5.37	10.24	2.36	24.12
20	Chan	9692.44	9732.07	111.03	31.42	14.53	0.77	2.28	3.53	0.95	3.36
21	Chan	9732.07	9771.71							0.00	0.00
22	Chan	9771.71	9811.35	43.10	20.51	20.70	0.30	1.01	2.10	0.44	0.92
23	Chan	9811.35	9850.99	0.16	0.27	1.87	0.00	0.15	0.58	0.06	0.04
24	Chan	9850.99	9890.62							0.00	0.00
25	Chan	9890.62	9930.26							0.00	0.00
26	Chan	9930.26	9969.90	830.71	106.47	30.97	5.76	3.54	7.80	1.51	11.80
27	Chan	9969.90	10009.54	1511.17	168.76	39.64	10.48	4.26	8.95	1.87	16.77
28	Chan	10009.54	10049.17	1501.58	168.31	39.75	10.42	4.25	8.92	1.86	16.62
29	Chan	10049.17	10088.81	79.81	16.00	9.04	0.55	1.94	4.99	0.78	3.89

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9494.25	9533.89	1076.34	134.25	38.55	7.47	3.59	8.02	1.53	12.31
2	Chan	9533.89	9573.52	2387.78	221.94	39.64	16.57	5.60	10.76	2.47	26.55
3	Chan	9573.52	9613.16	2378.97	221.44	39.64	16.51	5.59	10.74	2.46	26.45
4	Chan	9613.16	9652.80	2311.81	217.67	39.64	16.04	5.49	10.62	2.42	25.70
5	Chan	9652.80	9692.44	2181.16	212.94	39.77	15.13	5.37	10.24	2.36	24.17
6	Chan	9692.44	9732.07	110.97	31.38	14.52	0.77	2.28	3.54	0.95	3.37
7	Chan	9732.07	9771.71							0.00	0.00
8	Chan	9771.71	9811.35	42.97	20.46	20.68	0.30	1.00	2.10	0.44	0.92
9	Chan	9811.35	9850.99	0.15	0.26	1.85	0.00	0.14	0.58	0.06	0.04
10	Chan	9850.99	9890.62							0.00	0.00
11	Chan	9890.62	9930.26							0.00	0.00
12	Chan	9930.26	9969.90	830.60	106.39	30.96	5.76	3.53	7.81	1.51	11.82
13	Chan	9969.90	10009.54	1511.06	168.65	39.64	10.48	4.25	8.96	1.88	16.80
14	Chan	10009.54	10049.17	1501.47	168.21	39.75	10.42	4.24	8.93	1.86	16.64
15	Chan	10049.17	10088.81	79.74	15.98	9.03	0.55	1.94	4.99	0.78	3.89

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9494.25	9533.89	365.56	64.68	34.83	5.44	1.89	5.65	0.81	4.60
2	Chan	9533.89	9573.52	1264.17	144.93	39.64	18.80	3.66	8.72	1.60	13.97
3	Chan	9573.52	9613.16	1256.99	144.43	39.64	18.69	3.64	8.70	1.60	13.89
4	Chan	9613.16	9652.80	1202.76	140.66	39.64	17.88	3.55	8.55	1.55	13.29
5	Chan	9652.80	9692.44	1114.14	135.93	39.77	16.57	3.43	8.20	1.50	12.27
6	Chan	9692.44	9732.07	27.08	10.31	8.32	0.40	1.30	2.63	0.54	1.43

7	Chan	9732.07	9771.71							0.00	0.00
8	Chan	9771.71	9811.35							0.00	0.00
9	Chan	9811.35	9850.99							0.00	0.00
10	Chan	9850.99	9890.62							0.00	0.00
11	Chan	9890.62	9930.26							0.00	0.00
12	Chan	9930.26	9969.90	310.89	52.42	25.91	4.62	2.06	5.93	0.89	5.26
13	Chan	9969.90	10009.54	588.92	91.64	39.64	8.76	2.31	6.43	1.01	6.51
14	Chan	10009.54	10049.17	583.03	91.20	39.75	8.67	2.30	6.39	1.00	6.42
15	Chan	10049.17	10088.81	11.45	3.63	4.57	0.17	0.86	3.15	0.35	1.10

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9494.25	9533.89	840.95	113.29	37.46	7.05	3.11	7.42	1.33	9.85
2	Chan	9533.89	9573.52	2033.94	199.44	39.64	17.05	5.03	10.20	2.21	22.52
3	Chan	9573.52	9613.16	2025.57	198.94	39.64	16.98	5.02	10.18	2.20	22.43
4	Chan	9613.16	9652.80	1961.97	195.17	39.64	16.45	4.92	10.05	2.16	21.73
5	Chan	9652.80	9692.44	1843.96	190.44	39.77	15.46	4.80	9.68	2.10	20.35
6	Chan	9692.44	9732.07	79.18	24.04	12.71	0.66	1.99	3.29	0.83	2.73
7	Chan	9732.07	9771.71							0.00	0.00
8	Chan	9771.71	9811.35	16.03	10.03	15.68	0.13	0.65	1.60	0.28	0.45
9	Chan	9811.35	9850.99							0.00	0.00
10	Chan	9850.99	9890.62							0.00	0.00
11	Chan	9890.62	9930.26							0.00	0.00
12	Chan	9930.26	9969.90	658.27	89.68	29.48	5.52	3.12	7.34	1.34	9.80
13	Chan	9969.90	10009.54	1211.58	146.15	39.64	10.16	3.69	8.29	1.62	13.42
14	Chan	10009.54	10049.17	1203.08	145.71	39.75	10.09	3.68	8.26	1.61	13.28
15	Chan	10049.17	10088.81	52.47	11.60	7.81	0.44	1.62	4.52	0.65	2.95

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9115.27	9140.54	7.85	9.48	25.68	0.04	0.38	0.83	0.17	0.14
2	LOB	9140.54	9165.80	42.19	25.88	25.34	0.21	1.02	1.63	0.46	0.75
3	LOB	9165.80	9191.07	14.60	13.68	25.29	0.07	0.54	1.07	0.24	0.26
4	LOB	9191.07	9216.33	4.03	6.32	25.27	0.02	0.25	0.64	0.11	0.07
5	LOB	9216.33	9241.60	7.31	9.03	25.27	0.04	0.36	0.81	0.16	0.13
6	LOB	9241.60	9266.86	5.44	7.56	25.26	0.03	0.30	0.72	0.13	0.10
7	LOB	9266.86	9292.13	2.51	4.57	22.91	0.01	0.20	0.55	0.09	0.05
8	LOB	9292.13	9317.39							0.00	0.00
9	LOB	9317.39	9342.66							0.00	0.00
10	LOB	9342.66	9367.92							0.00	0.00
11	LOB	9367.92	9393.19							0.00	0.00
12	LOB	9393.19	9418.45							0.00	0.00
13	LOB	9418.45	9443.72							0.00	0.00
14	LOB	9443.72	9468.98	2.46	4.62	24.23	0.01	0.19	0.53	0.09	0.05
15	LOB	9468.98	9494.25	9.07	10.28	25.28	0.05	0.41	0.88	0.18	0.16
16	Chan	9494.25	9533.89	1608.65	179.95	41.06	8.05	4.54	8.94	1.96	17.57

17	Chan	9533.89	9573.52	3138.99	268.96	39.64	15.71	6.79	11.67	3.04	35.50
18	Chan	9573.52	9613.16	3129.47	268.46	39.64	15.66	6.77	11.66	3.04	35.39
19	Chan	9613.16	9652.80	3056.51	264.69	39.64	15.29	6.68	11.55	2.99	34.57
20	Chan	9652.80	9692.44	2900.93	259.96	39.77	14.51	6.56	11.16	2.93	32.70
21	Chan	9692.44	9732.07	196.41	49.87	18.31	0.98	2.87	3.94	1.22	4.81
22	Chan	9732.07	9771.71							0.00	0.00
23	Chan	9771.71	9811.35	141.02	51.98	33.37	0.71	1.57	2.71	0.70	1.89
24	Chan	9811.35	9850.99	11.11	7.27	11.04	0.06	0.66	1.53	0.30	0.45
25	Chan	9850.99	9890.62							0.00	0.00
26	Chan	9890.62	9930.26							0.00	0.00
27	Chan	9930.26	9969.90	1218.35	144.04	35.11	6.10	4.23	8.46	1.84	15.56
28	Chan	9969.90	10009.54	2172.67	215.68	39.64	10.87	5.44	10.07	2.44	24.57
29	Chan	10009.54	10049.17	2160.95	215.23	39.75	10.81	5.43	10.04	2.43	24.37
30	Chan	10049.17	10088.81	155.51	27.10	11.59	0.78	2.58	5.74	1.05	6.02

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 0.822

INPUT
Description:
Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9171.05	2075.61	9174.35	2075.66	9175.56	2075.66	9179.6	2075.68	9183.59	2075.68
9184.79	2075.68	9191.62	2075.66	9195.23	2075.63	9199.64	2075.57	9211.91	2074.96
9217.11	2074.74	9220.2	2074.61	9224.98	2074.75	9243.75	2075.38	9255.85	2075.75
9263.86	2075.99	9268.34	2076.06	9271.88	2076.08	9278.78	2076.13	9279.91	2076.14
9283.66	2076.16	9287.94	2076.18	9289.22	2076.19	9295.96	2076.23	9299.67	2076.26
9303.99	2076.29	9310.11	2076.34	9312.02	2076.35	9318.35	2076.39	9320.04	2076.4
9320.55	2076.4	9328.07	2076.42	9331	2076.42	9336.1	2076.41	9341.44	2076.4
9344.12	2076.39	9351.88	2076.33	9352.15	2076.33	9353.03	2076.32	9360.18	2076.25
9362.33	2076.22	9368.2	2076.14	9372.77	2076.05	9376.23	2075.99	9383.21	2075.84
9384.26	2075.82	9387.72	2075.72	9392.28	2075.6	9393.66	2075.55	9402.71	2074.95
9412.18	2074.36	9434.71	2074.75	9440.96	2074.89	9456.27	2075.82	9456.5	2075.83
9457.1	2075.85	9464.53	2076.14	9466.76	2076.2	9472.55	2076.28	9477.21	2076.31
9480.09	2076.32	9480.58	2076.32	9487.65	2076.29	9488.61	2076.27	9491.78	2076.2
9497	2076.1	9512	2076	9532	2075	9538	2074	9554	2070
9648	2069.4	9722	2069.4	9730	2074	9750	2075	9768.71	2076.04
9772.15	2076.12	9778.84	2076.27	9780.86	2076.3	9788.97	2076.44	9789.58	2076.44
9793.32	2076.48	9798.3	2076.54	9799.1	2076.54	9807.01	2076.59	9808.8	2076.6
9809.23	2076.61	9815.73	2076.63	9819.37	2076.64	9824.44	2076.66	9829.5	2076.67
9833.16	2076.67	9839.63	2076.68	9841.88	2076.69	9849.76	2076.71	9850.59	2076.71
9855.73	2076.73	9859.31	2076.75	9859.89	2076.75	9864.88	2076.78	9868.02	2076.79
9870.02	2076.8	9876.74	2076.84	9880.15	2076.85	9885.46	2076.86	9890.28	2076.87
9894.17	2076.85	9900.41	2076.81	9902.89	2076.77	9910.54	2076.64	9911.6	2076.61
9918.15	2076.42	9920.32	2076.36	9920.67	2076.35	9925	2075.2	9940	2075
9945	2074	9955	2070	10000	2069.8	10060	2070	10075	2079
10090	2079								

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9171.05	.069	9497	.069	9554	.03	9722	.05	9925	.067
9955	.031	10075	.05						

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9512	10075	200	200	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2076.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.40	Wt. n-Val.	0.069	0.031	
W.S. Elev (ft)	2074.78	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)	7.52	1514.94	
E.G. Slope (ft/ft)	0.004921	Area (sq ft)	7.52	1514.94	
Q Total (cfs)	14413.00	Flow (cfs)	3.86	14409.14	
Top Width (ft)	380.12	Top Width (ft)	40.83	339.29	
Vel Total (ft/s)	9.47	Avg. Vel. (ft/s)	0.51	9.51	
Max Chl Dpth (ft)	5.38	Hydr. Depth (ft)	0.18	4.47	
Conv. Total (cfs)	205461.3	Conv. (cfs)	55.0	205406.2	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	40.85	343.27	
Min Ch El (ft)	2069.40	Shear (lb/sq ft)	0.06	1.36	
Alpha	1.01	Stream Power (lb/ft s)	10090.00	0.00	0.00
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	0.55	138.06	0.02
C & E Loss (ft)	0.06	Cum SA (acres)	0.34	19.19	0.03

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2076.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.40	Wt. n-Val.		0.031	
W.S. Elev (ft)	2074.80	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1518.42	
E.G. Slope (ft/ft)	0.004890	Area (sq ft)		1518.42	
Q Total (cfs)	14413.00	Flow (cfs)		14413.00	
Top Width (ft)	339.63	Top Width (ft)		339.63	
Vel Total (ft/s)	9.49	Avg. Vel. (ft/s)		9.49	
Max Chl Dpth (ft)	5.39	Hydr. Depth (ft)		4.47	
Conv. Total (cfs)	206107.7	Conv. (cfs)		206107.7	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		343.61	
Min Ch El (ft)	2069.40	Shear (lb/sq ft)		1.35	
Alpha	1.00	Stream Power (lb/ft s)	10090.00	0.00	0.00
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	0.51	138.04	0.02
C & E Loss (ft)	0.06	Cum SA (acres)	0.09	19.19	0.03

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2073.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.80	Wt. n-Val.		0.031	
W.S. Elev (ft)	2072.96	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		937.16	
E.G. Slope (ft/ft)	0.004774	Area (sq ft)		937.16	
Q Total (cfs)	6725.00	Flow (cfs)		6725.00	
Top Width (ft)	303.34	Top Width (ft)		303.34	
Vel Total (ft/s)	7.18	Avg. Vel. (ft/s)		7.18	

Max Chl Dpth (ft)	3.56	Hydr. Depth (ft)		3.09	
Conv. Total (cfs)	97329.2	Conv. (cfs)		97329.2	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		306.04	
Min Ch El (ft)	2069.40	Shear (lb/sq ft)		0.91	
Alpha	1.00	Stream Power (lb/ft s)	10090.00	0.00	0.00
Frctn Loss (ft)	1.34	Cum Volume (acre-ft)	0.28	76.52	
C & E Loss (ft)	0.05	Cum SA (acres)	0.09	18.31	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2075.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.23	Wt. n-Val.		0.031	
W.S. Elev (ft)	2074.25	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1339.15	
E.G. Slope (ft/ft)	0.004889	Area (sq ft)		1339.15	
Q Total (cfs)	11927.00	Flow (cfs)		11927.00	
Top Width (ft)	321.92	Top Width (ft)		321.92	
Vel Total (ft/s)	8.91	Avg. Vel. (ft/s)		8.91	
Max Chl Dpth (ft)	4.85	Hydr. Depth (ft)		4.16	
Conv. Total (cfs)	170575.5	Conv. (cfs)		170575.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		325.64	
Min Ch El (ft)	2069.40	Shear (lb/sq ft)		1.26	
Alpha	1.00	Stream Power (lb/ft s)	10090.00	0.00	0.00
Frctn Loss (ft)	1.28	Cum Volume (acre-ft)	0.45	120.06	0.01
C & E Loss (ft)	0.06	Cum SA (acres)	0.09	18.75	0.03

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2077.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.74	Wt. n-Val.	0.069	0.031	
W.S. Elev (ft)	2075.76	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	2075.25	Flow Area (sq ft)	92.74	1873.72	
E.G. Slope (ft/ft)	0.005163	Area (sq ft)	92.74	1873.72	
Q Total (cfs)	19986.00	Flow (cfs)	107.10	19878.91	
Top Width (ft)	547.57	Top Width (ft)	154.02	393.55	
Vel Total (ft/s)	10.16	Avg. Vel. (ft/s)	1.15	10.61	
Max Chl Dpth (ft)	6.36	Hydr. Depth (ft)	0.60	4.76	
Conv. Total (cfs)	278155.5	Conv. (cfs)	1490.5	276665.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	154.28	397.96	
Min Ch El (ft)	2069.40	Shear (lb/sq ft)	0.19	1.52	
Alpha	1.08	Stream Power (lb/ft s)	10090.00	0.00	0.00
Frctn Loss (ft)	1.20	Cum Volume (acre-ft)	1.56	175.92	0.06
C & E Loss (ft)	0.05	Cum SA (acres)	1.50	19.59	0.03

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9193.78	9216.51	0.00	0.00	0.45	0.00	0.01	0.06	0.00	0.00
2	LOB	9216.51	9239.24	0.25	0.87	9.50	0.00	0.09	0.29	0.03	0.01
3	LOB	9239.24	9261.97							0.00	0.00
4	LOB	9261.97	9284.70							0.00	0.00
5	LOB	9284.70	9307.43							0.00	0.00
6	LOB	9307.43	9330.16							0.00	0.00
7	LOB	9330.16	9352.89							0.00	0.00
8	LOB	9352.89	9375.62							0.00	0.00
9	LOB	9375.62	9398.35							0.00	0.00
10	LOB	9398.35	9421.08	2.81	4.54	15.73	0.02	0.29	0.62	0.09	0.05
11	LOB	9421.08	9443.81	0.80	2.10	15.17	0.01	0.14	0.38	0.04	0.02
12	LOB	9443.81	9466.54							0.00	0.00
13	LOB	9466.54	9489.27							0.00	0.00
14	LOB	9489.27	9512.00							0.00	0.00
15	Chan	9512.00	9549.53	57.87	27.52	16.66	0.40	1.69	2.10	0.51	1.07
16	Chan	9549.53	9587.07	1685.00	180.57	37.67	11.69	4.81	9.33	1.47	13.74
17	Chan	9587.07	9624.60	1972.73	192.00	37.53	13.69	5.12	10.27	1.57	16.15
18	Chan	9624.60	9662.13	2117.93	200.36	37.53	14.69	5.34	10.57	1.64	17.33
19	Chan	9662.13	9699.67	2148.78	202.10	37.53	14.91	5.38	10.63	1.65	17.59
20	Chan	9699.67	9737.20	1366.63	149.28	38.77	9.48	3.98	9.15	1.18	10.83
21	Chan	9737.20	9774.73	1.33	1.80	8.50	0.01	0.21	0.74	0.07	0.05
22	Chan	9774.73	9812.27							0.00	0.00
23	Chan	9812.27	9849.80							0.00	0.00
24	Chan	9849.80	9887.33							0.00	0.00
25	Chan	9887.33	9924.87							0.00	0.00
26	Chan	9924.87	9962.40	410.67	64.91	22.17	2.85	3.04	6.33	0.90	5.69
27	Chan	9962.40	9999.93	1777.49	183.94	37.53	12.33	4.90	9.66	1.51	14.55
28	Chan	9999.93	10037.47	1790.42	184.74	37.53	12.42	4.92	9.69	1.51	14.65
29	Chan	10037.47	10075.00	1080.29	127.73	31.83	7.50	4.19	8.46	1.23	10.43

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9512.00	9549.53	58.12	27.69	16.72	0.40	1.70	2.10	0.51	1.06
2	Chan	9549.53	9587.07	1685.59	180.96	37.67	11.69	4.82	9.31	1.47	13.66
3	Chan	9587.07	9624.60	1973.07	192.38	37.53	13.69	5.13	10.26	1.56	16.05
4	Chan	9624.60	9662.13	2118.00	200.74	37.53	14.70	5.35	10.55	1.63	17.23
5	Chan	9662.13	9699.67	2148.80	202.48	37.53	14.91	5.39	10.61	1.65	17.48
6	Chan	9699.67	9737.20	1367.15	149.66	38.77	9.49	3.99	9.13	1.18	10.77
7	Chan	9737.20	9774.73	1.41	1.89	8.70	0.01	0.22	0.75	0.07	0.05
8	Chan	9774.73	9812.27							0.00	0.00
9	Chan	9812.27	9849.80							0.00	0.00
10	Chan	9849.80	9887.33							0.00	0.00
11	Chan	9887.33	9924.87							0.00	0.00
12	Chan	9924.87	9962.40	410.99	65.13	22.22	2.85	3.05	6.31	0.89	5.65
13	Chan	9962.40	9999.93	1778.06	184.33	37.53	12.34	4.91	9.65	1.50	14.46
14	Chan	9999.93	10037.47	1790.97	185.13	37.53	12.43	4.93	9.67	1.51	14.57
15	Chan	10037.47	10075.00	1080.83	128.04	31.85	7.50	4.19	8.44	1.23	10.36

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9512.00	9549.53	9.32	6.78	7.59	0.14	0.92	1.38	0.27	0.37
2	Chan	9549.53	9587.07	757.05	111.99	37.67	11.26	2.98	6.76	0.89	5.99
3	Chan	9587.07	9624.60	931.57	123.42	37.53	13.85	3.29	7.55	0.98	7.40
4	Chan	9624.60	9662.13	1039.06	131.77	37.53	15.45	3.51	7.89	1.05	8.25
5	Chan	9662.13	9699.67	1062.11	133.52	37.53	15.79	3.56	7.95	1.06	8.43
6	Chan	9699.67	9737.20	662.06	90.45	29.47	9.84	3.17	7.32	0.91	6.70
7	Chan	9737.20	9774.73							0.00	0.00
8	Chan	9774.73	9812.27							0.00	0.00
9	Chan	9812.27	9849.80							0.00	0.00
10	Chan	9849.80	9887.33							0.00	0.00
11	Chan	9887.33	9924.87							0.00	0.00
12	Chan	9924.87	9962.40	170.98	32.94	15.36	2.54	2.23	5.19	0.64	3.32
13	Chan	9962.40	9999.93	805.61	115.36	37.53	11.98	3.07	6.98	0.92	6.40
14	Chan	9999.93	10037.47	814.96	116.16	37.53	12.12	3.09	7.02	0.92	6.47
15	Chan	10037.47	10075.00	472.28	74.77	28.28	7.02	2.72	6.32	0.79	4.98

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9512.00	9549.53	38.31	19.73	13.42	0.32	1.51	1.94	0.45	0.87
2	Chan	9549.53	9587.07	1386.20	160.61	37.67	11.62	4.28	8.63	1.30	11.23
3	Chan	9587.07	9624.60	1639.72	172.04	37.53	13.75	4.58	9.53	1.40	13.33
4	Chan	9624.60	9662.13	1774.62	180.40	37.53	14.88	4.81	9.84	1.47	14.43
5	Chan	9662.13	9699.67	1803.35	182.14	37.53	15.12	4.85	9.90	1.48	14.67
6	Chan	9699.67	9737.20	1129.56	129.44	36.62	9.47	3.66	8.73	1.08	9.41
7	Chan	9737.20	9774.73							0.00	0.00
8	Chan	9774.73	9812.27							0.00	0.00
9	Chan	9812.27	9849.80							0.00	0.00
10	Chan	9849.80	9887.33							0.00	0.00
11	Chan	9887.33	9924.87							0.00	0.00
12	Chan	9924.87	9962.40	331.40	54.28	19.46	2.78	2.91	6.11	0.85	5.20
13	Chan	9962.40	9999.93	1464.95	163.98	37.53	12.28	4.37	8.93	1.33	11.91
14	Chan	9999.93	10037.47	1476.91	164.78	37.53	12.38	4.39	8.96	1.34	12.01
15	Chan	10037.47	10075.00	881.98	111.75	30.80	7.39	3.77	7.89	1.11	8.74

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9171.05	9193.78	0.58	2.15	22.88	0.00	0.09	0.27	0.03	0.01
2	LOB	9193.78	9216.51	9.03	11.07	22.75	0.05	0.49	0.82	0.16	0.13
3	LOB	9216.51	9239.24	24.40	20.09	22.74	0.12	0.88	1.21	0.28	0.35
4	LOB	9239.24	9261.97	2.37	4.41	16.93	0.01	0.26	0.54	0.08	0.05
5	LOB	9261.97	9284.70							0.00	0.00
6	LOB	9284.70	9307.43							0.00	0.00
7	LOB	9307.43	9330.16							0.00	0.00
8	LOB	9330.16	9352.89							0.00	0.00
9	LOB	9352.89	9375.62							0.00	0.00
10	LOB	9375.62	9398.35	1.12	2.44	12.00	0.01	0.20	0.46	0.07	0.03
11	LOB	9398.35	9421.08	35.39	25.12	22.76	0.18	1.11	1.41	0.36	0.50
12	LOB	9421.08	9443.81	31.60	23.47	22.74	0.16	1.03	1.35	0.33	0.45
13	LOB	9443.81	9466.54	2.60	3.99	11.48	0.01	0.35	0.65	0.11	0.07
14	LOB	9466.54	9489.27							0.00	0.00
15	LOB	9489.27	9512.00							0.00	0.00
16	Chan	9512.00	9549.53	101.90	50.24	33.18	0.51	1.54	2.03	0.49	0.99
17	Chan	9549.53	9587.07	2336.42	217.16	37.67	11.69	5.79	10.76	1.86	19.99
18	Chan	9587.07	9624.60	2696.97	228.59	37.53	13.49	6.09	11.80	1.96	23.16
19	Chan	9624.60	9662.13	2863.34	236.95	37.53	14.33	6.31	12.08	2.03	24.59
20	Chan	9662.13	9699.67	2898.58	238.69	37.53	14.50	6.36	12.14	2.05	24.89
21	Chan	9699.67	9737.20	1903.73	185.87	38.77	9.53	4.95	10.24	1.55	15.83
22	Chan	9737.20	9774.73	32.31	19.00	26.50	0.16	0.72	1.70	0.23	0.39
23	Chan	9774.73	9812.27							0.00	0.00
24	Chan	9812.27	9849.80							0.00	0.00
25	Chan	9849.80	9887.33							0.00	0.00
26	Chan	9887.33	9924.87	0.44	0.52	2.04	0.00	0.26	0.85	0.08	0.07
27	Chan	9924.87	9962.40	594.53	96.59	38.41	2.97	2.57	6.15	0.81	4.99
28	Chan	9962.40	9999.93	2458.52	220.53	37.53	12.30	5.88	11.15	1.89	21.11
29	Chan	9999.93	10037.47	2473.43	221.33	37.53	12.38	5.90	11.18	1.90	21.24
30	Chan	10037.47	10075.00	1518.74	158.26	33.73	7.60	4.93	9.60	1.51	14.51

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 0.785

INPUT
Description:
Station Elevation Data num= 107

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9252	2073.49	9254.89	2073.51	9262.17	2073.55	9262.94	2073.56	9265.57	2073.58
9270.99	2073.63	9272.59	2073.64	9279.04	2073.66	9283.02	2073.65	9287.09	2073.62
9296.51	2073.32	9309.83	2072.83	9321.51	2072.66	9336.47	2072.66	9339.17	2072.8
9344.38	2073.07	9355.96	2073.64	9359.54	2073.82	9366.43	2073.96	9367.6	2073.98
9371.53	2074.03	9375.65	2074.07	9376.86	2074.08	9383.7	2074.14	9387.29	2074.16
9391.75	2074.21	9397.71	2074.24	9399.8	2074.26	9406.85	2074.29	9407.85	2074.3
9408.14	2074.3	9415.9	2074.26	9418.57	2074.23	9423.95	2074.13	9430.79	2073.91
9445.88	2073.04	9451.43	2073.04	9460.91	2073.14	9471	2073.21	9475.51	2073.3
9490.7	2074.02	9496.4	2074.26	9501.98	2074.42	9504.45	2074.47	9512.41	2074.58
9512.5	2074.58	9512.8	2074.58	9517.27	2074.6	9520.55	2074.62	9522.83	2074.61
9528.6	2074.57	9533.26	2074.46	9535	2074.5	9559	2074.33	9577	2074
9588	2073	9600	2072	9613	2068	9632	2068	9687	2068.2
9759	2069	9770	2074	9770.1	2074.74	9773.07	2074.77	9778.15	2074.8

9780.57	2074.82	9783.5	2074.85	9786.2	2074.88	9793.92	2074.97	9794.26	2074.98
9795.38	2074.99	9802.31	2075.09	9803.53	2075.11	9804.32	2075.12	9811.08	2075.21
9814.41	2075.24	9819.97	2075.29	9824.5	2075.32	9828.87	2075.32	9834.59	2075.34
9837.77	2075.33	9842.57	2075.33	9844.68	2075.33	9846.67	2075.33	9854.77	2075.32
9855.57	2075.32	9861.58	2075.32	9864.47	2075.32	9864.86	2075.32	9873.37	2075.3
9874.94	2075.3	9882.27	2075.27	9885.03	2075.26	9891.17	2075.19	9895.12	2075.16
9900.07	2075.05	9905.21	2074.93	9908.96	2074.76	9910	2074.2	9925	2074
9935	2073	9945	2069	10000	2068.4	10060	2068	10074	2076
10080	2077	10095	2077						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9252	.069	9535	.069	9613	.03	9759	.067	9945	.031
10074	.05								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9577	10080	200	200	200	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2074.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.02	Wt. n-Val.	0.069	0.031	
W.S. Elev (ft)	2072.85	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	2072.85	Flow Area (sq ft)	4.49	1264.17	
E.G. Slope (ft/ft)	0.008322	Area (sq ft)	4.49	1264.17	
Q Total (cfs)	14413.00	Flow (cfs)	2.44	14410.56	
Top Width (ft)	341.78	Top Width (ft)	30.95	310.82	
Vel Total (ft/s)	11.36	Avg. Vel. (ft/s)	0.54	11.40	
Max Chl Dpth (ft)	4.85	Hydr. Depth (ft)	0.15	4.07	
Conv. Total (cfs)	157995.9	Conv. (cfs)	26.7	157969.2	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	30.96	314.34	
Min Ch El (ft)	2068.00	Shear (lb/sq ft)	0.08	2.09	
Alpha	1.01	Stream Power (lb/ft s)	10095.00	0.00	0.00
Frctn Loss (ft)	1.41	Cum Volume (acre-ft)	0.52	131.68	0.02
C & E Loss (ft)	0.22	Cum SA (acres)	0.17	17.70	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2074.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.03	Wt. n-Val.		0.031	
W.S. Elev (ft)	2072.84	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	2072.84	Flow Area (sq ft)		1259.55	
E.G. Slope (ft/ft)	0.008419	Area (sq ft)		1259.55	
Q Total (cfs)	14413.00	Flow (cfs)		14413.00	
Top Width (ft)	310.55	Top Width (ft)		310.55	
Vel Total (ft/s)	11.44	Avg. Vel. (ft/s)		11.44	
Max Chl Dpth (ft)	4.84	Hydr. Depth (ft)		4.06	
Conv. Total (cfs)	157082.3	Conv. (cfs)		157082.3	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		314.05	
Min Ch El (ft)	2068.00	Shear (lb/sq ft)		2.11	
Alpha	1.00	Stream Power (lb/ft s)	10095.00	0.00	0.00

Frctn Loss (ft)	1.42	Cum Volume (acre-ft)	0.51	131.66	0.02
C & E Loss (ft)	0.22	Cum SA (acres)	0.09	17.69	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2072.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.30	Wt. n-Val.		0.031	
W.S. Elev (ft)	2071.06	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	2071.06	Flow Area (sq ft)		734.12	
E.G. Slope (ft/ft)	0.010064	Area (sq ft)		734.12	
Q Total (cfs)	6725.00	Flow (cfs)		6725.00	
Top Width (ft)	286.03	Top Width (ft)		286.03	
Vel Total (ft/s)	9.16	Avg. Vel. (ft/s)		9.16	
Max Chl Dpth (ft)	3.06	Hydr. Depth (ft)		2.57	
Conv. Total (cfs)	67035.3	Conv. (cfs)		67035.3	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		288.15	
Min Ch El (ft)	2068.00	Shear (lb/sq ft)		1.60	
Alpha	1.00	Stream Power (lb/ft s)	10095.00	0.00	0.00
Frctn Loss (ft)	1.42	Cum Volume (acre-ft)	0.28	72.69	
C & E Loss (ft)	0.19	Cum SA (acres)	0.09	16.96	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2074.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.83	Wt. n-Val.		0.031	
W.S. Elev (ft)	2072.31	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	2072.31	Flow Area (sq ft)		1098.86	
E.G. Slope (ft/ft)	0.008794	Area (sq ft)		1098.86	
Q Total (cfs)	11927.00	Flow (cfs)		11927.00	
Top Width (ft)	300.85	Top Width (ft)		300.85	
Vel Total (ft/s)	10.85	Avg. Vel. (ft/s)		10.85	
Max Chl Dpth (ft)	4.31	Hydr. Depth (ft)		3.65	
Conv. Total (cfs)	127184.5	Conv. (cfs)		127184.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		303.98	
Min Ch El (ft)	2068.00	Shear (lb/sq ft)		1.98	
Alpha	1.00	Stream Power (lb/ft s)	10095.00	0.00	0.00
Frctn Loss (ft)	1.33	Cum Volume (acre-ft)	0.45	114.46	0.01
C & E Loss (ft)	0.24	Cum SA (acres)	0.09	17.32	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2076.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.20	Wt. n-Val.	0.069	0.031	
W.S. Elev (ft)	2074.06	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	2074.06	Flow Area (sq ft)	133.38	1654.94	
E.G. Slope (ft/ft)	0.007019	Area (sq ft)	133.38	1654.94	
Q Total (cfs)	19986.00	Flow (cfs)	191.68	19794.32	
Top Width (ft)	532.99	Top Width (ft)	190.29	342.71	
Vel Total (ft/s)	11.18	Avg. Vel. (ft/s)	1.44	11.96	
Max Chl Dpth (ft)	6.05	Hydr. Depth (ft)	0.70	4.83	
Conv. Total (cfs)	238561.8	Conv. (cfs)	2287.9	236273.8	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	190.94	346.97	
Min Ch El (ft)	2068.00	Shear (lb/sq ft)	0.31	2.09	
Alpha	1.13	Stream Power (lb/ft s)	10095.00	0.00	0.00
Frctn Loss (ft)	1.17	Cum Volume (acre-ft)	1.04	167.82	0.06
C & E Loss (ft)	0.22	Cum SA (acres)	0.71	17.90	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9295.33	9317.00	0.17	0.54	7.77	0.00	0.07	0.31	0.04	0.01
2	LOB	9317.00	9338.67	2.26	3.90	21.67	0.02	0.18	0.58	0.09	0.05
3	LOB	9338.67	9360.33	0.01	0.06	1.51	0.00	0.04	0.21	0.02	0.00
4	LOB	9360.33	9382.00							0.00	0.00
5	LOB	9382.00	9403.67							0.00	0.00
6	LOB	9403.67	9425.33							0.00	0.00
7	LOB	9425.33	9447.00							0.00	0.00
8	LOB	9447.00	9468.67							0.00	0.00
9	LOB	9468.67	9490.33							0.00	0.00
10	LOB	9490.33	9512.00							0.00	0.00
11	LOB	9512.00	9533.67							0.00	0.00
12	LOB	9533.67	9555.33							0.00	0.00
13	LOB	9555.33	9577.00							0.00	0.00
14	Chan	9577.00	9610.53	75.45	30.40	21.28	0.52	1.46	2.48	0.74	1.84
15	Chan	9610.53	9644.07	1995.38	161.51	33.65	13.84	4.82	12.35	2.49	30.81
16	Chan	9644.07	9677.60	2023.55	159.20	33.53	14.04	4.75	12.71	2.47	31.35
17	Chan	9677.60	9711.13	1892.62	152.94	33.54	13.13	4.56	12.38	2.37	29.32
18	Chan	9711.13	9744.67	1648.34	140.77	33.54	11.44	4.20	11.71	2.18	25.54

19	Chan	9744.67	9778.20	679.56	72.68	23.64	4.71	3.19	9.35	1.60	14.93
20	Chan	9778.20	9811.73							0.00	0.00
21	Chan	9811.73	9845.27							0.00	0.00
22	Chan	9845.27	9878.80							0.00	0.00
23	Chan	9878.80	9912.33							0.00	0.00
24	Chan	9912.33	9945.87	90.85	21.89	11.24	0.63	2.09	4.15	1.01	4.20
25	Chan	9945.87	9979.40	1499.38	135.63	33.54	10.40	4.04	11.05	2.10	23.23
26	Chan	9979.40	10012.93	1725.21	147.54	33.53	11.97	4.40	11.69	2.29	26.73
27	Chan	10012.93	10046.47	1891.99	155.94	33.53	13.13	4.65	12.13	2.42	29.31
28	Chan	10046.47	10080.00	888.23	85.66	23.31	6.16	3.89	10.37	1.91	19.79

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9577.00	9610.53	75.04	30.10	21.10	0.52	1.46	2.49	0.75	1.87
2	Chan	9610.53	9644.07	1996.68	161.01	33.65	13.85	4.80	12.40	2.52	31.19
3	Chan	9644.07	9677.60	2024.68	158.70	33.53	14.05	4.73	12.76	2.49	31.73
4	Chan	9677.60	9711.13	1893.28	152.44	33.54	13.14	4.55	12.42	2.39	29.67
5	Chan	9711.13	9744.67	1648.14	140.27	33.54	11.44	4.18	11.75	2.20	25.83
6	Chan	9744.67	9778.20	679.01	72.34	23.61	4.71	3.18	9.39	1.61	15.12
7	Chan	9778.20	9811.73							0.00	0.00
8	Chan	9811.73	9845.27							0.00	0.00
9	Chan	9845.27	9878.80							0.00	0.00
10	Chan	9878.80	9912.33							0.00	0.00
11	Chan	9912.33	9945.87	90.58	21.74	11.20	0.63	2.08	4.17	1.02	4.25
12	Chan	9945.87	9979.40	1498.85	135.14	33.54	10.40	4.03	11.09	2.12	23.49
13	Chan	9979.40	10012.93	1725.46	147.05	33.53	11.97	4.39	11.73	2.30	27.04
14	Chan	10012.93	10046.47	1892.84	155.44	33.53	13.13	4.64	12.18	2.44	29.67
15	Chan	10046.47	10080.00	888.44	85.33	23.28	6.16	3.88	10.41	1.93	20.05

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9577.00	9610.53	19.78	8.64	7.84	0.29	1.15	2.29	0.69	1.59
2	Chan	9610.53	9644.07	1013.60	101.56	33.65	15.07	3.03	9.98	1.90	18.93
3	Chan	9644.07	9677.60	1009.95	99.24	33.53	15.02	2.96	10.18	1.86	18.92
4	Chan	9677.60	9711.13	905.98	92.98	33.54	13.47	2.77	9.74	1.74	16.97
5	Chan	9711.13	9744.67	717.13	80.82	33.54	10.66	2.41	8.87	1.51	13.44

6	Chan	9744.67	9778.20	262.18	35.42	19.32	3.90	1.88	7.40	1.15	8.53
7	Chan	9778.20	9811.73							0.00	0.00
8	Chan	9811.73	9845.27							0.00	0.00
9	Chan	9845.27	9878.80							0.00	0.00
10	Chan	9878.80	9912.33							0.00	0.00
11	Chan	9912.33	9945.87	25.35	7.12	6.42	0.38	1.18	3.56	0.70	2.48
12	Chan	9945.87	9979.40	622.06	75.68	33.54	9.25	2.26	8.22	1.42	11.65
13	Chan	9979.40	10012.93	793.68	87.59	33.53	11.80	2.61	9.06	1.64	14.87
14	Chan	10012.93	10046.47	924.53	95.99	33.53	13.75	2.86	9.63	1.80	17.32
15	Chan	10046.47	10080.00	430.75	49.08	19.71	6.41	2.60	8.78	1.56	13.73

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9577.00	9610.53	53.12	20.94	14.77	0.45	1.47	2.54	0.78	1.97
2	Chan	9610.53	9644.07	1683.12	143.39	33.65	14.11	4.28	11.74	2.34	27.46
3	Chan	9644.07	9677.60	1700.48	141.07	33.53	14.26	4.21	12.05	2.31	27.84
4	Chan	9677.60	9711.13	1576.54	134.81	33.54	13.22	4.02	11.69	2.21	25.81
5	Chan	9711.13	9744.67	1346.57	122.64	33.54	11.29	3.66	10.98	2.01	22.05
6	Chan	9744.67	9778.20	540.35	60.67	22.34	4.53	2.81	8.91	1.49	13.28
7	Chan	9778.20	9811.73							0.00	0.00
8	Chan	9811.73	9845.27							0.00	0.00
9	Chan	9845.27	9878.80							0.00	0.00
10	Chan	9878.80	9912.33							0.00	0.00
11	Chan	9912.33	9945.87	66.42	16.58	9.78	0.56	1.81	4.01	0.93	3.73
12	Chan	9945.87	9979.40	1213.47	117.51	33.54	10.17	3.50	10.33	1.92	19.87
13	Chan	9979.40	10012.93	1425.34	129.42	33.53	11.95	3.86	11.01	2.12	23.34
14	Chan	10012.93	10046.47	1582.83	137.82	33.53	13.27	4.11	11.49	2.26	25.91
15	Chan	10046.47	10080.00	738.77	74.01	22.22	6.19	3.51	9.98	1.83	18.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9252.00	9273.67	10.33	10.64	22.23	0.05	0.49	0.97	0.21	0.20
2	LOB	9273.67	9295.33	9.68	10.13	21.67	0.05	0.47	0.96	0.20	0.20
3	LOB	9295.33	9317.00	38.10	23.05	21.68	0.19	1.06	1.65	0.47	0.77
4	LOB	9317.00	9338.67	58.97	29.95	21.67	0.30	1.38	1.97	0.61	1.19
5	LOB	9338.67	9360.33	20.55	15.92	21.69	0.10	0.73	1.29	0.32	0.42

6	LOB	9360.33	9382.00	0.42	1.28	13.74	0.00	0.09	0.33	0.04	0.01
7	LOB	9382.00	9403.67							0.00	0.00
8	LOB	9403.67	9425.33							0.00	0.00
9	LOB	9425.33	9447.00	10.10	10.21	20.74	0.05	0.49	0.99	0.22	0.21
10	LOB	9447.00	9468.67	31.42	20.53	21.67	0.16	0.95	1.53	0.42	0.64
11	LOB	9468.67	9490.33	12.09	11.57	21.68	0.06	0.53	1.04	0.23	0.24
12	LOB	9490.33	9512.00	0.00	0.03	1.19	0.00	0.03	0.14	0.01	0.00
13	LOB	9512.00	9533.67							0.00	0.00
14	LOB	9533.67	9555.33							0.00	0.00
15	LOB	9555.33	9577.00	0.01	0.08	2.98	0.00	0.03	0.14	0.01	0.00
16	Chan	9577.00	9610.53	172.48	63.47	34.11	0.86	1.89	2.72	0.82	2.22
17	Chan	9610.53	9644.07	2653.00	201.83	33.65	13.27	6.02	13.14	2.63	34.55
18	Chan	9644.07	9677.60	2706.44	199.52	33.53	13.54	5.95	13.56	2.61	35.36
19	Chan	9677.60	9711.13	2566.34	193.26	33.54	12.84	5.76	13.28	2.53	33.53
20	Chan	9711.13	9744.67	2302.68	181.09	33.54	11.52	5.40	12.72	2.37	30.09
21	Chan	9744.67	9778.20	995.72	101.69	26.48	4.98	4.01	9.79	1.68	16.48
22	Chan	9778.20	9811.73							0.00	0.00
23	Chan	9811.73	9845.27							0.00	0.00
24	Chan	9845.27	9878.80							0.00	0.00
25	Chan	9878.80	9912.33							0.00	0.00
26	Chan	9912.33	9945.87	137.54	40.59	25.79	0.69	1.63	3.39	0.69	2.34
27	Chan	9945.87	9979.40	2124.10	175.96	33.54	10.63	5.25	12.07	2.30	27.75
28	Chan	9979.40	10012.93	2369.13	187.86	33.53	11.85	5.60	12.61	2.45	30.96
29	Chan	10012.93	10046.47	2548.29	196.26	33.53	12.75	5.85	12.98	2.56	33.30
30	Chan	10046.47	10080.00	1218.62	113.41	25.74	6.10	4.70	10.75	1.93	20.75

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 0.746

INPUT
Description: Filled right overbank approximately 2'.
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9395.96	2072.08	9398.46	2072.12	9400.21	2072.14	9400.67	2072.14	9408.38	2072.18
9411.01	2072.19	9416.56	2072.21	9421.36	2072.2	9424.74	2072.2	9431.7	2072.15
9432.92	2072.15	9437.51	2072	9441.1	2071.89	9442.14	2071.84	9458.55	2070.5
9460.74	2070.65	9467.81	2071.32	9488.27	2071.88	9492.1	2072.06	9494.84	2072.03
9511.95	2071.89	9521.27	2071.92	9530.66	2072.01	9540.44	2072	9550.71	2072.03
9562.52	2072.44	9566.18	2072.59	9566.98	2072.61	9571.96	2072.74	9576.53	2072.87
9580.13	2072.91	9586.87	2072.99	9588.31	2072.99	9593.74	2072.95	9596.49	2072.93
9597.22	2072.93	9600.39	2072.79	9623	2072.6	9638	2072	9653	2068
9665	2067	9695	2066.83	9830	2066.77	10000	2066.63	10058	2066.7
10075	2073								

Manning's n Values num= 2

Sta	n Val	Sta	n Val
9395.96	.069	9665	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9623	10075	200	200	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2071.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.30	Wt. n-Val.	0.069	0.030	
W.S. Elev (ft)	2070.58	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)	0.08	1576.09	
E.G. Slope (ft/ft)	0.006055	Area (sq ft)	0.08	1576.09	
Q Total (cfs)	14413.00	Flow (cfs)	0.02	14412.98	
Top Width (ft)	427.25	Top Width (ft)	2.11	425.14	
Vel Total (ft/s)	9.14	Avg. Vel. (ft/s)	0.19	9.14	
Max Chl Dpth (ft)	3.95	Hydr. Depth (ft)	0.04	3.71	
Conv. Total (cfs)	185229.2	Conv. (cfs)	0.2	185229.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	2.12	426.21	
Min Ch El (ft)	2066.63	Shear (lb/sq ft)	0.01	1.40	
Alpha	1.00	Stream Power (lb/ft s)	10075.00	0.00	0.00
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	0.51	125.16	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.10	16.01	0.03

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2071.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.30	Wt. n-Val.		0.030	
W.S. Elev (ft)	2070.58	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1576.40	
E.G. Slope (ft/ft)	0.006051	Area (sq ft)		1576.40	
Q Total (cfs)	14413.00	Flow (cfs)		14413.00	
Top Width (ft)	425.14	Top Width (ft)		425.14	
Vel Total (ft/s)	9.14	Avg. Vel. (ft/s)		9.14	
Max Chl Dpth (ft)	3.95	Hydr. Depth (ft)		3.71	
Conv. Total (cfs)	185288.6	Conv. (cfs)		185288.6	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		426.22	
Min Ch El (ft)	2066.63	Shear (lb/sq ft)		1.40	
Alpha	1.00	Stream Power (lb/ft s)	10075.00	0.00	0.00
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	0.51	125.15	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.09	16.00	0.03

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2069.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.		0.030	
W.S. Elev (ft)	2069.28	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1028.13	
E.G. Slope (ft/ft)	0.005296	Area (sq ft)		1028.13	
Q Total (cfs)	6725.00	Flow (cfs)		6725.00	
Top Width (ft)	416.74	Top Width (ft)		416.74	
Vel Total (ft/s)	6.54	Avg. Vel. (ft/s)		6.54	
Max Chl Dpth (ft)	2.65	Hydr. Depth (ft)		2.47	
Conv. Total (cfs)	92411.2	Conv. (cfs)		92411.2	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		417.41	

Min Ch El (ft)	2066.63	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)	10075.00	0.00	0.00
Frctn Loss (ft)	1.44	Cum Volume (acre-ft)	0.28	68.64	
C & E Loss (ft)	0.04	Cum SA (acres)	0.09	15.35	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2071.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.02	Wt. n-Val.		0.030	
W.S. Elev (ft)	2070.33	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1470.32	
E.G. Slope (ft/ft)	0.005195	Area (sq ft)		1470.32	
Q Total (cfs)	11927.00	Flow (cfs)		11927.00	
Top Width (ft)	423.53	Top Width (ft)		423.53	
Vel Total (ft/s)	8.11	Avg. Vel. (ft/s)		8.11	
Max Chl Dpth (ft)	3.70	Hydr. Depth (ft)		3.47	
Conv. Total (cfs)	165480.3	Conv. (cfs)		165480.3	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		424.53	
Min Ch El (ft)	2066.63	Shear (lb/sq ft)		1.12	
Alpha	1.00	Stream Power (lb/ft s)	10075.00	0.00	0.00
Frctn Loss (ft)	1.36	Cum Volume (acre-ft)	0.45	108.56	0.01
C & E Loss (ft)	0.05	Cum SA (acres)	0.09	15.66	0.03

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2073.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.47	Wt. n-Val.	0.069	0.030	
W.S. Elev (ft)	2071.69	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)	18.64	2053.06	
E.G. Slope (ft/ft)	0.004942	Area (sq ft)	18.64	2053.06	
Q Total (cfs)	19986.00	Flow (cfs)	17.71	19968.29	
Top Width (ft)	469.72	Top Width (ft)	37.41	432.31	
Vel Total (ft/s)	9.65	Avg. Vel. (ft/s)	0.95	9.73	
Max Chl Dpth (ft)	5.06	Hydr. Depth (ft)	0.50	4.75	
Conv. Total (cfs)	284300.3	Conv. (cfs)	251.9	284048.4	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	37.50	433.73	
Min Ch El (ft)	2066.63	Shear (lb/sq ft)	0.15	1.46	
Alpha	1.02	Stream Power (lb/ft s)	10075.00	0.00	0.00
Frctn Loss (ft)	0.81	Cum Volume (acre-ft)	0.69	159.31	0.06
C & E Loss (ft)	0.08	Cum SA (acres)	0.19	16.12	0.03

Warning: Divided flow computed for this cross-section.

