FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

GILA BEND AREA DRAINAGE MASTER PLAN

Floodplain Delineation Study

August, 2003

Appendix E-F

Book 3 of 3

Engineering and Environmental Consultants, Inc.

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GILA BEND AREA DRAINAGE MASTER PLAN
FLOODPLAIN DELINEATION STUDY
FCD 99-18

TECHNICAL DATA NOTEBOOK

Appendices E & F

Book 3 of 3

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August 2003

TECHNICAL DATA NOTEBOOK
HYDRAULICS
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Appendix E

HYDRAULIC ANALYSIS SUPPORTING DOCUMENTATION

Appendix E.1

ROUGHNESS COEFFICIENT ESTIMATION

APPENDIX E.1.: ROUGHNESS COEFFICIENT ESTIMATION

The Manning's "n" value estimation is based upon an weighted average flow area method adopted by the Flood Control District of Maricopa County. This method is presented in a report by the U.S. Geological Survey entitled "Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona".

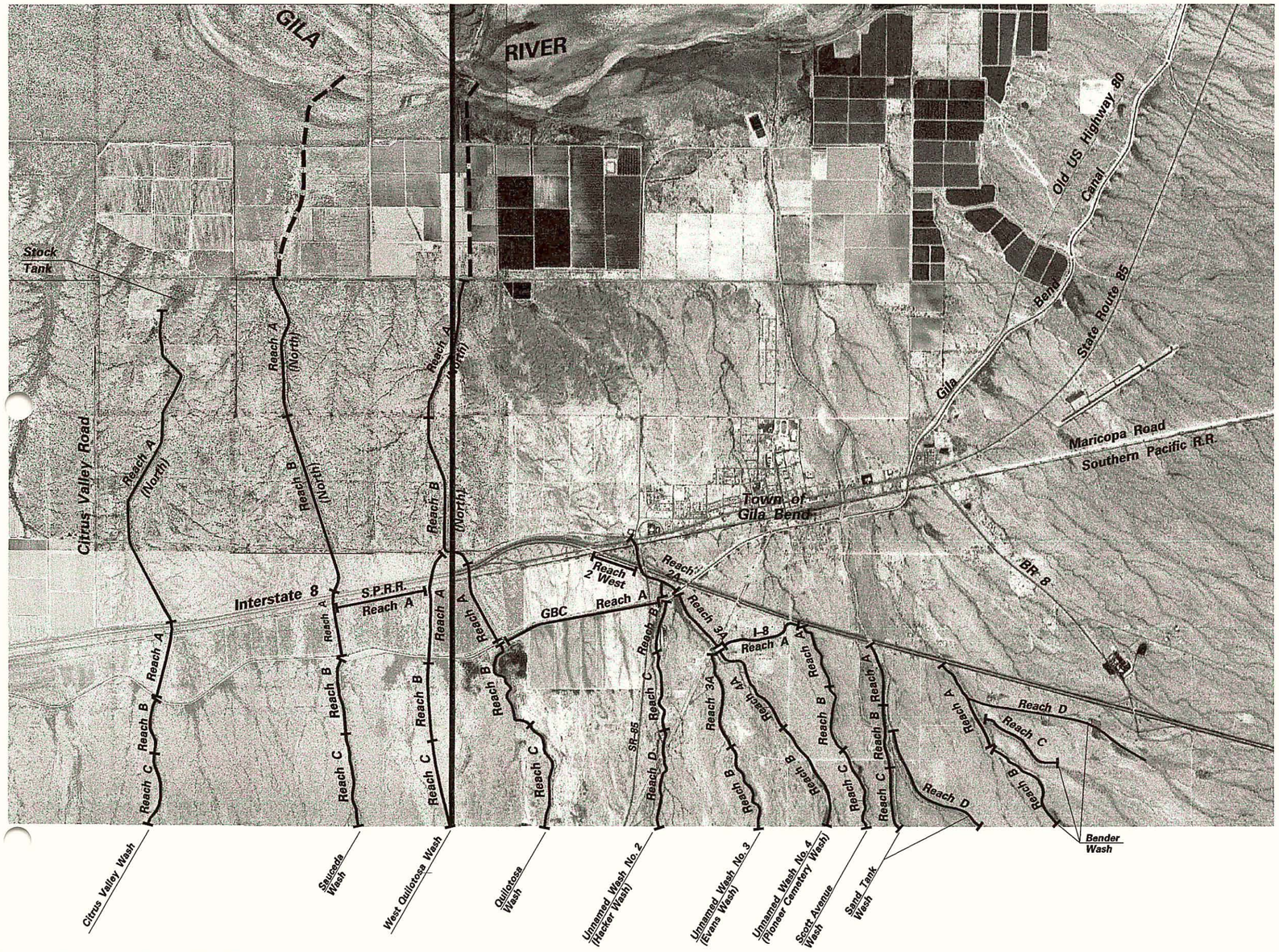
After review of the draft report the FCD requested that the "n" values be adjusted as follows:

1. If the "n" value is under 0.030 then it is not changed
2. If the "n" value is over 0.030 then it is to be rounded off to the nearest 0.005

The values which can be found in the following tables show the base "n" value developed for each reach. The values in the HEC-RAS hydraulic models have been adjusted per number 2 above.

GILA BEND
Area Drainage Master Plan

Manning's n-Value Report
Reach Identification Map



LEGEND

—|—	WASH & REACH IDENTIFICATION
Reach A	REACH IDENTIFICATION
(Hacker Wash)	PROPOSED NEW NAME

N

0 1000 2000 4000 8000

SCALE: 1" = 2,000'

Unnamed Wash No. 1
(North of I-8)
Reach A

Main Wash - Bed Material

Main Wash - Looking Downstream

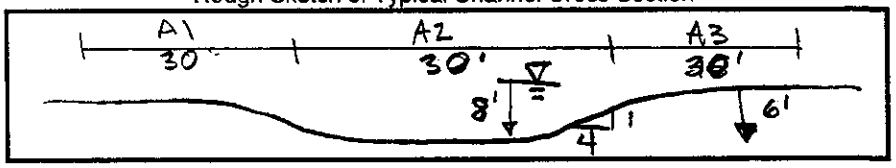
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Citrus Valley Wash (North) Reach A**
Photograph No.: 6-(18-21), Misc. Supplemental Photos:
Section Description: Channel consists of gravel, L & ROB's are firm soil
CH vegetation of grass and small and medium brush,
LOB and ROB are vegetated with grass

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					108	240	108	
% [decimal]					0.24	0.53	0.24	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.029	0.028		0.028	0.029
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.030		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.004		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.001	0.000	0.000	0.000	0.002
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.006		0.004		0.005
	Medium		0.01-0.025		0.015		0.010	
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.047	0.034	0.041	
x (% of Area)					0.011	0.018	0.010	
Sum (left, right,center)						0.039		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.036		0.039		0.036

Unnamed Wash No. 1
Reach A

Main Wash - Bed Material

Main Wash - Looking Downstream

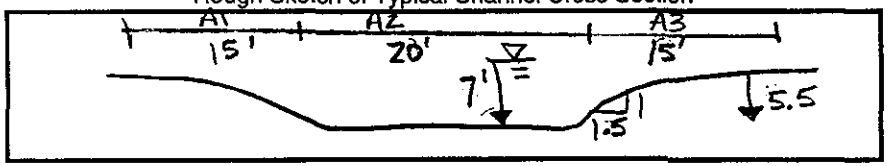
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Citrus Valley Wash Reach A**
Photograph No.: 2-(17-20), Misc. Supplemental Photos:
Section Description: Channel consists of gravel w/ some cobbles, L & R are firm soil, CH vegetation of grass and small brush, LOB and ROB are vegetated with grass

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					68	140	68	
% [decimal]					0.25	0.51	0.25	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.030	0.030		0.030	0.030
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.033		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.002		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.002	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.002		0.010		0.002
	Medium		0.01-0.025		0.010		0.015	
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.042	0.043	0.048	
x (% of Area)					0.010	0.022	0.012	
Sum (left, right,center)						0.044		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.034		0.044		0.032

Unnamed Wash No. 1
Reach B

Main Wash - Bed Material

Main Wash - Looking Downstream

Left Overbank - Looking Downstream

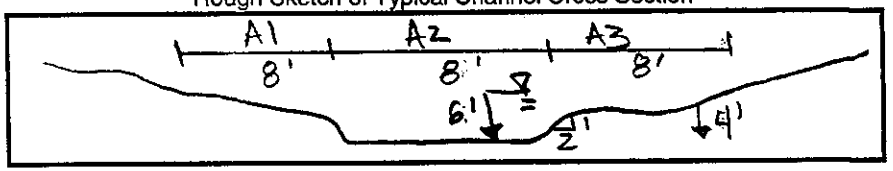
Right Overbank - Looking Downstream

Left Overbank - Looking Downstream (upper bench)

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan (FCD 99-18)**
Stream: **Citrus Valley Wash Reach B**
Photograph No.: 2-(13-16), Misc. Supplemental Photos: 2-12
Section Description: Channel consists of gravel, L & ROB's are firm soil
CH vegetation of grass and small and medium brush,
LOB and ROB are vegetated with medium brush
ROB is vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					24	48	24	
% [decimal]					0.25	0.50	0.25	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.030	0.030		0.030	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.032		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000			0.000		
	Minor		0.001-0.005	0.001	0.004			0.001
	Moderate		0.006-0.010				0.007	
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004		0.004	0.004	0.004	0.000
	Minor		0.005-0.015	0.005				
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0.000		
	Medium		0.01-0.025	0.012				0.010
	Large		0.025-0.050		0.025		0.025	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.063	0.036	0.066	
x (% of Area)					0.016	0.018	0.017	
Sum (left, right,center)						0.050		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.048		0.050		0.039

Unnamed Wash No. 1
Reach C

Main Wash - Bed Material

Main Wash - Looking Downstream

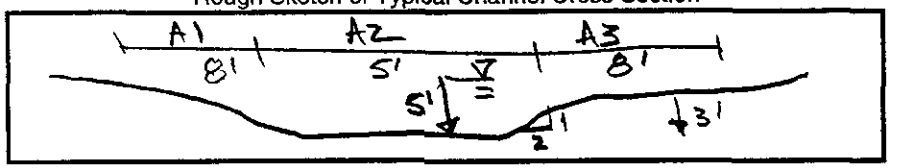
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Citrus Valley Wash Reach C**
Photograph No.: 2-(8-11), Misc. Supplemental Photos:
Section Description: CH consists of coarse sand, L & ROB's are firm soil
CH vegetation of grass and small and medium brush,
LOB and ROB are vegetated with grass and small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					25	25	25	
% [decimal]					0.33	0.33	0.33	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.027	0.026		0.027	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.028		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.004		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.002	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.008		0.000		0.005
	Medium		0.01-0.025					
	Large		0.025-0.050		0.025		0.030	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000		0.000	0.000	0.000	
	Alternating (occasionally)		0.001-0.005	0.002				0.002
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.055	0.028	0.060	
x (% of Area)					0.018	0.009	0.020	
Sum (left, right,center)						0.048		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.039		0.048		0.035

Sauceda Wash (North of I-8)
Reach A

Main Wash - Bed Material

Main Wash - Looking Downstream

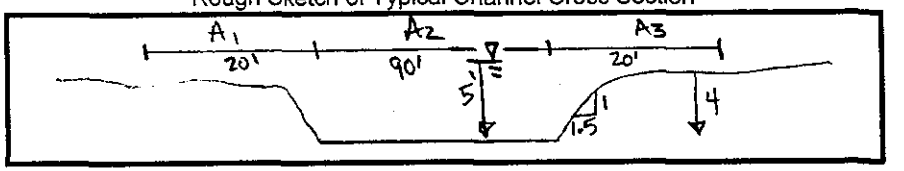
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

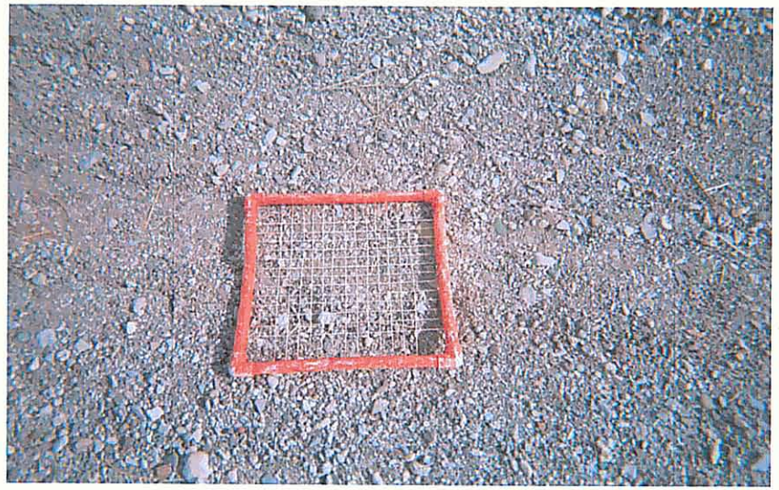
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Sauceda Wash (North) Reach A**
Photograph No.: 6-(13,15-17), Misc. Supplemental Photos:
Section Description: CH consists of gravel, L & ROB's are firm soil
CH vegetation of grass and small and medium brush, w/ a few trees, LOB and ROB is vegetated with small and medium brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					32	450	32	
% [decimal]					0.06	0.88	0.06	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.027	0.027		0.027	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.031		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.003		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.008		0.000		0.006
	Medium		0.01-0.025					
	Large		0.025-0.050		0.060		0.050	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000		0.000	0.000	0.000	
	Alternating (occasionally)		0.001-0.005	0.002				0.002
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.090	0.031	0.080	
x (% of Area)					0.006	0.027	0.005	
Sum (left, right,center)						0.038		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.037		0.038		0.036

Sauceda Wash (North of I-8)
Reach B



Main Wash - Bed Material

Main Wash - Looking Downstream

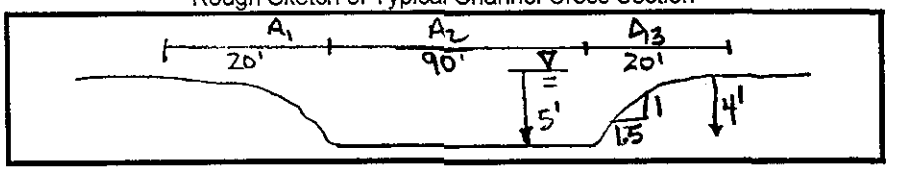
Left Overbank - Looking Upstream

Right Overbank - Looking Upstream

Determination of Manning's Roughness Coefficients by FCDMC Method

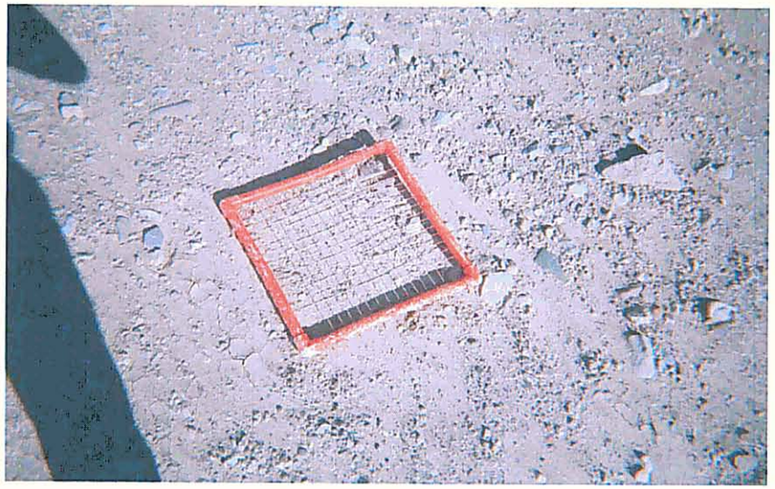
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Sauceda Wash (North) Reach B**
Photograph No.: 6-(12,14,16-17), Misc. Supplemental Photos:
Section Description: CH consists of gravel, L & ROB's are firm soil
CH vegetation of grass and small brush,
LOB and ROB are vegetated with grass and small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					32	450	32	
% [decimal]					0.06	0.88	0.06	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.027	0.027		0.027	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.031		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.005		0.005	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.005		0.000		0.004
	Medium		0.01-0.025					
	Large		0.025-0.050		0.050		0.050	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.082	0.031	0.082	
x (% of Area)					0.005	0.027	0.005	
Sum (left, right,center)						0.037		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.032		0.037		0.032

Sauceda Wash
Reach A



Main Wash - Bed Material

Main Wash - Looking Downstream

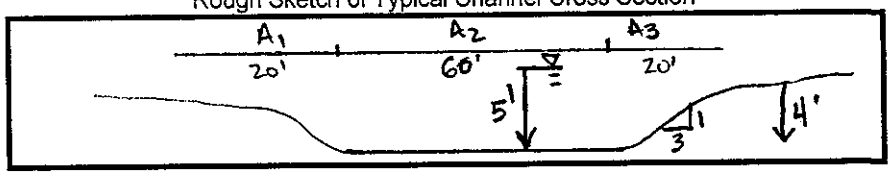
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

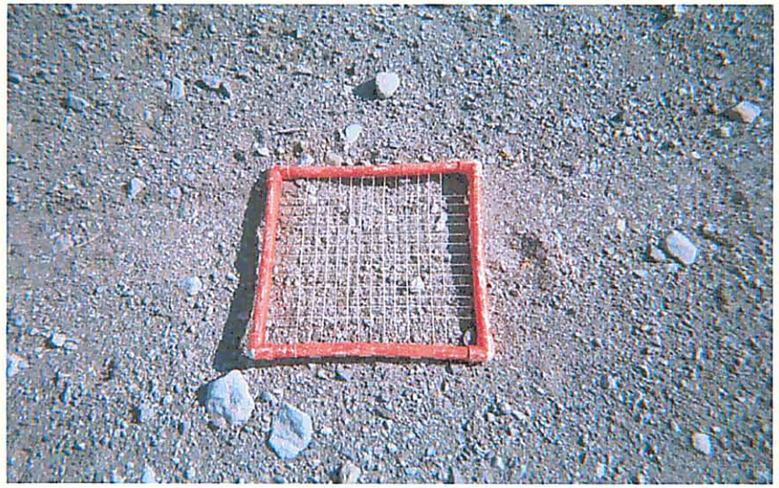
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Sauceda Wash Reach A**
Photograph No.: 2-(4-7), Misc. Supplemental Photos:
Section Description: CH consists of gravel w/cobbles, L & ROB's are firm soil
CH vegetation of small and medium brush w/ few trees,
LOB is vegetated with grass and small brush
ROB is barren

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					44	300	44	
% [decimal]					0.11	0.77	0.11	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.027		0.027	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.035		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.005		0.004	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.002	0.000	0.000	0.000	0.002
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.006		0.000		0.000
	Medium		0.01-0.025					
	Large		0.025-0.050		0.075		0.075	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.107	0.035	0.106	
x (% of Area)					0.012	0.027	0.012	
Sum (left, right,center)						0.051		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.036		0.051		0.030

Sauceda Wash
Reach B



Main Wash - Bed Material

Main Wash - Looking Downstream

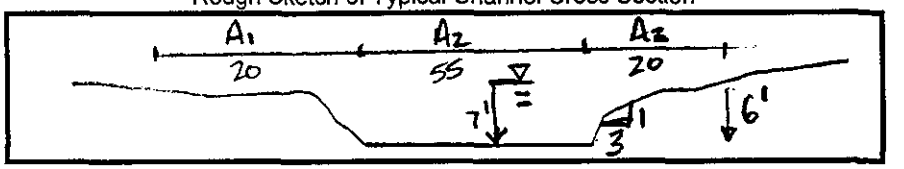
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

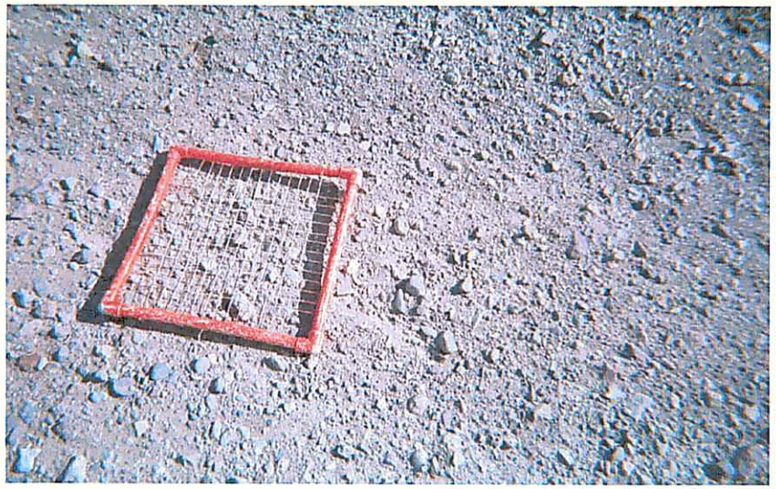
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Sauceda Wash Reach B**
Photograph No.: 2-(1-3), 3-27, Misc. Supplemental Photos:
Section Description: CH consists of gravel, L & ROB's are firm soil
CH vegetation of small and medium brush w/ few trees
LOB is vegetated with grass and small brush
ROB is vegetated with grass

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					74	385	74	
% [decimal]					0.14	0.72	0.14	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.030	0.028		0.028	0.030
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.031		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.004		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.003	0.000	0.000	0.000	0.002
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0.000		
	Medium		0.01-0.025	0.010				0.012
	Large		0.025-0.050		0.075		0.075	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000		0.000	0.000	0.000	
	Alternating (occasionally)		0.001-0.005	0.002				0.002
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.107	0.031	0.106	
x (% of Area)					0.015	0.022	0.015	
Sum (left, right,center)						0.052		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.045		0.052		0.046

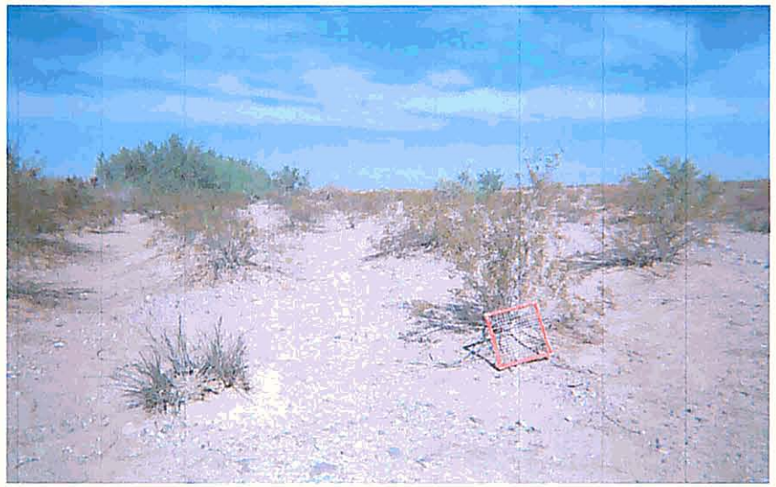
Sauceda Wash
Reach C



Main Wash - Bed Material

Main Wash - Looking Downstream

Left Overbank - Looking Downstream

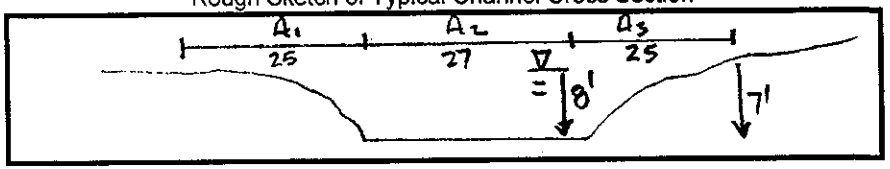


Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Sauceda Wash Reach C**
Photograph No.: 3-(23-26), Misc. Supplemental Photos:
Section Description: CH consists of gravel, L & ROB's are firm soil w/cobbles
CH vegetation of small and medium brush w/ few trees
LOB is vegetated with grass and small brush
ROB is vegetated with grass and small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					99	216	99	
% [decimal]					0.24	0.52	0.24	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.030	0.028		0.028	0.032
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.032		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.005			
	Moderate		0.006-0.010				0.008	
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.003		0.003	0.000
	Minor		0.005-0.015			0.010		
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.005		0.000		0.010
	Medium		0.01-0.025					
	Large		0.025-0.050		0.050		0.040	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.086	0.042	0.079	
x (% of Area)					0.021	0.022	0.019	
Sum (left, right,center)						0.061		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.035		0.061		0.042

Southern Pacific Railroad
Reach A

Main Wash - Bed Mateial

Main Wash - Looking Downstream

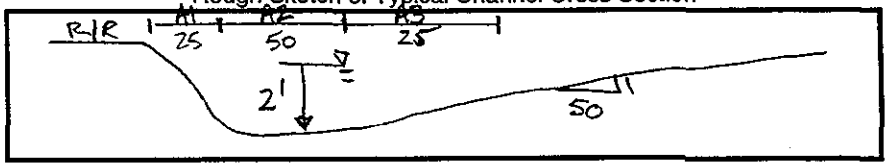
Left Overbank - N/A

Right Overbank - Looking Upstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Southern Pacific Railroad Reach A**
Photograph No.: 7-(22,14-15)
Section Description: CH & ROB are firm soil
CH vegetation of small brush
ROB is vegetated with grass and small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					40	100	40	
% [decimal]					0.22	0.56	0.22	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032		0.032	0.032	0.032	0.030
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000					0.000
	Minor		0.001-0.005		0.002	0.002	0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010					0.005
	Medium		0.01-0.025		0.010	0.010	0.010	
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.044	0.044	0.044	
x (% of Area)					0.010	0.024	0.010	
Sum (left, right,center)						0.044		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.000		0.044		0.035

Unnamed Wash No. 6
Reach A

Main Channel - Bed Material

Main Channel - Looking Downstream

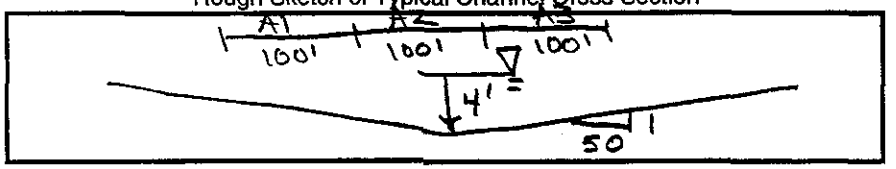
Left Overbank

Right Overbank

Determination of Manning's Roughness Coefficients by FCDMC Method

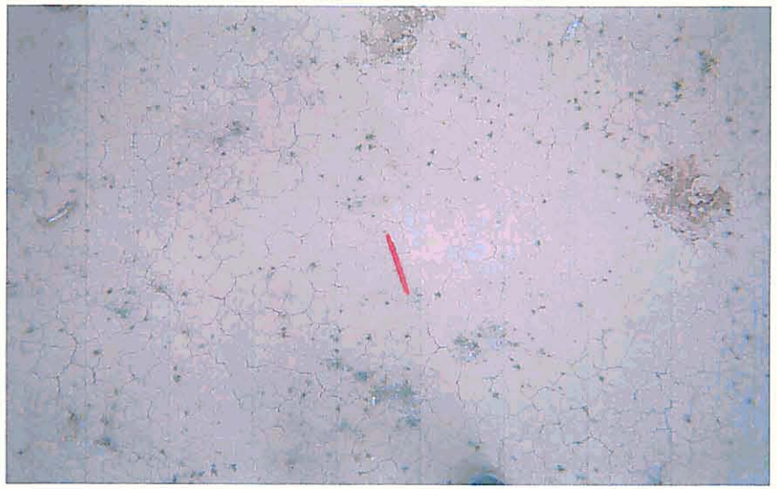
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **West Quilotosa Wash Reach A**
Photograph No.:
Section Description: CH consists of firm soil w/gravel
L & ROB are firm soil
Ch vegetation is grass with few small brush
L & ROB vegetation is grass w/small and med. brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					300	400	300	
% [decimal]					0.30	0.40	0.30	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.028	0.028	0.028	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000	0.000	0.000	0.000	0.000
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004		0.002	0.002	0.003	
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.005				0.007
	Medium		0.01-0.025		0.015	0.015	0.015	
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.045	0.045	0.046	
x (% of Area)					0.014	0.018	0.014	
Sum (left, right,center)						0.045		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.033		0.045		0.035

Unnamed Wash No. 6
Reach B



Main Channel - Bed Material

Main Channel - Looking Downstream

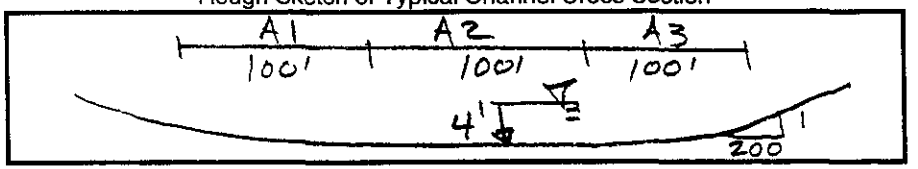
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficie by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** *(FCD 99-18)*
Stream: **West Quilotosa Wash Reach B**
Photograph No.: 8-(13-18)
Section Description: CH, L & ROB's are firm soil
CH vegetation of small & medium brush w/few trees,
LOB is vegetated with small and medium brush
ROB is vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					375	400	375	
% [decimal]					0.33	0.35	0.33	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.028	0.028	0.028	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000	0.000	0.000	0.000	0.000
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004		0.002	0.002	0.002	
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010					
	Medium		0.01-0.025	0.010				0.013
	Large		0.025-0.050		0.025	0.025	0.025	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.055	0.055	0.055	
x (% of Area)					0.018	0.019	0.018	
Sum (left, right,center)						0.055		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.038		0.055		0.041

Unnamed Wash No. 6
Reach C

Main Wash - Bed Material

Main Wash - Looking Downstream

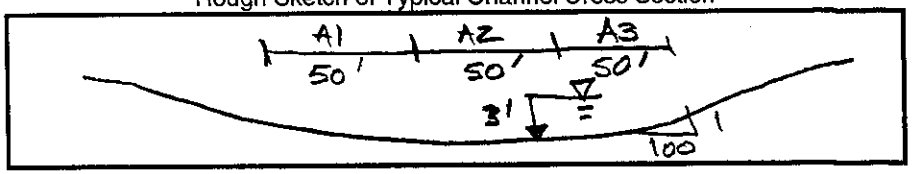
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

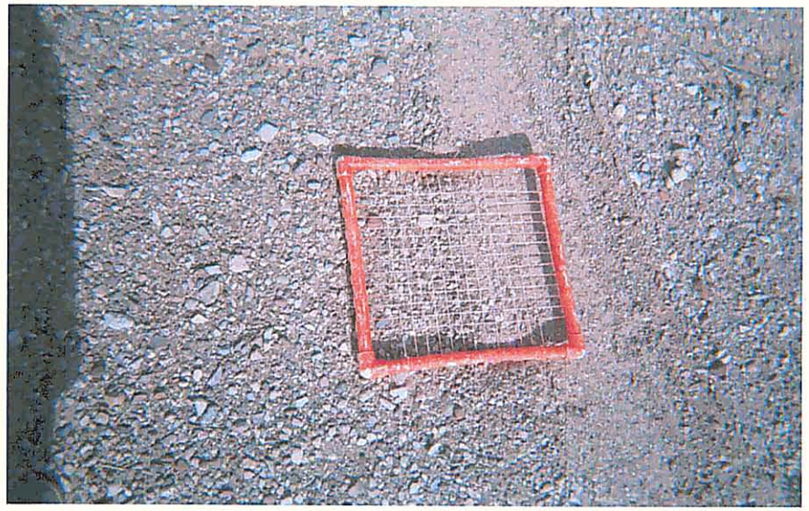
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **West Quilotosa Wash Reach C**
Photograph No.: 8-(9-12)
Section Description: CH, L & ROB's are firm soil
CH vegetation of small & medium brush w/few trees,
LOB is vegetated with small and medium brush
ROB is vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					125	150	125	
% [decimal]					0.31	0.38	0.31	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.028	0.028	0.028	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000	0.000	0.000	0.000	0.000
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.004	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.004				0.004
	Medium		0.01-0.025		0.025	0.020	0.025	
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.053	0.052	0.053	
x (% of Area)					0.017	0.020	0.017	
Sum (left, right,center)						0.053		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.032		0.053		0.032

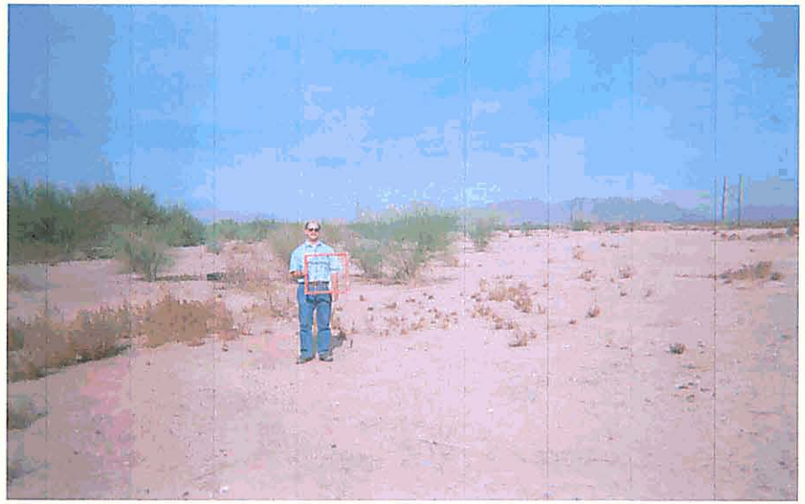
Quilotosa Wash (North of I-8)
Reach A



Main Wash - Bed Material

Main Wash - Looking Downstream

Left Overbank - Looking Downstream

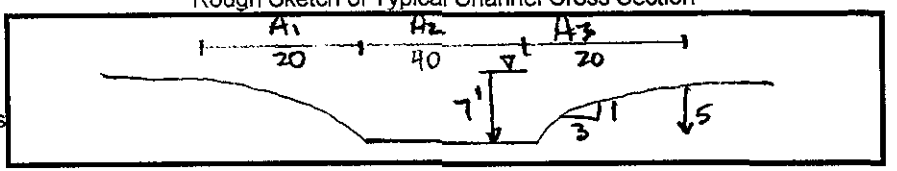


Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

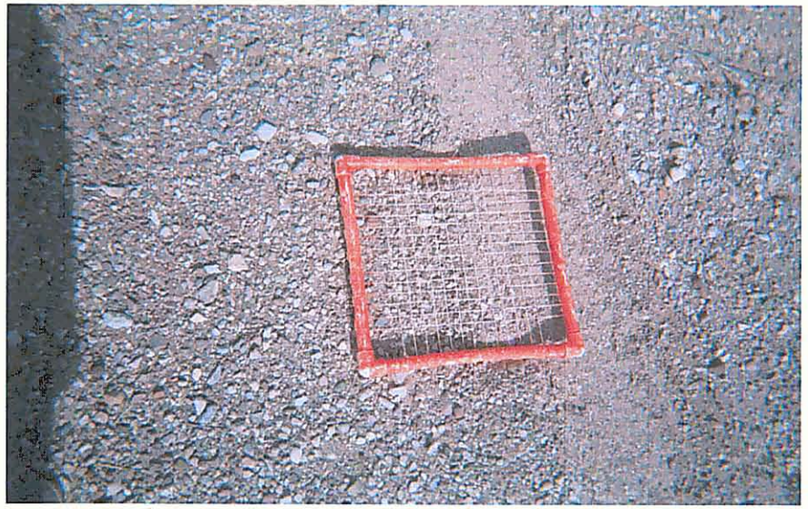
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Quilotosa Wash (North) Reach A**
Photograph No.: 6-(7,9-11), Misc. Supplemental Photos:
Section Description: CH consists of gravel, L & ROB's are firm soil
CH vegetation of grass,small & medium brush w/ few trees
LOB and ROB are vegetated with small & medium brush

Rough Sketch of Typical Channel Cross Section



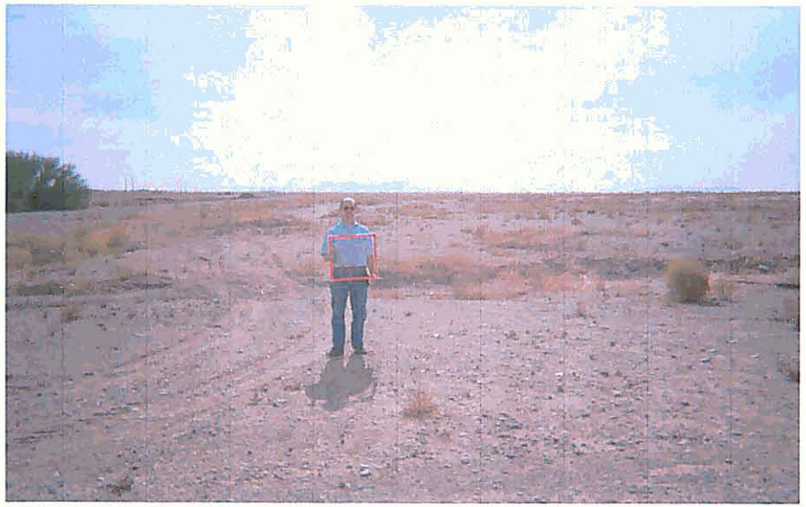
Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					58	240	58	
% [decimal]					0.16	0.67	0.16	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.028		0.028	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.030		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000	0.000	0.000	0.000	0.000
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.005		0.000		0.004
	Medium		0.01-0.025					
	Large		0.025-0.050					
	Very Large		0.050-0.100		0.070		0.065	
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.098	0.030	0.093	
x (% of Area)					0.016	0.020	0.015	
Sum (left, right,center)						0.051		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.033		0.051		0.032

Quilotosa Wash (North of I-8)
Reach B



Main Wash - Bed Material

Main Wash - Looking Upstream



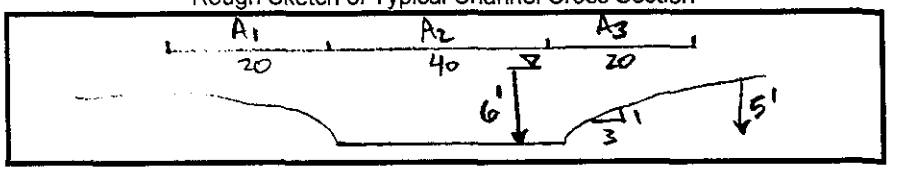
Left Overbank - Looking Upstream

Right Overbank - Looking Upstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Quilotosa Wash (North) Reach B**
Photograph No.: 6-(6,8,10-11), Misc. Supplemental Photos:
Section Description: CH consists of gravel, L & ROB's are firm soil
CH vegetation of grass, small & medium brush
LOB vegetated with grass and small brush
ROB is vegetated with grass and small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					57	240	57	
% [decimal]					0.16	0.68	0.16	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.027	0.027		0.027	0.027
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.031		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.003		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.003		0.000		0.004
	Medium		0.01-0.025		0.020		0.025	
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.050	0.031	0.055	
x (% of Area)					0.008	0.021	0.009	
Sum (left, right,center)						0.038		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.030		0.038		0.031

Quilotosa Wash
Reach A

Main Wash - Bed Material

Main Wash - Looking Downstream

Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Quilotosa Wash
Reach B

Main Wash - Bed Material

Main Wash - Looking Downstream

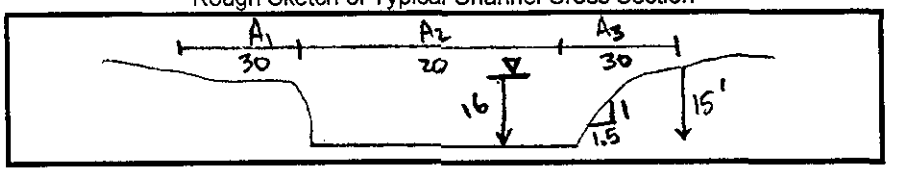
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Quilotosa Wash Reach B**
Photograph No.: 3-(19-22), Misc. Supplemental Photos:
Section Description: CH consists of gravel, L & ROB's are firm soil w/cobbles
CH vegetation of medium brush and a few trees
LOB and ROB are vegetated with grass and small brush

Rough Sketch of Typical Channel Cross Section

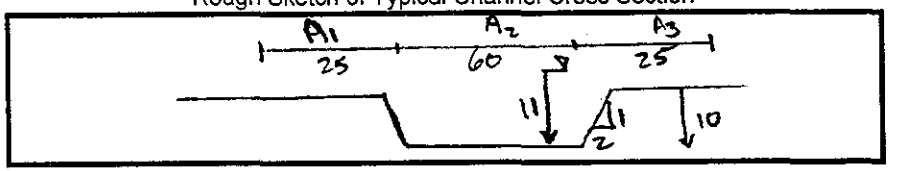


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					199	320	199	
% [decimal]					0.28	0.45	0.28	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.030	0.028		0.028	0.030
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.031		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.004		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.005		0.000		0.005
	Medium		0.01-0.025					
	Large		0.025-0.050		0.060		0.060	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.092	0.031	0.091	
x (% of Area)					0.025	0.014	0.025	
Sum (left, right,center)						0.065		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.035		0.065		0.035

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Quilotosa Wash Reach A**
Photograph No.: 3-(15-18), Misc. Supplemental Photos:
Section Description: CH consists of gravel w/cobbles, L & ROB's are firm soil
CH vegetation of grass and small brush w/ few trees
LOB is lightly vegetated with small brush
ROB is lightly vetetated with grass

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					125	660	125	
% [decimal]					0.14	0.73	0.14	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.028		0.029	0.030
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.034		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.005		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.002		0.002		0.002
	Medium		0.01-0.025		0.025		0.025	
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000		0.000	0.000	0.000	
	Alternating (occasionally)		0.001-0.005	0.002				0.002
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.058	0.036	0.057	
x (% of Area)					0.008	0.026	0.008	
Sum (left, right,center)						0.042		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.032		0.042		0.034

Quilotosa Wash
Reach C

Main Wash - Bed Material

Main Wash - Looking Downstream

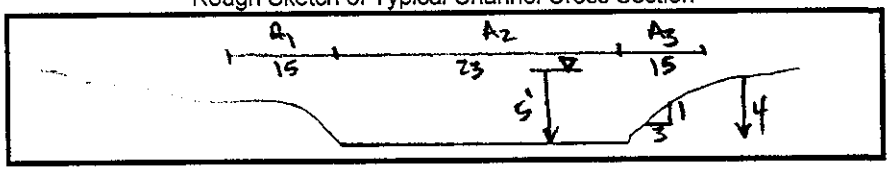
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

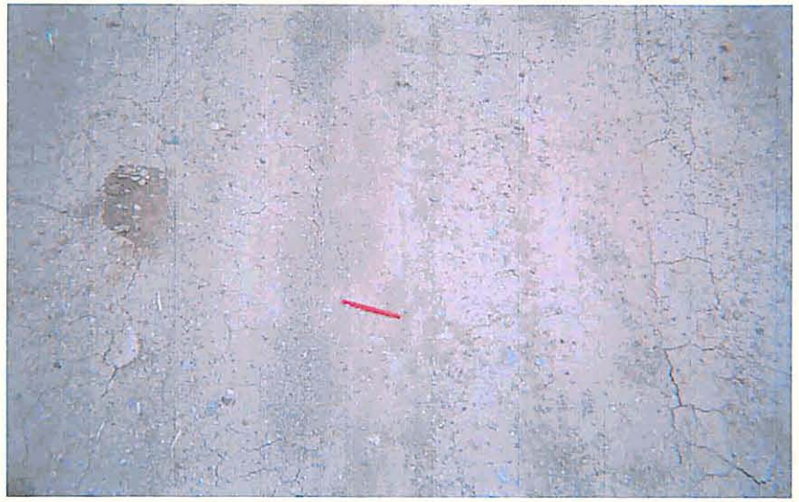
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Quilotosa Wash Reach C**
Photograph No.: 3-(11-14), Misc. Supplemental Photos:
Section Description: CH consists of gravel, L & ROB's are firm soil w/cobbles
CH vegetation of small and medium brush w/few trees
LOB and ROB are vegetated with grass and small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					54	138	54	
% [decimal]					0.22	0.56	0.22	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.029	0.029		0.028	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.032		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.005		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.004		0.000		0.003
	Medium		0.01-0.025					
	Large		0.025-0.050		0.040		0.050	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.074	0.032	0.081	
x (% of Area)					0.016	0.018	0.018	
Sum (left, right,center)						0.052		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.033		0.052		0.031

Gila Bend Canal
Reach A



Main Channel - Bed Material

Main Channel - Looking Downstream

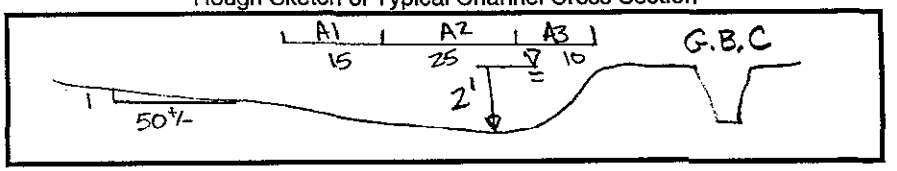
Main Channel - Looking Upstream

Leftt Overbank

Determination of Manning's Roughness Coefficients by FCDMC Method

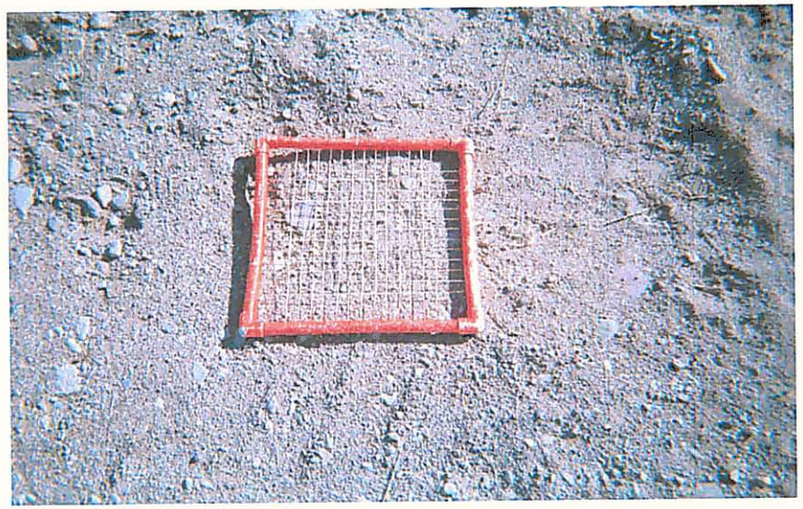
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Gila Bend Canal Reach A**
Photograph No.: 7-(19-22)
Section Description: CH & LOB's are firm soil
CH vegetation of grass and small brush
LOB is vegetated with small and medium brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					25	50	10	
% [decimal]					0.29	0.59	0.12	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.030	0.032	0.030	0.028	
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000			0.000	0.000	
	Minor		0.001-0.005		0.003			
	Moderate		0.006-0.010	0.006				
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.008	0.006	0.002	0.000	
	Medium		0.01-0.025					
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.041	0.032	0.028	
x (% of Area)					0.012	0.019	0.003	
Sum (left, right,center)						0.034		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.044		0.034		0.000