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9456.50	9471.64	0.02	0.08	2.12	0.00	0.04	0.19	0.01	0.00
2	LOB	9471.64	9486.78							0.00	0.00
3	LOB	9486.78	9501.91							0.00	0.00

4	LOB	9501.91	9517.05							0.00	0.00
5	LOB	9517.05	9532.18							0.00	0.00
6	LOB	9532.18	9547.32							0.00	0.00
7	LOB	9547.32	9562.46							0.00	0.00
8	LOB	9562.46	9577.59							0.00	0.00
9	LOB	9577.59	9592.73							0.00	0.00
10	LOB	9592.73	9607.86							0.00	0.00
11	LOB	9607.86	9623.00							0.00	0.00
12	Chan	9623.00	9653.13	25.02	12.81	10.14	0.17	1.31	1.95	0.48	0.93
13	Chan	9653.13	9683.27	731.22	102.91	30.17	5.07	3.42	7.11	1.29	9.16
14	Chan	9683.27	9713.40	1042.65	112.64	30.13	7.23	3.74	9.26	1.41	13.08
15	Chan	9713.40	9743.53	1054.40	113.40	30.13	7.32	3.76	9.30	1.42	13.23
16	Chan	9743.53	9773.67	1060.65	113.81	30.13	7.36	3.78	9.32	1.43	13.30
17	Chan	9773.67	9803.80	1066.91	114.21	30.13	7.40	3.79	9.34	1.43	13.38
18	Chan	9803.80	9833.93	1073.31	114.62	30.13	7.45	3.80	9.36	1.44	13.46
19	Chan	9833.93	9864.07	1082.94	115.23	30.13	7.51	3.82	9.40	1.45	13.58
20	Chan	9864.07	9894.20	1094.75	115.99	30.13	7.60	3.85	9.44	1.45	13.73
21	Chan	9894.20	9924.33	1106.55	116.74	30.13	7.68	3.87	9.48	1.46	13.88
22	Chan	9924.33	9954.47	1118.40	117.49	30.13	7.76	3.90	9.52	1.47	14.03
23	Chan	9954.47	9984.60	1130.24	118.23	30.13	7.84	3.92	9.56	1.48	14.18
24	Chan	9984.60	10014.73	1138.71	118.76	30.13	7.90	3.94	9.59	1.49	14.28
25	Chan	10014.73	10044.87	1125.03	117.90	30.13	7.81	3.91	9.54	1.48	14.11
26	Chan	10044.87	10075.00	562.20	71.34	24.30	3.90	3.02	7.88	1.11	8.75

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9623.00	9653.13	25.03	12.82	10.15	0.17	1.31	1.95	0.48	0.93
2	Chan	9653.13	9683.27	731.24	102.93	30.17	5.07	3.42	7.10	1.29	9.15
3	Chan	9683.27	9713.40	1042.65	112.67	30.13	7.23	3.74	9.25	1.41	13.07
4	Chan	9713.40	9743.53	1054.40	113.42	30.13	7.32	3.76	9.30	1.42	13.22
5	Chan	9743.53	9773.67	1060.66	113.83	30.13	7.36	3.78	9.32	1.43	13.30
6	Chan	9773.67	9803.80	1066.91	114.23	30.13	7.40	3.79	9.34	1.43	13.38
7	Chan	9803.80	9833.93	1073.31	114.64	30.13	7.45	3.80	9.36	1.44	13.45
8	Chan	9833.93	9864.07	1082.94	115.26	30.13	7.51	3.82	9.40	1.44	13.58
9	Chan	9864.07	9894.20	1094.75	116.01	30.13	7.60	3.85	9.44	1.45	13.72
10	Chan	9894.20	9924.33	1106.54	116.76	30.13	7.68	3.87	9.48	1.46	13.87
11	Chan	9924.33	9954.47	1118.40	117.51	30.13	7.76	3.90	9.52	1.47	14.02
12	Chan	9954.47	9984.60	1130.23	118.25	30.13	7.84	3.92	9.56	1.48	14.17
13	Chan	9984.60	10014.73	1138.70	118.78	30.13	7.90	3.94	9.59	1.49	14.27
14	Chan	10014.73	10044.87	1125.02	117.92	30.13	7.81	3.91	9.54	1.48	14.10
15	Chan	10044.87	10075.00	562.23	71.36	24.30	3.90	3.02	7.88	1.11	8.74

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9623.00	9653.13	3.73	3.23	5.09	0.06	0.66	1.15	0.21	0.24
2	Chan	9653.13	9683.27	317.37	63.69	30.17	4.72	2.11	4.98	0.70	3.48
3	Chan	9683.27	9713.40	478.23	73.42	30.13	7.11	2.44	6.51	0.81	5.25
4	Chan	9713.40	9743.53	486.52	74.18	30.13	7.23	2.46	6.56	0.81	5.34
5	Chan	9743.53	9773.67	490.93	74.58	30.13	7.30	2.47	6.58	0.82	5.39

6	Chan	9773.67	9803.80	495.36	74.98	30.13	7.37	2.49	6.61	0.82	5.44
7	Chan	9803.80	9833.93	499.88	75.39	30.13	7.43	2.50	6.63	0.83	5.48
8	Chan	9833.93	9864.07	506.71	76.01	30.13	7.53	2.52	6.67	0.83	5.56
9	Chan	9864.07	9894.20	515.09	76.76	30.13	7.66	2.55	6.71	0.84	5.65
10	Chan	9894.20	9924.33	523.49	77.51	30.13	7.78	2.57	6.75	0.85	5.74
11	Chan	9924.33	9954.47	531.94	78.26	30.13	7.91	2.60	6.80	0.86	5.84
12	Chan	9954.47	9984.60	540.41	79.00	30.13	8.04	2.62	6.84	0.87	5.93
13	Chan	9984.60	10014.73	546.47	79.53	30.13	8.13	2.64	6.87	0.87	6.00
14	Chan	10014.73	10044.87	536.68	78.68	30.13	7.98	2.61	6.82	0.86	5.89
15	Chan	10044.87	10075.00	252.19	42.91	20.55	3.75	2.14	5.88	0.69	4.06

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9623.00	9653.13	17.74	10.49	9.17	0.15	1.18	1.69	0.37	0.63
2	Chan	9653.13	9683.27	599.41	95.40	30.17	5.03	3.17	6.28	1.03	6.44
3	Chan	9683.27	9713.40	861.03	105.13	30.13	7.22	3.49	8.19	1.13	9.27
4	Chan	9713.40	9743.53	871.43	105.89	30.13	7.31	3.51	8.23	1.14	9.38
5	Chan	9743.53	9773.67	876.97	106.30	30.13	7.35	3.53	8.25	1.14	9.44
6	Chan	9773.67	9803.80	882.51	106.70	30.13	7.40	3.54	8.27	1.15	9.50
7	Chan	9803.80	9833.93	888.17	107.11	30.13	7.45	3.55	8.29	1.15	9.56
8	Chan	9833.93	9864.07	896.70	107.72	30.13	7.52	3.57	8.32	1.16	9.65
9	Chan	9864.07	9894.20	907.17	108.48	30.13	7.61	3.60	8.36	1.17	9.76
10	Chan	9894.20	9924.33	917.62	109.22	30.13	7.69	3.62	8.40	1.18	9.88
11	Chan	9924.33	9954.47	928.13	109.97	30.13	7.78	3.65	8.44	1.18	9.99
12	Chan	9954.47	9984.60	938.62	110.72	30.13	7.87	3.67	8.48	1.19	10.10
13	Chan	9984.60	10014.73	946.14	111.25	30.13	7.93	3.69	8.50	1.20	10.18
14	Chan	10014.73	10044.87	934.00	110.39	30.13	7.83	3.66	8.46	1.19	10.05
15	Chan	10044.87	10075.00	461.35	65.54	23.58	3.87	2.86	7.04	0.90	6.35

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	LOB	9441.37	9456.50	5.50	6.42	12.58	0.03	0.51	0.86	0.16	0.13
2	LOB	9456.50	9471.64	11.76	10.92	15.18	0.06	0.72	1.08	0.22	0.24
3	LOB	9471.64	9486.78	0.45	1.30	9.74	0.00	0.13	0.35	0.04	0.01
4	LOB	9486.78	9501.91							0.00	0.00
5	LOB	9501.91	9517.05							0.00	0.00
6	LOB	9517.05	9532.18							0.00	0.00
7	LOB	9532.18	9547.32							0.00	0.00
8	LOB	9547.32	9562.46							0.00	0.00
9	LOB	9562.46	9577.59							0.00	0.00
10	LOB	9577.59	9592.73							0.00	0.00
11	LOB	9592.73	9607.86							0.00	0.00
12	LOB	9607.86	9623.00							0.00	0.00
13	Chan	9623.00	9653.13	58.13	26.04	14.46	0.29	1.86	2.23	0.56	1.24
14	Chan	9653.13	9683.27	1043.19	136.44	30.17	5.22	4.53	7.65	1.40	10.67
15	Chan	9683.27	9713.40	1452.73	146.17	30.13	7.27	4.85	9.94	1.50	14.87
16	Chan	9713.40	9743.53	1465.34	146.93	30.13	7.33	4.88	9.97	1.50	15.00

17	Chan	9743.53	9773.67	1472.05	147.33	30.13	7.37	4.89	9.99	1.51	15.07
18	Chan	9773.67	9803.80	1478.75	147.73	30.13	7.40	4.90	10.01	1.51	15.14
19	Chan	9803.80	9833.93	1485.61	148.15	30.13	7.43	4.92	10.03	1.52	15.21
20	Chan	9833.93	9864.07	1495.91	148.76	30.13	7.48	4.94	10.06	1.52	15.32
21	Chan	9864.07	9894.20	1508.56	149.51	30.13	7.55	4.96	10.09	1.53	15.45
22	Chan	9894.20	9924.33	1521.15	150.26	30.13	7.61	4.99	10.12	1.54	15.57
23	Chan	9924.33	9954.47	1533.82	151.01	30.13	7.67	5.01	10.16	1.55	15.70
24	Chan	9954.47	9984.60	1546.43	151.75	30.13	7.74	5.04	10.19	1.55	15.83
25	Chan	9984.60	10014.73	1555.47	152.29	30.13	7.78	5.05	10.21	1.56	15.93
26	Chan	10014.73	10044.87	1540.87	151.43	30.13	7.71	5.03	10.18	1.55	15.78
27	Chan	10044.87	10075.00	810.28	99.27	27.50	4.05	3.73	8.16	1.11	9.09

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 0.708

INPUT
Description: Filled right overbank approximately 2'.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9662	2071	9675	2070	9706	2066	9715	2065.32	9840	2065.2
10000	2065.1	10067	2065	10085	2072.4				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
9662	.069	9715	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9662	10085	240	215	215 .1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2070.60	Element	Left OB	Channel	Right OB	
Vel Head (ft)	1.45	Wt. n-Val.		0.031		
W.S. Elev (ft)	2069.15	Reach Len. (ft)	240.00	215.00	215.00	
Crit W.S. (ft)	2068.82	Flow Area (sq ft)		1493.06		
E.G. Slope (ft/ft)	0.006577	Area (sq ft)		1493.06		
Q Total (cfs)	14413.00	Flow (cfs)		14413.00		
Top Width (ft)	395.54	Top Width (ft)		395.54		
Vel Total (ft/s)	9.65	Avg. Vel. (ft/s)		9.65		
Max Chl Dpth (ft)	4.15	Hydr. Depth (ft)		3.77		
Conv. Total (cfs)	177728.2	Conv. (cfs)		177728.2		
Length Wtd. (ft)	215.00	Wetted Per. (ft)		396.59		
Min Ch El (ft)	2065.00	Shear (lb/sq ft)		1.55		
Alpha	1.00	Stream Power (lb/ft s)	10085.00	0.00	0.00	
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	0.51	118.12	0.02	
C & E Loss (ft)	0.22	Cum SA (acres)	0.09	14.13	0.03	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2070.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.45	Wt. n-Val.		0.031	

W.S. Elev (ft)	2069.15	Reach Len. (ft)	240.00	215.00	215.00
Crit W.S. (ft)	2068.82	Flow Area (sq ft)		1492.48	
E.G. Slope (ft/ft)	0.006583	Area (sq ft)		1492.48	
Q Total (cfs)	14413.00	Flow (cfs)		14413.00	
Top Width (ft)	395.40	Top Width (ft)		395.40	
Vel Total (ft/s)	9.66	Avg. Vel. (ft/s)		9.66	
Max Chl Dpth (ft)	4.15	Hydr. Depth (ft)		3.77	
Conv. Total (cfs)	177635.3	Conv. (cfs)		177635.3	
Length Wtd. (ft)	215.00	Wetted Per. (ft)		396.48	
Min Ch El (ft)	2065.00	Shear (lb/sq ft)		1.55	
Alpha	1.00	Stream Power (lb/ft s)	10085.00	0.00	0.00
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	0.51	118.11	0.02
C & E Loss (ft)	0.22	Cum SA (acres)	0.09	14.12	0.03

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2068.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.08	Wt. n-Val.		0.030	
W.S. Elev (ft)	2067.38	Reach Len. (ft)	240.00	215.00	215.00
Crit W.S. (ft)	2067.38	Flow Area (sq ft)		806.13	
E.G. Slope (ft/ft)	0.010413	Area (sq ft)		806.13	
Q Total (cfs)	6725.00	Flow (cfs)		6725.00	
Top Width (ft)	377.44	Top Width (ft)		377.44	
Vel Total (ft/s)	8.34	Avg. Vel. (ft/s)		8.34	
Max Chl Dpth (ft)	2.38	Hydr. Depth (ft)		2.14	
Conv. Total (cfs)	65904.0	Conv. (cfs)		65904.0	
Length Wtd. (ft)	215.00	Wetted Per. (ft)		378.03	
Min Ch El (ft)	2065.00	Shear (lb/sq ft)		1.39	
Alpha	1.00	Stream Power (lb/ft s)	10085.00	0.00	0.00
Frctn Loss (ft)	1.35	Cum Volume (acre-ft)	0.28	64.43	
C & E Loss (ft)	0.13	Cum SA (acres)	0.09	13.52	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2069.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.55	Wt. n-Val.		0.030	
W.S. Elev (ft)	2068.38	Reach Len. (ft)	240.00	215.00	215.00
Crit W.S. (ft)	2068.38	Flow Area (sq ft)		1191.89	
E.G. Slope (ft/ft)	0.009262	Area (sq ft)		1191.89	
Q Total (cfs)	11927.00	Flow (cfs)		11927.00	
Top Width (ft)	387.71	Top Width (ft)		387.71	
Vel Total (ft/s)	10.01	Avg. Vel. (ft/s)		10.01	
Max Chl Dpth (ft)	3.38	Hydr. Depth (ft)		3.07	
Conv. Total (cfs)	123928.1	Conv. (cfs)		123928.1	
Length Wtd. (ft)	215.00	Wetted Per. (ft)		388.56	
Min Ch El (ft)	2065.00	Shear (lb/sq ft)		1.77	

Alpha	1.00	Stream Power (lb/ft s)	10085.00	0.00	0.00
Frctn Loss (ft)	0.93	Cum Volume (acre-ft)	0.45	102.45	0.01
C & E Loss (ft)	0.25	Cum SA (acres)	0.09	13.80	0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2072.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.20	Wt. n-Val.		0.031	
W.S. Elev (ft)	2071.07	Reach Len. (ft)	240.00	215.00	215.00
Crit W.S. (ft)		Flow Area (sq ft)		2272.99	
E.G. Slope (ft/ft)	0.003367	Area (sq ft)		2272.99	
Q Total (cfs)	19986.00	Flow (cfs)		19986.00	
Top Width (ft)	419.77	Top Width (ft)		419.77	
Vel Total (ft/s)	8.79	Avg. Vel. (ft/s)		8.79	
Max Chl Dpth (ft)	6.07	Hydr. Depth (ft)		5.41	
Conv. Total (cfs)	344442.4	Conv. (cfs)		344442.4	
Length Wtd. (ft)	215.00	Wetted Per. (ft)		421.36	
Min Ch El (ft)	2065.00	Shear (lb/sq ft)		1.13	
Alpha	1.00	Stream Power (lb/ft s)	10085.00	0.00	0.00
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	0.65	149.38	0.06
C & E Loss (ft)	0.14	Cum SA (acres)	0.10	14.16	0.03

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9662.00	9690.20	5.64	4.81	8.71	0.04	0.56	1.17	0.23	0.27
2	Chan	9690.20	9718.40	342.81	78.20	28.36	2.38	2.77	4.38	1.13	4.96
3	Chan	9718.40	9746.60	1067.26	108.57	28.20	7.40	3.85	9.83	1.58	15.54
4	Chan	9746.60	9774.80	1079.85	109.33	28.20	7.49	3.88	9.88	1.59	15.72
5	Chan	9774.80	9803.00	1092.46	110.10	28.20	7.58	3.90	9.92	1.60	15.91
6	Chan	9803.00	9831.20	1105.13	110.86	28.20	7.67	3.93	9.97	1.61	16.09
7	Chan	9831.20	9859.40	1116.84	111.57	28.20	7.75	3.96	10.01	1.62	16.26
8	Chan	9859.40	9887.60	1125.35	112.07	28.20	7.81	3.97	10.04	1.63	16.38
9	Chan	9887.60	9915.80	1133.70	112.57	28.20	7.87	3.99	10.07	1.64	16.51
10	Chan	9915.80	9944.00	1142.03	113.07	28.20	7.92	4.01	10.10	1.65	16.63
11	Chan	9944.00	9972.20	1150.39	113.57	28.20	7.98	4.03	10.13	1.65	16.75
12	Chan	9972.20	10000.40	1158.77	114.06	28.20	8.04	4.04	10.16	1.66	16.87
13	Chan	10000.40	10028.60	1173.16	114.91	28.20	8.14	4.07	10.21	1.67	17.08
14	Chan	10028.60	10056.80	1193.54	116.10	28.20	8.28	4.12	10.28	1.69	17.38
15	Chan	10056.80	10085.00	526.09	63.27	21.12	3.65	3.12	8.32	1.23	10.23

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9662.00	9690.20	5.65	4.80	8.65	0.04	0.56	1.18	0.23	0.27
2	Chan	9690.20	9718.40	342.73	78.16	28.36	2.38	2.77	4.39	1.13	4.97
3	Chan	9718.40	9746.60	1067.19	108.53	28.20	7.40	3.85	9.83	1.58	15.55
4	Chan	9746.60	9774.80	1079.78	109.29	28.20	7.49	3.88	9.88	1.59	15.74
5	Chan	9774.80	9803.00	1092.39	110.06	28.20	7.58	3.90	9.93	1.60	15.92
6	Chan	9803.00	9831.20	1105.07	110.82	28.20	7.67	3.93	9.97	1.62	16.11
7	Chan	9831.20	9859.40	1116.79	111.53	28.20	7.75	3.95	10.01	1.63	16.28
8	Chan	9859.40	9887.60	1125.30	112.03	28.20	7.81	3.97	10.04	1.63	16.40
9	Chan	9887.60	9915.80	1133.65	112.53	28.20	7.87	3.99	10.07	1.64	16.52
10	Chan	9915.80	9944.00	1141.98	113.03	28.20	7.92	4.01	10.10	1.65	16.64
11	Chan	9944.00	9972.20	1150.34	113.52	28.20	7.98	4.03	10.13	1.65	16.77
12	Chan	9972.20	10000.40	1158.73	114.02	28.20	8.04	4.04	10.16	1.66	16.89
13	Chan	10000.40	10028.60	1173.12	114.87	28.20	8.14	4.07	10.21	1.67	17.10
14	Chan	10028.60	10056.80	1193.50	116.06	28.20	8.28	4.12	10.28	1.69	17.39
15	Chan	10056.80	10085.00	526.80	63.24	21.07	3.66	3.13	8.33	1.23	10.27

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9690.20	9718.40	112.08	29.78	23.18	1.67	1.29	3.76	0.84	3.14
2	Chan	9718.40	9746.60	479.65	58.45	28.20	7.13	2.07	8.21	1.35	11.06
3	Chan	9746.60	9774.80	490.16	59.21	28.20	7.29	2.10	8.28	1.36	11.30
4	Chan	9774.80	9803.00	500.75	59.98	28.20	7.45	2.13	8.35	1.38	11.54
5	Chan	9803.00	9831.20	511.43	60.74	28.20	7.60	2.15	8.42	1.40	11.79
6	Chan	9831.20	9859.40	521.34	61.45	28.20	7.75	2.18	8.48	1.42	12.02
7	Chan	9859.40	9887.60	528.58	61.95	28.20	7.86	2.20	8.53	1.43	12.18
8	Chan	9887.60	9915.80	535.66	62.45	28.20	7.97	2.21	8.58	1.44	12.35
9	Chan	9915.80	9944.00	542.77	62.95	28.20	8.07	2.23	8.62	1.45	12.51
10	Chan	9944.00	9972.20	549.91	63.44	28.20	8.18	2.25	8.67	1.46	12.68
11	Chan	9972.20	10000.40	557.09	63.94	28.20	8.28	2.27	8.71	1.47	12.84
12	Chan	10000.40	10028.60	569.47	64.79	28.20	8.47	2.30	8.79	1.49	13.13
13	Chan	10028.60	10056.80	587.05	65.98	28.20	8.73	2.34	8.90	1.52	13.53
14	Chan	10056.80	10085.00	239.08	31.02	16.45	3.56	1.94	7.71	1.23	9.45

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9662.00	9690.20	0.30	0.46	2.70	0.00	0.17	0.64	0.10	0.06

2	Chan	9690.20	9718.40	248.09	56.51	28.36	2.08	2.00	4.39	1.15	5.06
3	Chan	9718.40	9746.60	874.94	86.88	28.20	7.34	3.08	10.07	1.78	17.94
4	Chan	9746.60	9774.80	887.83	87.65	28.20	7.44	3.11	10.13	1.80	18.21
5	Chan	9774.80	9803.00	900.77	88.41	28.20	7.55	3.14	10.19	1.81	18.47
6	Chan	9803.00	9831.20	913.79	89.18	28.20	7.66	3.16	10.25	1.83	18.74
7	Chan	9831.20	9859.40	925.84	89.88	28.20	7.76	3.19	10.30	1.84	18.98
8	Chan	9859.40	9887.60	934.60	90.39	28.20	7.84	3.21	10.34	1.85	19.16
9	Chan	9887.60	9915.80	943.19	90.89	28.20	7.91	3.22	10.38	1.86	19.34
10	Chan	9915.80	9944.00	951.78	91.38	28.20	7.98	3.24	10.42	1.87	19.52
11	Chan	9944.00	9972.20	960.40	91.88	28.20	8.05	3.26	10.45	1.88	19.69
12	Chan	9972.20	10000.40	969.06	92.37	28.20	8.12	3.28	10.49	1.89	19.87
13	Chan	10000.40	10028.60	983.93	93.22	28.20	8.25	3.31	10.55	1.91	20.18
14	Chan	10028.60	10056.80	1005.01	94.41	28.20	8.43	3.35	10.64	1.94	20.61
15	Chan	10056.80	10085.00	427.47	48.37	19.10	3.58	2.62	8.84	1.46	12.94

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9662.00	9690.20	58.69	38.59	28.43	0.29	1.37	1.52	0.29	0.43
2	Chan	9690.20	9718.40	561.22	132.26	28.36	2.81	4.69	4.24	0.98	4.16
3	Chan	9718.40	9746.60	1492.49	162.62	28.20	7.47	5.77	9.18	1.21	11.12
4	Chan	9746.60	9774.80	1504.25	163.39	28.20	7.53	5.79	9.21	1.22	11.21
5	Chan	9774.80	9803.00	1515.99	164.16	28.20	7.59	5.82	9.23	1.22	11.30
6	Chan	9803.00	9831.20	1527.77	164.92	28.20	7.64	5.85	9.26	1.23	11.39
7	Chan	9831.20	9859.40	1538.65	165.63	28.20	7.70	5.87	9.29	1.23	11.47
8	Chan	9859.40	9887.60	1546.53	166.13	28.20	7.74	5.89	9.31	1.24	11.53
9	Chan	9887.60	9915.80	1554.28	166.63	28.20	7.78	5.91	9.33	1.24	11.58
10	Chan	9915.80	9944.00	1561.99	167.13	28.20	7.82	5.93	9.35	1.25	11.64
11	Chan	9944.00	9972.20	1569.72	167.62	28.20	7.85	5.94	9.36	1.25	11.70
12	Chan	9972.20	10000.40	1577.47	168.12	28.20	7.89	5.96	9.38	1.25	11.76
13	Chan	10000.40	10028.60	1590.73	168.96	28.20	7.96	5.99	9.41	1.26	11.86
14	Chan	10028.60	10056.80	1609.52	170.16	28.20	8.05	6.03	9.46	1.27	12.00
15	Chan	10056.80	10085.00	776.72	106.66	26.16	3.89	4.27	7.28	0.86	6.24

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 0.668

INPUT
Description: Filled right overbank approximately 2'.
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

9718 2072.5 9718 2066.32 9719.5 2066.32 9719.5 2063.32 10000 2063.3
10087.3 2063.3 10108 2071.4

Manning's n Values num= 1

Sta	n Val
9718	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9718	10108	160	135	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2069.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.		0.030	
W.S. Elev (ft)	2068.95	Reach Len. (ft)	160.00	135.00	135.00
Crit W.S. (ft)		Flow Area (sq ft)		2117.99	
E.G. Slope (ft/ft)	0.001993	Area (sq ft)		2117.99	
Q Total (cfs)	14459.00	Flow (cfs)		14459.00	
Top Width (ft)	383.73	Top Width (ft)		383.73	
Vel Total (ft/s)	6.83	Avg. Vel. (ft/s)		6.83	
Max Chl Dpth (ft)	5.64	Hydr. Depth (ft)		5.52	
Conv. Total (cfs)	323889.1	Conv. (cfs)		323889.1	
Length Wtd. (ft)	135.00	Wetted Per. (ft)		390.42	
Min Ch El (ft)	2063.30	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)	10108.00	0.00	0.00
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	0.51	109.21	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.09	12.20	0.03

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2069.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.		0.030	
W.S. Elev (ft)	2068.94	Reach Len. (ft)	160.00	135.00	135.00
Crit W.S. (ft)		Flow Area (sq ft)		2117.52	
E.G. Slope (ft/ft)	0.001994	Area (sq ft)		2117.52	
Q Total (cfs)	14459.00	Flow (cfs)		14459.00	
Top Width (ft)	383.67	Top Width (ft)		383.67	
Vel Total (ft/s)	6.83	Avg. Vel. (ft/s)		6.83	
Max Chl Dpth (ft)	5.64	Hydr. Depth (ft)		5.52	
Conv. Total (cfs)	323791.9	Conv. (cfs)		323791.9	
Length Wtd. (ft)	135.00	Wetted Per. (ft)		390.37	
Min Ch El (ft)	2063.30	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)	10108.00	0.00	0.00
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	0.51	109.20	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.09	12.20	0.03

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2066.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.63	Wt. n-Val.		0.030	
W.S. Elev (ft)	2066.16	Reach Len. (ft)	160.00	135.00	135.00
Crit W.S. (ft)		Flow Area (sq ft)		1059.32	
E.G. Slope (ft/ft)	0.004206	Area (sq ft)		1059.32	
Q Total (cfs)	6758.00	Flow (cfs)		6758.00	
Top Width (ft)	375.11	Top Width (ft)		375.11	
Vel Total (ft/s)	6.38	Avg. Vel. (ft/s)		6.38	
Max Chl Dpth (ft)	2.86	Hydr. Depth (ft)		2.82	
Conv. Total (cfs)	104203.9	Conv. (cfs)		104203.9	
Length Wtd. (ft)	135.00	Wetted Per. (ft)		378.49	
Min Ch El (ft)	2063.30	Shear (lb/sq ft)		0.73	

Alpha	1.00	Stream Power (lb/ft s)	10108.00	0.00	0.00
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)	0.28	59.83	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	11.67	

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2068.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.		0.030	
W.S. Elev (ft)	2068.02	Reach Len. (ft)	160.00	135.00	135.00
Crit W.S. (ft)		Flow Area (sq ft)		1763.19	
E.G. Slope (ft/ft)	0.002484	Area (sq ft)		1763.19	
Q Total (cfs)	11964.00	Flow (cfs)		11964.00	
Top Width (ft)	381.36	Top Width (ft)		381.36	
Vel Total (ft/s)	6.79	Avg. Vel. (ft/s)		6.79	
Max Chl Dpth (ft)	4.72	Hydr. Depth (ft)		4.62	
Conv. Total (cfs)	240035.0	Conv. (cfs)		240035.0	
Length Wtd. (ft)	135.00	Wetted Per. (ft)		386.94	
Min Ch El (ft)	2063.30	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)	10108.00	0.00	0.00
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	0.45	95.16	0.01
C & E Loss (ft)	0.01	Cum SA (acres)	0.09	11.90	0.03

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2071.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.74	Wt. n-Val.		0.030	
W.S. Elev (ft)	2070.95	Reach Len. (ft)	160.00	135.00	135.00
Crit W.S. (ft)		Flow Area (sq ft)		2891.79	
E.G. Slope (ft/ft)	0.001386	Area (sq ft)		2891.79	
Q Total (cfs)	20005.00	Flow (cfs)		20005.00	
Top Width (ft)	388.84	Top Width (ft)		388.84	
Vel Total (ft/s)	6.92	Avg. Vel. (ft/s)		6.92	
Max Chl Dpth (ft)	7.65	Hydr. Depth (ft)		7.44	
Conv. Total (cfs)	537392.0	Conv. (cfs)		537392.0	
Length Wtd. (ft)	135.00	Wetted Per. (ft)		397.92	
Min Ch El (ft)	2063.30	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)	10108.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.65	136.63	0.06
C & E Loss (ft)	0.02	Cum SA (acres)	0.10	12.17	0.03

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9718.00	9744.00	846.74	141.76	31.62	5.86	5.45	5.97	0.56	3.33
2	Chan	9744.00	9770.00	1016.98	146.31	26.00	7.03	5.63	6.95	0.70	4.87
3	Chan	9770.00	9796.00	1017.53	146.36	26.00	7.04	5.63	6.95	0.70	4.87
4	Chan	9796.00	9822.00	1018.08	146.41	26.00	7.04	5.63	6.95	0.70	4.87
5	Chan	9822.00	9848.00	1018.67	146.46	26.00	7.05	5.63	6.96	0.70	4.87
6	Chan	9848.00	9874.00	1019.22	146.51	26.00	7.05	5.63	6.96	0.70	4.88
7	Chan	9874.00	9900.00	1019.78	146.55	26.00	7.05	5.64	6.96	0.70	4.88
8	Chan	9900.00	9926.00	1020.33	146.60	26.00	7.06	5.64	6.96	0.70	4.88
9	Chan	9926.00	9952.00	1020.88	146.65	26.00	7.06	5.64	6.96	0.70	4.89
10	Chan	9952.00	9978.00	1021.47	146.70	26.00	7.06	5.64	6.96	0.70	4.89
11	Chan	9978.00	10004.00	1022.02	146.75	26.00	7.07	5.64	6.96	0.70	4.89
12	Chan	10004.00	10030.00	1022.21	146.76	26.00	7.07	5.64	6.96	0.70	4.89
13	Chan	10030.00	10056.00	1022.21	146.76	26.00	7.07	5.64	6.96	0.70	4.89
14	Chan	10056.00	10082.00	1022.21	146.76	26.00	7.07	5.64	6.96	0.70	4.89
15	Chan	10082.00	10108.00	350.67	70.63	20.79	2.43	3.58	4.96	0.42	2.10

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9718.00	9744.00	846.73	141.73	31.62	5.86	5.45	5.97	0.56	3.33
2	Chan	9744.00	9770.00	1016.95	146.28	26.00	7.03	5.63	6.95	0.70	4.87
3	Chan	9770.00	9796.00	1017.51	146.33	26.00	7.04	5.63	6.95	0.70	4.87
4	Chan	9796.00	9822.00	1018.06	146.38	26.00	7.04	5.63	6.96	0.70	4.87
5	Chan	9822.00	9848.00	1018.65	146.43	26.00	7.05	5.63	6.96	0.70	4.88
6	Chan	9848.00	9874.00	1019.20	146.48	26.00	7.05	5.63	6.96	0.70	4.88
7	Chan	9874.00	9900.00	1019.75	146.52	26.00	7.05	5.64	6.96	0.70	4.88
8	Chan	9900.00	9926.00	1020.30	146.57	26.00	7.06	5.64	6.96	0.70	4.89
9	Chan	9926.00	9952.00	1020.85	146.62	26.00	7.06	5.64	6.96	0.70	4.89
10	Chan	9952.00	9978.00	1021.44	146.67	26.00	7.06	5.64	6.96	0.70	4.89
11	Chan	9978.00	10004.00	1021.99	146.72	26.00	7.07	5.64	6.97	0.70	4.89
12	Chan	10004.00	10030.00	1022.18	146.73	26.00	7.07	5.64	6.97	0.70	4.89
13	Chan	10030.00	10056.00	1022.18	146.73	26.00	7.07	5.64	6.97	0.70	4.89
14	Chan	10056.00	10082.00	1022.18	146.73	26.00	7.07	5.64	6.97	0.70	4.89
15	Chan	10082.00	10108.00	351.03	70.61	20.75	2.43	3.59	4.97	0.42	2.11

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9718.00	9744.00	415.70	69.59	27.34	6.15	2.84	5.97	0.67	3.99
2	Chan	9744.00	9770.00	475.12	73.89	26.00	7.03	2.84	6.43	0.75	4.80
3	Chan	9770.00	9796.00	475.63	73.94	26.00	7.04	2.84	6.43	0.75	4.80
4	Chan	9796.00	9822.00	476.14	73.99	26.00	7.05	2.85	6.44	0.75	4.81
5	Chan	9822.00	9848.00	476.68	74.04	26.00	7.05	2.85	6.44	0.75	4.81
6	Chan	9848.00	9874.00	477.20	74.09	26.00	7.06	2.85	6.44	0.75	4.82
7	Chan	9874.00	9900.00	477.71	74.13	26.00	7.07	2.85	6.44	0.75	4.82
8	Chan	9900.00	9926.00	478.22	74.18	26.00	7.08	2.85	6.45	0.75	4.83
9	Chan	9926.00	9952.00	478.73	74.23	26.00	7.08	2.85	6.45	0.75	4.83
10	Chan	9952.00	9978.00	479.28	74.28	26.00	7.09	2.86	6.45	0.75	4.84
11	Chan	9978.00	10004.00	479.79	74.33	26.00	7.10	2.86	6.46	0.75	4.85
12	Chan	10004.00	10030.00	479.96	74.34	26.00	7.10	2.86	6.46	0.75	4.85
13	Chan	10030.00	10056.00	479.96	74.34	26.00	7.10	2.86	6.46	0.75	4.85
14	Chan	10056.00	10082.00	479.96	74.34	26.00	7.10	2.86	6.46	0.75	4.85
15	Chan	10082.00	10108.00	127.94	25.60	13.15	1.89	2.03	5.00	0.51	2.56

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9718.00	9744.00	707.65	117.65	30.70	5.91	4.52	6.01	0.59	3.58
2	Chan	9744.00	9770.00	842.09	122.20	26.00	7.04	4.70	6.89	0.73	5.02
3	Chan	9770.00	9796.00	842.64	122.25	26.00	7.04	4.70	6.89	0.73	5.03
4	Chan	9796.00	9822.00	843.19	122.29	26.00	7.05	4.70	6.89	0.73	5.03
5	Chan	9822.00	9848.00	843.77	122.34	26.00	7.05	4.71	6.90	0.73	5.03
6	Chan	9848.00	9874.00	844.32	122.39	26.00	7.06	4.71	6.90	0.73	5.04
7	Chan	9874.00	9900.00	844.87	122.44	26.00	7.06	4.71	6.90	0.73	5.04
8	Chan	9900.00	9926.00	845.41	122.49	26.00	7.07	4.71	6.90	0.73	5.04
9	Chan	9926.00	9952.00	845.96	122.54	26.00	7.07	4.71	6.90	0.73	5.05
10	Chan	9952.00	9978.00	846.54	122.59	26.00	7.08	4.71	6.91	0.73	5.05
11	Chan	9978.00	10004.00	847.09	122.63	26.00	7.08	4.72	6.91	0.73	5.05
12	Chan	10004.00	10030.00	847.28	122.65	26.00	7.08	4.72	6.91	0.73	5.05
13	Chan	10030.00	10056.00	847.28	122.65	26.00	7.08	4.72	6.91	0.73	5.05
14	Chan	10056.00	10082.00	847.28	122.65	26.00	7.08	4.72	6.91	0.73	5.05

15	Chan	10082.00	10108.00	268.65	53.44	18.25	2.25	3.08	5.03	0.45	2.28

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9718.00	9744.00	1138.42	193.85	33.63	5.69	7.46	5.87	0.50	2.93
2	Chan	9744.00	9770.00	1404.68	198.40	26.00	7.02	7.63	7.08	0.66	4.67
3	Chan	9770.00	9796.00	1405.24	198.44	26.00	7.02	7.63	7.08	0.66	4.68
4	Chan	9796.00	9822.00	1405.80	198.49	26.00	7.03	7.63	7.08	0.66	4.68
5	Chan	9822.00	9848.00	1406.40	198.54	26.00	7.03	7.64	7.08	0.66	4.68
6	Chan	9848.00	9874.00	1406.97	198.59	26.00	7.03	7.64	7.08	0.66	4.68
7	Chan	9874.00	9900.00	1407.53	198.64	26.00	7.04	7.64	7.09	0.66	4.68
8	Chan	9900.00	9926.00	1408.09	198.68	26.00	7.04	7.64	7.09	0.66	4.69
9	Chan	9926.00	9952.00	1408.65	198.73	26.00	7.04	7.64	7.09	0.66	4.69
10	Chan	9952.00	9978.00	1409.25	198.78	26.00	7.04	7.65	7.09	0.66	4.69
11	Chan	9978.00	10004.00	1409.81	198.83	26.00	7.05	7.65	7.09	0.66	4.69
12	Chan	10004.00	10030.00	1410.00	198.85	26.00	7.05	7.65	7.09	0.66	4.69
13	Chan	10030.00	10056.00	1410.00	198.85	26.00	7.05	7.65	7.09	0.66	4.69
14	Chan	10056.00	10082.00	1410.00	198.85	26.00	7.05	7.65	7.09	0.66	4.69
15	Chan	10082.00	10108.00	564.14	115.27	26.29	2.82	4.64	4.89	0.38	1.86

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 0.642

INPUT
Description: Filled right overbank approximately 2'.

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9792	2072.5	9792	2070.4	9802	2067.9	9802	2064.9	9803.5	2064.9
9803.5	2062.1	10000	2062.1	10097	2062.1	10119.5	2070.8		

Manning's n Values num= 1

Sta	n Val
9792	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9792	10119.5	135	150	150	.1 .3

CROSS SECTION OUTPUT Profile #100-Sols

			Left OB	Channel	Right OB
E.G. Elev (ft)	2069.38	Element			
Vel Head (ft)	0.86	Wt. n-Val.		0.030	
W.S. Elev (ft)	2068.53	Reach Len. (ft)	135.00	150.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		1945.28	
E.G. Slope (ft/ft)	0.002040	Area (sq ft)		1945.28	
Q Total (cfs)	14459.00	Flow (cfs)		14459.00	
Top Width (ft)	314.12	Top Width (ft)		314.12	
Vel Total (ft/s)	7.43	Avg. Vel. (ft/s)		7.43	
Max Chl Dpth (ft)	6.42	Hydr. Depth (ft)		6.19	
Conv. Total (cfs)	320135.1	Conv. (cfs)		320135.1	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		321.19	
Min Ch El (ft)	2062.10	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)	10119.50	0.00	0.00
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	0.51	102.91	0.02
C & E Loss (ft)	0.08	Cum SA (acres)	0.09	11.12	0.03

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2069.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.86	Wt. n-Val.		0.030	
W.S. Elev (ft)	2068.52	Reach Len. (ft)	135.00	150.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		1944.82	
E.G. Slope (ft/ft)	0.002041	Area (sq ft)		1944.82	
Q Total (cfs)	14459.00	Flow (cfs)		14459.00	
Top Width (ft)	314.04	Top Width (ft)		314.04	
Vel Total (ft/s)	7.43	Avg. Vel. (ft/s)		7.43	
Max Chl Dpth (ft)	6.42	Hydr. Depth (ft)		6.19	
Conv. Total (cfs)	320045.9	Conv. (cfs)		320045.9	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		321.14	
Min Ch El (ft)	2062.10	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)	10119.50	0.00	0.00
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	0.51	102.90	0.02
C & E Loss (ft)	0.08	Cum SA (acres)	0.09	11.12	0.03

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2066.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.		0.030	
W.S. Elev (ft)	2065.68	Reach Len. (ft)	135.00	150.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		1069.24	
E.G. Slope (ft/ft)	0.003105	Area (sq ft)		1069.24	
Q Total (cfs)	6758.00	Flow (cfs)		6758.00	
Top Width (ft)	304.27	Top Width (ft)		304.27	
Vel Total (ft/s)	6.32	Avg. Vel. (ft/s)		6.32	
Max Chl Dpth (ft)	3.58	Hydr. Depth (ft)		3.51	
Conv. Total (cfs)	121286.7	Conv. (cfs)		121286.7	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		308.52	
Min Ch El (ft)	2062.10	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)	10119.50	0.00	0.00
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	0.28	56.53	
C & E Loss (ft)	0.06	Cum SA (acres)	0.09	10.61	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2068.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.		0.030	
W.S. Elev (ft)	2067.58	Reach Len. (ft)	135.00	150.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		1651.45	
E.G. Slope (ft/ft)	0.002356	Area (sq ft)		1651.45	
Q Total (cfs)	11964.00	Flow (cfs)		11964.00	
Top Width (ft)	309.17	Top Width (ft)		309.17	
Vel Total (ft/s)	7.24	Avg. Vel. (ft/s)		7.24	
Max Chl Dpth (ft)	5.48	Hydr. Depth (ft)		5.34	
Conv. Total (cfs)	246502.4	Conv. (cfs)		246502.4	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		315.68	
Min Ch El (ft)	2062.10	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)	10119.50	0.00	0.00

Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	0.45	89.87	0.01
C & E Loss (ft)	0.08	Cum SA (acres)	0.09	10.83	0.03

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2071.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.		0.030	
W.S. Elev (ft)	2070.55	Reach Len. (ft)	135.00	150.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		2594.55	
E.G. Slope (ft/ft)	0.001579	Area (sq ft)		2594.55	
Q Total (cfs)	20005.00	Flow (cfs)		20005.00	
Top Width (ft)	326.85	Top Width (ft)		326.85	
Vel Total (ft/s)	7.71	Avg. Vel. (ft/s)		7.71	
Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)		7.94	
Conv. Total (cfs)	503370.1	Conv. (cfs)		503370.1	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		334.68	
Min Ch El (ft)	2062.10	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	10119.50	0.00	0.00
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	0.65	128.13	0.06
C & E Loss (ft)	0.08	Cum SA (acres)	0.10	11.06	0.03

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9792.00	9813.83	374.77	72.61	20.21	2.59	5.07	5.16	0.46	2.36
2	Chan	9813.83	9835.67	1066.80	140.28	21.83	7.38	6.42	7.60	0.82	6.22
3	Chan	9835.67	9857.50	1066.75	140.27	21.83	7.38	6.42	7.60	0.82	6.22
4	Chan	9857.50	9879.33	1066.75	140.27	21.83	7.38	6.42	7.60	0.82	6.22
5	Chan	9879.33	9901.17	1066.80	140.28	21.83	7.38	6.42	7.60	0.82	6.22
6	Chan	9901.17	9923.00	1066.75	140.27	21.83	7.38	6.42	7.60	0.82	6.22
7	Chan	9923.00	9944.83	1066.75	140.27	21.83	7.38	6.42	7.60	0.82	6.22
8	Chan	9944.83	9966.67	1066.80	140.28	21.83	7.38	6.42	7.60	0.82	6.22
9	Chan	9966.67	9988.50	1066.75	140.27	21.83	7.38	6.42	7.60	0.82	6.22
10	Chan	9988.50	10010.33	1066.75	140.27	21.83	7.38	6.42	7.60	0.82	6.22
11	Chan	10010.33	10032.17	1066.80	140.28	21.83	7.38	6.42	7.60	0.82	6.22
12	Chan	10032.17	10054.00	1066.75	140.27	21.83	7.38	6.42	7.60	0.82	6.22
13	Chan	10054.00	10075.83	1066.75	140.27	21.83	7.38	6.42	7.60	0.82	6.22
14	Chan	10075.83	10097.67	1064.15	140.19	21.88	7.36	6.42	7.59	0.82	6.19
15	Chan	10097.67	10119.50	218.86	49.18	17.10	1.51	3.08	4.45	0.37	1.63

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9792.00	9813.83	374.84	72.59	20.20	2.59	5.07	5.16	0.46	2.36
2	Chan	9813.83	9835.67	1066.77	140.25	21.83	7.38	6.42	7.61	0.82	6.23
3	Chan	9835.67	9857.50	1066.73	140.24	21.83	7.38	6.42	7.61	0.82	6.23
4	Chan	9857.50	9879.33	1066.73	140.24	21.83	7.38	6.42	7.61	0.82	6.23
5	Chan	9879.33	9901.17	1066.77	140.25	21.83	7.38	6.42	7.61	0.82	6.23
6	Chan	9901.17	9923.00	1066.73	140.24	21.83	7.38	6.42	7.61	0.82	6.23

7	Chan	9923.00	9944.83	1066.73	140.24	21.83	7.38	6.42	7.61	0.82	6.23
8	Chan	9944.83	9966.67	1066.77	140.25	21.83	7.38	6.42	7.61	0.82	6.23
9	Chan	9966.67	9988.50	1066.73	140.24	21.83	7.38	6.42	7.61	0.82	6.23
10	Chan	9988.50	10010.33	1066.73	140.24	21.83	7.38	6.42	7.61	0.82	6.23
11	Chan	10010.33	10032.17	1066.77	140.25	21.83	7.38	6.42	7.61	0.82	6.23
12	Chan	10032.17	10054.00	1066.73	140.24	21.83	7.38	6.42	7.61	0.82	6.23
13	Chan	10054.00	10075.83	1066.73	140.24	21.83	7.38	6.42	7.61	0.82	6.23
14	Chan	10075.83	10097.67	1064.12	140.16	21.88	7.36	6.42	7.59	0.82	6.20
15	Chan	10097.67	10119.50	219.15	49.15	17.05	1.52	3.09	4.46	0.37	1.64

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9792.00	9813.83	191.39	38.19	15.42	2.83	3.23	5.01	0.48	2.41
2	Chan	9813.83	9835.67	501.23	78.22	21.83	7.42	3.58	6.41	0.69	4.45
3	Chan	9835.67	9857.50	501.21	78.22	21.83	7.42	3.58	6.41	0.69	4.45
4	Chan	9857.50	9879.33	501.21	78.22	21.83	7.42	3.58	6.41	0.69	4.45
5	Chan	9879.33	9901.17	501.23	78.22	21.83	7.42	3.58	6.41	0.69	4.45
6	Chan	9901.17	9923.00	501.21	78.22	21.83	7.42	3.58	6.41	0.69	4.45
7	Chan	9923.00	9944.83	501.21	78.22	21.83	7.42	3.58	6.41	0.69	4.45
8	Chan	9944.83	9966.67	501.23	78.22	21.83	7.42	3.58	6.41	0.69	4.45
9	Chan	9966.67	9988.50	501.21	78.22	21.83	7.42	3.58	6.41	0.69	4.45
10	Chan	9988.50	10010.33	501.21	78.22	21.83	7.42	3.58	6.41	0.69	4.45
11	Chan	10010.33	10032.17	501.23	78.22	21.83	7.42	3.58	6.41	0.69	4.45
12	Chan	10032.17	10054.00	501.21	78.22	21.83	7.42	3.58	6.41	0.69	4.45
13	Chan	10054.00	10075.83	501.21	78.22	21.83	7.42	3.58	6.41	0.69	4.45
14	Chan	10075.83	10097.67	499.58	78.13	21.88	7.39	3.58	6.39	0.69	4.43
15	Chan	10097.67	10119.50	52.40	14.29	9.22	0.78	1.66	3.67	0.30	1.10

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9792.00	9813.83	332.21	60.65	17.31	2.78	5.13	5.48	0.52	2.82
2	Chan	9813.83	9835.67	883.30	119.67	21.83	7.38	5.48	7.38	0.81	5.95
3	Chan	9835.67	9857.50	883.26	119.66	21.83	7.38	5.48	7.38	0.81	5.95
4	Chan	9857.50	9879.33	883.26	119.66	21.83	7.38	5.48	7.38	0.81	5.95
5	Chan	9879.33	9901.17	883.30	119.67	21.83	7.38	5.48	7.38	0.81	5.95
6	Chan	9901.17	9923.00	883.26	119.66	21.83	7.38	5.48	7.38	0.81	5.95
7	Chan	9923.00	9944.83	883.26	119.66	21.83	7.38	5.48	7.38	0.81	5.95
8	Chan	9944.83	9966.67	883.30	119.67	21.83	7.38	5.48	7.38	0.81	5.95
9	Chan	9966.67	9988.50	883.26	119.66	21.83	7.38	5.48	7.38	0.81	5.95
10	Chan	9988.50	10010.33	883.26	119.66	21.83	7.38	5.48	7.38	0.81	5.95
11	Chan	10010.33	10032.17	883.30	119.67	21.83	7.38	5.48	7.38	0.81	5.95
12	Chan	10032.17	10054.00	883.26	119.66	21.83	7.38	5.48	7.38	0.81	5.95
13	Chan	10054.00	10075.83	883.26	119.66	21.83	7.38	5.48	7.38	0.81	5.95
14	Chan	10075.83	10097.67	880.94	119.58	21.88	7.36	5.48	7.37	0.80	5.92
15	Chan	10097.67	10119.50	151.62	35.27	14.48	1.27	2.61	4.30	0.36	1.54

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9792.00	9813.83	522.31	109.77	28.09	2.61	5.03	4.76	0.39	1.83
2	Chan	9813.83	9835.67	1467.68	184.47	21.83	7.34	8.45	7.96	0.83	6.63
3	Chan	9835.67	9857.50	1467.62	184.47	21.83	7.34	8.45	7.96	0.83	6.63
4	Chan	9857.50	9879.33	1467.62	184.47	21.83	7.34	8.45	7.96	0.83	6.63
5	Chan	9879.33	9901.17	1467.68	184.47	21.83	7.34	8.45	7.96	0.83	6.63
6	Chan	9901.17	9923.00	1467.62	184.47	21.83	7.34	8.45	7.96	0.83	6.63
7	Chan	9923.00	9944.83	1467.62	184.47	21.83	7.34	8.45	7.96	0.83	6.63
8	Chan	9944.83	9966.67	1467.68	184.47	21.83	7.34	8.45	7.96	0.83	6.63
9	Chan	9966.67	9988.50	1467.62	184.47	21.83	7.34	8.45	7.96	0.83	6.63
10	Chan	9988.50	10010.33	1467.62	184.47	21.83	7.34	8.45	7.96	0.83	6.63
11	Chan	10010.33	10032.17	1467.68	184.47	21.83	7.34	8.45	7.96	0.83	6.63
12	Chan	10032.17	10054.00	1467.62	184.47	21.83	7.34	8.45	7.96	0.83	6.63
13	Chan	10054.00	10075.83	1467.62	184.47	21.83	7.34	8.45	7.96	0.83	6.63
14	Chan	10075.83	10097.67	1464.39	184.39	21.88	7.32	8.45	7.94	0.83	6.60
15	Chan	10097.67	10119.50	406.63	86.76	22.71	2.03	4.10	4.69	0.38	1.77

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 0.614

INPUT
Description: Filled right overbank approximately 2'.
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9880	2071.5	9880	2069.4	9890.5	2066.9	9890.5	2063.9	9892	2063.9
9892	2060.9	10000	2060.8	10103.5	2060.9	10127	2070.2		

Manning's n Values num= 1

Sta	n Val
9880	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9880	10127	120	120	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

			Left OB	Channel	Right OB
E.G. Elev (ft)	2068.89	Element			
Vel Head (ft)	1.62	Wt. n-Val.		0.030	
W.S. Elev (ft)	2067.27	Reach Len. (ft)	120.00	120.00	120.00
Crit W.S. (ft)		Flow Area (sq ft)		1413.77	
E.G. Slope (ft/ft)	0.003961	Area (sq ft)		1413.77	
Q Total (cfs)	14459.00	Flow (cfs)		14459.00	
Top Width (ft)	230.63	Top Width (ft)		230.63	
Vel Total (ft/s)	10.23	Avg. Vel. (ft/s)		10.23	
Max Chl Dpth (ft)	6.47	Hydr. Depth (ft)		6.13	
Conv. Total (cfs)	229751.6	Conv. (cfs)		229751.6	
Length Wtd. (ft)	120.00	Wetted Per. (ft)		237.89	
Min Ch El (ft)	2060.80	Shear (lb/sq ft)		1.47	
Alpha	1.00	Stream Power (lb/ft s)	10127.00	0.00	0.00
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	0.51	97.13	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.09	10.18	0.03

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2068.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.63	Wt. n-Val.		0.030	
W.S. Elev (ft)	2067.27	Reach Len. (ft)	120.00	120.00	120.00
Crit W.S. (ft)		Flow Area (sq ft)		1413.20	
E.G. Slope (ft/ft)	0.003958	Area (sq ft)		1413.20	
Q Total (cfs)	14459.00	Flow (cfs)		14459.00	
Top Width (ft)	230.17	Top Width (ft)		230.17	
Vel Total (ft/s)	10.23	Avg. Vel. (ft/s)		10.23	
Max Chl Dpth (ft)	6.46	Hydr. Depth (ft)		6.14	
Conv. Total (cfs)	229820.9	Conv. (cfs)		229820.9	
Length Wtd. (ft)	120.00	Wetted Per. (ft)		237.54	
Min Ch El (ft)	2060.80	Shear (lb/sq ft)		1.47	
Alpha	1.00	Stream Power (lb/ft s)	10127.00	0.00	0.00
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	0.51	97.12	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.09	10.18	0.03

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2065.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.21	Wt. n-Val.		0.030	
W.S. Elev (ft)	2064.40	Reach Len. (ft)	120.00	120.00	120.00
Crit W.S. (ft)		Flow Area (sq ft)		766.87	
E.G. Slope (ft/ft)	0.006208	Area (sq ft)		766.87	
Q Total (cfs)	6758.00	Flow (cfs)		6758.00	
Top Width (ft)	221.84	Top Width (ft)		221.84	
Vel Total (ft/s)	8.81	Avg. Vel. (ft/s)		8.81	
Max Chl Dpth (ft)	3.60	Hydr. Depth (ft)		3.46	
Conv. Total (cfs)	85769.2	Conv. (cfs)		85769.2	
Length Wtd. (ft)	120.00	Wetted Per. (ft)		226.01	
Min Ch El (ft)	2060.80	Shear (lb/sq ft)		1.32	
Alpha	1.00	Stream Power (lb/ft s)	10127.00	0.00	0.00
Frctn Loss (ft)	0.84	Cum Volume (acre-ft)	0.28	53.37	
C & E Loss (ft)	0.03	Cum SA (acres)	0.09	9.71	

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2067.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.63	Wt. n-Val.		0.030	
W.S. Elev (ft)	2066.19	Reach Len. (ft)	120.00	120.00	120.00
Crit W.S. (ft)		Flow Area (sq ft)		1168.19	
E.G. Slope (ft/ft)	0.004973	Area (sq ft)		1168.19	
Q Total (cfs)	11964.00	Flow (cfs)		11964.00	
Top Width (ft)	226.37	Top Width (ft)		226.37	
Vel Total (ft/s)	10.24	Avg. Vel. (ft/s)		10.24	
Max Chl Dpth (ft)	5.39	Hydr. Depth (ft)		5.16	
Conv. Total (cfs)	169659.1	Conv. (cfs)		169659.1	
Length Wtd. (ft)	120.00	Wetted Per. (ft)		232.67	
Min Ch El (ft)	2060.80	Shear (lb/sq ft)		1.56	
Alpha	1.00	Stream Power (lb/ft s)	10127.00	0.00	0.00
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	0.45	85.01	0.01
C & E Loss (ft)	0.02	Cum SA (acres)	0.09	9.91	0.03

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2071.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.69	Wt. n-Val.		0.030	

W.S. Elev (ft)	2069.39	Reach Len. (ft)	120.00	120.00	120.00
Crit W.S. (ft)		Flow Area (sq ft)		1918.63	
E.G. Slope (ft/ft)	0.002972	Area (sq ft)		1918.63	
Q Total (cfs)	20005.00	Flow (cfs)		20005.00	
Top Width (ft)	244.91	Top Width (ft)		244.91	
Vel Total (ft/s)	10.43	Avg. Vel. (ft/s)		10.43	
Max Chl Dpth (ft)	8.59	Hydr. Depth (ft)		7.83	
Conv. Total (cfs)	366983.9	Conv. (cfs)		366983.9	
Length Wtd. (ft)	120.00	Wetted Per. (ft)		252.83	
Min Ch El (ft)	2060.80	Shear (lb/sq ft)		1.41	
Alpha	1.00	Stream Power (lb/ft s)	10127.00	0.00	0.00
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	0.65	120.36	0.06
C & E Loss (ft)	0.00	Cum SA (acres)	0.10	10.07	0.03

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9880.00	9896.47	188.39	33.78	13.55	1.30	4.50	5.58	0.62	3.44
2	Chan	9896.47	9912.93	1095.81	105.04	16.47	7.58	6.38	10.43	1.58	16.45
3	Chan	9912.93	9929.40	1100.18	105.29	16.47	7.61	6.39	10.45	1.58	16.52
4	Chan	9929.40	9945.87	1104.49	105.54	16.47	7.64	6.41	10.47	1.58	16.59
5	Chan	9945.87	9962.33	1108.91	105.79	16.47	7.67	6.42	10.48	1.59	16.65
6	Chan	9962.33	9978.80	1113.30	106.04	16.47	7.70	6.44	10.50	1.59	16.72
7	Chan	9978.80	9995.27	1117.70	106.29	16.47	7.73	6.46	10.52	1.60	16.78
8	Chan	9995.27	10011.73	1119.82	106.42	16.47	7.74	6.46	10.52	1.60	16.81
9	Chan	10011.73	10028.20	1115.62	106.18	16.47	7.72	6.45	10.51	1.59	16.75
10	Chan	10028.20	10044.67	1111.02	105.91	16.47	7.68	6.43	10.49	1.59	16.68
11	Chan	10044.67	10061.13	1106.42	105.65	16.47	7.65	6.42	10.47	1.59	16.61
12	Chan	10061.13	10077.60	1101.79	105.38	16.47	7.62	6.40	10.46	1.58	16.55
13	Chan	10077.60	10094.07	1097.31	105.13	16.47	7.59	6.38	10.44	1.58	16.48
14	Chan	10094.07	10110.53	909.08	95.10	17.00	6.29	5.78	9.56	1.38	13.22
15	Chan	10110.53	10127.00	69.17	16.23	9.74	0.48	1.79	4.26	0.41	1.76

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9880.00	9896.47	190.41	33.76	13.32	1.32	4.68	5.64	0.63	3.53
2	Chan	9896.47	9912.93	1095.62	105.00	16.47	7.58	6.38	10.43	1.58	16.44
3	Chan	9912.93	9929.40	1099.99	105.25	16.47	7.61	6.39	10.45	1.58	16.51
4	Chan	9929.40	9945.87	1104.31	105.50	16.47	7.64	6.41	10.47	1.58	16.57
5	Chan	9945.87	9962.33	1108.72	105.75	16.47	7.67	6.42	10.48	1.59	16.64
6	Chan	9962.33	9978.80	1113.12	106.00	16.47	7.70	6.44	10.50	1.59	16.70
7	Chan	9978.80	9995.27	1117.52	106.25	16.47	7.73	6.45	10.52	1.59	16.77
8	Chan	9995.27	10011.73	1119.64	106.38	16.47	7.74	6.46	10.53	1.60	16.80
9	Chan	10011.73	10028.20	1115.44	106.14	16.47	7.71	6.45	10.51	1.59	16.74
10	Chan	10028.20	10044.67	1110.83	105.87	16.47	7.68	6.43	10.49	1.59	16.67
11	Chan	10044.67	10061.13	1106.23	105.61	16.47	7.65	6.41	10.47	1.58	16.60
12	Chan	10061.13	10077.60	1101.61	105.34	16.47	7.62	6.40	10.46	1.58	16.53
13	Chan	10077.60	10094.07	1097.12	105.09	16.47	7.59	6.38	10.44	1.58	16.46
14	Chan	10094.07	10110.53	908.86	95.06	17.00	6.29	5.77	9.56	1.38	13.21
15	Chan	10110.53	10127.00	69.57	16.20	9.62	0.48	1.82	4.29	0.42	1.79

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9880.00	9896.47	91.06	16.39	9.47	1.35	2.75	5.56	0.67	3.73

2	Chan	9896.47	9912.93	514.64	57.81	16.47	7.62	3.51	8.90	1.36	12.11
3	Chan	9912.93	9929.40	518.37	58.07	16.47	7.67	3.53	8.93	1.37	12.20
4	Chan	9929.40	9945.87	522.09	58.31	16.47	7.73	3.54	8.95	1.37	12.29
5	Chan	9945.87	9962.33	525.84	58.57	16.47	7.78	3.56	8.98	1.38	12.38
6	Chan	9962.33	9978.80	529.61	58.82	16.47	7.84	3.57	9.00	1.38	12.47
7	Chan	9978.80	9995.27	533.38	59.07	16.47	7.89	3.59	9.03	1.39	12.55
8	Chan	9995.27	10011.73	535.20	59.19	16.47	7.92	3.59	9.04	1.39	12.60
9	Chan	10011.73	10028.20	531.60	58.95	16.47	7.87	3.58	9.02	1.39	12.51
10	Chan	10028.20	10044.67	527.65	58.69	16.47	7.81	3.56	8.99	1.38	12.42
11	Chan	10044.67	10061.13	523.71	58.42	16.47	7.75	3.55	8.96	1.38	12.33
12	Chan	10061.13	10077.60	519.78	58.16	16.47	7.69	3.53	8.94	1.37	12.23
13	Chan	10077.60	10094.07	515.92	57.90	16.47	7.63	3.52	8.91	1.36	12.14
14	Chan	10094.07	10110.53	367.95	47.88	17.00	5.44	2.91	7.69	1.09	8.39
15	Chan	10110.53	10127.00	1.20	0.65	1.95	0.02	0.36	1.85	0.13	0.24

Profile #50-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9880.00	9896.47	166.28	27.07	11.26	1.39	4.54	6.14	0.75	4.59
2	Chan	9896.47	9912.93	908.19	87.30	16.47	7.59	5.30	10.40	1.65	17.12
3	Chan	9912.93	9929.40	912.55	87.55	16.47	7.63	5.32	10.42	1.65	17.20
4	Chan	9929.40	9945.87	916.87	87.80	16.47	7.66	5.33	10.44	1.66	17.29
5	Chan	9945.87	9962.33	921.26	88.05	16.47	7.70	5.35	10.46	1.66	17.37
6	Chan	9962.33	9978.80	925.65	88.31	16.47	7.74	5.36	10.48	1.66	17.45
7	Chan	9978.80	9995.27	930.04	88.56	16.47	7.77	5.38	10.50	1.67	17.53
8	Chan	9995.27	10011.73	932.16	88.68	16.47	7.79	5.39	10.51	1.67	17.57
9	Chan	10011.73	10028.20	927.97	88.44	16.47	7.76	5.37	10.49	1.67	17.50
10	Chan	10028.20	10044.67	923.37	88.18	16.47	7.72	5.35	10.47	1.66	17.41
11	Chan	10044.67	10061.13	918.77	87.91	16.47	7.68	5.34	10.45	1.66	17.32
12	Chan	10061.13	10077.60	914.17	87.65	16.47	7.64	5.32	10.43	1.65	17.24
13	Chan	10077.60	10094.07	909.69	87.39	16.47	7.60	5.31	10.41	1.65	17.15
14	Chan	10094.07	10110.53	726.96	77.36	17.00	6.08	4.70	9.40	1.41	13.28
15	Chan	10110.53	10127.00	30.08	7.94	6.81	0.25	1.25	3.79	0.36	1.37

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9880.00	9896.47	289.27	59.20	22.72	1.45	3.60	4.89	0.48	2.36
2	Chan	9896.47	9912.93	1505.15	140.00	16.47	7.52	8.50	10.75	1.58	16.96
3	Chan	9912.93	9929.40	1509.66	140.26	16.47	7.55	8.52	10.76	1.58	17.01
4	Chan	9929.40	9945.87	1514.08	140.50	16.47	7.57	8.53	10.78	1.58	17.06
5	Chan	9945.87	9962.33	1518.65	140.76	16.47	7.59	8.55	10.79	1.59	17.11
6	Chan	9962.33	9978.80	1523.17	141.01	16.47	7.61	8.56	10.80	1.59	17.16
7	Chan	9978.80	9995.27	1527.70	141.26	16.47	7.64	8.58	10.81	1.59	17.21
8	Chan	9995.27	10011.73	1529.87	141.38	16.47	7.65	8.59	10.82	1.59	17.24
9	Chan	10011.73	10028.20	1525.56	141.14	16.47	7.63	8.57	10.81	1.59	17.19
10	Chan	10028.20	10044.67	1520.82	140.88	16.47	7.60	8.56	10.80	1.59	17.13
11	Chan	10044.67	10061.13	1516.08	140.61	16.47	7.58	8.54	10.78	1.58	17.08
12	Chan	10061.13	10077.60	1511.30	140.34	16.47	7.55	8.52	10.77	1.58	17.03
13	Chan	10077.60	10094.07	1506.70	140.09	16.47	7.53	8.51	10.76	1.58	16.97
14	Chan	10094.07	10110.53	1303.46	130.07	17.00	6.52	7.90	10.02	1.42	14.23
15	Chan	10110.53	10127.00	203.54	41.15	15.51	1.02	2.85	4.95	0.49	2.43

CROSS SECTION

RIVER: Sols Wash

REACH: Sols Wash Main RS: 0.592

INPUT
Description: Filled right overbank approximately 2'.
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9901	2071.5	9901	2070.7	9909	2068.7	9909	2065.7	9910.5	2065.7
9910.5	2062.7	9912	2062.7	9912	2059.8	10000	2059.7	10105	2059.8
10130	2069.8	10130	2071						

Manning's n Values num= 1

Sta	n Val
9901	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9901	10130	180	180	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2068.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.55	Wt. n-Val.		0.030	
W.S. Elev (ft)	2066.89	Reach Len. (ft)	180.00	180.00	180.00
Crit W.S. (ft)		Flow Area (sq ft)		1447.86	
E.G. Slope (ft/ft)	0.003339	Area (sq ft)		1447.86	
Q Total (cfs)	14459.00	Flow (cfs)		14459.00	
Top Width (ft)	213.71	Top Width (ft)		213.71	
Vel Total (ft/s)	9.99	Avg. Vel. (ft/s)		9.99	
Max Chl Dpth (ft)	7.19	Hydr. Depth (ft)		6.77	
Conv. Total (cfs)	250209.1	Conv. (cfs)		250209.1	
Length Wtd. (ft)	180.00	Wetted Per. (ft)		222.16	
Min Ch El (ft)	2059.70	Shear (lb/sq ft)		1.36	
Alpha	1.00	Stream Power (lb/ft s)	10130.00	0.00	0.00
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	0.51	93.18	0.02
C & E Loss (ft)	0.15	Cum SA (acres)	0.09	9.57	0.03

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2068.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.55	Wt. n-Val.		0.030	
W.S. Elev (ft)	2066.88	Reach Len. (ft)	180.00	180.00	180.00
Crit W.S. (ft)		Flow Area (sq ft)		1447.43	
E.G. Slope (ft/ft)	0.003340	Area (sq ft)		1447.43	
Q Total (cfs)	14459.00	Flow (cfs)		14459.00	
Top Width (ft)	213.49	Top Width (ft)		213.49	
Vel Total (ft/s)	9.99	Avg. Vel. (ft/s)		9.99	
Max Chl Dpth (ft)	7.18	Hydr. Depth (ft)		6.78	
Conv. Total (cfs)	250202.6	Conv. (cfs)		250202.6	
Length Wtd. (ft)	180.00	Wetted Per. (ft)		222.01	
Min Ch El (ft)	2059.70	Shear (lb/sq ft)		1.36	
Alpha	1.00	Stream Power (lb/ft s)	10130.00	0.00	0.00
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	0.51	93.18	0.02
C & E Loss (ft)	0.15	Cum SA (acres)	0.09	9.57	0.03

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2064.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.51	Wt. n-Val.		0.030	
W.S. Elev (ft)	2063.22	Reach Len. (ft)	180.00	180.00	180.00
Crit W.S. (ft)	2063.08	Flow Area (sq ft)		685.85	
E.G. Slope (ft/ft)	0.008020	Area (sq ft)		685.85	

Q Total (cfs)	6758.00	Flow (cfs)		6758.00	
Top Width (ft)	203.06	Top Width (ft)		203.06	
Vel Total (ft/s)	9.85	Avg. Vel. (ft/s)		9.85	
Max Chl Dpth (ft)	3.52	Hydr. Depth (ft)		3.38	
Conv. Total (cfs)	75464.5	Conv. (cfs)		75464.5	
Length Wtd. (ft)	180.00	Wetted Per. (ft)		207.14	
Min Ch El (ft)	2059.70	Shear (lb/sq ft)		1.66	
Alpha	1.00	Stream Power (lb/ft s)	10130.00	0.00	0.00
Frctn Loss (ft)	1.35	Cum Volume (acre-ft)	0.28	51.37	
C & E Loss (ft)	0.04	Cum SA (acres)	0.09	9.12	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2067.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.56	Wt. n-Val.		0.030	
W.S. Elev (ft)	2065.70	Reach Len. (ft)	180.00	180.00	180.00
Crit W.S. (ft)		Flow Area (sq ft)		1195.43	
E.G. Slope (ft/ft)	0.004177	Area (sq ft)		1195.43	
Q Total (cfs)	11964.00	Flow (cfs)		11964.00	
Top Width (ft)	209.24	Top Width (ft)		209.24	
Vel Total (ft/s)	10.01	Avg. Vel. (ft/s)		10.01	
Max Chl Dpth (ft)	6.00	Hydr. Depth (ft)		5.71	
Conv. Total (cfs)	185105.5	Conv. (cfs)		185105.5	
Length Wtd. (ft)	180.00	Wetted Per. (ft)		216.27	
Min Ch El (ft)	2059.70	Shear (lb/sq ft)		1.44	
Alpha	1.00	Stream Power (lb/ft s)	10130.00	0.00	0.00
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)	0.45	81.76	0.01
C & E Loss (ft)	0.16	Cum SA (acres)	0.09	9.31	0.03

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-yr

E.G. Elev (ft)	2070.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.69	Wt. n-Val.		0.030	
W.S. Elev (ft)	2069.05	Reach Len. (ft)	180.00	180.00	180.00
Crit W.S. (ft)		Flow Area (sq ft)		1916.61	
E.G. Slope (ft/ft)	0.002648	Area (sq ft)		1916.61	
Q Total (cfs)	20005.00	Flow (cfs)		20005.00	
Top Width (ft)	220.52	Top Width (ft)		220.52	
Vel Total (ft/s)	10.44	Avg. Vel. (ft/s)		10.44	
Max Chl Dpth (ft)	9.35	Hydr. Depth (ft)		8.69	
Conv. Total (cfs)	388785.4	Conv. (cfs)		388785.4	
Length Wtd. (ft)	180.00	Wetted Per. (ft)		231.25	
Min Ch El (ft)	2059.70	Shear (lb/sq ft)		1.37	
Alpha	1.00	Stream Power (lb/ft s)	10130.00	0.00	0.00
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	0.65	115.08	0.06
C & E Loss (ft)	0.14	Cum SA (acres)	0.10	9.43	0.03

Profile #100-Sols

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9901.00	9916.27	204.14	38.29	14.35	1.41	5.27	5.33	0.56	2.97
2	Chan	9916.27	9931.53	1109.13	108.37	15.27	7.67	7.10	10.23	1.48	15.15
3	Chan	9931.53	9946.80	1113.65	108.63	15.27	7.70	7.12	10.25	1.48	15.21

4	Chan	9946.80	9962.07	1118.18	108.90	15.27	7.73	7.13	10.27	1.49	15.27
5	Chan	9962.07	9977.33	1122.71	109.16	15.27	7.76	7.15	10.28	1.49	15.33
6	Chan	9977.33	9992.60	1127.28	109.43	15.27	7.80	7.17	10.30	1.49	15.39
7	Chan	9992.60	10007.87	1130.72	109.63	15.27	7.82	7.18	10.31	1.50	15.44
8	Chan	10007.87	10023.13	1127.96	109.47	15.27	7.80	7.17	10.30	1.49	15.40
9	Chan	10023.13	10038.40	1124.08	109.24	15.27	7.77	7.16	10.29	1.49	15.35
10	Chan	10038.40	10053.67	1120.25	109.02	15.27	7.75	7.14	10.28	1.49	15.30
11	Chan	10053.67	10068.93	1116.46	108.80	15.27	7.72	7.13	10.26	1.49	15.25
12	Chan	10068.93	10084.20	1112.67	108.58	15.27	7.70	7.11	10.25	1.48	15.19
13	Chan	10084.20	10099.47	1108.88	108.36	15.27	7.67	7.10	10.23	1.48	15.14
14	Chan	10099.47	10114.73	777.04	89.23	16.02	5.37	5.84	8.71	1.16	10.11
15	Chan	10114.73	10130.00	45.85	12.73	8.59	0.32	1.60	3.60	0.31	1.11

Profile #100-Sols FW

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9901.00	9916.27	204.12	38.28	14.35	1.41	5.27	5.33	0.56	2.97
2	Chan	9916.27	9931.53	1109.11	108.34	15.27	7.67	7.10	10.24	1.48	15.15
3	Chan	9931.53	9946.80	1113.63	108.60	15.27	7.70	7.11	10.25	1.48	15.21
4	Chan	9946.80	9962.07	1118.15	108.87	15.27	7.73	7.13	10.27	1.49	15.27
5	Chan	9962.07	9977.33	1122.68	109.13	15.27	7.76	7.15	10.29	1.49	15.33
6	Chan	9977.33	9992.60	1127.26	109.40	15.27	7.80	7.17	10.30	1.49	15.39
7	Chan	9992.60	10007.87	1130.70	109.60	15.27	7.82	7.18	10.32	1.50	15.44
8	Chan	10007.87	10023.13	1127.94	109.44	15.27	7.80	7.17	10.31	1.49	15.40
9	Chan	10023.13	10038.40	1124.06	109.21	15.27	7.77	7.15	10.29	1.49	15.35
10	Chan	10038.40	10053.67	1120.23	108.99	15.27	7.75	7.14	10.28	1.49	15.30
11	Chan	10053.67	10068.93	1116.43	108.77	15.27	7.72	7.12	10.26	1.49	15.25
12	Chan	10068.93	10084.20	1112.64	108.55	15.27	7.70	7.11	10.25	1.48	15.19
13	Chan	10084.20	10099.47	1108.85	108.33	15.27	7.67	7.10	10.24	1.48	15.14
14	Chan	10099.47	10114.73	776.94	89.20	16.02	5.37	5.84	8.71	1.16	10.11
15	Chan	10114.73	10130.00	46.27	12.71	8.44	0.32	1.64	3.64	0.31	1.14

Profile #10-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9901.00	9916.27	95.29	15.40	9.19	1.41	2.67	6.19	0.84	5.19
2	Chan	9916.27	9931.53	523.99	52.47	15.27	7.75	3.44	9.99	1.72	17.18
3	Chan	9931.53	9946.80	528.40	52.74	15.27	7.82	3.45	10.02	1.73	17.33
4	Chan	9946.80	9962.07	532.83	53.00	15.27	7.88	3.47	10.05	1.74	17.47
5	Chan	9962.07	9977.33	537.27	53.27	15.27	7.95	3.49	10.09	1.75	17.62
6	Chan	9977.33	9992.60	541.75	53.53	15.27	8.02	3.51	10.12	1.76	17.77
7	Chan	9992.60	10007.87	545.14	53.73	15.27	8.07	3.52	10.15	1.76	17.88
8	Chan	10007.87	10023.13	542.39	53.57	15.27	8.03	3.51	10.12	1.76	17.79
9	Chan	10023.13	10038.40	538.62	53.35	15.27	7.97	3.49	10.10	1.75	17.66
10	Chan	10038.40	10053.67	534.86	53.12	15.27	7.91	3.48	10.07	1.74	17.54
11	Chan	10053.67	10068.93	531.14	52.90	15.27	7.86	3.47	10.04	1.73	17.42
12	Chan	10068.93	10084.20	527.44	52.68	15.27	7.80	3.45	10.01	1.73	17.30
13	Chan	10084.20	10099.47	523.74	52.46	15.27	7.75	3.44	9.98	1.72	17.18
14	Chan	10099.47	10114.73	255.16	33.61	14.75	3.78	2.39	7.59	1.14	8.66

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #50-yr

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)

1	Chan	9901.00	9916.27	172.64	29.66	11.66	1.44	5.14	5.82	0.66	3.86
2	Chan	9916.27	9931.53	921.22	90.21	15.27	7.70	5.91	10.21	1.54	15.74
3	Chan	9931.53	9946.80	925.73	90.48	15.27	7.74	5.93	10.23	1.55	15.81
4	Chan	9946.80	9962.07	930.25	90.74	15.27	7.78	5.94	10.25	1.55	15.89
5	Chan	9962.07	9977.33	934.78	91.01	15.27	7.81	5.96	10.27	1.55	15.97
6	Chan	9977.33	9992.60	939.34	91.27	15.27	7.85	5.98	10.29	1.56	16.05
7	Chan	9992.60	10007.87	942.78	91.47	15.27	7.88	5.99	10.31	1.56	16.11
8	Chan	10007.87	10023.13	940.01	91.31	15.27	7.86	5.98	10.29	1.56	16.06
9	Chan	10023.13	10038.40	936.15	91.09	15.27	7.82	5.97	10.28	1.56	15.99
10	Chan	10038.40	10053.67	932.32	90.86	15.27	7.79	5.95	10.26	1.55	15.93
11	Chan	10053.67	10068.93	928.53	90.64	15.27	7.76	5.94	10.24	1.55	15.86
12	Chan	10068.93	10084.20	924.75	90.42	15.27	7.73	5.92	10.23	1.54	15.80
13	Chan	10084.20	10099.47	920.97	90.20	15.27	7.70	5.91	10.21	1.54	15.73
14	Chan	10099.47	10114.73	599.62	71.07	16.02	5.01	4.66	8.44	1.16	9.76
15	Chan	10114.73	10130.00	14.91	5.01	5.39	0.12	1.00	2.98	0.24	0.72

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Profile #500-yr

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9901.00	9916.27	280.64	54.27	17.61	1.40	6.26	5.17	0.51	2.63
2	Chan	9916.27	9931.53	1523.10	141.42	15.27	7.61	9.26	10.77	1.53	16.49
3	Chan	9931.53	9946.80	1527.86	141.68	15.27	7.64	9.28	10.78	1.53	16.54
4	Chan	9946.80	9962.07	1532.61	141.95	15.27	7.66	9.30	10.80	1.54	16.59
5	Chan	9962.07	9977.33	1537.38	142.21	15.27	7.68	9.32	10.81	1.54	16.65
6	Chan	9977.33	9992.60	1542.18	142.48	15.27	7.71	9.33	10.82	1.54	16.70
7	Chan	9992.60	10007.87	1545.80	142.68	15.27	7.73	9.35	10.83	1.54	16.74
8	Chan	10007.87	10023.13	1542.92	142.52	15.27	7.71	9.34	10.83	1.54	16.70
9	Chan	10023.13	10038.40	1538.82	142.29	15.27	7.69	9.32	10.81	1.54	16.66
10	Chan	10038.40	10053.67	1534.80	142.07	15.27	7.67	9.31	10.80	1.54	16.62
11	Chan	10053.67	10068.93	1530.80	141.85	15.27	7.65	9.29	10.79	1.54	16.57
12	Chan	10068.93	10084.20	1526.82	141.63	15.27	7.63	9.28	10.78	1.53	16.53
13	Chan	10084.20	10099.47	1522.83	141.40	15.27	7.61	9.26	10.77	1.53	16.49
14	Chan	10099.47	10114.73	1157.69	122.28	16.02	5.79	8.01	9.47	1.26	11.95
15	Chan	10114.73	10130.00	160.74	35.86	14.42	0.80	2.68	4.48	0.41	1.84

CROSS SECTION

RIVER: Sols Wash
REACH: Sols Wash Main RS: 0.557

INPUT
Description: Filled right overbank approximately 2'.
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9893.5	2070.5	9893.5	2069.3	9902	2067.3	9902	2064.3	9903.5	2064.3
9903.5	2061.3	9905	2061.3	9905	2058.5	10000	2058.3	10102	2058.5
10127	2068.5	10127	2071						

Manning's n Values num= 1

Sta	n Val
9893.5	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9893.5	10127	150	150	150	.1	.3

CROSS SECTION OUTPUT Profile #100-Sols

E.G. Elev (ft)	2067.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.06	Wt. n-Val.		0.030	
W.S. Elev (ft)	2066.79	Reach Len. (ft)	150.00	150.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		1750.01	
E.G. Slope (ft/ft)	0.001866	Area (sq ft)		1750.01	
Q Total (cfs)	14459.00	Flow (cfs)		14459.00	
Top Width (ft)	220.72	Top Width (ft)		220.72	
Vel Total (ft/s)	8.26	Avg. Vel. (ft/s)		8.26	
Max Chl Dpth (ft)	8.49	Hydr. Depth (ft)		7.93	
Conv. Total (cfs)	334735.5	Conv. (cfs)		334735.5	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		230.60	
Min Ch El (ft)	2058.30	Shear (lb/sq ft)		0.88	
Alpha	1.00	Stream Power (lb/ft s)	10127.00	0.00	0.00
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	0.51	86.58	0.02
C & E Loss (ft)	0.09	Cum SA (acres)	0.09	8.67	0.03

CROSS SECTION OUTPUT Profile #100-Sols FW

E.G. Elev (ft)	2067.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.06	Wt. n-Val.		0.030	
W.S. Elev (ft)	2066.79	Reach Len. (ft)	150.00	150.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		1749.62	
E.G. Slope (ft/ft)	0.001865	Area (sq ft)		1749.62	
Q Total (cfs)	14459.00	Flow (cfs)		14459.00	
Top Width (ft)	220.47	Top Width (ft)		220.47	
Vel Total (ft/s)	8.26	Avg. Vel. (ft/s)		8.26	
Max Chl Dpth (ft)	8.49	Hydr. Depth (ft)		7.94	
Conv. Total (cfs)	334776.0	Conv. (cfs)		334776.0	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		230.43	
Min Ch El (ft)	2058.30	Shear (lb/sq ft)		0.88	
Alpha	1.00	Stream Power (lb/ft s)	10127.00	0.00	0.00
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	0.51	86.57	0.02
C & E Loss (ft)	0.09	Cum SA (acres)	0.09	8.67	0.03

CROSS SECTION OUTPUT Profile #10-yr

E.G. Elev (ft)	2063.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.37	Wt. n-Val.		0.030	
W.S. Elev (ft)	2061.97	Reach Len. (ft)	150.00	150.00	150.00
Crit W.S. (ft)	2061.69	Flow Area (sq ft)		719.44	
E.G. Slope (ft/ft)	0.007022	Area (sq ft)		719.44	
Q Total (cfs)	6758.00	Flow (cfs)		6758.00	
Top Width (ft)	207.18	Top Width (ft)		207.18	
Vel Total (ft/s)	9.39	Avg. Vel. (ft/s)		9.39	
Max Chl Dpth (ft)	3.67	Hydr. Depth (ft)		3.47	
Conv. Total (cfs)	80644.5	Conv. (cfs)		80644.5	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		211.31	
Min Ch El (ft)	2058.30	Shear (lb/sq ft)		1.49	
Alpha	1.00	Stream Power (lb/ft s)	10127.00	0.00	0.00
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	0.28	48.46	
C & E Loss (ft)	0.16	Cum SA (acres)	0.09	8.28	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-yr

E.G. Elev (ft)	2066.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.02	Wt. n-Val.		0.030	
W.S. Elev (ft)	2065.54	Reach Len. (ft)	150.00	150.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		1476.54	
E.G. Slope (ft/ft)	0.002191	Area (sq ft)		1476.54	
Q Total (cfs)	11964.00	Flow (cfs)		11964.00	
Top Width (ft)	217.60	Top Width (ft)		217.60	
Vel Total (ft/s)	8.10	Avg. Vel. (ft/s)		8.10	
Max Chl Dpth (ft)	7.24	Hydr. Depth (ft)		6.79	
Conv. Total (cfs)	255596.3	Conv. (cfs)		255596.3	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		225.99	
Min Ch El (ft)	2058.30	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)	10127.00	0.00	0.00
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	0.45	76.24	0.01
C & E Loss (ft)	0.10	Cum SA (acres)	0.09	8.43	0.03

CROSS SECTION OUTPUT Profile #500-yr

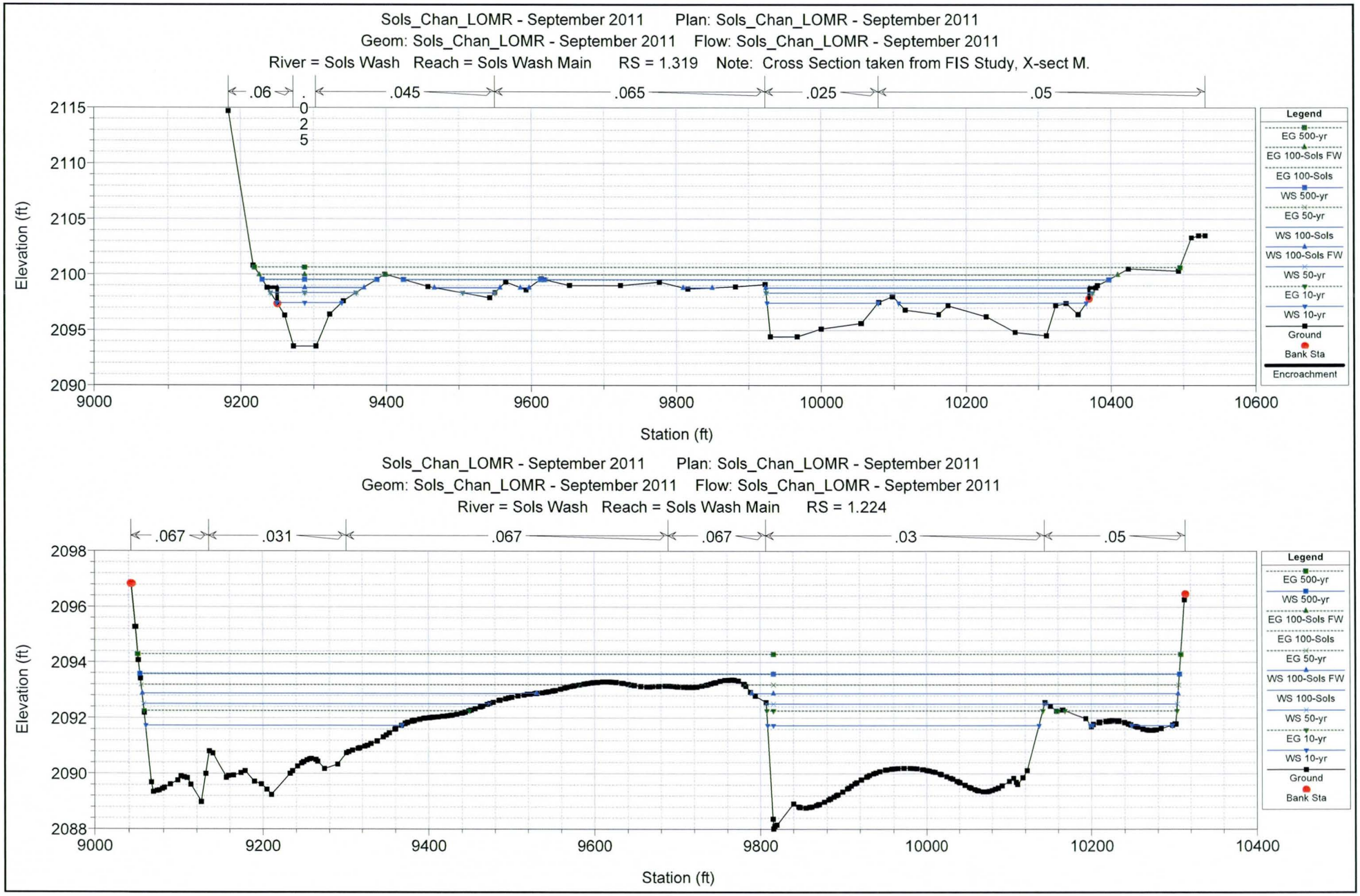
E.G. Elev (ft)	2070.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.23	Wt. n-Val.		0.030	
W.S. Elev (ft)	2069.00	Reach Len. (ft)	150.00	150.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		2251.12	
E.G. Slope (ft/ft)	0.001661	Area (sq ft)		2251.12	
Q Total (cfs)	20005.00	Flow (cfs)		20005.00	
Top Width (ft)	232.24	Top Width (ft)		232.24	
Vel Total (ft/s)	8.89	Avg. Vel. (ft/s)		8.89	
Max Chl Dpth (ft)	10.70	Hydr. Depth (ft)		9.69	
Conv. Total (cfs)	490918.4	Conv. (cfs)		490918.4	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		243.66	
Min Ch El (ft)	2058.30	Shear (lb/sq ft)		0.96	
Alpha	1.00	Stream Power (lb/ft s)	10127.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.65	106.47	0.06
C & E Loss (ft)	0.09	Cum SA (acres)	0.10	8.50	0.03

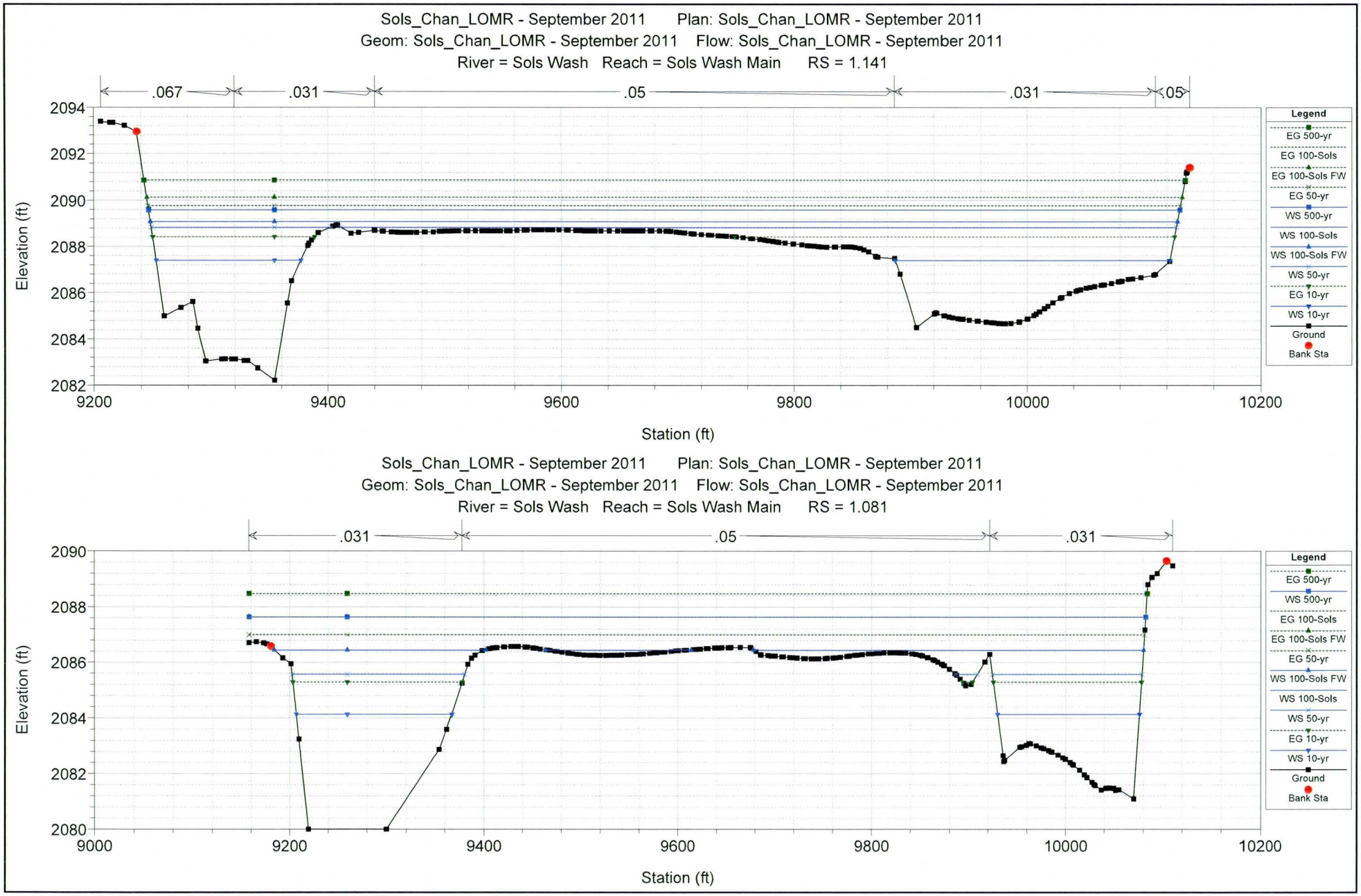
Profile #100-Sols

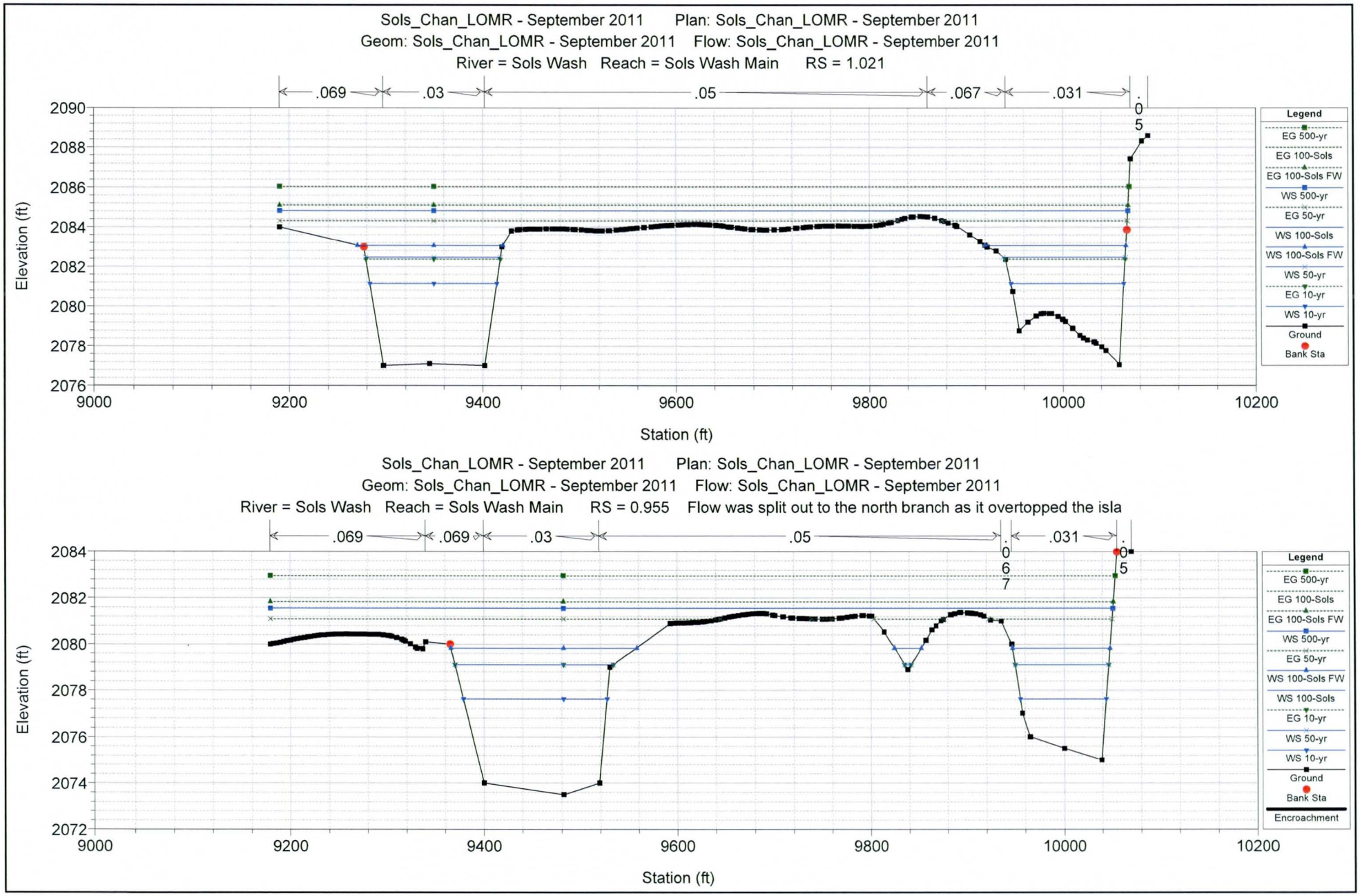
	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9893.50	9909.07	194.87	45.68	15.35	1.35	6.46	4.27	0.35	1.48
2	Chan	9909.07	9924.63	1095.06	129.39	15.57	7.57	8.31	8.46	0.97	8.19
3	Chan	9924.63	9940.20	1102.18	129.89	15.57	7.62	8.34	8.49	0.97	8.25
4	Chan	9940.20	9955.77	1109.42	130.40	15.57	7.67	8.38	8.51	0.98	8.30
5	Chan	9955.77	9971.33	1116.68	130.92	15.57	7.72	8.41	8.53	0.98	8.36
6	Chan	9971.33	9986.90	1124.00	131.43	15.57	7.77	8.44	8.55	0.98	8.41
7	Chan	9986.90	10002.47	1131.03	131.92	15.57	7.82	8.47	8.57	0.99	8.46
8	Chan	10002.47	10018.03	1129.21	131.80	15.57	7.81	8.47	8.57	0.99	8.45
9	Chan	10018.03	10033.60	1122.44	131.32	15.57	7.76	8.44	8.55	0.98	8.40
10	Chan	10033.60	10049.17	1115.75	130.85	15.57	7.72	8.41	8.53	0.98	8.35
11	Chan	10049.17	10064.73	1108.94	130.37	15.57	7.67	8.38	8.51	0.98	8.30
12	Chan	10064.73	10080.30	1102.21	129.90	15.57	7.62	8.34	8.49	0.97	8.25
13	Chan	10080.30	10095.87	1095.50	129.42	15.57	7.58	8.31	8.46	0.97	8.20
14	Chan	10095.87	10111.43	825.72	111.24	16.29	5.71	7.15	7.42	0.80	5.90
15	Chan	10111.43	10127.00	86.00	25.46	12.15	0.59	2.26	3.38	0.24	0.82

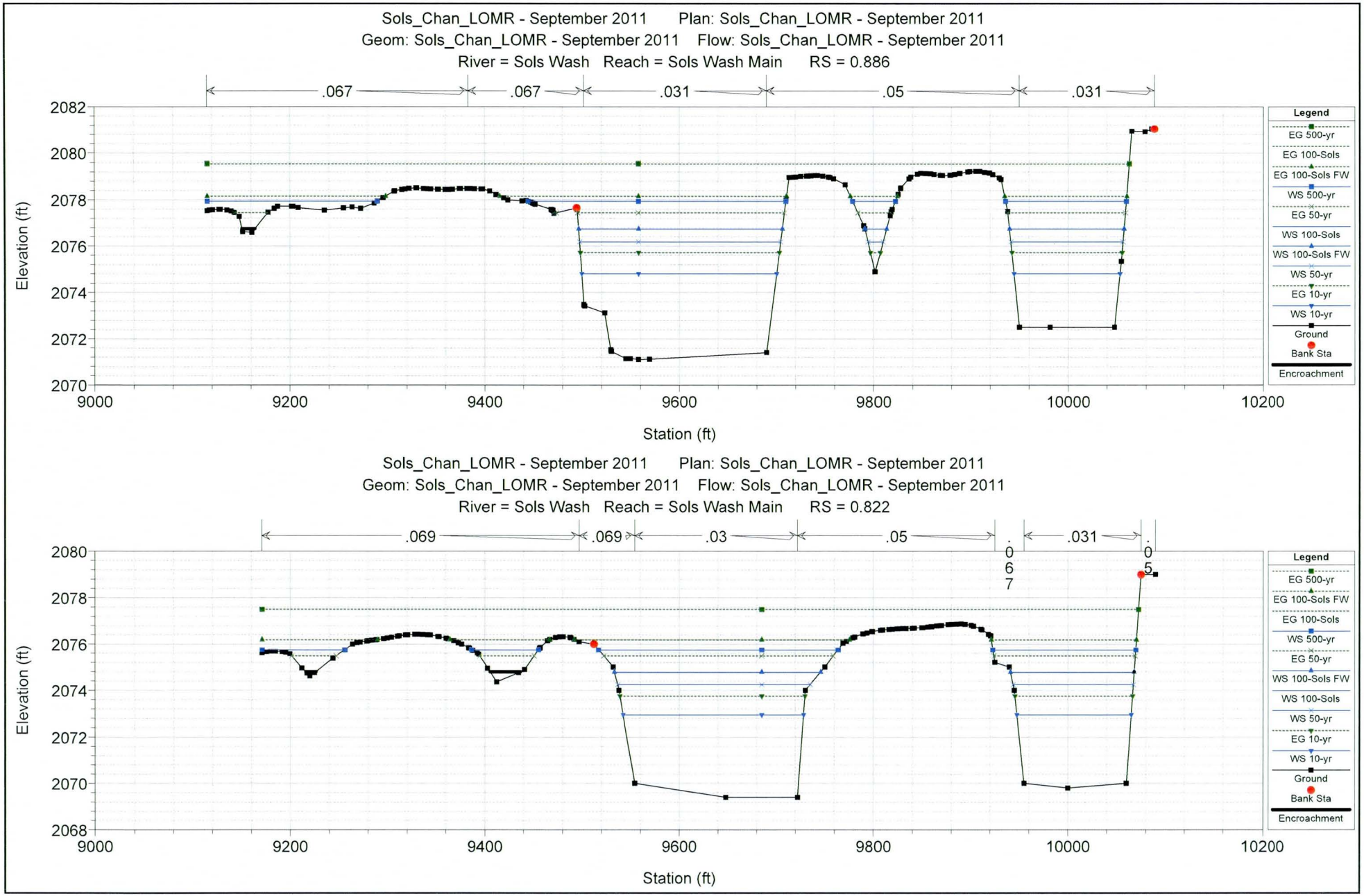
Profile #100-Sols FW

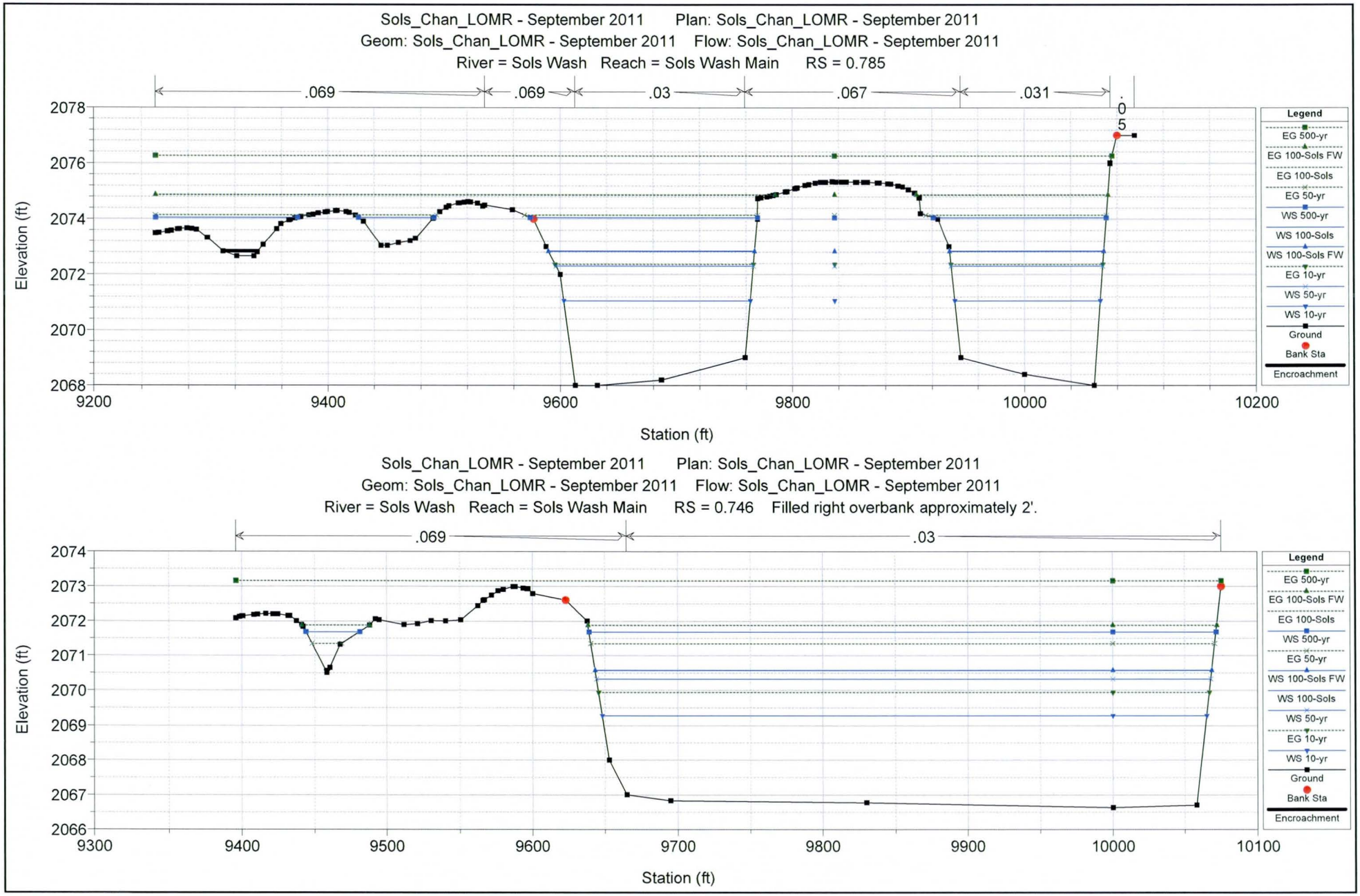
	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	9893.50	9909.07	194.85	45.66	15.35	1.35	6.46	4.27	0.35	1.48

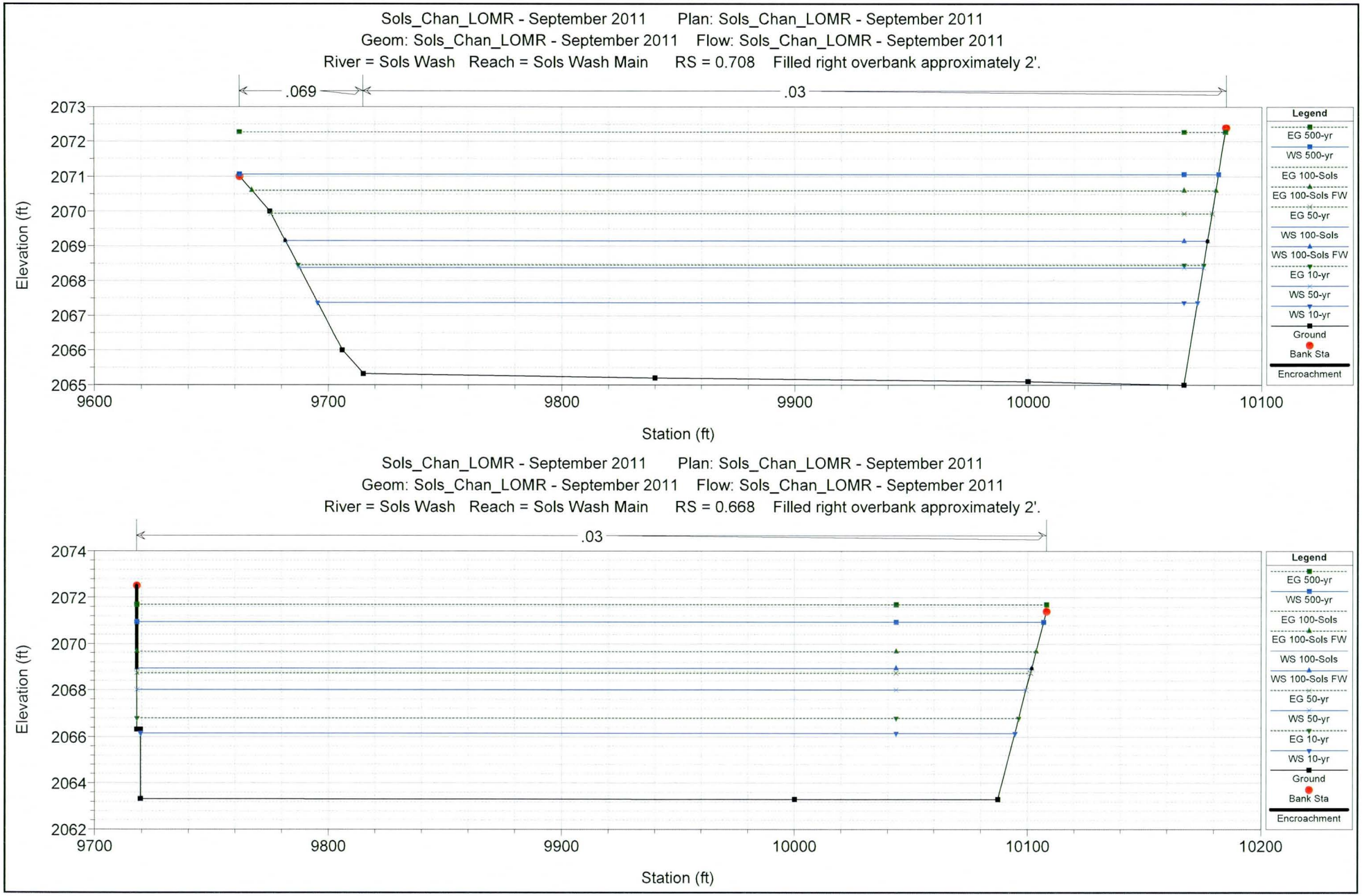

Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 1.319 Note: Cross Section taken from FIS Study, X-sect M.
.06
.025
.045
.065
.025
.05
Elevation (ft)
Station (ft)
Legend
EG 500-yr
EG 100-Sols FW
EG 100-Sols
WS 500-yr
EG 50-yr
WS 100-Sols
WS 100-Sols FW
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 1.224
.067
.031
.067
.067
.03
.05
Elevation (ft)
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols FW
EG 100-Sols
EG 50-yr
WS 100-Sols FW
WS 100-Sols
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta


Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 1.141
.067
.031
.05
.031
.05
Elevation (ft)
2094
2092
2090
2088
2086
2084
2082
9200
9400
9600
9800
10000
10200
Station (ft)
Legend
EG 500-yr
EG 100-Sols
EG 100-Sols FW
EG 50-yr
WS 500-yr
WS 100-Sols
WS 100-Sols FW
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 1.081
.031
.05
.031
Elevation (ft)
2090
2088
2086
2084
2082
2080
9000
9200
9400
9600
9800
10000
10200
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols
EG 100-Sols FW
EG 50-yr
WS 100-Sols FW
WS 100-Sols
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta

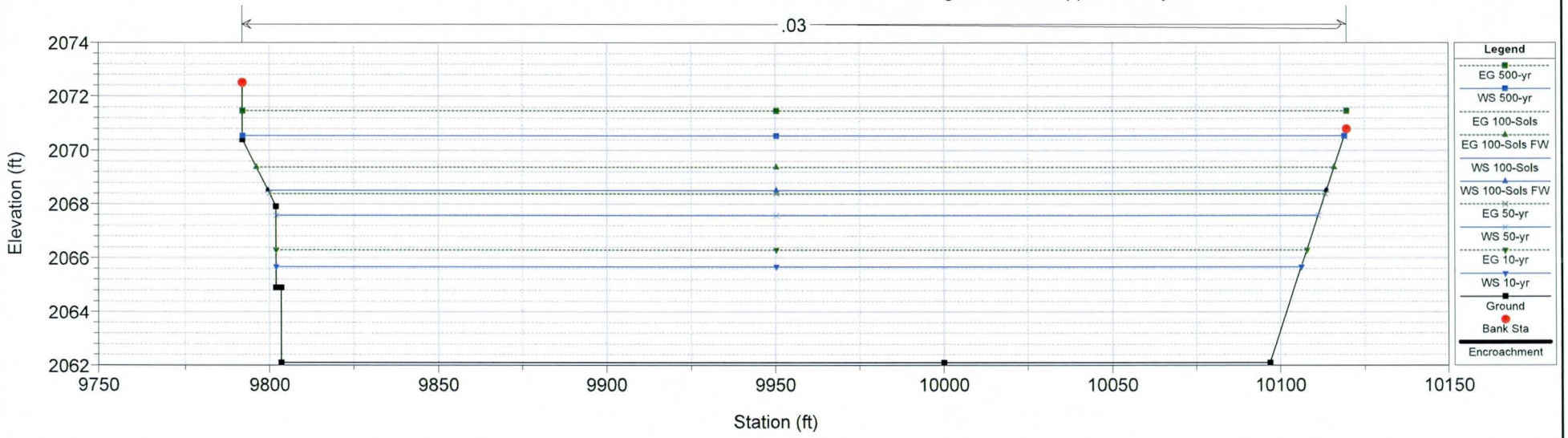

Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 1.021
.069
.03
.05
.067
.031
Elevation (ft)
Station (ft)
Legend
EG 500-yr
EG 100-Sols
EG 100-Sols FW
WS 500-yr
EG 50-yr
WS 100-Sols
WS 100-Sols FW
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.955 Flow was split out to the north branch as it overtopped the isla
.069
.069
.03
.05
.031
Elevation (ft)
Station (ft)
Legend
EG 500-yr
EG 100-Sols
EG 100-Sols FW
WS 500-yr
EG 50-yr
WS 100-Sols FW
WS 100-Sols
EG 10-yr
WS 50-yr
WS 10-yr
Ground
Bank Sta
Encroachment


Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.886
.067
.067
.031
.05
.031
Elevation (ft)
2082
2080
2078
2076
2074
2072
2070
9000
9200
9400
9600
9800
10000
10200
Station (ft)
Legend
EG 500-yr
EG 100-Sols
EG 100-Sols FW
WS 500-yr
EG 50-yr
WS 100-Sols
WS 100-Sols FW
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.822
.069
.069
.03
.05
.031
Elevation (ft)
2080
2078
2076
2074
2072
2070
2068
9000
9200
9400
9600
9800
10000
10200
Station (ft)
Legend
EG 500-yr
EG 100-Sols FW
EG 100-Sols
WS 500-yr
EG 50-yr
WS 100-Sols FW
WS 100-Sols
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment

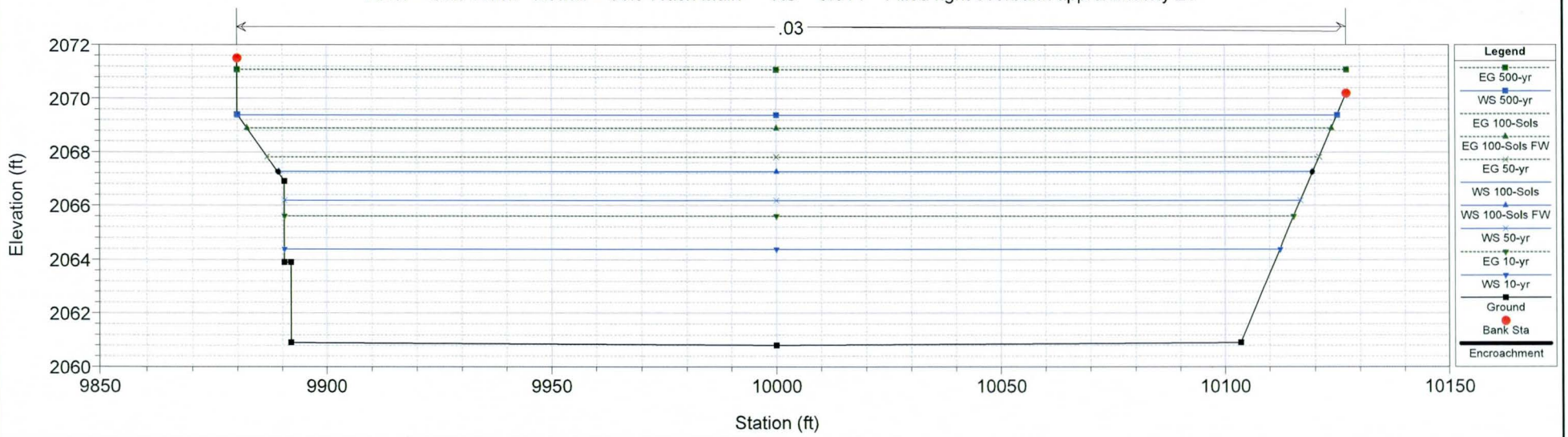

Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.785
.069
.069
.03
.067
.031
Elevation (ft)
Station (ft)
Legend
EG 500-yr
EG 100-Sols FW
EG 100-Sols
EG 50-yr
WS 500-yr
WS 100-Sols
WS 100-Sols FW
EG 10-yr
WS 50-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.746 Filled right overbank approximately 2'.
.069
.03
Elevation (ft)
Station (ft)
Legend
EG 500-yr
EG 100-Sols FW
EG 100-Sols
WS 500-yr
EG 50-yr
WS 100-Sols FW
WS 100-Sols
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment

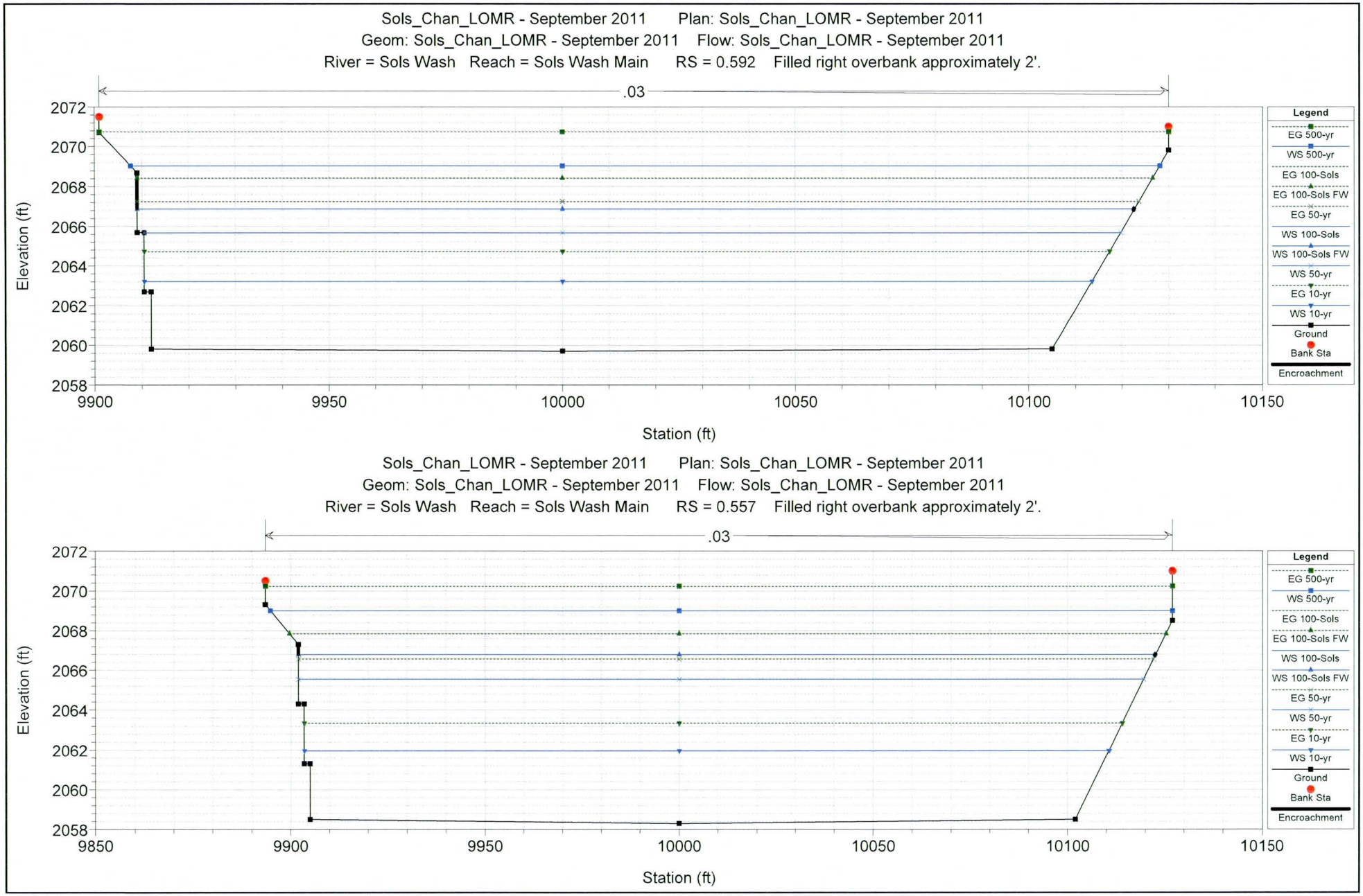

Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.708 Filled right overbank approximately 2'.
.069
.03
Elevation (ft)
2073
2072
2071
2070
2069
2068
2067
2066
2065
9600
9700
9800
9900
10000
10100
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols
EG 100-Sols FW
EG 50-yr
WS 100-Sols
WS 100-Sols FW
EG 10-yr
WS 50-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.668 Filled right overbank approximately 2'.
.03
Elevation (ft)
2074
2072
2070
2068
2066
2064
2062
9700
9800
9900
10000
10100
10200
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols
EG 100-Sols FW
WS 100-Sols
WS 100-Sols FW
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment

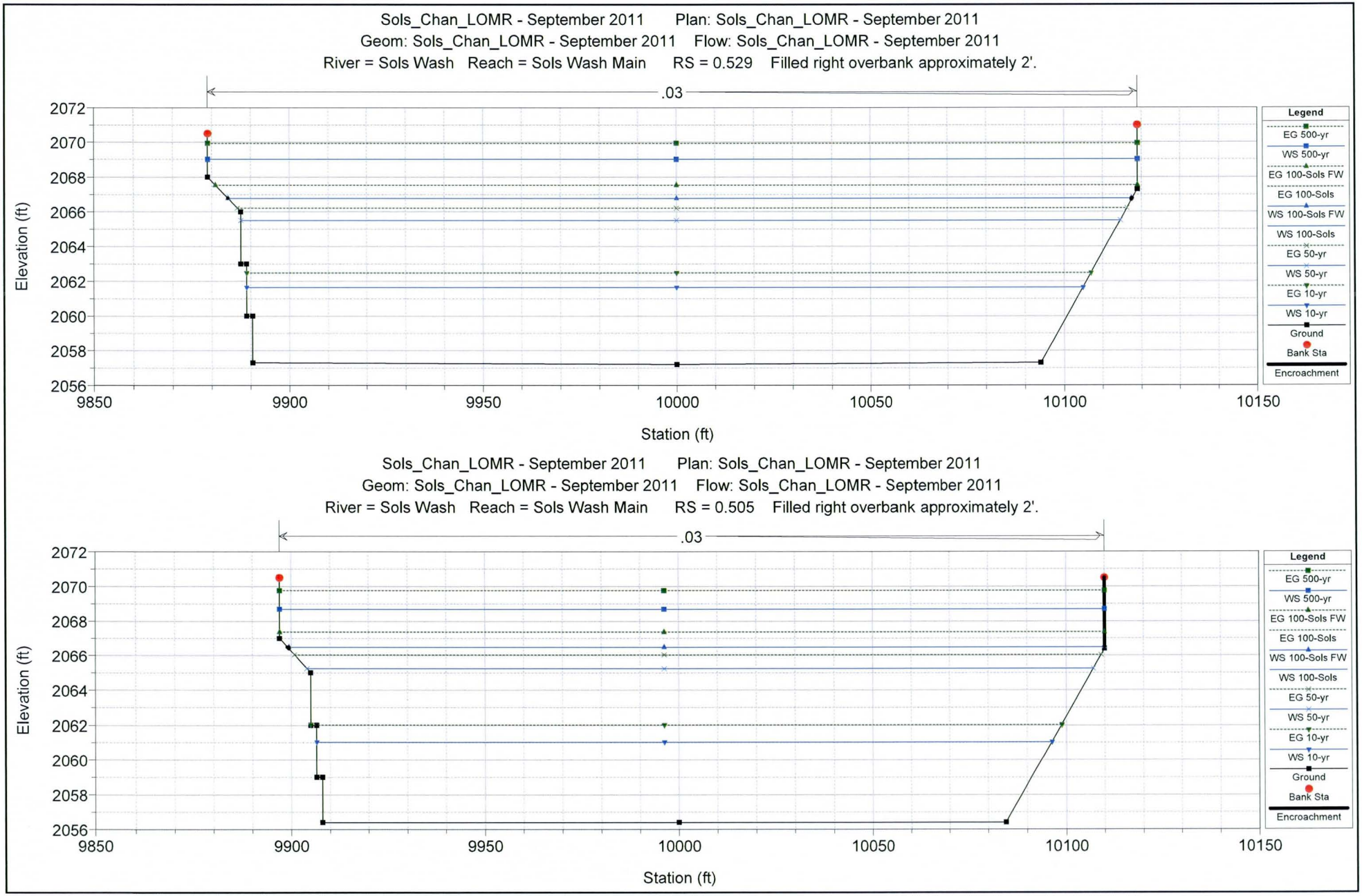
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.642 Filled right overbank approximately 2'.



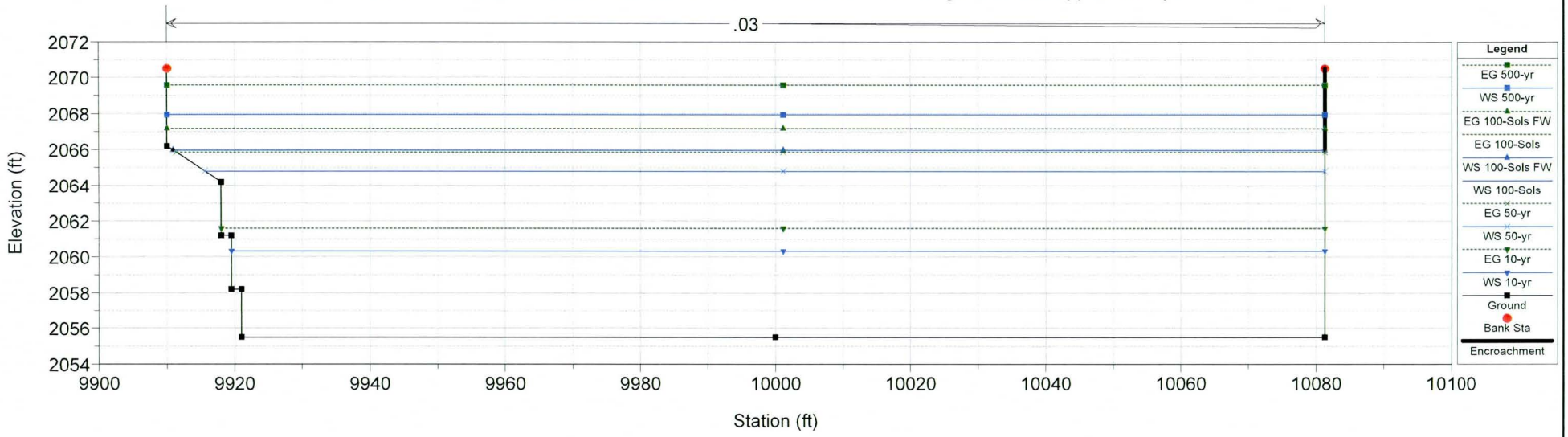
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.614 Filled right overbank approximately 2'.



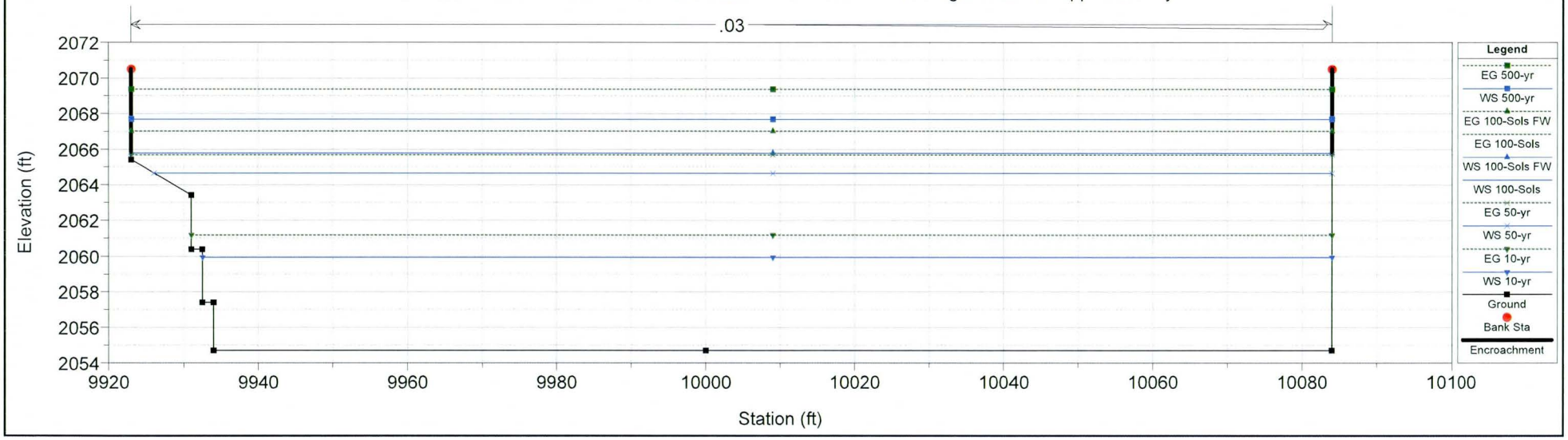

Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.592 Filled right overbank approximately 2'.
.03
Elevation (ft)
2072
2070
2068
2066
2064
2062
2060
2058
9900
9950
10000
10050
10100
10150
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols
EG 100-Sols FW
EG 50-yr
WS 100-Sols
WS 100-Sols FW
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.557 Filled right overbank approximately 2'.
.03
Elevation (ft)
2072
2070
2068
2066
2064
2062
2060
2058
9850
9900
9950
10000
10050
10100
10150
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols
EG 100-Sols FW
WS 100-Sols
WS 100-Sols FW
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment


Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.529 Filled right overbank approximately 2'.
.03
Elevation (ft)
2072
2070
2068
2066
2064
2062
2060
2058
2056
9850
9900
9950
10000
10050
10100
10150
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols FW
EG 100-Sols
WS 100-Sols FW
WS 100-Sols
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.505 Filled right overbank approximately 2'.
.03
Elevation (ft)
2072
2070
2068
2066
2064
2062
2060
2058
2056
9850
9900
9950
10000
10050
10100
10150
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols FW
EG 100-Sols
WS 100-Sols FW
WS 100-Sols
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment

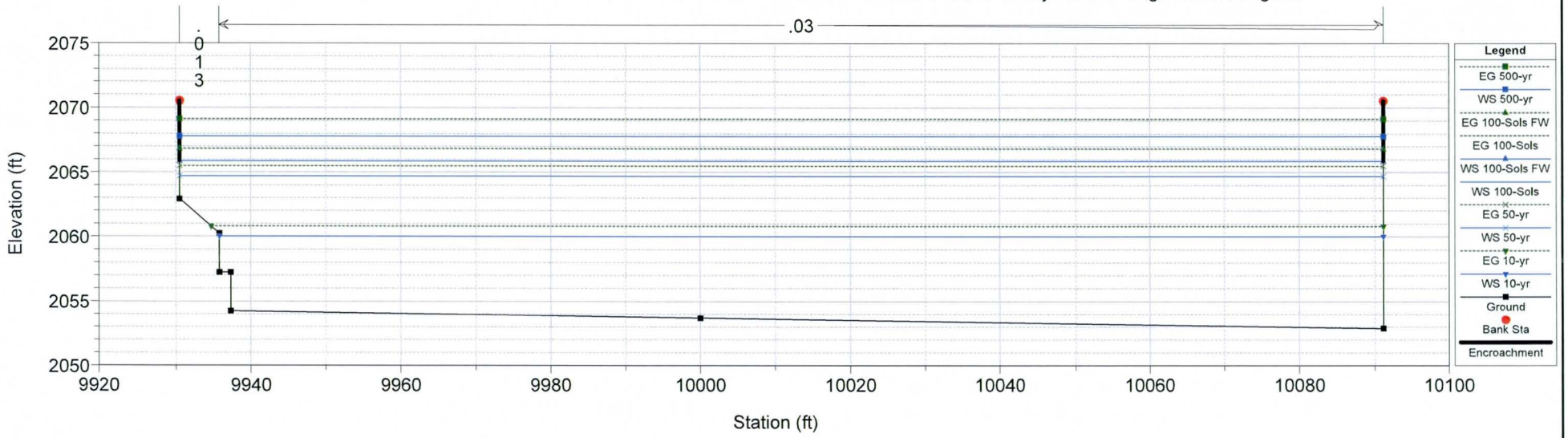
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.485 Filled right overbank approximately 2'.



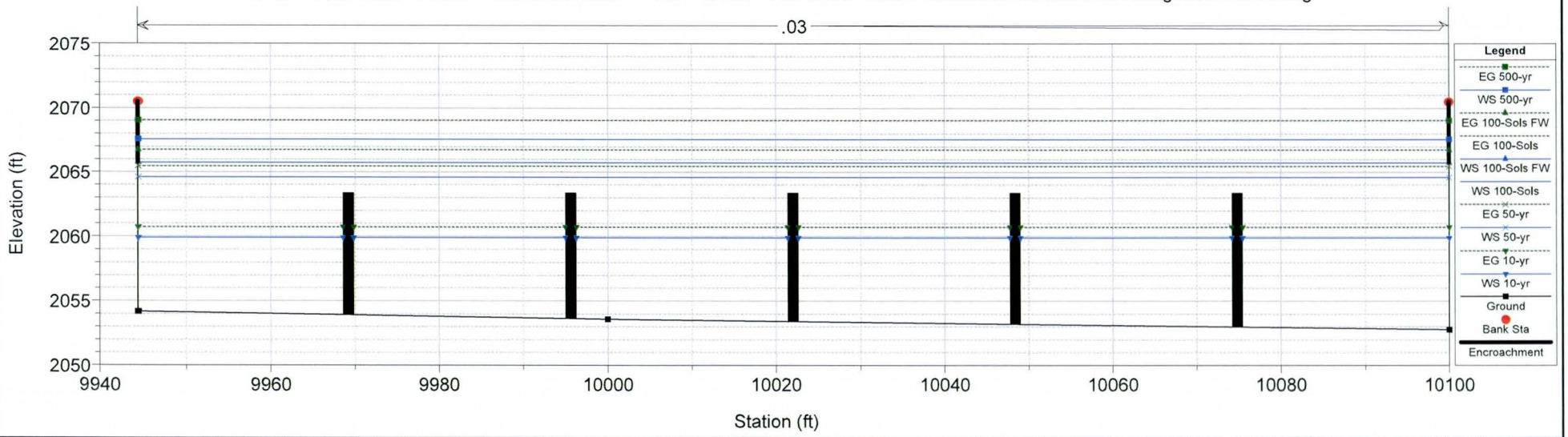
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.467 Filled right overbank approximately 2'.



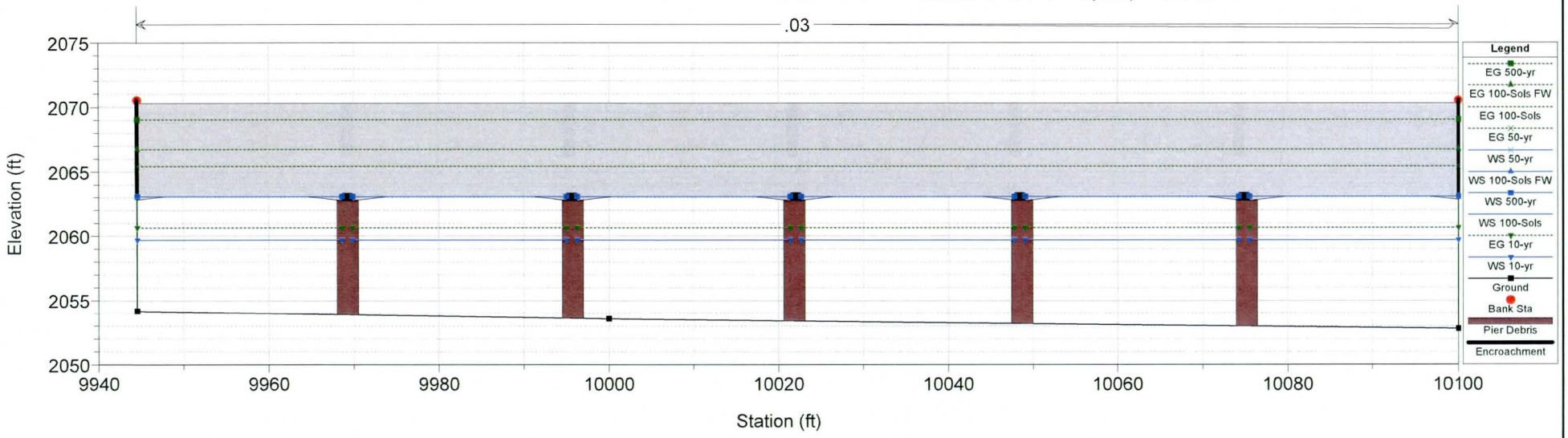
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.447 This cross section was skewed by hand an angle of 42.5 degrees



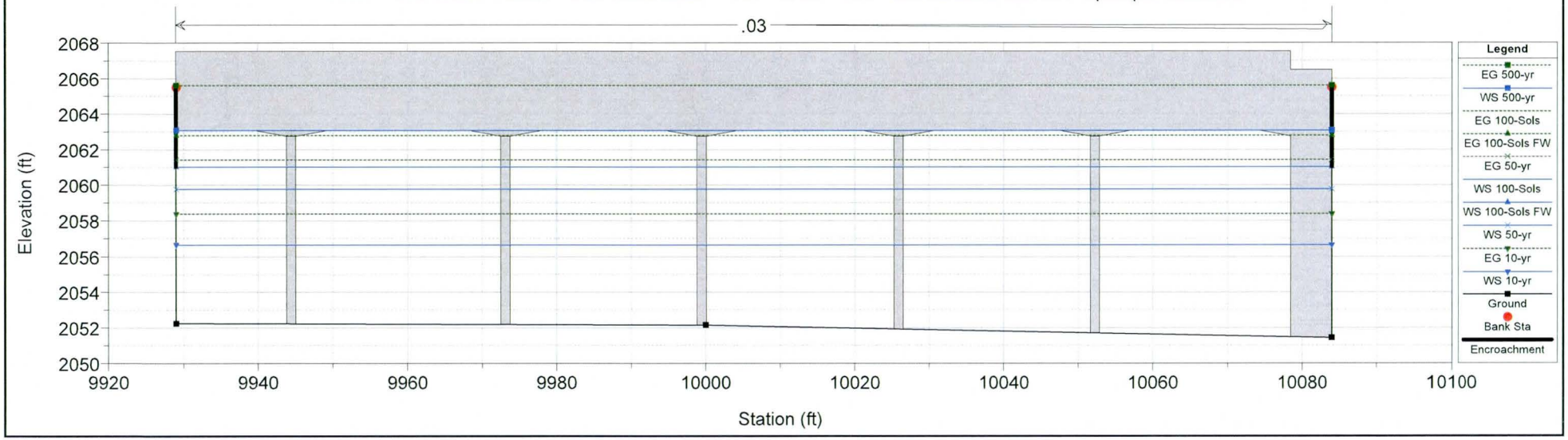
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.442 This cross section was skewed to match the bridge skew of 45 deg

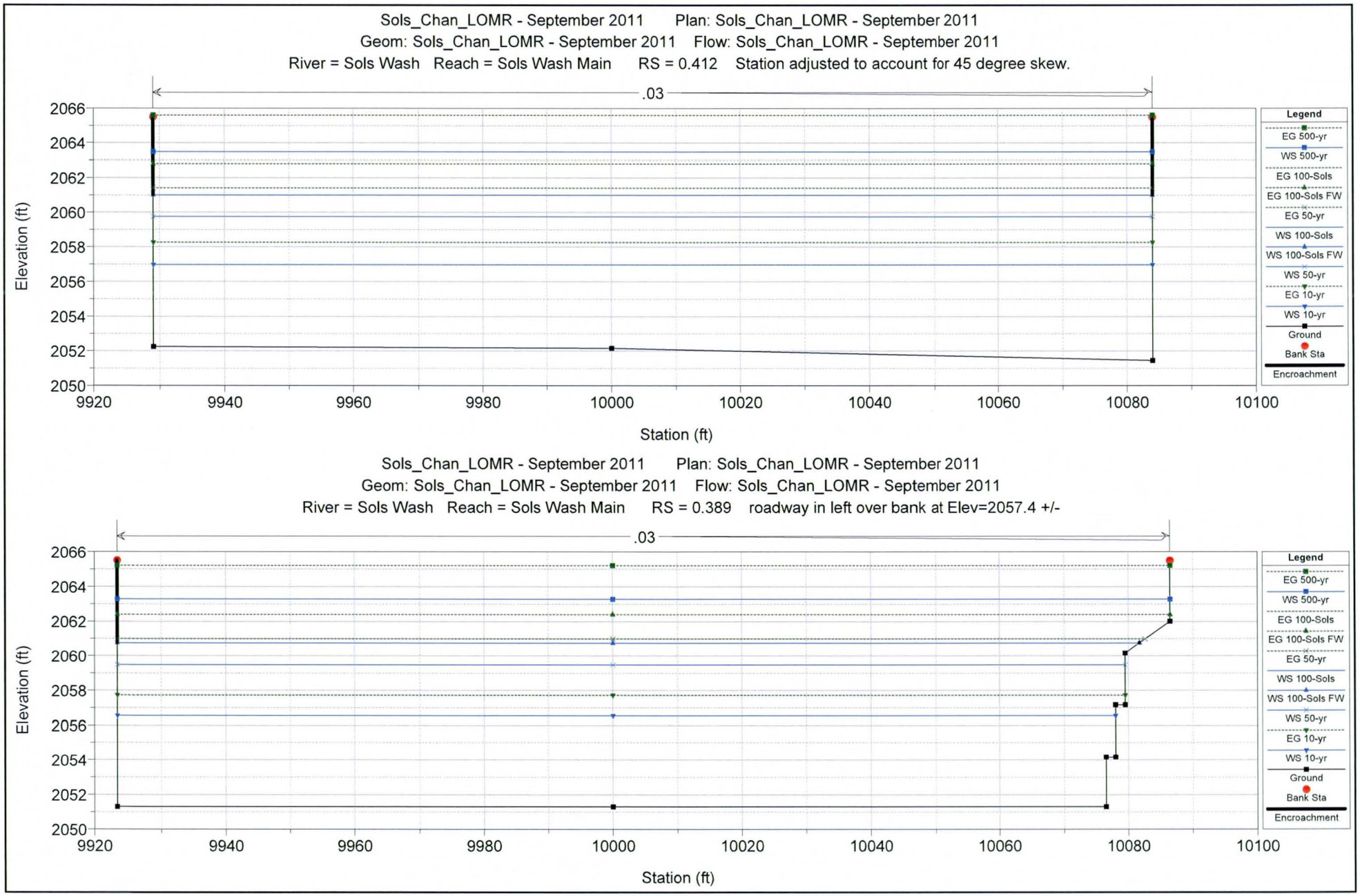


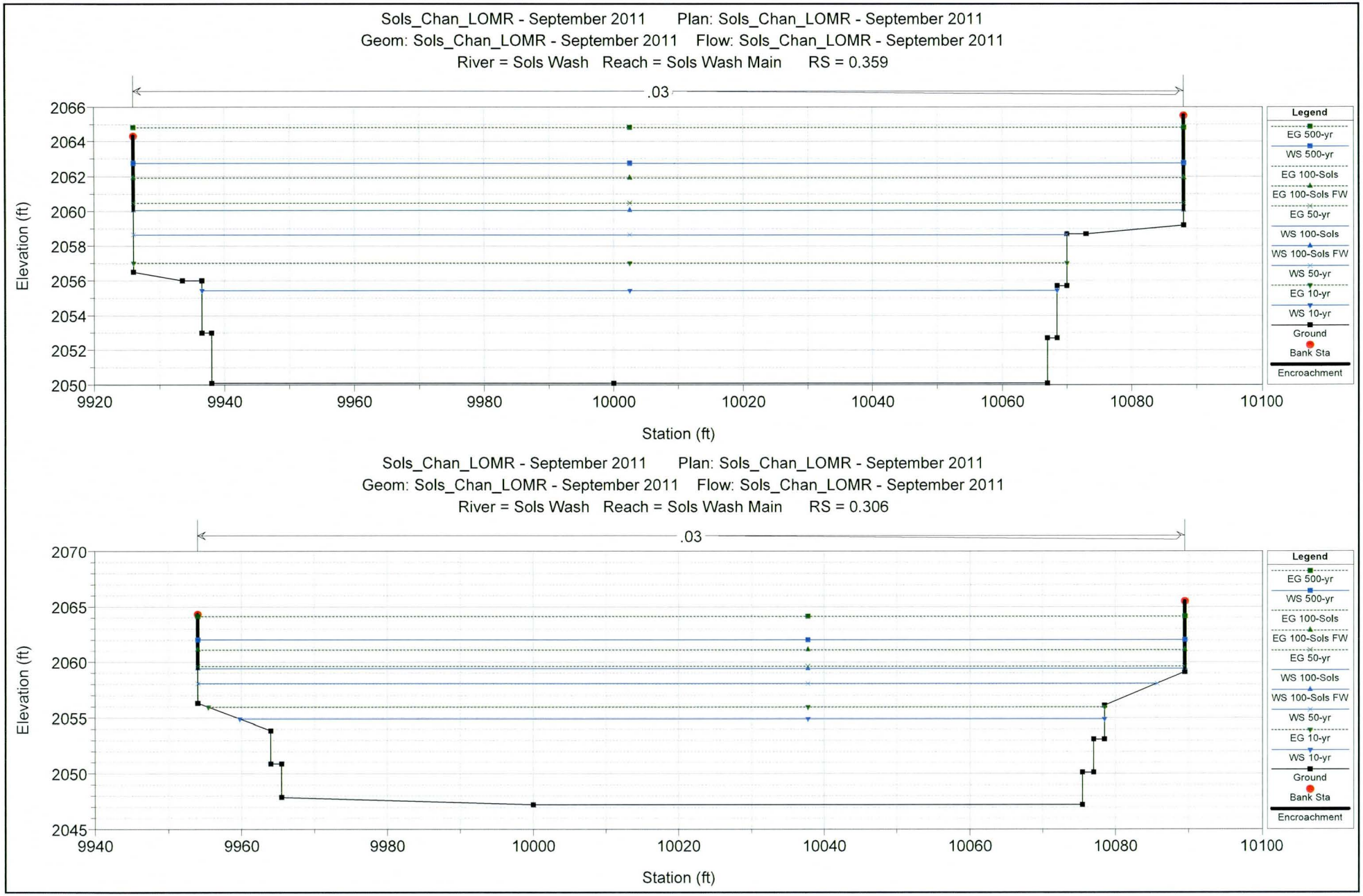
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.423 BR U/S Modeled with 2.75 ft parapet extension



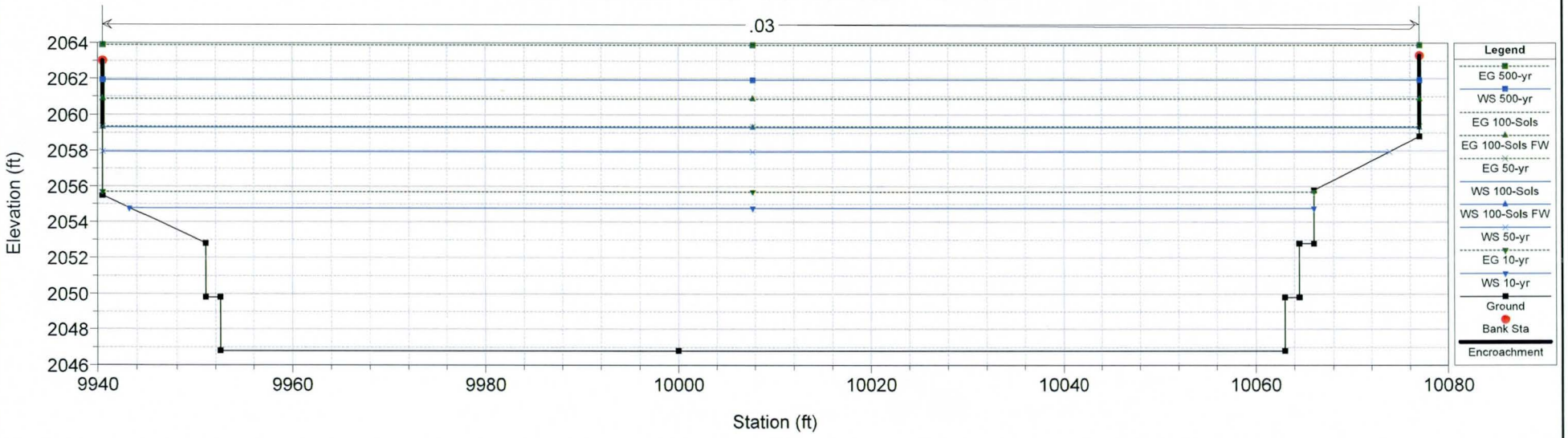
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.423 BR U/S Modeled with 2.75 ft parapet extension



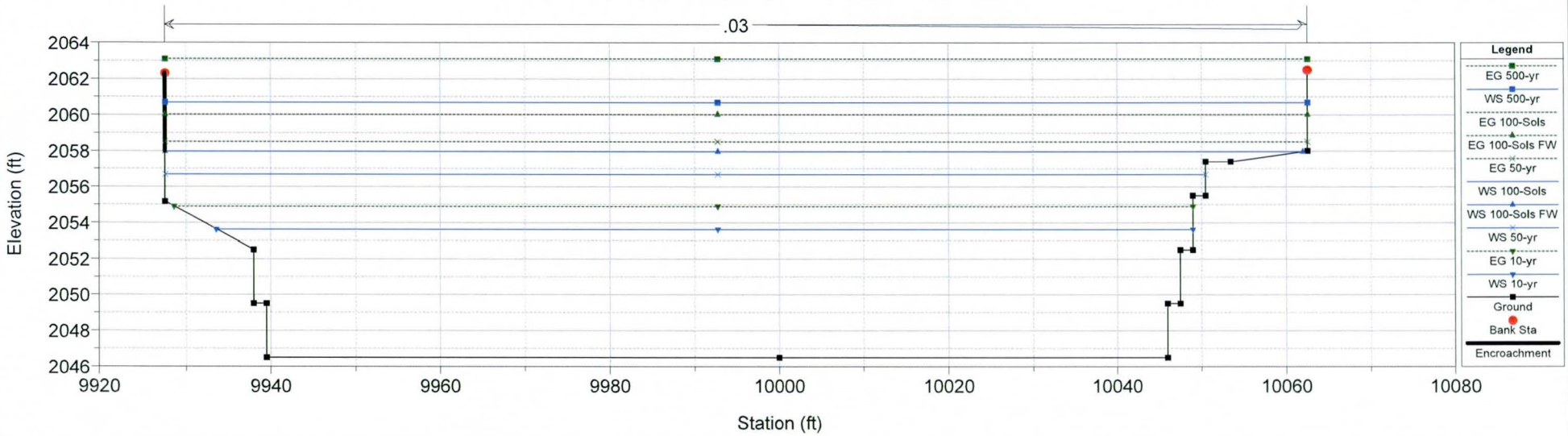

Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.412 Station adjusted to account for 45 degree skew.
.03
Elevation (ft)
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols
EG 100-Sols FW
EG 50-yr
WS 100-Sols
WS 100-Sols FW
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.389 roadway in left over bank at Elev=2057.4 +/-
.03
Elevation (ft)
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols
EG 100-Sols FW
EG 50-yr
WS 100-Sols
WS 100-Sols FW
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment

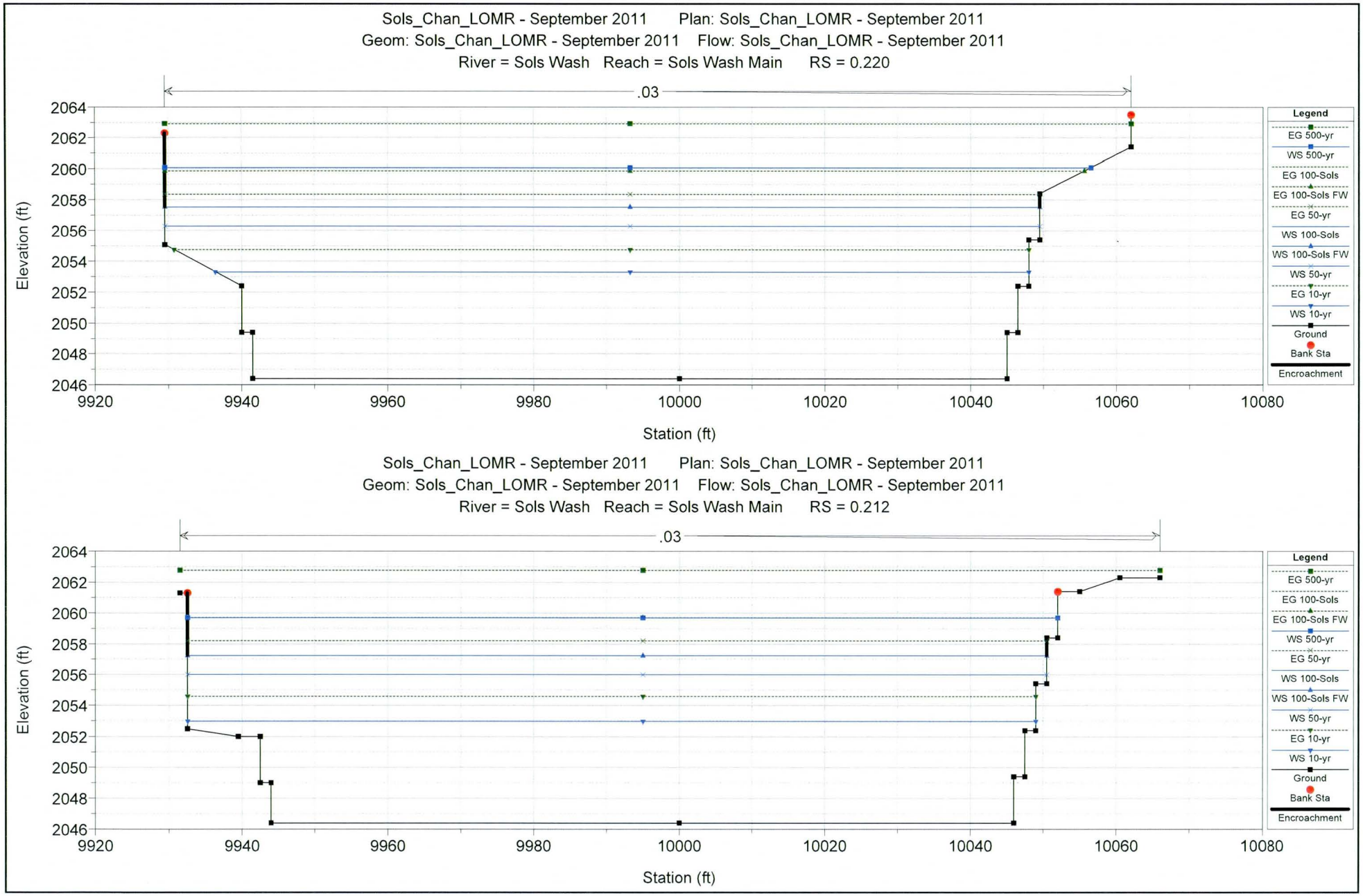

Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.359
.03
Elevation (ft)
2066
2064
2062
2060
2058
2056
2054
2052
2050
9920
9940
9960
9980
10000
10020
10040
10060
10080
10100
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols
EG 100-Sols FW
EG 50-yr
WS 100-Sols
WS 100-Sols FW
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.306
.03
Elevation (ft)
2070
2065
2060
2055
2050
2045
9940
9960
9980
10000
10020
10040
10060
10080
10100
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols
EG 100-Sols FW
EG 50-yr
WS 100-Sols
WS 100-Sols FW
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment

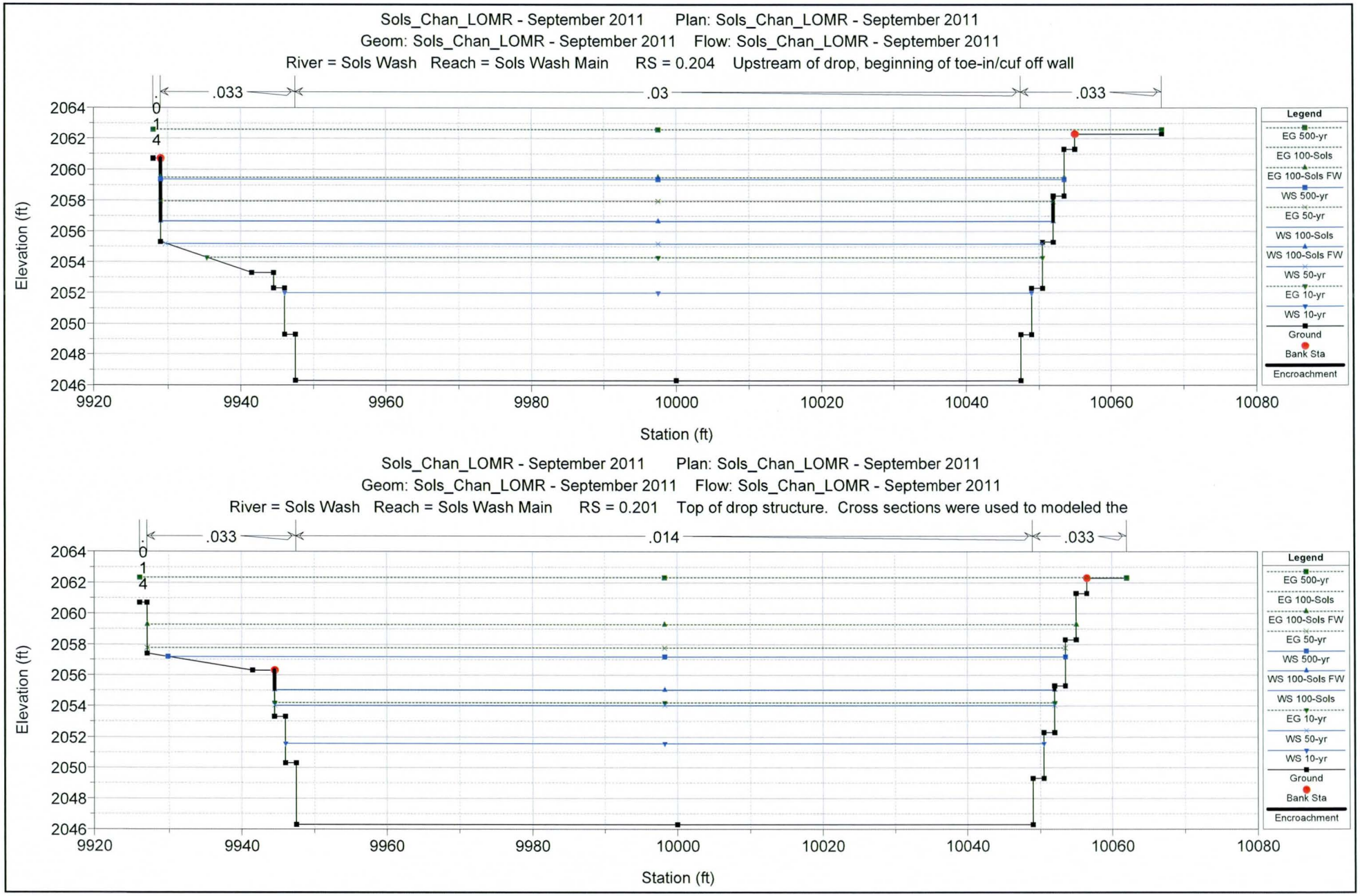
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.288



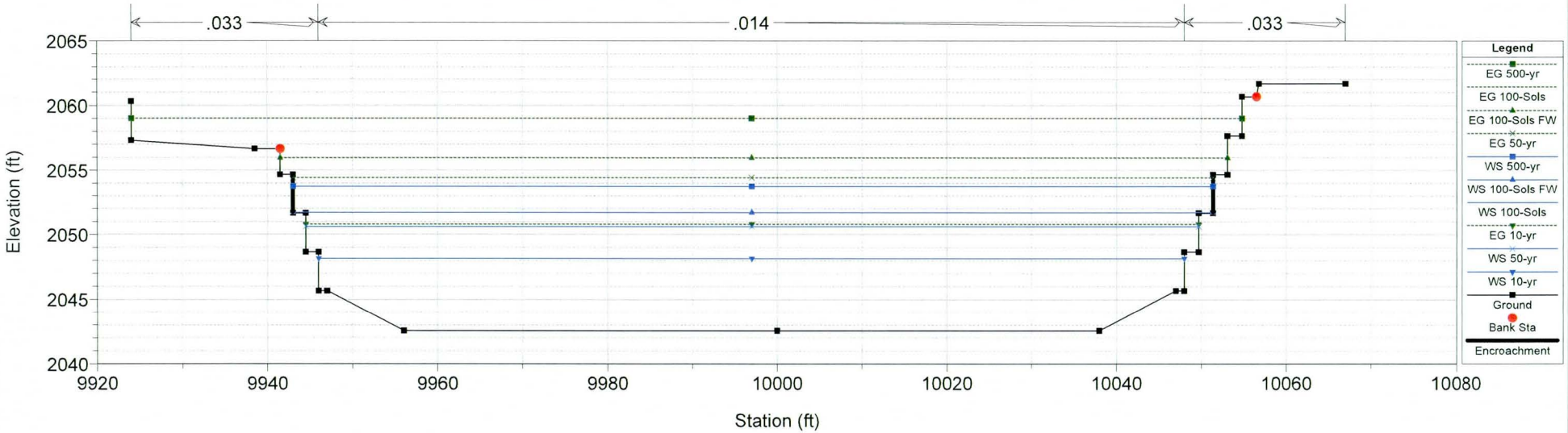
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.227




Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.220
.03
Elevation (ft)
2064
2062
2060
2058
2056
2054
2052
2050
2048
2046
9920
9940
9960
9980
10000
10020
10040
10060
10080
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols
EG 100-Sols FW
EG 50-yr
WS 100-Sols
WS 100-Sols FW
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.212
.03
Elevation (ft)
2064
2062
2060
2058
2056
2054
2052
2050
2048
2046
9920
9940
9960
9980
10000
10020
10040
10060
10080
Station (ft)
Legend
EG 500-yr
EG 100-Sols
EG 100-Sols FW
WS 500-yr
EG 50-yr
WS 100-Sols
WS 100-Sols FW
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment


Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.204 Upstream of drop, beginning of toe-in/cuf off wall
.033
.03
.033
0
1
4
Elevation (ft)
2064
2062
2060
2058
2056
2054
2052
2050
2048
2046
9920
9940
9960
9980
10000
10020
10040
10060
10080
Station (ft)
Legend
EG 500-yr
EG 100-Sols
EG 100-Sols FW
WS 500-yr
EG 50-yr
WS 100-Sols
WS 100-Sols FW
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.201 Top of drop structure. Cross sections were used to modeled the
.033
.014
.033
0
1
4
Elevation (ft)
2064
2062
2060
2058
2056
2054
2052
2050
2048
2046
9920
9940
9960
9980
10000
10020
10040
10060
10080
Station (ft)
Legend
EG 500-yr
EG 100-Sols
EG 100-Sols FW
EG 50-yr
WS 500-yr
WS 100-Sols FW
WS 100-Sols
EG 10-yr
WS 50-yr
WS 10-yr
Ground
Bank Sta
Encroachment

Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.198 Halfway down drop structure.