Unnamed Wash No. 2
Reach A



Main Wash - Bed Material

Main Wash - Looking Upstream

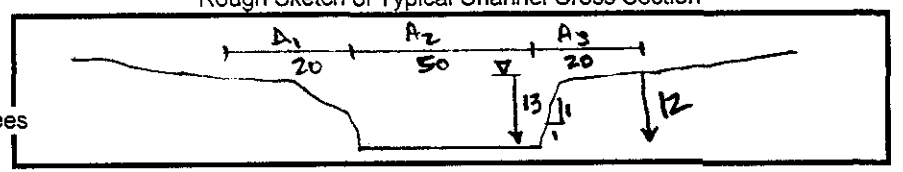
Left Overbank - Looking Downstream

Right Overbank - Looking Upstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Unnamed Wash No. 2 Reach A**
Photograph No.: 4-(17-19), Misc. Supplemental Photos:
Section Description: CH consists of sand and gravel, L & ROB's are firm soil
CH vegetation of medium brush and large brush w/few trees
LOB and ROB are vegetated with small & medium brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					92	650	92	
% [decimal]					0.11	0.78	0.11	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.029		0.030	0.030
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.030		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005					
	Moderate		0.006-0.010		0.006		0.008	
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0.000		
	Medium		0.01-0.025	0.012				0.010
	Large		0.025-0.050					
	Very Large		0.050-0.100		0.075		0.070	
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.110	0.030	0.108	
x (% of Area)					0.012	0.023	0.012	
Sum (left, right,center)						0.047		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.040		0.047		0.040

Unnamed Wash No. 2 West
Reach A

Main Channel - Bed Material

Main Channel - Looking Downstream

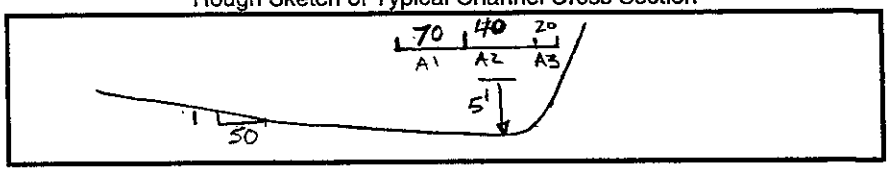
Left Overbank

Right Overbank

Determination of Manning's Roughness Coefficients by FCDMC Method

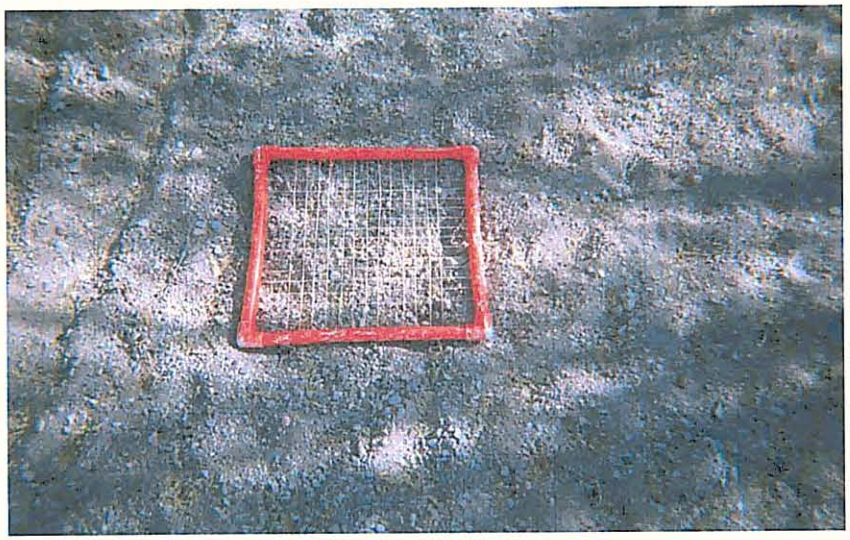
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Unnamed Wash No. 2 West**
Photograph No.:
Section Description: CH consists of firm soil w/gravel, LOB is firm soil
CH vegetation of grass and small brush and medium
LOB is vegetated with small & medium brush
ROB is I-8 embankment

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					350	200	50	
% [decimal]					0.58	0.33	0.08	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.028	0.028		
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035				0.032	0.032
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000			0.000	0.000
	Minor		0.001-0.005		0.002	0.002		
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.008				0.002
	Medium		0.01-0.025		0.014	0.015	0.010	
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.044	0.045	0.042	
x (% of Area)					0.026	0.015	0.004	
Sum (left, right,center)						0.044		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.036		0.044		0.034

Unnamed Wash No. 2
Reach B



Main Wash - Bed Material

Main Wash - Looking Downstream

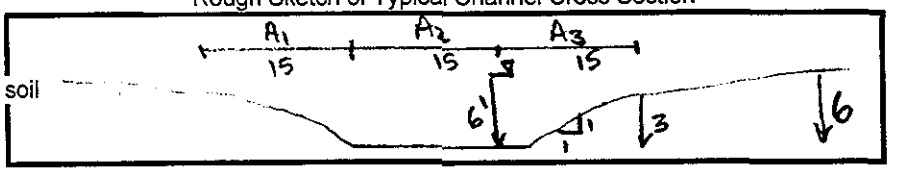
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Unnamed Wash No. 2 Reach B**
Photograph No.: 4-(20-23), Misc. Supplemental Photos:
Section Description: CH consists of mixed sand and gravel, L & ROB's are firm soil
CH vegetation of medium and large brush w/few trees
LOB and ROB are vegetated with small & medium brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					50	90	50	
% [decimal]					0.26	0.47	0.26	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.027		0.027	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.030		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005				0.004	
	Moderate		0.006-0.010		0.008			
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.004	0.000	0.000	0.000	0.004
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0.000		
	Medium		0.01-0.025	0.012				0.015
	Large		0.025-0.050		0.050		0.050	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000		0.000	0.000	0.000	
	Alternating (occasionally)		0.001-0.005	0.002				0.002
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.085	0.030	0.081	
x (% of Area)					0.022	0.014	0.021	
Sum (left, right,center)						0.058		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.046		0.058		0.049

Unnamed Wash No. 2
Reach C

Main Wash - Bed Material

Main Wash - Looking Downstream

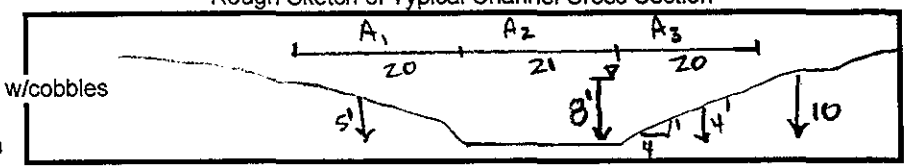
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Unnamed Wash No. 2 Reach C**
Photograph No.: 4-(24-27), Misc. Supplemental Photos:
Section Description: CH consists of gravel w/cobbles, L & ROB's are firm soil w/cobbles
CH vegetation of medium and large brush w/few trees
LOB and ROB are vegetated with small & medium brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					130	168	130	
% [decimal]					0.30	0.39	0.30	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.034	0.030		0.029	0.035
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.033		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000	0.000	0.000		0.000
	Minor		0.001-0.005				0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.009		0.000		0.006
	Medium		0.01-0.025					
	Large		0.025-0.050					
	Very Large		0.050-0.100		0.060		0.060	
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.090	0.033	0.091	
x (% of Area)					0.027	0.013	0.028	
Sum (left, right,center)						0.068		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.043		0.068		0.041

Unnamed Wash No. 2
Reach D

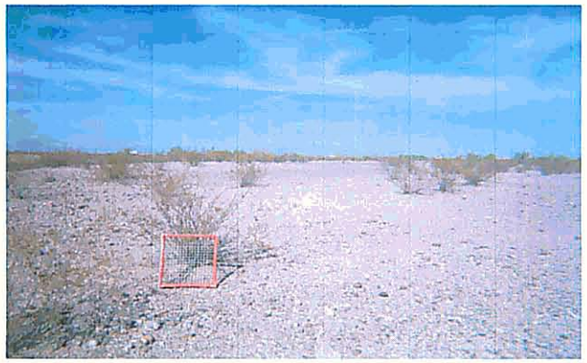
Main Wash - Bed Material

Main Wash - Looking Downstream

Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Left Overbank - Looking Downstream (upper bench)

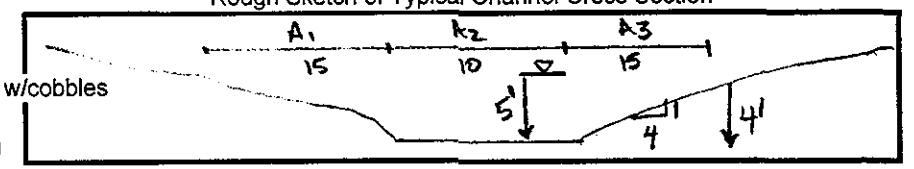


Right Overbank - Looking Downstream (upper bench)

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Unnamed Wash No. 2 Reach D**
Photograph No.: 3-(4,6-8), Misc. Supplemental Photos:
Section Description: CH consists of gravel w/cobbles, L & ROB's are firm soil w/cobbles
CH vegetation of medium brush and few trees
LOB and ROB are vegetated with small & medium brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					40	50	40	
% [decimal]					0.31	0.38	0.31	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.032	0.029		0.030	0.030
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.033		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000	0.000	0.000	0.000	0.000
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.002	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	..01		0.000		
	Medium		0.01-0.025					0.012
	Large		0.025-0.050				0.045	
	Very Large		0.050-0.100		0.050			
Variations in the Channel Cross Section	Gradual	n4	0.000		0.000	0.000	0.000	
	Alternating (occasionally)		0.001-0.005	0.002				0.002
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.079	0.033	0.075	
x (% of Area)					0.024	0.013	0.023	
Sum (left, right,center)						0.060		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.036		0.060		0.044

Unnamed Wash No. 3
Reach A

Main Wash - Bed Material

Main Wash - Looking Downstream

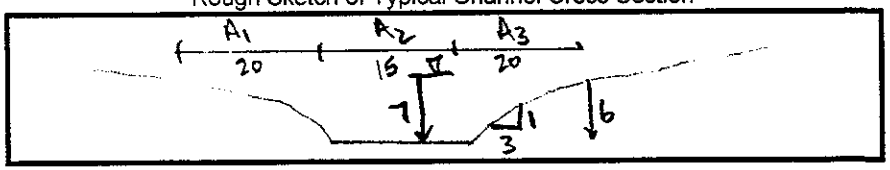
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

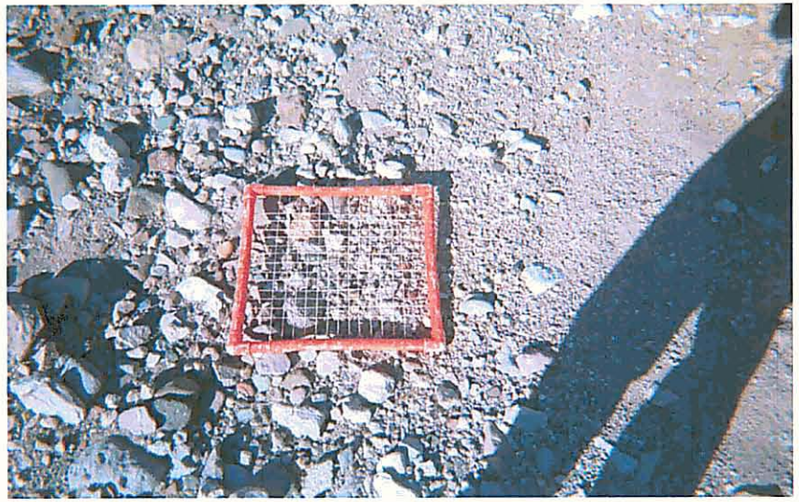
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Unnamed Wash No. 3 Reach A**
Photograph No.: 5-(1-4), Misc. Supplemental Photos:
Section Description: CH consists of gravel, L & ROB's are firm soil w/cobbles
CH vegetation of medium & large brush w/few trees,
LOB is vegetated with small and medium brush
ROB is lightly vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					65	105	65	
% [decimal]					0.28	0.45	0.28	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.032	0.030		0.029	0.030
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.032		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.005			
	Moderate		0.006-0.010				0.007	
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.002	0.000	0.000	0.000	0.002
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.008		0.000		0.005
	Medium		0.01-0.025					
	Large		0.025-0.050		0.045		0.045	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000		0.000	0.000	0.000	
	Alternating (occasionally)		0.001-0.005	0.002				0.002
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.080	0.032	0.081	
x (% of Area)					0.022	0.014	0.022	
Sum (left, right,center)						0.059		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.044		0.059		0.039

Unnamed Wash No. 3
Reach B



Main Wash - Bed Material

Main Wash - Looking Downstream

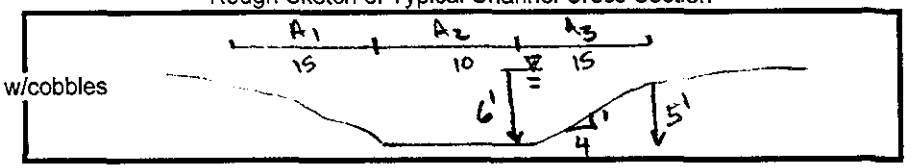
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Unnamed Wash No. 3 Reach B**
Photograph No.: 4-(9-12), Misc. Supplemental Photos:
Section Description: CH consists of gravel w/cobbles, L & ROB's are firm soil w/cobbles
CH vegetation of medium & large brush,
LOB is vegetated with small brush
ROB is vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					47	60	47	
% [decimal]					0.31	0.39	0.31	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.030	0.029		0.029	0.030
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.035		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000	0.000	0.000	0.000	0.000
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.002
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.005		0.000		0.008
	Medium		0.01-0.025		0.025			
	Large		0.025-0.050				0.050	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000		0.000	0.000	0.000	
	Alternating (occasionally)		0.001-0.005	0.002				0.002
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.054	0.035	0.079	
x (% of Area)					0.016	0.014	0.024	
Sum (left, right,center)						0.054		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.037		0.054		0.042

Unnamed Wash No. 4
Reach A

Main Wash - Bed Material

Main Wash - Looking Downstream

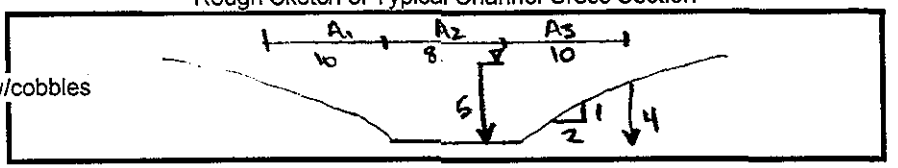
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

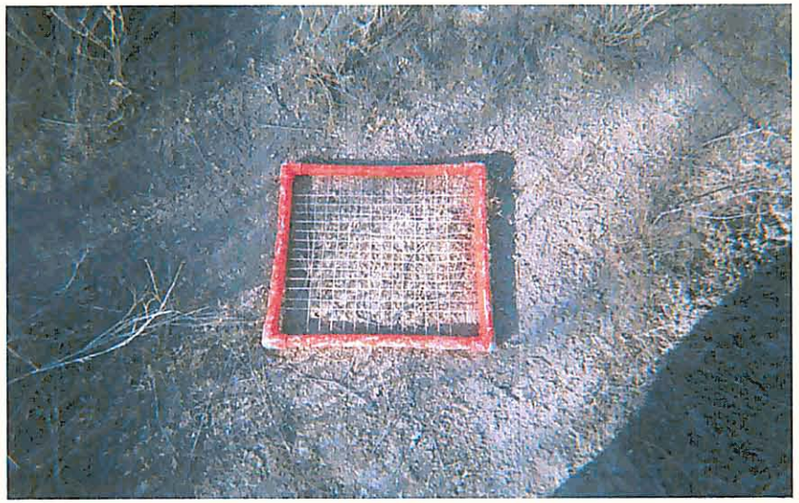
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Unnamed Wash No. 4 Reach A**
Photograph No.: 4-(20-23), Misc. Supplemental Photos:
Section Description: CH consists of gravel w/cobbles, L & ROB's are firm soil w/cobbles
CH vegetation of medium & large brush w/few trees,
LOB is vegetated with small brush
ROB is vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					26	40	26	
% [decimal]					0.28	0.43	0.28	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.030	0.028		0.029	0.030
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.031		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000	0.000	0.000	0.000	0.000
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.002
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.005		0.000		0.006
	Medium		0.01-0.025					
	Large		0.025-0.050		0.040		0.050	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.068	0.031	0.079	
x (% of Area)					0.019	0.013	0.022	
Sum (left, right,center)						0.055		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.035		0.055		0.038

Unnamed Wash No. 4
Reach B



Main Wash - Bed Material

Main Wash - Looking Downstream

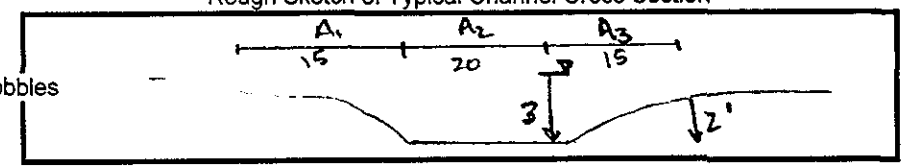
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Unnamed Wash No. 4 Reach B**
Photograph No.: 4-(5-8), Misc. Supplemental Photos:
Section Description: CH consists of coarse sand, L & ROB's are firm soil w/cobbles
CH vegetation of grass, medium brush w/few trees,
LOB is vegetated with small and medium brush
ROB is vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					30	210	30	
% [decimal]					0.11	0.78	0.11	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.031	0.029		0.029	0.032
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.029		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000	0.000	0.000	0.000	0.000
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.002
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.010				0.009
	Medium		0.01-0.025			0.015		
	Large		0.025-0.050		0.050		0.050	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.079	0.044	0.079	
x (% of Area)					0.009	0.034	0.009	
Sum (left, right,center)						0.052		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.041		0.052		0.043

Interstate Highway (I-8)
Reach A

Center of Borrow Pit - Looking North

Center of Borrow Pit - Looking East

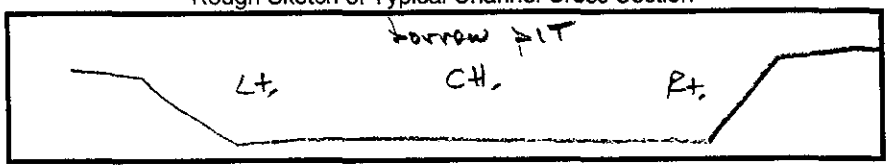
Center of Borrow Pit - Looking South

Center of Borrow Pit - Looking West

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Interstate Highway Reach A**
Photograph No.: 9-(6-9)
Section Description: CH & OB's are firm soil w/gravel & some cobbles
Sparce vegetation except in bottom of borrow pit.
Where vegetation exists, mostly medium and large brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]						100		
% [decimal]						1.00		
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.035		0.035		0.035
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000					
	Minor		0.001-0.005	0.005		0.005		0.005
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000		0.000		0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010					
	Medium		0.01-0.025	0.015		0.010		0.015
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.000	0.050	0.000	
x (% of Area)					0.000	0.050	0.000	
Sum (left, right,center)						0.050		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.055		0.050		0.055

Scott Avenue Wash
Reach A

Main Wash - Bed Material

Main Wash - Looking Downstream

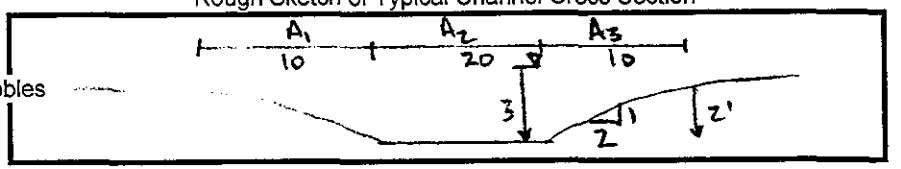
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Scott Avenue Wash Reach A**
Photograph No.: 5-(11-14), Misc. Supplemental Photos:
Section Description: CH consists of coarse sand, L & ROB's are firm soil w/cobbles
CH vegetation of grass, medium brush w/a few trees,
LOB is vegetated with small and medium brush
ROB is vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					14	40	14	
% [decimal]					0.21	0.59	0.21	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.032	0.029		0.029	0.033
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.030		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.004		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004		0.000	0.000	0.000	0.000
	Minor		0.005-0.015	0.005				
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0.000		
	Medium		0.01-0.025	0.012				0.010
	Large		0.025-0.050		0.050		0.040	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.083	0.030	0.072	
x (% of Area)					0.017	0.018	0.015	
Sum (left, right,center)						0.050		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.049		0.050		0.043

Scott Avenue Wash
Reach B

Main Wash - Bed Material

Main Wash - Looking Downstream

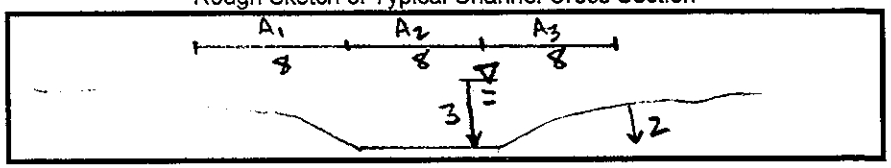
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

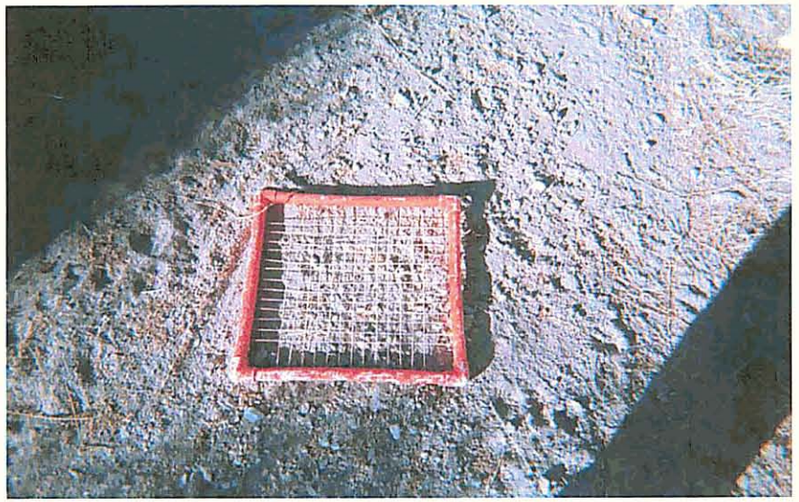
Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Scott Avenue Wash Reach B**
Photograph No.: 5-(15-18), Misc. Supplemental Photos:
Section Description: CH consists of gravel, L & ROB's are firm soil w/cobbles
CH vegetation of grass, medium brush w/a few trees,
LOB is vegetated with small brush
ROB is vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					16	24	16	
% [decimal]					0.29	0.43	0.29	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.030	0.028		0.028	0.031
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.033		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000	0.000	0.000		0.000
	Minor		0.001-0.005				0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.005		0.000		0.008
	Medium		0.01-0.025					
	Large		0.025-0.050		0.040			
	Very Large		0.050-0.100				0.055	
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.068	0.033	0.086	
x (% of Area)					0.019	0.014	0.025	
Sum (left, right,center)						0.058		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.035		0.058		0.039

Scott Avenue Wash
Reach C



Main Wash - Bed Material

Main Wash - Looking Downstream

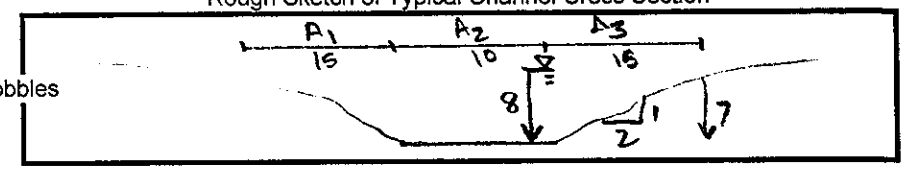
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Scott Avenue Wash Reach C**
Photograph No.: 4-(1-4), Misc. Supplemental Photos:
Section Description: CH consists of coarse sand, L & ROB's are firm soil w/cobbles
CH vegetation of medium brush w/a few trees,
LOB is vegetated with small and medium brush
ROB is lightly vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					64	70	64	
% [decimal]					0.32	0.35	0.32	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.033	0.028		0.028	0.029
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.029		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000	0.000	0.000
	Minor		0.001-0.005		0.002			
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.002
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0.000		0.008
	Medium		0.01-0.025	0.011				
	Large		0.025-0.050		0.040		0.045	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	
	Alternating (occasionally)		0.001-0.005					0.002
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.070	0.029	0.073	
x (% of Area)					0.023	0.010	0.024	
Sum (left, right,center)						0.056		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.044		0.056		0.041

Sand Tank Wash
Reach A

Main Wash - Bed Material

Main Wash - Looking Downstream

Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

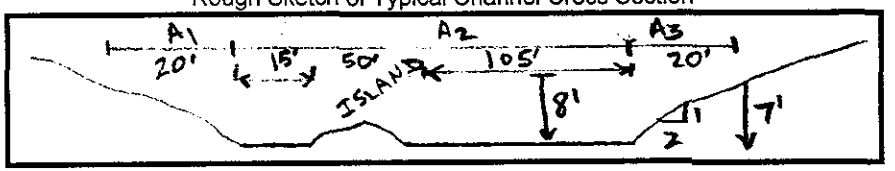
Overflow Channel - Bed Material

Overflow Channel - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Sand Tank Wash Reach A**
Photograph No.: 5-(7-10), Misc. Supplemental Photos:5-(5-6)
Section Description: CH consists of sand, L & ROB's are firm soil
CH vegetation of medium brush w/a few trees,
LOB is vegetated with small and medium brush
ROB is lightly vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					69	1260	69	
% [decimal]					0.05	0.90	0.05	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.029	0.029		0.029	0.029
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.030		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005					
	Moderate		0.006-0.010		0.007		0.005	
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.008		0.005		0.007
	Medium		0.01-0.025					
	Large		0.025-0.050		0.050		0.030	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.086	0.035	0.064	
x (% of Area)					0.004	0.032	0.003	
Sum (left, right,center)						0.039		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.037		0.039		0.036

Sand Tank Wash
Reach B

Main Wash - Bed Material

Main Wash - Looking Downstream

Left Overbank - Looking Downstream

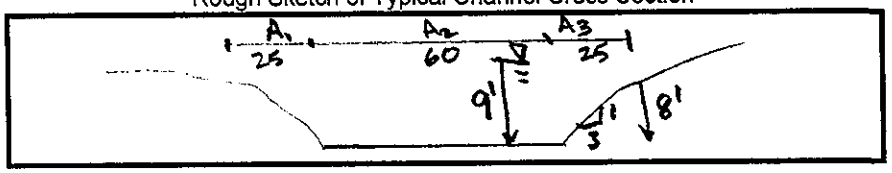
Right Overbank - Looking Downstream

Center Island - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Sand Tank Wash Reach B**
Photograph No.: 5-(19,21-23), Misc. Supplemental Photos:5-20
Section Description: CH consists of sand, L & ROB's are firm soil
CH vegetation of medium & large brush w/few trees,
LOB is vegetated with small and medium brush
ROB is vegetated with small & medium brush

Rough Sketch of Typical Channel Cross Section



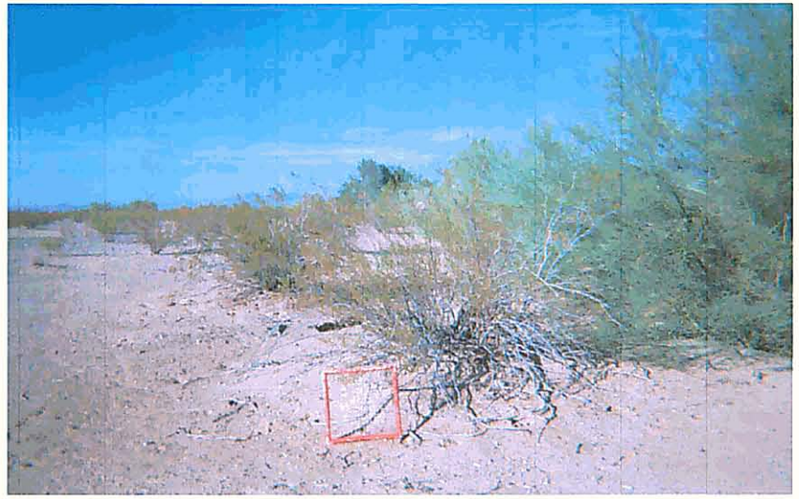
Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					121	540	121	
% [decimal]					0.15	0.69	0.15	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.029	0.029		0.029	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.030		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.005		0.004	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.006		0.000		
	Medium		0.01-0.025					0.012
	Large		0.025-0.050		0.075		0.075	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.109	0.030	0.108	
x (% of Area)					0.017	0.021	0.017	
Sum (left, right,center)						0.054		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.035		0.054		0.040

Sand Tank Wash
Reach C

Main Wash - Bed Material

Main Wash - Looking Downstream

Left Overbank - Looking Downstream

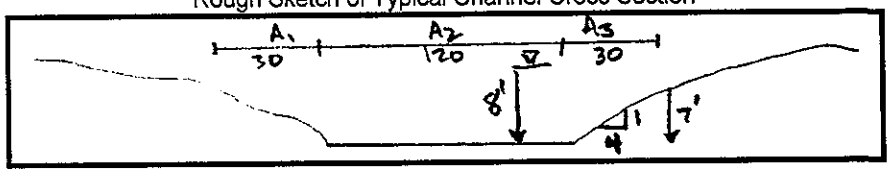


Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Sand Tank Wash Reach C**
Photograph No.: 5-(1-4), Misc. Supplemental Photos:
Section Description: CH consists of coarse sand, L & ROB's are firm soil
CH vegetation of medium brush w/few trees,
LOB is vegetated with small and medium brush
ROB is lightly vegetated with small brush

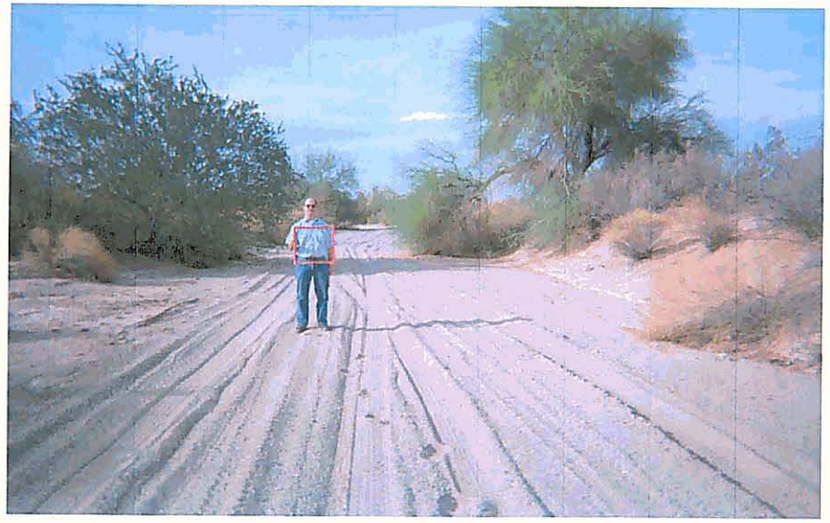
Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					128	960	128	
% [decimal]					0.11	0.79	0.11	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.030	0.028		0.029	0.030
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.033		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.004		0.005	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.010		0.000		
	Medium		0.01-0.025					0.012
	Large		0.025-0.050					
	Very Large		0.050-0.100		0.075		0.075	
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.107	0.033	0.109	
x (% of Area)					0.011	0.026	0.011	
Sum (left, right,center)						0.049		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.040		0.049		0.042

Sand Tank Wash
Reach D

Main Wash - Bed Material



Main Wash - Looking Downstream

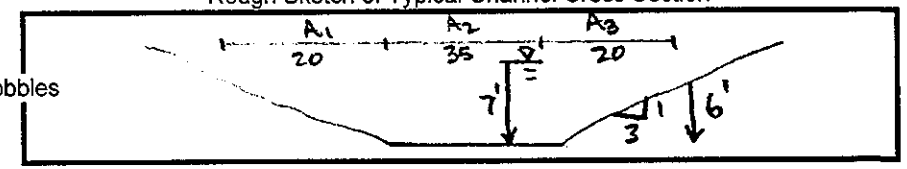
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Sand Tank Wash Reach D**
Photograph No.: 5-(1-4), Misc. Supplemental Photos:
Section Description: CH consists of coarse sand, L & ROB's are firm soil w/cobbles
CH vegetation of medium & large brush w/few trees,
LOB is vegetated with small and medium brush
ROB is vegetated with small & medium brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					74	245	74	
% [decimal]					0.19	0.62	0.19	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.032	0.029		0.029	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.029		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000			0.000		
	Minor		0.001-0.005	0.003	0.005		0.004	0.005
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.002	0.000	0.000	0.000	0.002
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.008		0.000		0.008
	Medium		0.01-0.025					
	Large		0.025-0.050					
	Very Large		0.050-0.100		0.050		0.050	
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.084	0.029	0.083	
x (% of Area)					0.016	0.018	0.016	
Sum (left, right,center)						0.050		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.045		0.050		0.043

Bender Wash
Reach A

Main Wash - Bed Material

Main Wash - Looking Downstream

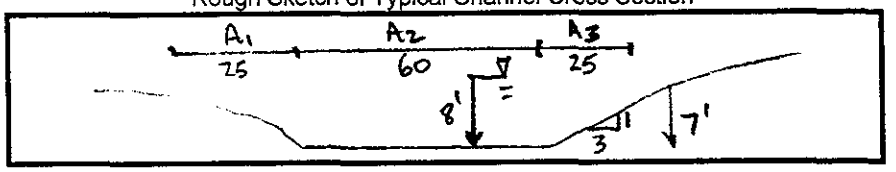
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Bender Wash Reach A**
Photograph No.: 7-(12-15), Misc. Supplemental Photos:
Section Description: CH consists of coarse sand, L & ROB's are firm soil
CH vegetation of medium & large brush w/few trees,
LOB is vegetated with small and medium brush
ROB is vegetated with grass & small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					99	480	99	
% [decimal]					0.15	0.71	0.15	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.029		0.030	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.030		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.004		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.009		0.000		
	Medium		0.01-0.025					0.011
	Large		0.025-0.050					
	Very Large		0.050-0.100		0.075		0.075	
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.108	0.030	0.108	
x (% of Area)					0.016	0.021	0.016	
Sum (left, right,center)						0.053		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.037		0.053		0.039

Bender Wash
Reach B

Main Wash - Bed Material

Main Wash - Looking Downstream

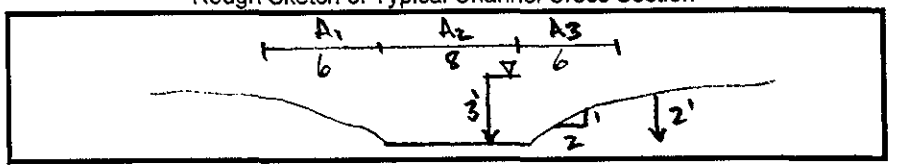
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Bender Wash Reach B**
Photograph No.: 7-(21-23), Misc. Supplemental Photos:
Section Description: CH consists of firm soil, L & ROB's are firm soil
CH vegetation of small & medium brush w/a few trees,
LOB is vegetated with small brush
ROB is vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					10	24	10	
% [decimal]					0.23	0.55	0.23	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.029	0.029	0.029	0.029
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.003		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.000	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.007		0.000		0.010
	Medium		0.01-0.025					
	Large		0.025-0.050		0.030		0.045	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.062	0.029	0.076	
x (% of Area)					0.014	0.016	0.017	
Sum (left, right,center)						0.047		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.035		0.047		0.039

Bender Wash
Reach C

Main Wash - Bed Material

Main Wash - Looking Downstream

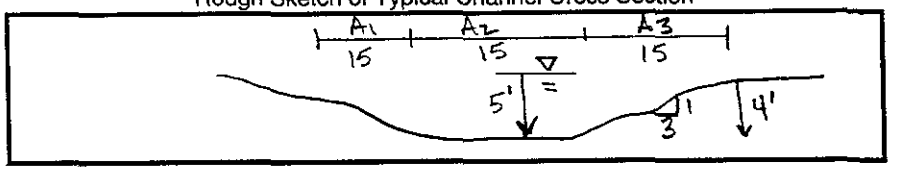
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Bender Wash Reach C**
Photograph No.: 6-(2-5), Misc. Supplemental Photos:
Section Description: CH consists of gravel, L & ROB's are firm soil
CH vegetation of small & medium brush w/few trees,
LOB is vegetated with small and medium brush
ROB is vegetated with small brush

Rough Sketch of Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					39	75	39	
% [decimal]					0.25	0.49	0.25	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.029	0.029		0.029	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.031		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000	0.000	0.000		0.000
	Minor		0.001-0.005				0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.002	0.000	0.000	0.000	0.002
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0.000		0.009
	Medium		0.01-0.025	0.012				
	Large		0.025-0.050					
	Very Large		0.050-0.100		0.060		0.060	
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.089	0.031	0.092	
x (% of Area)					0.023	0.015	0.023	
Sum (left, right,center)						0.061		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.043		0.061		0.039

Bender Wash
Reach D

Main Wash - Bed Material

Main Wash - Looking Downstream

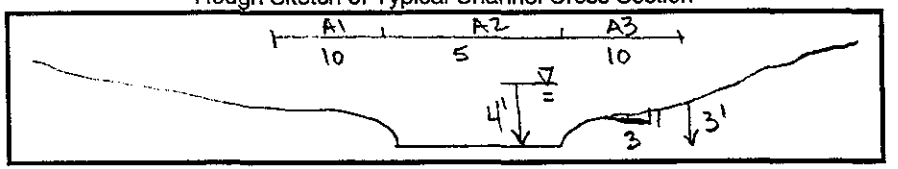
Left Overbank - Looking Downstream

Right Overbank - Looking Downstream

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Gila Bend Area Drainage Master Plan** ***(FCD 99-18)***
Stream: **Bender Wash Reach D**
Photograph No.: 7-(24-27), Misc. Supplemental Photos:
Section Description: CH consists of firm soil w/cobbles, L & ROB's are firm soil
CH vegetation of small & medium brush w/few trees,
LOB is vegetated with small brush
ROB is vegetated with small brush

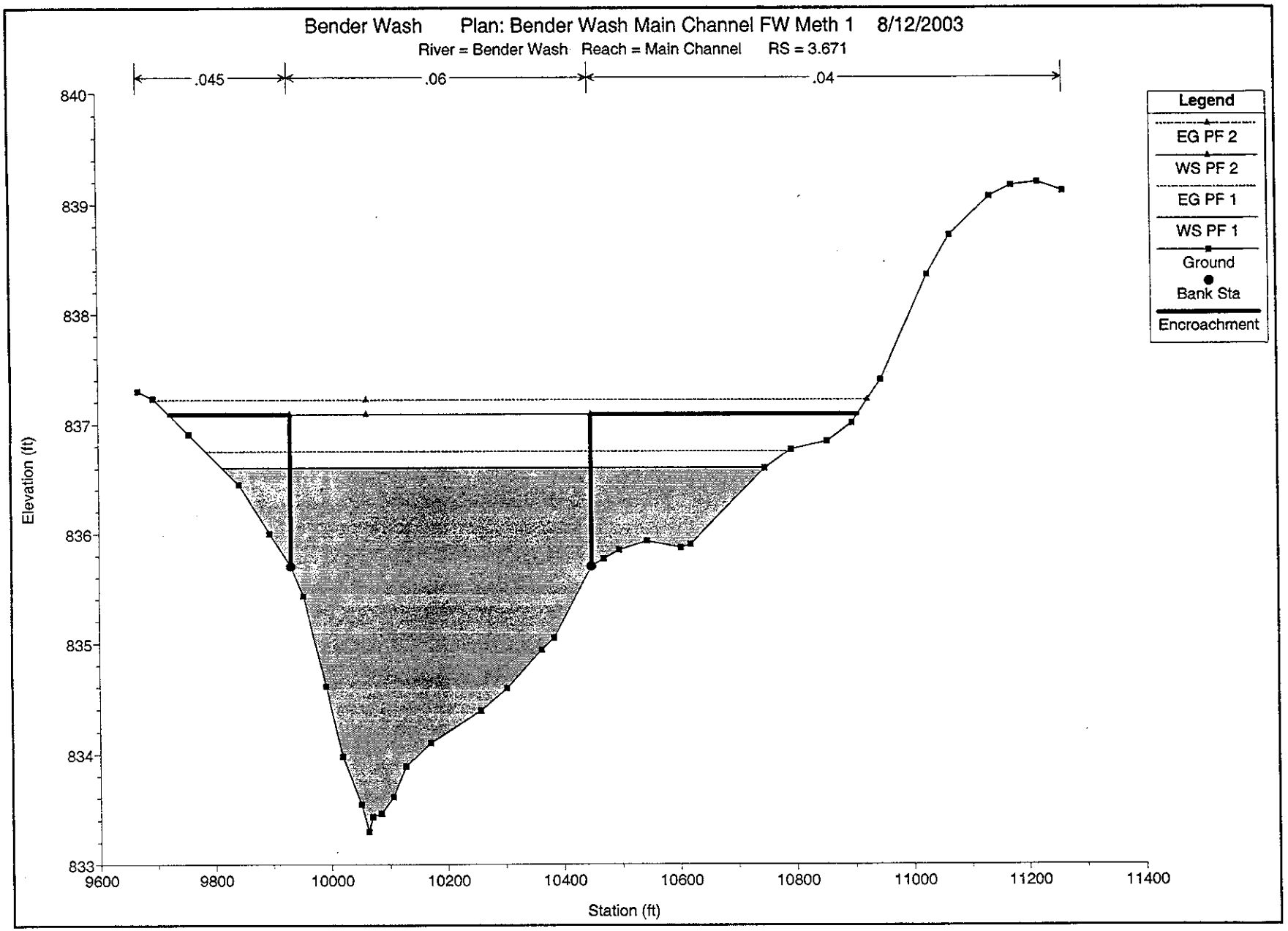
Rough Sketch of Typical Channel Cross Section