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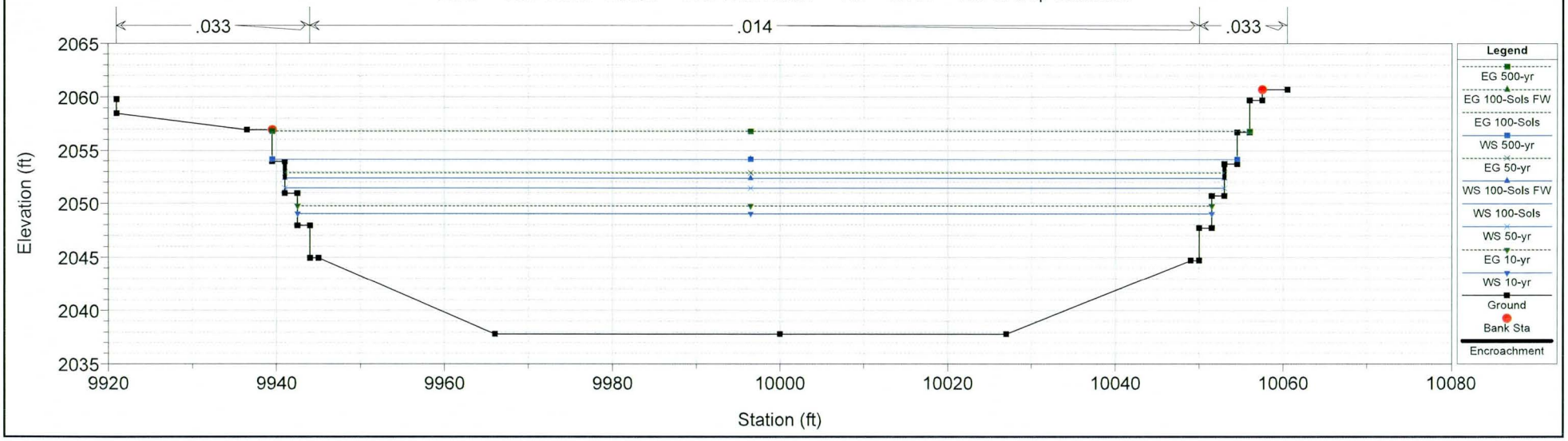
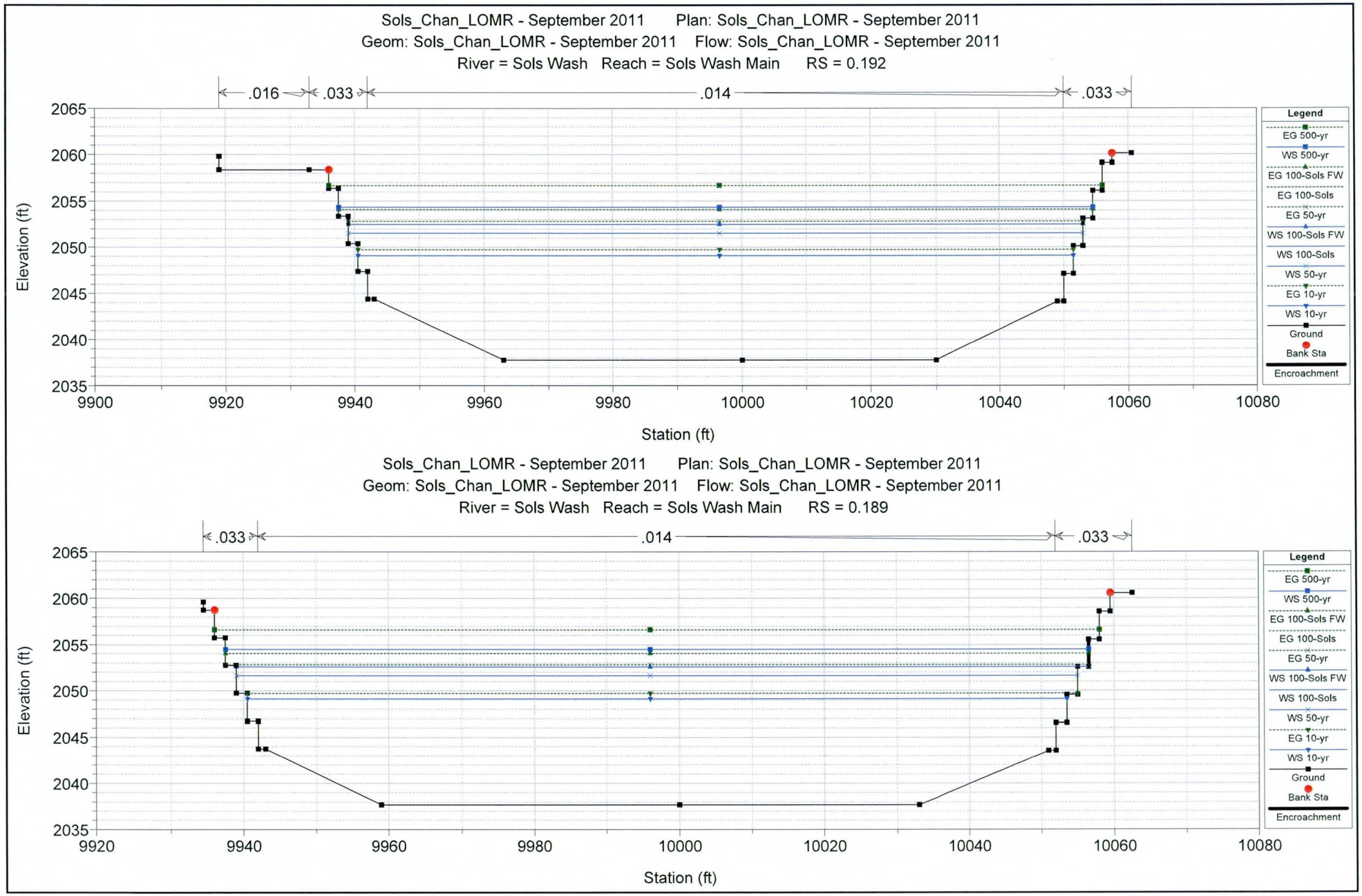
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.195 Toe of drop structure.




Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.192
.016
.033
.014
.033
Elevation (ft)
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols FW
EG 100-Sols
EG 50-yr
WS 100-Sols FW
WS 100-Sols
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.189
.033
.014
.033
Elevation (ft)
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols FW
EG 100-Sols
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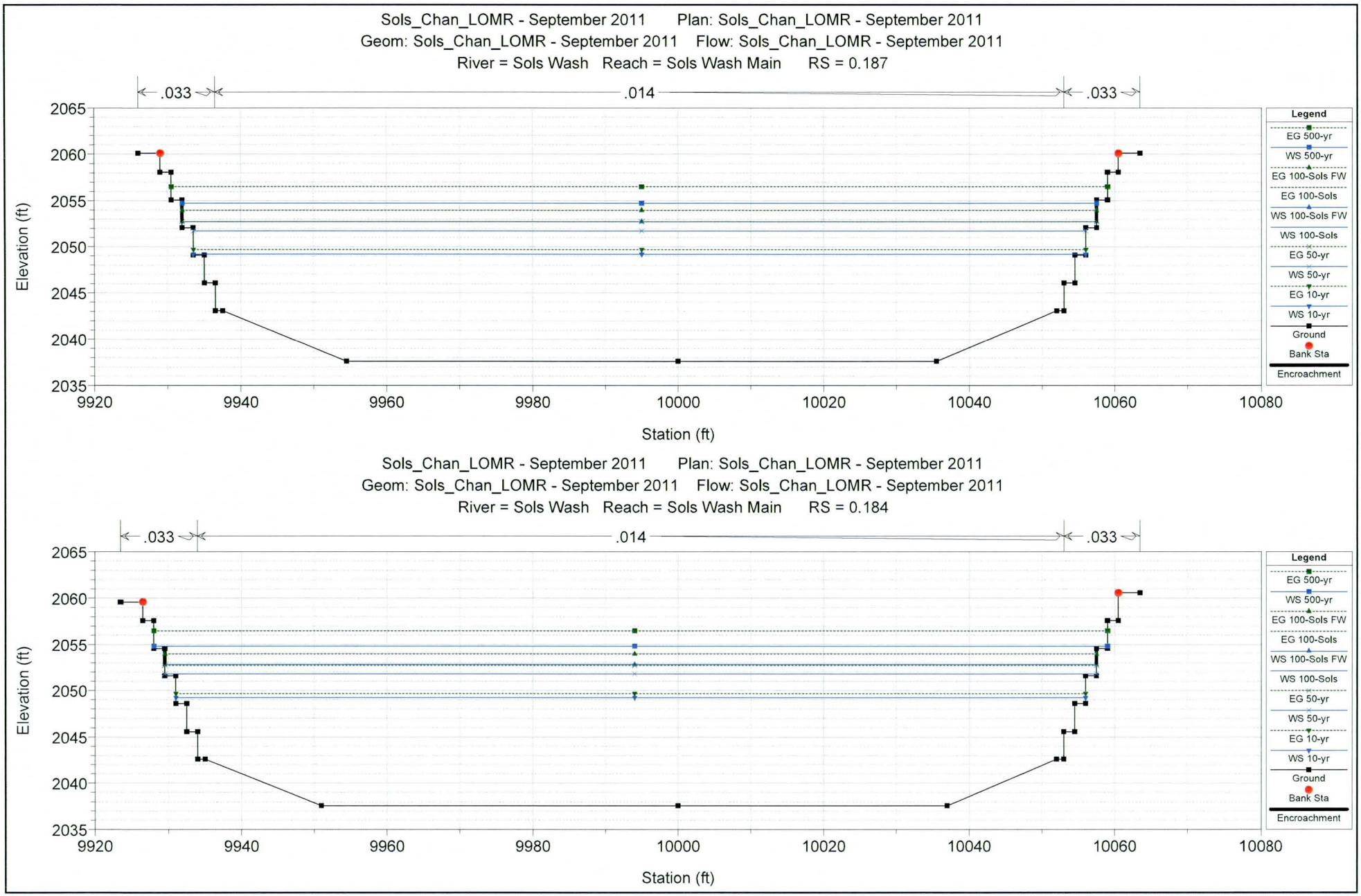
WS 100-Sols FW
WS 100-Sols
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment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River = Sols Wash Reach = Sols Wash Main RS = 0.187
.033
.014
.033
Elevation (ft)
2065
2060
2055
2050
2045
2040
2035
9920
9940
9960
9980
10000
10020
10040
10060
10080
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols FW
EG 100-Sols
WS 100-Sols FW
WS 100-Sols
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.184
.033
.014
.033
Elevation (ft)
2065
2060
2055
2050
2045
2040
2035
9920
9940
9960
9980
10000
10020
10040
10060
10080
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols FW
EG 100-Sols
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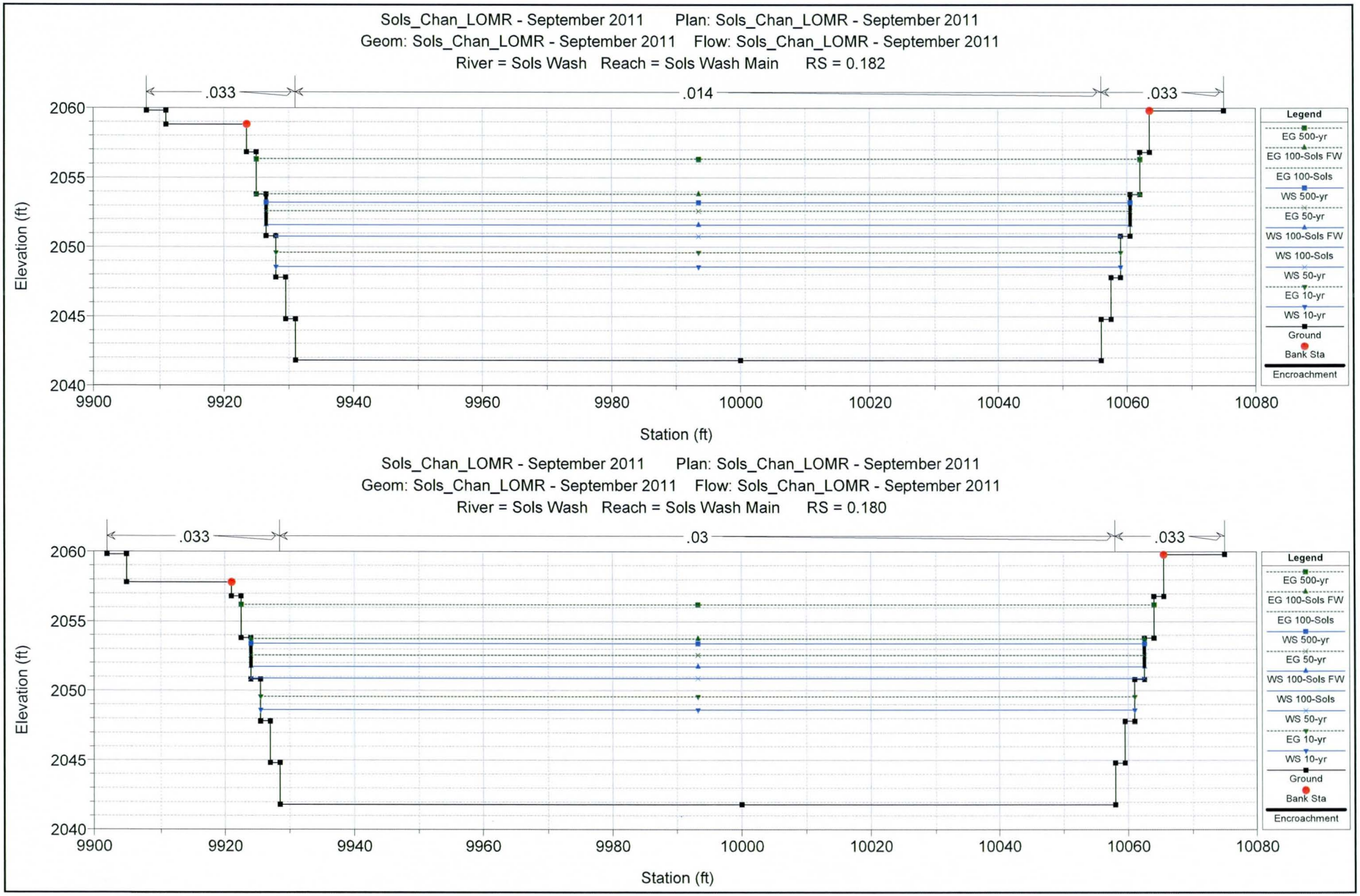
WS 100-Sols
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment


Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.182
.033
.014
.033
Elevation (ft)
2060
2055
2050
2045
2040
9900
9920
9940
9960
9980
10000
10020
10040
10060
10080
Station (ft)
Legend
EG 500-yr
EG 100-Sols FW
EG 100-Sols
WS 500-yr
EG 50-yr
WS 100-Sols FW
WS 100-Sols
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.180
.033
.03
.033
Elevation (ft)
2060
2055
2050
2045
2040
9900
9920
9940
9960
9980
10000
10020
10040
10060
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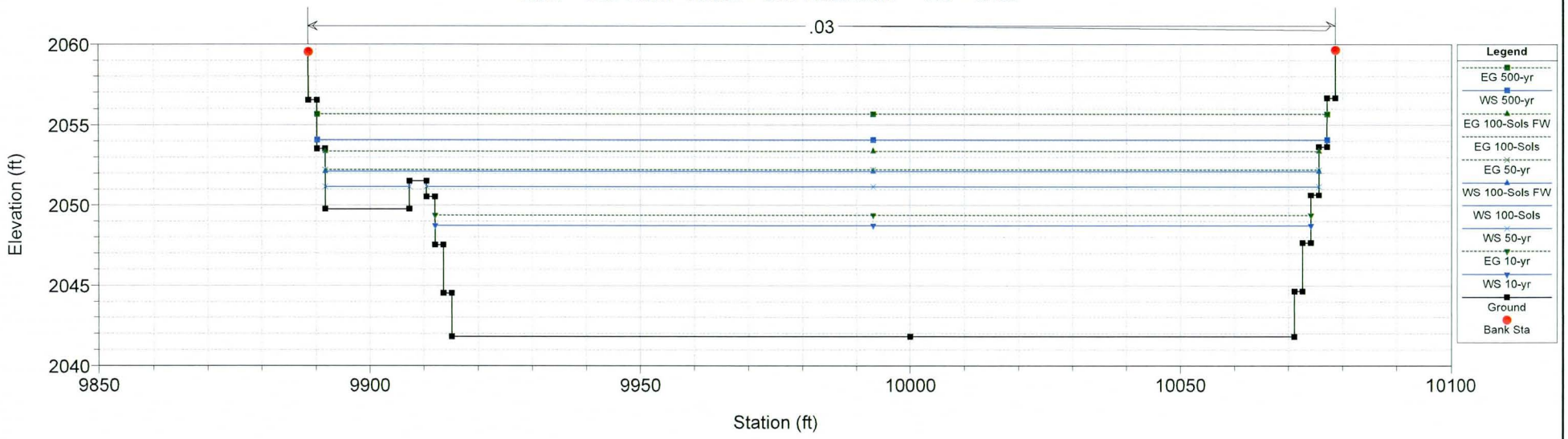
Station (ft)
Legend
EG 500-yr
EG 100-Sols FW
EG 100-Sols
WS 500-yr
EG 50-yr
WS 100-Sols FW
WS 100-Sols
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment

Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.169



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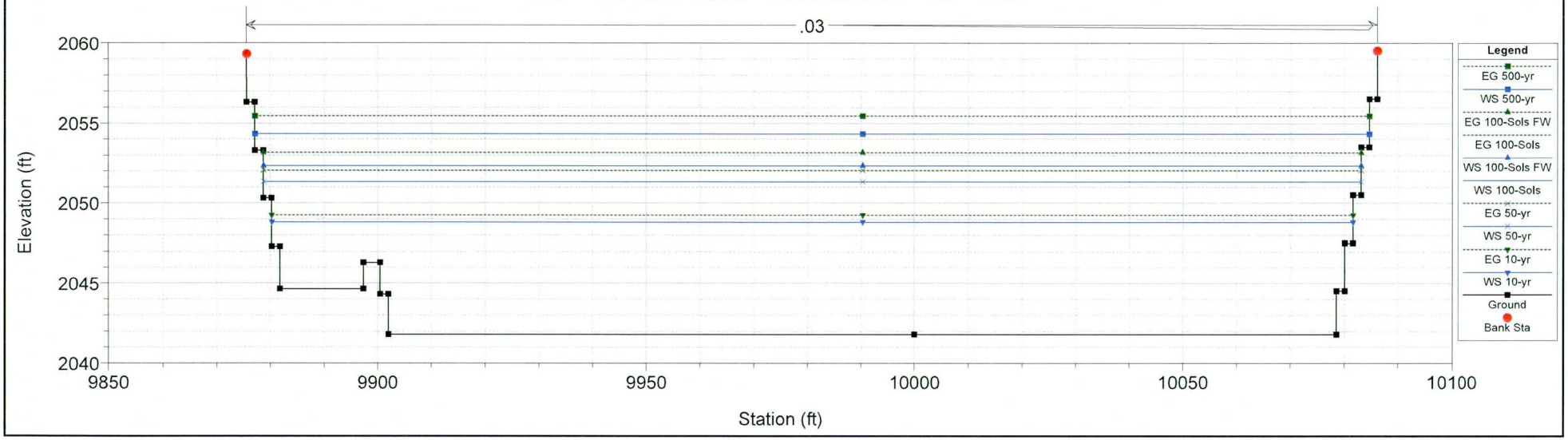
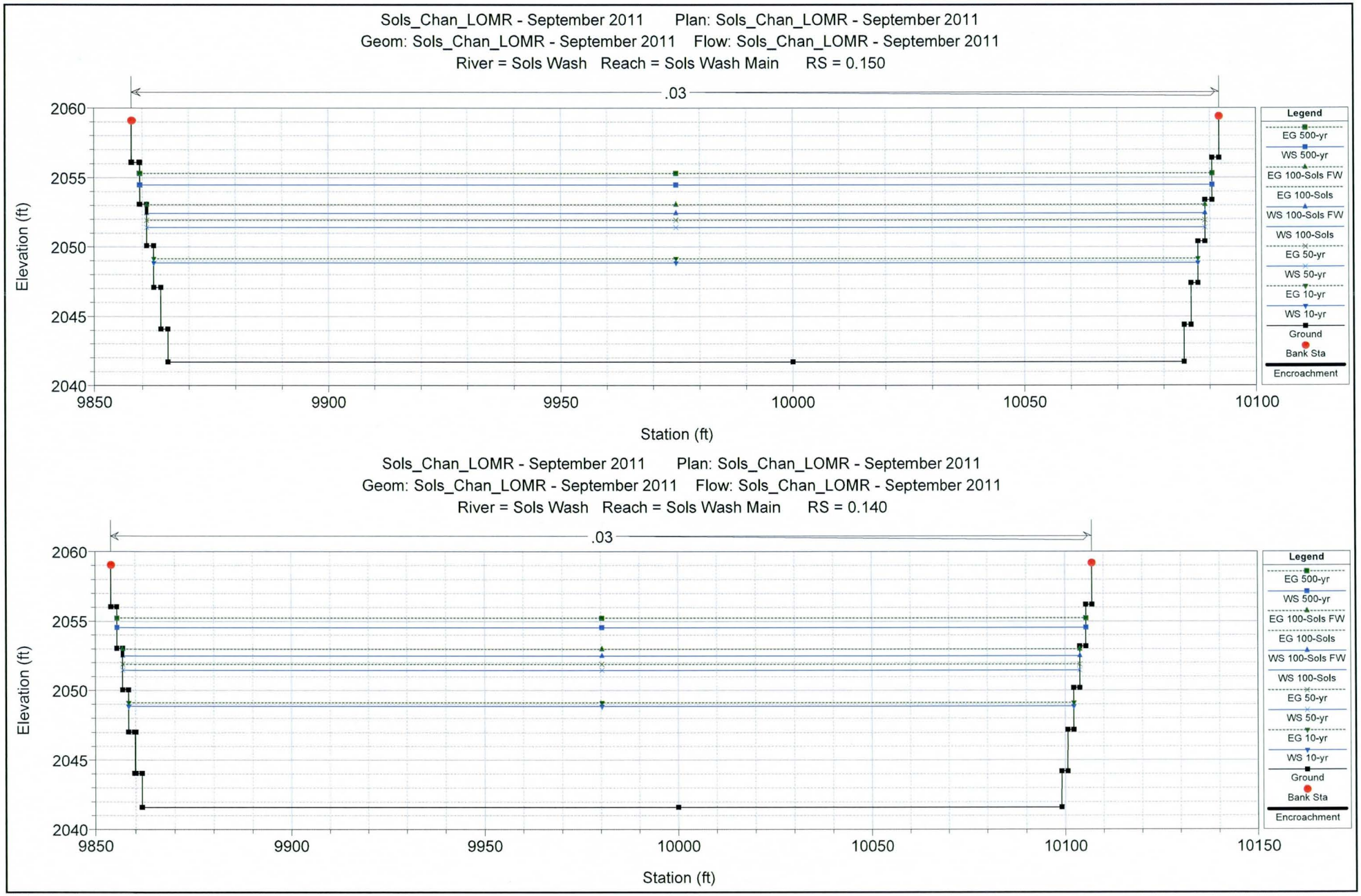
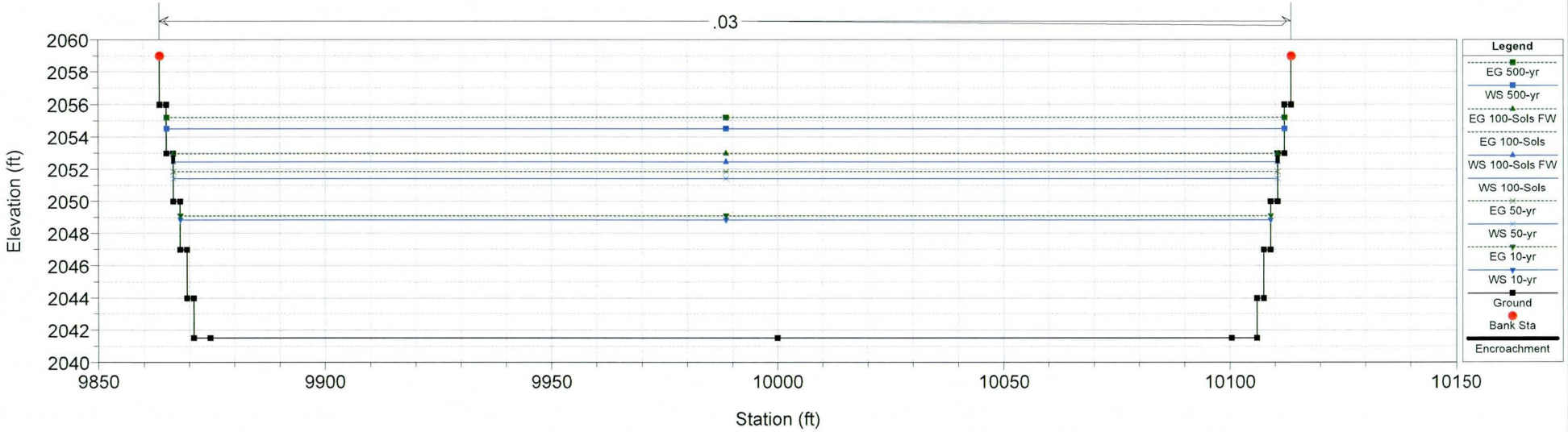
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.159

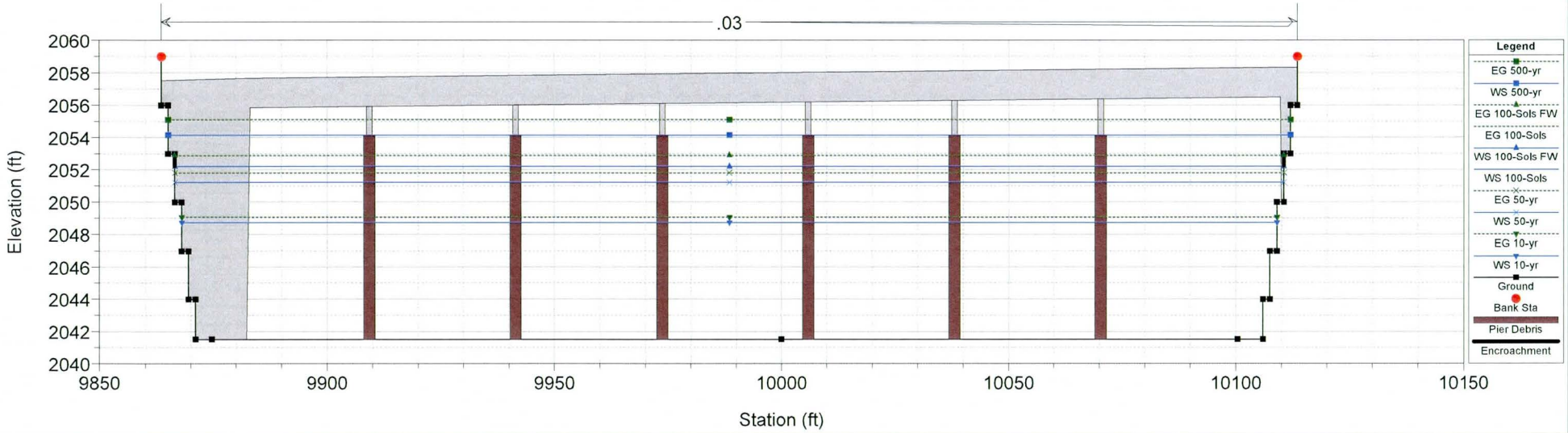



Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.150
.03
Elevation (ft)
2060
2055
2050
2045
2040
9850
9900
9950
10000
10050
10100
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols FW
EG 100-Sols
WS 100-Sols FW
WS 100-Sols
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.140
.03
Elevation (ft)
2060
2055
2050
2045
2040
9850
9900
9950
10000
10050
10100
10150
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-Sols FW
EG 100-Sols
WS 100-Sols FW
WS 100-Sols
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Encroachment

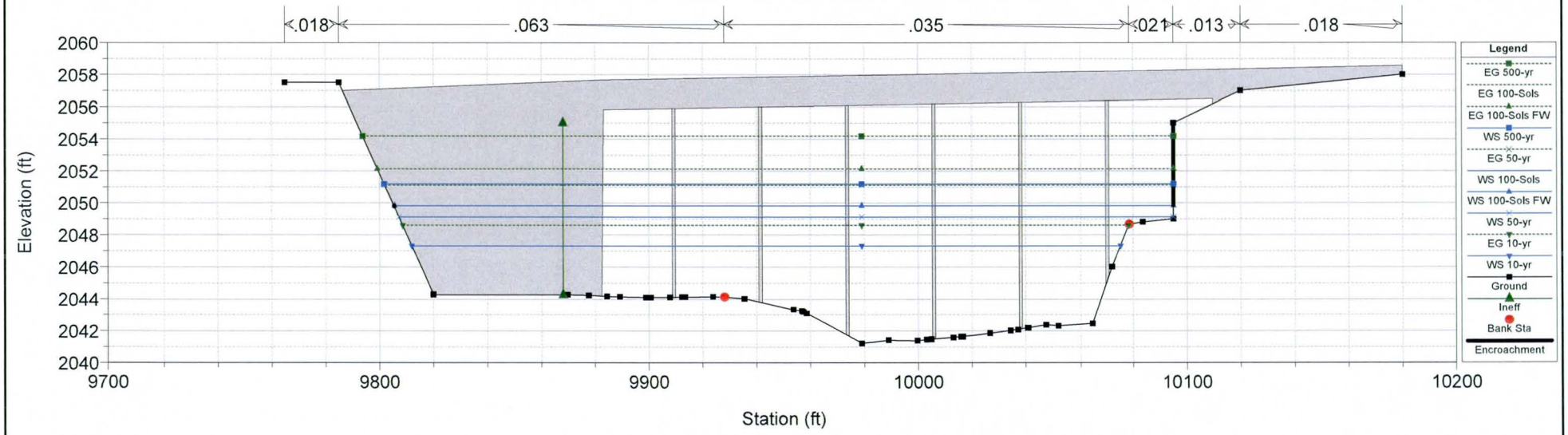
Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.132 Just upstream of the proposed ADOT superbox. Cross section skew



Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.121 BR



Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.121 BR



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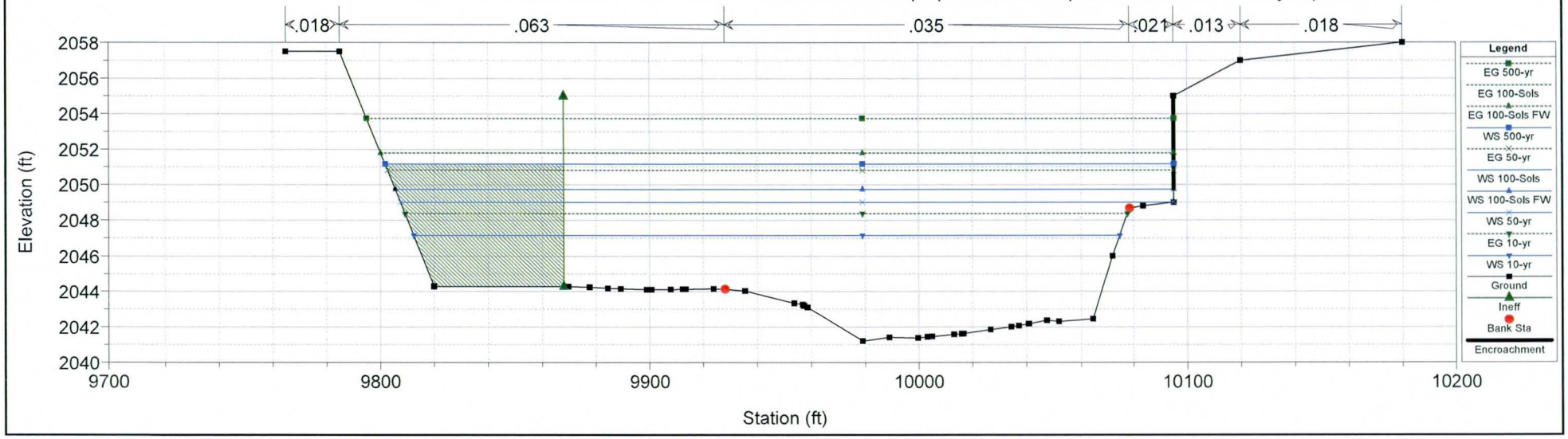
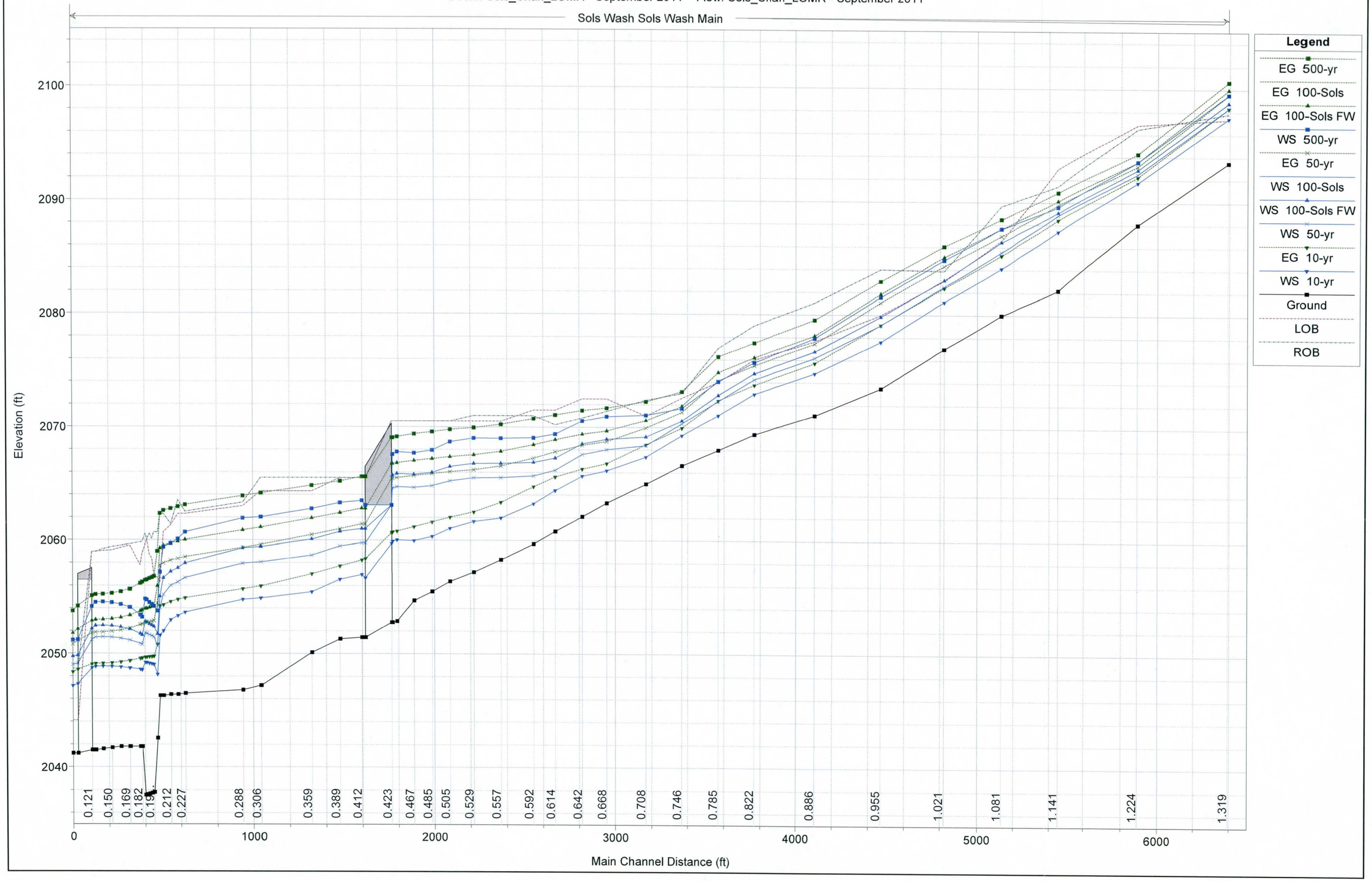
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011
River = Sols Wash Reach = Sols Wash Main RS = 0.111 Downstream of the proposed ADOT superbox. Within the Hassayampa



Sols_Chan_LOMR - September 2011 Plan: Sols_Chan_LOMR - September 2011
Geom: Sols_Chan_LOMR - September 2011 Flow: Sols_Chan_LOMR - September 2011

Sols Wash Sols Wash Main



Flood Control District
of Maricopa County

Board of Directors
Fulton Brock, District 1
Don Stapley, District 2
Andrew Kunasek, District 3
Max Wilson, District 4
Mary Rose Wilcox, District 5

www.fcd.maricopa.gov

2801 West Durango Street
Phoenix, Arizona 85009
Phone: 602-506-1501
Fax: 602-506-4601
TT: 602-505-5897

June 27, 2011

LOMC Clearinghouse
7390 Coca Cola Drive, Suite 204
Hanover, MD 21076

ATTN: LOMR Manager

RE: Letters of Map Revision (LOMR) requests for:
US-93 Interim Wickenburg Bypass (follows CLOMR Case No. 07-09-0858R) &
Wickenburg Downtown Flooding Hazard Mitigation (follows CLOMR Case No. 07-09-0738R)
Town of Wickenburg and Unincorporated County, Maricopa County, Arizona

Dear LOMR Manager:

On July 3, 2007, the Federal Emergency Management Agency (FEMA) issued a CLOMR for the Arizona Department of Transportation's project *US-93 Interim Wickenburg Bypass* (CLOMR Case No. 07-09-0858R) for the Hassayampa River. On October 5, 2007, FEMA issued a CLOMR for the *Wickenburg Downtown Flooding Hazard Mitigation* project (CLOMR Case No. 07-09-0738R), a joint project between the Flood Control District of Maricopa County and the Town of Wickenburg for Sols Wash which also included revisions to Hospital and Casandro Washes.

It was stated in each CLOMR that flood protection was incomplete without the proposed changes described in the other CLOMR. Therefore, as the construction of each project has been completed, LOMRs for both projects are hereby submitted concurrently for your review. Individual transmittal letters with FEMA forms, project contact information, FEMA review fees, etc. are included in each individual submittal package.

If you have any questions regarding this overall submittal or the *Wickenburg Downtown* project, please feel free to call me at 602-506-4001 or contact me by e-mail at cwr@mail.maricopa.gov. If you have any questions regarding the *US-93 Interim Bypass* project please contact Mr. Berwyn Wilbrink, Jacobs Project Manager, at 602-530-1661 or by e-mail at berwyn.wilbrink@jacobs.com.

Yours truly,

Catherine W. Regester

Catherine W. Regester, P.E., CFM
Senior Engineer

Enclosures: LOMR Packages (2)

Copies to (w/o enclosures):

Beth Norton
Engineering Management Section
Mitigation Division
Federal Emergency Management Agency
500 C Street SW
Washington, D.C. 20472-0001

Robert Bezek
Federal Emergency Management Agency
Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607

Brian Cosson
NFIP Coordinator
Arizona Department of Water Resources
Office of Dam Safety and Flood Mitigation
500 North Third Street
Phoenix, AZ 85004

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Town Manager
Town of Wickenburg
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Wickenburg, AZ 85390

Rick DeStefano
Floodplain Administrator
Town of Wickenburg
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60 East Rio Salado Parkway
Suite 501
Tempe, AZ 85281

Berwyn S. Wilbrink, P.E.
Jacobs
101 North First Ave, Suite 3100
Phoenix, AZ 85003-1902

Wickenburg Downtown Flooding Hazard Mitigation Project
(FCD #2006C018)

Letter of Map Revision (LOMR)
(Previously, FEMA CLOMR Case No. 07-09-0738R)

Prepared by:

Flood Control District of Maricopa County
Engineering Division
Hydrology & Hydraulics Branch
2801 W Durango Street
Phoenix, AZ 85009
Phone: (602) 506-1501
Fax: (602) 506-4601

April 2011

Table of Contents

LIST OF APPENDICES

WICKENBURG DOWNTOWN FLOODING HAZARD MITIGATION PROJECT

I. INTRODUCTION

Purpose of Report

The purpose of this report is to transmit the documentation necessary to obtain a Letter of Map Revision (LOMR) for the floodplain/floodway impacted by the Wickenburg Downtown Flooding Hazard Mitigation Project. This project was previously submitted and approved as a CLOMR, dated October 5, 2007, under FEMA Case No. 07-09-0738R. Data included in the previous CLOMR submittals has been included on the CD in the back of this notebook.

In the CLOMR letter, FEMA stipulated that the Wickenburg Downtown Project LOMR incorporate the changes described in FEMA Case No. 07-09-0858R, a CLOMR for a reach of the Hassayampa River prepared by WEST Consultants for the Arizona Department of Transportation (ADOT). The Wickenburg Downtown Project and the ADOT project (the Wickenburg Bypass, U.S. 93 Project) have been closely coordinated. The LOMRs for both projects are being submitted separately but concurrently. FEMA should be in receipt of the ADOT project LOMR.

Changes since CLOMR Approval

- The delineation on the south side of Sols Wash on work map sheet 2 was revised to reflect the as-built grading which included a wider channel for Casandro Wash than the original design. The revised delineation is shown on revised work map sheet 2A.

- The HEC-RAS hydraulic models for both Sols and Hospital Washes were renamed to include "LOMR" in the project name so as to identify the models as the as-built conditions LOMR models. No changes were made to the models themselves.

- The CLOMR included a re-delineation of Hospital Wash. Since the CLOMR, minor revisions were made to the floodplain delineation between HEC-RAS cross sections to better match the topographic contours. As well, minor refinements were made to the floodway to obtain a more

hydraulically smooth floodway delineation within the floodplain. There were no changes to the floodplain or floodway at the cross sections themselves and no changes to the HEC-RAS hydraulic modeling other than the name as explained in the preceding paragraph. New work maps were prepared for Hospital Wash and are included in this notebook.

II. RESPONSE TO FEMA CLOMR LETTER

In FEMA's CLOMR, FEMA listed eleven (11) items to be submitted for the LOMR. Those items are submitted in the following sections. A copy of the CLOMR follows this page. At the end of the CLOMR, a "Response to FEMA CLOMR Comments" is provided with a listing of the original CLOMR comments along with a statement of response to each. These responses immediately precede Section A.

Federal Emergency Management Agency

Washington, D.C. 20472

OCT 0 5 2007

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 07-09-0738R

The Honorable Fulton Brock
Chairman, Maricopa County
Board of Supervisors
301 West Jefferson, 10th Floor
Phoenix, AZ 85003

Community: Maricopa County, AZ
Community No.: 040037

104

Dear Mr. Brock:

This responds to a request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) comment on the effects that a proposed project would have on the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for Maricopa County, Arizona and Incorporated Areas, in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated January 30, 2007, Ms. Catherine W. Regester, P.E., CFM, Flood Control District of Maricopa County, requested that FEMA evaluate the effects that revised hydrologic and hydraulic analyses, updated topographic information, and changes associated with the Downtown Wickenburg Flooding Hazard Mitigation project along Sols Wash from the confluence with the Hassayampa River to approximately 4,380 feet upstream of Tegner Street (US89); Hospital Wash from the confluence with Sols Wash to approximately 1,100 feet upstream of Sombrero Road; and Cassandro Wash from the confluence with Sols Wash to just downstream of the Santa Fe Railroad would have on the flood hazard information shown on the effective FIRM and FIS report.

The proposed Downtown Wickenburg Flooding Hazard Mitigation project will involve the construction of a new US93 Bypass bridge near the mouth of Sols Wash, fill placed on the right overbanks of Sols Wash upstream of Tegner Street (US89), channelization of Sols Wash, and levees constructed along Sols Wash from 1,500 feet downstream to 1,600 feet upstream of Tegner Street (US89). The proposed project also includes replacement of the Cavaness Avenue culvert at Hospital Wash.

The affected areas in the unincorporated areas of Maricopa County are on the right overbank of Hospital Wash and the left overbank of Sols Wash from approximately 3,780 feet upstream to approximately 4,380 feet upstream of Tegner Street (US89). The remainder of the revised reach is within the Town of Wickenburg; therefore, a separate Conditional Letter of Map Revision (CLOMR) for that community was issued on the same date as this CLOMR.

All data required to complete our review of this request for a Conditional Letter of Map Revision (CLOMR) were submitted with letters from Ms. Regester.

We reviewed the submitted data and the data used to prepare the effective FIRM for your community and determined that the proposed project meets the minimum floodplain management criteria of the NFIP. The submitted existing conditions HEC-RAS hydraulic computer model for Sols Wash, dated July 12, 2002, based on updated topographic information, and the submitted HY-8 and HEC-RAS hydraulic computer models for Hospital Wash, both undated, based on corrected culvert dimensions, updated topographic information, and a revised hydrologic analysis, were used as the base conditions

model in our review of the proposed conditions model for this CLOMR request. We believe that, if the proposed project is constructed as shown on the submitted report entitled "Sols Wash Conditional Letter of Map Revision," prepared by Engineering and Environmental Consultants, Inc., dated December 2006, updated July 2007, and the data listed below are received, a revision to the FIRM would be warranted.

The existing conditions model for Sols Wash was based on updated topographic information. Our comparison of existing conditions to the effective flood hazard information revealed that the Base (1-percent-annual-chance) Flood Elevations (BFEs) for Sols Wash increased. The maximum increase, 4.8 feet, occurred just upstream of Tegner Street. The existing conditions model for Hospital Wash was based on a revised hydrologic analysis, updated topographic information, and corrected culvert dimensions. Our comparison of existing conditions to the effective flood hazard information revealed that the BFEs increased in some areas and decreased in some areas. The maximum increase, 2.6 feet, occurred approximately 200 feet downstream of Sombrero Road. The maximum decrease, 1.2 feet, occurred approximately 1,080 feet upstream of Cavaness Avenue.

As a result of the proposed project, the BFEs along Sols Wash will increase in some areas and decrease in some areas compared to the existing conditions. The maximum increase, 5.4 feet, will occur approximately 1,480 feet downstream of Tegner Street. The maximum decrease, 2.8 feet, will occur approximately 1,800 feet upstream of Tegner Road. The BFEs along Hospital Wash will decrease compared to existing conditions. The maximum decrease, approximately 0.8 feet, will occur just upstream of Cavaness Avenue.

As a result of the revised hydraulic analysis, updated topographic information, and the proposed project, the BFEs along Sols Wash will increase in some areas and decrease in others compared to the effective BFEs. The maximum increase, 5.5 feet, will occur just upstream of Tegner Street. The maximum decrease, 2.4 feet, will occur approximately 1,660 feet upstream of Tegner Street. The width of the Special Flood Hazard Area (SFHA) for Sols Wash will decrease compared to the effective SFHA width. The maximum decrease, approximately 1,450 feet, will occur approximately 1,000 feet upstream of Tegner Street.

As a result of the revised hydraulic analysis, updated topographic information, and the proposed project, the width of the regulatory floodway for Sols Wash will increase in some areas and decrease in some areas, compared to the effective floodway width. The maximum increase in floodway width, approximately 120 feet, will occur approximately 3,780 feet upstream of Tegner Street. The maximum decrease in floodway width, approximately 550 feet, will occur approximately 500 feet upstream of Tegner Street.

As a result of the revised hydrologic and hydraulic analysis, updated topographic information, and the proposed project, the BFEs along Hospital Wash will increase in some areas and decrease in some areas compared to the effective BFEs. The maximum increase, 2.6 feet, will occur approximately 200 feet downstream of Sombrero Road. The maximum decrease, 1.2 feet, will occur approximately 1,080 feet upstream of Cavaness Avenue. The width of the SFHA for Hospital Wash will increase in some areas and decrease in some areas compared to the effective SFHA width. The maximum increase in SFHA width, approximately 70 feet, will occur approximately 240 feet upstream of Sombrero Wash. The maximum decrease in SFHA width, approximately 380 feet, will occur just downstream of Rose Lane.

As a result of the revised hydrologic and hydraulic analysis, updated topographic information, and the proposed project, the width of the regulatory floodway for Hospital Wash will decrease compared to the effective floodway width. The maximum decrease in floodway width, approximately 100 feet, will occur approximately 750 feet downstream of Rose Lane.

As a result the proposed project, BFEs for Cassandro Wash will increase compared to effective BFEs. The maximum increase, 1.0 foot, will occur near the confluence with Sols Wash. The proposed project will also result in a revised SFHA and floodway for Cassandro Wash. The SFHA and floodway widths will be reduced as compared to the effective SFHA and floodway width because they are based solely on the hydraulic analysis for Cassandro Wash.

Upon completion of the project, your community may submit the data listed below and request that we make a final determination on revising the effective FIRM and FIS report.

- With this request, your community has complied with all requirements of Paragraph 65.12(a) of the NFIP regulations. Compliance with Paragraph 65.12(b) also is necessary before FEMA can issue a Letter of Map Revision when a community proposes to permit encroachments into the effective regulatory floodway that will cause increases in BFE in excess of those permitted under Paragraph 60.3(d)(3). Please provide evidence that your community has, prior to approval of the proposed encroachment, adopted floodplain management ordinances that incorporate the increased BFEs and revised floodway boundary delineations to reflect post-project conditions, as stated in Paragraph 65.12(b).

- Detailed application and certification forms, which were used in processing this request, must be used for requesting final revisions to the maps. Therefore, when the map revision request for the area covered by this letter is submitted, Form 1, entitled "Overview & Concurrence Form," must be included. (A copy of this form is enclosed.)

- The detailed application and certification forms listed below may be required if as-built conditions differ from the preliminary plans. If required, please submit new forms (copies of which are enclosed) or annotated copies of the previously submitted forms showing the revised information.

  Form 2, entitled "Riverine Hydrology & Hydraulics Form"

  Form 3, entitled "Riverine Structures Form"

  Hydraulic analyses, for as-built conditions, of the base flood; the 10-percent-, 2-percent-, and 0.2-percent-annual-chance floods; and the regulatory floodway, together with a topographic work map showing the revised floodplain and floodway boundaries, must be submitted with Form 2.

- Effective October 1, 2007, FEMA revised the fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps. In accordance with this schedule, the current fee for this map revision request is $4,800 and must be received before we can begin processing the request. Please note, however, that the fee schedule is subject to change, and requesters are required to submit the fee in effect at the time of the submittal. Payment of this fee shall be made in the form of a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card (Visa or MasterCard only). The payment, along with the revision application, must be forwarded to the following address:

  FEMA National Service Provider
  3601 Eisenhower Avenue
  Alexandria, VA 22304-6425

- As-built plans, certified by a registered professional engineer, of all proposed project elements

- Community acknowledgment of the map revision request

- A copy of the public notice distributed by your community stating its intent to revise the regulatory floodway, or a statement by your community that it has notified all affected property owners and affected adjacent jurisdictions

- An officially adopted maintenance and operation plan for the levee system. This plan, which may be in the form of a written statement from the community Chief Executive Officer, an ordinance, or other legislation, must describe the nature of the maintenance activities, the frequency with which they will be performed, and the title of the local community official who will be responsible for ensuring that the maintenance activities are accomplished.

- Evidence of notification of all property owners who will be affected by any increases in width and/or shifting of the base floodplain and/or increases in BFE.

- An annotated FIRM, at the scale of the effective FIRM, that shows the revised base floodplain and floodway boundary delineations shown on the submitted work map and how they tie into the base floodplain and floodway boundary delineations shown on the effective FIRM at the downstream and upstream ends of the revised reach

- On July 3, 2007, we completed a CLOMR request (Case No. 07-09-0858R), that proposes to revise a reach of the Hassayampa River that influences the flooding in the revised reach of Sols Wash for this CLOMR. Flood protection described in this CLOMR is incomplete without the proposed changes described in the submittal for Case No. 07-09-0858R. Therefore, the Letter of Map Revision that follows this CLOMR must also incorporate the changes described in Case 07-09-0738R for FEMA to revise the FIRM as described in this CLOMR.

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM and FIS report. Because the BFEs would change as a result of the project, a 90-day appeal period would be initiated, during which community officials and interested persons may appeal the revised BFEs based on scientific or technical data.

The basis of this CLOMR is, in whole or in part, a channel-modification/culvert project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel and culvert rests with your community.

This CLOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on

the CCO for your community may be obtained by calling the Director, Mitigation Division of FEMA in Oakland, California, at (510) 627-7175. If you have any questions regarding this CLOMR, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan, P.E., Project Engineer
Engineering Management Section
Mitigation Directorate

For: William R. Blanton Jr., CFM, Chief
Engineering Management Section
Mitigation Directorate

Enclosures

cc: The Honorable Ron Badowski
Mayor, Town of Wickenburg

Mr. Lyle Murdock
Floodplain Administrator
Town of Wickenburg

Mr. Ted Collins, CFM
Principal Floodplain Administrator
Flood Control District of Maricopa County

Mr. Tim S. Phillips, P.E.
Chief Engineer and General Manager
Flood Control District of Maricopa County

Catherine W. Regester, P.E., CFM
Senior Civil Engineer
Flood Control District of Maricopa County

Mr. Brian Cosson, CFM
NFIP Coordinator
Office of Dam Safety and Flood Mitigation
Arizona Department of Water Resources

Lloyd Vick, P.E.
EEC

Response to FEMA CLOMR Comments

also result in a revised SFHA and floodway for Cassandro Wash. The SFHA and floodway widths will be reduced as compared to the effective SFHA and floodway width because they are based solely on the hydraulic analysis for Cassandro Wash.

Upon completion of the project, your community may submit the data listed below and request that we make a final determination on revising the effective FIRM and FIS report.

- With this request, your community has complied with all requirements of Paragraph 65.12(a) of the NFIP regulations. Compliance with Paragraph 65.12(b) also is necessary before FEMA can issue a Letter of Map Revision when a community proposes to permit encroachments into the effective regulatory floodway that will cause increases in BFE in excess of those permitted under Paragraph 60.3(d)(3). Please provide evidence that your community has, prior to approval of the proposed encroachment, adopted floodplain management ordinances that incorporate the increased BFEs and revised floodway boundary delineations to reflect post-project conditions, as stated in Paragraph 65.12(b). Town of Wickenburg has adopted Floodplain Regulations and has complied with Paragraph 65.12. See Section B of LOMR notebook.

- Detailed application and certification forms, which were used in processing this request, must be used for requesting final revisions to the maps. Therefore, when the map revision request for the area covered by this letter is submitted, Form 1, entitled "Overview & Concurrence Form," must be included. (A copy of this form is enclosed.)
  Form included. See Section A of LOMR Notebook.

- The detailed application and certification forms listed below may be required if as-built conditions differ from the preliminary plans. If required, please submit new forms (copies of which are enclosed) or annotated copies of the previously submitted forms showing the revised information.

  Form 2, entitled "Riverine Hydrology & Hydraulics Form"

  Form 3, entitled "Riverine Structures Form"

  Hydraulic analyses, for as-built conditions, of the base flood; the 10-percent-, 2-percent-, and 0.2-percent-annual-chance floods; and the regulatory floodway, together with a topographic work map showing the revised floodplain and floodway boundaries, must be submitted with Form 2.
  Forms provided. See Section A of LOMR Notebook.

- Effective October 1, 2007, FEMA revised the fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps. In accordance with this schedule, the current fee for this map revision request is $4,800 and must be received before we can begin processing the request. Please note, however, that the fee schedule is subject to change, and requesters are required to submit the fee in effect at the time of the submittal. Payment of this fee shall be made in the form of a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card (Visa or MasterCard only). The payment, along with the revision application, must be forwarded to the following address:

  FEMA National Service Provider
  3601 Eisenhower Avenue
  Alexandria, VA 22304-6425

  Check for $5000.00 included. (LOMR Based on As-Built Information (CLOMR previously approved))

- As-built plans, certified by a registered professional engineer, of all proposed project elements
  11" X 17" As-built plans provided in hard-copy. PDFs of plans also provided on enclosed CD.

- Community acknowledgment of the map revision request
  Overview and Concurrence form signed by Town of Wickenburg.
- A copy of the public notice distributed by your community stating its intent to revise the regulatory floodway, or a statement by your community that it has notified all affected property owners and affected adjacent jurisdictions
  Public notice placed in newspaper. See Section C of LOMR Notebook.
- An officially adopted maintenance and operation plan for the levee system. This plan, which may be in the form of a written statement from the community Chief Executive Officer, an ordinance, or other legislation, must describe the nature of the maintenance activities, the frequency with which they will be performed, and the title of the local community official who will be responsible for ensuring that the maintenance activities are accomplished.
  O&M plan provided in Section D of LOMR Notebook and PDF version included on enclosed CD.
- Evidence of notification of all property owners who will be affected by any increases in width and/or shifting of the base floodplain and/or increases in BFE.
  Sample letter and mailing list provided. See Section C of LOMR Notebook.
- An annotated FIRM, at the scale of the effective FIRM, that shows the revised base floodplain and floodway boundary delineations shown on the submitted work map and how they tie into the base floodplain and floodway boundary delineations shown on the effective FIRM at the downstream and upstream ends of the revised reach
  Annotated FIRM Panel 0251H provided. See Section E of LOMR Notebook.
- On July 3, 2007, we completed a CLOMR request (Case No. 07-09-0858R), that proposes to revise a reach of the Hassayampa River that influences the flooding in the revised reach of Sols Wash for this CLOMR. Flood protection described in this CLOMR is incomplete without the proposed changes described in the submittal for Case No. 07-09-0858R. Therefore, the Letter of Map Revision that follows this CLOMR must also incorporate the changes described in Case 07-09-0738R for FEMA to revise the FIRM as described in this CLOMR.
  See Arizona Department of Transportation (ADOT) LOMR submittal being made concurrently with this submittal.

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM and FIS report. Because the BFEs would change as a result of the project, a 90-day appeal period would be initiated, during which community officials and interested persons may appeal the revised BFEs based on scientific or technical data.

The basis of this CLOMR is, in whole or in part, a channel-modification/culvert project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel and culvert rests with your community.

This CLOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by calling the Director, Mitigation Division of FEMA in

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour 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 a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, 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.**

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
Ex: 480301	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
040037	Maricopa County, Unincorporated Areas	AZ	04013C	0251H	9/30/05
040056	Town of Wickenburg	AZ	04013C	0251H	9/30/05

2. a. Flooding Source: Sols Wash & Hospital Wash

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

3. Project Name/Identifier: Downtown Wickenburg Flooding Hazard Mitigation Project

4. FEMA zone designations affected: AE (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)

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $5000.00

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_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: Scott Vogel	Company: Flood Control District of Maricopa Co.	
Mailing Address: 2801 W Durango Street Phoenix, AZ 85009	Daytime Telephone No.: 602-506-4771	Fax No.: 602-506-8561
	E-Mail Address: csv@mail.maricopa.gov	
Signature of Requester (required): C. Scott Vogel	Date: 4/25/11	

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 requirement that no fill be 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. 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: Rick DeStefano Flood Plain Administrator	Community Name: Town of Wickenburg	
Mailing Address: Town of Wickenburg 155 N. Tegner St, Ste A Wickenburg, AZ. 85390	Daytime Telephone No.: 928-668-0513	Fax No.: 602-506-1580
	E-Mail Address: rdestefano@ci.wickenburg.az.us	
Community Official's Signature (required):	Date: Feb. 1, 2011	

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 data. All documents submitted in support of this request are correct to the best of my knowledge. All analyses have been performed correctly and in accordance with sound engineering practices. All project works are designed in accordance with sound engineering practices to provide protection from the 1% annual chance flood. If "as-built" conditions data/plan provided, then the structure(s) has been built according to the plans being certified, is in place, and is fully functioning. 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: Catherine W. Regester	License No.: AZ PE 37883	Expiration Date: 9/30/2011
Company Name: Flood Control District of Maricopa Co.	Telephone No.: 602-506-4001	Fax No.: 602-506-4601
Signature: Catherine W. Regester		Date: 4/25/11

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 dam
☐ 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

Seal (Optional)

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
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040056	Town of Wickenburg	AZ	04013C	0251H	9/30/05

2. a. Flooding Source: Sols Wash & Hospital Wash

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

3. Project Name/Identifier: Downtown Wickenburg Flooding Hazard Mitigation Project

4. FEMA zone designations affected: AE (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)

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $5000.00

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_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: Scott Vogel	Company: Flood Control District of Maricopa Co.	
Mailing Address: 2801 W Durango Street Phoenix, AZ 85009	Daytime Telephone No.: 602-506-4771	Fax No.: 602-506-8561
	E-Mail Address: csv@mail.maricopa.gov	
Signature of Requester (required): C. Scott Vogel	Date: 4/25/11	

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 requirement that no fill be 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. 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: Timothy S. Phillips, Chief Engineer / General Manager	Community Name: Maricopa County	
Mailing Address: 2801 W Durango Street Phoenix, AZ 85009	Daytime Telephone No.: 602-506-1501	Fax No.: 602-372-0989
	E-Mail Address: tsp@ mail.maricopa.gov	
Community Official's Signature (required): T-SR	Date: 5/6/11	

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 data. All documents submitted in support of this request are correct to the best of my knowledge. All analyses have been performed correctly and in accordance with sound engineering practices. All project works are designed in accordance with sound engineering practices to provide protection from the 1% annual chance flood. If "as-built" conditions data/plan provided, then the structure(s) has been built according to the plans being certified, is in place, and is fully functioning. 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: Catherine W. Regester	License No.: AZ PE 37883	Expiration Date: 9/30/2011
Company Name: Flood Control District of Maricopa Co.	Telephone No.: 602-506-4001	Fax No.: 602-506-4601
Signature: Catherine W. Regester		Date: 4/25/11

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 dam
☐ 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

Seal (Optional)

Additional Information for FEMA Forms

Form 1

Sols Wash

Form 1, Section B, #4

The Sols Wash levee and the new SR-93 Bypass levee interconnect at the new SR-93 Bypass Bridge. The local drainage area isolated by the two levees concentrates flow in a detention basin behind the two levees and discharges to Sols Wash via two 48-inch pipes (with flap gates). The high water ponding elevation is 2050.4 (NAVD 1988 datum). A new **AH** zone is identified on the work maps showing the extent of the new flood pool.

On the north side of Sols Wash, west of the confluence of Hospital Wash, the north (left) bank is exceeded with flow breaking out into the overbank area. The breakout of flow is limited to a short section as the downstream channel has conveyance without overtopping the banks. The breakout flow makes its way through the mobile home community located on the north bank of Sols Wash and, ultimately, returns to Sols Wash near the Hospital Wash confluence. The flow in the overbank is characterized as shallow sheet flow with average depths of less than 1 foot and is, therefore, classified as an **AO1** zone on the work maps.

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3.25 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 a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, 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.**

Flooding Source: Sols Wash
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)

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

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model
☐ 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

Was sediment transport considered? ☒ 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.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	Hassayampa River	0.011	2052.48	2054.17
Upstream Limit	Effective X-Section "M"	1.319	2098.98	2098.61

2. Hydraulic Method/Model Used

HEC-RAS

B. HYDRAULICS (CONTINUED)

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. These review programs may help verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. **These tools do not replace engineering judgment.** CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/plan/prevent/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. Review of your submittal and resolution of valid modeling discrepancies may result in reduced review time.

4. Models Submitted

	Natural Run		Floodway Run		Datum
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:	Plan Name:	File Name:	Plan Name:	_____
Revised or Post-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	_____
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 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

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,** 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 of 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.
      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot.

   b. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☒ Yes ☐ No
      If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notification 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 added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR/CLOMR requests, does this request have the potential to impact an endangered species? ☐ Yes ☒ No

   If Yes, please submit documentation to the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA). Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the 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.

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

Additional Information for FEMA Forms

Form 2

Sols Wash

Form 2, Section B, #1

The revised downstream water surface elevation is based on the Hassayampa River peak stage, taken from the US-93 Interim Wickenburg Bypass CLOMR prepared by WEST Consultants, Inc. dated January 2006 (FEMA Case #06-09-B575R). Elevations in this section are NAVD1988 datum.

Form 2, Section B, #4

Duplicate Effective Model, Natural and Floodway Run: Sol206Pa.prj (multi-profile NGVD 1929 datum) & Sol206Wa.prj (floodway NGVD 1929 datum)

Corrected Effective Model: Existing conditions model provided

Existing or Pre-Project Conditions Model: Sols_ex.prj (NAVD 1988 datum)

Revised or Post-Project Conditions Model, Natural and Floodway Run: Sols_Chan_LOMR.prj (same model as T1Q.prj, the final CLOMR model. Only the name has been changed. NAVD 1988 datum)

Form 2, Section D, #1.b

A copy of the letter mailed to property owners informing them of the increases in BFEs is attached along with the mailing list.

Form 2, Section D, #3

A copy of the original affidavit of publication of the legal ad notifying the public of the floodway revision is attached.

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3.25 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 a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, 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.**

Flooding Source: Hospital Wash
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)
@ Confluence w/ Sols Wash	0.5	900	
Revised	0.4		500

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model HEC-1
☐ 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

Was sediment transport considered? ☒ 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.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	Sols Wash	0.070	2071.5	2068.95
Upstream Limit	Upstream Limit of Study	0.703	2105	2102.71

2. Hydraulic Method/Model Used

HEC-RAS

B. HYDRAULICS (CONTINUED)

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. These review programs may help verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. **These tools do not replace engineering judgment.** CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/plan/prevent/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. Review of your submittal and resolution of valid modeling discrepancies may result in reduced review time.

4. Models Submitted

Models Submitted	Natural Run		Floodway Run		Datum
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:	Plan Name:	File Name:	Plan Name:	_____
Revised or Post-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	_____
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 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

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,** 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 of 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.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot.

   b. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notification 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 added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR/CLOMR requests, does this request have the potential to impact an endangered species? ☐ Yes ☒ No

   If Yes, please submit documentation to the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA). Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the 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.

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

Additional Information for FEMA Forms

Form 2

Hospital Wash

Form 2, Section A, #4

Not required.

Form 2, Section B, #1

Elevations in this section are NAVD1988 datum.

Form 2, Section B, #4

Duplicate Effective Model: N/A
Corrected Effective Model: N/A
Existing or Pre-Project Conditions Model: N/A
Revised or Post-Project Conditions Model, Natural and Floodway Run: Hospital_LOMR.prj (same model as Hospital_CLOMR, the final CLOMR model. Only the name has been changed. NAVD 1988 datum)

Form 2, Section D, #1.b

A copy of the letter mailed to property owners informing them of the increases in BFEs is attached along with the mailing list.

Form 2, Section D, #3

A copy of the original affidavit of publication of the legal ad notifying the public of the floodway revision is attached.

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 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 a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, 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.**

Flooding Source: Sols Wash
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/Basin ..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport ..... complete Section F (if required)

Description Of Structure

1. Name of Structure: Wickenburg Downtown Flooding Hazard Mitigation Project (Channelization)

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

Location of Structure: HEC-RAS X-Sec & River Mile 0.132 through 0.746

Downstream Limit/Cross Section: 0.132

Upstream Limit/Cross Section: 0.746

2. Name of Structure: US-93 Bridge (Tegner Street Bridge)

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

Location of Structure: HEC-RAS X-Sec & River Mile 0.423

Downstream Limit/Cross Section: 0.412

Upstream Limit/Cross Section: 0.442

3. Name of Structure: Wickenburg Downtown Flooding Hazard Mitigation Project (Levees/Floodwalls)

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

Location of Structure: HEC-RAS X-Sec & River Mile 0.132 through 0.746

Downstream Limit/Cross Section: 0.132

Upstream Limit/Cross Section: 0.746

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source: Sols Wash

Name of Structure: Wickenburg Downtown Flooding Hazard Mitigation Project

1. Accessory Structures

The channelization includes (check one):

- ☒ Levees [Attach Section E (Levee/Floodwall)]
- ☒ Superelevated sections
- ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)]
- ☐ Other (Describe):
- ☒ Drop structures
- ☒ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

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

3. Hydraulic Considerations

The channel was designed to carry (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):

4. Sediment Transport Considerations

Was sediment transport considered? ☒ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Sols Wash

Name of Structure: US-93 Bridge (Tegner Street Bridge)

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): HEC-RAS
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)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☒ Distances Between Cross Sections
- ☒ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☒ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

D. DAM/BASIN

Flooding Source:

Name of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of existing dam

2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency ☐ Private organization

   Name of the agency or organization:

3. The Dam was permitted as (check one):

   a. ☐ Federal Dam ☐ State Dam

      Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

      Permit or ID number Permitting Agency or Organization

   b. ☐ Local Government Dam ☐ Private Dam

      Provided related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

   Was the dam/basin designed using critical duration storm?

   ☐ Yes, provide supporting documentation with your completed Form 2.

   ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If yes, then fill out Section F (Sediment Transport).
   If No, then attach your explanation for why debris/sediment analysis was not considered.

6. Does the Base Flood Elevation behind the dam or downstream of the dam change?

   ☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

   Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)		
50-year (2%)		
100-year (1%)		
500-year (0.2%)		
Normal Pool Elevation		

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

- ☐ upgrading of an existing levee/floodwall system
- ☒ a newly constructed levee/floodwall system
- ☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

☒ earthen embankment, dike, berm, etc.	Station SEE to ATTACHED
☒ structural floodwall	Station SEE to ATTACHED
☐ Other (describe):	Station to

c. Structural Type (check one):

- ☒ monolithic cast-in place reinforced concrete
- ☐ reinforced concrete masonry block
- ☐ sheet piling
- ☐ Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☒ No

If Yes, by which agency?

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures.	Sheet Numbers: 48 - 66
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system.	Sheet Numbers: 49 - 67
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure.	Sheet Numbers: 35 - 64
4. A layout detail for the embankment protection measures.	Sheet Numbers: 48 - 66
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations.	Sheet Numbers: 8 - 103R

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

3.0 feet or more at the downstream end and throughout	☒ Yes	☐ No
3.5 feet or more at the upstream end	☒ Yes	☐ No
4.0 feet within 100 feet upstream of all structures and/or constrictions	☒ Yes	☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater).	☐ Yes	☐ No
2.0 feet above the 1%-annual-chance stillwater surge elevation	☐ Yes	☐ No

E. LEVEE/FLOODWALL (CONTINUED)

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☒ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☒ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device
see attached				

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

a. The maximum levee slope landside is: 3H: 1 V

b. The maximum levee slope floodside is: 0.5H : 1V

c. The range of velocities along the levee during the base flood is: 6 (min.) to 14 (max.)

d. Embankment material is protected by (describe what kind): Gabion matress/basket with geotextile liner

e. Riprap Design Parameters (check one): ☐ Velocity ☒ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D_{100}	D_{50}	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embankment Protection (continued)

f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No

g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:

☒ Overall height: Sta. 212+50; height 21 ft.

☐ Limiting foundation soil strength:

Sta. 212+50, depth 0 ft to 31 ft

strength ϕ = 31 degrees, c = 0 psf

slope: SS = 0.5 (h) to 1 (v)

(Repeat as needed on an added sheet for additional locations)

b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

Circular Arc

c. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction	1.3	1.3
II	Sudden drawdown	1.3	1.0
III	Critical flood stage	N/A	1.4
IV	Steady seepage at flood stage	N/A	1.4
VI	Earthquake (Case I)	N/A	1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☒ Yes ☐ No

If Yes, describe methodology used: SEEP/W numerical analysis

e. Was a seepage analysis for the foundation performed? ☒ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☒ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☒ No

h. The duration of the base flood hydrograph against the embankment is 24 hours.

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☒ Other (specify): USACE EM 1110-02-2502

b. Stability analysis submitted provides for:

☒ Overturning ☒ Sliding If not, explain:

c. Loading included in the analyses were:

☒ Lateral earth @ P_A = 0.32 psf; P_p = 3.12 psf

☐ Surcharge-Slope @ , ☐ surface psf

☐ Wind @ P_w = psf

☒ Seepage (Uplift); Yes ☐ Earthquake @ P_{eq} = <0.05 %g

☐ 1%-annual-chance significant wave height: ft.

☐ 1%-annual-chance significant wave period: sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5	See Attach			
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum	1978	
Maximum allowable	>2000	

f. Foundation scour protection ☒ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

7. Settlement

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No

b. The computed range of settlement is 0.04 ft. to 0.08 ft.

c. Settlement of the levee crest is determined to be primarily from :

☐ Foundation consolidation
☒ Embankment compression
☐ Other (Describe):

d. Differential settlement of floodwalls ☐ has ☒ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☒ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 135 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm (River Watershed)	☒ Yes	☐ No
• Historical ponding probability	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

If No for any of the above, attach explanation.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☒ Yes ☐ No

If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is cfs

h. The length of levee system used to drive this seepage rate in item g: ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☒ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☒ is not a problem
Hydrocompaction ☐ is ☒ is not a problem
Heave differential movement due to soils of high shrink/swell ☐ is ☒ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No

Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☒ Yes ☐ No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☒ Yes ☐ No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☒ Yes ☐ No

If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☒ Yes ☐ No
If No, please attach supporting documentation.

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

F. SEDIMENT TRANSPORT

Flooding Source: Sols Wash

Name of Structure: Wickenburg Downtown Flooding Hazard Mitigation Project (Channelization)

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport: See Attached Sheet

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:
Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

Additional Information for FEMA Forms

Form 3

Sols Wash

Form 3, Section A, #4

Name of Structure: US-93 Bypass Bridge (superbox)
Type: Bridge/Culvert
Location of Structure: HEC-RAS X-Sec & River Mile 0.121
Downstream Limit/Cross Section: 0.111
Upstream Limit/Cross Section: 0.132

This structure is included in the HEC-RAS modeling of the Wickenburg Downtown Flood Hazard Mitigation Project for determination of a water surface elevation for the upstream improvement project. Construction of this box culvert, however, was performed by the Arizona Department of Transportation (ADOT). Please see ADOT's submittal for the US-93 Interim Bypass LOMR (FEMA CLOMR Case No. 07-09-0858R) for the as-built drawings for this structure.

Form 3, Section B, #3

A hydraulic jump was designed into the channel at the drop structure where a stilling basin on the downstream side is used to transition from supercritical back to a subcritical flow regime.

Form 3, Section C, #4

US-93 Bridge (Tegner Street Bridge)
Sediment transport was not considered an issue because the bridge is a superbox with upstream and downstream cutoff walls.

Form 3, Section E, #4

Structural calculations can be found under a separate cover: *Final Structural Calculations – Wickenburg Downtown Flooding Hazard Mitigation Project* (FCD Project No. 2005C006) prepared by Gannett Fleming, Inc., dated September 6, 2006.

Form 3, Section E, #8

Historical ponding probability was not analyzed other than as a comparison of the existing and proposed floodplains. Coastal wave overtopping was not a concern for the location.

Form 3, Section F

A sediment transport analysis was prepared based upon methodology found in the *Design Manual for Engineering Analysis of Fluvial Systems* (Arizona Department of Water Resources). Sediment transport was not considered to have a significant impact due to the gradual nature of the slopes and the grade stabilizing structures located within the wash. These structures include the Tegner Street Bridge (superbox), the drop structure, and the SR-93 Bypass Bridge (superbox).

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 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 a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, 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.**

Flooding Source: Hospital Wash
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/Basin ..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport ..... complete Section F (if required)

Description Of Structure

1. **Name of Structure: Cavaness Avenue Box Culverts**

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

   Location of Structure: HEC-RAS X-Sec & River Mile 0.080

   Downstream Limit/Cross Section: 0.074

   Upstream Limit/Cross Section: 0.081

2. **Name of Structure:**

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

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

3. **Name of Structure:**

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

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)]
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

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

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -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):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Hospital Wash

Name of Structure: Cavaness Avenue Box Culverts

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

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

D. DAM/BASIN

Flooding Source:

Name of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of existing dam

2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency ☐ Private organization

   Name of the agency or organization:

3. The Dam was permitted as (check one):

   a. ☐ Federal Dam ☐ State Dam

      Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

      Permit or ID number Permitting Agency or Organization

   b. ☐ Local Government Dam ☐ Private Dam

      Provided related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

   Was the dam/basin designed using critical duration storm?

   ☐ Yes, provide supporting documentation with your completed Form 2.

   ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If yes, then fill out Section F (Sediment Transport).
   If No, then attach your explanation for why debris/sediment analysis was not considered.

6. Does the Base Flood Elevation behind the dam or downstream of the dam change?

   ☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

   Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)		
50-year (2%)		
100-year (1%)		
500-year (0.2%)		
Normal Pool Elevation		

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

☐ upgrading of an existing levee/floodwall system
☐ a newly constructed levee/floodwall system
☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

☐ earthen embankment, dike, berm, etc.	Station	to
☐ structural floodwall	Station	to
☐ Other (describe):	Station	to

c. Structural Type (check one):

☐ monolithic cast-in place reinforced concrete
☐ reinforced concrete masonry block
☐ sheet piling
☐ Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency?

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures. Sheet Numbers:
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers:
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers:
4. A layout detail for the embankment protection measures. Sheet Numbers:
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers:

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

3.0 feet or more at the downstream end and throughout	☐ Yes	☐ No
3.5 feet or more at the upstream end	☐ Yes	☐ No
4.0 feet within 100 feet upstream of all structures and/or constrictions	☐ Yes	☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater).	☐ Yes	☐ No
2.0 feet above the 1%-annual-chance stillwater surge elevation	☐ Yes	☐ No

E. LEVEE/FLOODWALL (CONTINUED)

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

a. The maximum levee slope landside is:

b. The maximum levee slope floodside is:

c. The range of velocities along the levee during the base flood is: (min.) to (max.)

d. Embankment material is protected by (describe what kind):

e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D_{100}	D_{50}	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embankment Protection (continued)

f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No

g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:

☐ Overall height: Sta. ; height ft.

☐ Limiting foundation soil strength:

Sta. , depth to

strength ϕ = degrees, c = psf

slope: SS = (h) to (v)

(Repeat as needed on an added sheet for additional locations)

b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

c. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0
(Reference: USACE EM-1110-2-1913 Table 6-1)			

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is hours.

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☐ Other (specify):

b. Stability analysis submitted provides for:

☐ Overturning ☐ Sliding If not, explain:

c. Loading included in the analyses were:

☐ Lateral earth @ P_A = psf; P_p = psf

☐ Surcharge-Slope @ , ☐ surface psf

☐ Wind @ P_w = psf

☐ Seepage (Uplift); ☐ Earthquake @ P_{eq} = %g

☐ 1%-annual-chance significant wave height: ft.

☐ 1%-annual-chance significant wave period: sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

7. Settlement

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No

b. The computed range of settlement is ft. to ft.

c. Settlement of the levee crest is determined to be primarily from :

☐ Foundation consolidation
☐ Embankment compression
☐ Other (Describe):

d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☐ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☐ No

d. Specify the discharge capacity of the head pressure conduit: cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☐ Yes	☐ No
• Common storm (River Watershed)	☐ Yes	☐ No
• Historical ponding probability	☐ Yes	☐ No
• Coastal wave overtopping	☐ Yes	☐ No

If No for any of the above, attach explanation.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No

If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is cfs

h. The length of levee system used to drive this seepage rate in item g: ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem
Hydrocompaction ☐ is ☐ is not a problem
Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No

Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

    a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

    b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations? ☐ Yes ☐ No

    c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations? ☐ Yes ☐ No

    If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

    a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
    If No, please attach supporting documentation.

12. Operations and Maintenance Plan

    Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

F. SEDIMENT TRANSPORT

Flooding Source:

Name of Structure:

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:
Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

Additional Information for FEMA Forms

Form 3

Hospital Wash

Form 3, Section F

Sediment transport was not considered to have a significant impact since the upstream reach consists of a rock lined channel that appears stable and the lower reach is a man-made trapezoidal grass lined channel with a gradual slope.

Adoption of Floodplain Management Regulations

The Town of Wickenburg first adopted floodplain management regulations in 1978. Revisions have been made over the years with the latest revision being adopted in October 2004.

The Floodplain Regulations are found in Chapter 15* of the Town Code. Its purpose is to promote the public health, safety and general welfare and to minimize those losses described in Section 15-1-2(A) by provisions designed to:

- Restrict or prohibit uses which are dangerous to the health, safety or property in times of flood or which cause increased flood heights or velocities.
- Require that uses vulnerable to floods, including public facilities, which serve such uses, be provided with flood protection at the time of initial construction.
- Protect individuals from buying lands, which are unsuited for intended purposes because of flood hazard.
- Assure that eligibility is maintained for property owners in the Town to purchase flood insurance in the federal flood insurance program.

(* A copy of the Town's Floodplain Regulations may be viewed at the following web address: http://www.ci.wickenburg.az.us/documents/Town%20Code/15%20Floodplain%20Regulations.PDF)

AFFIDAVIT OF PUBLICATION
FLOODWAY REVISION

01

Arizona Business Gazette
The business resource

PO BOX 194
Phoenix, Arizona 85001-0194
(602) 444-7315 FAX (602) 444-7364

Announcement of Floodway Revision for the Hassayampa River, Sols Wash, Hospital Wash, and Casandro Wash in the Town of Wickenburg

The Town of Wickenburg, in accordance with National Flood Insurance Program regulation 65.7(b)(1), hereby gives notice of the Town of Wickenburg's intent to revise the floodway, generally located within Township 7 North Range 5 West Sections 1, 2, and 12. Specifically, the floodway shall be revised for the Hassayampa River from 320 feet downstream of the existing U.S. 60 overpass to a point 6,710 feet upstream of the existing U.S. 60 overpass. The floodway shall be revised for Sols Wash from the confluence with the Hassayampa River to approx 4,750 feet upstream of Tegner Street. For Hospital Wash, the floodway shall be revised from the confluence with Sols Wash to approximately 1,530 feet upstream of Rose Lane. For Casandro Wash the floodway shall be revised from the confluence with Sols Wash to the Burlington Northern Santa Fe Railroad. As a result of the floodway revision, the floodway for the Hassayampa River shall both widen and narrow with a maximum widening of approximately 90 feet at a point approximately 4,130 feet upstream of the existing U.S. 60 overpass and a maximum narrowing of 520 feet at a point approximately 1,160 feet upstream of the existing U.S. 60 overpass. The floodway for Sols Wash shall both widen and narrow with a maximum widening of approximately 130 feet approximately 4,100 feet upstream of Tegner Street and with a maximum narrowing of approximately 550 feet approximately 500 feet upstream of Tegner Street. The floodway for Hospital Wash shall narrow with a maximum narrowing of approximately 100 feet approximately 750 feet downstream of Rose Lane. The floodway for Hospital Wash shall be revised to be located in an area not currently shown within the effective floodway from approximately 160 feet downstream of Rose Lane to approximately 300 feet upstream of Rose Lane; and, from approximately 800 feet upstream of Rose Lane to approximately 1,530 feet upstream of Rose Lane. The floodway width for Casandro Wash shall be reduced as compared to the effective floodway.

Maps and detailed analysis of the floodway revision can be reviewed at the offices of the Town of Wickenburg, 155 N. Tegner St., Suite A, Wickenburg, AZ 85390. Interested persons may contact Rick DeStefano at 928-668-0513 or rdestefano@ci.wickenburg.az.us for additional information.

Published: April 21, 2011

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

Mark Gilmore, being first duly sworn, upon oath deposes and says: That he is the Legal Ad Rep of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published weekly at Phoenix, Arizona, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates indicated.

4/21/2011

Mark Gilmore

Sworn to before me this
21ST day of
APRIL 2011

MELISSA HOEKSTRA
Notary Public - Arizona
Maricopa County
My Comm. Expires Aug 1, 2014

Notary Public

ANNOUNCEMENT OF FLOODWAY REVISION FOR THE HASSAYAMPA RIVER, SOLS WASH, HOSPITAL WASH AND CASSANDRO WASH IN THE TOWN OF WICKENBURG

STATE OF ARIZONA

County of Maricopa

Kevin Cloe, being duly sworn, upon oath, deposes and says: That he is the Publisher of

The Wickenburg Sun

A newspaper of general circulation in the County of Maricopa State of Arizona, published in Wickenburg, Arizona, and that the copy hereto attached is a true copy of the advertisement as published weekly in The Wickenburg Sun on the Dates following:

April 20, 2011

KEVIN CLOE
PUBLISHER

Notary Public State of Arizona
Maricopa County
Tamara Thomas
My Commission Expires
02/02/2012

Sworn to before me this **20th** day of **April,** A.D. **2011.**

Tamara Thomas

Notary Public My commission expires February 2, 2012

Announcement of Floodway Revision for the Hassayampa River, Sols Wash, Hospital Wash, and Casandro Wash in the Town of Wickenburg

The Town of Wickenburg, in accordance with National Flood Insurance Program regulation 65.7(b)(1), hereby gives notice of the Town of Wickenburg's intent to revise the floodway, generally located within Township 7 North Range 5 West Sections 1, 2, and 12. Specifically, the floodway shall be revised for the Hassayampa River from 320 feet downstream of the existing U.S. 60 overpass to a point 6,710 feet upstream of the existing U.S. 60 overpass. The floodway shall be revised for Sols Wash from the confluence with the Hassayampa River to approx 4,750 feet upstream of Tegner Street. For Hospital Wash, the floodway shall be revised from the confluence with Sols Wash to approximately 1,530 feet upstream of Rose Lane. For Casandro Wash the floodway shall be revised from the confluence with Sols Wash to the Burlington Northern Santa Fe Railroad. As a result of the floodway revision, the floodway for the Hassayampa River shall both widen and narrow with a maximum widening of approximately 90 feet at a point approximately 4,130 feet upstream of the existing U.S. 60 overpass and a maximum narrowing of 520 feet at a point approximately 1,160 feet upstream of the existing U.S. 60 overpass. The floodway for Sols Wash shall both widen and narrow with a maximum widening of approximately 130 feet approximately 4,100 feet upstream of Tegner Street and with a maximum narrowing of approximately 550 feet approximately 500 feet upstream of Tegner Street. The floodway for Hospital Wash shall narrow with a maximum narrowing of approximately 100 feet approximately 750 feet downstream of Rose Lane. The floodway for Hospital Wash shall be revised to be located in an area not currently shown within the effective floodway from approximately 160 feet downstream of Rose Lane to approximately 300 feet upstream of Rose Lane; and, from approximately 800 feet upstream of Rose Lane to approximately 1,530 feet upstream of Rose Lane. The floodway width for Casandro Wash shall be reduced as compared to the effective floodway.

Maps and detailed analysis of the floodway revision can be reviewed at the offices of the Town of Wickenburg, 155 N. Tegner St., Suite A, Wickenburg, AZ 85390. Interested persons may contact Rick DeStefano at 928-668-0513 or rdestefano@ci.wickenburg.az.us for additional information.

Published in The Wickenburg Sun on April 20, 2011.

SolsBFEincreaseChannel

TOWN OF WICKENBURG

155 N. Tegner, Ste. A • Wickenburg, Arizona 85390 • (928) 684-5451
Phoenix Line (602) 506-1622 • FAX (602) 506-1580
Voice & TTY (928) 684-5411

May 3, 2011

[redacted]

Maricopa County Assessor's Parcel Number: [redacted]

Dear Property Owner:

The Flood Insurance Rate Map (FIRM) for a community depicts land which has been determined to be subject to a 1% (100-year) or greater chance of flooding in any given year. The FIRM is used to determine flood insurance rates and to help the community with floodplain management.

The Town of Wickenburg and the Flood Control District of Maricopa County (District) are applying for a Letter of Map Revision (LOMR) from the Federal Emergency Management Agency (FEMA) to revise FIRM panel 04013C0251H for the Town of Wickenburg, Arizona along Sols Wash from the confluence with the Hassayampa River to approximately 4,750 feet upstream of Tegner Street. The revision will reflect the changes resulting from the recently completed channelization and levee project along Sols Wash and from more current topographic mapping of the area.

This letter is to inform you of the proposed increases in the 1% annual chance water-surface elevations on your property. These increases are located within the banks of the newly channelized portion of Sols Wash within your property.

The channelization and levee project resulted in both increases and decreases in the 1% annual chance water-surface elevations for Sols Wash with a maximum increase of 5.4 feet at a point approximately 1,480 feet downstream of Tegner Street; and, a maximum decrease in the 1% annual chance water-surface elevation of 2.8 feet at a point approximately 1,800 feet upstream of Tegner Street.

The width of the 1% annual chance floodplain will decrease with a maximum narrowing of approximately 1,450 feet occurring approximately 1,000 feet upstream of Tegner Street.

If you have any questions or concerns about the project or its affect on your property, please contact Rick DeStefano, Floodplain Administrator for the Town of Wickenburg, at 928-668-0513 or, by e-mail, at rdestefano@ci.wickenburg.az.us.

Sincerely,

Rick DeStefano, Floodplain Administrator

SolsBFEincreaseChannel

APN	OwnerAddress1	OwnerAddress2	OwnerCity	OwnerState	OwnerZip	PropertyAddress	PropertyCity	PropertyZip
50515038	205 S 17TH AVE		PHOENIX	AZ	850073212			
50515031A	205 S 17TH AVE	#612E	PHOENIX	AZ	85007	571 S CHESTNUT ST	WICKENBURG	85390
50515031B	205 S 17TH AVE	#612E	PHOENIX	AZ	85007	571 W CHESTNUT ST	WICKENBURG	85390
50516027B	155 N TEGNER ST STE A		WICKENBURG	AZ	85390			
50515036Q	205 S 17TH AVE MAIL DROP 612E		PHOENIX	AZ	85007			
50515040A	205 SOUTH 17TH AVE 612E		PHOENIX	AZ	850073212			
50515039B	205 SOUTH 17TH AVE 612E		PHOENIX	AZ	850073212			
50515039C	155 N TETNER STE A		WICKENBURG	AZ	85390			
50515036M	2801 W DURANGO ST		PHOENIX	AZ	85009			
50515151B	965 E UNIVERSITY DR		TEMPE	AZ	85281			
50516013A	P O BOX 21059		WICKENBURG	AZ	85358			
50516014A	2801 W DURANGO ST		PHOENIX	AZ	85009			

SolsBFEincreaseGV

TOWN OF WICKENBURG

155 N. Tegner, Ste. A • Wickenburg, Arizona 85390 • (928) 684-5451
Phoenix Line (602) 506-1622 • FAX (602) 506-1580
Voice & TTY (928) 684-5411

May 3, 2011

[redacted]

Maricopa County Assessor's Parcel Number: [redacted]

Dear Property Owner:

The Flood Insurance Rate Map (FIRM) for a community depicts land which has been determined to be subject to a 1% (100-year) or greater chance of flooding in any given year. The FIRM is used to determine flood insurance rates and to help the community with floodplain management.

The Town of Wickenburg and the Flood Control District of Maricopa County (District) are applying for a Letter of Map Revision (LOMR) from the Federal Emergency Management Agency (FEMA) to revise FIRM panel 04013C0251H for the Town of Wickenburg, Arizona along Sols Wash from the confluence with the Hassayampa River to approximately 4,750 feet upstream of Tegner Street. The revision will reflect the changes resulting from the recently completed channelization and levee project along Sols Wash and from more current topographic mapping of the area.

This letter is to inform you of the proposed increases in the 1% annual chance water-surface elevations on your property. The overall extent of the 1% annual chance floodplain across your property has been reduced. However, that portion that remains within the Sols Wash floodplain has increases in water-surface elevations.

The channelization and levee project resulted in both increases and decreases in the 1% annual chance water-surface elevations for Sols Wash with a maximum increase of 5.4 feet at a point approximately 1,480 feet downstream of Tegner Street; and, a maximum decrease in the 1% annual chance water-surface elevation of 2.8 feet at a point approximately 1,800 feet upstream of Tegner Street.

The width of the 1% annual chance floodplain will decrease with a maximum narrowing of approximately 1,450 feet occurring approximately 1,000 feet upstream of Tegner Street.

If you have any questions or concerns about the project or its affect on your property, please contact Rick DeStefano, Floodplain Administrator for the Town of Wickenburg, at 928-668-0513 or, by e-mail, at rdestefano@ci.wickenburg.az.us

Sincerely,

Rick DeStefano, Floodplain Administrator

SolsBFEincreaseGV

APN	OwnerAddress1	OwnerAddress2	OwnerCity	OwnerState	OwnerZip	PropertyAddress	PropertyCity	PropertyZip
50516024G	P O BOX 21059		WICKENBURG	AZ	85358	510 N TEGNER ST		
50516044	2500 LOU MENK DR PO BOX 961089		FORT WORTH	TX	761610089			

SolsBFEincreaseMapping

TOWN OF WICKENBURG

155 N. Tegner, Ste. A • Wickenburg, Arizona 85390 • (928) 684-5451
Phoenix Line (602) 506-1622 • FAX (602) 506-1580
Voice & TTY (928) 684-5411

May 3, 2011

[redacted]

Maricopa County Assessor's Parcel Number: [redacted]

Dear Property Owner:

The Flood Insurance Rate Map (FIRM) for a community depicts land which has been determined to be subject to a 1% (100-year) or greater chance of flooding in any given year. The FIRM is used to determine flood insurance rates and to help the community with floodplain management.

The Town of Wickenburg and the Flood Control District of Maricopa County (District) are applying for a Letter of Map Revision (LOMR) from the Federal Emergency Management Agency (FEMA) to revise FIRM panel 04013C0251H for the Town of Wickenburg, Arizona along Sols Wash from the confluence with the Hassayampa River to approximately 4,750 feet upstream of Tegner Street. The revision will reflect the changes resulting from the recently completed channelization and levee project along Sols Wash and from more current topographic mapping of the area.

Although the project resulted in decreases in water-surface elevations in the vicinity of your property, natural changes in the river and more current and detailed topographic mapping of the area necessitated changes to the limits of the 1% annual chance floodplain. Some portions of your property not previously mapped within the floodplain are now shown within the floodplain. This letter is to inform you of these changes and, thereby, proposed increases in the 1% annual chance water-surface elevations on your property.

The channelization and levee project resulted in both increases and decreases in the 1% annual chance water-surface elevations for Sols Wash with a maximum increase of 5.4 feet at a point approximately 1,480 feet downstream of Tegner Street; and, a maximum decrease in the 1% annual chance water-surface elevation of 2.8 feet at a point approximately 1,800 feet upstream of Tegner Street.

The width of the 1% annual chance floodplain will decrease with a maximum narrowing of approximately 1,450 feet occurring approximately 1,000 feet upstream of Tegner Street.

If you have any questions or concerns about the project or its affect on your property, please contact Rick DeStefano, Floodplain Administrator for the Town of Wickenburg, at 928-668-0513 or, by e-mail, at rdestefano@ci.wickenburg.az.us.

Sincerely,

Rick DeStefano, Floodplain Administrator

SolsBFEincreaseMapping

APN	OwnerAddress1	OwnerAddress2	OwnerCity	OwnerState	OwnerZip	PropertyAddress	PropertySuite	PropertyCity	PropertyZip
50508041K	PO BOX 2479		WICKENBURG	AZ	853582479				
50508151A	28 N TEGNER		WICKENBURG	AZ	85390				
50527240	201 N FRONTIER ST		WICKENBURG	AZ	853901419				
50527241	201 N FRONTIER ST		WICKENBURG	AZ	853901419				
50527242	201 N FRONTIER ST		WICKENBURG	AZ	853901419				

HospitalBFEincrease

TOWN OF WICKENBURG

155 N. Tegner, Ste. A • Wickenburg, Arizona 85390 • (928) 684-5451
Phoenix Line (602) 506-1622 • FAX (602) 506-1580
Voice & TTY (928) 684-5411

May 3, 2011

[redacted]

Maricopa County Assessor's Parcel Number: [redacted]

Dear Property Owner:

The Flood Insurance Rate Map (FIRM) for a community depicts land which has been determined to be subject to a 1% (100-year) or greater chance of flooding in any given year. The FIRM is used to determine flood insurance rates and to help the community with floodplain management.

The Town of Wickenburg and the Flood Control District of Maricopa County (District) are applying for a Letter of Map Revision (LOMR) from the Federal Emergency Management Agency (FEMA) to revise FIRM panel 04013C0251H for the Town of Wickenburg, Arizona along Hospital Wash from the confluence with the Sols Wash to approximately 1,530 feet upstream of Rose Lane. The revision will reflect the results of a new floodplain delineation study including more current topographic mapping of the area.

The new floodplain delineation study resulted in decreases in the 1% annual chance water-surface elevations for Hospital Wash with a maximum decrease of approximately 3.8 feet at a point approximately 850 feet upstream of Rose Lane.

Although the study resulted in decreases in water-surface elevations, natural changes in the wash and more current and detailed topographic mapping of the area resulted in changes to the limits of the 1% annual chance floodplain. Some portions of your property not previously mapped within the floodplain are now shown within the floodplain. This letter is to inform you of these changes and, thereby, proposed increases in the 1% annual chance water-surface elevations on your property.

The width of the 1% annual chance floodplain will increase in some areas and decrease in some areas with a maximum widening of approximately 100 feet at a point approximately 520 feet upstream of Rose Lane and a maximum narrowing of approximately 380 feet at a point immediately downstream of Rose Lane.

If you have any questions or concerns about the study or its affect on your property, please contact Rick DeStefano, Floodplain Administrator for the Town of Wickenburg, at 928-668-0513 or, by e-mail, at rdestefano@ci.wickenburg.az.us

Sincerely,

Rick DeStefano, Floodplain Administrator

HospitalBFEincrease

APN	OwnerAddress1	OwnerAddress2	OwnerCity	OwnerState	OwnerZip	PropertyAddress	PropertySuite	PropertyCity	PropertyZip
50527204A	520 ROSE LN		WICKENBURG	AZ	85390				
50507992	PO BOX 2133		SUN CITY	AZ	85372				
50507038C	1221 E OSBORN STE 100		PHOENIX	AZ	85014	650 BRALLIAR RD		WICKENBURG	85390
50507032F	2009 N 7TH ST		PHOENIX	AZ	85006				
50507027A	1221 E OSBORN STE 100		PHOENIX	AZ	85014				
50507032E	2009 N 7TH ST		PHOENIX	AZ	85006				

Appendix B.4

OPERATION AND MAINTENANCE PLAN

Subject: Chain of Command
Purpose: Define reporting responsibility within the Town Of Wickenburg (TOW) and the Operations and Maintenance Division (O&M)

PROCEDURE A: Organization Structure

1. The Town of Wickenburg (TOW) is a municipal corporation and political subdivision of the State of Arizona, an entity that reports to and is governed by Common Council, the members of which are elected officials.

2. The TOW Town Manager directs the Town's operations. The reporting responsibility of this office is to the Town Council.

A schematic organizational chart is attached (Attachment A) that depicts both the authorized position title and vertical/horizontal relationship definitions.

PROCEDURE B: Personnel Responsibility

1. Each employee's responsibilities is to be made in accordance with the vertical chain of command as presented herein.

A. Daily assignments and project goals will be given by the immediate supervisor.
B. In the event that an assignment is given by another supervisor of equal or higher level, the assignment shall be undertaken with the priority given by the assignor, notifying the employee's immediate supervisor as soon as possible of the situation.
C. The employee's position responsibilities may necessitate directing employee activity for personnel not his subordinate(s); such direction may be deemed necessary by an emergency or work conditions.

2. When such assignments are made, it is the responsibility of the assignor to make known the reason for such direction to the assignee's immediate supervisor as soon as possible.

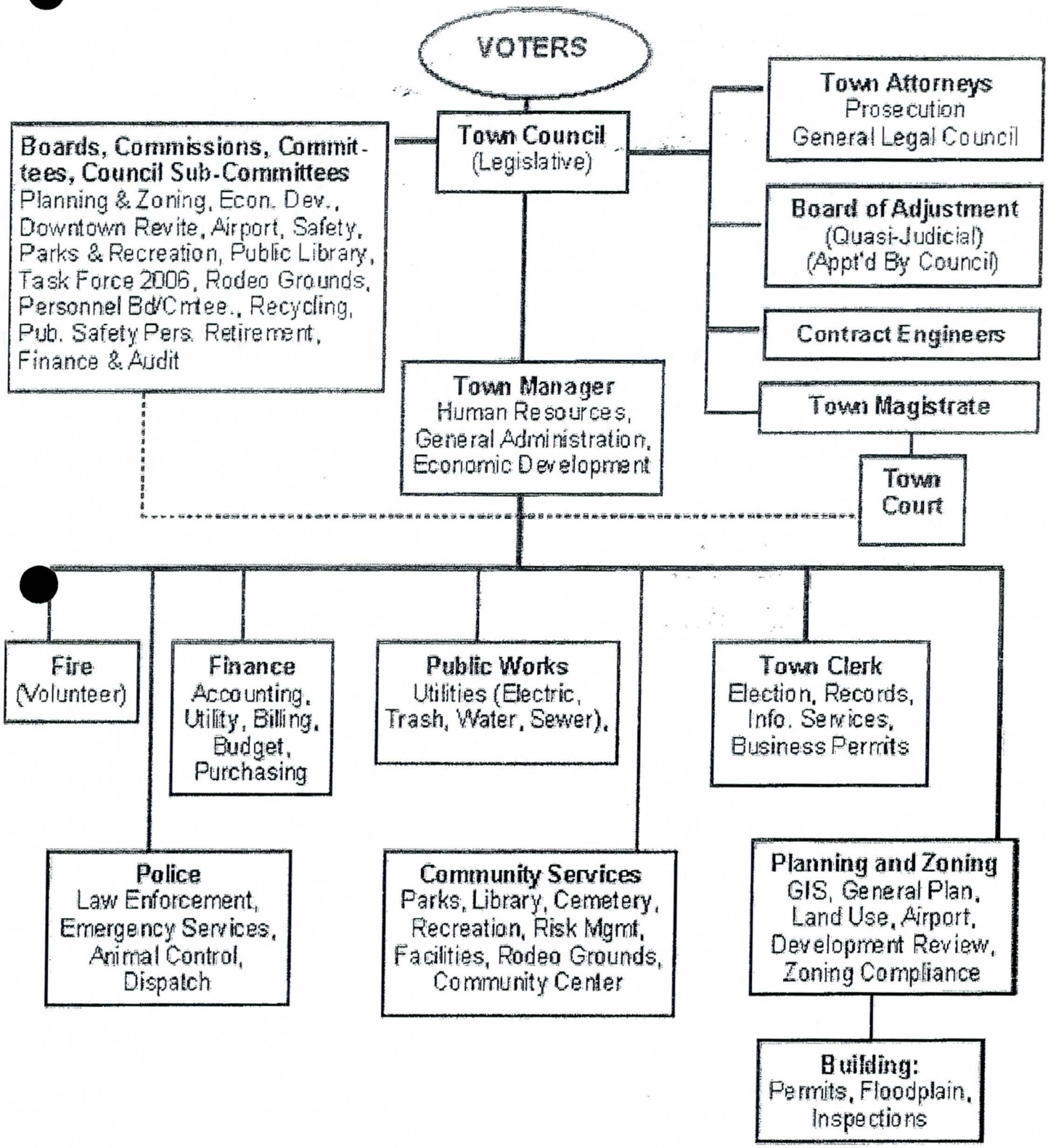
3. Each employee is to discharge, to the best of his ability, the responsibility of his position, and report to his immediate supervisor.

A. Questions regarding position duties shall be directed to the immediate supervisor.
B. Any deviations from the established chain of command initiated by the employee, shall be reported to the employee's immediate supervisor at the first available opportunity, along with an explanation of the reason(s) for such action.

4. No one is authorized to bypass the chain of command, which is shown on attachment. (Attachment: A: Schematic Organizational Chart)

ATTACHMENT "A"

Schematic Organizational Chart



Subject: Inspections and Documentation
Purpose: Document the Procedure for Tracking MFR Measures

PROCEDURE:
1. Annual Inspections:

The Work Control Center will conduct annual inspections of all of the Town's flood control facilities on an annual basis. The annual inspection will be documented in report form and reviewed by the Public Works Director. The report will include a statement concerning whether or not the structure will operate as designed. The inspection report will be filed away as a hard copy and an electronic form will also be documented and saved in the TOW share drive. Applicable copies of the inspection report will be mailed to the projects sponsoring agency, the Flood Control District of Maricopa County.

2. Maintenance Inspections:
The Maintenance Inspections also occur on an annual basis. This inspection precedes the Annual inspection by six to eight weeks. The Public Works Department conducts the maintenance inspections. The inspection staff will provide a detailed report noting any maintenance deficiencies, continuous monitored concerns, and any dam safety anomalies observed during the inspection. From this report, work orders will be generated, some deferred and assigned accordingly. The maintenance inspection report will be filed away as a hard copy and an electronic form will also be documented and saved in the TOW share drive. Each work order will be assigned a priority rating (see Sheet 1-3).

Managing for Results (MFR) Measure:

All priority #**1 work orders** generated from the maintenance inspections shall be completed before the start of the scheduled annual inspections. When this condition is met, the structure has been maintained to District and sponsoring agencies standards.

See attached priorities and inspection schedule.

Deficiency Levels and Maintenance Standards (Priorities)
(During Inspections and Routine Maintenance)
SUBJECT: Index
PURPOSE: List titles of deficiency levels and maintenance standards
Function & Integrity - Priority #1
Standard Number and Title
#1 Dams
#2 Flap Gates
#3 Inlet & Outlet Structures
#4 Inverts Channels & Storm Drains
#5 Levees
#6 Reservoirs Dams
#7 Channel & Storm Drain Walls
Security & Liability - Priority #2
Standard Number and Title
#8 Access Gates
#9 Retention Basins
#10 Buildings
#11 Bridges & Catwalks
#12 Catch Basins
#13 Handrails
Aesthetics - Priority #3
Standard Number and Title
#14 Access Roads
#15 Fencing
#16 Right-of-Way Vacant
#17 Signs & Staff Gages
#18 Trails

MONTH	DATE	DAM	FEDERAL AGENCY	DISTRICT RESPONSIBLE ENGINEER	FY 05/06 INSPECTING ENGINEER

Subject: Flood Emergency Operations
Purpose: To Define Duties and Responsibilities for O&M Personnel during Flood Emergency Conditions

Procedure A:
1. Each employee will be assigned to one of the defined observation teams to serve as "Flood Water Personnel." Each team will have specific observation points assigned, for which the team member will observe and report data as observed.

A. The observation points are established by the Police and Fire departments.
B. The police and fire personnel may define additional task(s) for any observation point at the time of team activation.
C. All personnel shall evaluate their personnel safety consideration when undertaking both defined and special assignments.

2. Police and Fire personnel will be assigned a TOW vehicle equipped with the following items:

A. Mobile 2-way radio
B. Rotating warning light
C. Most TOW vehicles are also equipped with a commercial radio for use in monitoring local emergency frequency available to the general public.
D. For off highway locations, a four-wheel drive vehicle will be assigned.

3. Police and Fire personnel will maintain radio contact at all times beginning with a preliminary radio check to "TOW Headquarters" prior to departing the TOW complex.