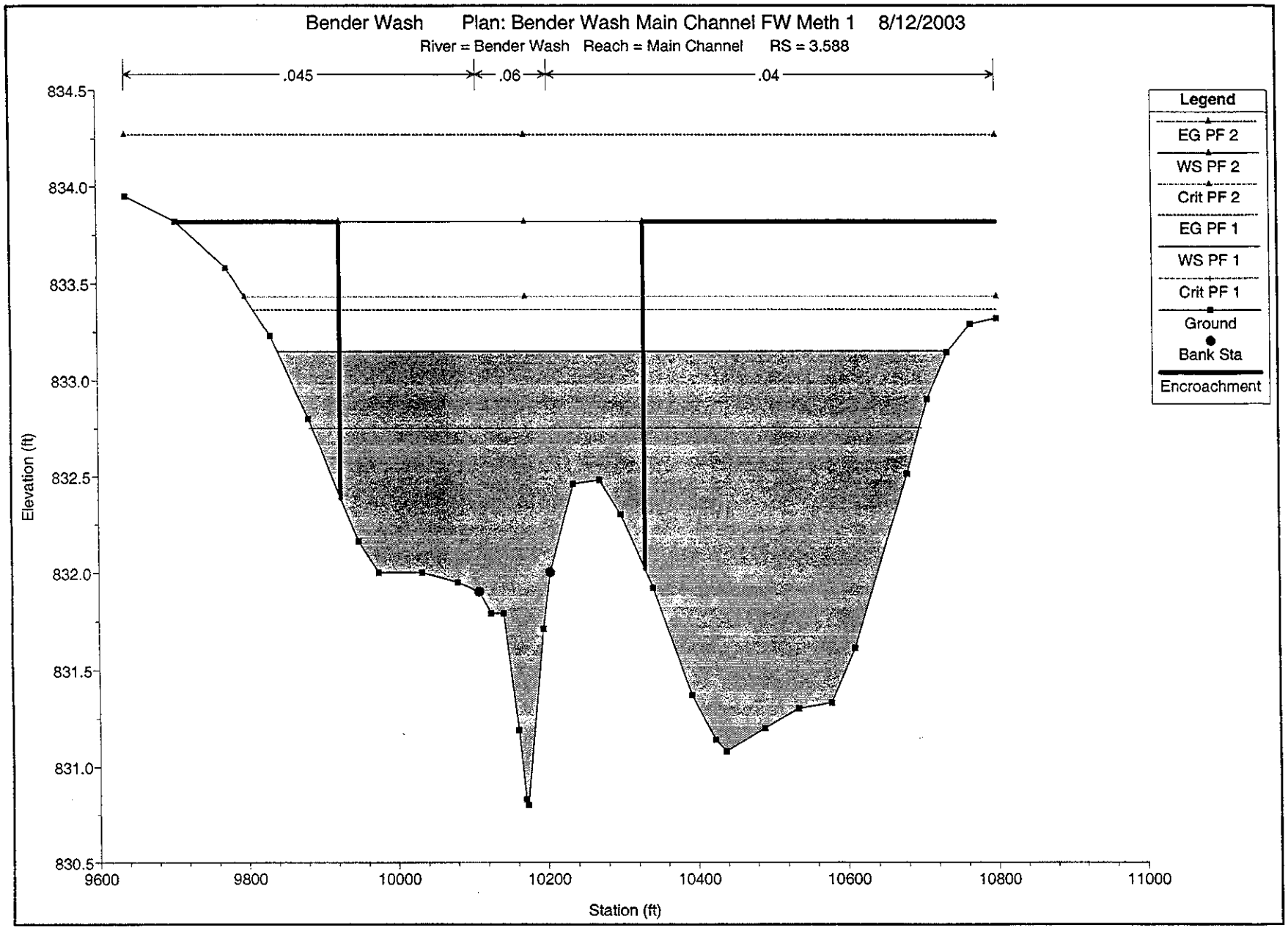


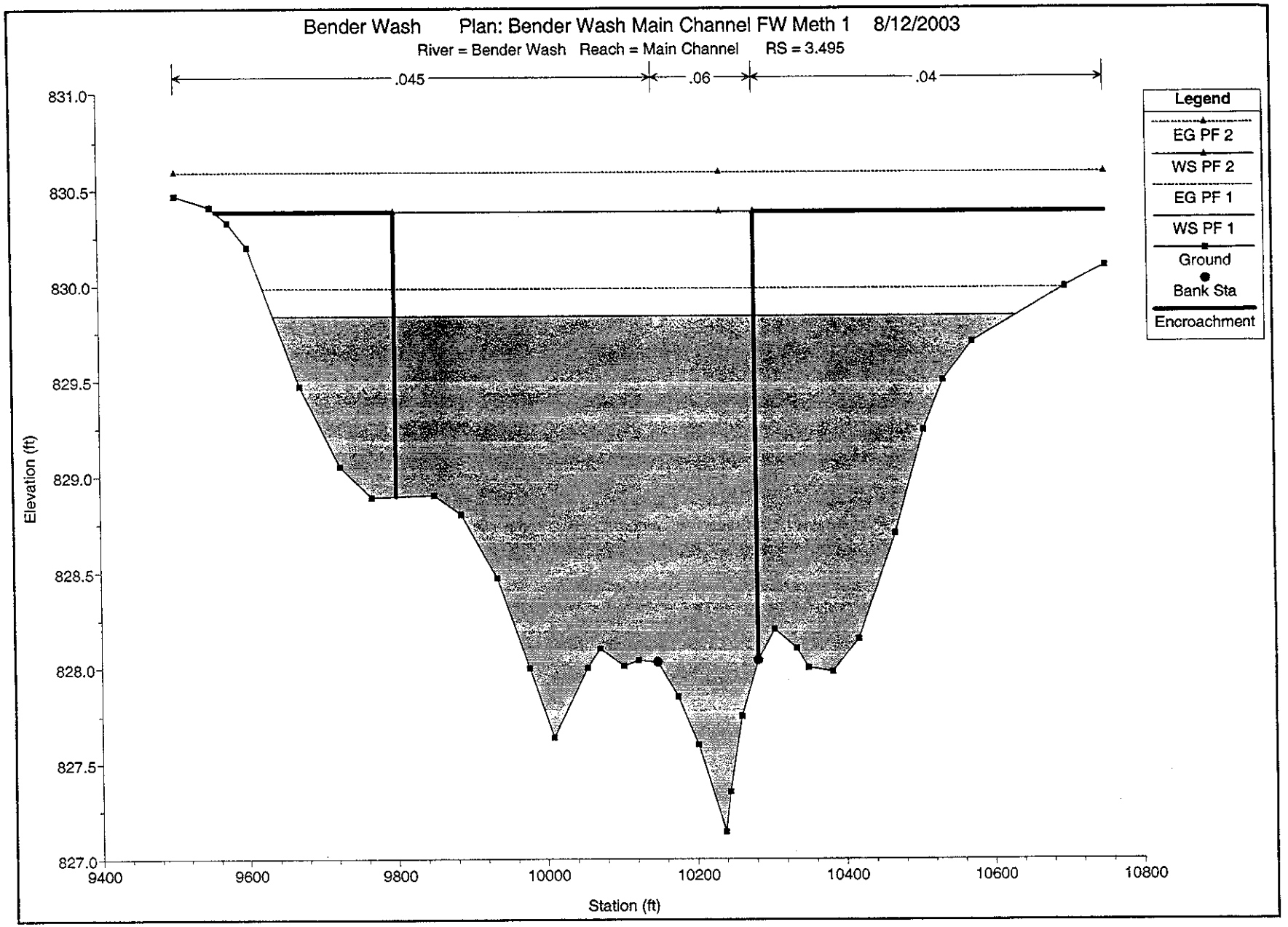
Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					24	20	24	
% [decimal]					0.35	0.29	0.35	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.028	0.031	0.028	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0.000		0.000		0.000
	Minor		0.001-0.005		0.003		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.002	0.000	0.000	0.000	0.000
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.010		0.000		0.008
	Medium		0.01-0.025					
	Large		0.025-0.050				0.040	
	Very Large		0.050-0.100		0.050			
Variations in the Channel Cross Section	Gradual	n4	0.000	0.000	0.000	0.000	0.000	0.000
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.081	0.031	0.070	
x (% of Area)					0.029	0.009	0.025	
Sum (left, right,center)						0.062		
Degree of Meandering	Minor	m	1	1.00		1.00		1.00
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.040		0.062		0.036

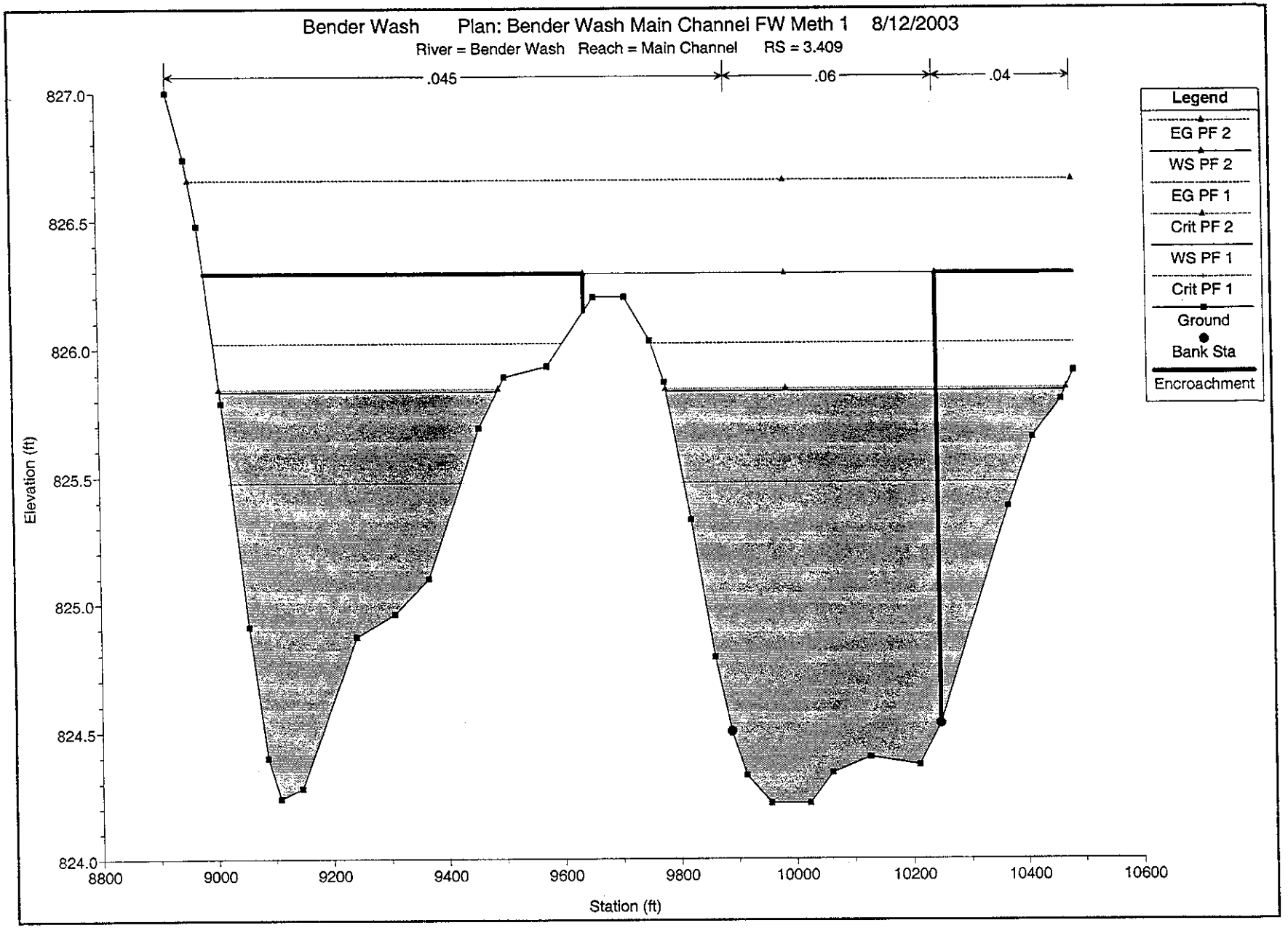
Appendix E.2

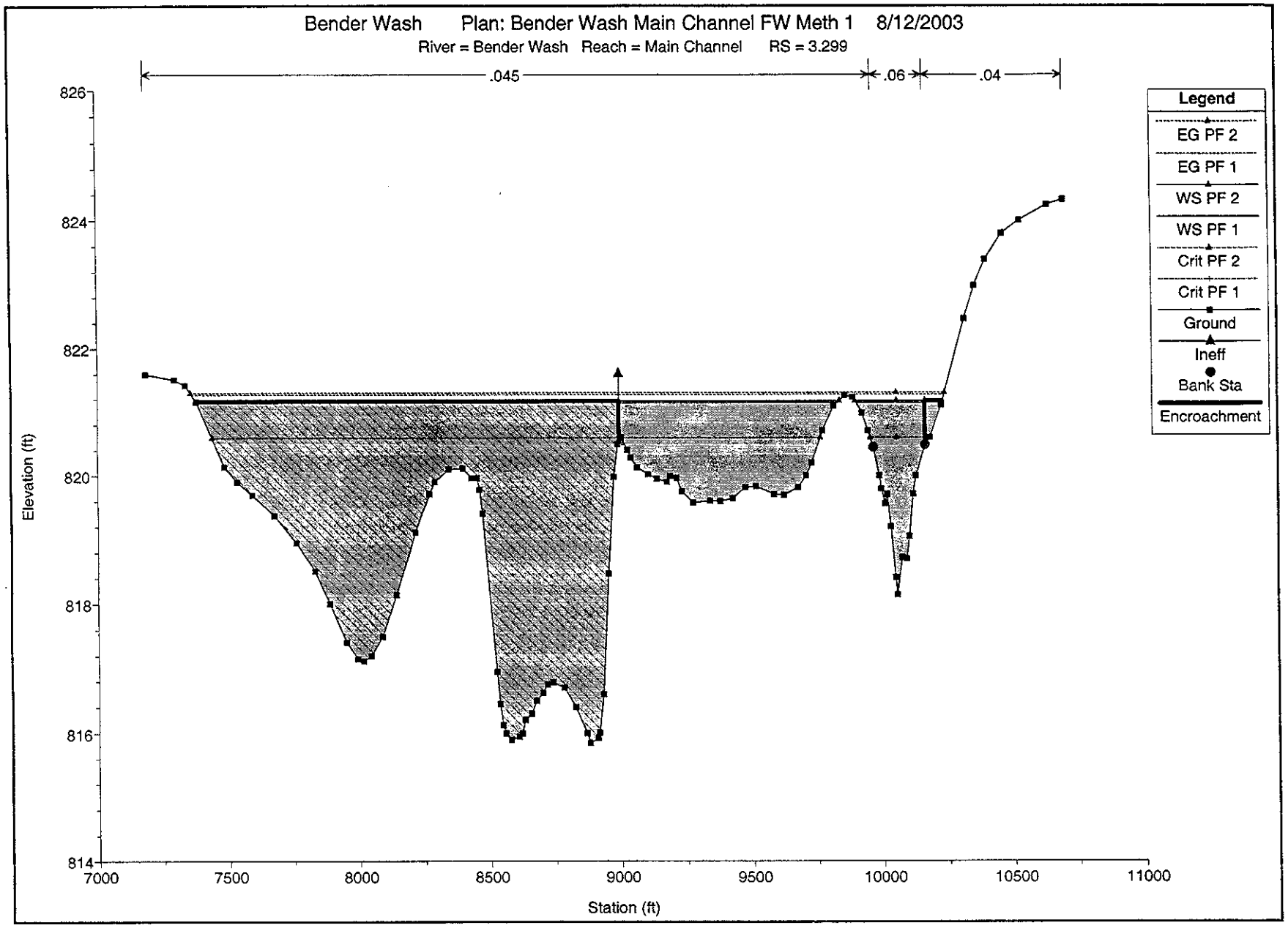
CROSS SECTION PLOTS

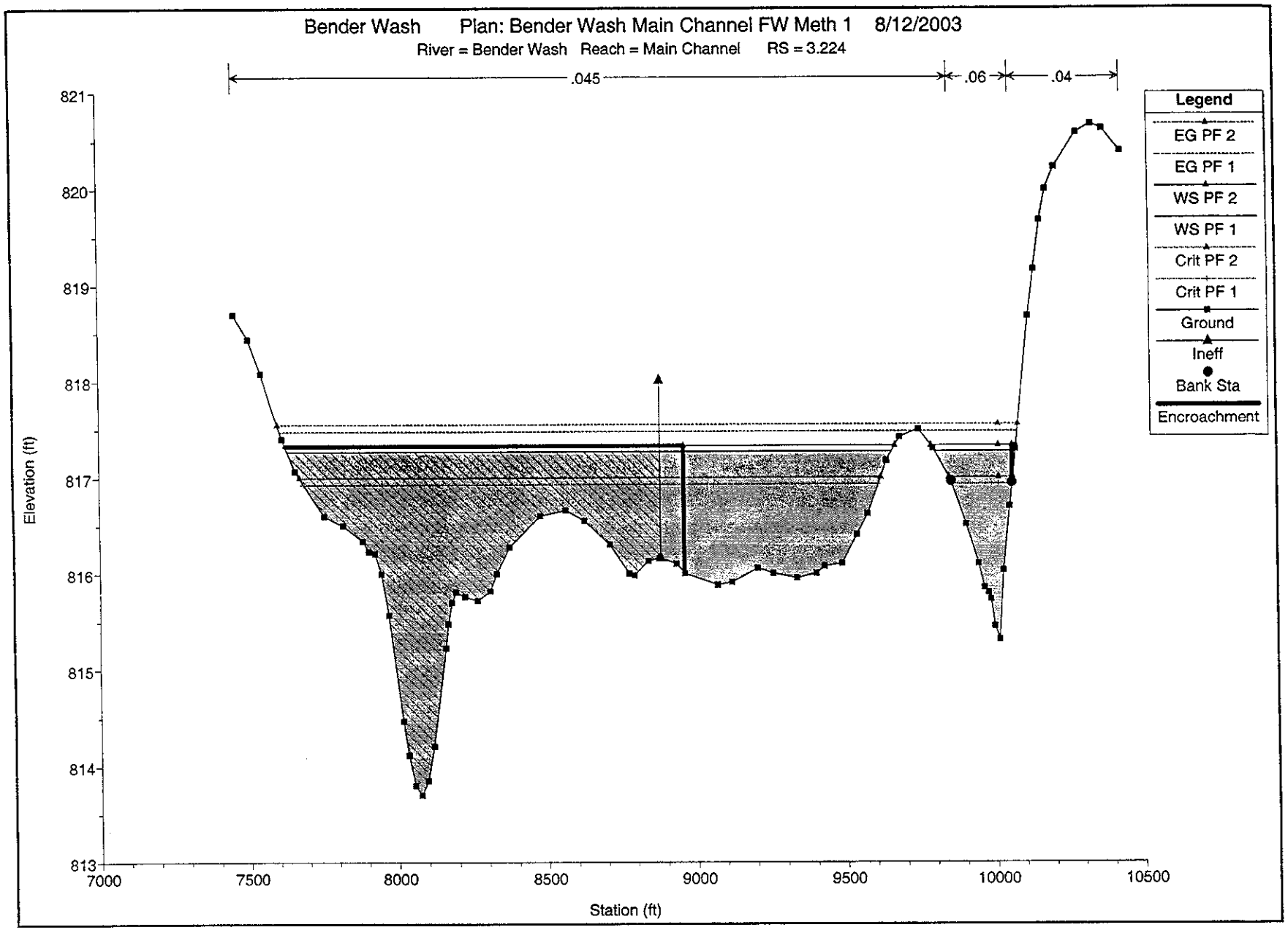

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 3.671
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
840
839
838
837
836
835
834
833
9600
9800
10000
10200
10400
10600
10800
11000
11200
11400
Station (ft)

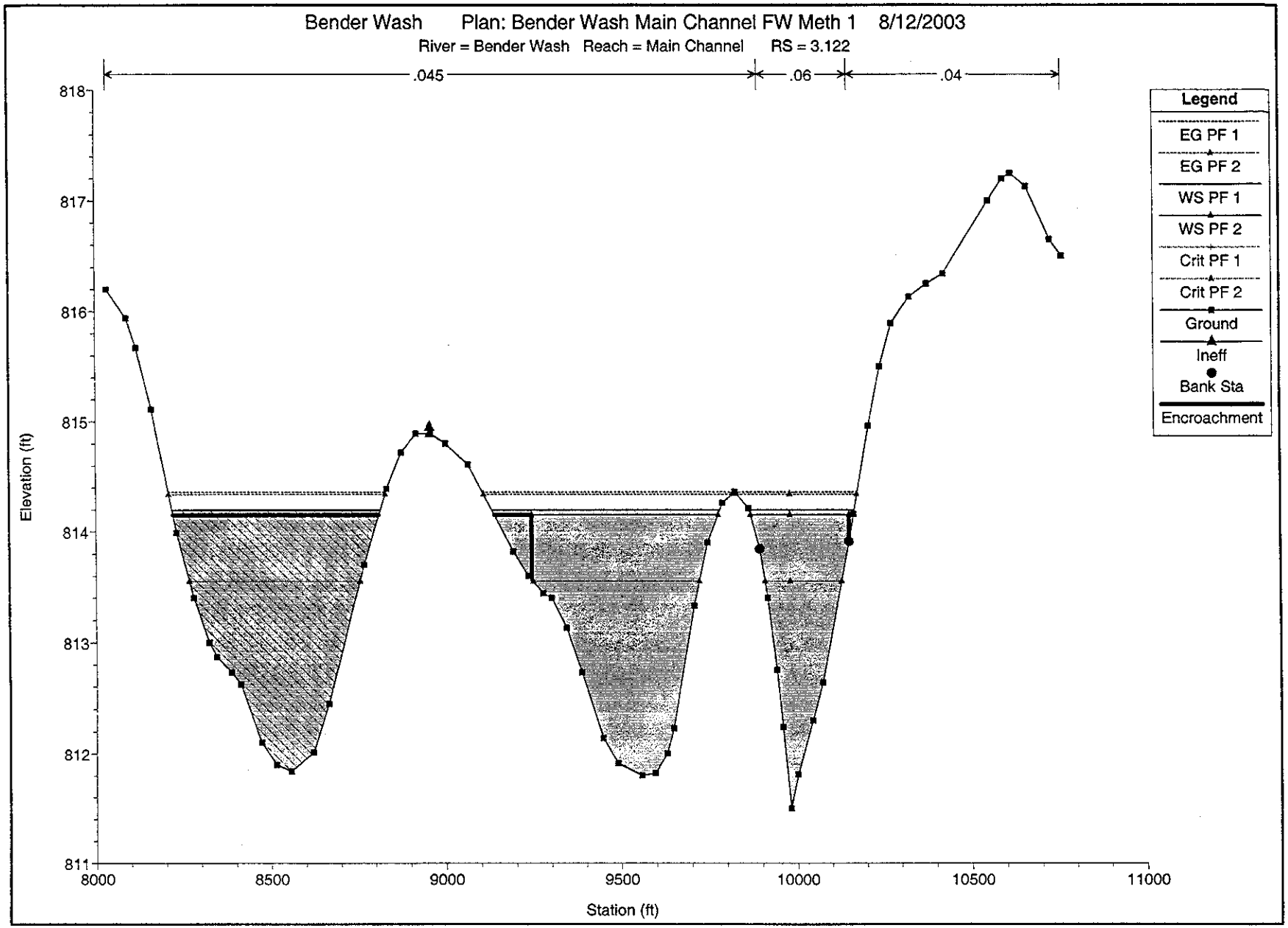

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 3.588
.045
.06
.04
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
834.5
834.0
833.5
833.0
832.5
832.0
831.5
831.0
830.5
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

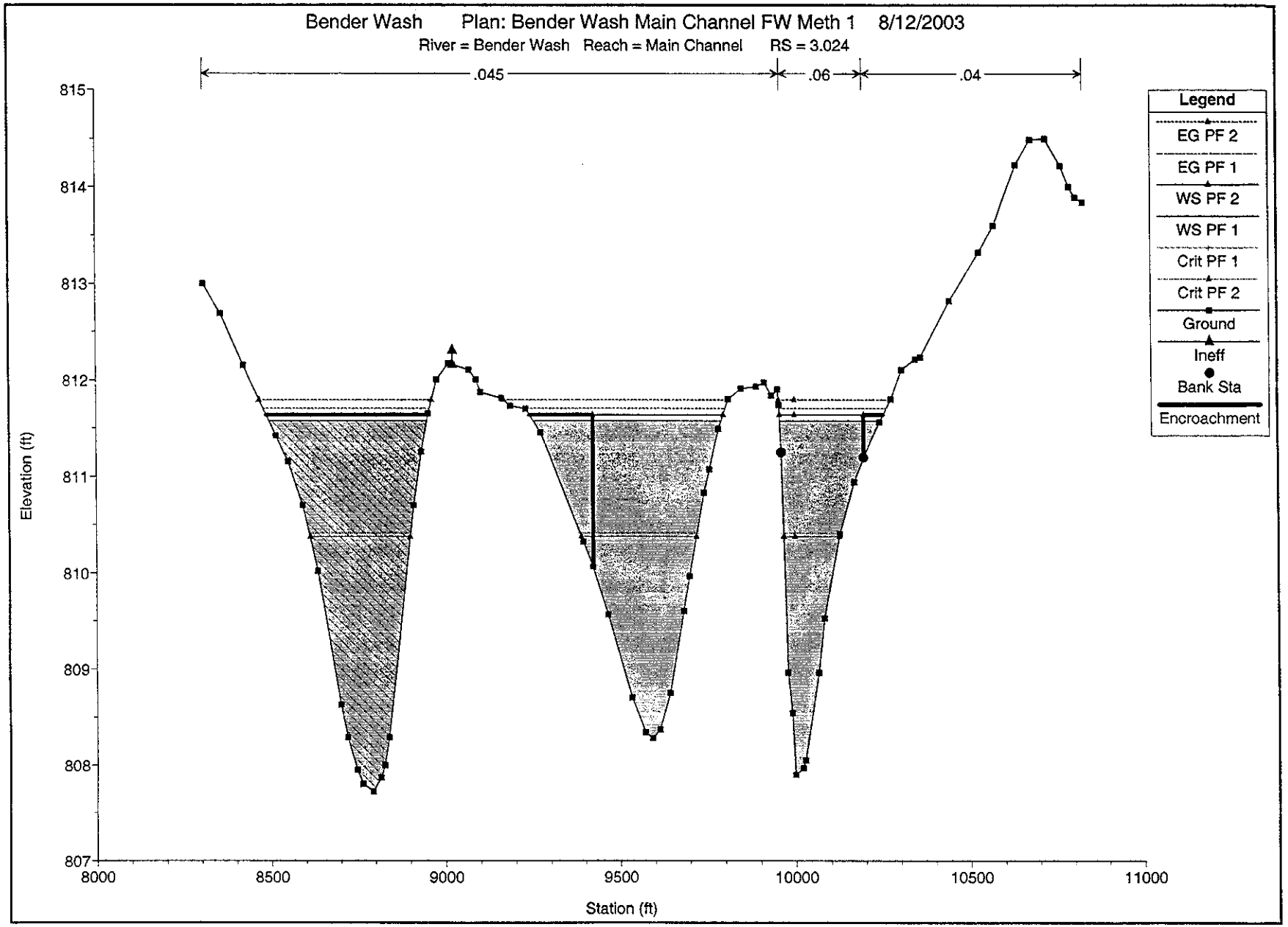

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 3.495
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
831.0
830.5
830.0
829.5
829.0
828.5
828.0
827.5
827.0
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

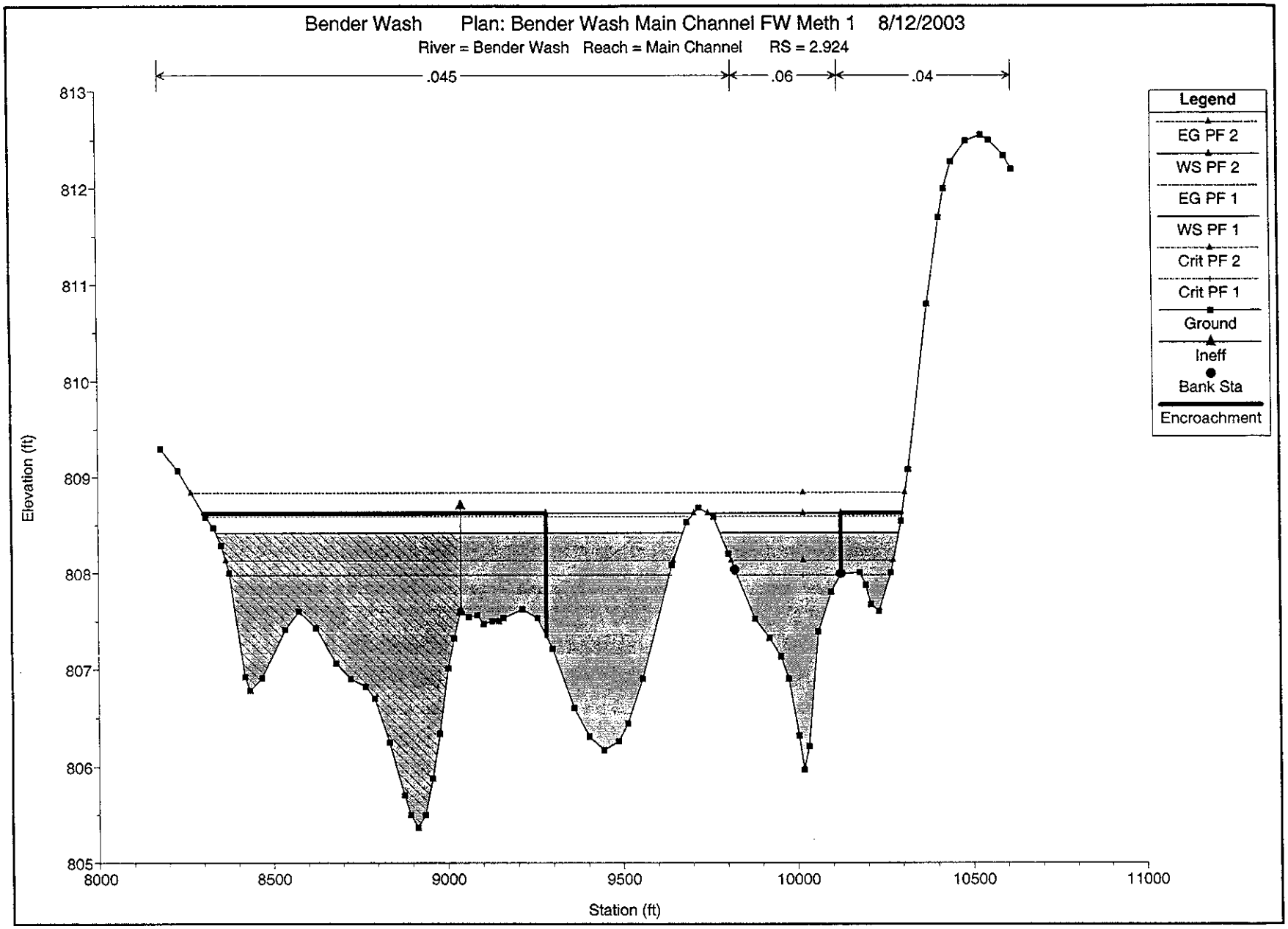

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 3.409
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 2
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
827.0
826.5
826.0
825.5
825.0
824.5
824.0
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

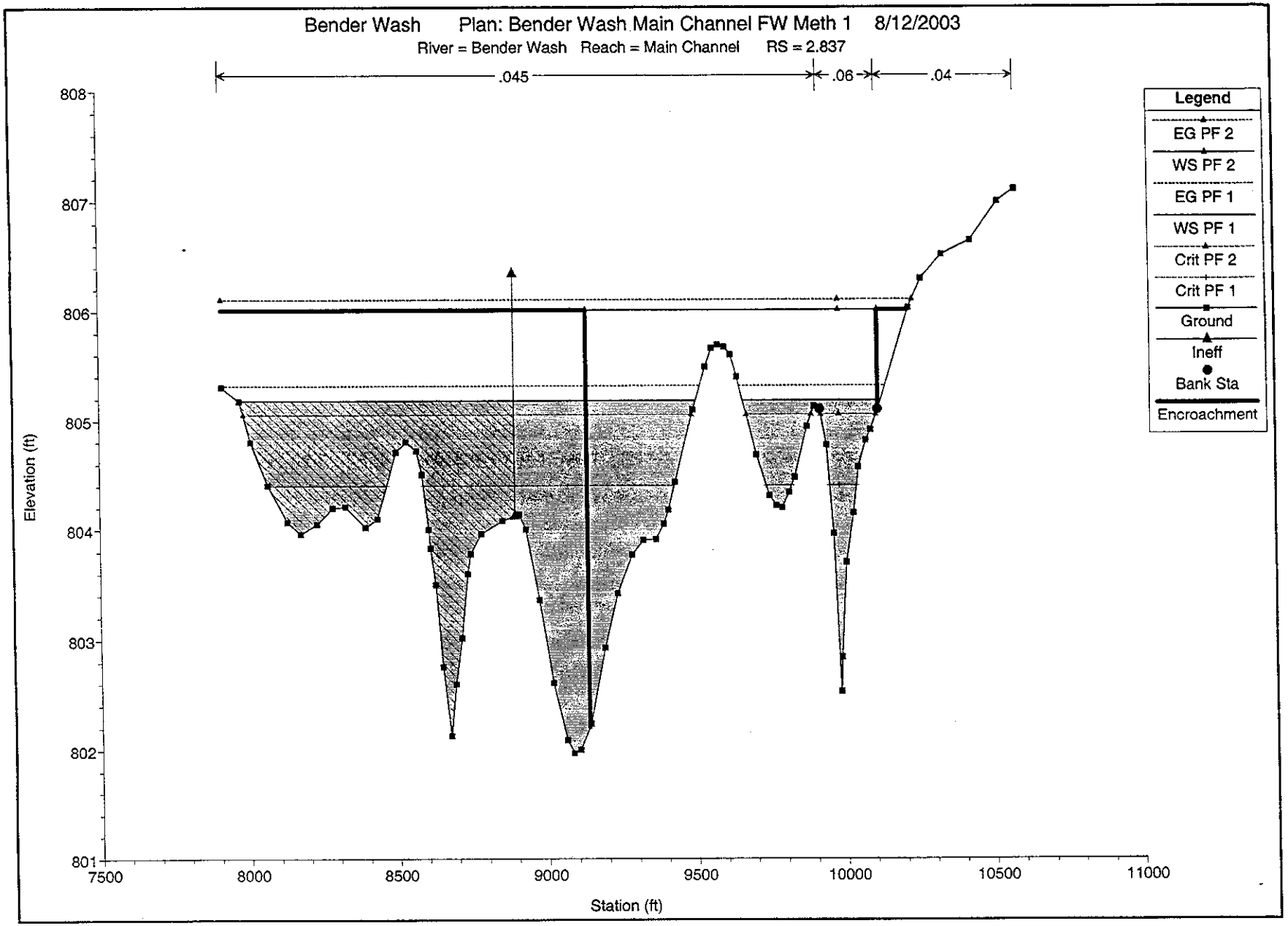

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 3.299
.045
.06
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
826
824
822
820
818
816
814
7000
7500
8000
8500
9000
9500
10000
10500
11000
Station (ft)

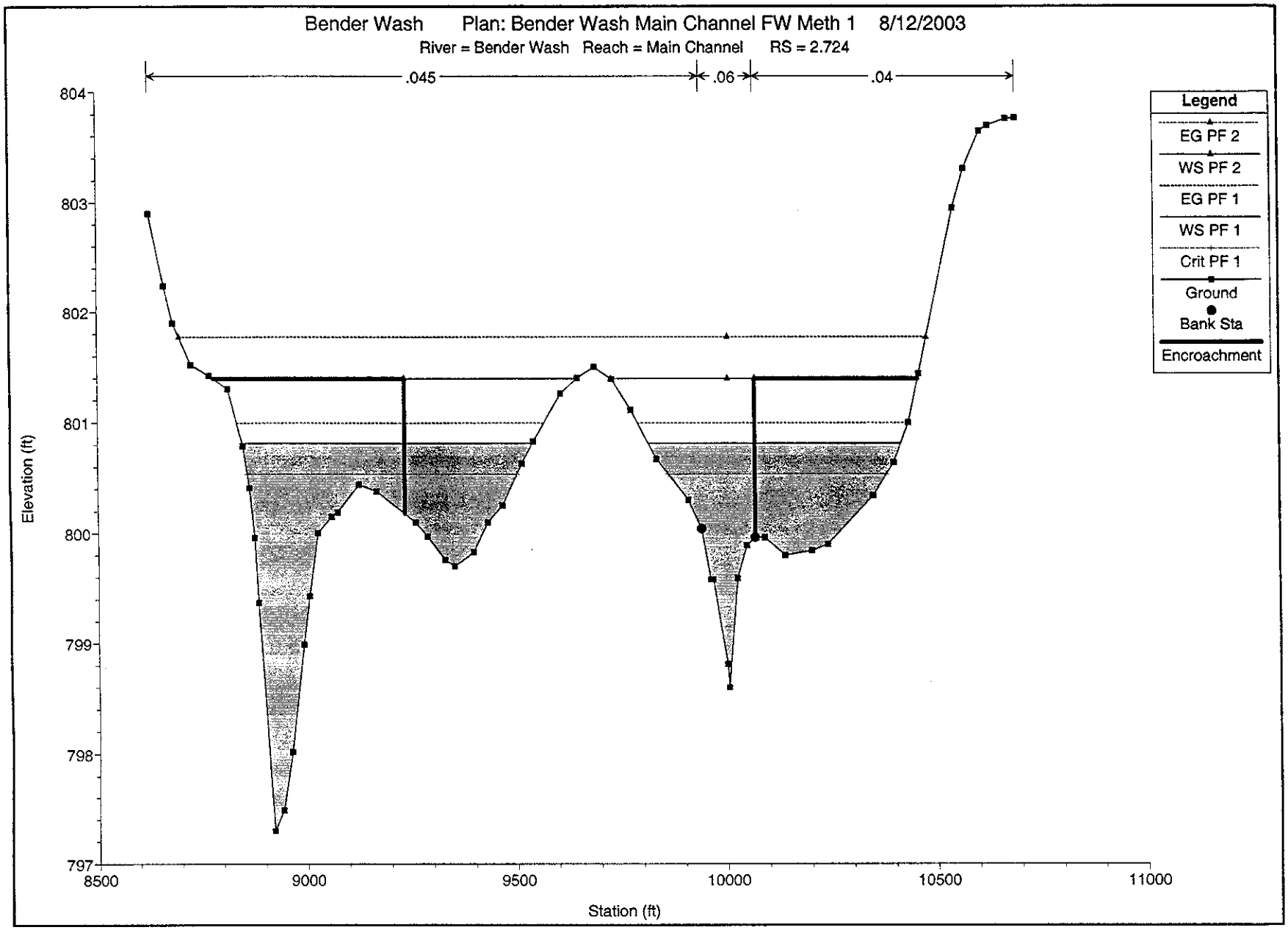

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 3.224
.045
.06
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
821
820
819
818
817
816
815
814
813
7000
7500
8000
8500
9000
9500
10000
10500
Station (ft)

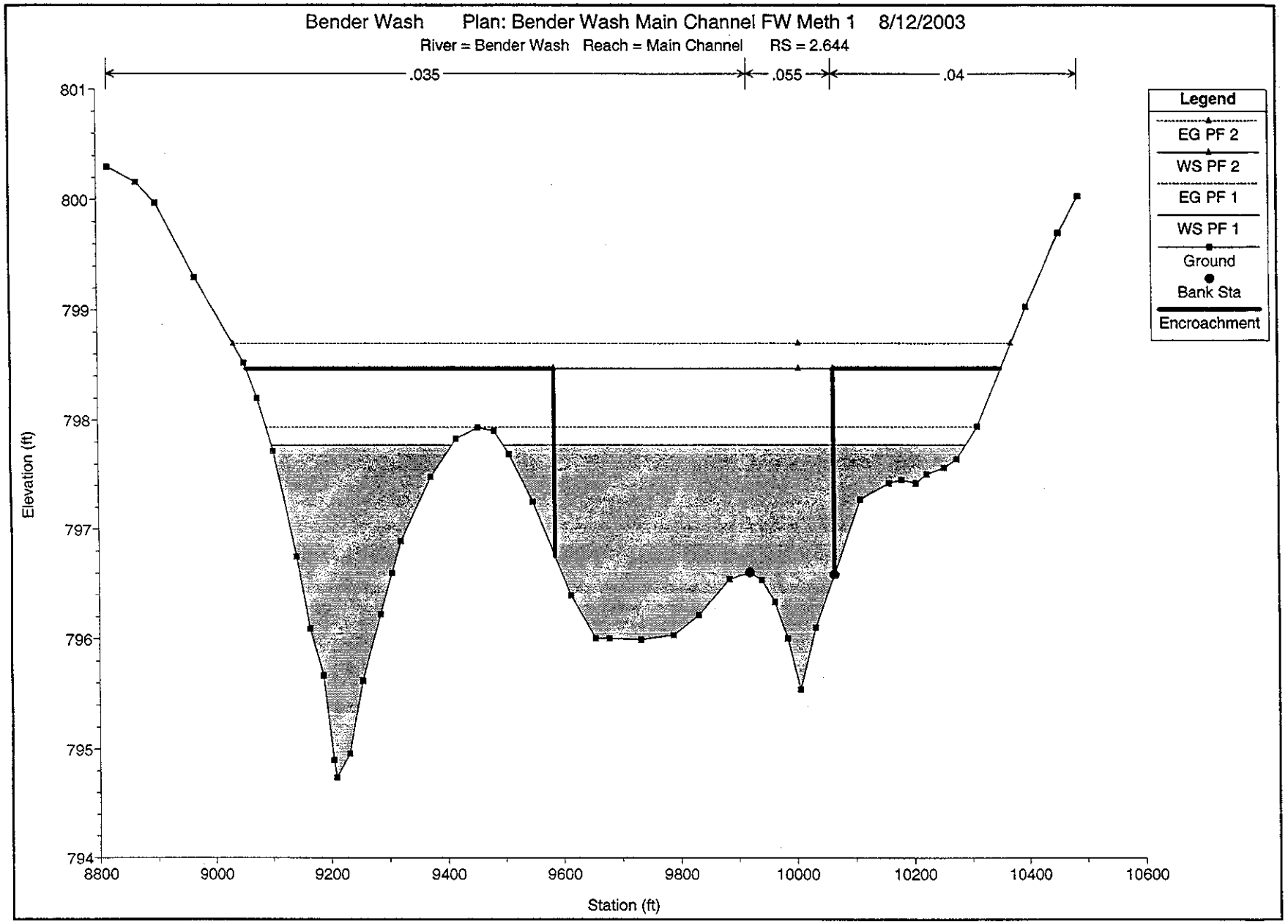

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 3.122
.045
.06
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
818
817
816
815
814
813
812
811
8000
8500
9000
9500
10000
10500
11000
Station (ft)

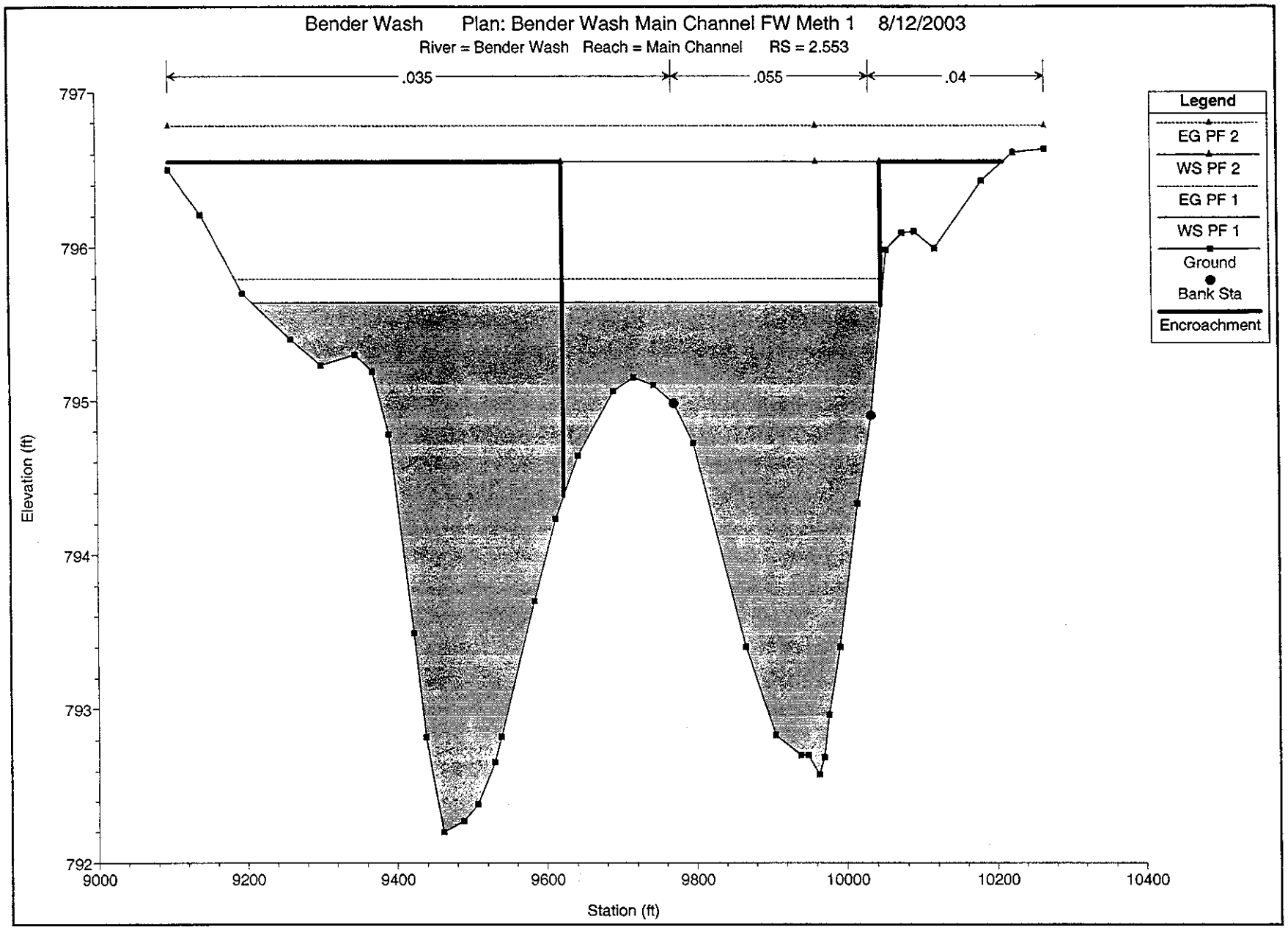

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 3.024
.045
.06
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
815
814
813
812
811
810
809
808
807
8000
8500
9000
9500
10000
10500
11000
Station (ft)

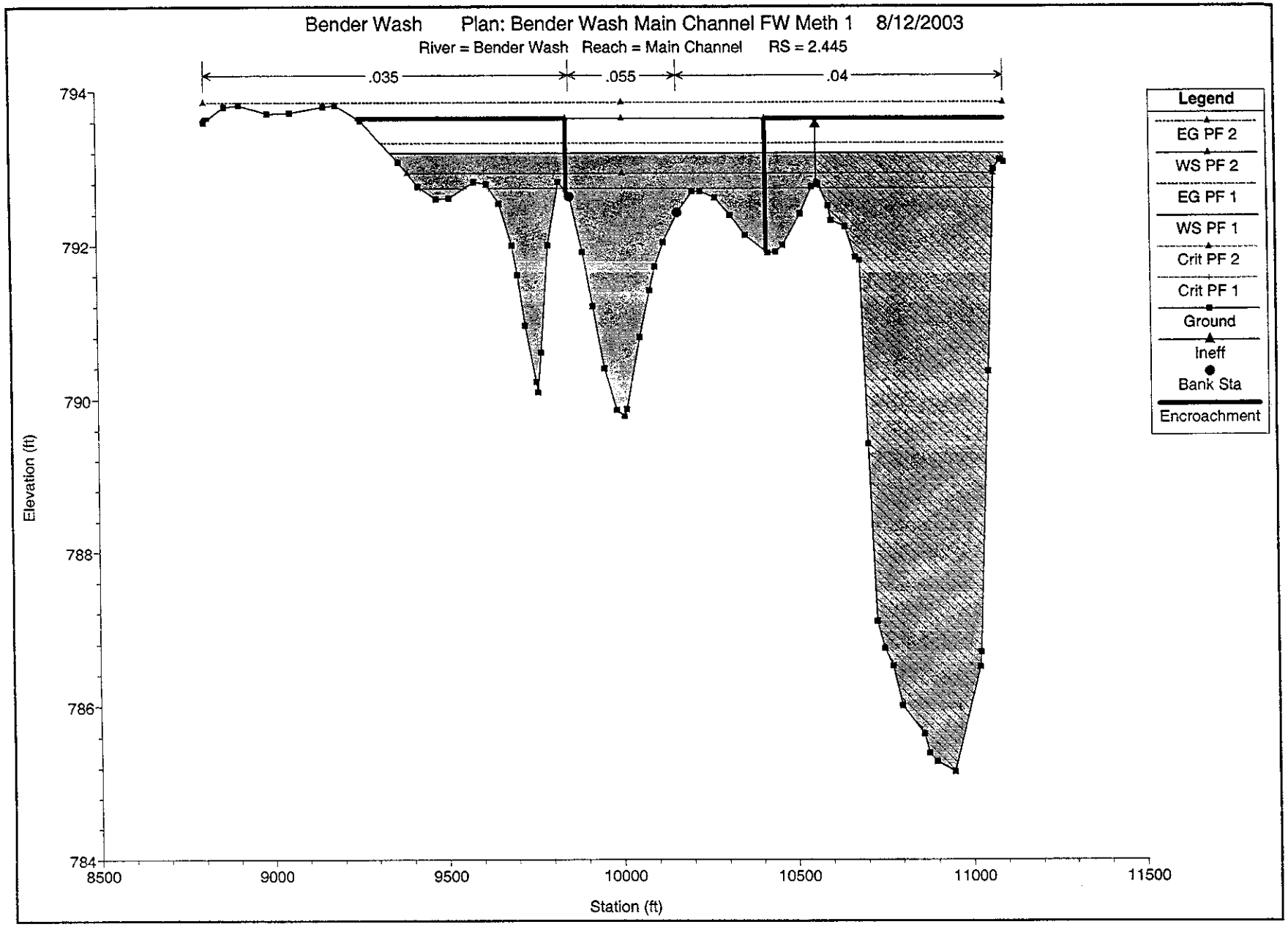

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 2.924
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
813
812
811
810
809
808
807
806
805
8000
8500
9000
9500
10000
10500
11000