A. Refer to "Radio Usage Procedures" for additional instruction.
B. Upon arrival at assigned observation point, Police and Fire personnel will observe, record, and report by radio the following data:

- Team number
- Observation point
- Stream flow characteristics:
  a. Stream and/or staff gage reading(s) to be measured in feet or elevation depending on the structure.
  b. Stream gage condition, (rising, falling, or steady).
  c. Estimated velocity, feet per second.
  d. Weather conditions (raining or not; light or hard).

C. The need for extended conversations should be made by cellular phone, if practical. REMEMBER, THE PUBLIC AND THE NEWS MEDIA ARE MONITORING YOUR RADIO TRANSMISSION.
D. Prior to departing from your assigned observation area notify the TOW headquarters that you are leaving and to receive any special instructions and clearance.

4. Any unusual or changing conditions having a significant potential to be life threatening or dangerous to the general public will be reported immediately.
5. When the TOW vehicle is so equipped, the local AM radio station shall be monitored for general public broadcasts that may conflict with observed conditions. Should conflicting information be heard it shall be reported to "61 Flood Control."
6. In severe situations, personnel will be required to go on twelve-hour shifts, generally from 0600 to 1800 hours. Personnel will report to TOW Headquarters at the beginning of the shift.
7. If a life-threatening situation occurs in your vicinity and you can assist without endangering yourself, do so, but use good judgment and keep safety in mind at all times.
8. Police and Fire personnel must understand and be experienced with the hazards of driving in rainy/foggy/snowing weather. Typical hazards can include:

A. Downed power/utility lines.
B. Flooded dip crossings.
C. General public vehicle accidents.

9. Flooded steams or dip crossings and impounded water behind structures at road crossings where a potential hazard exists for public traffic will be reported by radio to the TOW police dispatch and Public Works so that traffic control devices can be installed.
10. Do not divulge any information or give opinions to the news media or the general public; refer them to TOW Public Information office.
11. Maintain adequate vehicle fuel reserve during your shift and fill the fuel tank at the end of your shift.

FLOOD WATCH ASSIGNMENT AND RESPONIBILITES

Public Works Field Supervisor

- To assign areas that have been repaired or reconstructed to senior operators for transport on rotating schedule. Review and evaluate all assigned reports.
- Flood Watch Team Leaders will inspect drainage of various locations and structures that have been repaired or reconstructed and will complete a report on performance of repair work and note and prioritized any deficiencies.

Team Leaders

These field supervisors will update flood emergency staff list at least three times a year; all areas will be fully manned at all times. Each area is assigned a monitoring crew and the supervisor will make certain any emergency equipment is ready for use. Members of each team must be familiar with their areas. Storm surveillance and any work request forms must be properly completed, and each report checked to verify that all areas have been reported. Before each team departs, the supervisor is to verify that all members are present or substituted and the proper paper work is in their possession.

Police and Fire Dispatch
The Police and Fire Dispatch will assist the field observers in obtaining equipment, materials, and other resources for emergency repairs to District structures and will keep accurate logs of incoming calls. In addition, the TOW headquarters will monitor the various team locations movements as they make observations and inspections during the emergency.

This memo in no way supersedes the TOW procedures and policies that must be met during storm surveillance.

Subject: Removal of Unwanted or Nuisance Vegetation
Purpose: To standardize the removal of unwanted, deep-rooted, or nuisance vegetation on TOW structures and right-of-way.

PROCEDURE: Deep-Rooted Vegetation

1. The following species have been determined to be deep-rooted and will not be acceptable on all TOW dams, dikes, levees, and earthen slopes:

a) Desert Broom
b) Ironwood Trees
c) Mesquite Trees
d) Palo Verde Trees
e) Salt Cedar

Deep-rooted vegetation is defined as trees and shrubs having a woody structure penetrating below a 3' ft. depth.

Plants will be stump cut flush with the soil surface and a suitable herbicide will be applied to the stump immediately.

All trees will be kept a minimum of 20' ft. from the toe of the dams, levees, and dikes.

Any tree branches or foliage canopy that reduce the roadway clearance to less than 14' ft. above the road surface or which reduce the width to less than 12' feet, must be trimmed or removed.

2. Deep rooted trees must not be allowed on embankments because they limit access and visibility, and can pose potential hazards by toppling in windstorms, fill cracking by root invasion, or openings of seepage paths by root decay. Any vegetation with an extensive root system or prevents a clear view of the embankment or abutment areas should be removed.

3. **Maintenance of unlined floodways**. To ensure that the integrity of the structure is preserved and that the floodway will function as designed.
a) Unwanted vegetation will be removed or destroyed within the flow line of the floodway, collection ditches, or side inlet basins. Remove any trash or debris that may impede flows. If grasses are established, maintain to a height of 6" inches.

Subject: To insure that the integrity of the structure is preserved and that the Floodway will function as designed.
Purpose: Procedures for the maintenance of unlined floodways

PROCEDURE A.

1. Nuisance or high unwanted vegetation.

Remove and or destroy any woody vegetation within the flow area of the floodway, of the floodway, collection ditches, or side inlet basins. Also, remove trash/debris that will impede flows in these areas. If grasses are established, maintain to the height to six inches.

2. Sediment/silt deposits.

Remove accumulated deposits of loose material to obtain designed grades and cross sections Loose deposited materials shall not be used for repairs within the floodway unless tested and meets the earth fill criteria in the construction specifications. Depending on the amount of accumulation in the invert, a sediment survey may be required. Ensure any 404 permits are in order to perform the job. The lead operator shall keep a copy the 404 with him at all times.

3. Erosion/deep rills. Contact the Work Control Center for job assessment.

A sample of the stockpiled material that will be used for the repair of the erosion/rills will be submitted for a proctor test through coordination by the Work Control Center. Once the proctor test is completed, repairs of eroded areas may begin by replacing displaced material with approved proctored material. Moisture conditioned material will be placed in lifts not to exceed 6" inches. Each lift will have a compaction test required to meet 95% density or in accordance with the project's specified requirements. If the compaction lift does not meet the 95% criteria, the tested lift will be removed, reprocessed and reinstalled accordingly and re-tested. 5 ea. nuclear compaction tests to1ea. sand cone test will be the normal. A daily field report(s) will be submitted by the consultant once the job scope is completed along with the density results report. Compaction equipment to be used will be approved through coordination with the Work Control Center as the job plan dictates.

#1. ACCESS GATES

Deficiency Noted

Maintenance Standard

A. General

1. Damaged or missing members.

a. Missing gates, panels, or locks

a. Replace with standard panel and appropriate locks (3E59 or 3E56)

b. Broken or missing gate hinges

b. Replace or repair as needed

c. Members bent or out of alignment causing the gate not to function properly.

c. Repair members and align accordingly

d. Large space or opening under gate panel

d. Standard calls for 4" inches of clearing

e. Large voids or erosion around gate post/braces

e. Fill in holes flush & compact to grade with natural fill

B. Chain-link & Wire gates

1. Rusty surfaces

a. Rusty surfaces that affect the integrity of the existing gate fabric or wire.

a. Remove damaging rust and either repaint or replace damaged gate fabric or wire.

b. Holes in chain link gate fabric of more than 6" wide and 12" long

b. Repair or replace damaged section as needed

c. Chain link gate fabric stretched or bent out more than 6" inches

c. If possible refurbish stretched out chain link fabric or replace sections as needed.

d. Gates out of adjustment more than 2" inches

d. Adjust gates to within ½" inch.

e. Loose or sagging smooth or barbed wire more than a 2" inch sag

e. Re-stretch wire to remove sag in wire fence.

f. Missing strands of wire.

f. Reinstall missing strands to match up to existing fence.

C. Pipe Gate

1. Surface paint.

a. 25% of overall surface of pipe gate needing repainting

a. Remove any peeling paint, primer and repaint as needed.

b. Rusty surface

b. Remove rust, primer and paint.

#2. ACCESS ROADS

Deficiency Noted

Maintenance Standard

A. General

1. Unsightly condition visible to public (paralleling residences, streets, bridge crossings, etc….).

a. Trash/debris, or litter along an access road.

a. Remove trash & debris

b. Unwanted or high vegetation.

b. Cut, remove, or chemical spray and follow up if needed for control

c. Large rocks or debris.

c. Remove rocks/debris

2. Health hazard

a. Animal droppings

a. Remove and dispose of accordingly

b. Garbage, dead animals causing unpleasant odors or attracting insects

b. Remove and dispose of accordingly

2. Restricted roadway

a. Any storm debris, or trash that reduces the driving width to less than 10' ft.

a. Clear debris /trash from roadway for access

3. Shoulder erosion

a. Erosion within 1' ft. of the roadway more than 8" inches wide and 12" deep

a. Repair with natural fill and compact as needed

B. Asphaltic Concrete

1. Vegetation concerns

a. Unwanted or high vegetation

a. Cut, remove and chemical spray if needed

2.Cracks

b. Cracks wider than a ¼" inch.

b. Repair cracks with a suitable fill material

3. Potholes

c. Potholes no larger than 6" inch in diameter

c. Repair & compact potholes with SS1 oil and cold-patch mix

4. Depressions or settlement.

a. Depressions on the surface deeper than 4" inches.

a. Clean area and fill and compact with SS1 oil & cold-patch material as to reestablish surface area to flush conditions with existing road

C. Concrete & Grouted Rip-rap ramps

1. Cracks

a. Cracks wider than ½" inch

a. Fill with a suitable filler material

#3. RETENTION BASINS

Deficiency Noted

Maintenance Standard

A. Earthen

1. Vegetation

a. High or unwanted vegetation taller than 2' ft.

a. Mower operations or hand cut to manage high vegetation to acceptable standard of 6" inches

b. Deep-rooted vegetation (Palo Verde, Mesquite, Ironwood, and Salt Cedar trees). Remove or destroy all woody vegetation within the sediment basin.

b. Any volunteer growth that is not part of the original project landscape will be cut, stump treated and removed if needed. All herbicide treatment should be environmentally friendly (consult with Ecology Branch)

c. Citizen concerns regarding unpleasant odors from stagnant water or annoying insects or other pests.

c. Treat area for insects and schedule follow up treatments as needed. Remove any stagnant water by pumping out with water truck or portable pump.

d. Dead animals.

d. Remove and dispose of dead animal accordingly.

e. Trash & debris.

e. Remove trash/debris and dispose of accordingly.

2. Pollutants

a. Oil, gas, or other contaminants.

a. Contact Public Works Department @ (928)-684-2761 & Fire Department @ (928)-684-7702 for instructions and dispose of accordingly.

3. Sediment

a. Accumulated silt/sediment in basin invert that adversely affects the integrity of the structure.

a. Remove silt/sediment to restore basin to original or baseline conditions.

B. Concrete Lined Basin

1. Sediment

1. Concrete lined basins are generally self-cleaning, although excess sediment should be removed for the inspection of the concrete
works.

a. Accumulated sediment/silt on the concrete apron.

a. Remove & dispose of accordingly.

2. Stagnant water

b. Citizen concerns regarding unpleasant odors from stagnant water or annoying insects or other pests.

b. Treat area for insects and schedule follow up treatments as needed. Remove any stagnant water by pumping out with water truck or portable pump.

3. Cracks

a. Cracks wider than a ¼"

a. Cracks should be cleaned out and sealed with a suitable filler material.

#6. CATCH BASINS

Deficiency Noted

Maintenance Standard

A. General

1. Trash & Debris

a. Trash & debris located at the inlet of the catch basin opening.

a. Remove obstructions so flows are not restricted.

b. Unwanted vegetation restricting the catch basin inlet.

b. Remove unwanted vegetation from inlet.

2. Settlement or movement

a. Settlement or movement of walls or invert that has a difference or separation more than ½" inch.

a. Stabilize condition to no more than ¼" inch difference or separation. This could involve repairing voids and or erosion sheet flow damage.

3. Fire Hazard

a. Presence of chemicals, such as gasoline or oil

a. Contact Public Works Department @ (928)-684-2761 & Fire Department @ (928)-684-7702 for instructions and dispose of accordingly.

4. Vegetation

a. Vegetation growth in the joints that is more than 6" tall

a. Cut and remove vegetation from joints and if applicable treat with proper herbicide.

B. Steps 1. Defective or missing steps

a. Defective or missing step(s) that are broken or missing.

a. Repair or replace so that step(s) are structurally adequate.

C. Catch basins with metal grates

1. Safety hazard

a. Safety hazard where grate opening is wider than design

a. Restore to design condition.

b. High or lower than design elevation

b. Correct to elevation difference of no more than ¼" inch than surrounding area

2. Settlement or movement

a. Separation of more than ½" between apron & frame

a. Stabilize condition to no more than ¼" inch.

3. Trash & debris

a. Trash/debris that is restricting more than 20% of the grate surface

a. Remove obstructions so that flows are not restricted

4. Damaged or missing

a. Broken member of the grate

a. Repair or replace as needed.

b. Missing grate

b. Reinstall or replace as needed.

#9. FLAP GATES

Deficiency Noted

Maintenance Standard

General

1. Loose anchor bolts

a. Loose anchor bolts

a. Refasten bolts securely in place

b. Missing, broken or bent frame or parts that prevent the gate from functioning properly

b. Repair or replace damaged parts & ensure the frame is structurally sound & functioning properly

c. Flap gate "frozen" and not able to open & close freely

c. Service and lubricate to function properly

2. Trash/debris

a. Trash/debris that prevents the flap gate from opening or closing

a. Remove as needed to function as designed.

3. Painted flap gates

a. Paint is peeling off the flap gate.

a. Clean, remove any rust and re-apply a protective coating.

4. Graffiti

a. Graffiti present on the flap gate metal works.

a. Remove or paint over to match in kind.

#11. INLET & OUTLET STRUCTURES:

Deficiency Noted

Maintenance Standard

A. General

1. Trash & debris

a. Trash & debris that obstructs the inlet or outlet more than ¼ the height or diameter of the structure.

a. Inlet/outlet clear & free of restriction so as not to restrict flows.

2. Rodents/animals

a. Holes or diggings caused by burrowing animals.

a. Area adjacent to structure free of holes and burrowing animals by initial treatment and follow up for control.

3. Erosion

a. Erosion around the wing-walls or headwalls that create voids leading to the result of undermining or unwanted settlement.

a. Fill & compact voids or holes with proper moisture conditioned material. Lifts should not exceed 6" inches and density results at 95%.

4. Settlement or movement.

a. Settlement or movements that have dropped or uplifted the structure facing or base more than 3" inches.

a. Structure should be reinstalled firmly and bedded in place.

5. Vegetation

a. Vegetation 18" tall closer than 2 feet apart located on the apron or within 5' ft. of the structure.

a. Remove vegetation as needed. If applicable, apply proper herbicide to control unwanted vegetation growth.

B. Concrete

1. Structural damage

a. Parts of the structure that is cracked, chipped, broken off, or spalled more than 2" deep & 6" in diameter.

a. Remove any damaged pieces or sections; clean thoroughly, patch, replace, or repair as needed.

2. Graffiti

a. Obscenities

a. Repaint areas of surface affected to match in kind the surroundings.

C. Rock or masonry

1. Structural damage

a. Any missing and loose rock or block sections of the structure.

a. Remove any damaged pieces or sections; clean thoroughly, patch, replace, or repair as needed.

D. Metal

1. Worn or deteriorated

a. Eroded, rusted, or worn conditions that affect the structural integrity of the inlet/outlet.

a. Repair, refurbish, or replace as needed.

#12. CHANNEL & STORM DRAIN INVERTS

Deficiency Noted

Maintenance Standard

A. General

1. Trash, litter, & debris

a. Trash & debris restricting the intake into a storm drain.

a. Remove any obstructions from inlets and dispose of accordingly.

b. Debris/trash which impedes flows in a channel invert.

b. Remove any obstructions from the invert and dispose of accordingly.

c. Citizen concerns involving foul odors or unsightliness.

c. Remove trash, litter, or debris from premises that are causing concern.

d. Mud or sediment deposits which restrict 10% or more of the structure.

d. Remove accumulated sediment and dispose of accordingly.

d. Vegetation in excess of 2" inches high protruding through cracks or expansion joints.

d. Cut & remove protruding vegetation and chemically treat if applicable.

e. Ponded water complaints of foul odors or insects.

e. Pump out water with water truck or portable pump. If not practical, treat for vector concerns and schedule follow up treatments as needed.

f. Dead animals.

f. Remove dead animal and dispose of accordingly.

g. Pollution – any hazardous materials.

g. Contact Public Works Department @ (928)-684-2761 & Fire Department @ (928)-684-7702 for instructions and dispose of accordingly.

B. Improved channels

1. Deterioration concerns

a. Reinforcement exposed.

a. Remove exposed rust, refurbish, and or repair by patching areas of exposed reinforcement.

2. Cracks

a. Cracks wider than 3/8" wide x 6" inches deep

a. Cracks in the invert and slopes should be cleaned out and sealed with a suitable filler material.

b. Cracks wider than ¼" wide that go completely through the concrete less than 6" inches thick.

b. Cracks in the invert and slopes should be cleaned out and sealed with a suitable filler material.

3. Settlement or movement

a. Movement or settlement that has displaced the invert facing more than 4" from grade elevation.

a. Attempt to restore securely bedded within ¼" of grade. If not, remove either by saw putting or jack hammer methods. Repair damaged section.

C. Grouted rip-rap

1. Missing rip-rap or dislodged rip-rap

a. Missing grouted rip-rap

a. Clean out area where rock is missing; reinstall missing or dislodged rip-rap with proper grout application. Ensure to use a concrete glue to assist in repair.

D. Unimproved channel invert

1. Obstructions

a. Deep-rooted vegetation (Palo Verde, Mesquite, Ironwood, and Salt Cedar trees). Remove or destroy all woody vegetation within the sediment basin.

a. Any volunteer growth that is not part of the original project landscape will be cut, stump treated and removed if needed. All herbicide treatment should be environmentally friendly (consult with Ecology Branch).

b. Vegetation or debris which restricts more than 10% of channel capacity.

b. Remove restrictions and dispose of accordingly.

E. Asphaltic concrete

1. Erosion concerns

a. Sheet flow erosion causing damage to the asphalt structure.

a. Repair erosion by filling and compacting with proper moisture conditioned material. If needed, re-grade shoulder to drain properly.

b. Settlement or movement causing damage to asphalt structure.

b. Cut out damaged section of asphalt and replace accordingly by using SS1 oil and cold patch or hot mix asphalt.

F. Concrete low flow

1. Vegetation

a. High vegetation growing in joints.

a. Remove vegetation so joints are free of vegetation and root growth. Chemically treat if applicable.

b. Damage from flows to the curbing, which does not confine flows as designed.

b. Repair or replace damaged curbing to contain designed flows.

G. Low flow channel

1. Trash, debris or silt

a. Trash, debris or silt plugs that cause flows to divert out of defined low flow.

a. Remove restrictions so that flows stay within defined area.

#13. LEVEES

Deficiency Noted

Maintenance Standard

A. General right-of-way

1. Trash & Debris

a. Trash, litter, and debris creating an unsightly condition

a. Remove & dispose of accordingly.

2. Fencing damage

a. Nuisance vegetation taller than 18" inches

a. Cut vegetation and chemically spray treatment if applicable.

b. Cut or damaged fencing or gates.

b. Repair or replace damaged fencing or gates to set standards.

c. Damaged signs or stationing.

c. Refurbish or replace, as needed, any damaged signs.

3. Rodents

a. Rodents/animals creating holes or burrows on the crest or embankments.

a. Treat with proper rodenticides and schedule follow up treatments as needed.

B. Concrete/soil cement structures

1. Structural damage.

a. Cracks 1/8" inch or wider on the concrete which can expose reinforcement.

a. Clean out and fill in cracks with suitable fill material.

b. Erosion, spalling, or deterioration which affects the structural integrity.

b. Repair erosion from runoff/sheetflow. Repair areas where spalling or deterioration has occurred.

c. Broken or missing protective facing, which could allow water or rust to become a concern to the structure.

c. Repair or patch as needed to stabilize concerns.

2. Graffiti

a. Obscene material /writings

a. Remove or repaint as needed to match to existing conditions.

Earthen levee

1.Structural Damage

a. Erosion from sheet runoff is causing deep rills on crest or slopes of levee.

a. If erosion/rill is deeper than 2' ft. deep, a proctor test must be taken. Install moisture-conditioned material in lifts not to exceed more than 6" high and compaction tests will be administered on every lift and a 95% result or better must be obtained to continue each lift. Unless otherwise specified nuclear compaction tests will be suffice.

b. Plating material on the access road on the crest of the levee is displaced or missing. Plating missing on the access ramps.

b. Re-grade to design elevation with motor grader by bringing back into place any displaced material from the shoulder. If needed, reinstall ABC material on the crest as needed to reestablish safe all-weather access.

c. Slope protection missing or displaced.

c. Reinstall gravel mulch, loose rip-rap, or grouted rip-rap as needed.

2. Deep-rooted vegetation

a. Deep-rooted vegetation located on the crest or slopes.

a. Cut & stump treat as need. Remove any large root systems. Fill & compact holes accordingly.

3.Transverse or longitudinal cracks

a. Transverse or longitudinal cracks located on the crest or toe of the levees.

a. Record the station of the crack. Give location; crest, upstream shoulder, downstream shoulder, mid-slope, or toe of levee. Take measurements to include; diameter size, and depth of crack. Include photograph, inspector, date, and structure.

4. Other

a. Report any other levee safety related concerns (sink holes, depressions, slides, or other anomalies).

a. Record the station of the concern. Give location; crest, upstream shoulder, downstream shoulder, mid-slope, or toe of levee. Take measurements to include; diameter size, and depth of depression. Include photograph, inspector, date, and structure.

#19. CHANNEL & STORM DRAIN WALLS

Deficiency Noted

Maintenance Standard

A. Concrete

1. Structural Damage

a. Cracks wider than ¼" inch.

a. Clean out the crack and apply suitable filler material.

b. Spalling or chipping that is greater than 2" deep or which exposes reinforcement.

b. Remove any rust that may be present, clean damaged portion thoroughly, and patch accordingly with an approved product (dry patch product, rockite, etc.). Ensure the usage of a concrete glue to assist in adhering to the wall.

c. Chipping or spalling along an expansion joint or edge which is more than 1" deep.

c. Properly clean & remove damaged section along expansion joint. Patch damaged area to restore to original condition.

d. Missing expansion material or separation at the joint which permits passage of filler or backfill material.

d. Clean out the joint and replace missing expansion material (if needed, add "backerrod" to fill any large gaps).

2. Voids behind walls.

a. Voids behind concrete walls.

a. Excavate the void to the termination point. If the void is less than 4' feet deep; remove any loose material, add moisture to the void by wetting the cavity, install moisture conditioned material in lifts not to exceed 6" and compact to 95% density. If voids are deeper than 4' feet deep, contact Engineering and they will recommend a repair method.

3. Vegetation

a. Vegetation in the expansion joints.

a. Cut and remove vegetation, if applicable, apply proper herbicide to control vegetation.

4. Grouted rip-rap

a. Loose or missing rip-rap.

a. Clean out areas where rip-rap is missing, reinstall rock and grout in place. Ensure to use a concrete glue in the mix.

5. Weep holes

a. Animal guards missing.

a. Reinstall missing animal guards.

b. Blockage

b. Remove any restrictive material and clean out as needed.

HOLD FOR BASKET PICK-UP
CLERK OF THE BOARD

FILE COPY

OFFICIAL RECORDS OF
MARICOPA COUNTY RECORDER
HELEN PURCELL
2006-1294780 09/29/06 04 29 PM
2 OF 2

DELROSSOR

This document recorded without
Exhibit A (IGA FCD 2006A004) due to map format

INTERGOVERNMENTAL AGREEMENT

BETWEEN

MARICOPA COUNTY FLOOD CONTROL DISTRICT

AND

THE TOWN OF WICKENBURG

FOR THE

RIGHTS-OF-WAY ACQUISITION, UTILITY RELOCATION, CONSTRUCTION, CONSTRUCTION MANAGEMENT, OPERATION AND MAINTENANCE

OF THE

WICKENBURG DOWNTOWN FLOODING HAZARD MITIGATION PROJECT

APPROVED BY
MARICOPA COUNTY BOARD OF SUPERVISORS

ON

SEPTEMBER 25, 2006

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DO NOT REMOVE
This is part of the official document

When Recorded Return to
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009-6399

Intergovernmental Agreement

for the

Rights-of-Way Acquisition, Utility Relocation, Construction,

Construction Management, Operation and Maintenance

of the

Wickenburg Downtown Flooding Hazard Mitigation Project

between

The Flood Control District of Maricopa County

and

The Town of Wickenburg

IGA FCD 2006A004

Agenda Item C-69-07-014-2-00

This Agreement is entered into by and between the Flood Control District of Maricopa County, a municipal corporation and political subdivision of the State of Arizona, acting by and through its Board of Directors hereinafter called the DISTRICT and the Town of Wickenburg, a municipal corporation, acting by and through its Town Council, hereinafter called the TOWN

This Agreement shall become effective as of the date it has been executed by all parties

DATE FILED WITH MARICOPA COUNTY RECORDER _____

STATUTORY AUTHORIZATION

1 The DISTRICT is empowered by Arizona Revised Statutes Section 48-3603, as revised, to enter into this Agreement and has authorized the undersigned to execute this Agreement on behalf of the DISTRICT

2 The TOWN is empowered by Arizona Revised Statutes Section 48-572 and Town Charter, Chapter 2, Section 2, to enter into this Agreement and has authorized the undersigned to execute this Agreement on behalf of the TOWN

BACKGROUND

3 Sols Wash and the Hassayampa River have been identified as creating significant flooding hazards within the TOWN In October 2000, storm water exceeded the banks of Sols Wash and flowed over Tegner Street It flooded homes east of Tegner Street as well as Coffinger Park In addition, excess storm flows from the Hassayampa River have historically flooded homes in the Coffinger Park area

4. The DISTRICT, in cooperation with the TOWN, has developed the "Sols Wash Candidate Assessment Report and Pre-design Study" which provides recommended drainage solutions for the downtown Wickenburg area along Sols Wash Preliminary design plans and calculations for the recommended drainage solutions have been prepared

5. Channel excavation, levee, floodwall and detention basin improvements, designed to contain the 100-year floodplains associated with Sols Wash and convey the 100-year flows from upstream of Tegner Street to the Hassayampa River are hereinafter defined as the PROJECT (See Exhibit A) The PROJECT also includes in-kind relocation of a TOWN well on the south side of Sols Wash, upstream of Tegner Street The PROJECT length from upstream of Tegner Street to the Hassayampa River is approximately five thousand (5,000) feet

6. The DISTRICT and the TOWN, hereinafter called the PROJECT PARTNERS, wish to implement the PROJECT, which is designed to provide the 100-year level of protection to those portions of the Wickenburg Downtown area that are subject to flooding The PROJECT will also provide increased protection from flooding along much of the remainder of Sols Wash within the TOWN limits

7 The PROJECT will be designed to convey the 100-year flood flows to the future Highway 93 Interim Bypass box culvert over Sols Wash, allowing the Interim Bypass embankment to be constructed as a levee designed to contain the Hassayampa River 100-year floodplain in the area

8 The PROJECT PARTNERS wish to expedite implementation of the PROJECT The PROJECT PARTNERS will strive to complete the construction of the PROJECT by April 2008

9. The TOWN submitted the PROJECT to the DISTRICT for consideration in its FY 2004/2005 Capital Improvements Program Prioritization Procedure The PROJECT ranks as the TOWN's highest priority flood control project The PROJECT was recommended by the Flood Control Advisory Board for inclusion into the DISTRICT's current Five-year Capital Improvement Program

10 On May 4, 2005, the Board of Directors of the Flood Control District of Maricopa County (Board) adopted Resolution FCD 2005R008 (C-69-05-118-6-00) authorizing the DISTRICT to negotiate Intergovernmental Agreements (IGAs) for the PROJECT. The Board also approved IGA FCD 2005A012 for the design of the PROJECT

PURPOSE OF THE AGREEMENT

11 The purpose of this Agreement is to identify and define the responsibilities of the PROJECT PARTNERS for cost sharing, rights-of-way acquisition, utility relocation, construction, construction management, and operation and maintenance of the PROJECT

TERMS OF THE AGREEMENT

12 The PROJECT PARTNERS shall share in the PROJECT costs for rights-of-way acquisition, utility relocation, construction, and construction management, hereinafter referred to as the PROJECT COST, estimated to be $9,700,000

12 1 The PROJECT COST includes the design, construction, and construction management costs associated with relocation of the TOWN well on the south side of Sols Wash, upstream of Tegner Street, hereinafter referred to as the WELL RELOCATION COST, estimated to be $160,000.

13 The DISTRICT shall

13 1 Fund the PROJECT COST, minus the TOWN's cost share, making the DISTRICT's estimated share $7,300,000. DISTRICT funds will be from the DISTRICT's secondary tax levy revenues and DISTRICT funding shall be based on the availability of DISTRICT Capital Improvement Program Budget funding.

13 2 Serve as lead agency for acquisition of rights-of-way to be purchased for the PROJECT

13.3 Coordinate with the TOWN for the relocation of conflicting utilities prior to construction of the PROJECT. Conflicting utilities without prior rights shall be relocated at no cost to the PROJECT The cost of relocating utilities with prior rights shall be included as a PROJECT COST

13 4 Serve as lead agency for construction and construction management of the PROJECT, except the TOWN well relocation, for which the TOWN shall be the lead agency

13 4 1 The construction of the PROJECT shall not include landscaping nor irrigation features but shall include aesthetic treatment of the improvements being designed The aesthetic treatment shall consist of form liner or similar treatment to select areas of the concrete floodwalls The Town will be responsible for construction of future landscaping and irrigation improvements for the PROJECT

13 4.2 Participate in the final inspection of the constructed PROJECT with the TOWN

13 5 Invoice the TOWN for its share of the PROJECT COSTS as follows

13.5 1 Upon award of a construction contract for the PROJECT, invoice the TOWN for $1,200,000, minus the WELL RELOCATION COST

13 5 2 On or after June 10, 2007, invoice the TOWN for $50,000

13 5 3 On or after June 10, 2008, invoice the TOWN for $50,000

13.5 4 On or after June 10, 2009, invoice the TOWN for $25,000

13 6 Transfer fee and/or easement land rights, acquired by the DISTRICT and necessary for the operation and maintenance of the PROJECT, to the TOWN

13 6 1 Any PROJECT land and/or property purchased by the DISTRICT and conveyed to the TOWN shall be used for specific flood control purposes. Should that land and/or property cease to be used for flood control purposes, said land and/or property shall revert to the DISTRICT Said reversion shall be effectuated through judicial proceedings instituted by the DISTRICT in a court of general jurisdiction in the State of Arizona As required by A R S 48-3603 1 and DISTRICT policy, if all or part of this property is subsequently sold by the TOWN, the DISTRICT shall be repaid its cost share percentage of the original sale price or subsequent sale price, whichever is greater, for property acquired by the DISTRICT

13 7 The DISTRICT may participate with the TOWN in annual inspections of the PROJECT. Any deficiencies relating to flood control shall be corrected by the TOWN within sixty (60) calendar days If the TOWN has not taken corrective action within this time, the DISTRICT reserves the right to perform the corrective action and invoice the TOWN for the total costs incurred by the DISTRICT.

13 8 The DISTRICT shall review and comment on the design and/or construction of any future changes or modifications that could affect the hydraulic function of the PROJECT

14 The TOWN shall

14 1 Fund an estimated $2,400,000 of the PROJECT COST, which includes cash payments to the DISTRICT totaling $1,325,000 minus the actual WELL RELOCATION COST The TOWN must relocate the TOWN well as required for the PROJECT and obtain dedications for a portion of the rights-of-way required for the PROJECT The TOWN must be responsible for all future landscape aesthetic improvements TOWN funds will be from the ADOT Interim Bypass savings, the TOWN's General Fund and other sources.

14 1 1 Reimburse the DISTRICT within thirty (30) days of receipt of an invoice in accordance with paragraph 13 5

14 2 Provide adequate staffing and funding levels and meet all PROJECT milestones and schedules in support of the PROJECT Lack of such support, and any delays and additional costs caused thereby, will be solely at the TOWN's expense. These or any other adverse impacts to the PROJECT schedule and the DISTRICT's Capital Improvements Program (CIP) Budget may cause the delay or reallocation of DISTRICT CIP funds for the PROJECT.

14 3 Participate in all public involvement activities for the PROJECT This includes scheduling and providing the location for public meetings, and preparing and disseminating public meeting notices.

14 4 Serve as lead agency for obtaining rights-of-way to be dedicated for the PROJECT

14 4 1 The TOWN shall provide all TOWN owned or controlled rights-of-way necessary for construction of the PROJECT at no additional cost to the PROJECT

14 4 2 The TOWN shall provide rights-of-way for the local retention basin located east of River Street, as identified on the PROJECT construction plans

14 5 Cause to be relocated conflicting utilities within the TOWN's rights-of-way, prior to construction of the PROJECT Conflicting utilities without prior rights shall be relocated at no cost to the PROJECT.

14 6 Serve as lead agency for the design, construction, and construction management of the TOWN well relocation

14 6 1 The TOWN shall fund all WELL RELOCATION COSTS associated with the TOWN well relocation, including the removal and replacement of all improvements associated with the well that are in conflict with the PROJECT improvements

14 6 1 1 The TOWN shall provide actual WELL RELOCATION COST documentation to the DISTRICT for review and approval

14 6 2 The TOWN well relocation shall be completed no later than April 1, 2007 Any additional PROJECT costs, including costs owed to the PROJECT construction contractor due to the delays in the well relocation, shall be borne solely by the TOWN

14 7 Be responsible for, and assume ownership, liability, operation and maintenance of the PROJECT, following completion of each phase of construction, including relocation of the well

14 7.1 The operation and maintenance responsibility for the PROJECT which includes removal of trash, debris, sediment, and vegetation from the facilities, aesthetics maintenance and vandalism repair The TOWN is also responsible for structural maintenance and repair of the facilities, including project reconstruction and replacement and associated costs

14 7 2 The TOWN shall schedule and invite the DISTRICT to participate in the annual inspections of the PROJECT. Any deficiencies relating to flood control shall be corrected by the TOWN within sixty (60) calendar days If the TOWN has not taken corrective action within this time, the DISTRICT reserves the right to perform the corrective action and the TOWN shall reimburse the DISTRICT for the total costs incurred by the DISTRICT within thirty (30) calendar days of receipt of an invoice from the DISTRICT.

14 8 Obtain DISTRICT review and comment on the design and/or construction of any future changes or modifications to the PROJECT that may affect the hydraulic function of the PROJECT and resolve and/or incorporate the DISTRICT's comments into the future PROJECT modification

15 Any permits required by a PROJECT PARTNER, shall be issued by the appropriate PROJECT PARTNER at no cost to the PROJECT.

16 Either party to this Agreement may, with mutual written agreement of the other party, delegate responsibilities to another party. Any delegation, however, shall not relieve the delegating party of its original responsibilities as defined herein

17 In the case of any dispute over any items in this Agreement, the parties agree to use their best efforts and enter into good faith negotiations to resolve the disputed matters However, this shall not limit the rights of the parties to seek any remedies provided by law

18. Each party to this Agreement shall take reasonable and necessary actions within their authority to ensure that only storm water is discharged into the PROJECT and that such discharges into the PROJECT comply at the point of discharge with any applicable requirements of the U.S Environmental Protection Agency Clean Water Act, Arizona Pollutant Discharge Elimination System (AZPDES) or any other applicable discharge requirements, including any permit requirements

19 Each party to this Agreement (indemnitor) shall, to the extent permissible by law, indemnify, defend and save harmless the others (indemnitees) including agents, officers, directors, governors and employees thereof, from and against any loss or expense incurred as a result of any claim or suit of any nature whatsoever, which arises out of indemnitor's negligent or wrongful acts or omissions pursuant to this Agreement Such indemnification obligation shall encompass any personal injury, death or property damages resulting from the indemnitor's negligent or wrongful acts or omissions, as well as reasonable attorney's fees, court costs, and other expenses relating to the defense against claims or litigation, incurred by the indemnitee Indemnitee shall be liable for their own negligence or wrongful acts as provided by law.

20. All notices or demands upon any party to this Agreement shall be in writing and shall be delivered in person or sent by mail addressed as follows

Flood Control District of Maricopa County
Chief Engineer and General Manager
2801 West Durango Street
Phoenix, AZ 85009-6399

Town of Wickenburg
Town Manager
155 N Tegner
Wickenburg, AZ 85390

21 Each party to this Agreement will pay for and not seek reimbursement for its own personnel and administrative costs associated with this PROJECT, including but not limited to the following, unless specifically identified otherwise in this Agreement permitting, management and administration

22. This Agreement shall expire five (5) years from the date of recording with the County Recorder or upon completion of the PROJECT and after all funding obligations and reimbursements have been satisfied in accordance with this Agreement, whichever is the first to occur However, by mutual written agreement of all parties, this Agreement may be amended or terminated.

23 This Agreement is subject to cancellation by either party pursuant to the provisions of Arizona Revised Statutes Section 38-511

24. Attached to this Agreement or contained herein are the written determinations by the appropriate attorneys for the parties to this Agreement, that these agencies are authorized under the laws of the State of Arizona to enter into this Agreement and that it is in proper form

25 If legislation is enacted after the effective date of this Agreement that changes the relationship or structure of one or more parties to this Agreement, the parties agree that this Agreement shall be renegotiated at the written request of either party

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
A Municipal Corporation

Recommended by

9/7/06
Timothy S. Phillips, P E Date
for Chief Engineer and General Manager

Approved and Accepted

By: SEP 25 2006
Chairman, Board of Directors Date

Attest

By: SEP 25 2006
Clerk of the Board Date

The foregoing Intergovernmental Agreement FCD 2006A004 has been reviewed pursuant to Arizona Revised Statutes Section 11-952, as amended, by the undersigned General Counsel, who has determined that it is in proper form and within the powers and authority granted to the Flood Control District of Maricopa County under the laws of the State of Arizona

9/1/06
General Counsel Date

TOWN OF WICKENBURG

Town of Wickenburg, a Municipal Corporation
Shane Dille, Town Manager

By _____ 8/22/06
Date

Attest.

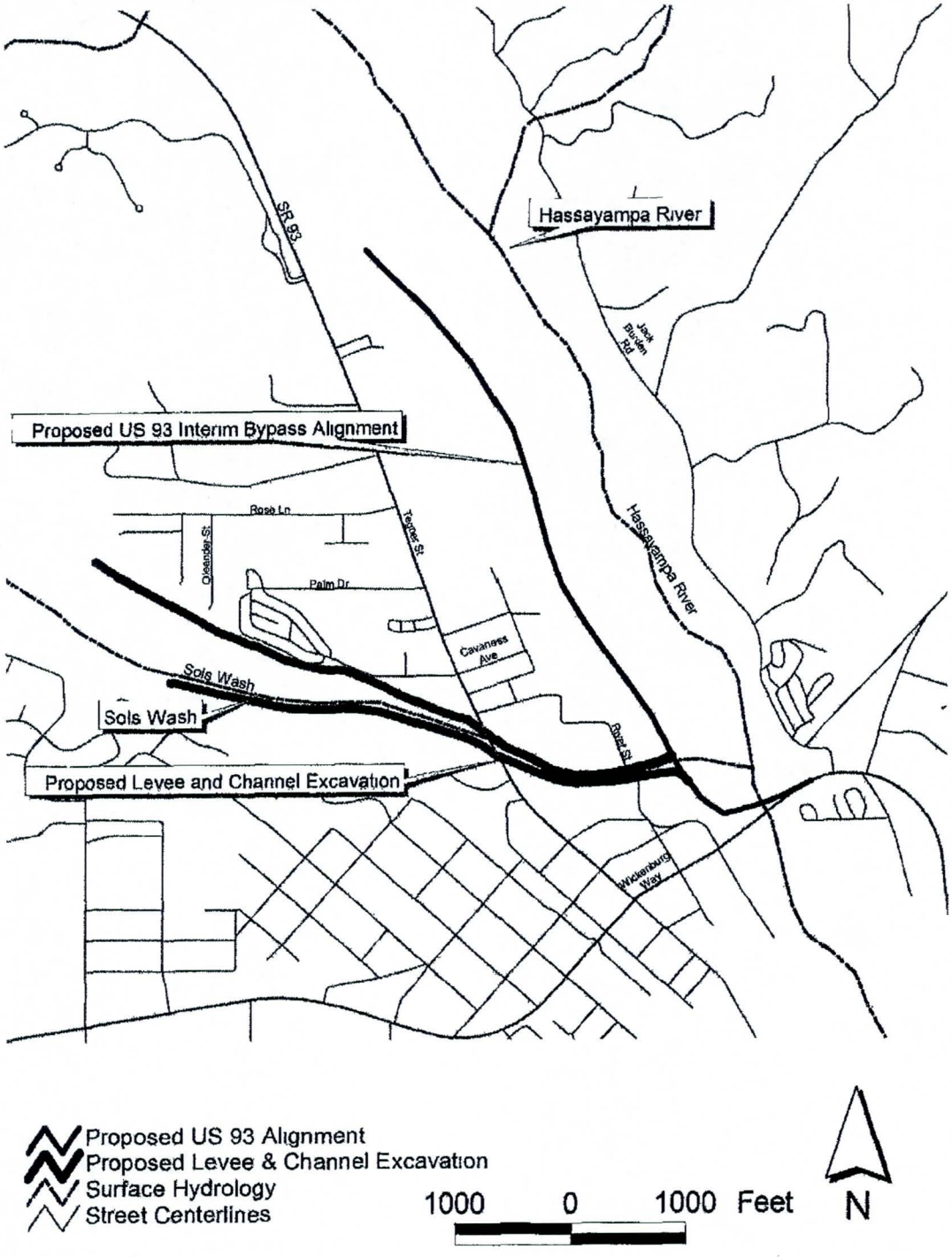
By: Donna Ruggel 8/24/06
Town Clerk Date

The foregoing Intergovernmental Agreement FCD 2006A004 has been reviewed pursuant to Arizona Revised Statues Section 48-572 and Town Charter, Chapter 2, Section 2, by the undersigned attorney who has determined that it is in proper form and within the power and authority granted to the Town of Wickenburg under the laws of the State of Arizona

By _____ 8/22/06
Town Attorney Date

IGA FCD 2006A004
EXHIBIT "A"

Wickenburg Downtown Flooding Hazard Mitigation



NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles, Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' National Geodetic Vertical Datum of 1929 (NGVD 29). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection used** in the preparation of this map was *Arizona State Plane Zone 3176 (central Arizona)*. The **horizontal datum** was *NAD83, GRS80 spheroid*. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the *National Geodetic Vertical Datum of 1929*. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(310) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Maricopa County. Orthophoto images were produced at a scale of 1:8000 using HARN for control. Aerial photography is dated December 2000 to December 2002.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

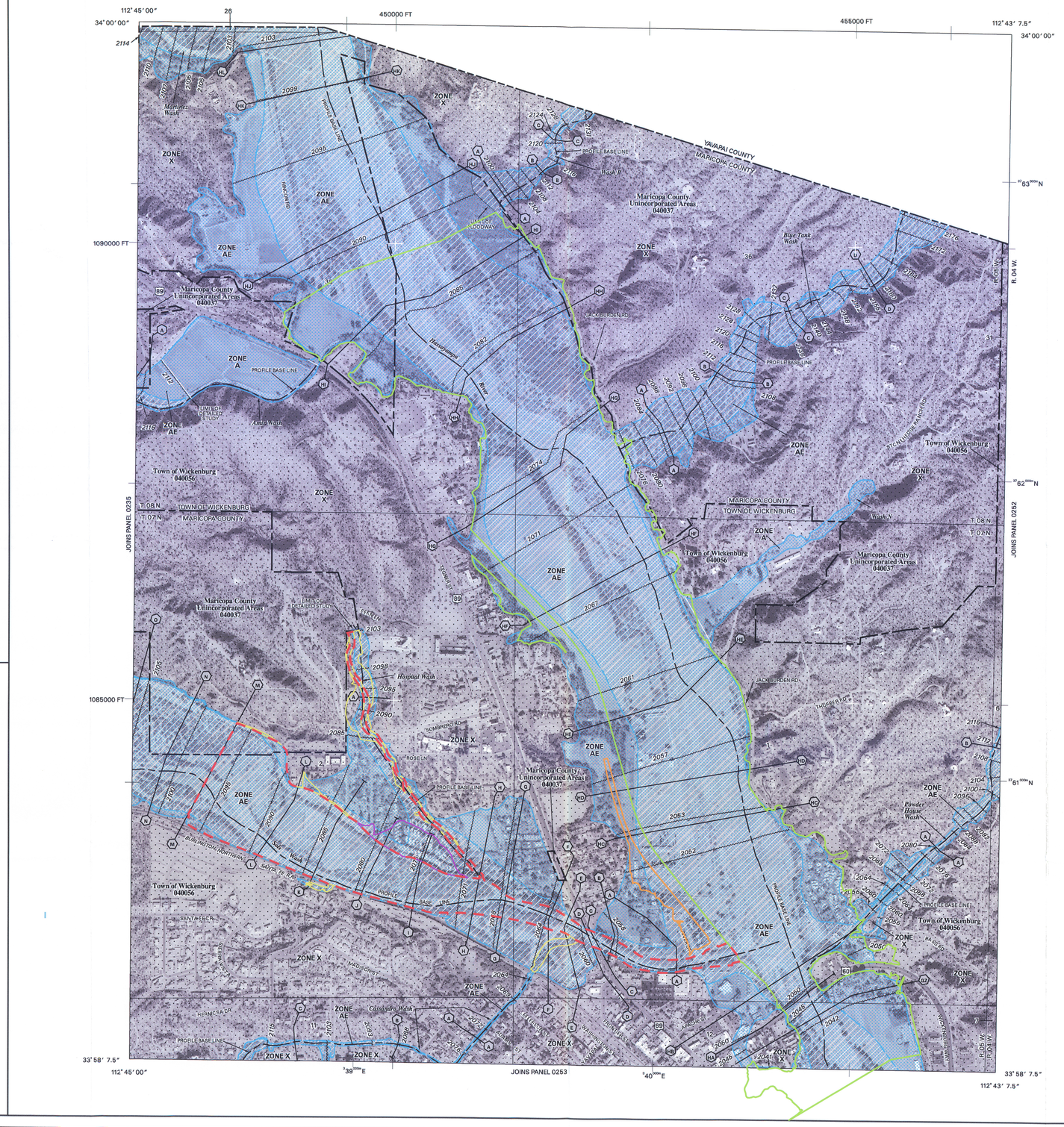
Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMAMAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.

Annotation Legend

FEMA Zone

- Floodway (Zone AE)
- Floodplain (Zone AE)
- AH
- AO1
- Floodplain (Zone AE) (per US 93, Wickenburg Bypass CLOMR Case No. 07-09-0858R. See Arizona Dept, of Transportation/Jacobs Engineering LOMR submittal)



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A — No Base Flood Elevations determined.
- ZONE AE — Base Flood Elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones, and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the National Geodetic Vertical Datum of 1929

- (A)—(A) — Cross section line
- (2)—(2) — Transect line
- 112° 07' 08", 33° 25' 41" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere.
- 76 000m E — 1000-meter Universal Transverse Mercator grid tick values zone 12.
- 875000 FT — 5000-foot grid tick values: Arizona State Plane coordinate system, central zone (FIPSZONE 3176) NAD83 (Transverse Mercator)
- DV2313 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to Repositories Listing on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
April 15, 1988

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 29, 1989, September 4, 1991, July 19, 2001

September 30, 2005 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to incorporate previously issued Letters of Map Amendment.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0251H

FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY, ARIZONA
AND INCORPORATED AREAS

PANEL 251 OF 4350

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	0251	H
WICKENBURG, TOWN OF	040056	0251	H

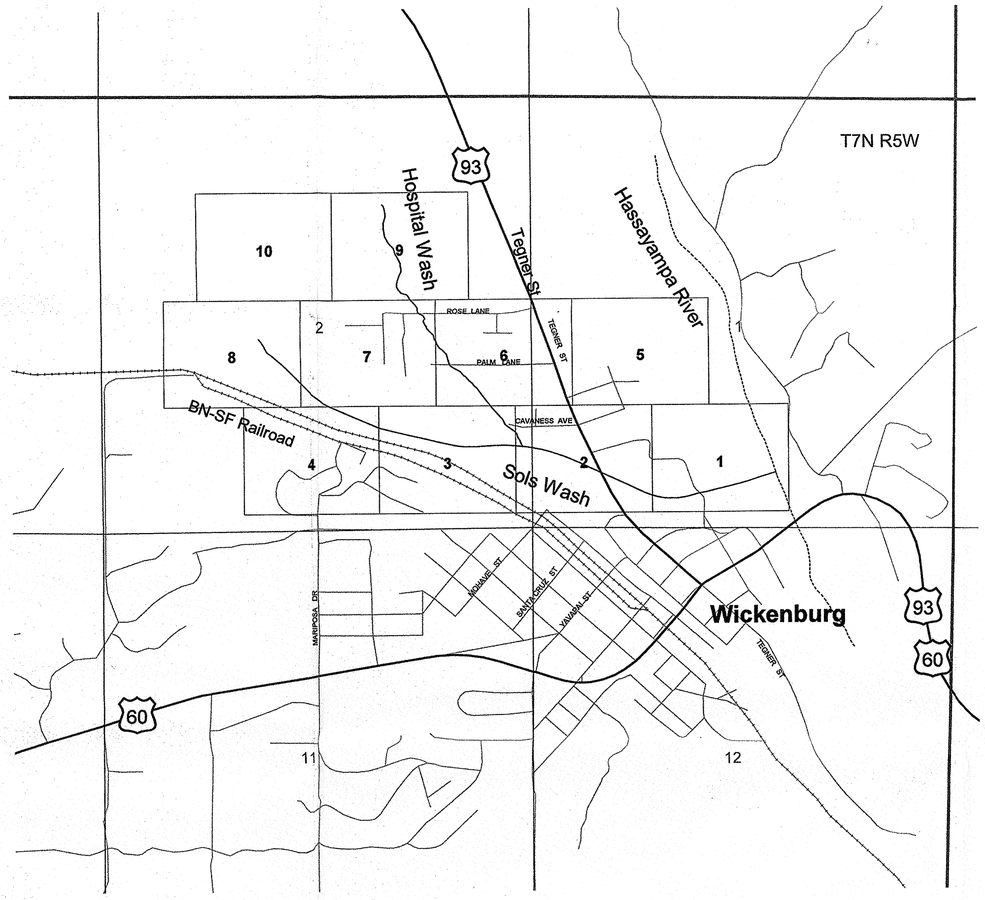
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

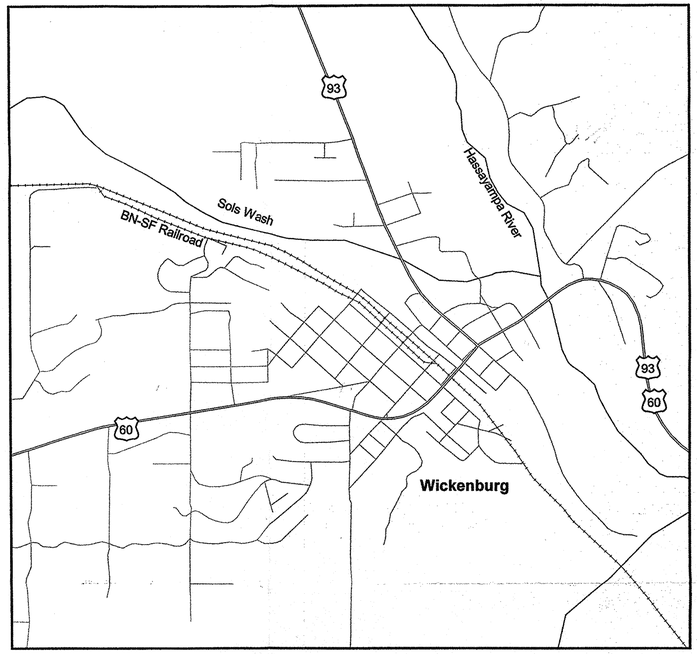
MAP NUMBER
04013C0251H
MAP REVISED
SEPTEMBER 30, 2005

Federal Emergency Management Agency

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SOLS WASH CLOMR
FCD CONTRACT NUMBER FCD2005C006





DATUM

HORIZONTAL: NORTH AMERICAN DATUM OF 1983
VERTICAL: NORTH AMERICAN VERTICAL DATUM OF 1988

AERIAL MAPPING

STEWART GEO-TECHNOLOGIES
NOVEMBER 2004
2' CONTOUR INTERVAL

STATEMENTS BY PROFESSIONAL REGISTRANTS

THE FOLLOWING STATEMENTS APPLY TO THE INDIVIDUAL SEALS AFFIXED TO EACH OF THE MAPS FOLLOWING THE COVER SHEET.

THE FLOODPLAIN AND FLOODWAY DELINEATION WERE PREPARED UNDER MY DIRECT SUPERVISION:

Registered Professional Engineer (State of Arizona) CERTIFICATE NO. 37890 LLOYD A. VICK Date Signed for 2005 ARIZONA, U.S.A.

HYDRAULICS

ENGINEERING AND ENVIRONMENTAL CONSULTANTS, INC.
3003 NORTH CENTRAL AVENUE, SUITE 600
PHOENIX, ARIZONA 85012

LIMIT OF ACCURACY

TOWNSHIP AND RANGE LINES WERE DIGITIZED FROM THE USGS 7.5' TOPOGRAPHICAL QUADRANGLE MAPS.

Matchline Sheet 5

Matchline Sheet 2

Reach	River Sta	Q Total (cfs)	FP W.S. Elev (ft)	FW W.S. Elev (ft)
Sols Wash Main	0.288	15045	2059.30	2059.30
Sols Wash Main	0.227	15045	2057.96	2057.96
Sols Wash Main	0.220	15045	2057.53	2057.53
Sols Wash Main	0.212	15045	2057.22	2057.22
Sols Wash Main	0.204	15045	2056.67	2056.67
Sols Wash Main	0.201	15045	2055.03	2055.04
Sols Wash Main	0.198	15045	2051.71*	2051.71
Sols Wash Main	0.195	15045	2052.37*	2052.37
Sols Wash Main	0.192	15045	2052.49*	2052.49
Sols Wash Main	0.189	15045	2052.60*	2052.60
Sols Wash Main	0.187	15045	2052.75*	2052.75
Sols Wash Main	0.184	15045	2052.82*	2052.82
Sols Wash Main	0.182	15045	2051.61*	2051.61
Sols Wash Main	0.180	15045	2051.73*	2051.73
Sols Wash Main	0.169	15045	2052.14*	2052.14
Sols Wash Main	0.159	15045	2052.33*	2052.33
Sols Wash Main	0.150	15045	2052.45*	2052.45
Sols Wash Main	0.140	15045	2052.49*	2052.49
Sols Wash Main	0.132	15045	2052.45*	2052.45
Sols Wash Main	0.111	15045	2049.75*	2049.74

* 100-yr backwater elevation of 2054.17' governs.

(CLOMR Prepared by West Consultants, Inc.)

ADOT R-O-W

US 93 BYPASS

DETENTION BASIN BEING BUILT BY ADOT AS PART OF WICKENBURG BYPASS 093-B-(008)

Hassayampa River

River St

Zone AH (2050.4)

Basin Bottom 2043'

Detention Basin Elev = 2050.4'

Limit of Study

Sols Wash

Floodplain/Floodway Zone AE

FCD R-O-W

T7N R5W

Scale: 1" = 60'
Contour Interval = 5'

60 0 60 120 Feet

Legend

- Cross Section
- Hydraulic Baseline
- Existing Elevation Contour (1' Interval)
- Proposed Elevation Contour (1' Interval)
- Township Boundary
- Section Boundary
- New 1% Annual Chance of Flood Hazard Boundary
- New Floodway
- Effective Floodplain
- Effective Floodway
- Floodplain from West CLOMR
- Highway
- Local Road
- Railroad
- 1.862 River Mile
- Flood Control ROW

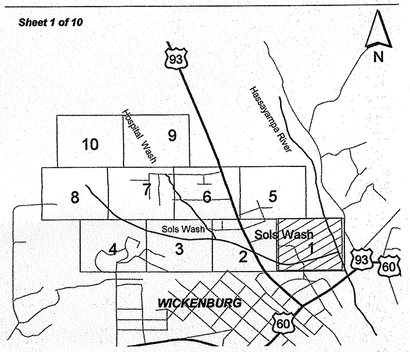
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NAVD88

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS OTHERWISE NOTED
2. SEE ADOT GRADING PLANS FOR WICKENBURG BYPASS [093-B-(008)] DETAILED INFORMATION.

Sheet 1 of 10



No.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SOLS WASH CLOMR

FCD Contract No. FCD2005C006

Registered Professional Engineer CERTIFICATE NO. 37890 LLOYD A. VICK Date Signed 06-29-07 ARIZONA U.S.A.

Engineering and Environmental Consultants, Inc.

	BY	DATE
DESIGN	CTG	06 - 07
DESIGN CHK	LAV	06 - 07
PLANS	ESM	06 - 07
PLANS CHK	LAV	06 - 07

SHEET 1 OF 10

Matchline Sheet 6

Matchline Sheet 5

Matchline Sheet 3

Reach	River Sta	Q Total (cfs)	FP W.S. Elev (ft)	FW W.S. Elev (ft)
Sols Wash Main	0.642	14459	2068.53	2068.52
Sols Wash Main	0.614	14459	2067.27	2067.27
Sols Wash Main	0.592	14459	2066.89	2066.88
Sols Wash Main	0.557	14459	2066.79	2066.79
Sols Wash Main	0.529	14459	2066.78	2066.78
Sols Wash Main	0.505	14459	2066.50	2066.50
Sols Wash Main	0.485	15045	2065.98	2065.98
Sols Wash Main	0.467	15045	2065.80	2065.80
Sols Wash Main	0.447	15045	2065.87	2065.87
Sols Wash Main	0.442	15045	2065.73	2065.73
Sols Wash Main	0.412	15045	2061.01	2061.01
Sols Wash Main	0.389	15045	2060.76	2060.76
Sols Wash Main	0.359	15045	2060.08	2060.08
Sols Wash Main	0.306	15045	2059.42	2059.42

Cavaness Ave

Buena Vista

Tegner St

Swilling Ave

Zone AH
(2050.4)

FCD
R-O-W

Floodplain/Floodway

Zone AE

Floodplain Limits

Delineation south of Sols Wash superseded. See Sheet 2A for as-built delineation.

Sols Wash Main

Floodplain Limit

Burlington Northern Santa Fe Railroad

Cassadino Wash

T7N R5W

Scale: 1" = 60'
Contour Interval = 1'

Legend

- Cross Section
- Hydraulic Baseline
- Existing Elevation Contour (1' Interval)
- Poposed Elevation Contour (1' Interval)
- Township Boundary
- Section Boundary
- New 1% Annual Chance of Flood Hazard Boundary
- New Floodway
- Effective Floodplain
- Effective Floodway
- Floodplain from West CLOMR
- Highway
- Local Road
- Railroad
- 1.862 River Mile
- Flood Control ROW

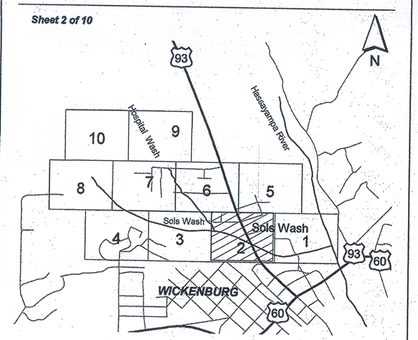
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NAVD88

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS OTHERWISE NOTED
2. SEE ADOT GRADING PLANS FOR WICKENBURG BYPASS [093-B-(008)] DETAILED INFORMATION.

Sheet 2 of 10



No.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SOLS WASH CLOMR

FCD Contract No. FCD2005C006

Engineering and Environmental Consultants, Inc.

	BY	DATE
DESIGN	CTG	06 - 07
DESIGN CHK	LAV	06 - 07
PLANS	ESM	06 - 07
PLANS CHK	LAV	06 - 07

Registered Professional Engineer Group CERTIFICATE No. 37890 LLOYD A. VICK Date Signed 06-26-07 ARIZONA, U.S.A.

SHEET 2 OF 10

Reach	River Sta	Q Total (cfs)	FP W.S. Elev (ft)	FW W.S. Elev (ft)
Sols Wash Main	0.642	14459	2068.53	2068.52
Sols Wash Main	0.614	14459	2067.27	2067.27
Sols Wash Main	0.592	14459	2066.89	2066.88
Sols Wash Main	0.557	14459	2066.79	2066.79
Sols Wash Main	0.529	14459	2066.78	2066.78
Sols Wash Main	0.505	14459	2066.50	2066.50
Sols Wash Main	0.485	15045	2065.98	2065.98
Sols Wash Main	0.467	15045	2065.80	2065.80
Sols Wash Main	0.447	15045	2065.87	2065.87
Sols Wash Main	0.442	15045	2065.73	2065.73
Sols Wash Main	0.412	15045	2061.01	2061.01
Sols Wash Main	0.389	15045	2060.76	2060.76
Sols Wash Main	0.359	15045	2060.08	2060.08
Sols Wash Main	0.306	15045	2059.42	2059.42

Matchline Sheet 6

Matchline Sheet 5

Matchline Sheet 3

Cavaness Ave

Buena Vista

Tegner St

Swilling Ave

Zone AH
(2050.4)

Zone AE

Floodplain/Floodway

FCD
R-O-W

FCD
R-O-W

FCD
R-O-W

0.642

0.614

0.592

0.557

0.529

0.505

0.485

0.467

0.447

0.442

0.412

0.389

0.359

0.306

REVISED FLOODPLAIN LIMITS

Floodplain Limits

Floodplain Limit

REVISED FLOODPLAIN LIMITS

Sols Wash Main

Cassandro Wash

Burlington Northern Santa Fe Railroad

T7N R5W

REVISED DELINEATION CERTIFICATION

I HEREBY CERTIFY THAT THE "REVISED DELINEATION" AS SHOWN IN GREEN HEREON WAS PREPARED UNDER MY SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Catherine W. Regester 4/25/11
REGISTERED ENGINEER DATE

Registered Professional Engineer (Civil)
CERTIFICATE NO.
37883
CATHERINE WEDIG
REGESTER
Date Signed 4/25/11
ARIZONA, U.S.A.

EXPIRES 9/30/11

2066.93 WALL COR @ WASH
2065.88 WALL COR @ WASH
2064.54 TOE OF OPENING @ TOP OF WALL
2065.67 TOE @ EDGE OF RIP RAP
2063.68 TOE @ EDGE OF RIP RAP
2065.88 TOE OF OPENING @ TOP OF WALL

FIELD SURVEY PROVIDED BY FLOOD CONTROL DISTRICT - 03/03/2011

TB = TOP OF BANK

Scale: 1" = 60'
Contour Interval = 1'

2 1

Legend

- Cross Section
- Hydraulic Baseline
- Existing Elevation Contour (1' Interval)
- Poposed Elevation Contour (1' Interval)
- Township Boundary
- Section Boundary
- New 1% Annual Chance of Flood Hazard Boundary
- New Floodway
- Effective Floodplain
- Effective Floodway
- Floodplain from West CLOMR
- Highway
- Local Road
- Railroad
- 1.862 River Mile
- Flood Control ROW

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NAVD88

NOTES

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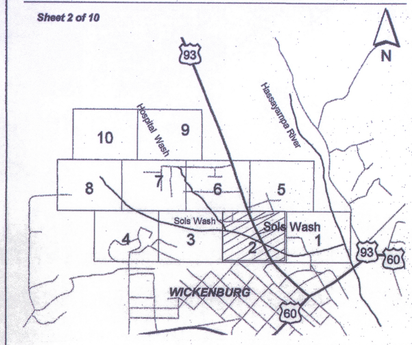
2. SEE ADOT GRADING PLANS FOR WICKENBURG BYPASS [093-B-(008)] DETAILED INFORMATION.

Sheet 2 of 10



No.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SOLS WASH CLOMR

FCD Contract No. FCD2005C006

Registered Professional Engineer (Civil)
CERTIFICATE NO.
37890
LLOYD A. VICK
Date Signed 06-28-07
ARIZONA, U.S.A.

Engineering and Environmental Consultants, Inc.

	BY	DATE
DESIGN	CTG	06 - 07
DESIGN CHK	LAV	06 - 07
PLANS	ESM	06 - 07
PLANS CHK	LAV	06 - 07

SHEET 2A OF 10

Matchline Sheet 7

Matchline Sheet 6

Matchline Sheet 4

Matchline Sheet 2

Sols Wash

Floodplain/Floodway

Zone AE

Zone AO1

Hospital Wash

Floodplain/Floodway

Zone AE

FCD
R-O-W

End Zone AO1

Delineation along Hospital Wash superseded. See "Hospital Wash Flood Delineation Study" work map sheet 1 of 3.

Santa Fe Dr

Madison St

Burlington Northern Santa Fe Railroad

FCD
R-O-W

2

T7N R5W

Reach	River Sta	Q Total (cfs)	FP W.S. Elev (ft)	FW W.S. Elev (ft)
Hospital Wash	0.097	500	2069.66	2069.66
Hospital Wash	0.083	500	2068.47	2068.47
Hospital Wash	0.081	500	2068.94	2068.94
Hospital Wash	0.074	500	2066.66	2066.66
Hospital Wash	0.070	500	2066.37	2066.37
Sols Wash Main	0.955	14459	2079.85	2079.85
Sols Wash Main	0.886	14459	2076.77	2076.77
Sols Wash Main	0.822	14459	2074.79	2074.80
Sols Wash Main	0.785	14459	2072.86	2072.85
Sols Wash Main	0.746	14459	2070.59	2070.59
Sols Wash Main	0.708	14459	2069.15	2069.15
Sols Wash Main	0.668	14459	2068.94	2068.94
Sols Wash Main	0.642	14459	2068.53	2068.52

N

Scale: 1" = 60'
Contour Interval = 5'

60 0 60 120 Feet

Legend

- Cross Section
- Hydraulic Baseline
- Existing Elevation Contour (1' Interval)
- Proposed Elevation Contour (1' interval)
- Township Boundary
- Section Boundary
- New 1% Annual Chance of Flood Hazard Boundary
- New Floodway
- Effective Floodplain
- Effective Floodway
- Floodplain from West CLOMR
- Highway
- Local Road
- Railroad
- 1.882 River Mile
- Flood Control ROW

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NAVD88

NOTES

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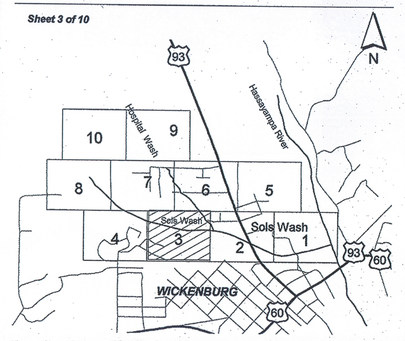
Sheet 3 of 10



No.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

SOLS WASH CLOMR

FCD Contract No. FCD2005C006

Registered Professional Engineer (Civil) CERTIFICATE NO. 37890 LLOYD A. VICK On Record 6-30-08 ARIZONA, U.S.A.

eac Engineering and Environmental Consultants, Inc.

	BY	DATE
DESIGN	CTG	06 - 07
DESIGN CHK	LAV	06 - 07
PLANS	ESM	06 - 07
PLANS CHK	LAV	06 - 07

SHEET 3 OF 10

Matchline Sheet 8

Matchline Sheet 7

Reach	River Sta	Q Total (cfs)	FP W.S. Elev (ft)	FW W.S. Elev (ft)
Sols Wash Main	1.081	14459	2086.48	2086.47
Sols Wash Main	1.021	14459	2083.09	2083.09

2110
2105
2100
2095
2090
2085
2080

1.081

Burlington Northern Santa Fe Railroad

Floodplain/Floodway Zone AE

Sols Wash

Floodplain Zone AE

Mclean Dr

Santa Fe Dr

Santa Fe Dr

Sierra Vista Dr

Mariposa Dr

Madison St

Madison St

Matchline Sheet 3

T7N R5W

N

Scale: 1" = 60'
Contour Interval = 1'
60 0 60 120 Feet

Legend

- Cross Section
- Hydraulic Baseline
- Existing Elevation Contour (1' Interval)
- Proposed Elevation Contour (1' Interval)
- Township Boundary
- Section Boundary
- New 1% Annual Chance of Flood Hazard Boundary
- New Floodway
- Effective Floodplain
- Effective Floodway
- Floodplain from West CLOMR
- Highway
- Local Road
- Railroad
- 1.862 River Mile
- Flood Control ROW

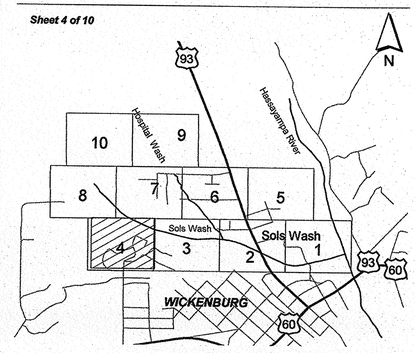
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NAVD88

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS OTHERWISE NOTED
2. SEE ADOT GRADING PLANS FOR WICKENBURG BYPASS [093-B-(008)] DETAILED INFORMATION.

Sheet 4 of 10



No.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SOLS WASH CLOMR

FCD Contract No. FCD2005C006

Registered Professional Engineer (Civil) CERTIFICATE NO. 37890 LLOYD A. VICK Date Signed for 2006.06.30 ARIZONA, U.S.A.

eac Engineering and Environmental Consultants, Inc.

	BY	DATE
DESIGN	CTG	06 - 07
DESIGN CHK	LAV	06 - 07
PLANS	ESM	06 - 07
PLANS CHK	LAV	06 - 07

SHEET 4 OF 10

Matchline Sheet 6

Zone AH
(2050.4)

2055

US 93 Bypass

(CLOMR prepared by
West Consultants, Inc)

DETENTION BASIN BEING BUILT BY ADOT AS
PART OF WICKENBURG BYPASS 093-B-(008)

2050

2060

Genung Ave

Weaver St

Zone AH
(2050.4)

T7N R5W

Matchline Sheet 2

Matchline Sheet 1

N

Scale: 1" = 60'
Contour Interval = 5'

60 0 60 120 Feet

Legend

- Cross Section
- Hydraulic Baseline
- Existing Elevation Contour (1' Interval)
- Proposed Elevation Contour (1' Interval)
- Township Boundary
- Section Boundary
- New 1% Annual Chance of Flood Hazard Boundary
- New Floodway
- Effective Floodplain
- Effective Floodway
- Floodplain from West CLOMR
- Highway
- Local Road
- Railroad
- 1.862 River Mile
- Flood Control ROW

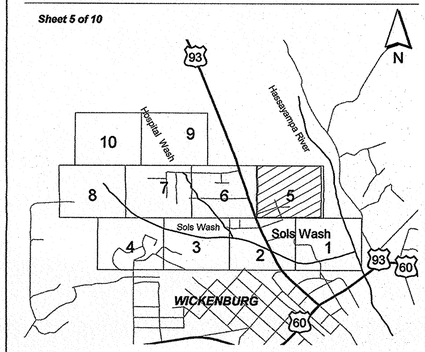
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NAVD88

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS OTHERWISE NOTED
2. SEE ADOT GRADING PLANS FOR WICKENBURG BYPASS [093-B-(008)] DETAILED INFORMATION.
3. SEE ADOT GRADING PLAN FOR HOW CONTOURS TIE INTO GRADING PLAN.

Sheet 5 of 10



No.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

SOLS WASH CLOMR

FCD Contract No. FCD2005C006

Registered Professional Engineer (Civil) CERTIFICATE NO. 37880 LLOYD A. VICK Date Signed 06-07-07 ARIZONA, U.S.A.

eec Engineering and Environmental Consultants, Inc.

	BY	DATE
DESIGN	CTG	06 - 07
DESIGN CHK	LAV	06 - 07
PLANS	ESM	06 - 07
PLANS CHK	LAV	06 - 07

SHEET 5 OF 10

Matchline Sheet 9

T7N R5W

Reach	River Sta	Q Total (cfs)	FP W.S. Elev (ft)	FW W.S. Elev (ft)
Hospital Wash	0.343	500	2077.26	2077.79
Hospital Wash	0.270	500	2073.98	2073.98
Hospital Wash	0.215	500	2071.38	2071.38
Hospital Wash	0.153	500	2070.43	2070.44
Sols Wash Main	0.822	14459	2074.79	2074.80

Rose Ln

Villa Sereno Dr

Palm Ln

Tegner St

0.343

0.270

0.215

0.822

0.153

0.785

0.246

Floodplain Zone AE

Floodway

Floodplain/Floodway

Zone AO1

Floodway

Floodplain/Floodway Zone AE

Hospital Wash

Sols Wash

2100

2095

2090

2085

2080

2075

2070

2065

Delineation along Hospital Wash superseded. See "Hospital Wash Flood Delineation Study" work map sheet 1 of 3.

Matchline Sheet 7

Matchline Sheet 3

Matchline Sheet 5

Matchline Sheet 2

N

Scale: 1" = 60'
Contour Interval = 5'

60 0 60 120 Feet

Legend

- Cross Section
- Hydraulic Baseline
- Existing Elevation Contour (5' Interval)
- Proposed Elevation Contour (1' Interval)
- Township Boundary
- Section Boundary
- New 1% Annual Chance of Flood Hazard Boundary
- New Floodway
- Effective Floodplain
- Effective Floodway
- Floodplain from West CLOMR
- Highway
- Local Road
- Railroad
- 1.862 River Mile
- Flood Control ROW

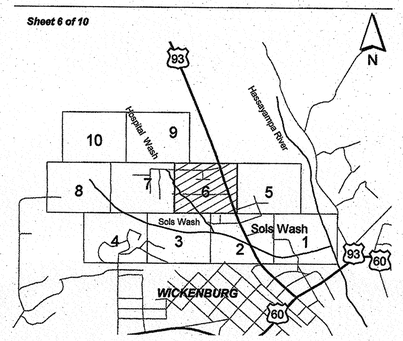
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NAVD88

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS OTHERWISE NOTED
2. SEE ADOT GRADING PLANS FOR WICKENBURG BYPASS [093-B-(008)] DETAILED INFORMATION.

Sheet 6 of 10



No.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SOLS WASH CLOMR

FCD Contract No. FCD2005C006

Registered Professional Engineer CERTIFICATE NO. 37890 LLOYD A. VICK Date Signed: 2/25/08 ARIZONA, U.S.A.

eec Engineering and Environmental Consultants, Inc.

	BY	DATE
DESIGN	CTG	06 - 07
DESIGN CHK	LAV	06 - 07
PLANS	ESM	06 - 07
PLANS CHK	LAV	06 - 07

SHEET 6 OF 10

Matchline Sheet 10

Matchline Sheet 9

Matchline Sheet 8

Matchline Sheet 6

Matchline Sheet 4

Matchline Sheet 3

Scale: 1" = 60'
Contour Interval = 5'
60 0 60 120 Feet

N

T7N R5W

Reach	River Sta	Q Total (cfs)	FP W.S. Elev (ft)	FW W.S. Elev (ft)
Hospital Wash	0.458	500	2085.82	2085.88
Hospital Wash	0.388	500	2079.14	2079.59
Hospital Wash	0.343	500	2077.26	2077.79
Sols Wash Main	1.224	14459	2092.89	2092.89
Sols Wash Main	1.141	14459	2089.09	2089.09
Sols Wash Main	1.081	14459	2086.48	2086.47
Sols Wash Main	1.021	14459	2083.09	2083.09
Sols Wash Main	0.955	14459	2079.85	2079.85
Sols Wash Main	0.886	14459	2076.77	2076.77

Delineation along Hospital Wash superseded. See "Hospital Wash Flood Delineation Study" work map sheets 1 and 2 of 3.

Floodplain Zone AE

Floodplain Zone AE

Floodplain Zone AE

Floodway

Rose Ln

Sunflower Ave

Poppy St

Oleander St

Hospital Wash

Floodplain/Floodway

Zone AE

Zone AE

Sols Wash

Begin Zone AO1

Zone AO1

1.224

1.141

1.081

1.021

0.955

0.886

0.458

0.388

0.343

2095 2090 2085 2080 2075 2070

Legend

- Cross Section
- Hydraulic Baseline
- Existing Elevation Contour (5' Interval)
- Proposed Elevation Contour (1' Interval)
- Township Boundary
- Section Boundary
- New 1% Annual Chance of Flood Hazard Boundary
- New Floodway
- Effective Floodplain
- Effective Floodway
- Floodplain from West CLOMR
- Highway
- Local Road
- Railroad
- 1.862 River Mile
- Flood Control ROW

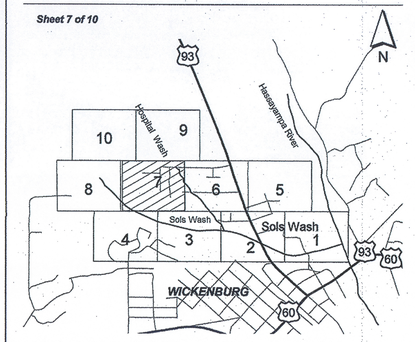
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NAVD88

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS OTHERWISE NOTED
2. SEE ADOT GRADING PLANS FOR WICKENBURG BYPASS [093-B-(008)] DETAILED INFORMATION.

Sheet 7 of 10



No.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SOLS WASH CLOMR

FCD Contract No. FCD2005C006

Registered Professional Engineer (Civil) CERTIFICATE NO. 37890 LLOYD A. VICK Date Signed 6/26/07 ARIZONA, U.S.A.

eec Engineering and Environmental Consultants, Inc.

	BY	DATE
DESIGN	CTG	06 - 07
DESIGN CHK	LAV	06 - 07
PLANS	ESM	06 - 07
PLANS CHK	LAV	06 - 07

SHEET 7 OF 10

Reach	River Sta	Q Total (cfs)	FP W.S. Elev (ft)	FW W.S. Elev (ft)
Sols Wash Main	1.319	14413	2098.62	2098.60
Sols Wash Main	1.224	14413	2092.89	2092.89

N

Scale: 1" = 60'
Contour Interval = 5'

60 0 60 120 Feet

T7N R5W

Matchline Sheet 10

Limit of Study

2100

2095

2090

2150

Existing Floodway
(not part of this study)

Existing Floodplain
(not part of this study)

Floodway

Zone AE

Burlington Northern Santa Fe Railroad

Sols Wash

Zone AE

2100

Floodplain

Floodplain/Floodway

EFFECTIVE CROSS SECTION M

1.319

1.224

Matchline Sheet 7

Matchline Sheet 4

Legend

- Cross Section
- Hydraulic Baseline
- Existing Elevation Contour (5' Interval)
- Proposed Elevation Contour (1' Interval)
- Township Boundary
- Section Boundary
- New 1% Annual Chance of Flood Hazard Boundary
- New Floodway
- Effective Floodplain
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- Floodplain from West CLOMR
- Highway
- Local Road
- Railroad
- 1.862 River Mile

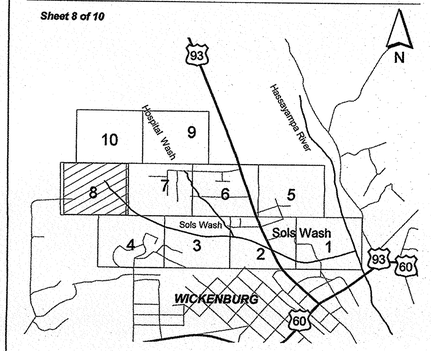
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NAVD88

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS OTHERWISE NOTED
2. SEE ADOT GRADING PLANS FOR WICKENBURG BYPASS [093-B-(008)] DETAILED INFORMATION.

Sheet 8 of 10



No.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

SOLS WASH CLOMR

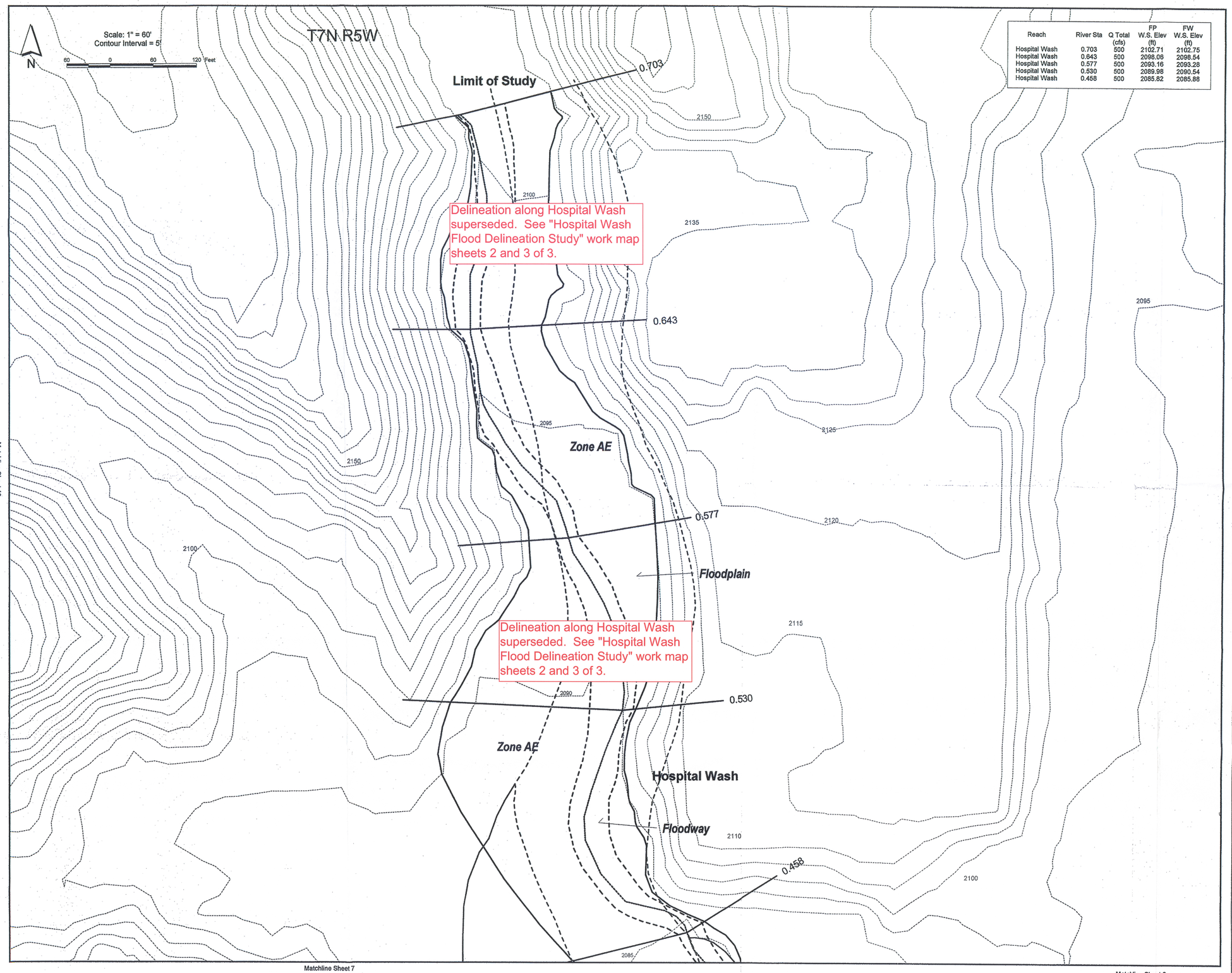
FCD Contract No. FCD2005C006

Registered Professional Engineer (Civil) CERTIFICATE NO. 37890 LLOYD A. VICK Date Signed 6-29-07 Arizona, U.S.A.

eec Engineering and Environmental Consultants, Inc.

	BY	DATE
DESIGN	CTG	06 - 07
DESIGN CHK	LAV	06 - 07
PLANS	ESM	06 - 07
PLANS CHK	LAV	06 - 07

SHEET 8 OF 10



Reach	River Sta	Q Total (cfs)	FP W.S. Elev (ft)	FW W.S. Elev (ft)
Hospital Wash	0.703	500	2102.71	2102.75
Hospital Wash	0.643	500	2098.06	2098.54
Hospital Wash	0.577	500	2093.16	2093.28
Hospital Wash	0.530	500	2089.98	2090.54
Hospital Wash	0.458	500	2085.82	2085.88

Legend

- Cross Section
- Hydraulic Baseline
- Existing Elevation Contour (5' Interval)
- Proposed Elevation Contour (1' Interval)
- Township Boundary
- Section Boundary
- New 1% Annual Chance of Flood Hazard Boundary
- New Floodway
- Effective Floodplain
- Effective Floodway
- Floodplain from West CLOMR
- Highway
- Local Road
- Railroad
- 1.862 River Mile

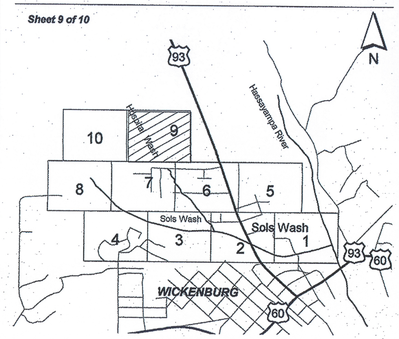
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NAVD88

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS OTHERWISE NOTED
2. SEE ADOT GRADING PLANS FOR WICKENBURG BYPASS [093-B-(008)] DETAILED INFORMATION.

Sheet 9 of 10



No.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SOLS WASH CLOMR

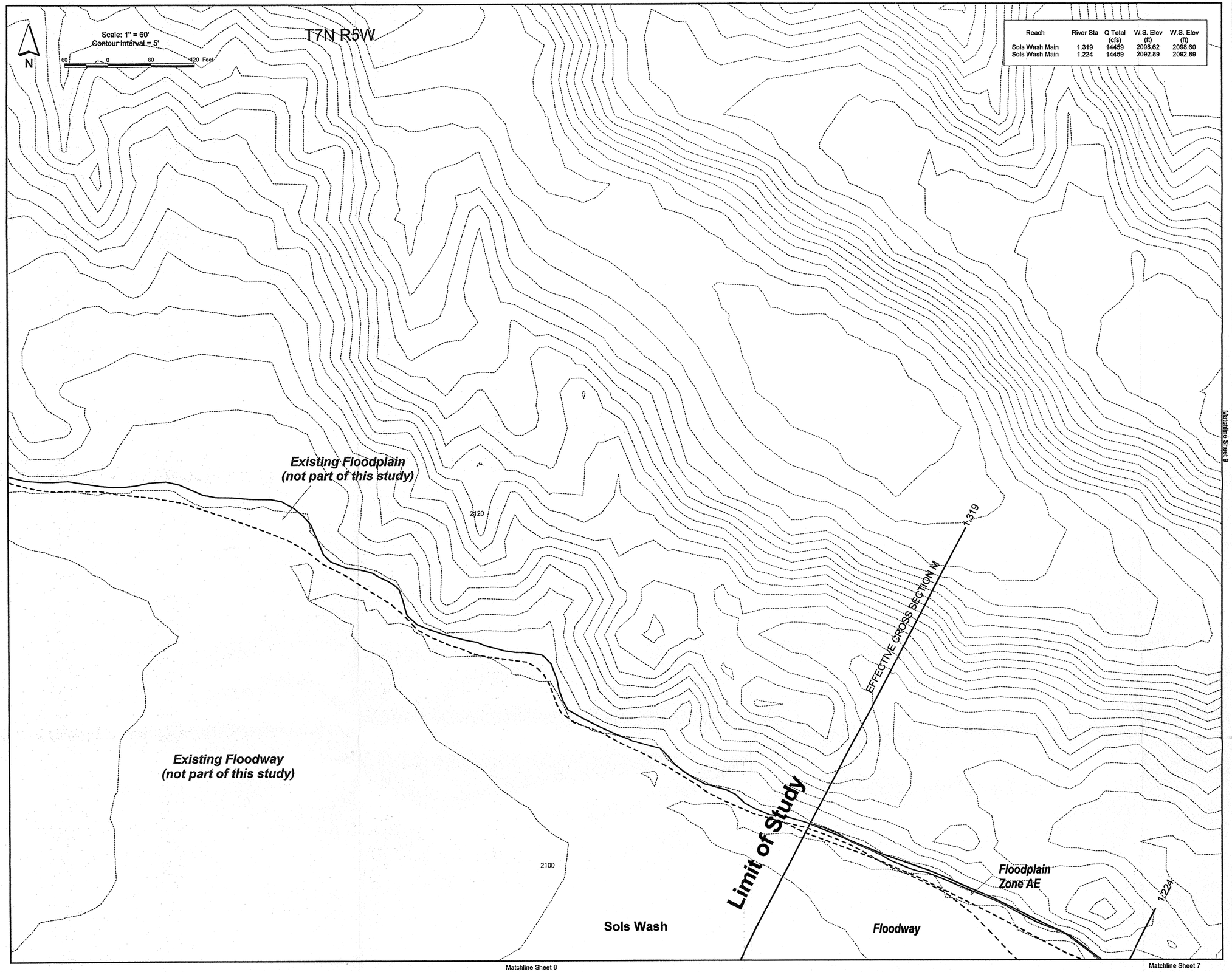
FCD Contract No. FCD2005C006

Registered Professional Engineer (Civil) CERTIFICATE NO. 37890 LLOYD A. VICK Date Signed 6-30-08 ARIZONA, U.S.A.

eec Engineering and Environmental Consultants, Inc.

	BY	DATE
DESIGN	CTG	06 - 07
DESIGN CHK	LAV	06 - 07
PLANS	ESM	06 - 07
PLANS CHK	LAV	06 - 07

SHEET 9 OF 10



Legend

- Cross Section
- Hydraulic Baseline
- Existing Elevation Contour (5' Interval)
- Proposed Elevation Contour (1' Interval)
- Township Boundary
- Section Boundary
- New 1% Annual Chance of Flood Hazard Boundary
- New Floodway
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- Effective Floodway
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- Local Road
- Railroad
- 1.862 River Mile

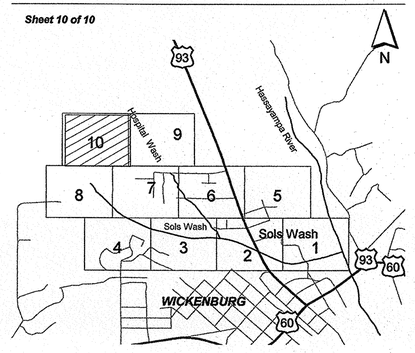
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NAVD88

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS OTHERWISE NOTED
2. SEE ADOT GRADING PLANS FOR WICKENBURG BYPASS [093-B-(008)] DETAILED INFORMATION.

Sheet 10 of 10



No.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

SOLS WASH CLOMR

FCD Contract No. FCD2005C006

Registered Professional Engineer (Civil) CERTIFICATE NO. 37890 LLOYD A. VICK Date Signed 12-20-07 ARIZONA U.S.A.

eec Engineering and Environmental Consultants, Inc.

	BY	DATE
DESIGN	CTG	06 - 07
DESIGN CHK	LAV	06 - 07
PLANS	ESM	06 - 07
PLANS CHK	LAV	06 - 07

SHEET 10 OF 10

Reach	River Sta	Q Total (cfs)	FLP W.S. Elev (ft)	FW W.S. Elev (ft)
Hospital Wash	0.343	500	2077.26	2077.79
Hospital Wash	0.270	500	2073.98	2073.98
Hospital Wash	0.215	500	2071.38	2071.38
Hospital Wash	0.153	500	2070.43	2070.44
Hospital Wash	0.097	500	2069.69	2069.69
Hospital Wash	0.083	500	2068.49	2068.49
Hospital Wash	0.081	500	2068.94	2068.94
Hospital Wash	0.074	500	2066.66	2066.66
Hospital Wash	0.070	500	2066.37	2066.37

MATCH LINE SHEET 2

LOMR FLOODPLAIN

LOMR FLOODPLAIN

HOSPITAL WASH

EFFECTIVE FLOODPLAIN

EFFECTIVE FLOODWAY

EFFECTIVE FLOODWAY

LOMR FLOODPLAIN

LOMR FLOODWAY

EFFECTIVE FLOODPLAIN

LOMR FLOODPLAIN

LOMR FLOODPLAIN

EFFECTIVE FLOODWAY

LOMR FLOODPLAIN

ZONE AE

HOSPITAL WASH

LOMR FLOODPLAIN

SOLS WASH

SOLS WASH

0.343

0.270

0.215

0.153

0.125

0.125

0.097

0.083

0.081

0.074

0.070

2091.5

2087.2

2077.2

2077.3

2068.9

2066.4

2070.5

2069.7

2090

2080

2070

PALM DR

PALM DR

HWY US 93

TEGNER ST

CAVANESS AVE

SEE "SOLS WASH CLOMR" MAPS (DATED 6/20/07) FOR FLOODPLAIN/ FLOODWAY DATA ALONG SOLS WASH

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS - AERIAL MAPPING BY: STEWART GEO TECHNOLOGIES

GROUND CONTROL SURVEY DATA PROVIDED BY: BRADY AULERICH & ASSOC.

LEGEND

- LOMR 100-YR FLOODPLAIN BOUNDARY
- LOMR FLOODWAY BOUNDARY
- HYDRAULIC BASE LINE WITH RIVER MILE (0.13 — 0.50)
- CROSS SECTION

ZONE DESIGNATIONS — ZONE AE

ELEVATION REFERENCE MARKS

1- ALL ELEVATIONS ARE BASED ON NAVD88

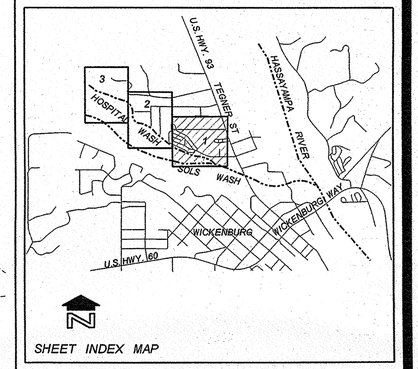
NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2- SEE "SOLS WASH CLOMR" MAPS (DATED 6/20/07) FOR FLOODPLAIN/FLOODWAY DATA ALONG SOLS WASH

60' 0' 60' 120'

SCALE: 1" = 60 FEET
CONTOUR INTERVAL = 2 FEET



SHEET INDEX MAP

NO.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

HOSPITAL WASH FLOOD DELINEATION STUDY

Professional Engineer (Civil) CERTIFICATE NO. 27883 CATHERINE WEDIG REGESTER 11 Registered 1/31/11 Expires 9/30/11

FLOOD CONTROL DISTRICT

	BY	DATE
DESIGN	EEC, Inc	06/07
DESIGN CHK.	CWR	8/27/10
PLANS	FDK	8/25/10
PLANS CHK.	CWR	8/26/10

SHEET 1 OF 3

Reach	River Sta	Q Total (cfs)	FLP W.S. Elev (ft)	FW W.S. Elev (ft)
Hospital Wash	0.577	500	2093.16	2093.28
Hospital Wash	0.530	500	2089.98	2090.54
Hospital Wash	0.458	500	2085.82	2085.88
Hospital Wash	0.388	500	2079.14	2079.59

LEGEND

- LOMR 100-YR FLOODPLAIN BOUNDARY
- LOMR FLOODWAY BOUNDARY
- HYDRAULIC BASE LINE WITH RIVER MILE (0.13 — 0.50)
- CROSS SECTION

ZONE DESIGNATIONS — ZONE AE

ELEVATION REFERENCE MARKS

1- ALL ELEVATIONS ARE BASED ON NAVD88

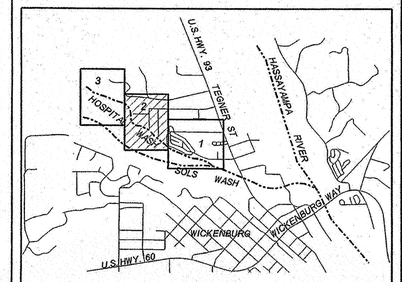
NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2- SEE "SOLS WASH CLOMR" MAPS (DATED 6/20/07) FOR FLOODPLAIN/FLOODWAY DATA ALONG SOLS WASH

60' 0' 60' 120'

SCALE: 1" = 60 FEET
CONTOUR INTERVAL = 2 FEET



SHEET INDEX MAP

NO.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

HOSPITAL WASH FLOOD DELINEATION STUDY

Professional Engineer Certificate No. 37683 Catherine Wedig Registered Arizona Engineer — Expires 9/30/11

FLOOD CONTROL DISTRICT

	BY	DATE
DESIGN	EEC, Inc	06/07
DESIGN CHK.	CWR	8/27/10
PLANS	FDK	8/25/10
PLANS CHK.	CWR	8/26/10

SHEET 2 OF 3

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2'CONTOUR INTERVALS - AERIAL MAPPING BY: STEWART GEO TECHNOLOGIES

GROUND CONTROL SURVEY DATA PROVIDED BY: BRADY AULERICH & ASSOC.

Reach	River Sta	Q Total (cfs)	FLP W.S. Elev (ft)	FW W.S. Elev (ft)
Hospital Wash	0.703	500	2102.71	2102.75
Hospital Wash	0.643	500	2098.06	2098.54

LEGEND

LOMR 100-YR FLOODPLAIN BOUNDARY	———
LOMR FLOODWAY BOUNDARY	- - - - -
HYDRAULIC BASE LINE WITH RIVER MILE	0.13 … 0.50
CROSS SECTION	━━━
ZONE DESIGNATIONS	ZONE AE

ELEVATION REFERENCE MARKS

1- ALL ELEVATIONS ARE BASED ON NAVD88

NOTES

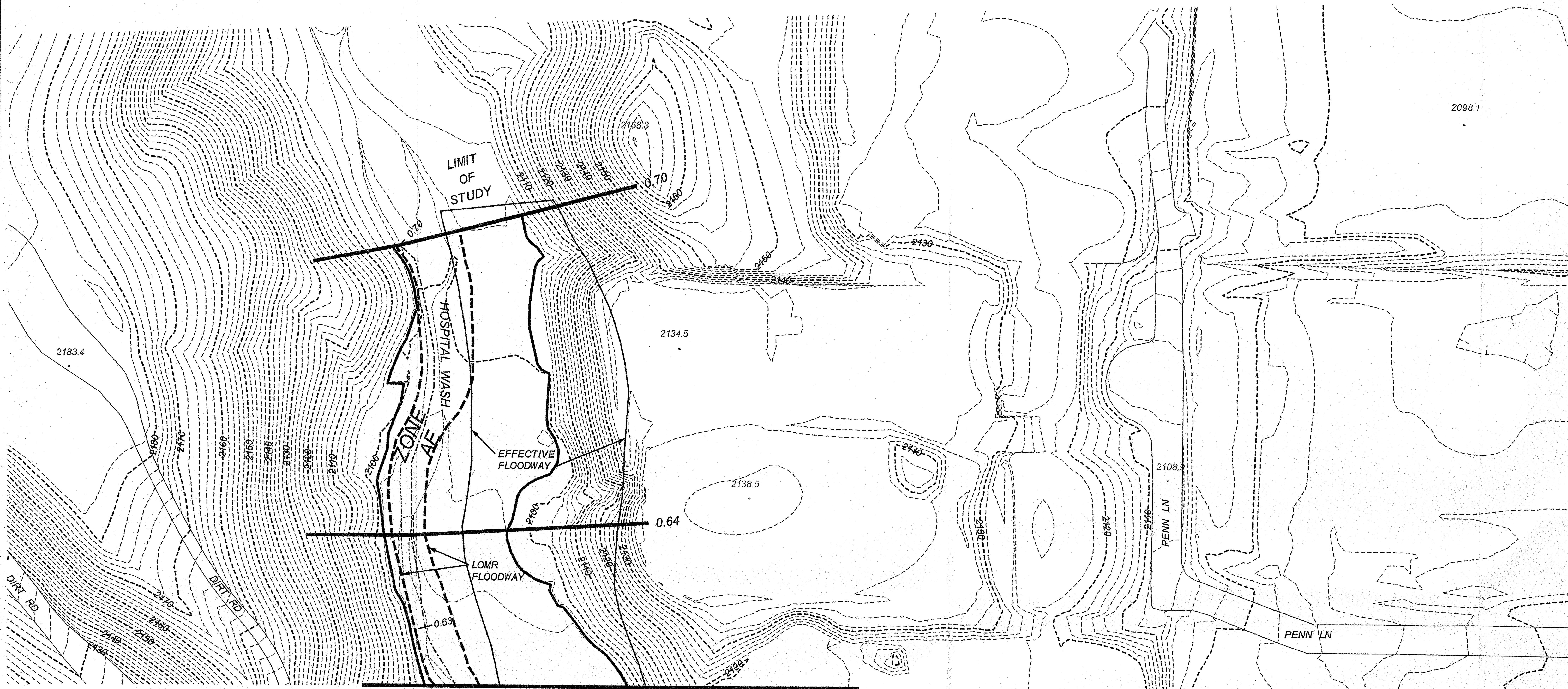
1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

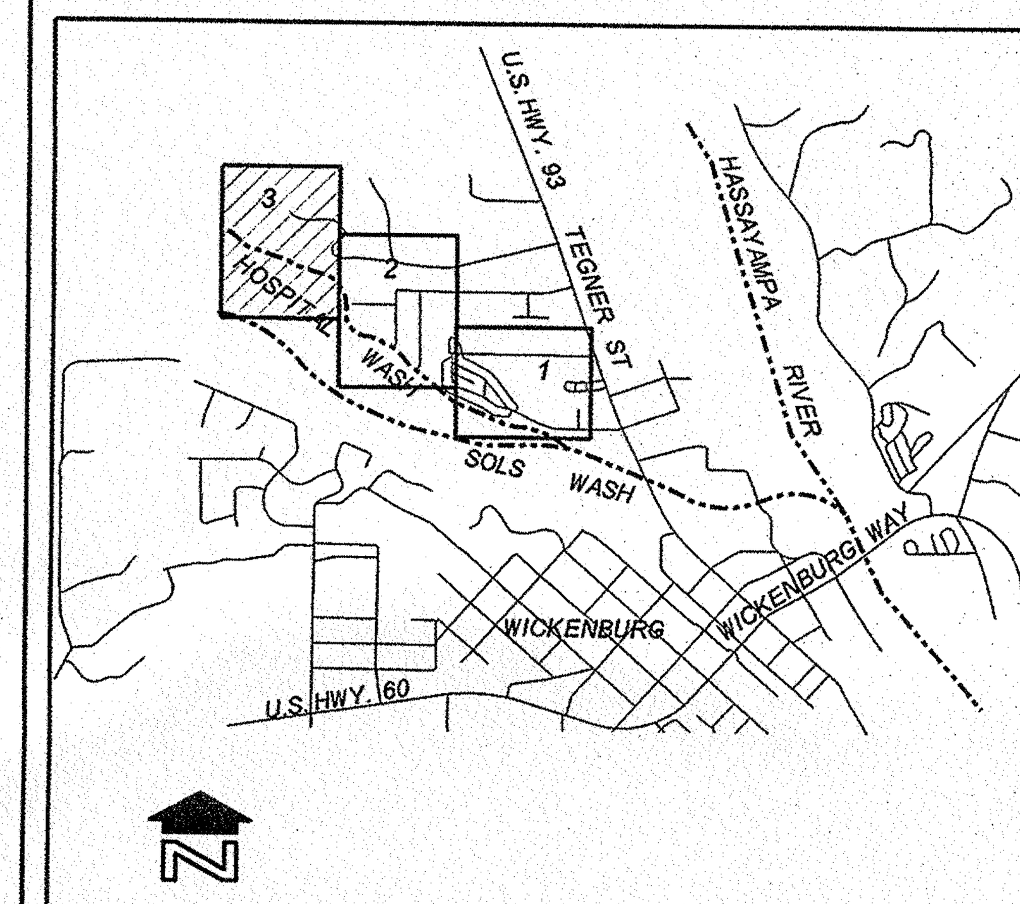
2- SEE "SOLS WASH CLOMR" MAPS (DATED 6/20/07) FOR FLOODPLAIN/FLOODWAY DATA ALONG SOLS WASH

N

60' 0' 60' 120'

SCALE: 1" = 60 FEET
CONTOUR INTERVAL = 2 FEET





SHEET INDEX MAP

NO.	REVISION	BY	DATE
2			
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

HOSPITAL WASH FLOOD DELINEATION STUDY

Registered Professional Engineer — CERTIFICATE NO. 37883 — CATHERINE WEDIG — REGESTER — ARIZONA, U.S.A. — EXPIRES 9/30/11

FLOOD CONTROL DISTRICT

	BY	DATE
DESIGN	EEC, Inc	06/07
DESIGN CHK.	CWR	8/27/10
PLANS	FDK	8/25/10
PLANS CHK.	CWR	8/26/10

SHEET 3 OF 3

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS - AERIAL MAPPING BY: STEWART GEO TECHNOLOGIES

GROUND CONTROL SURVEY DATA PROVIDED BY: BRADY AULERICH & ASSOC.

Wickenburg Downtown Flooding Hazard Mitigation Project
(Sols Wash and Hospital Wash)

This CD contains materials previously submitted for a CLOMR under FEMA Case No. 07-09-0738R; and, new materials submitted in support of a LOMR.

CLOMR: Two (2) submittals were made by the Flood Control District of Maricopa County (the District) in support of a CLOMR. The initial submittal was made January 30, 2007. A folder ("CLOMR 2007 0130 Submittal") has been provided on this CD containing the information submitted on that date. In response to FEMA review comments pertaining to the Jan. 30, 2007 submittal, a second submittal was made on May 5, 2007. A response to FEMA comments was provided at that time with additional information as appropriate. A folder ("CLOMR 2007 0505 Submittal") containing the information submitted at that time is also provided on this CD. FEMA issued the CLOMR on October 5, 2007 following the review of the District's second submittal. PDFs of the CLOMRs are provided in the folder "FEMA CLOMR Letters".

LOMR: Six (6) folders are contained within the "LOMR" folder on this CD. There content is as follows:

1) *Annotated FIRM Panel & Digital Files*: PDF of the annotated FIRM panel. Digital (shape) files of the floodplain/floodway limits, cross section locations, and the baselines for Sols, Hospital, and Casandro Washes.

2) *As-Built Plans*: PDF of the As-Built Plan set.

3) *Final LOMR Calculations*: DDMSW and HEC-1 files for Hospital Wash reviewed and approved by FEMA under the CLOMR. And, HEC-RAS files for both Hospital and Sols Washes. The names of the HEC-RAS files have been changed since the issuance of the CLOMR to distinguish these as the LOMR. However, no changes have been made to the data contained in these files. All contain the same data as those submitted for the CLOMR.

4) *LOMR Work Maps*: The work maps for Sols Wash remain the same as submitted for the CLOMR. For Hospital Wash, the work maps have been revised between cross sections to better match the contours of the final topographic mapping. The floodplain for Casandro Wash (south of Sols Wash) was modified on work map sheet 2A to match the as-built conditions.

5) *Operations & Maintenance*: PDF of the Intergovernmental Agreement (IGA) between the Town of Wickenburg and the District. Section 14 7 of the IGA addresses O&M responsibilities. A PDF of the O&M Plan submitted with the CLOMR is also included in this folder.

6) *Public Notification*: Legal notice for the floodway revision was placed in two (2) newspapers. Scanned copies of the Affidavits of Publications are included. The four (4) templates of letters notifying landowners of increases in BFEs are included.