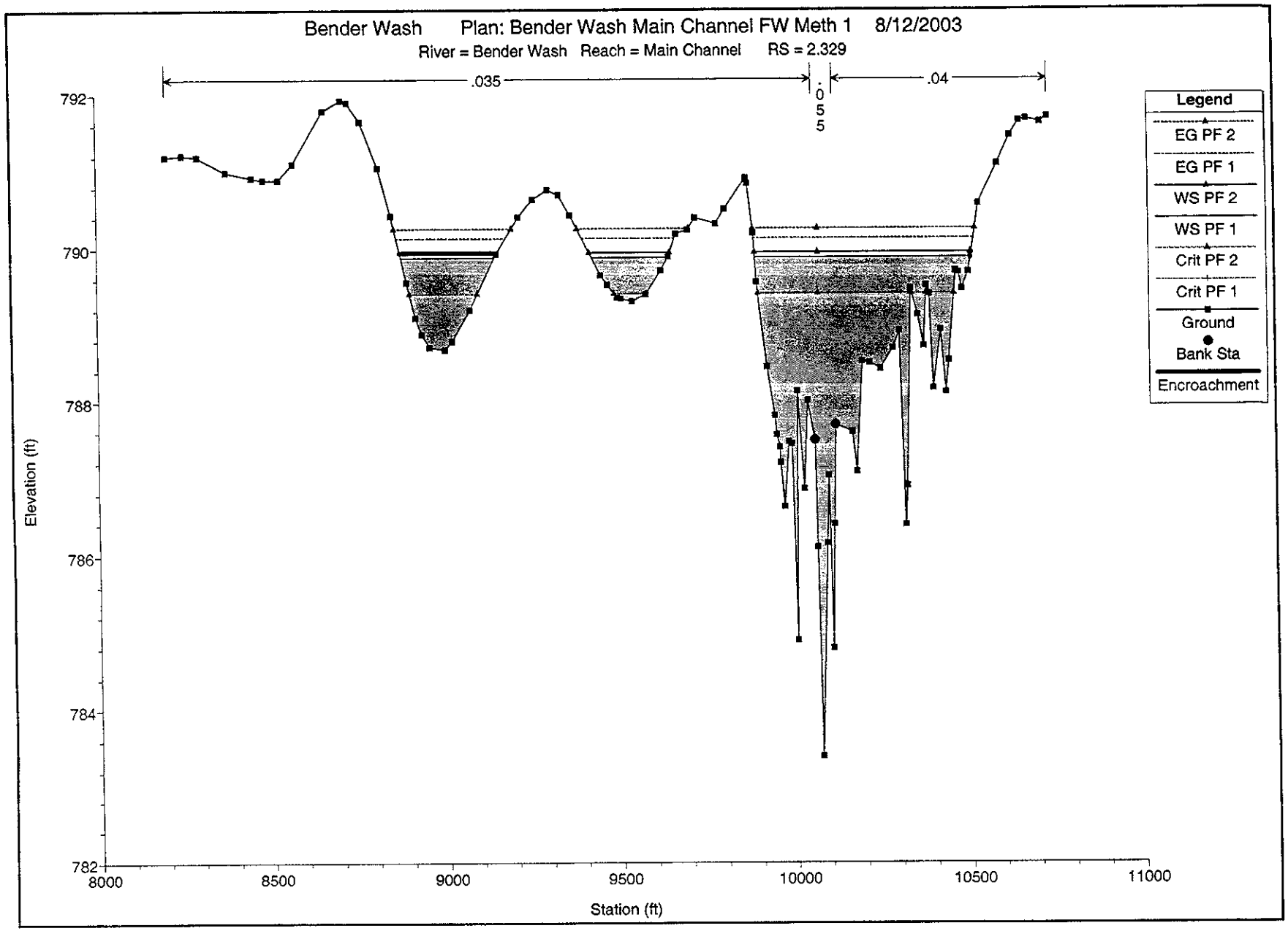

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 2.837
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
808
807
806
805
804
803
802
801
7500
8000
8500
9000
9500
10000
10500
11000
Station (ft)

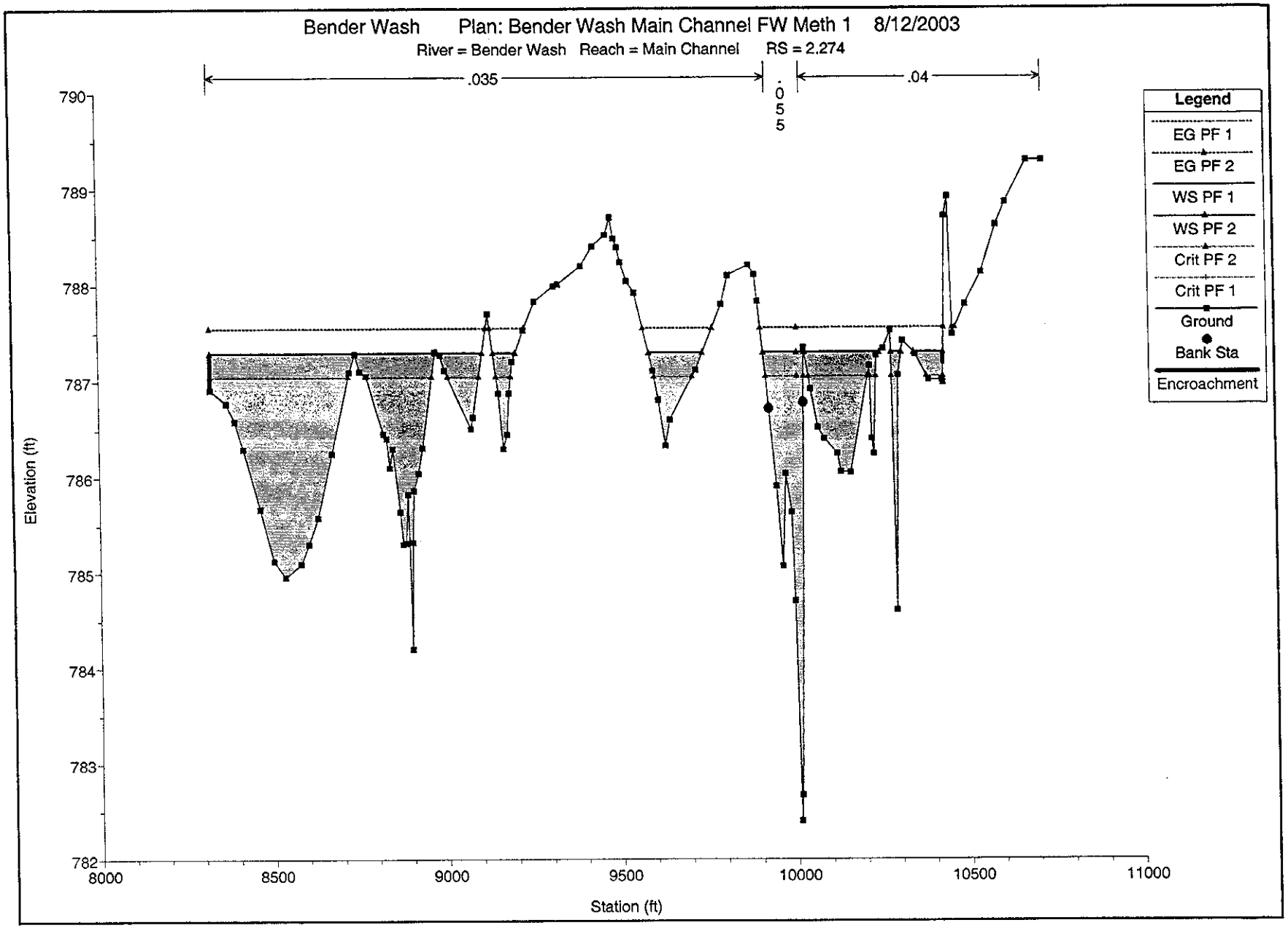

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 2.724
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
804
803
802
801
800
799
798
797
8500
9000
9500
10000
10500
11000
Station (ft)

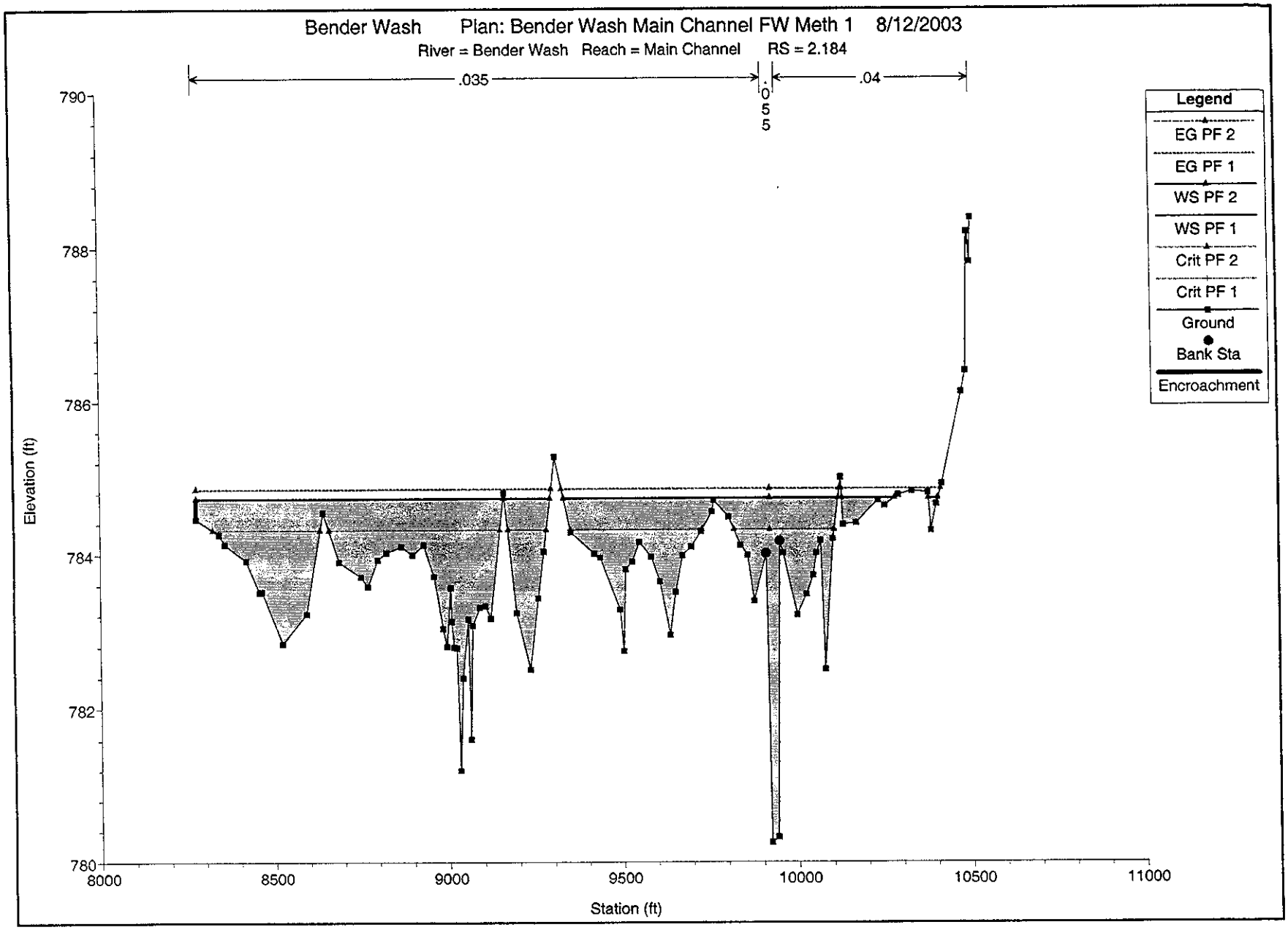

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 2.644
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
801
800
799
798
797
796
795
794
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

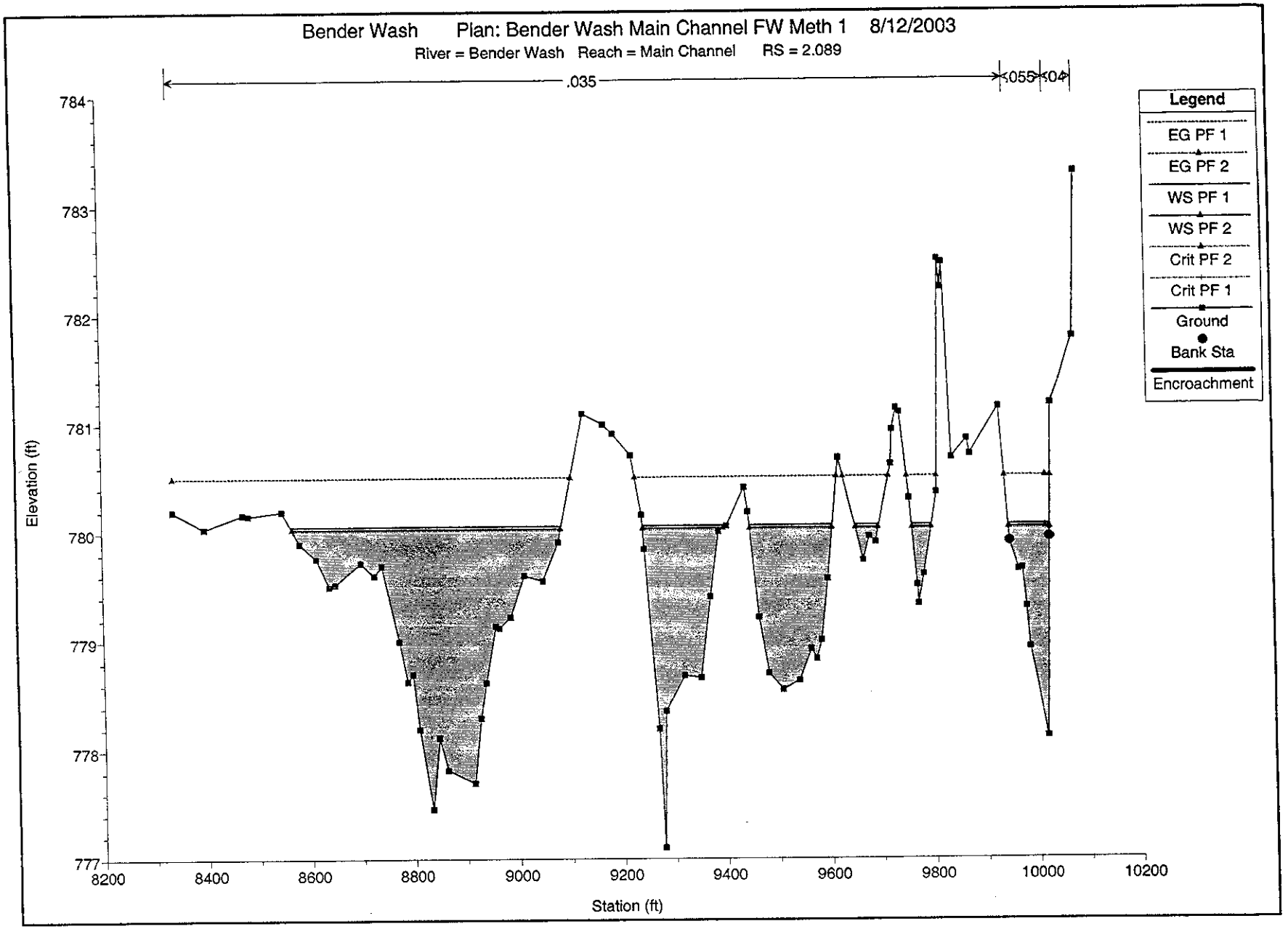

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 2.553
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
797
796
795
794
793
792
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

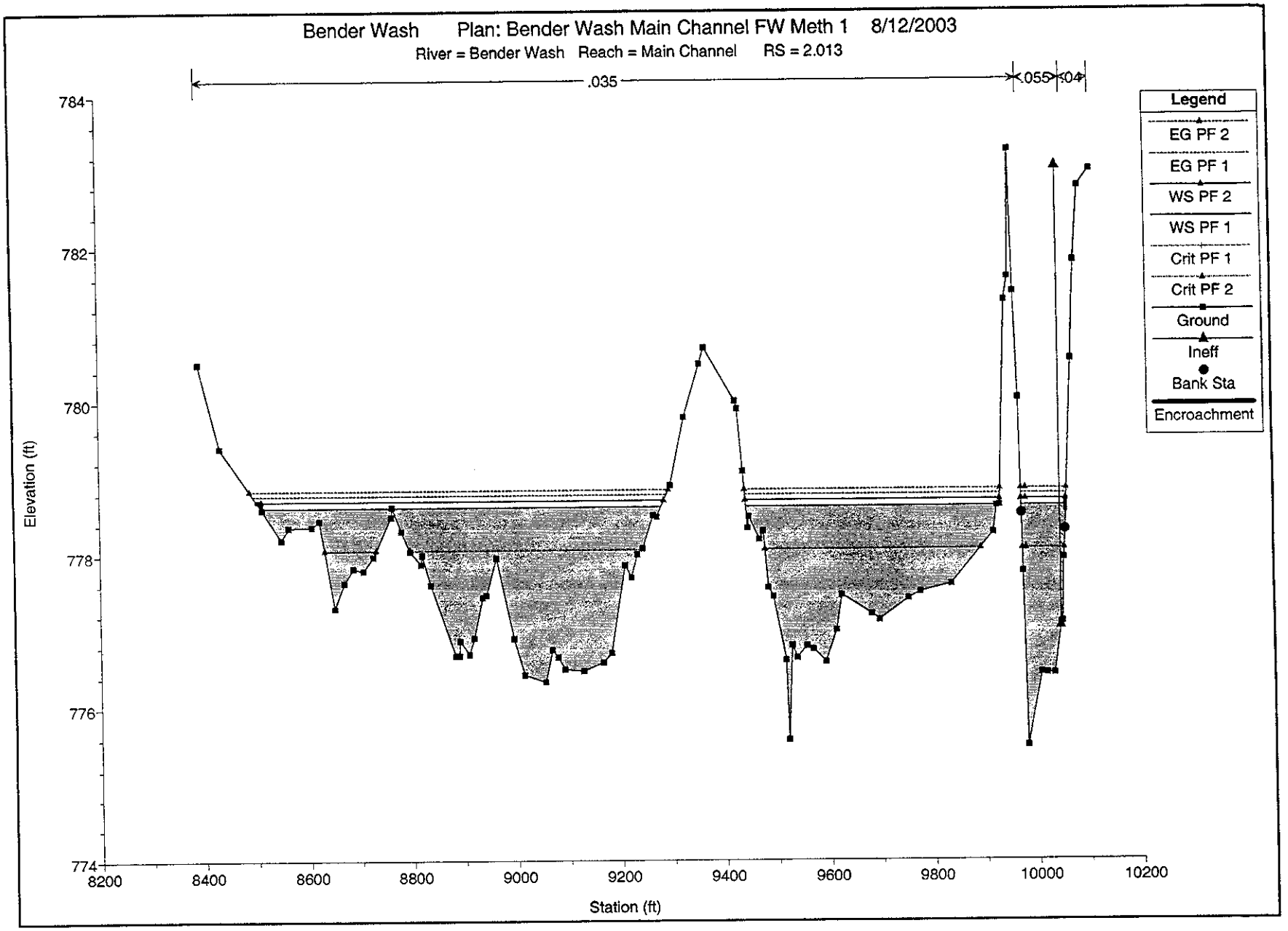

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 2.445
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
794
792
790
788
786
784
8500
9000
9500
10000
10500
11000
11500
Station (ft)

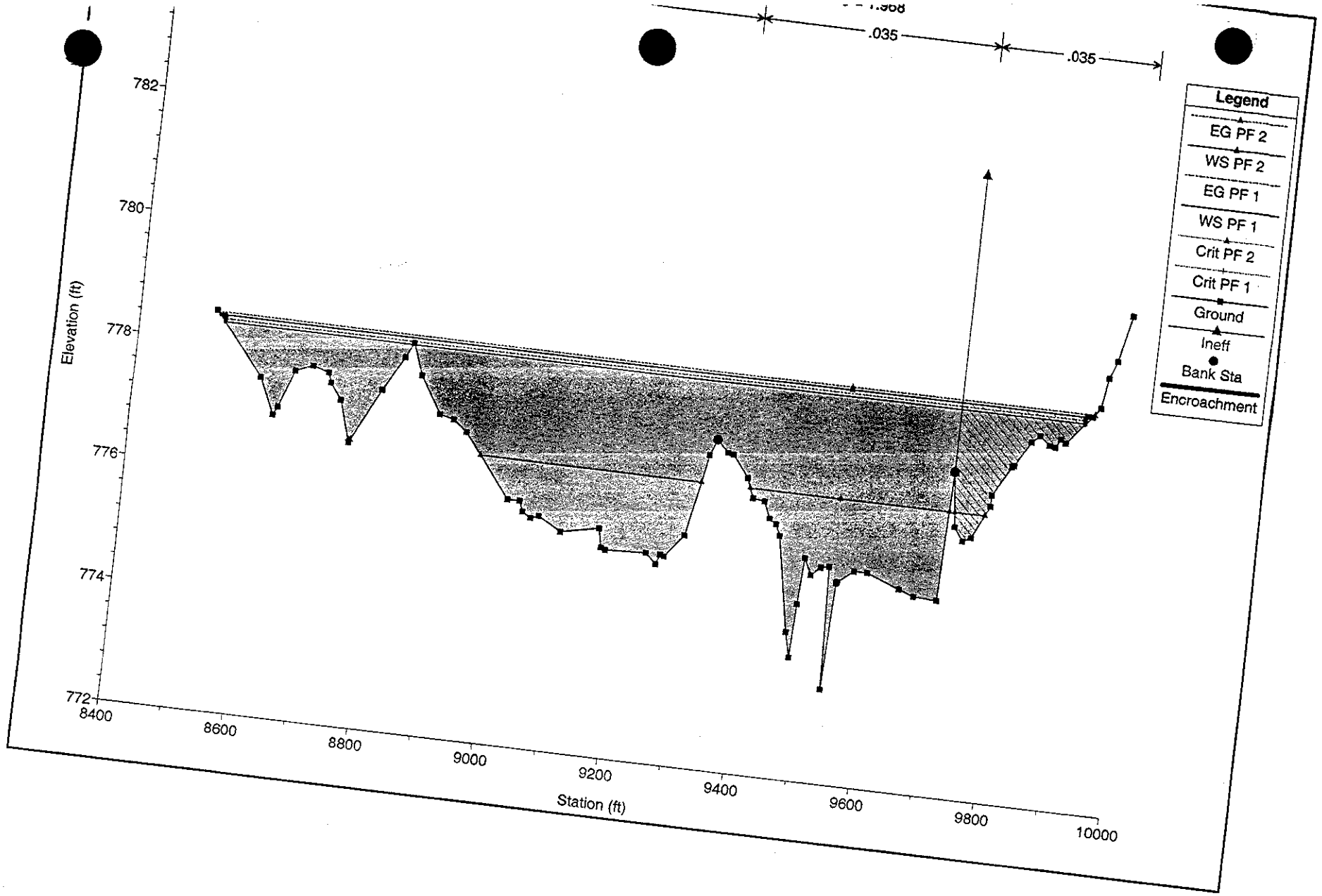

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 2.329
.035
.055
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
792
790
788
786
784
782
8000
8500
9000
9500
10000
10500
11000
Station (ft)

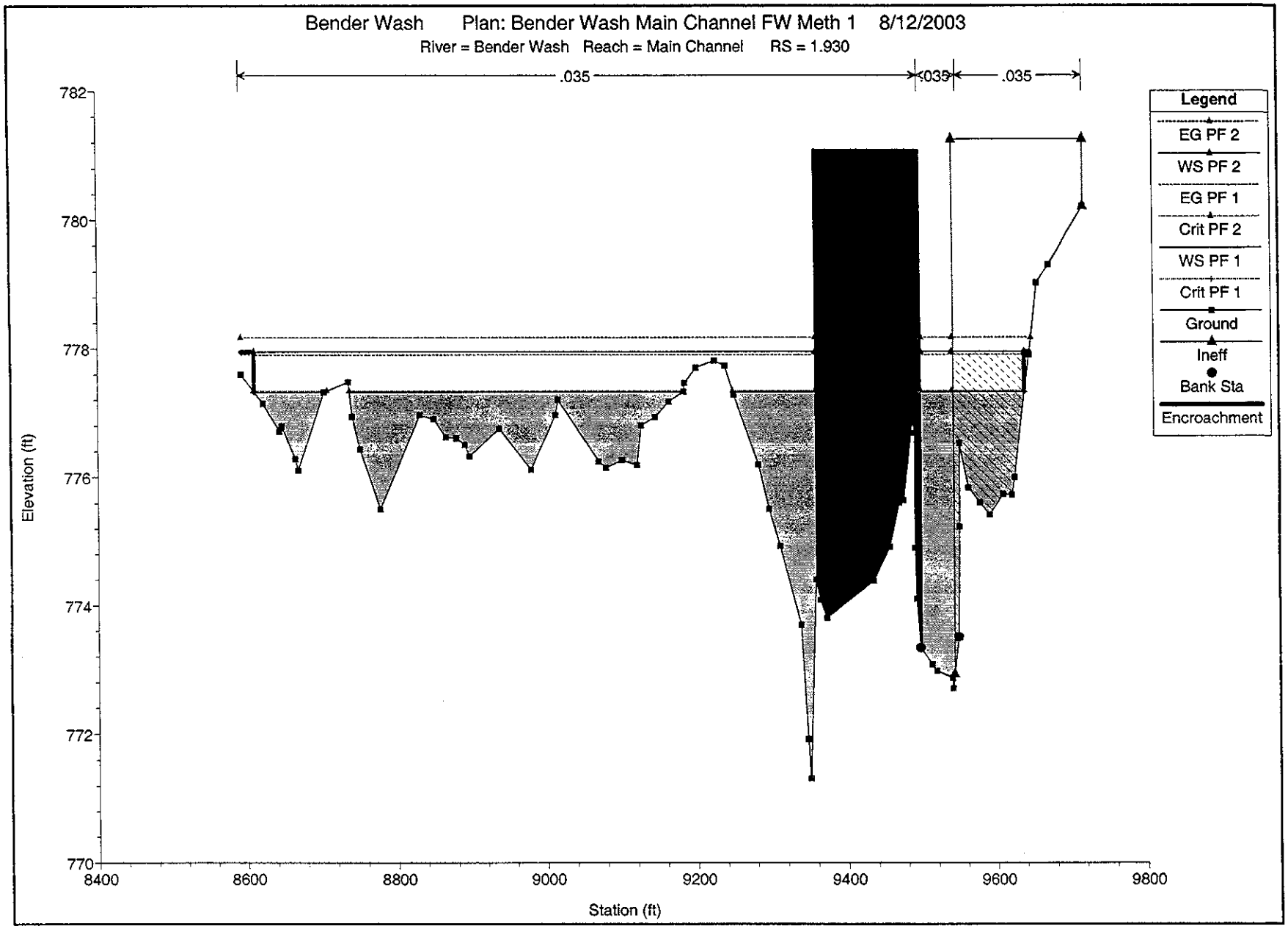

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 2.274
.035
.055
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
790
789
788
787
786
785
784
783
782
8000
8500
9000
9500
10000
10500
11000
Station (ft)

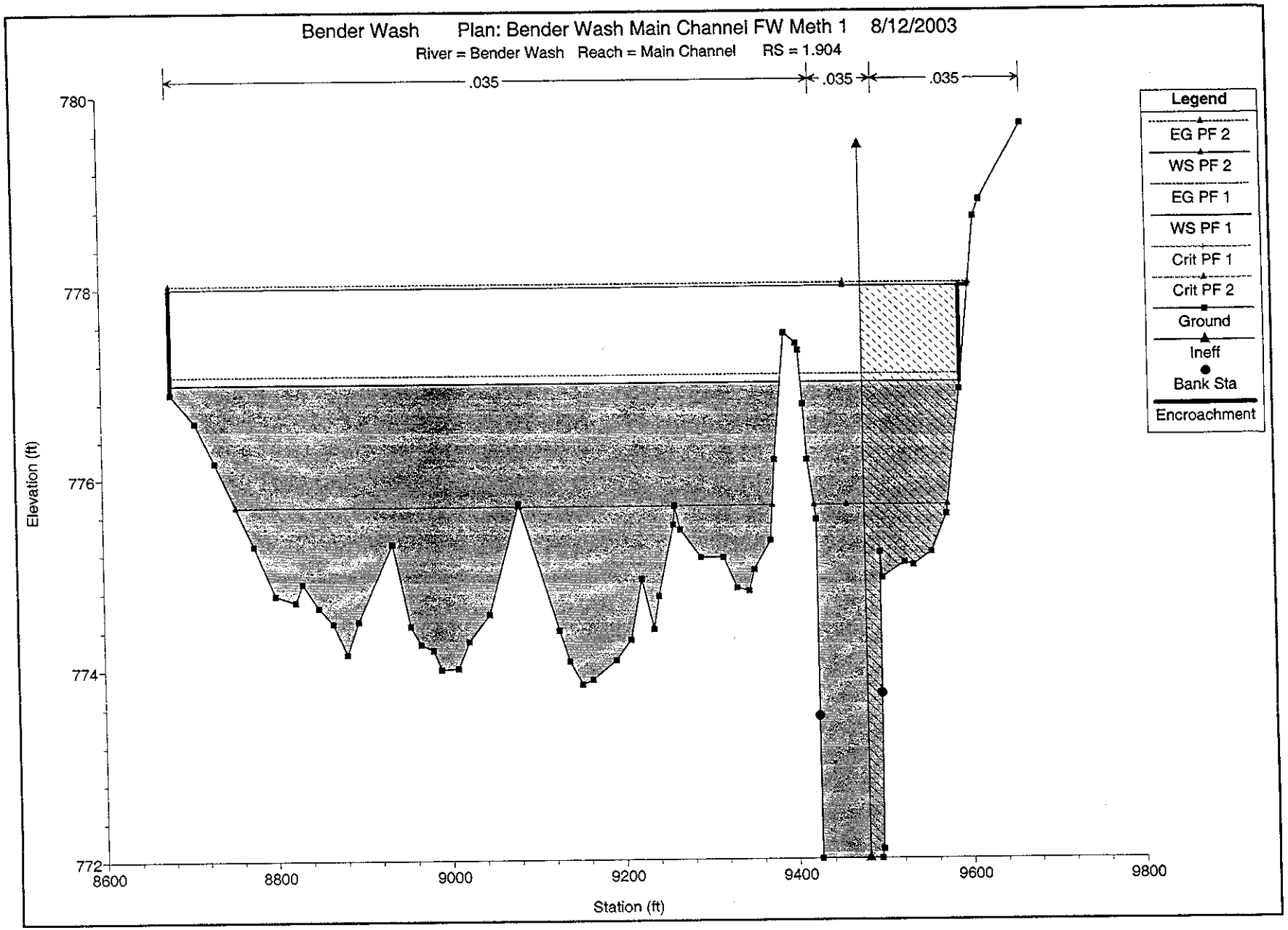

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 2.184
.035
.055
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
790
788
786
784
782
780
8000
8500
9000
9500
10000
10500
11000
Station (ft)

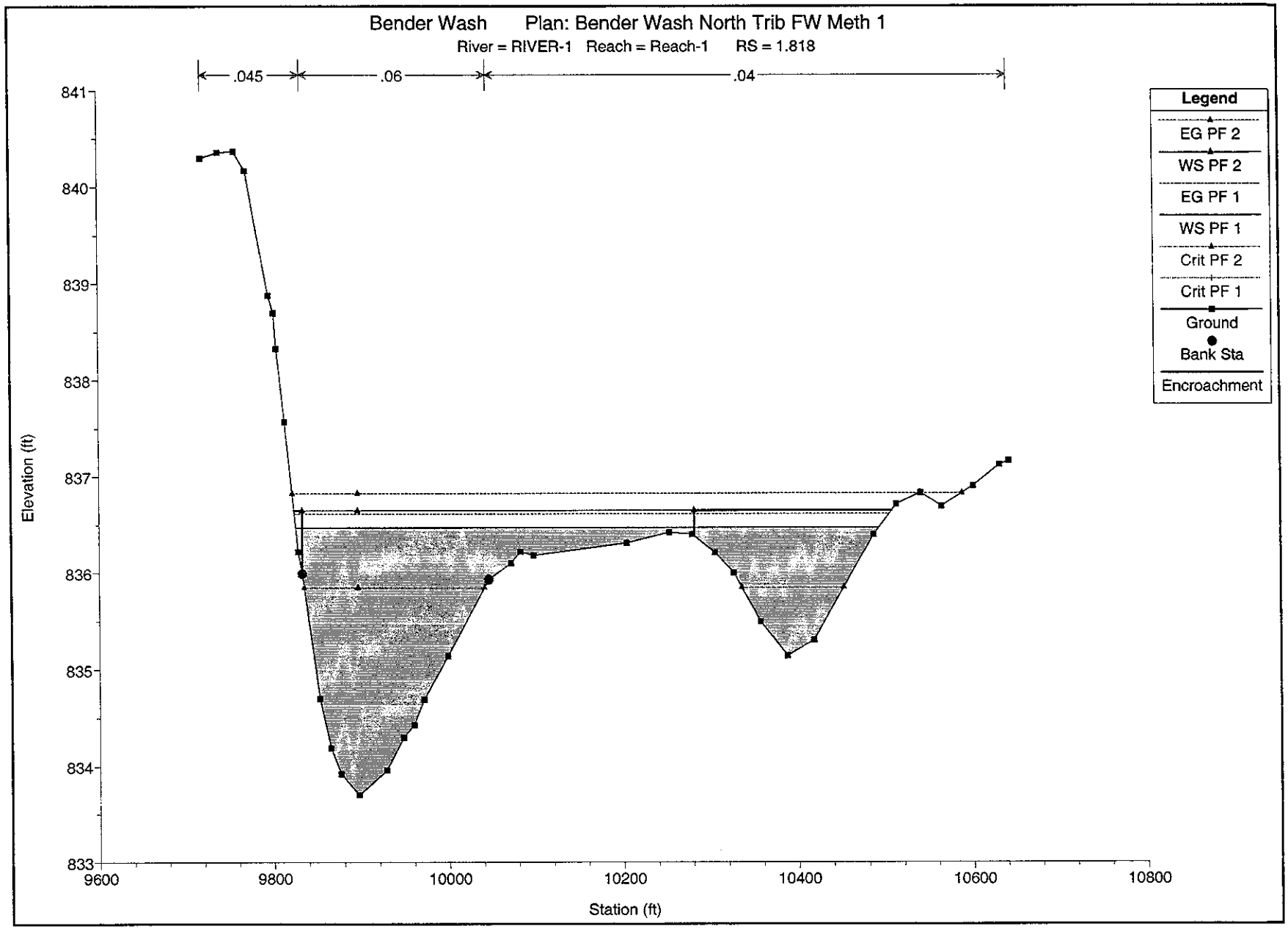

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 2.089
.035
.055
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
784
783
782
781
780
779
778
777
8200
8400
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

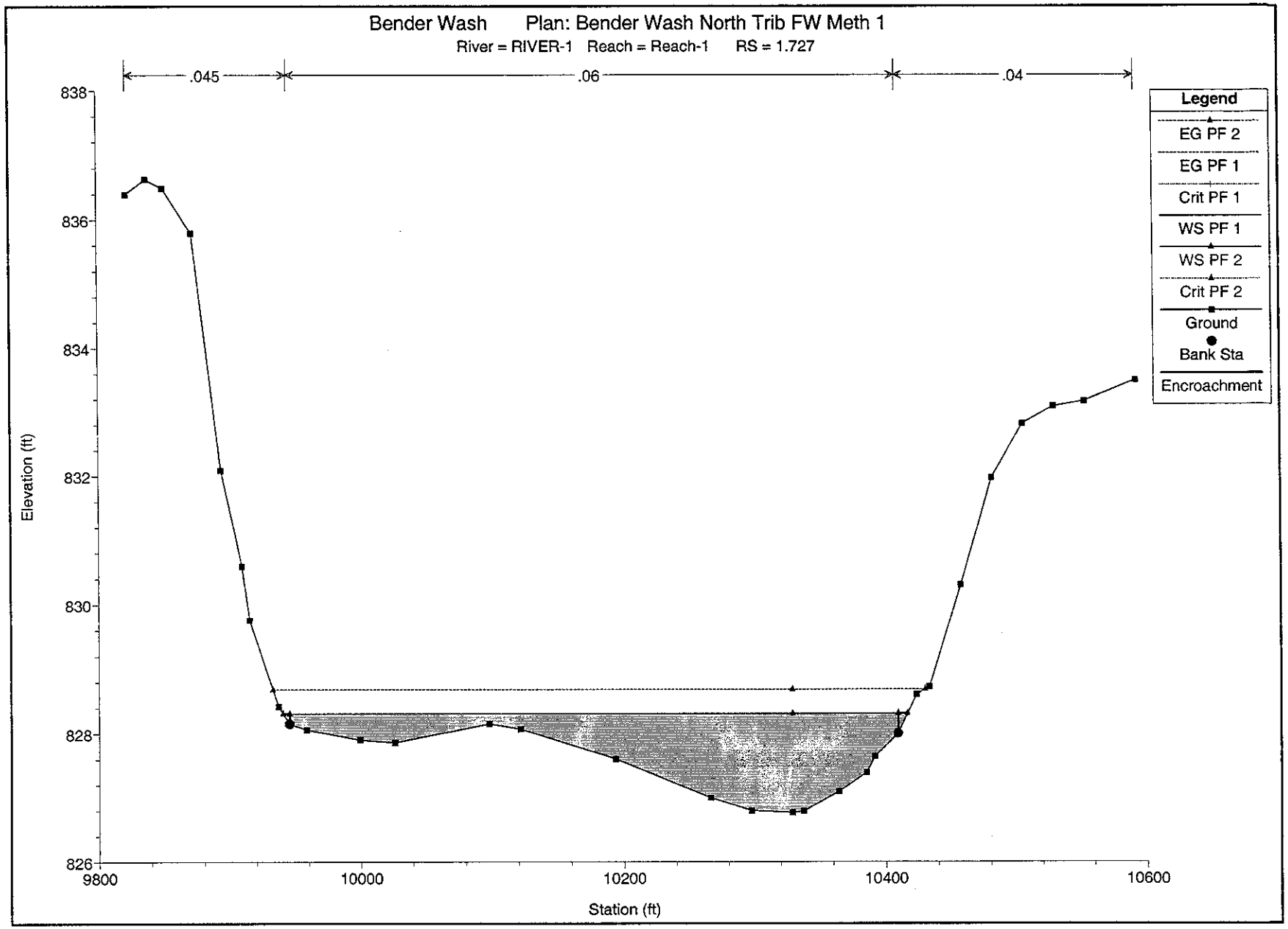

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 2.013
.035
.055
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
784
782
780
778
776
774
8200
8400
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

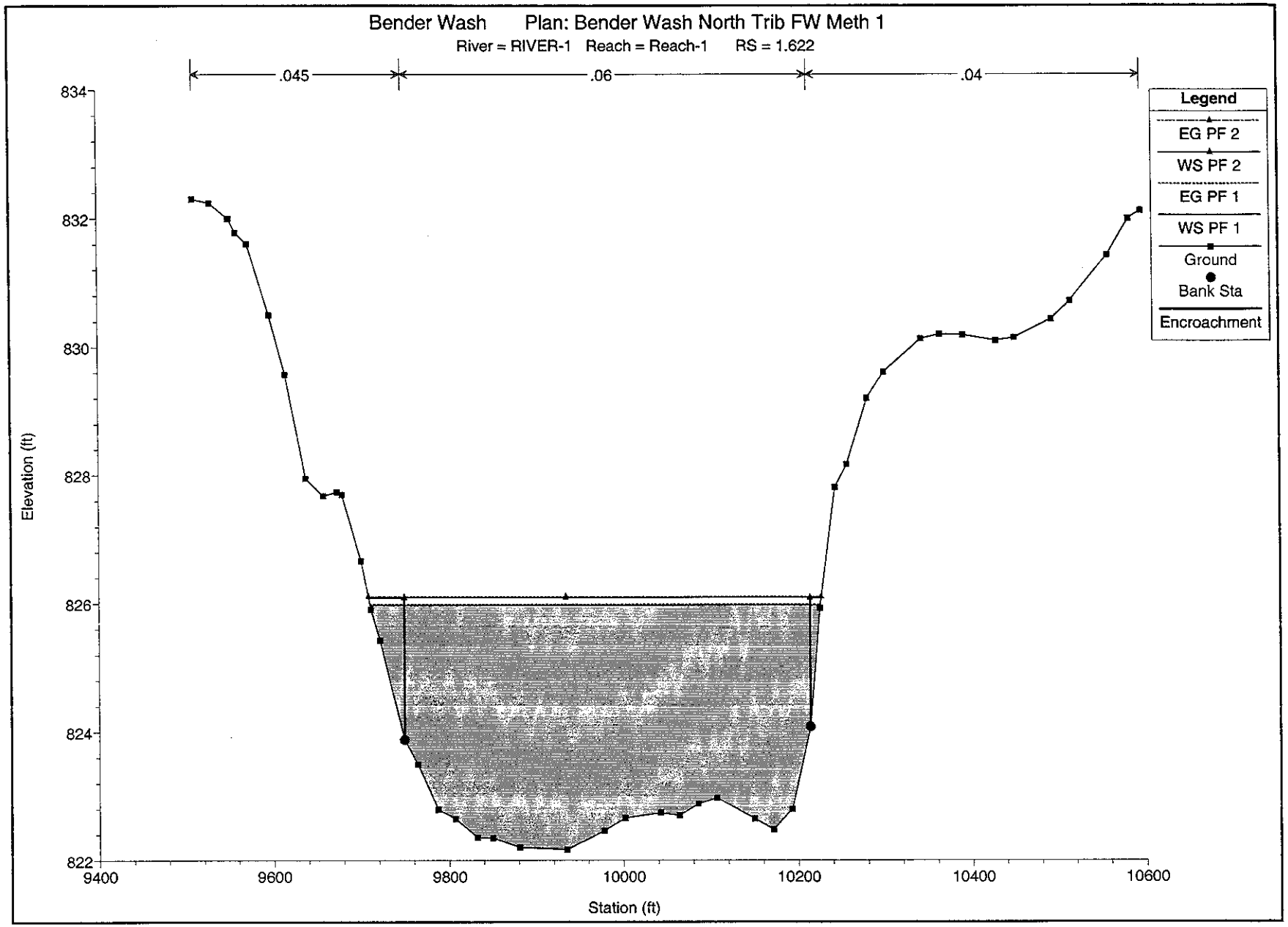

.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
782
780
778
776
774
772
8400
8600
8800
9000
9200
9400
9600
9800
10000
Station (ft)

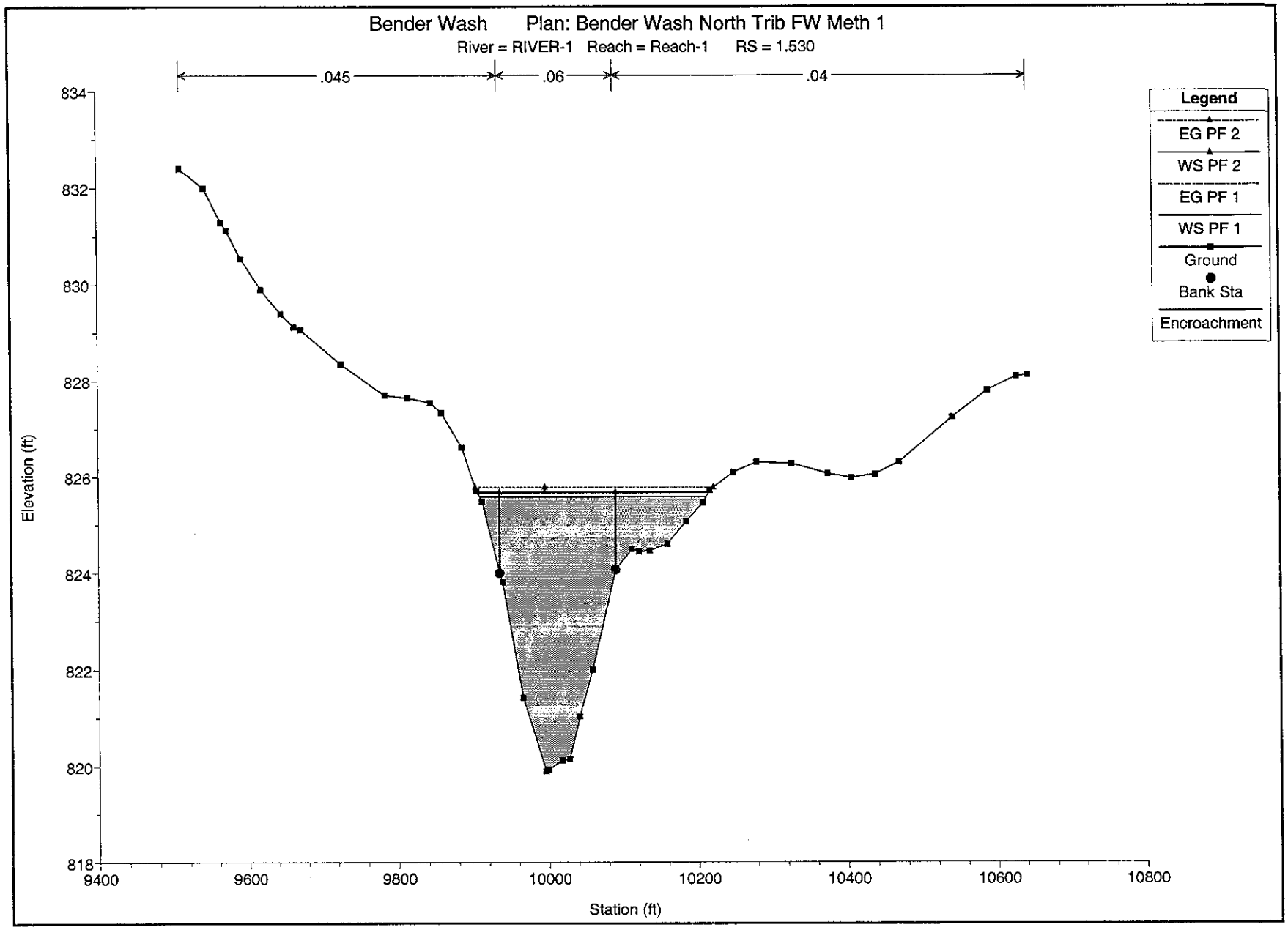

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 1.930
.035
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 2
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
782
780
778
776
774
772
770
8400
8600
8800
9000
9200
9400
9600
9800
Station (ft)

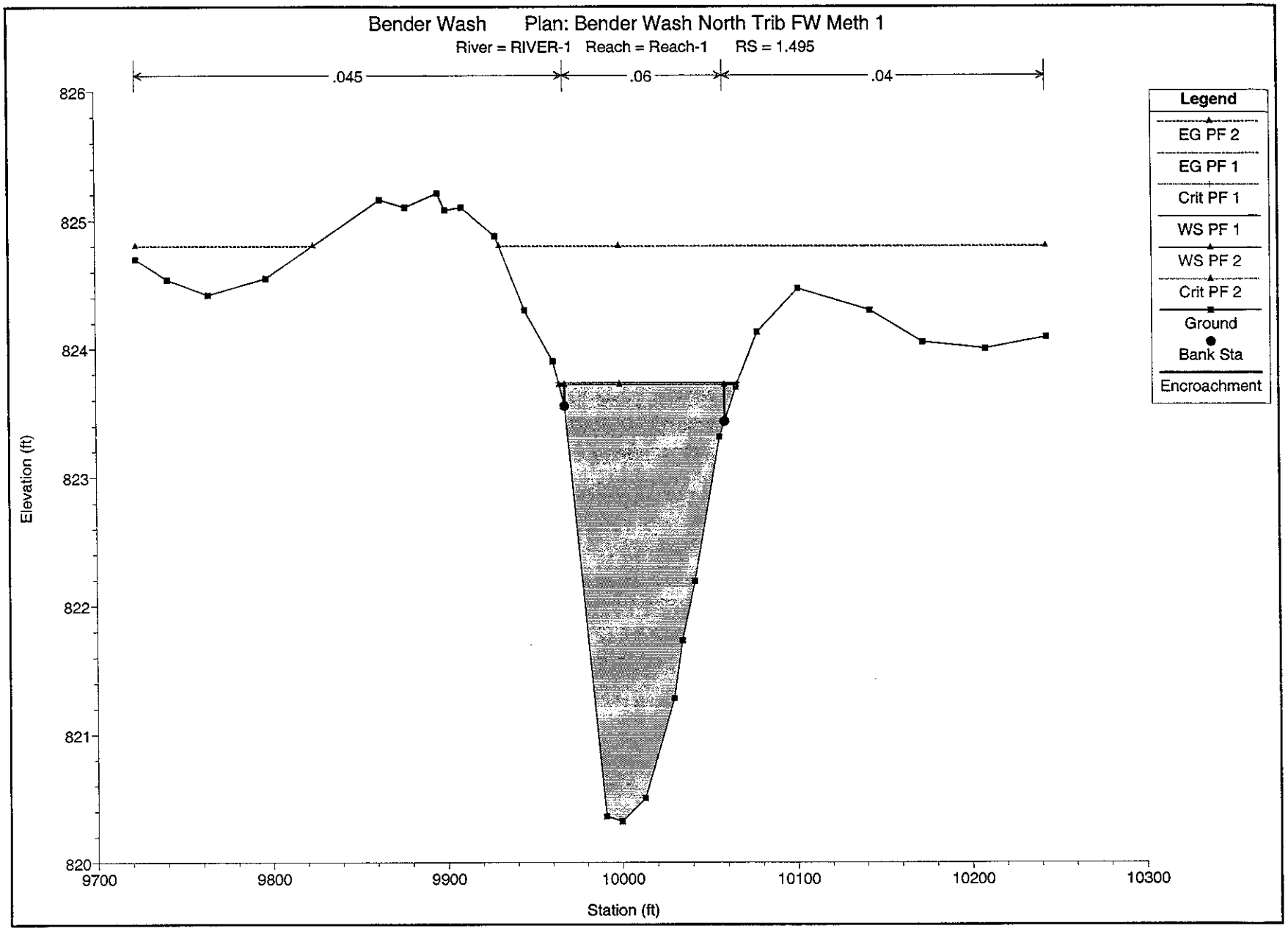

Bender Wash Plan: Bender Wash Main Channel FW Meth 1 8/12/2003
River = Bender Wash Reach = Main Channel RS = 1.904
.035
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
780
778
776
774
772
8600
8800
9000
9200
9400
9600
9800
Station (ft)

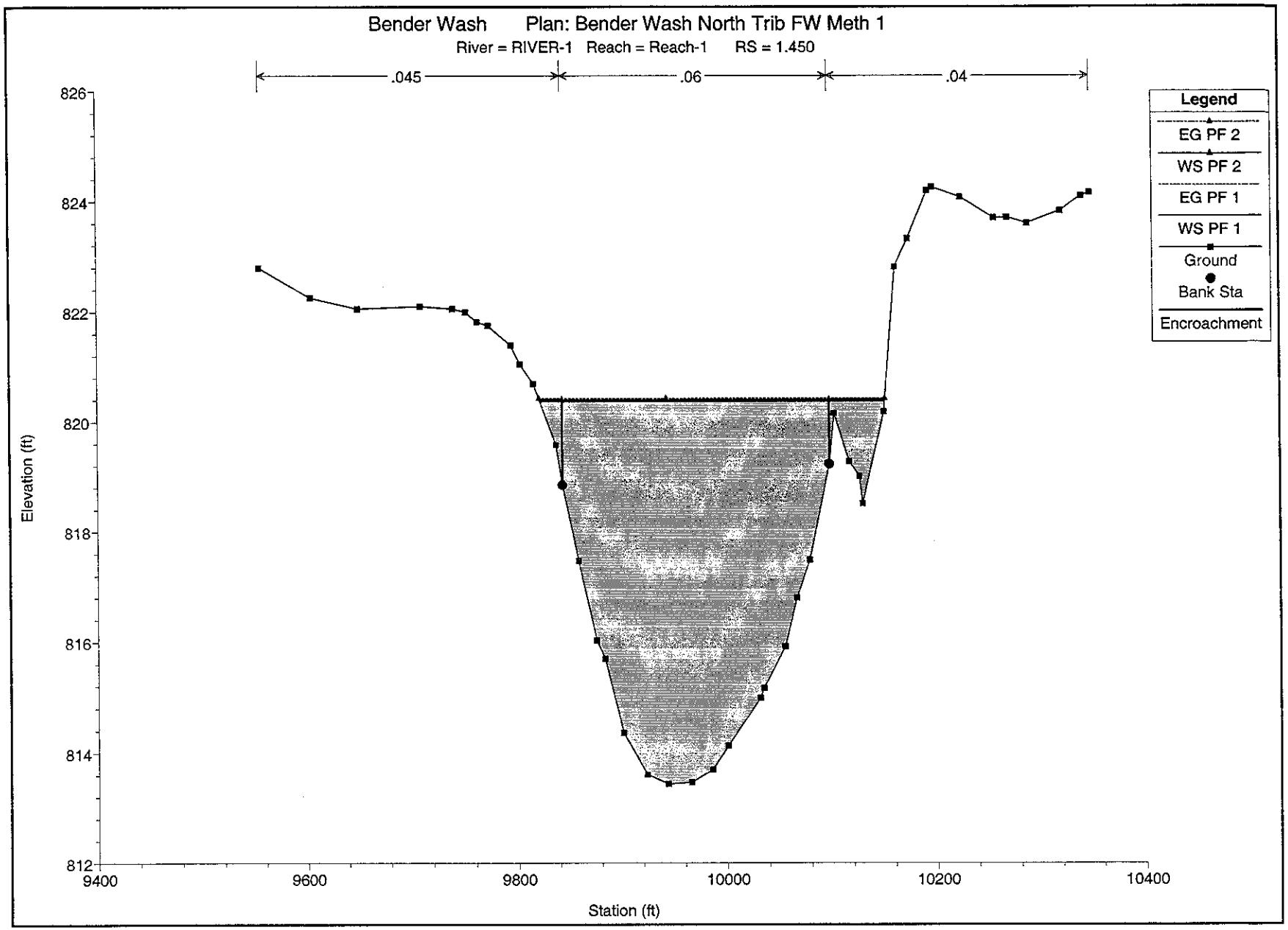

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 1.818
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
841
840
839
838
837
836
835
834
833
9600
9800
10000
10200
10400
10600
10800
Station (ft)

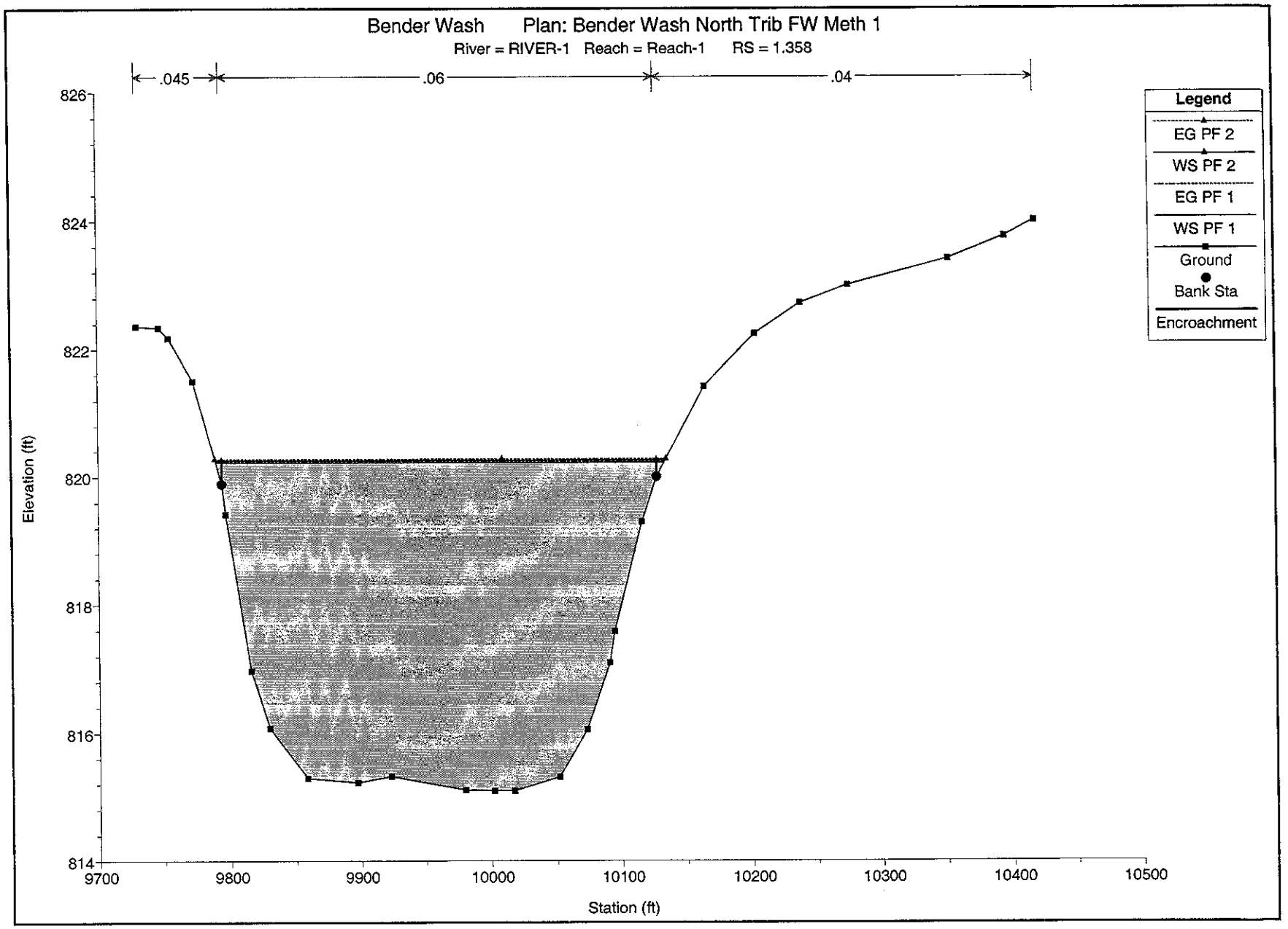

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 1.727
.045
.06
.04
Legend
EG PF 2
EG PF 1
Crit PF 1
WS PF 1
WS PF 2
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
838
836
834
832
830
828
826
9800
10000
10200
10400
10600
Station (ft)

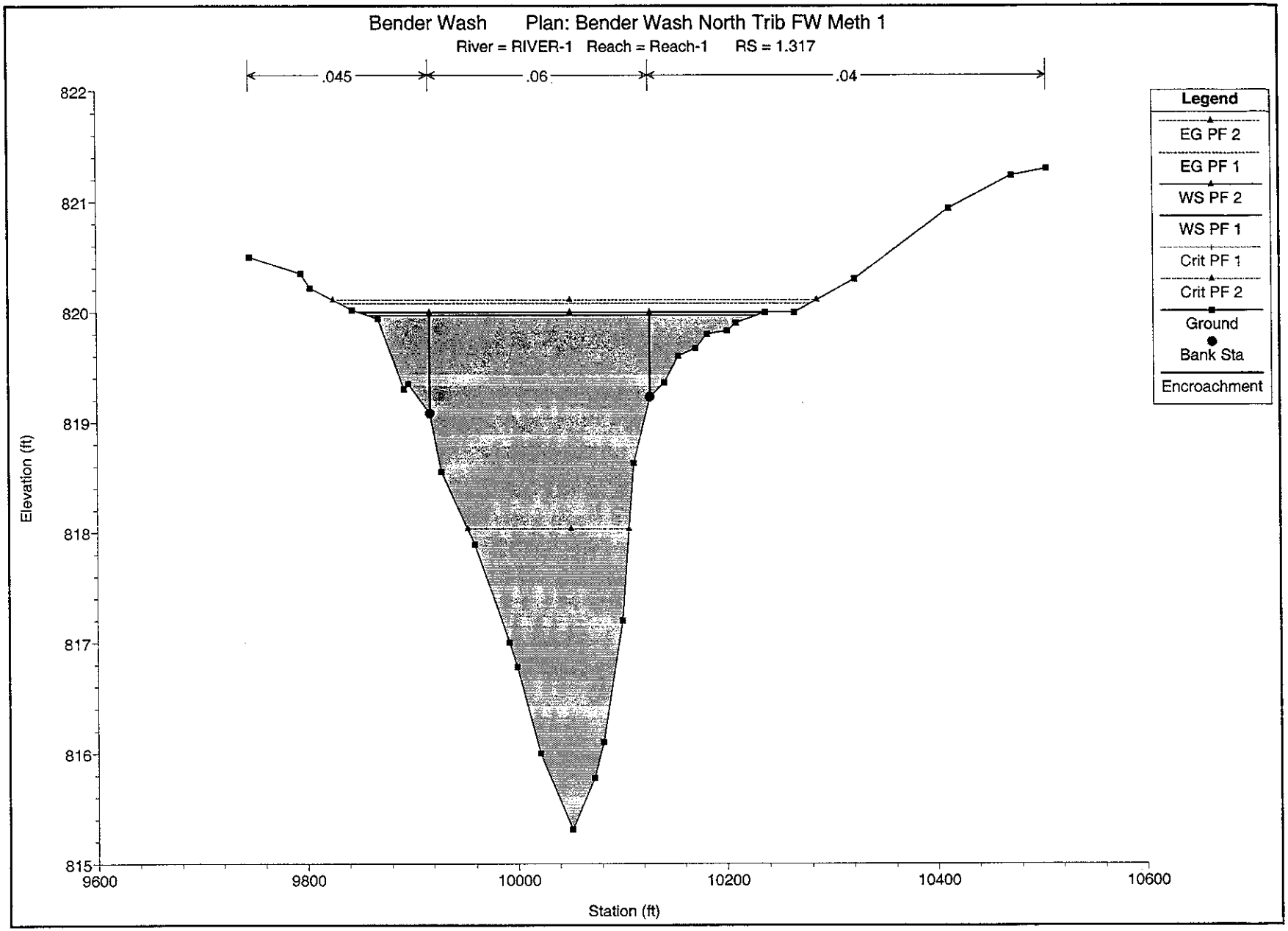

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 1.622
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
834
832
830
828
826
824
822
9400
9600
9800
10000
10200
10400
10600
Station (ft)

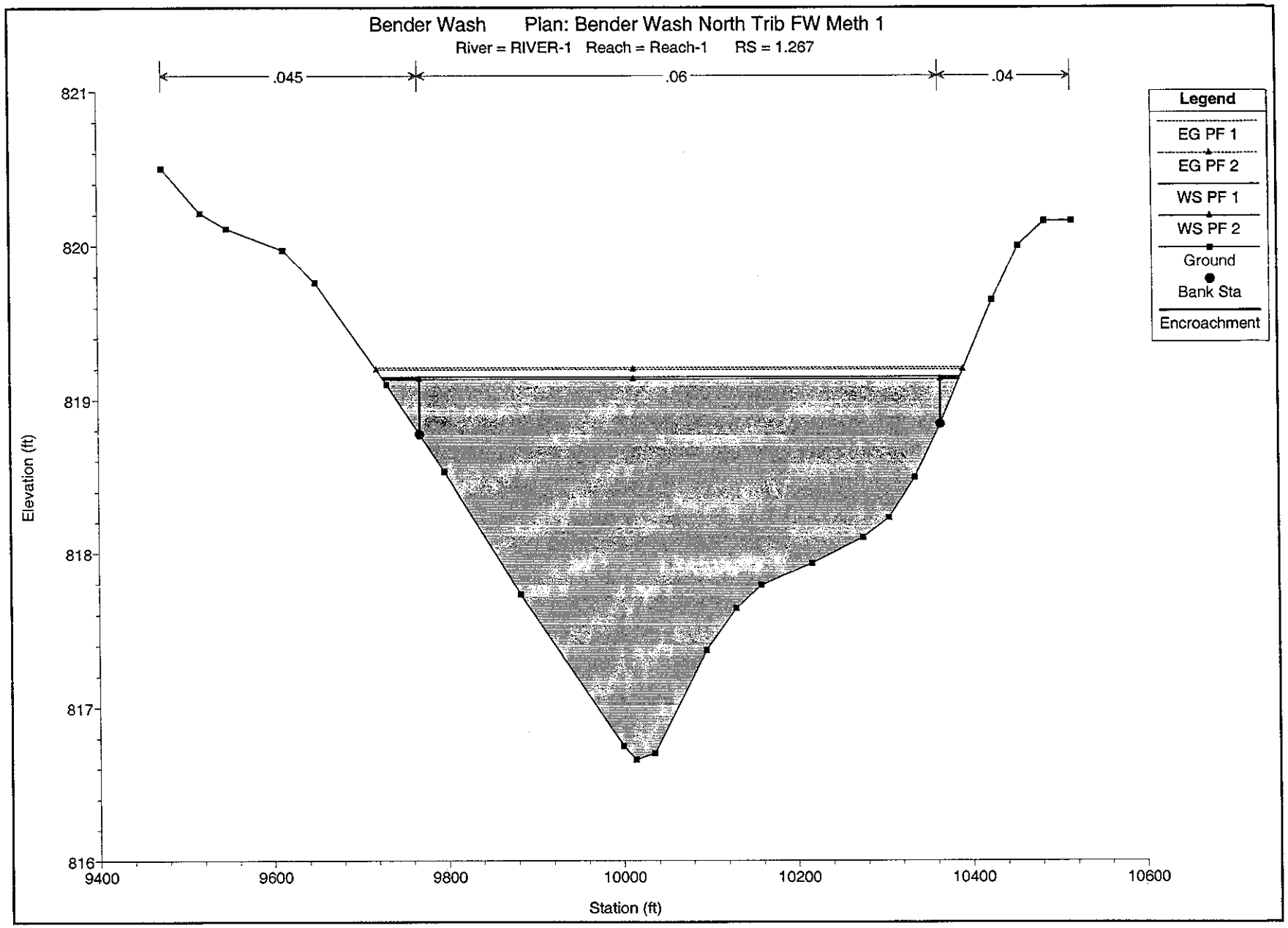

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 1.530
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
834
832
830
828
826
824
822
820
818
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

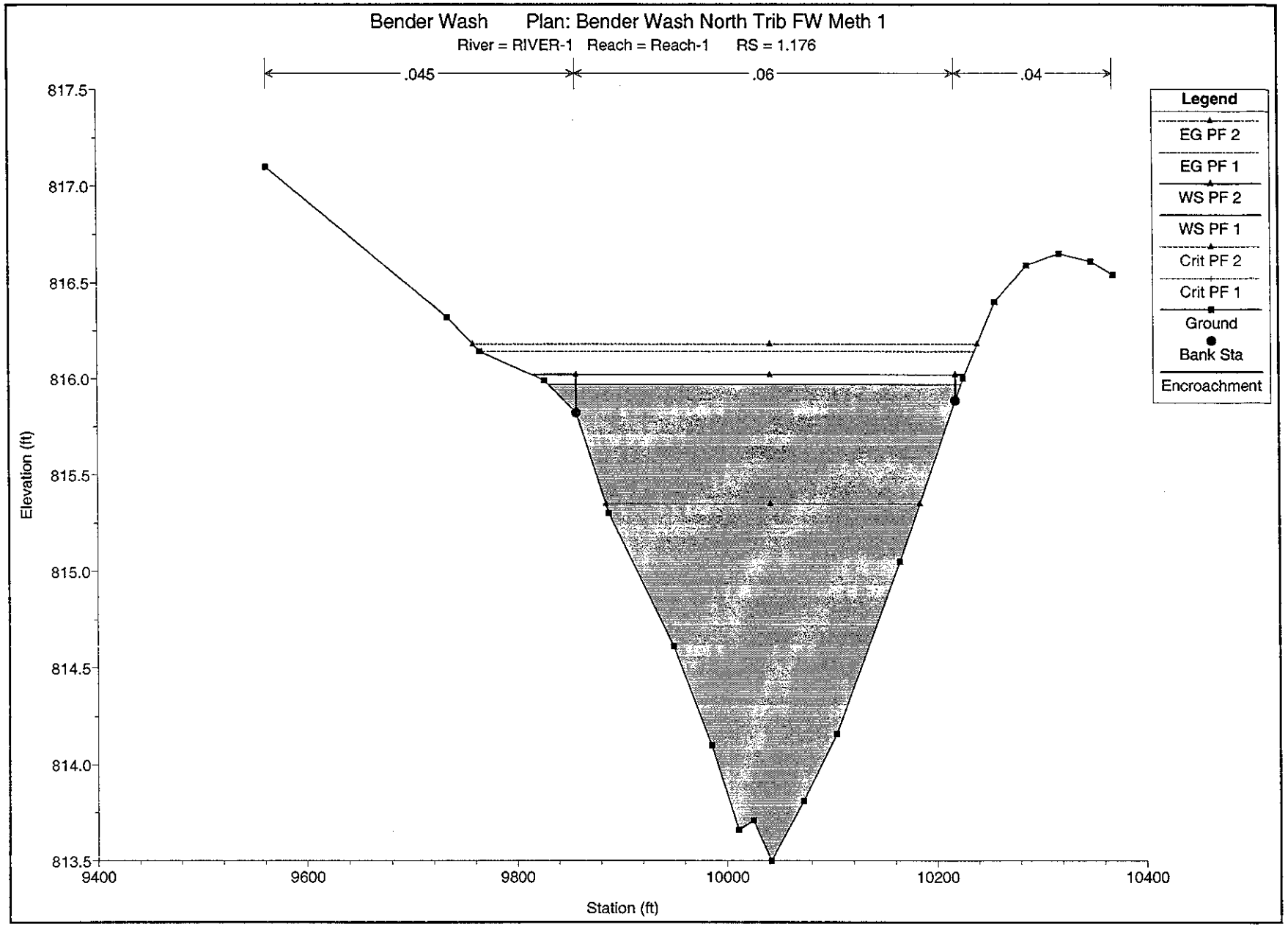

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 1.495
.045
.06
.04
Legend
EG PF 2
EG PF 1
Crit PF 1
WS PF 1
WS PF 2
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
826
825
824
823
822
821
820
9700
9800
9900
10000
10100
10200
10300
Station (ft)

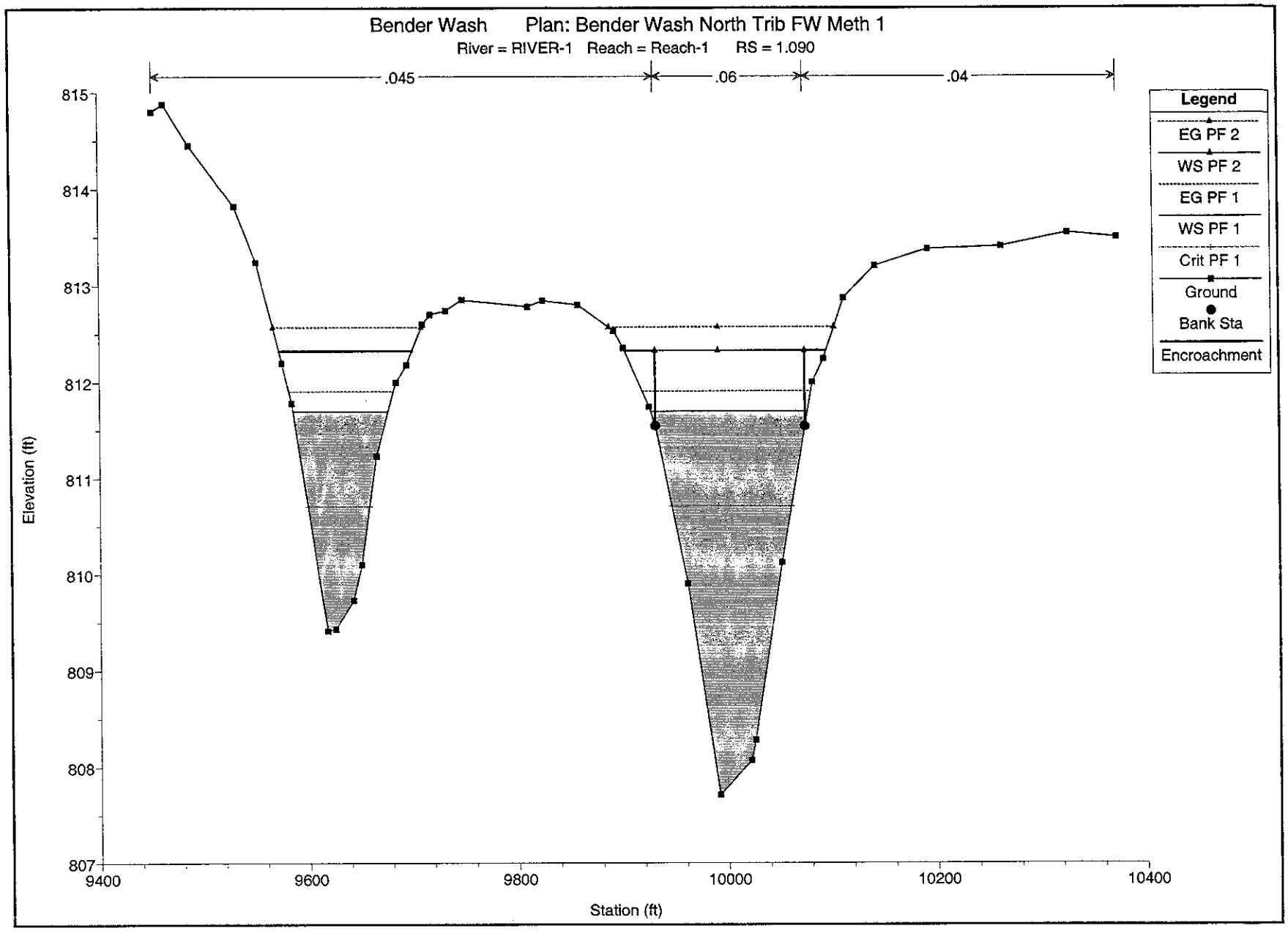

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 1.450
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
826
824
822
820
818
816
814
812
9400
9600
9800
10000
10200
10400
Station (ft)

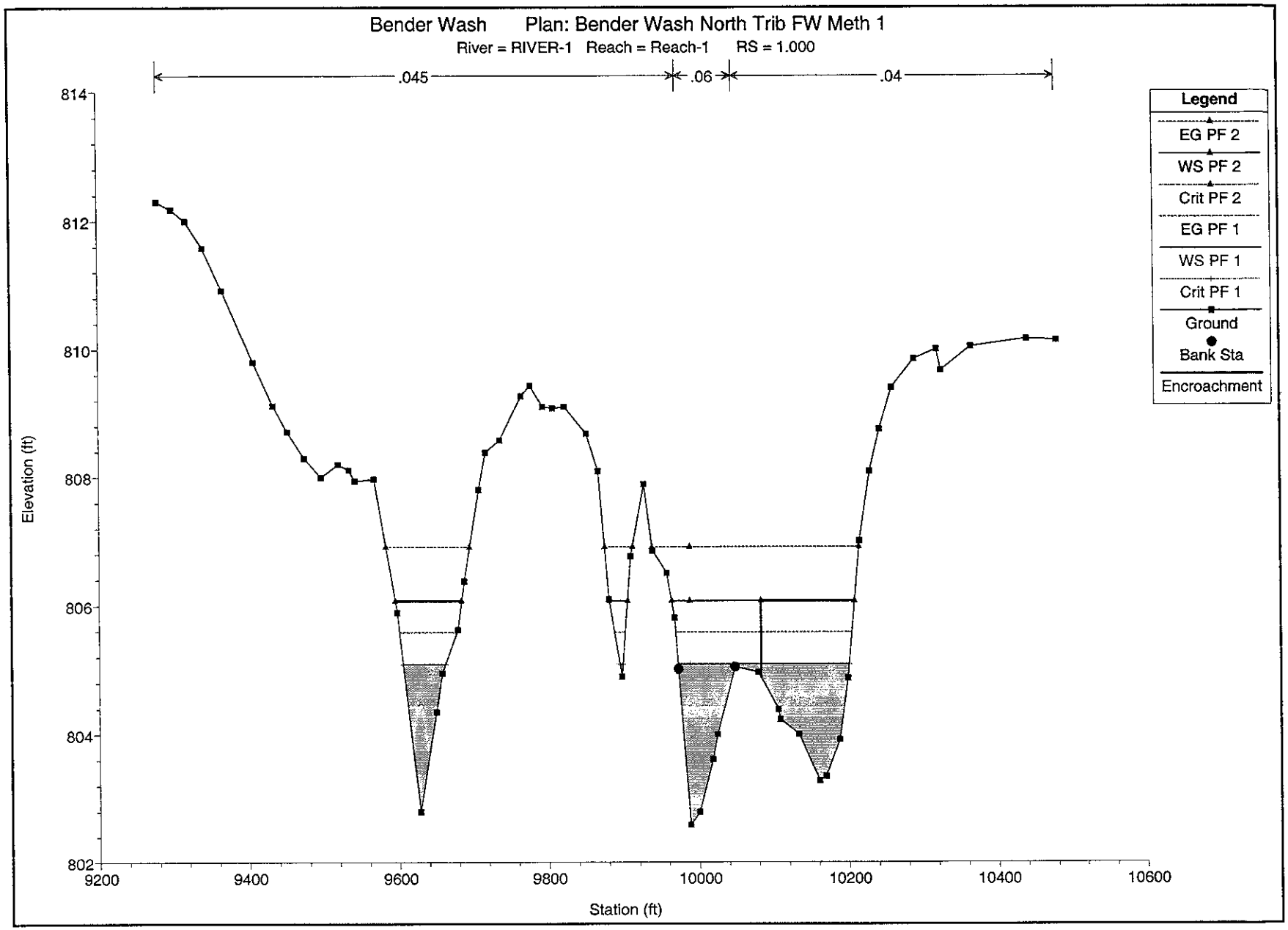

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 1.358
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
826
824
822
820
818
816
814
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

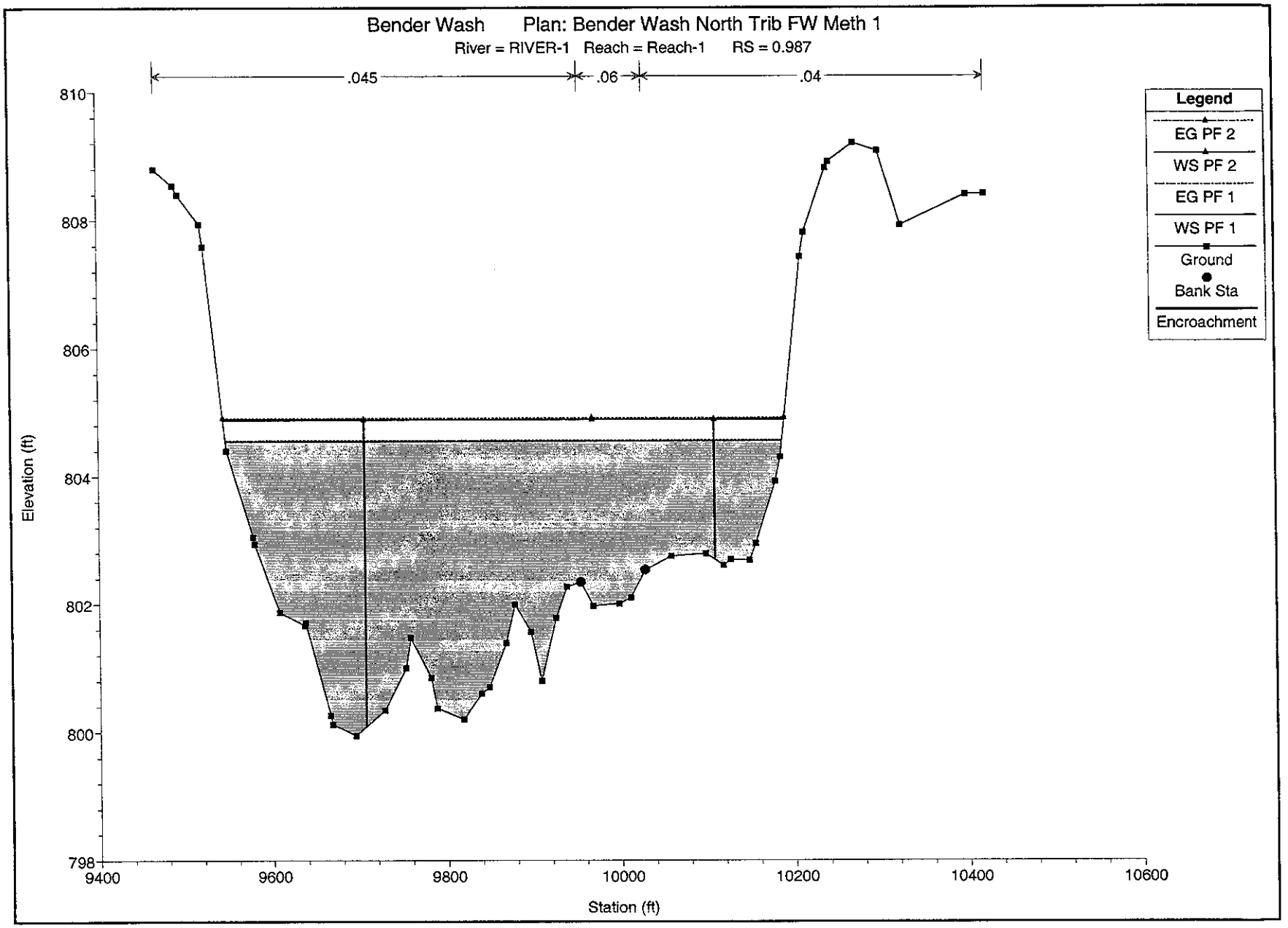

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 1.317
.045
.06
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
822
821
820
819
818
817
816
815
9600
9800
10000
10200
10400
10600
Station (ft)

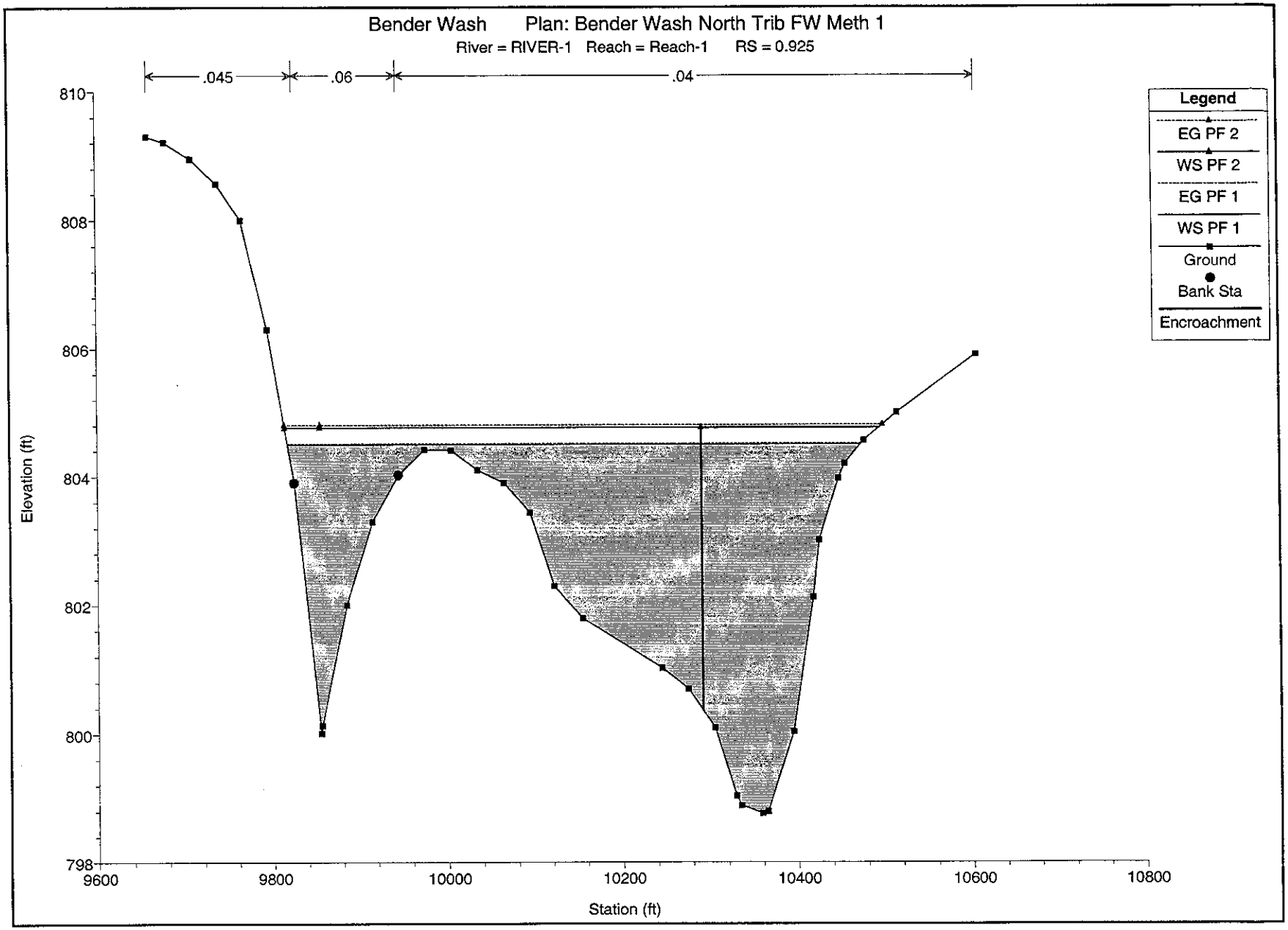

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 1.267
.045
.06
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
821
820
819
818
817
816
9400
9600
9800
10000
10200
10400
10600
Station (ft)

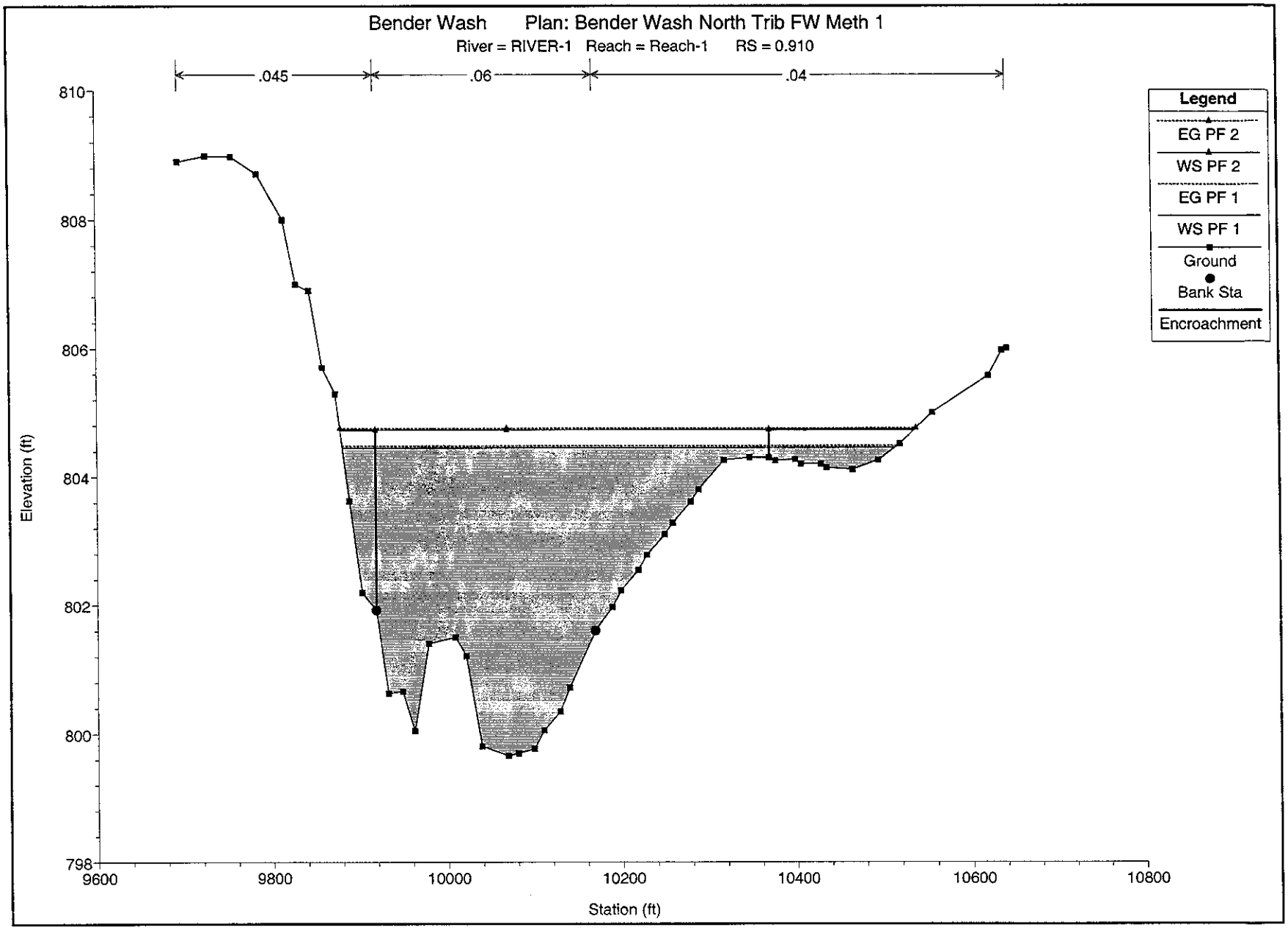

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 1.176
.045
.06
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
817.5
817.0
816.5
816.0
815.5
815.0
814.5
814.0
813.5
9400
9600
9800
10000
10200
10400
Station (ft)

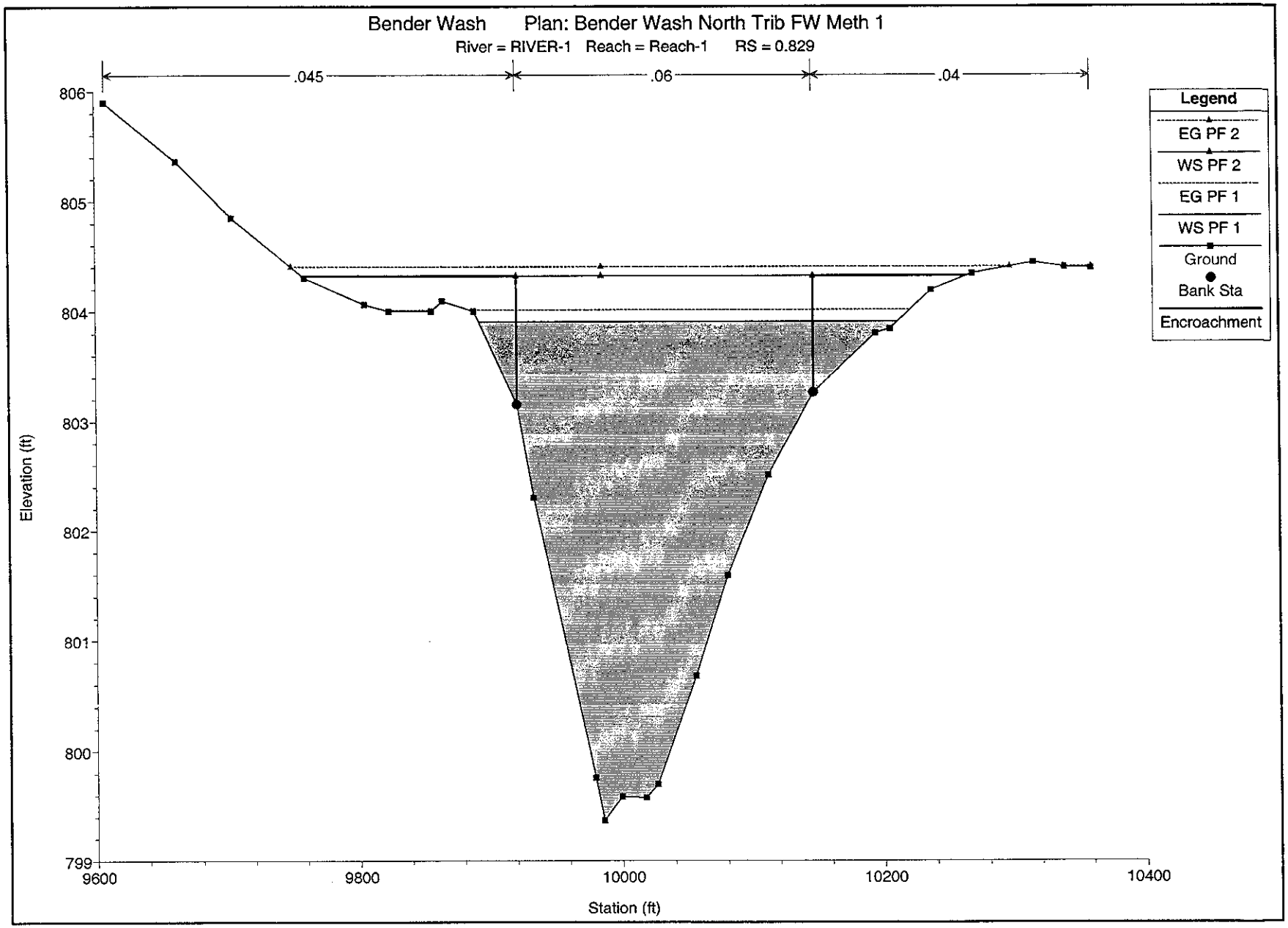

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 1.090
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
815
814
813
812
811
810
809
808
807
9400
9600
9800
10000
10200
10400
Station (ft)

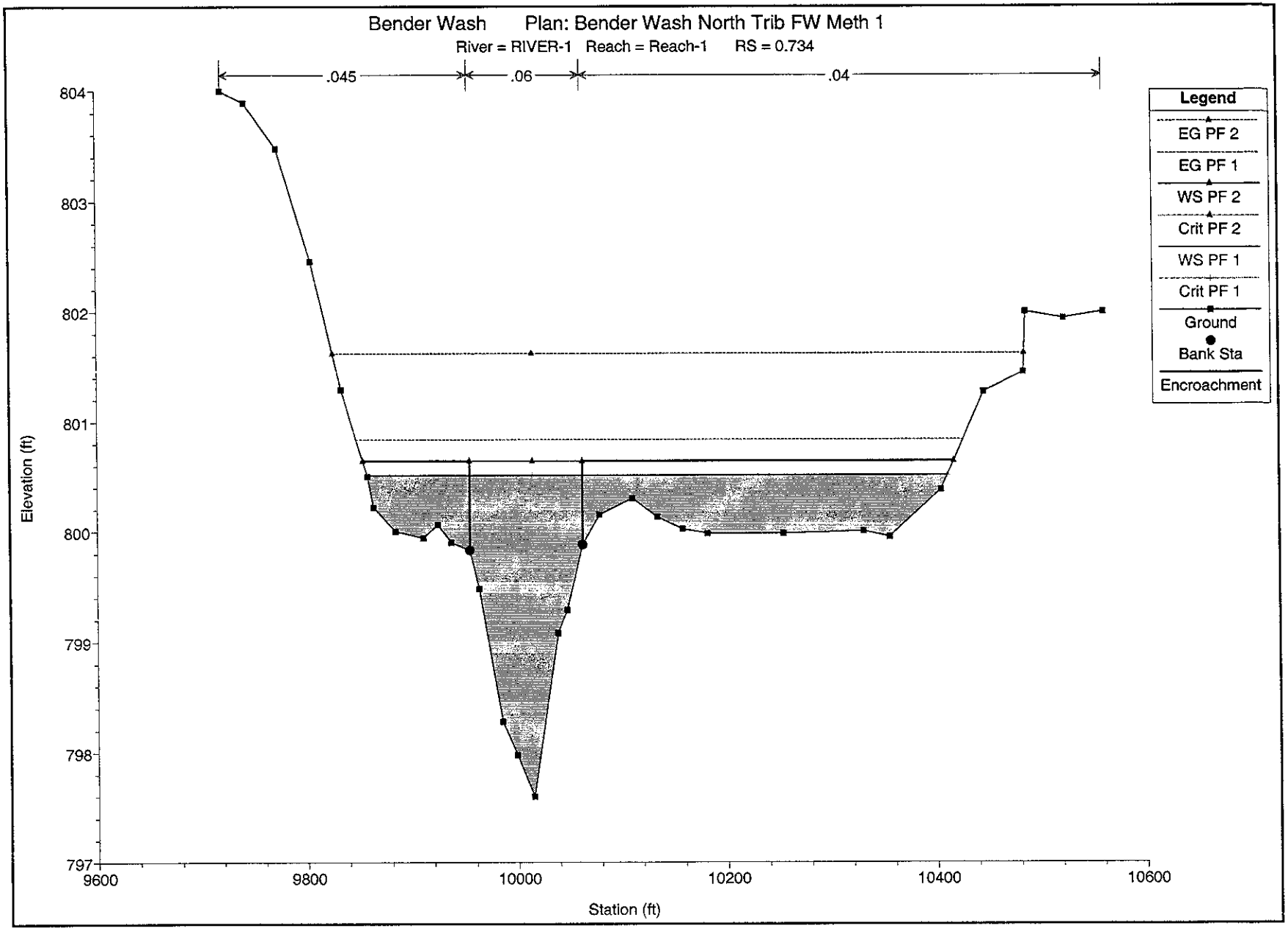

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 1.000
.045
.06
.04
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
814
812
810
808
806
804
802
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

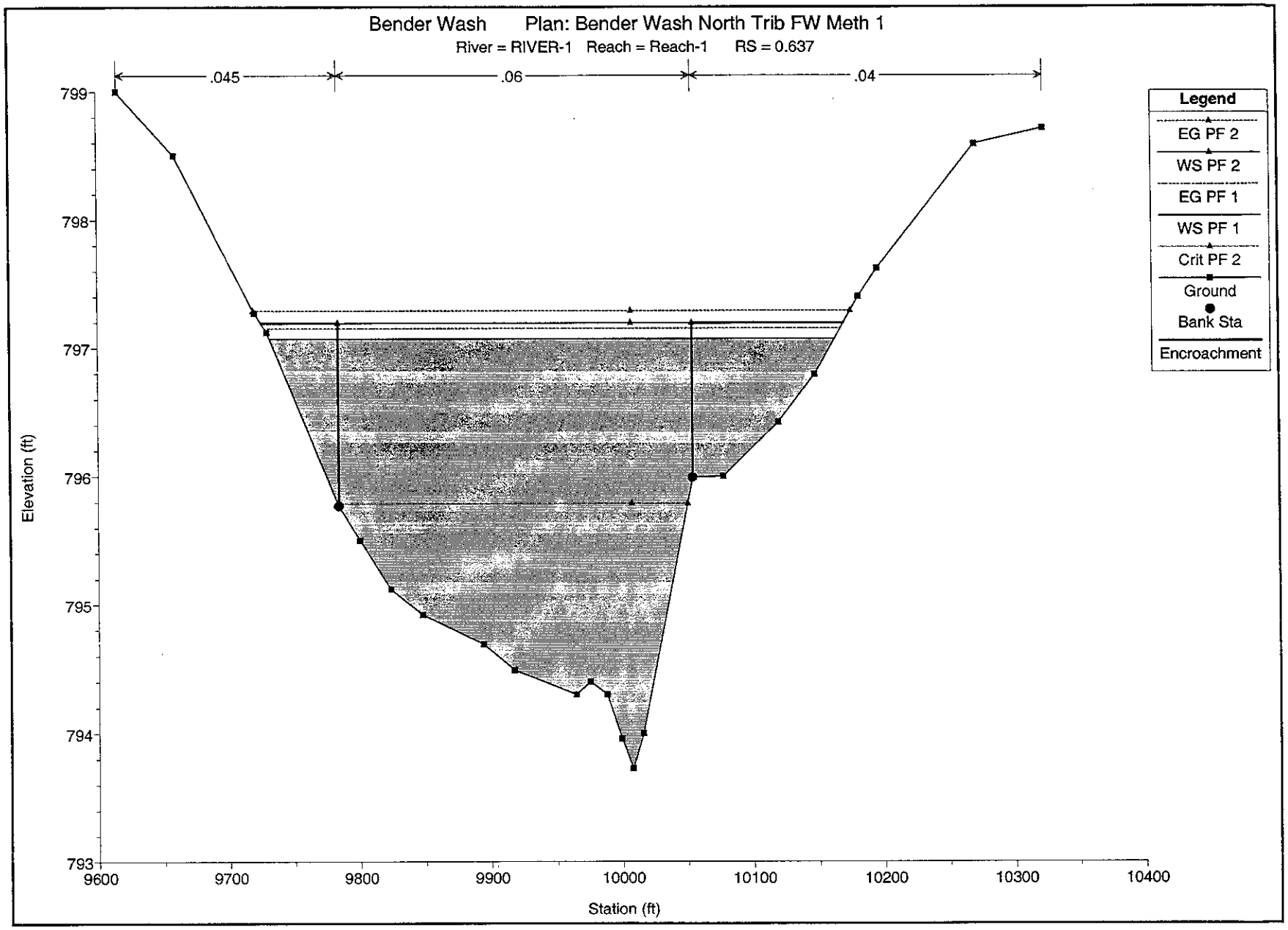

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 0.987
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
810
808
806
804
802
800
798
9400
9600
9800
10000
10200
10400
10600
Station (ft)

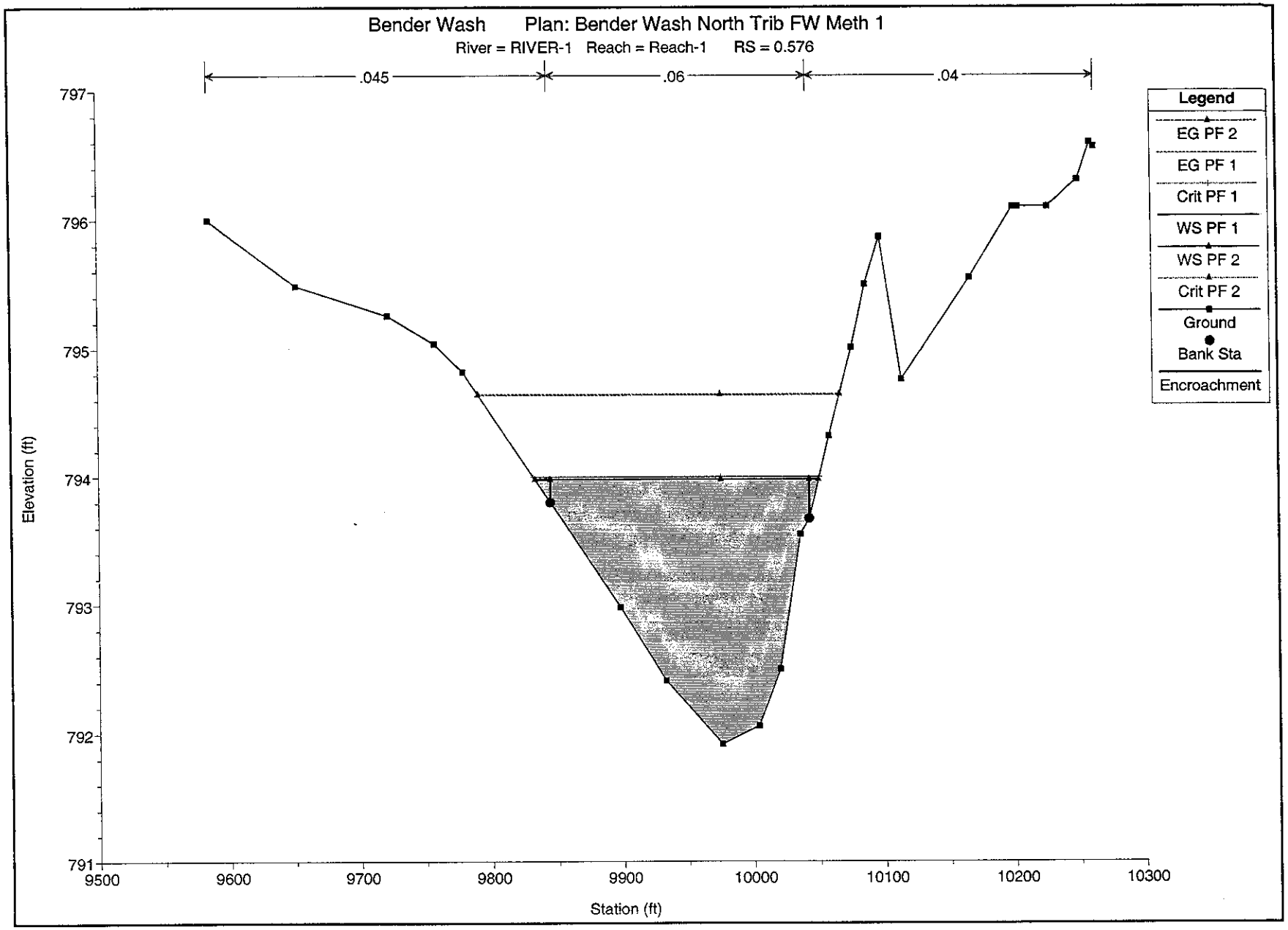

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 0.925
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
810
808
806
804
802
800
798
9600
9800
10000
10200
10400
10600
10800
Station (ft)

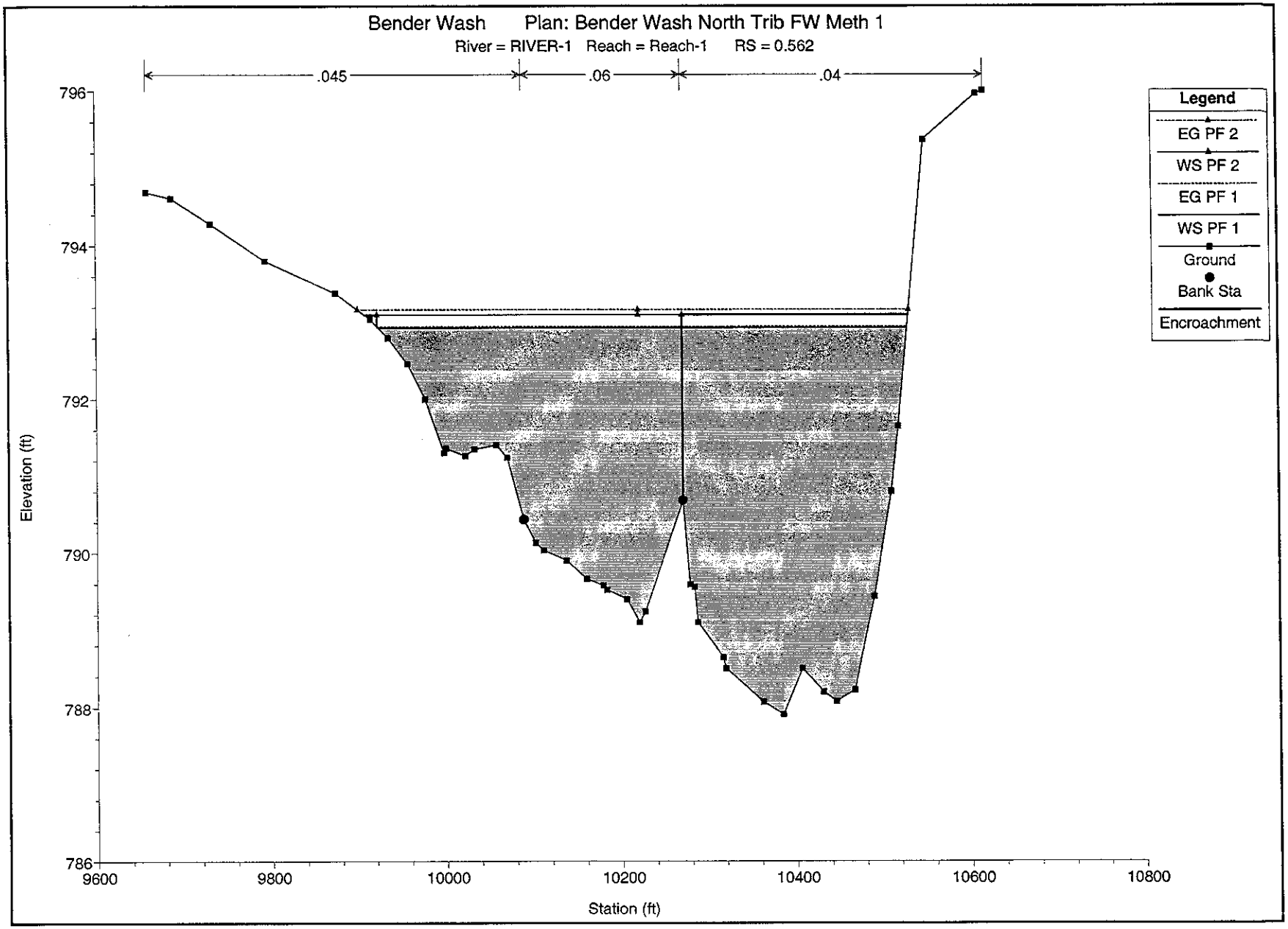

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 0.910
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
810
808
806
804
802
800
798
9600
9800
10000
10200
10400
10600
10800
Station (ft)

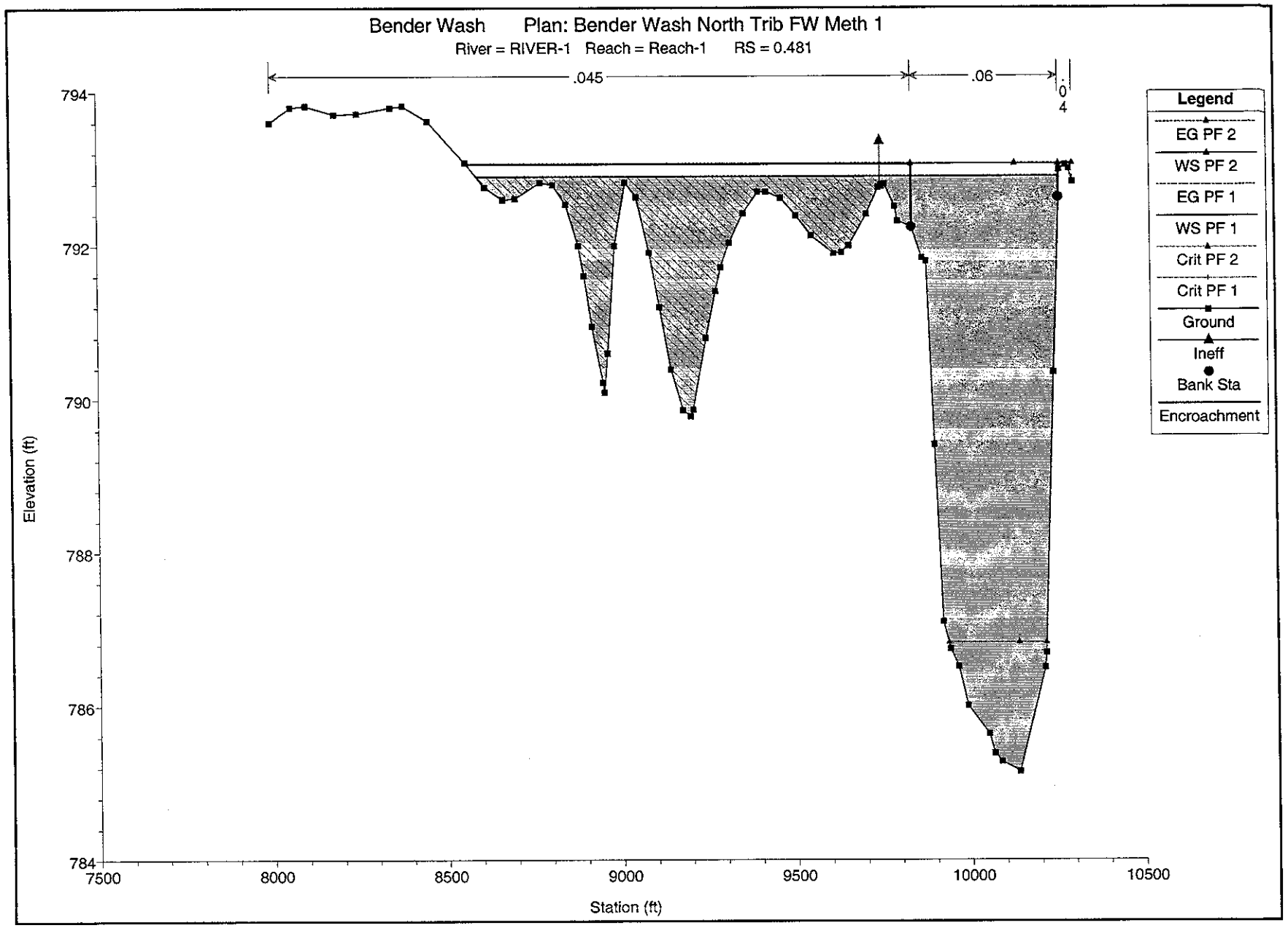

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 0.829
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
806
805
804
803
802
801
800
799
9600
9800
10000
10200
10400
Station (ft)

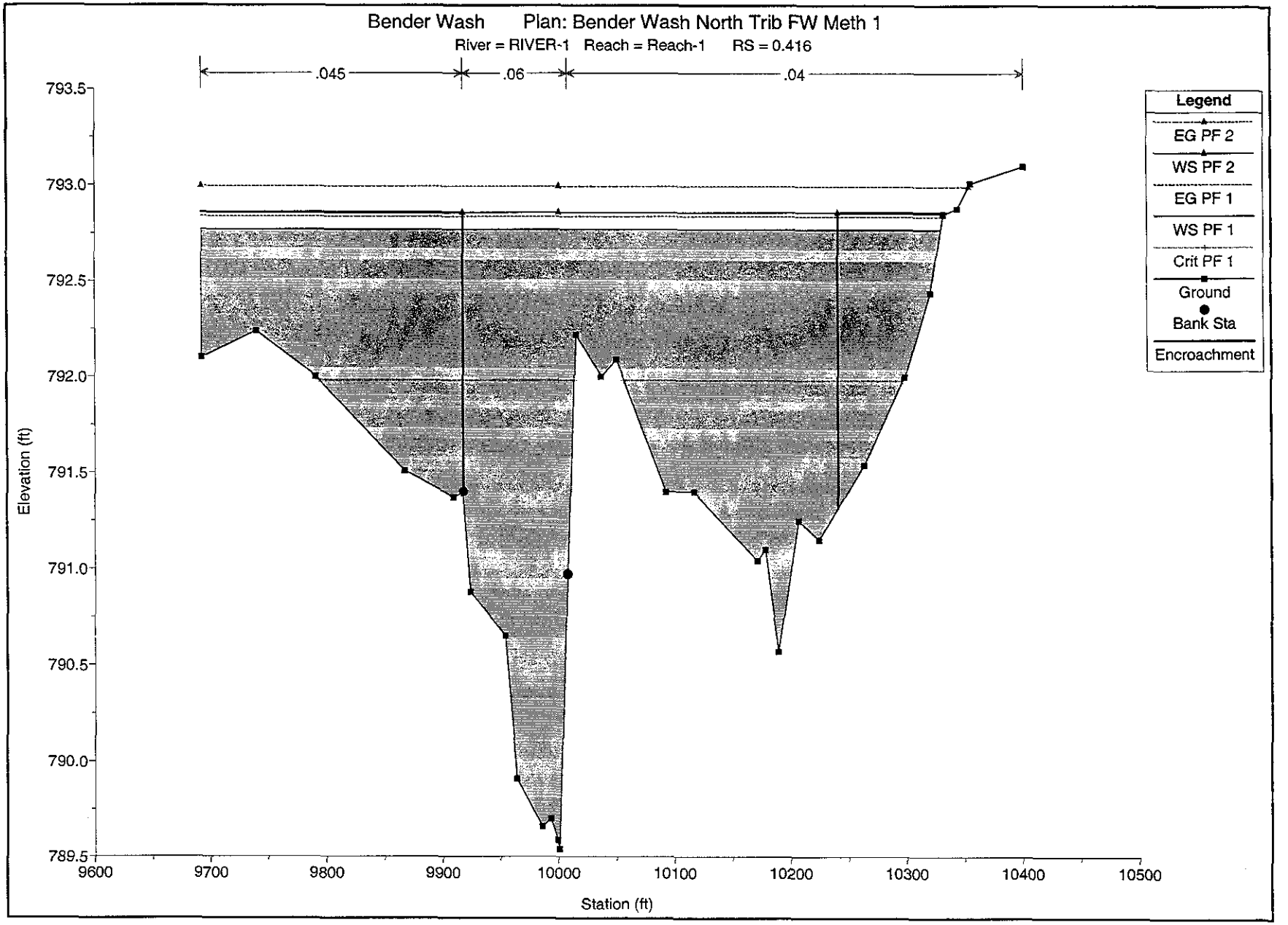

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 0.734
.045
.06
.04
Legend
EG PF 2
EG PF 1
WS PF 2
Crit PF 2
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
804
803
802
801
800
799
798
797
9600
9800
10000
10200
10400
10600
Station (ft)

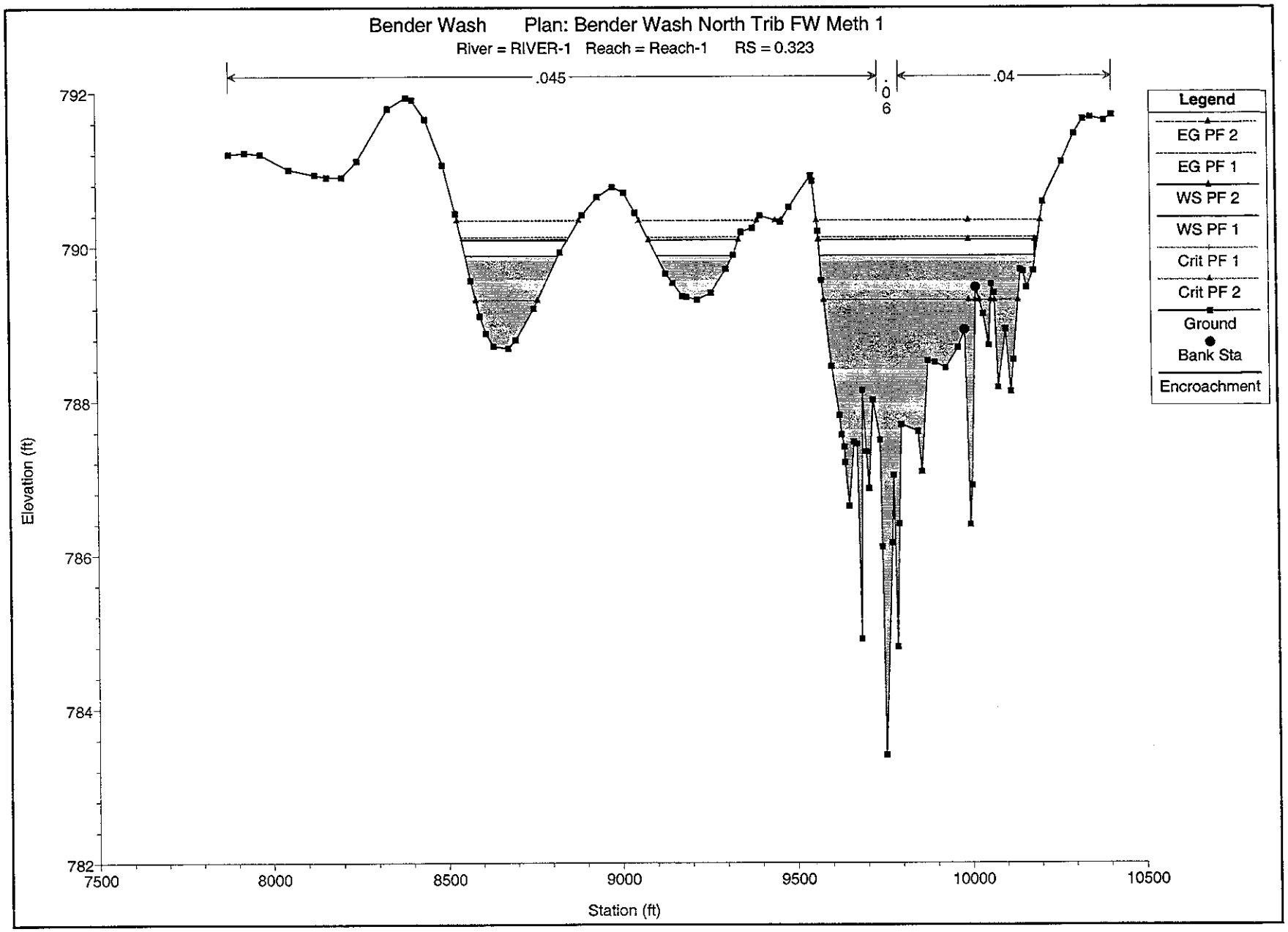

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 0.637
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
799
798
797
796
795
794
793
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

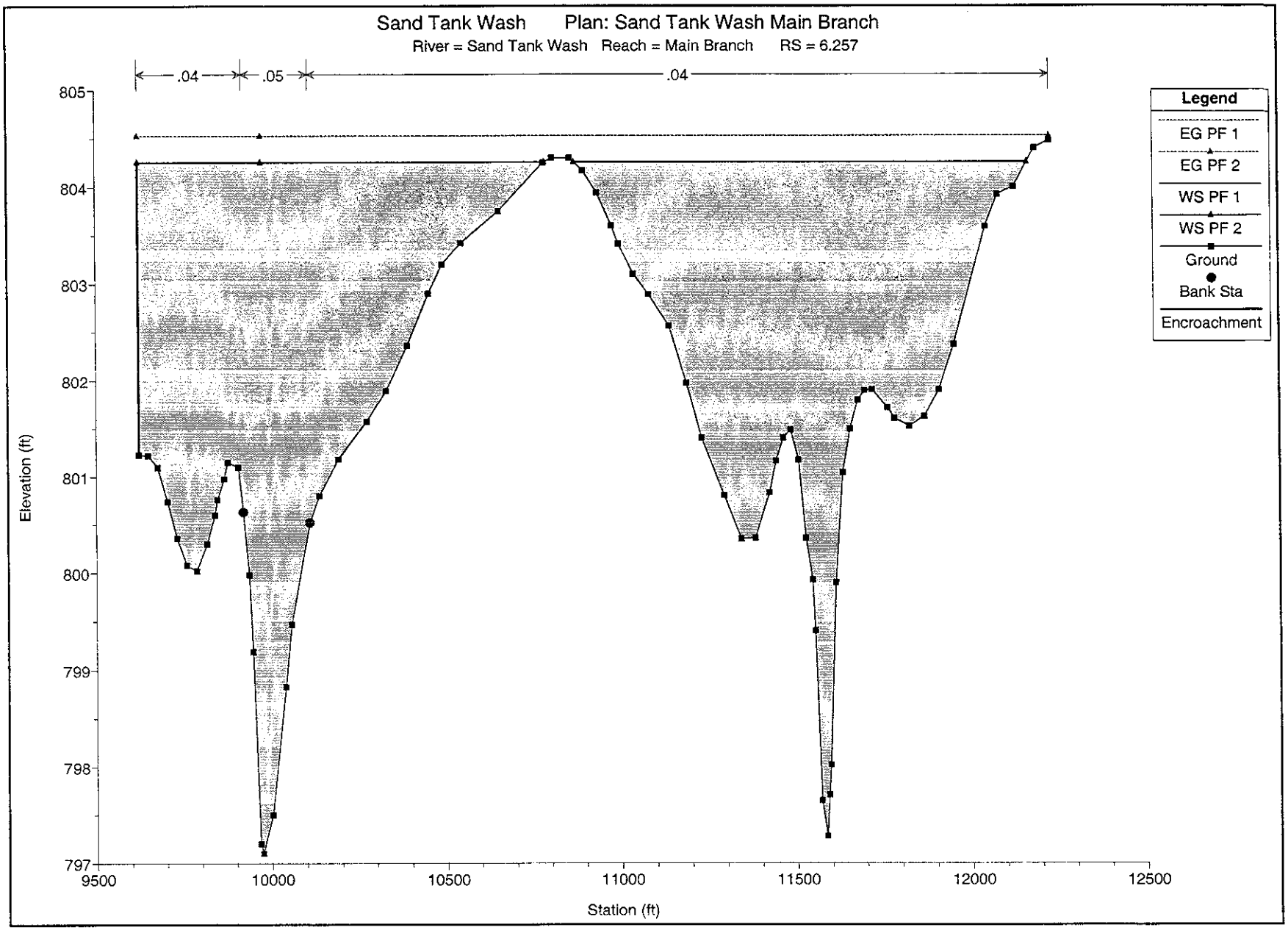

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 0.576
.045
.06
.04
Legend
EG PF 2
EG PF 1
Crit PF 1
WS PF 1
WS PF 2
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
797
796
795
794
793
792
791
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

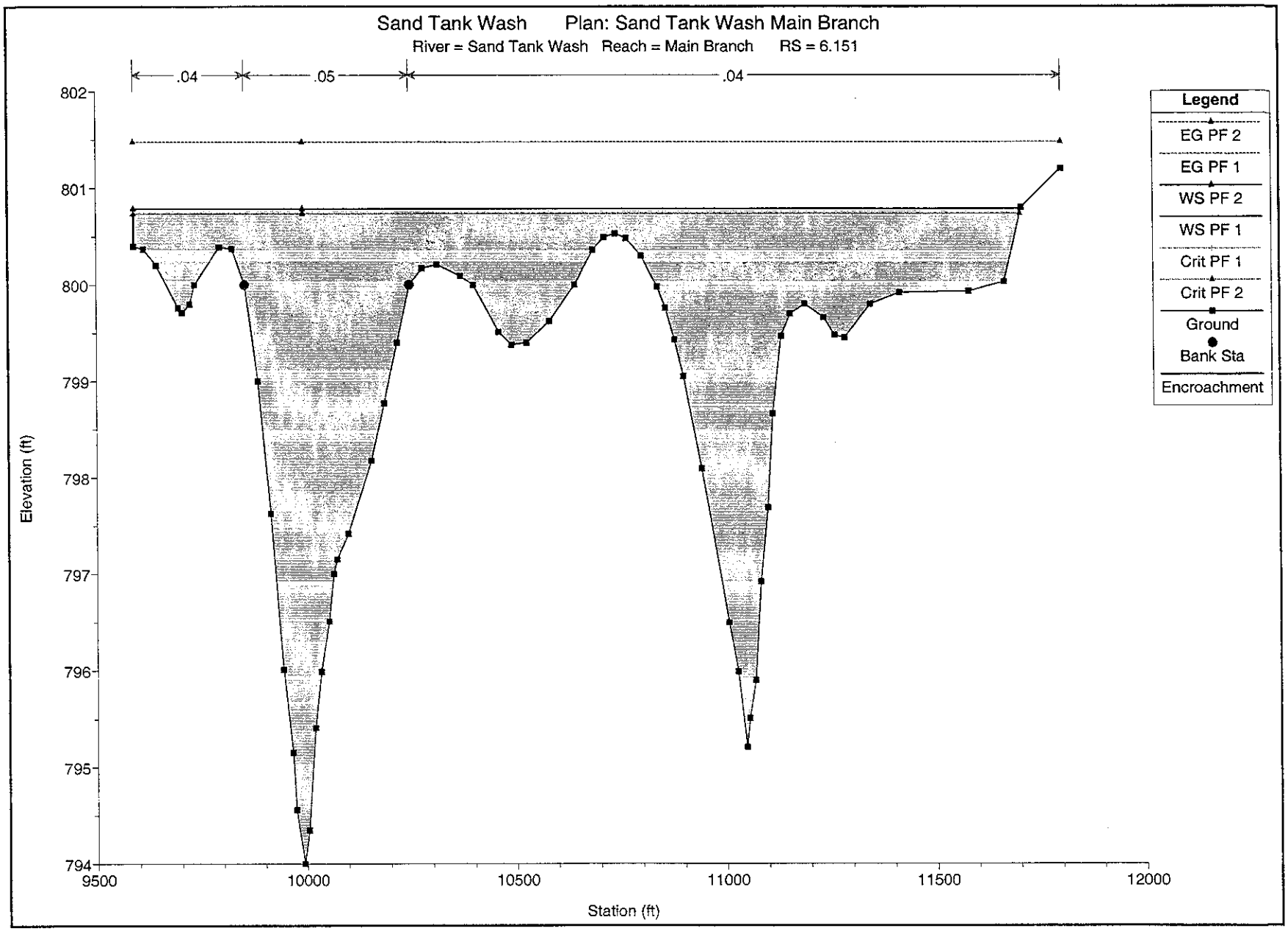

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 0.562
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
796
794
792
790
788
786
9600
9800
10000
10200
10400
10600
10800
Station (ft)

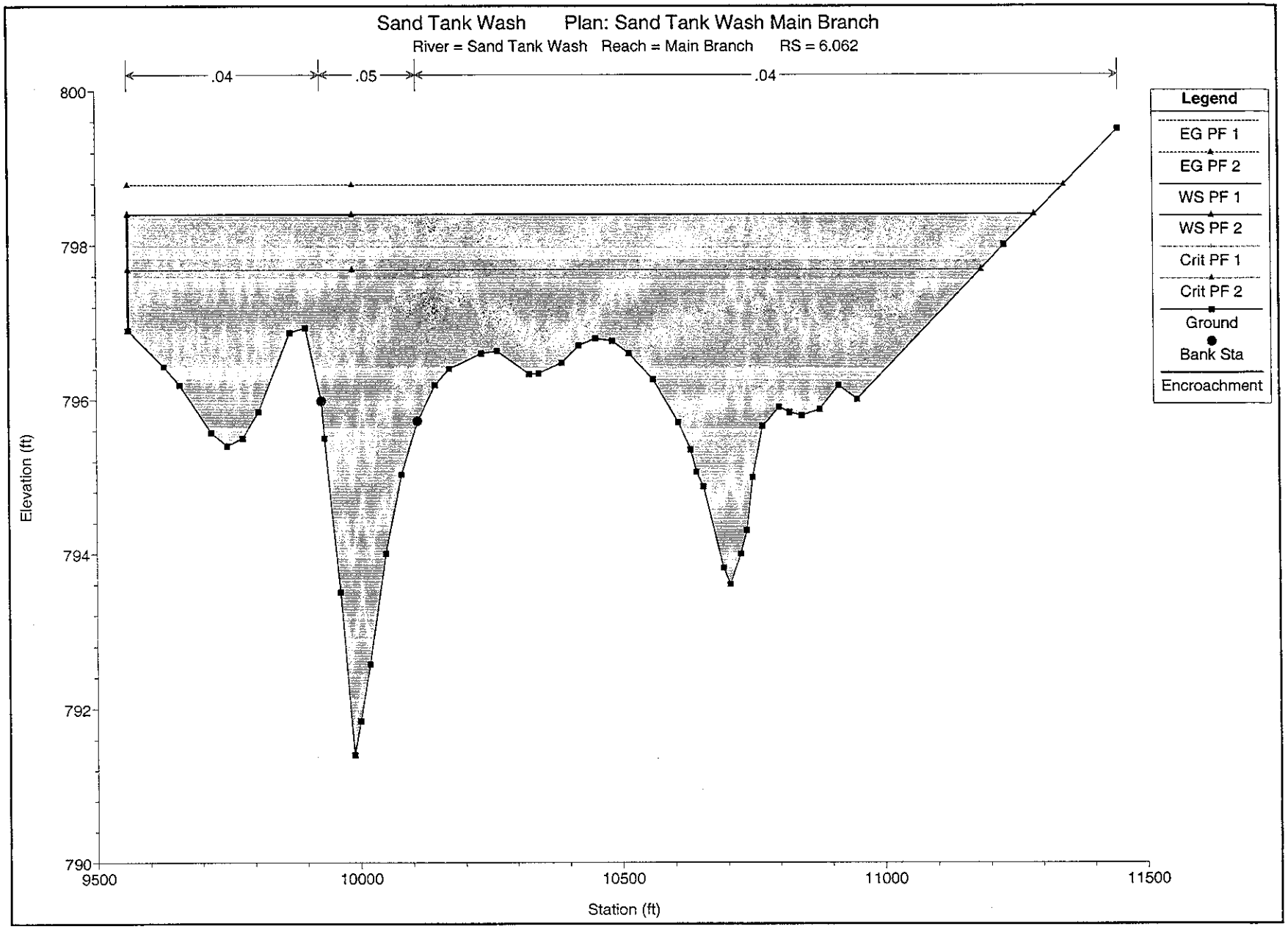

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 0.481
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
794
792
790
788
786
784
7500
8000
8500
9000
9500
10000
10500
Station (ft)

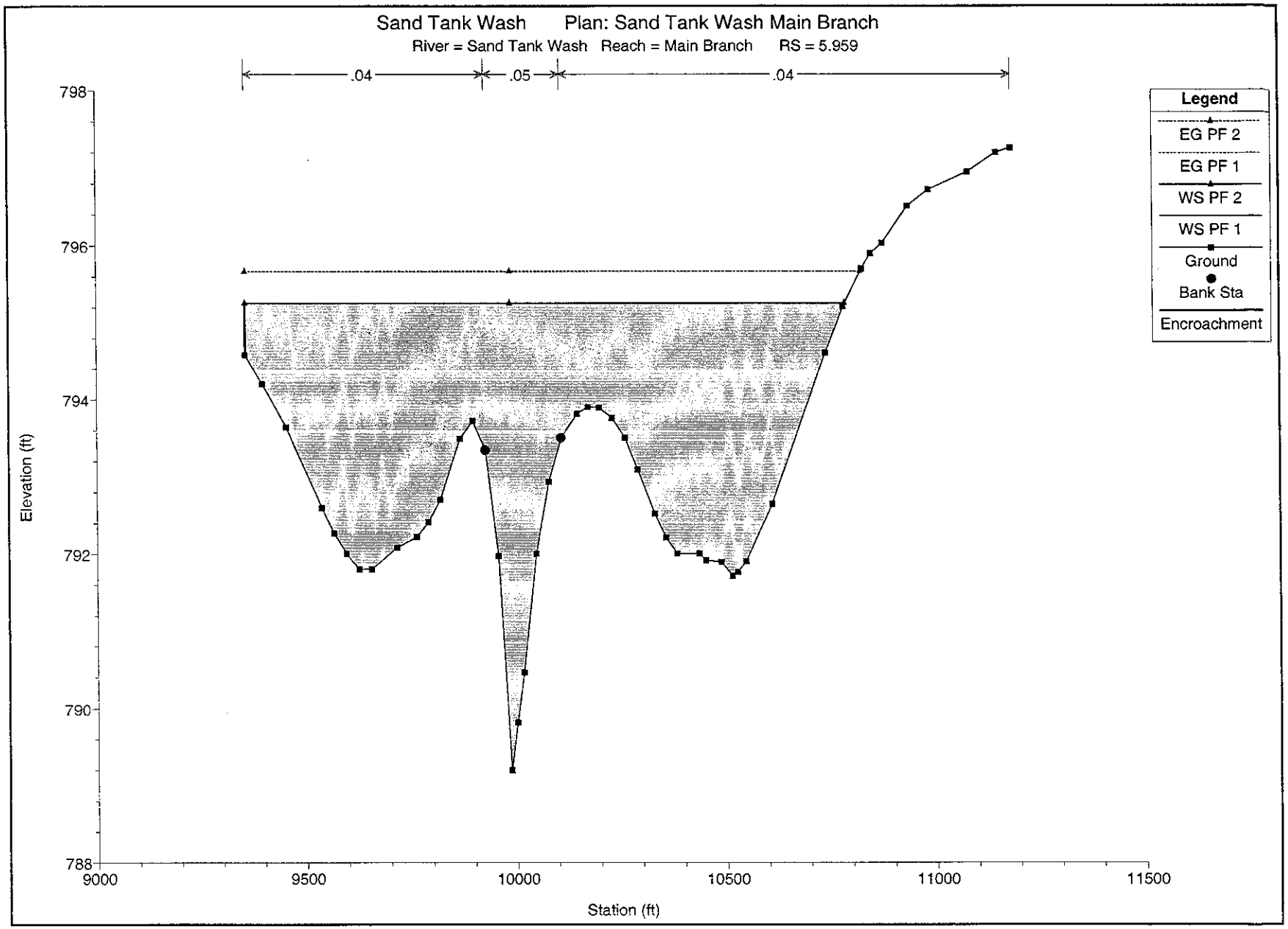

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 0.416
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
793.5
793.0
792.5
792.0
791.5
791.0
790.5
790.0
789.5
9600
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

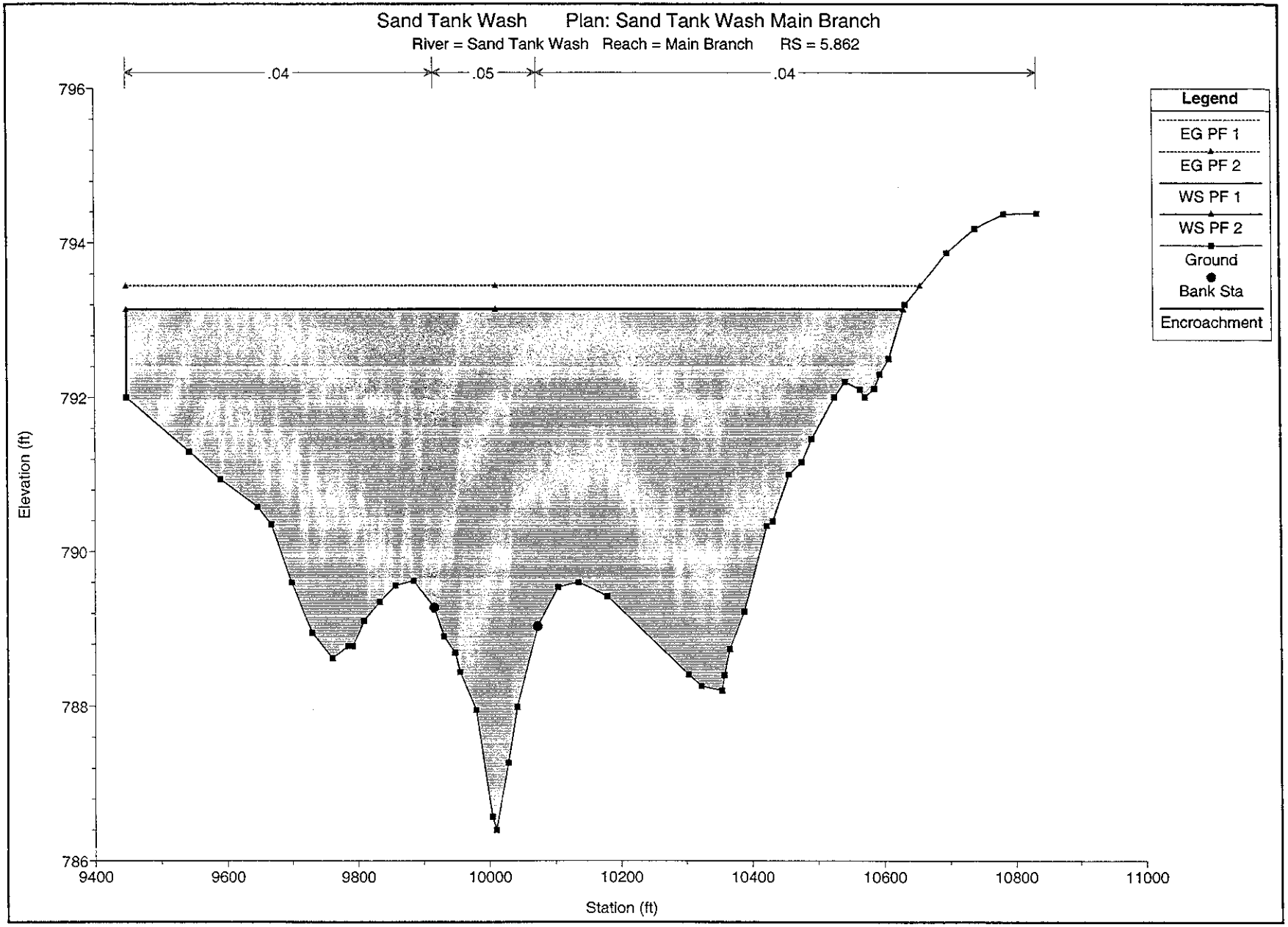

Bender Wash Plan: Bender Wash North Trib FW Meth 1
River = RIVER-1 Reach = Reach-1 RS = 0.323
.045
.06
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
792
790
788
786
784
782
7500
8000
8500
9000
9500
10000
10500
Station (ft)

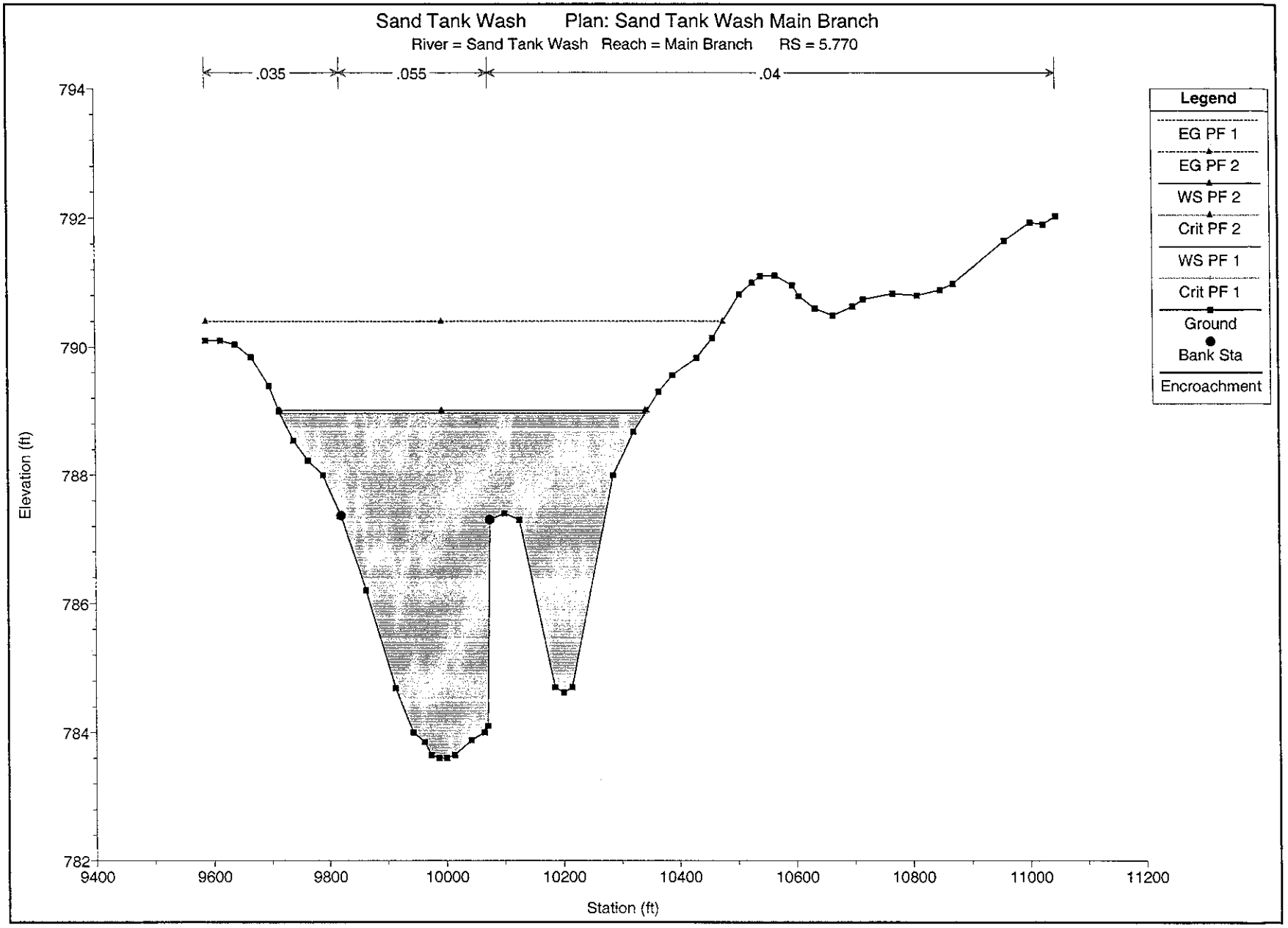

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 6.257
.04
.05
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
805
804
803
802
801
800
799
798
797
9500
10000
10500
11000
11500
12000
12500
Station (ft)

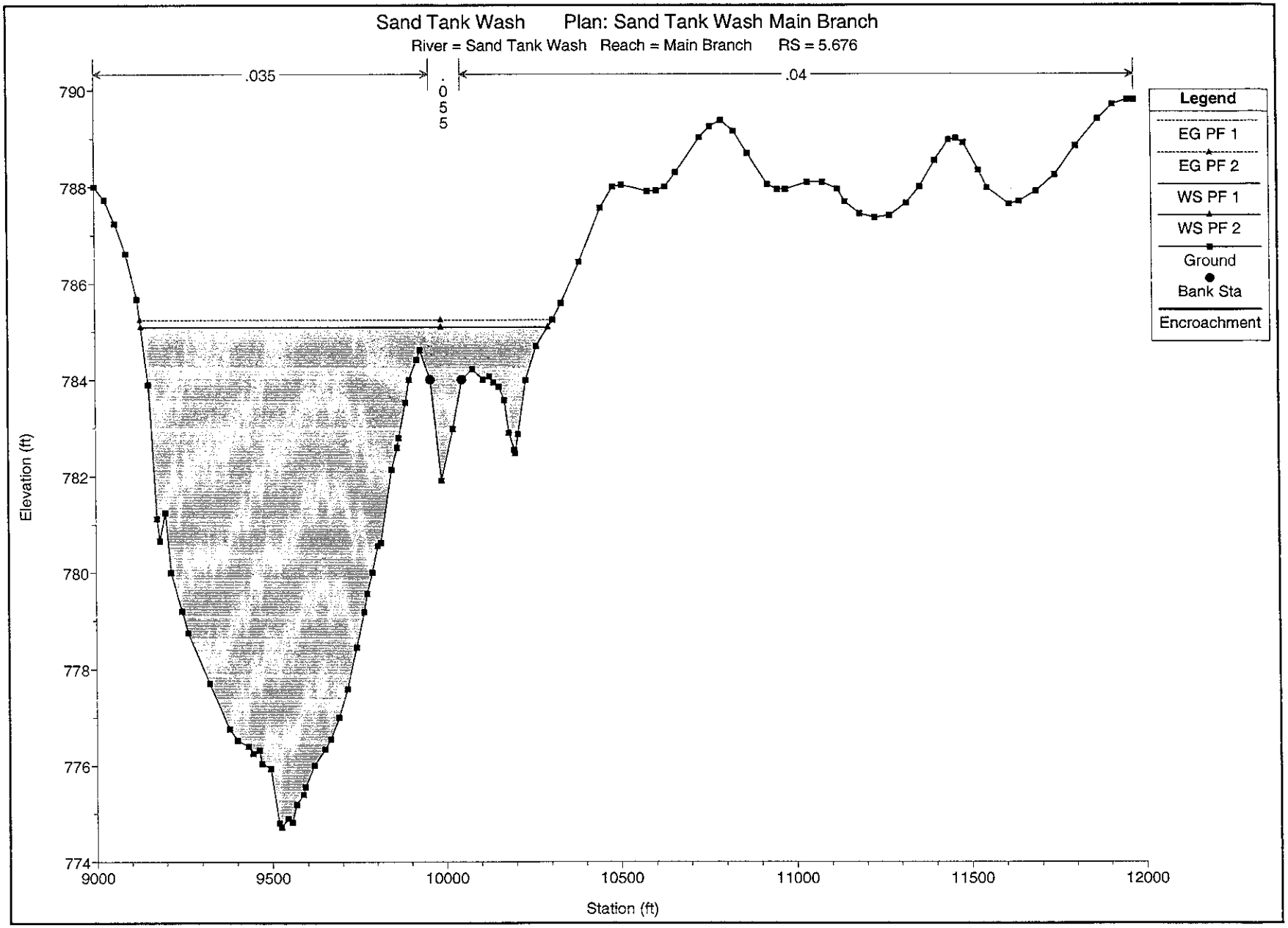

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 6.151
.04
.05
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
802
801
800
799
798
797
796
795
794
9500
10000
10500
11000
11500
12000
Station (ft)

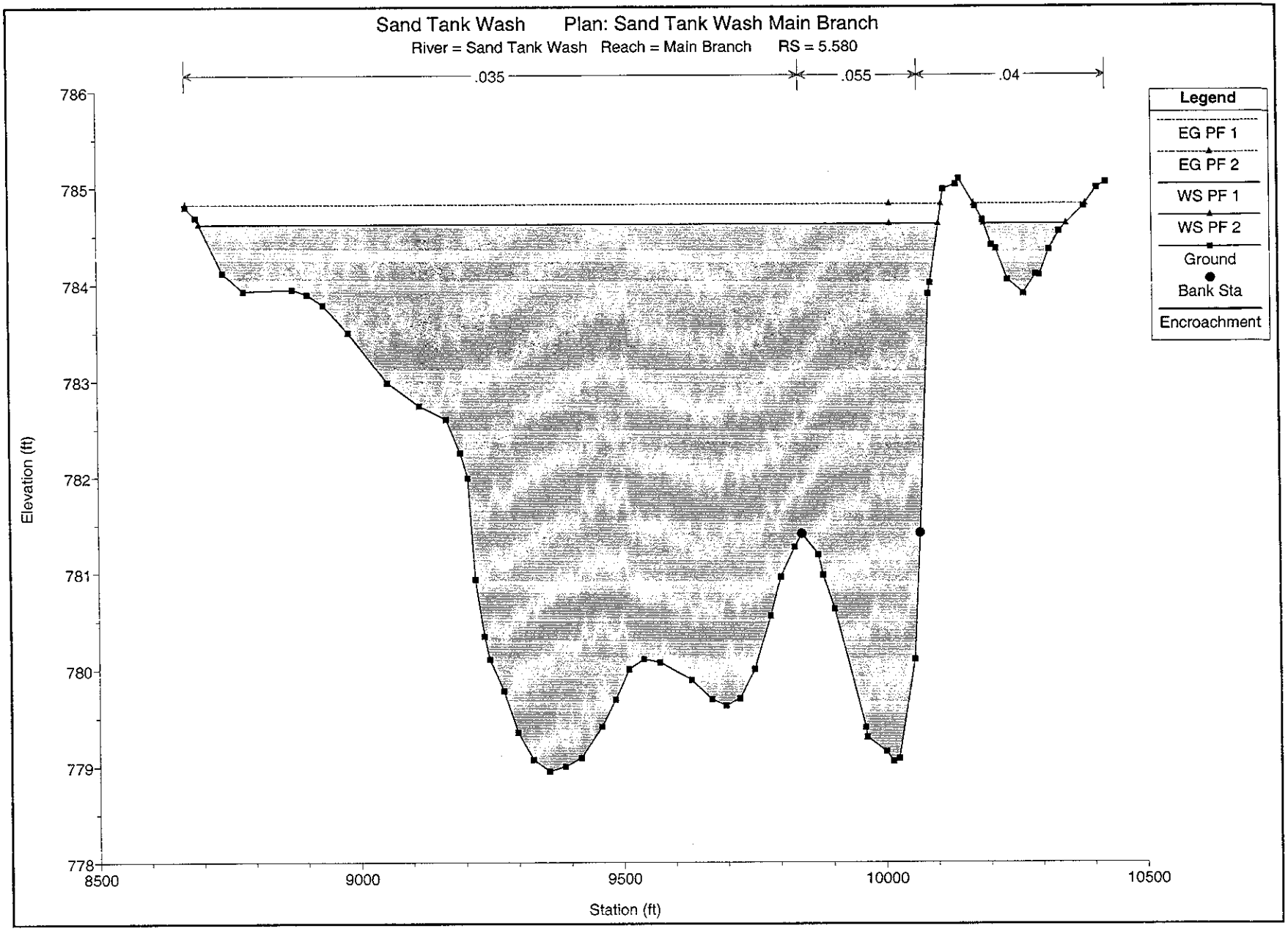

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 6.062
.04
.05
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
800
798
796
794
792
790
9500
10000
10500
11000
11500
Station (ft)

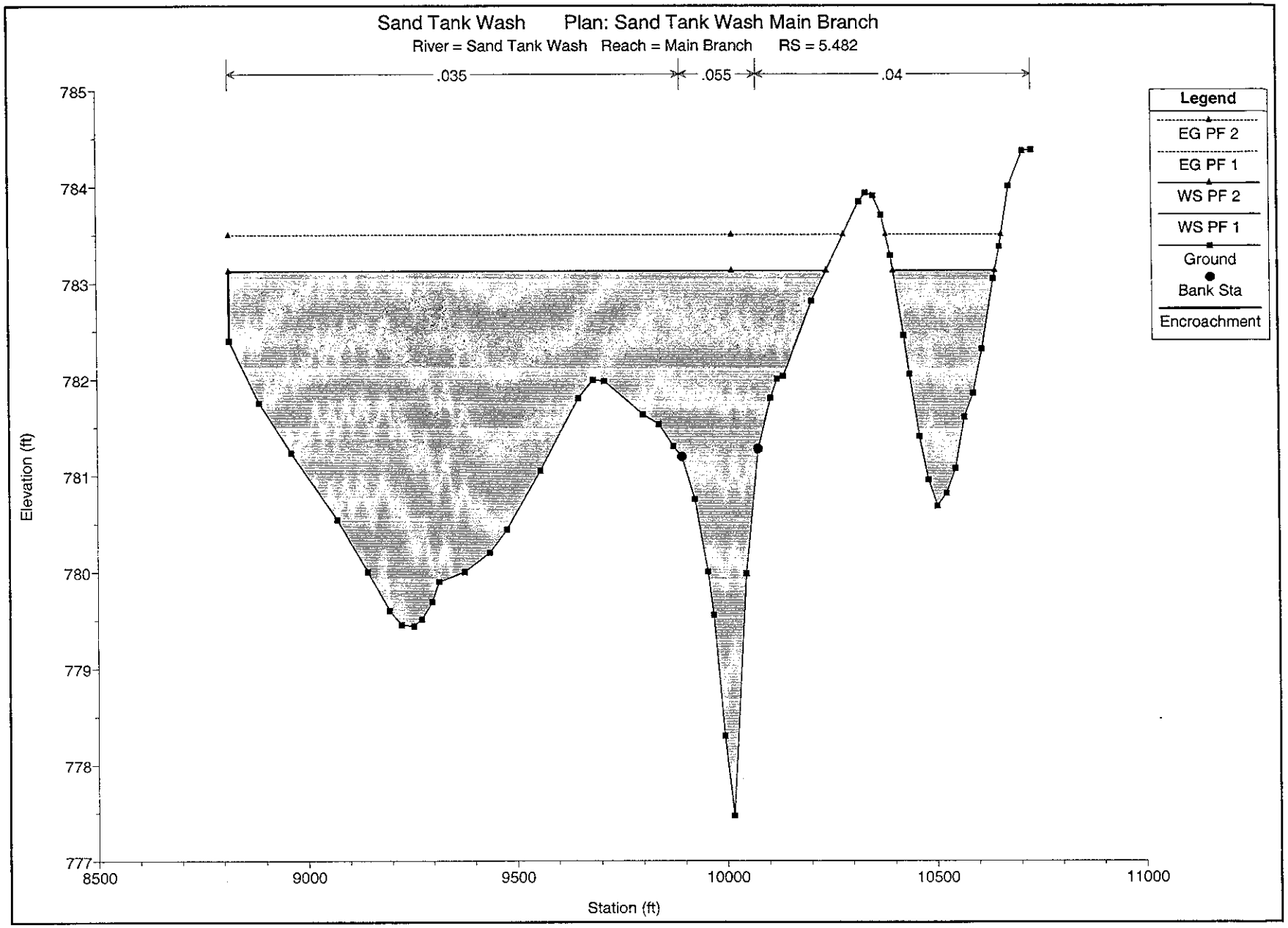

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 5.959
.04
.05
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
798
796
794
792
790
788
9000
9500
10000
10500
11000
11500
Station (ft)

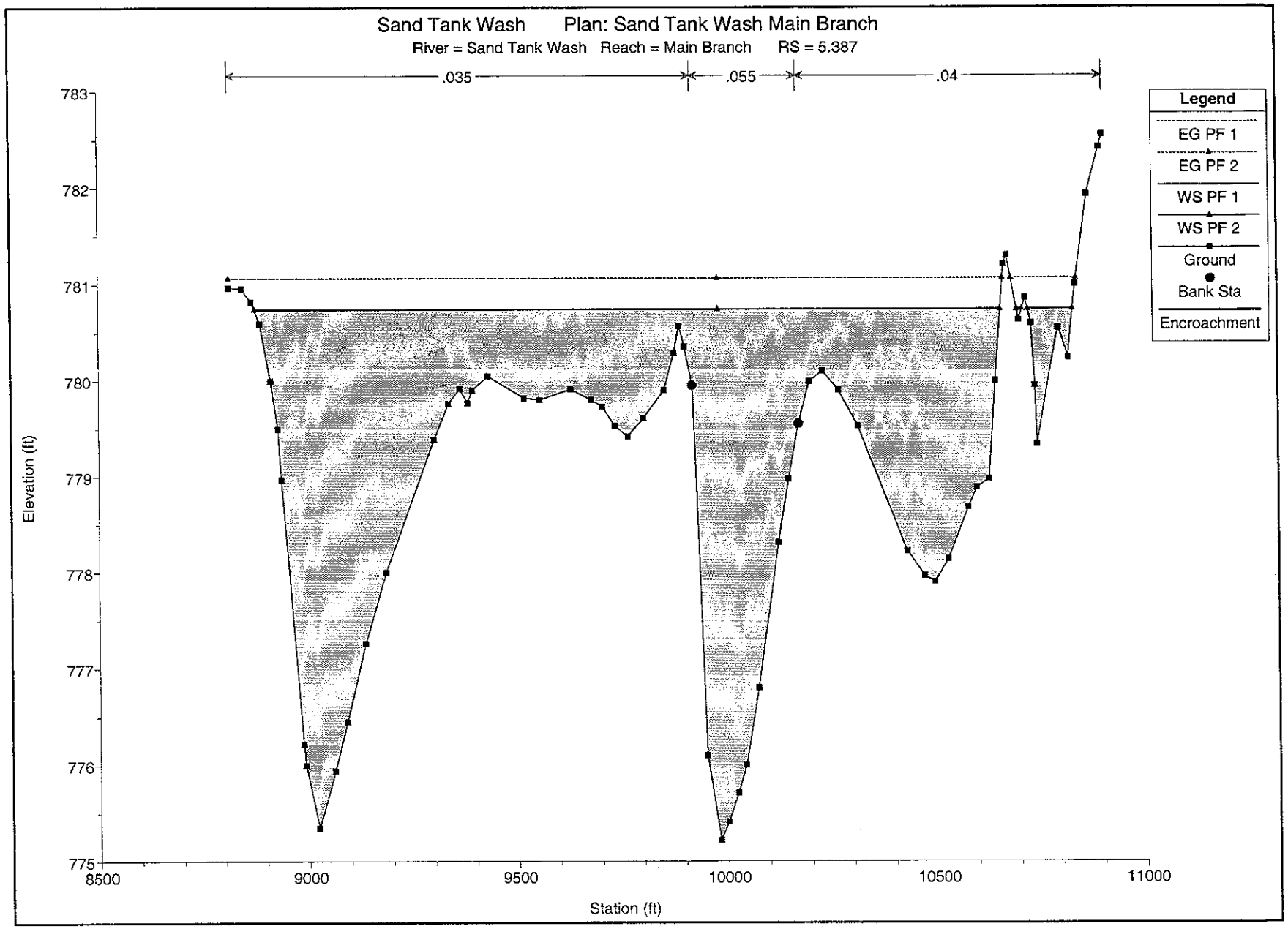

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 5.862
.04
.05
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
796
794
792
790
788
786
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

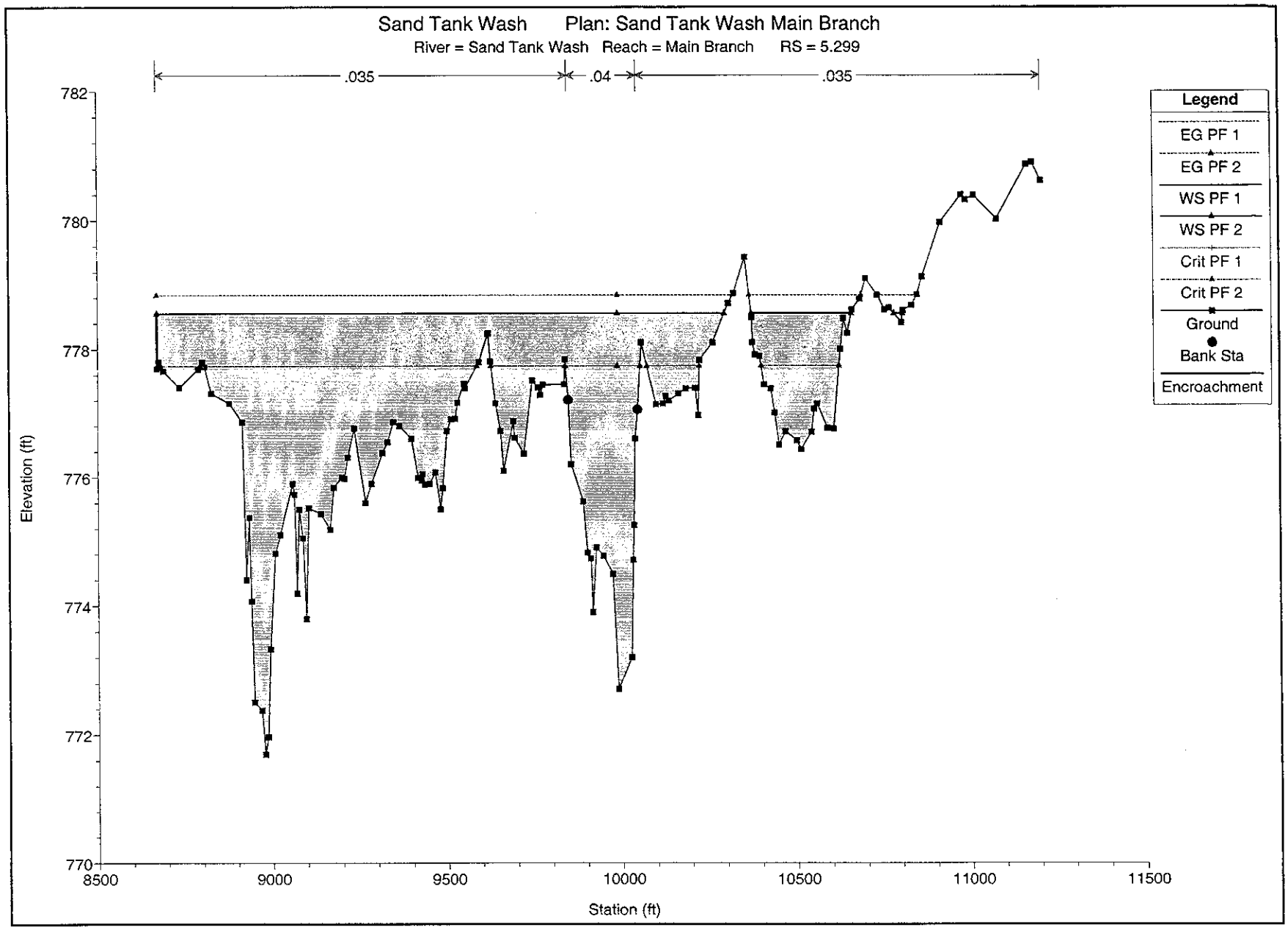

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 5.770
.035
.055
.04
Legend
EG PF 1
EG PF 2
WS PF 2
Crit PF 2
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
794
792
790
788
786
784
782
9400
9600
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

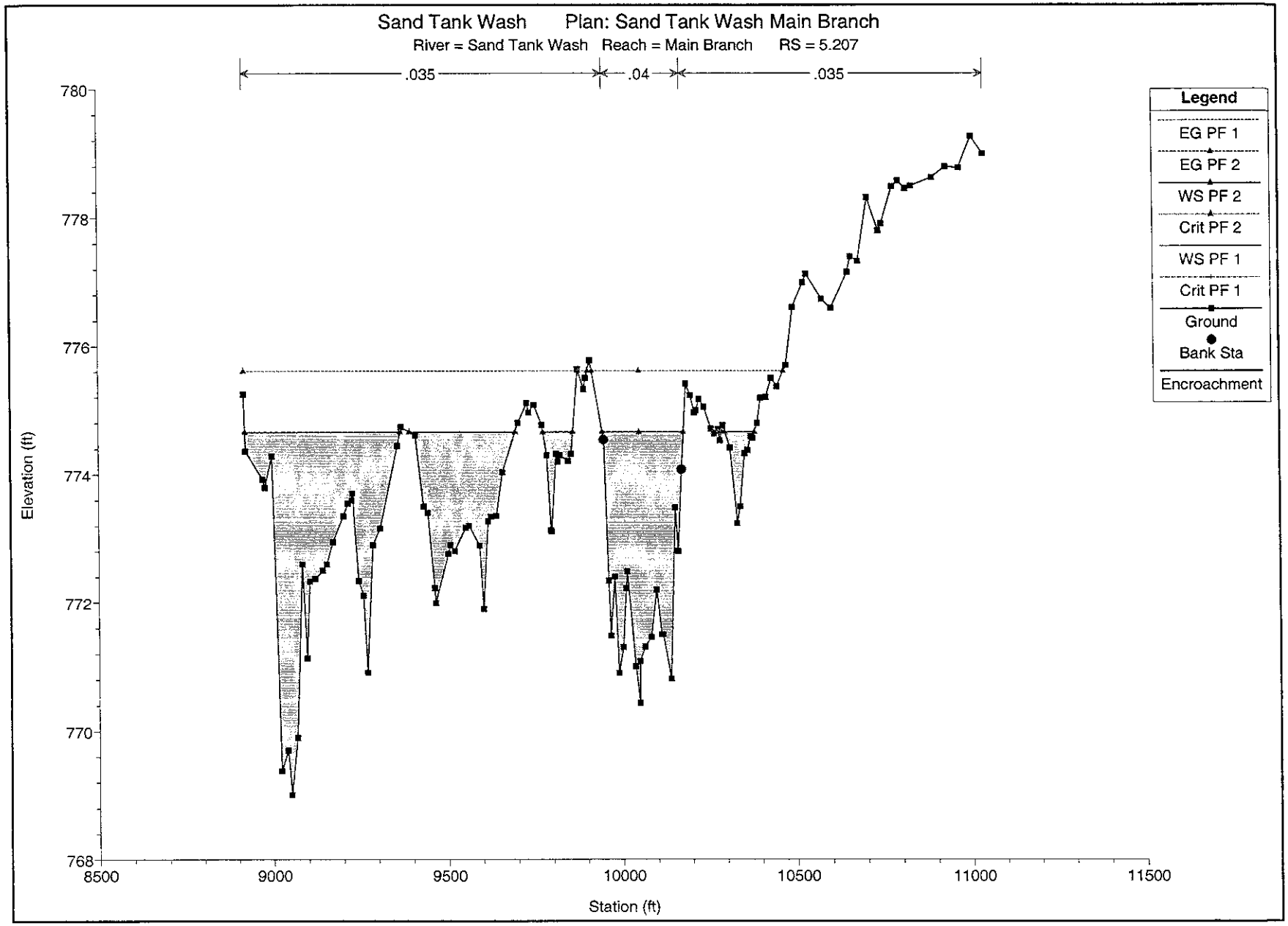

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 5.676
.035
.055
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
790
788
786
784
782
780
778
776
774
9000
9500
10000
10500
11000
11500
12000
Station (ft)

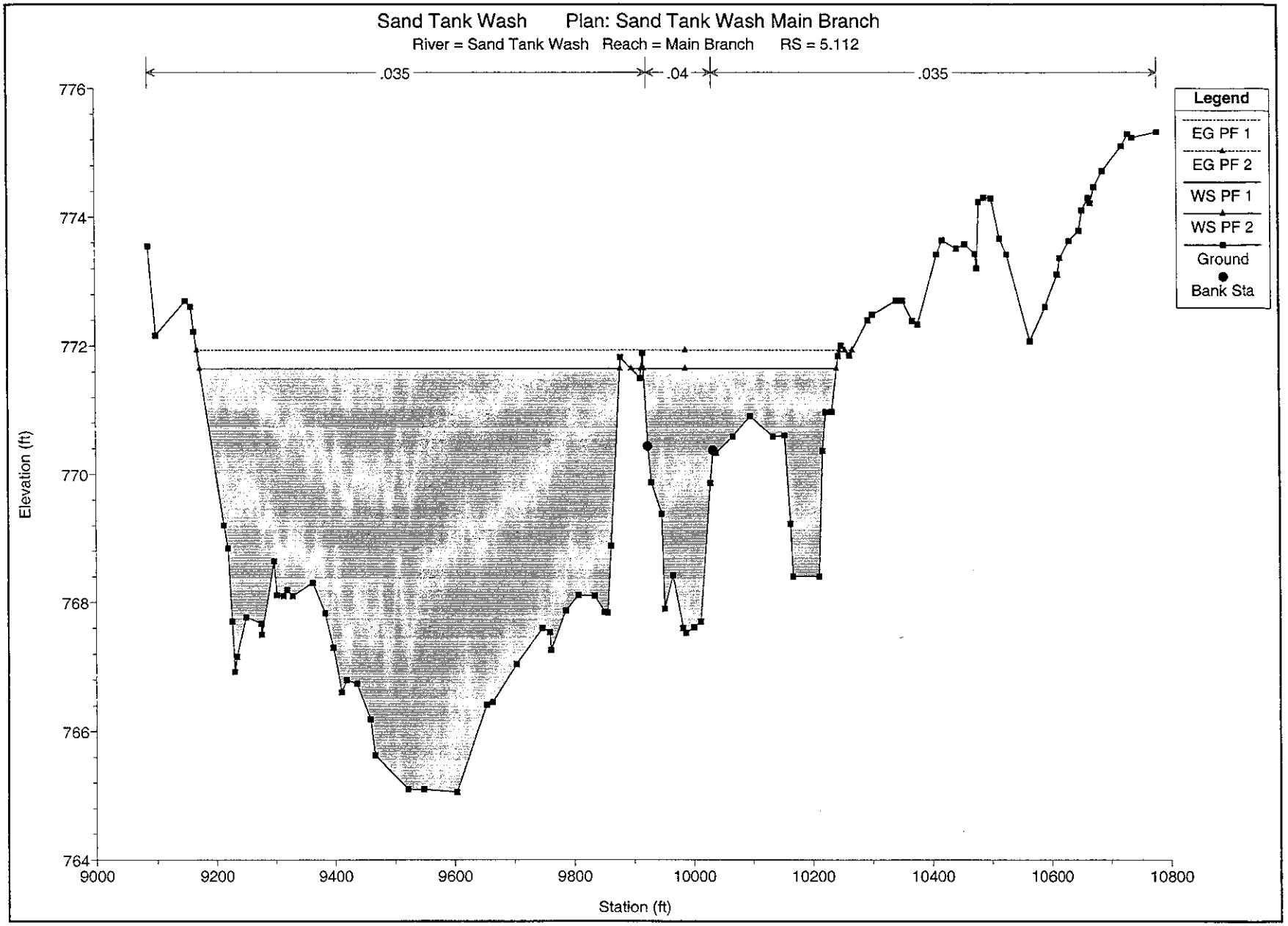

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 5.580
.035
.055
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
786
785
784
783
782
781
780
779
778
8500
9000
9500
10000
10500
Station (ft)

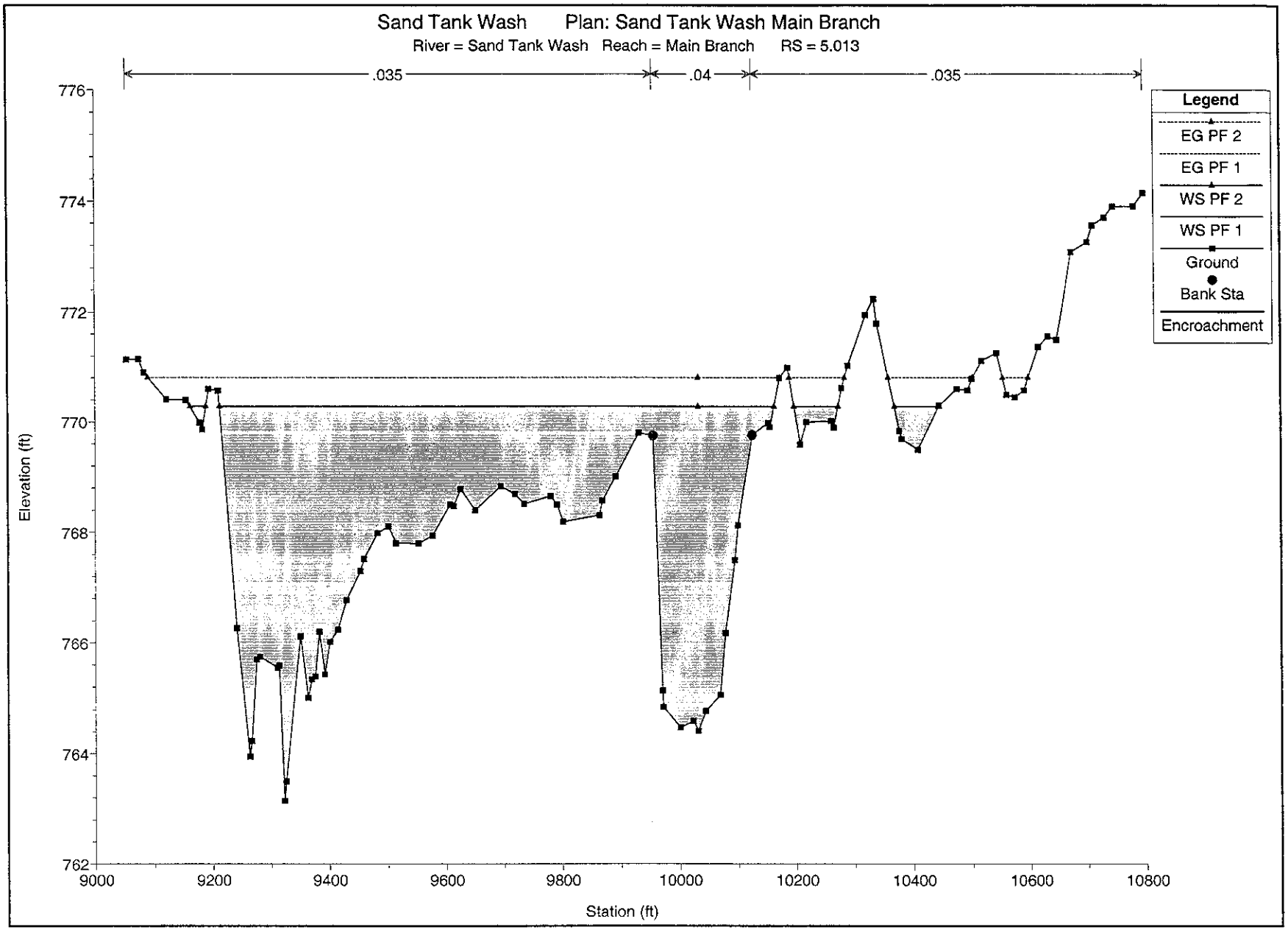

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 5.482
.035
.055
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
785
784
783
782
781
780
779
778
777
8500
9000
9500
10000
10500
11000
Station (ft)

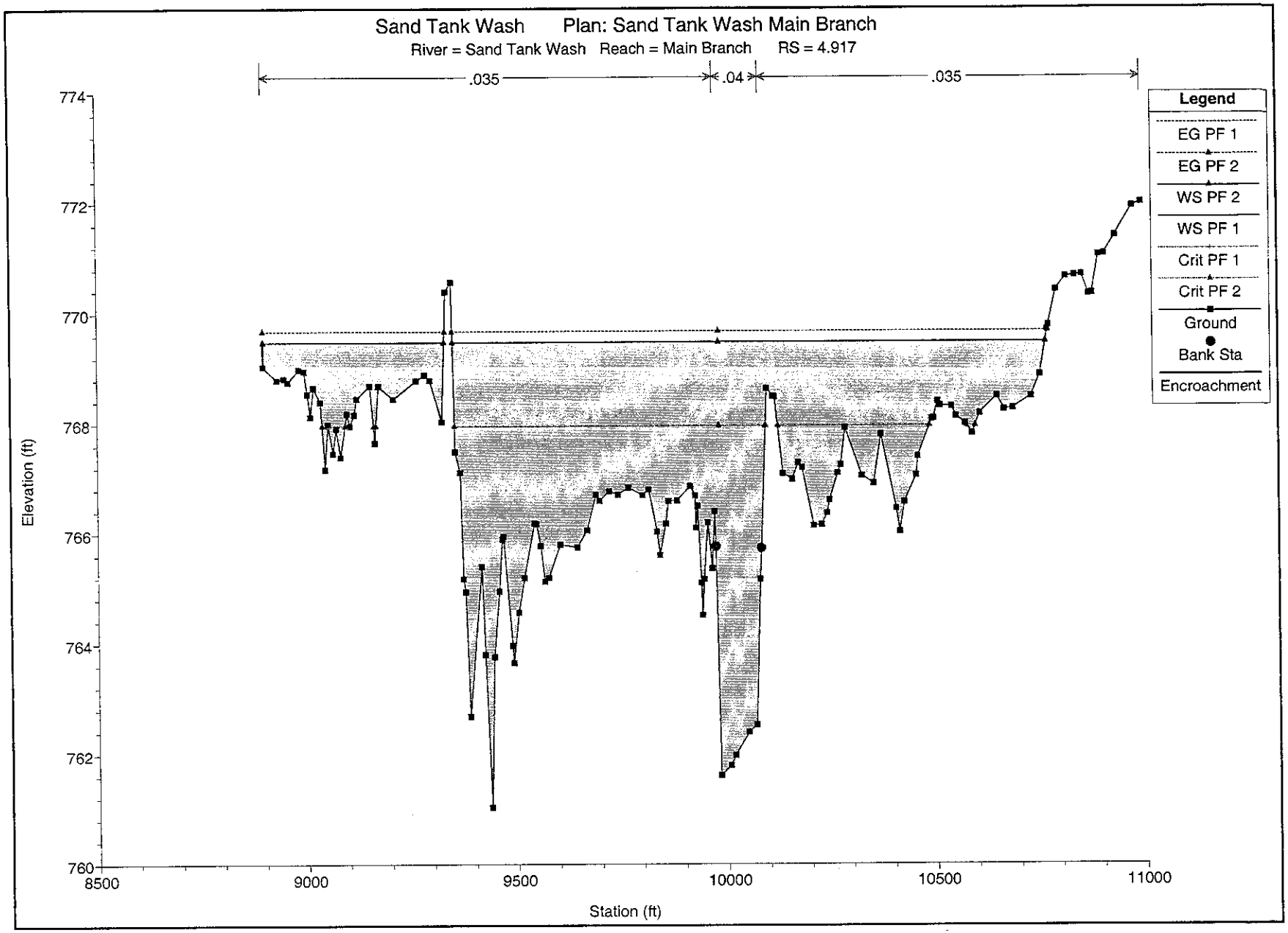

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 5.387
.035
.055
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
783
782
781
780
779
778
777
776
775
8500
9000
9500
10000
10500
11000
Station (ft)

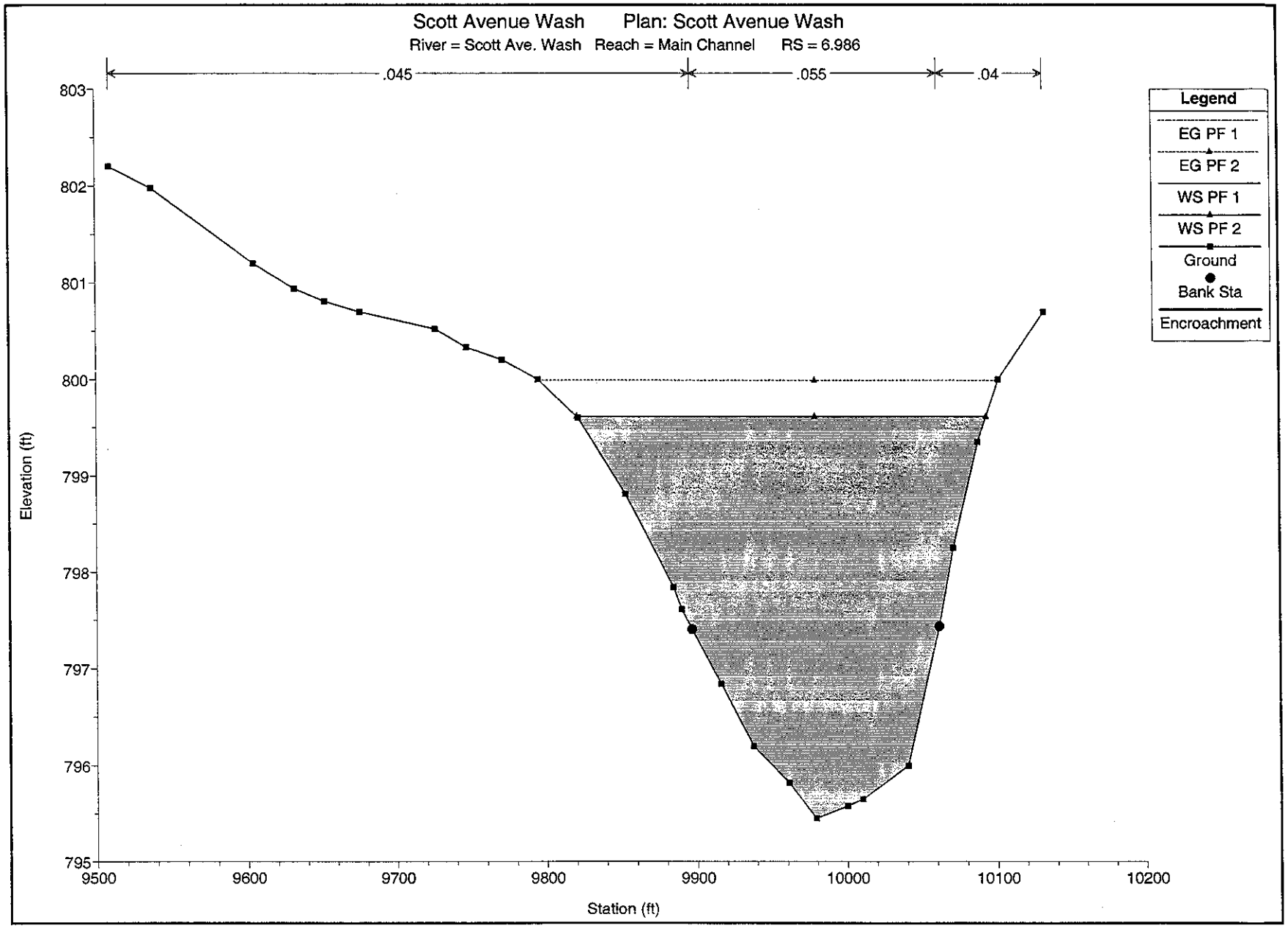

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 5.299
.035
.04
.035
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
782
780
778
776
774
772
770
8500
9000
9500
10000
10500
11000
11500
Station (ft)

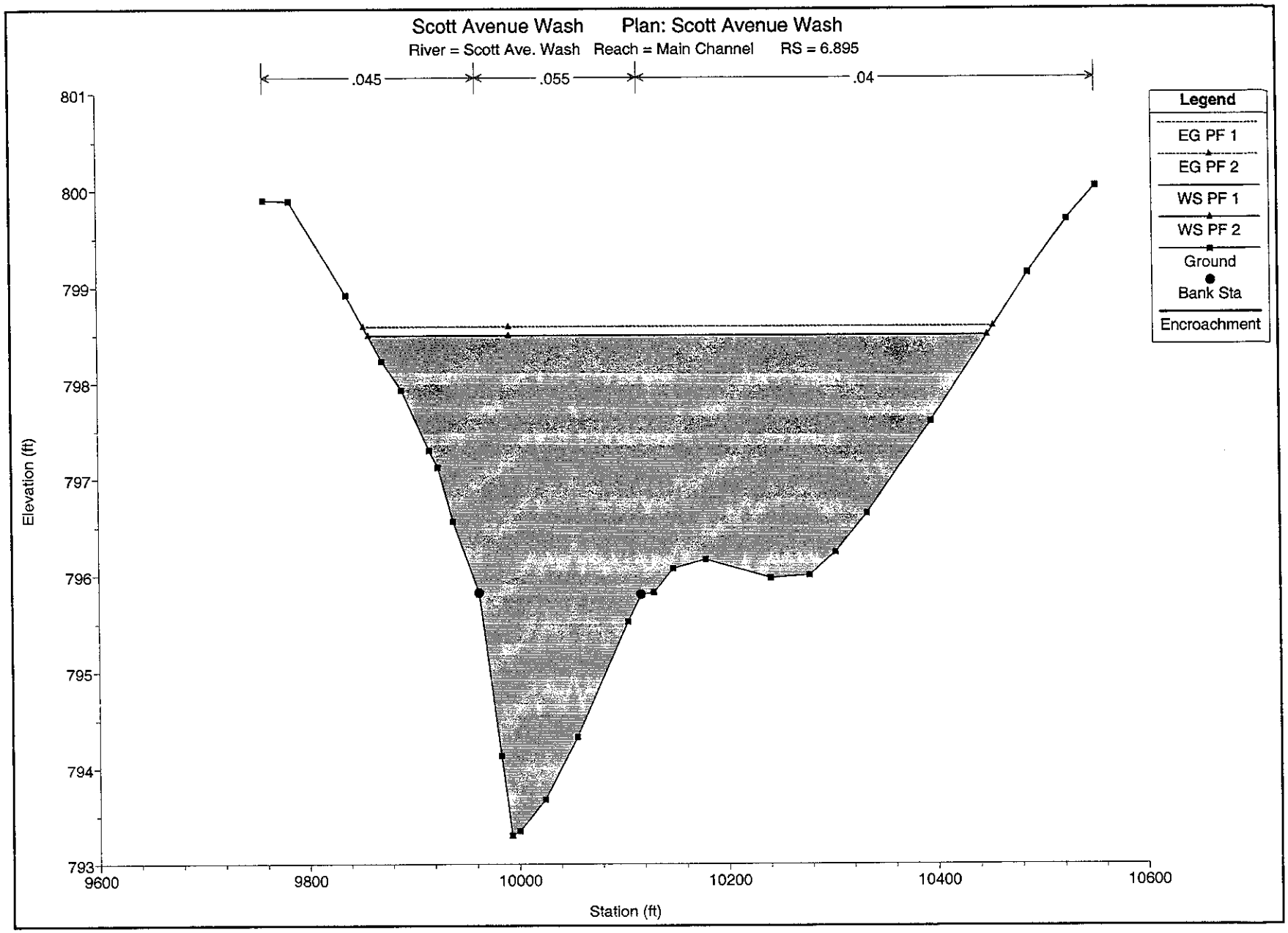

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 5.207
.035
.04
.035
Legend
EG PF 1
EG PF 2
WS PF 2
Crit PF 2
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
780
778
776
774
772
770
768
8500
9000
9500
10000
10500
11000
11500
Station (ft)


Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 5.112
.035
.04
.035
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Elevation (ft)
776
774
772
770
768
766
764
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

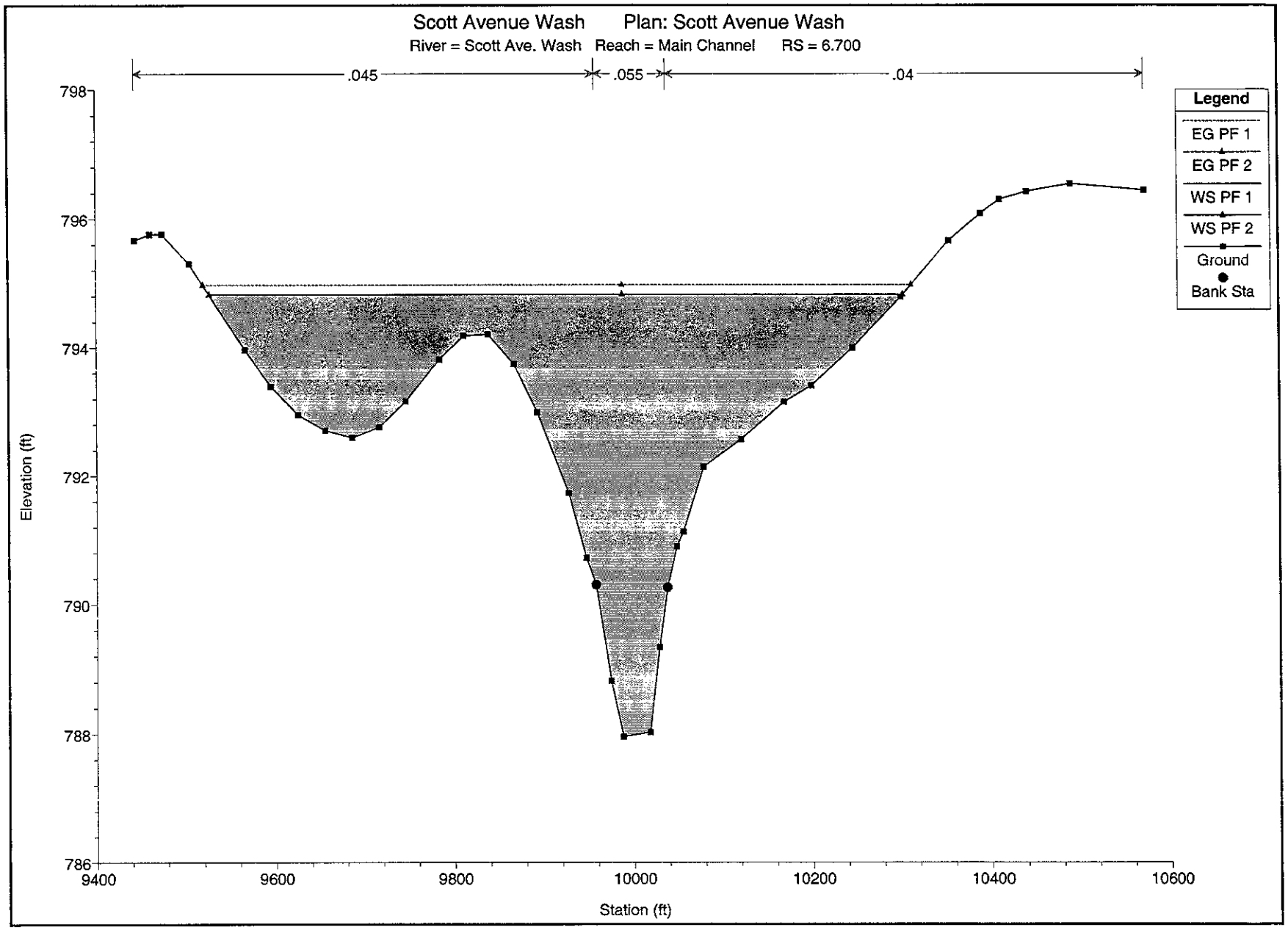

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 5.013
.035
.04
.035
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
776
774
772
770
768
766
764
762
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

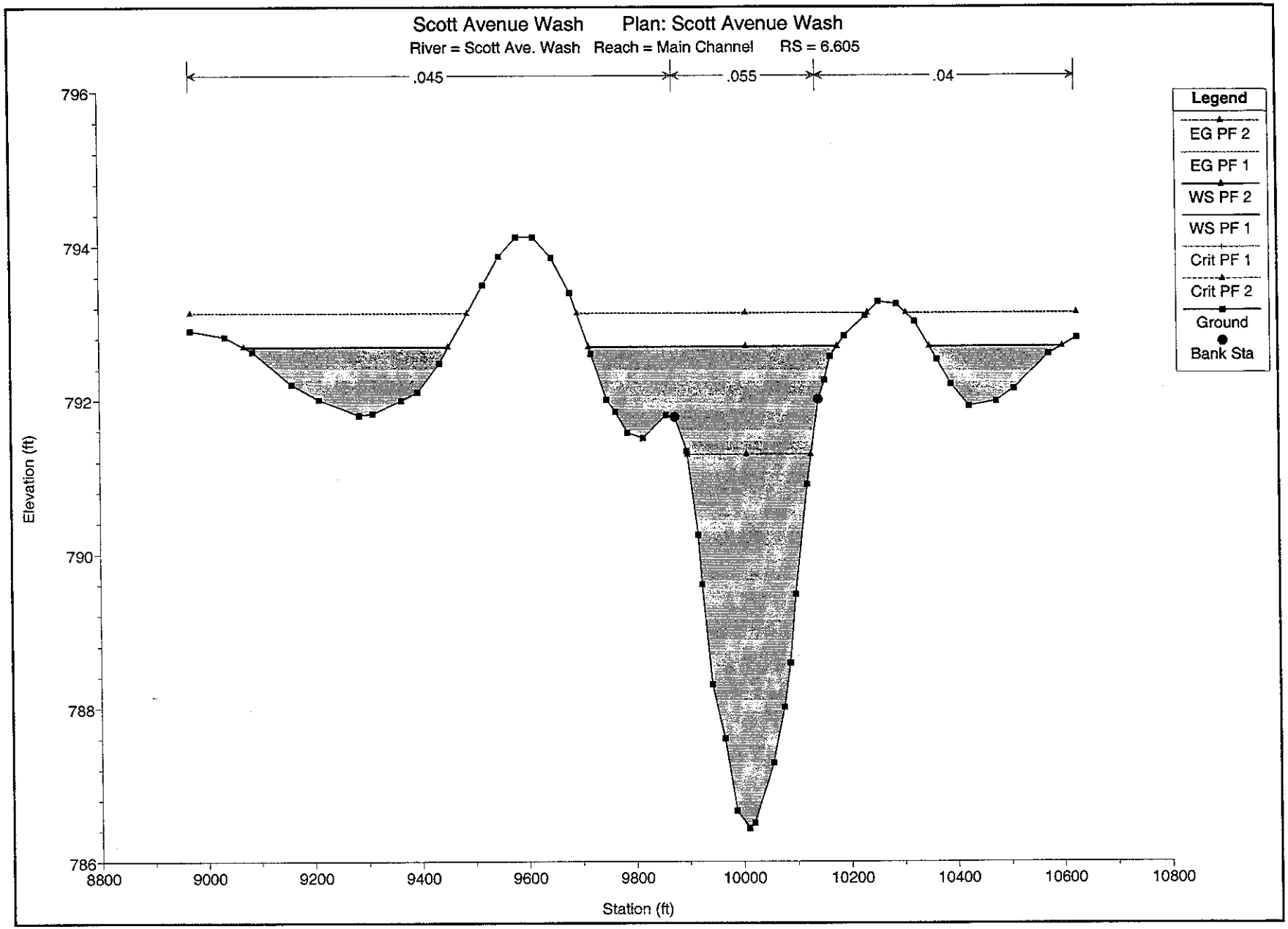

Sand Tank Wash Plan: Sand Tank Wash Main Branch
River = Sand Tank Wash Reach = Main Branch RS = 4.917
.035
.04
.035
Legend
EG PF 1
EG PF 2
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
774
772
770
768
766
764
762
760
8500
9000
9500
10000
10500
11000
Station (ft)

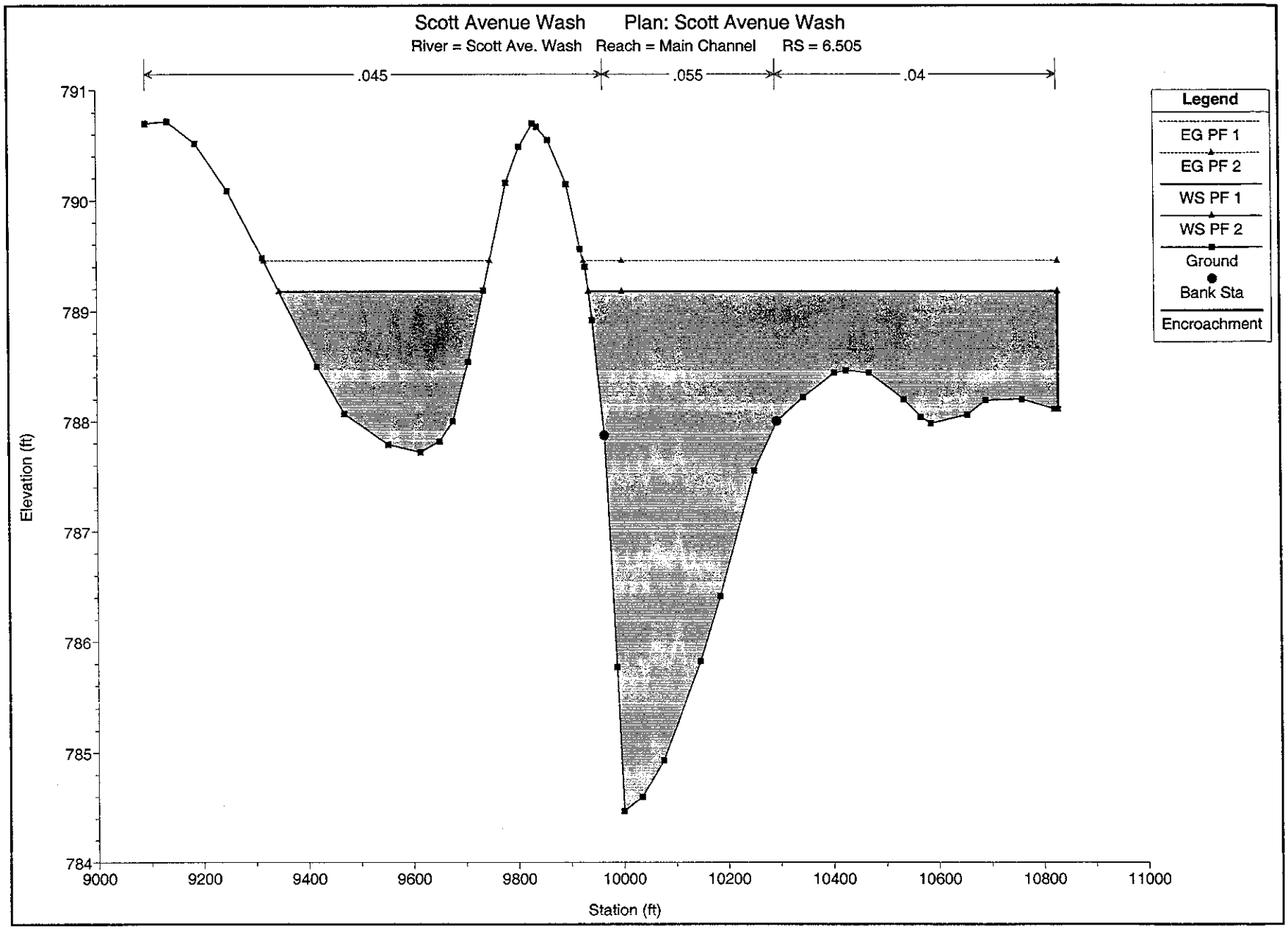

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 6.986
.045
.055
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
803
802
801
800
799
798
797
796
795
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

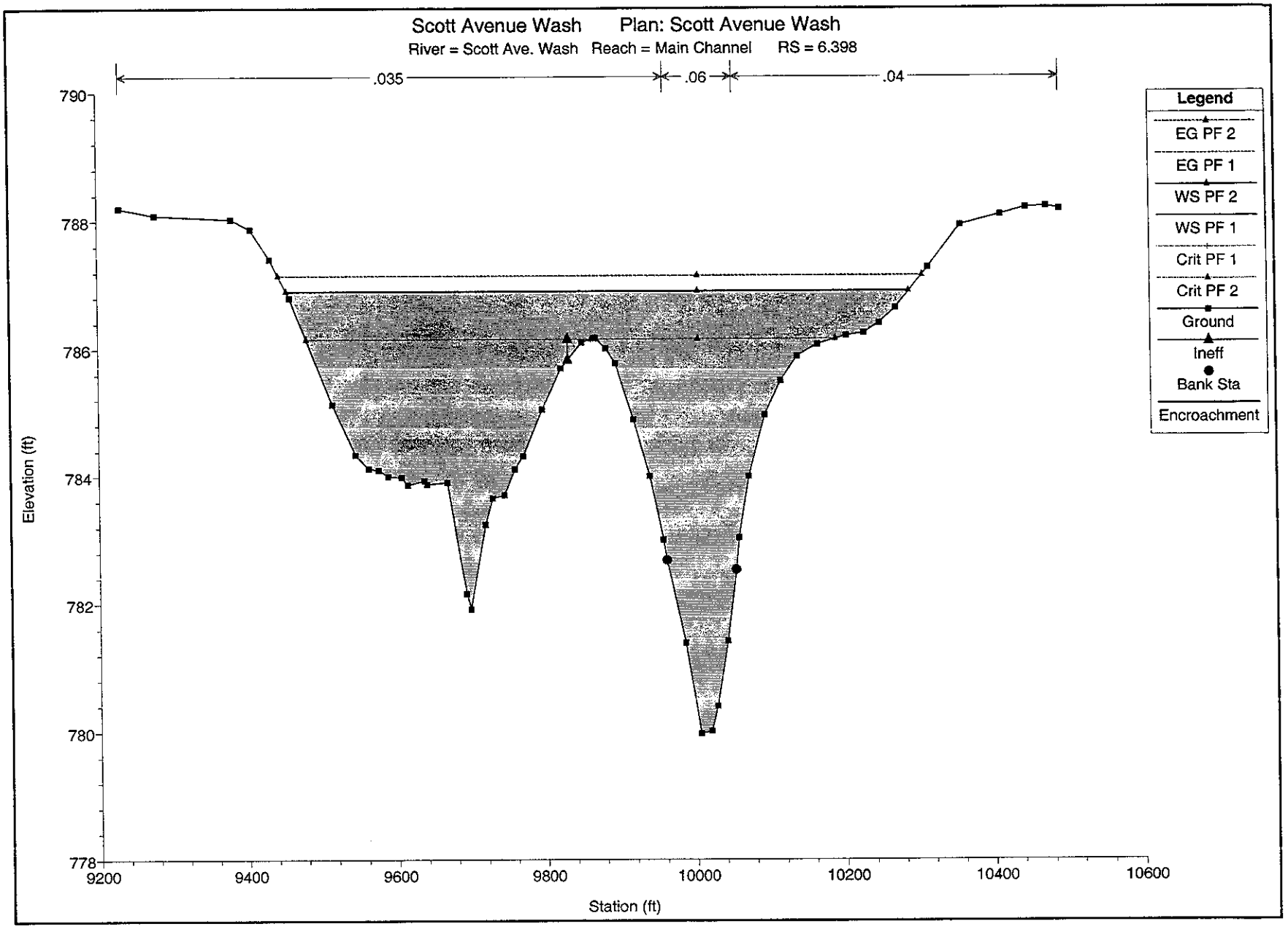

Scott Avenue Wash
Plan: Scott Avenue Wash
River = Scott Ave. Wash
Reach = Main Channel
RS = 6.895
.045
.055
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
801
800
799
798
797
796
795
794
793
9600
9800
10000
10200
10400
10600
Station (ft)

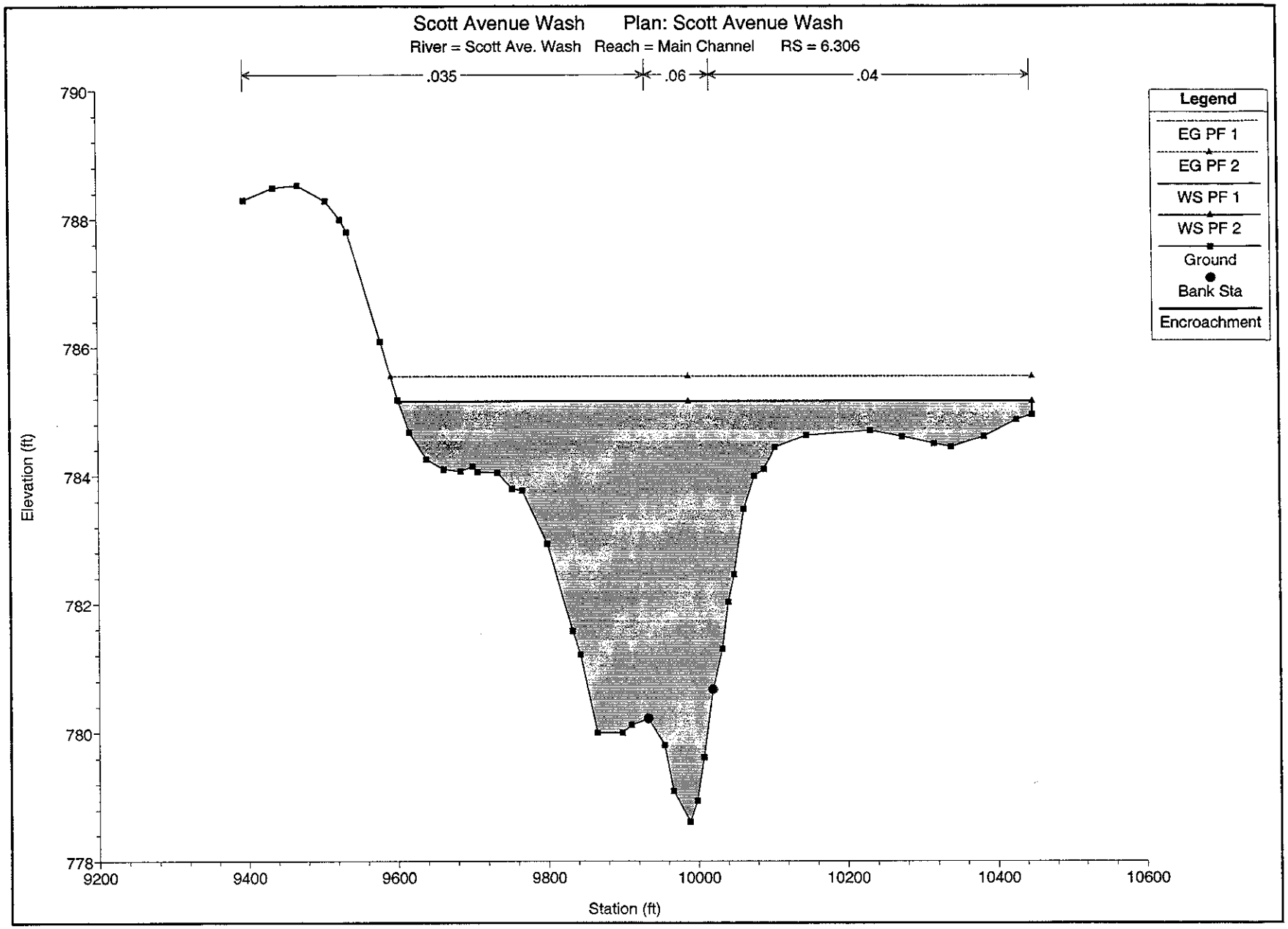
Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 6.792
.045
.055
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
802
800
798
796
794
792
790
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

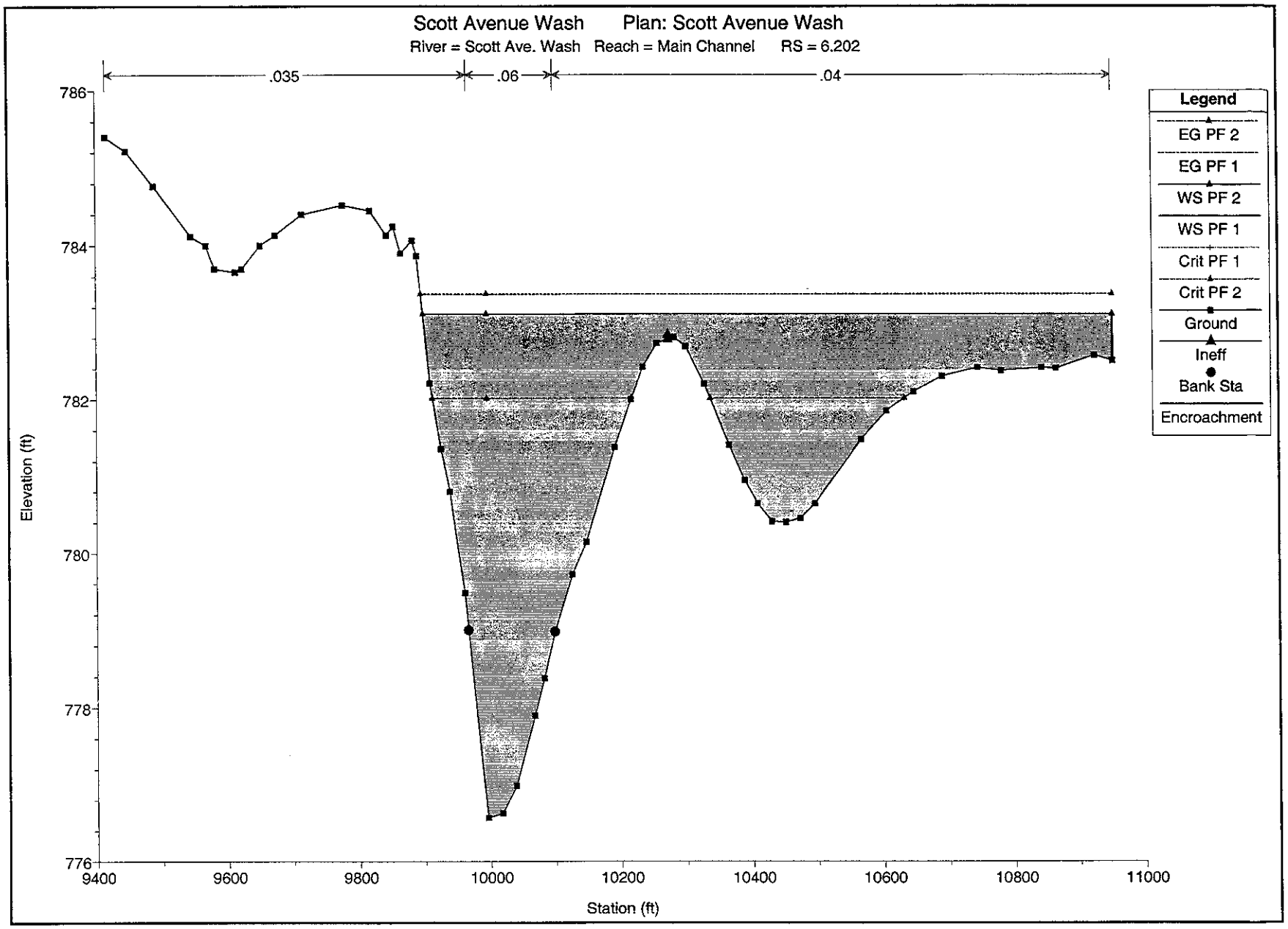

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 6.700
.045
.055
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Elevation (ft)
798
796
794
792
790
788
786
9400
9600
9800
10000
10200
10400
10600
Station (ft)

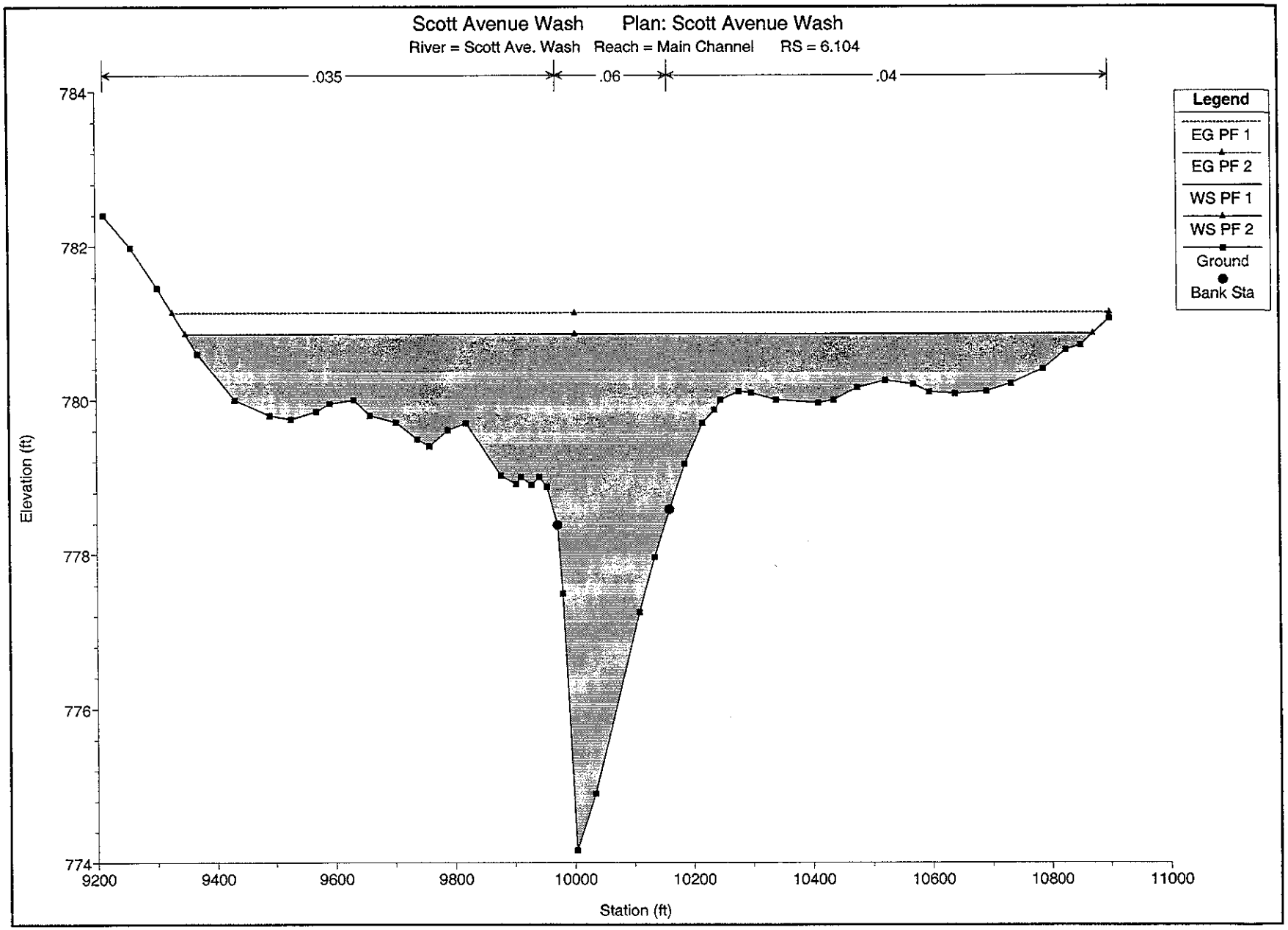

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 6.605
.045
.055
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Elevation (ft)
796
794
792
790
788
786
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

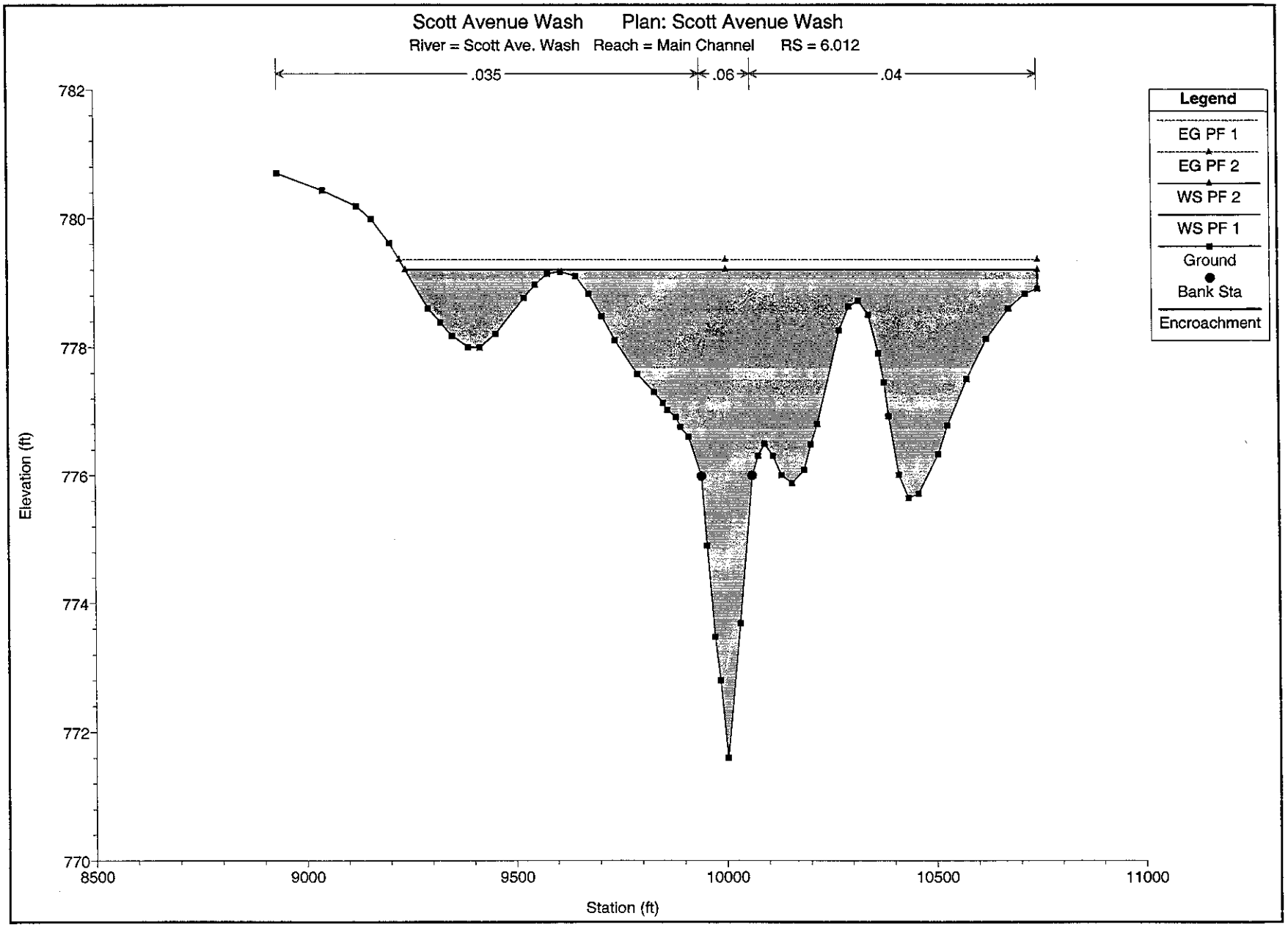

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 6.505
.045
.055
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
791
790
789
788
787
786
785
784
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

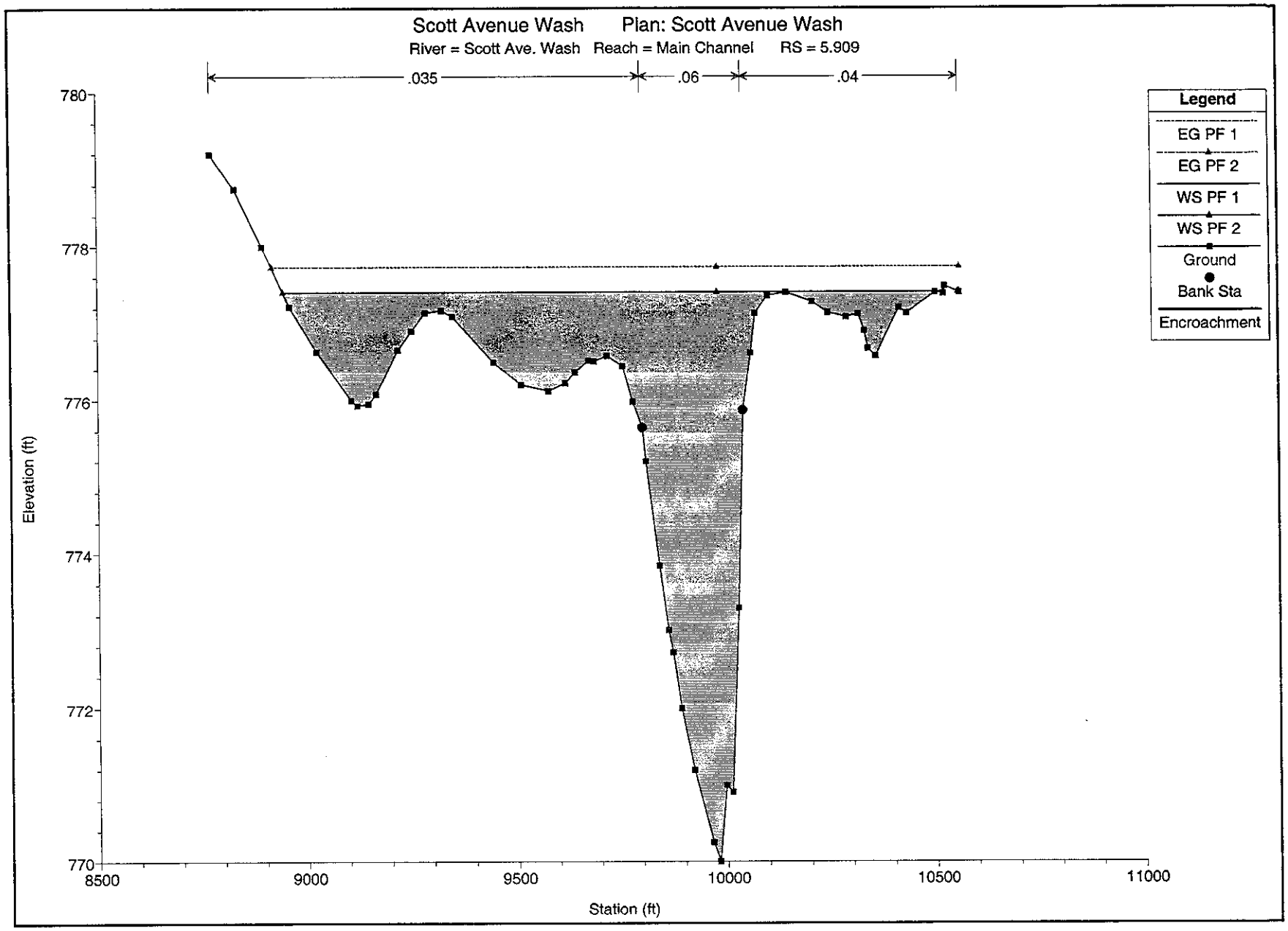

Scott Avenue Wash
Plan: Scott Avenue Wash
River = Scott Ave. Wash
Reach = Main Channel
RS = 6.398
.035
.06
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
790
788
786
784
782
780
778
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

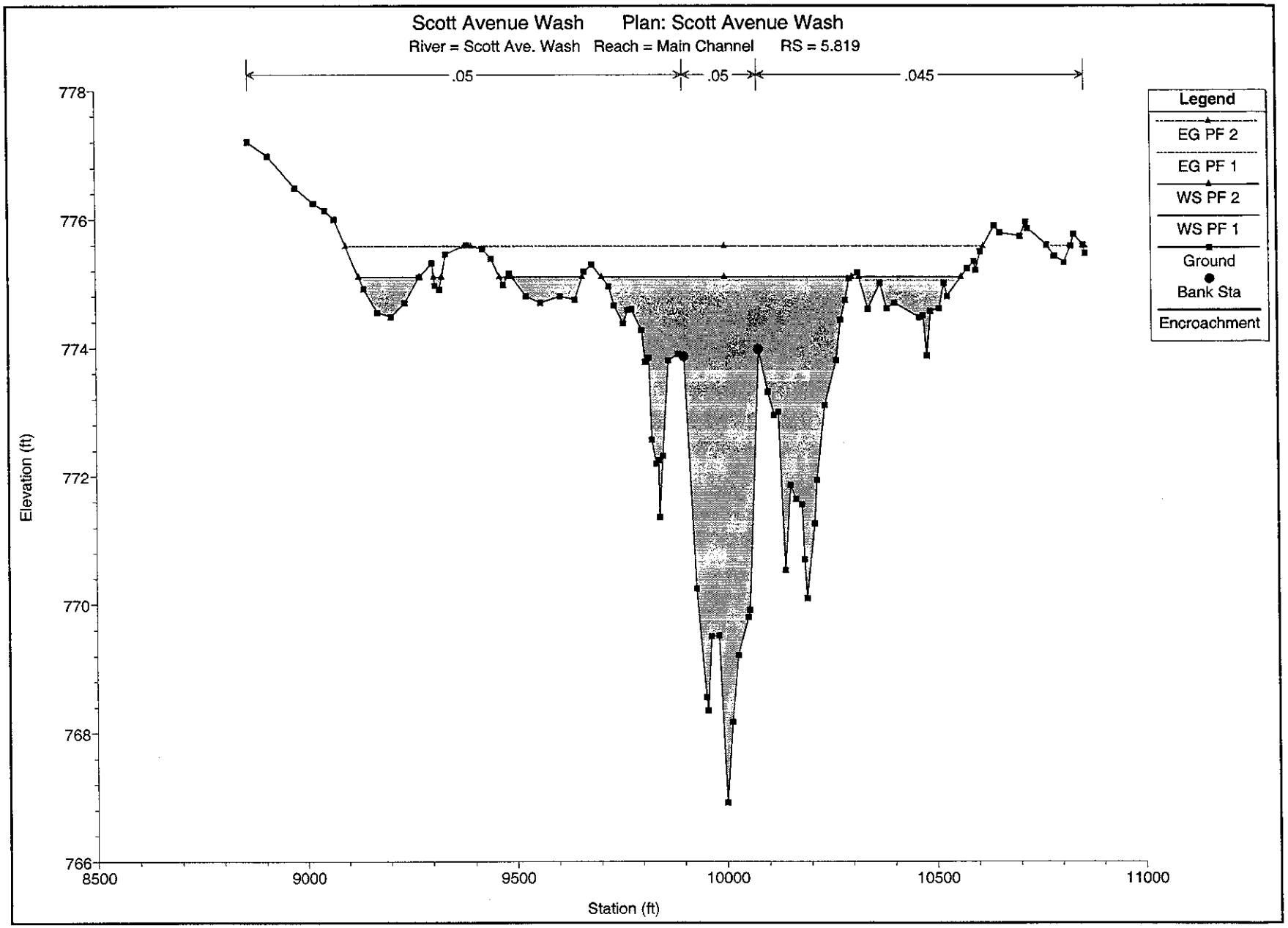

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 6.306
.035
.06
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
790
788
786
784
782
780
778
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

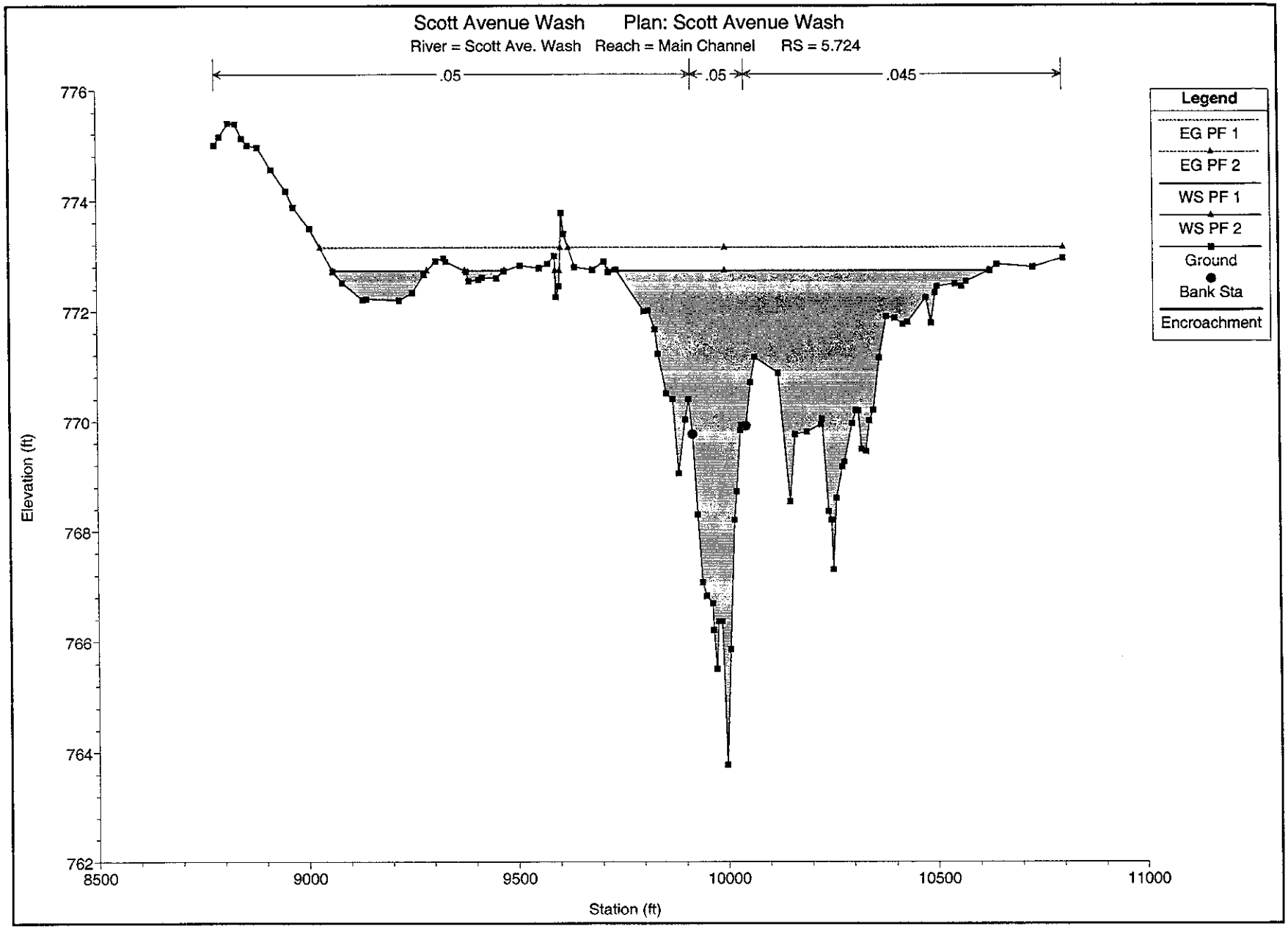

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 6.202
.035
.06
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
786
784
782
780
778
776
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

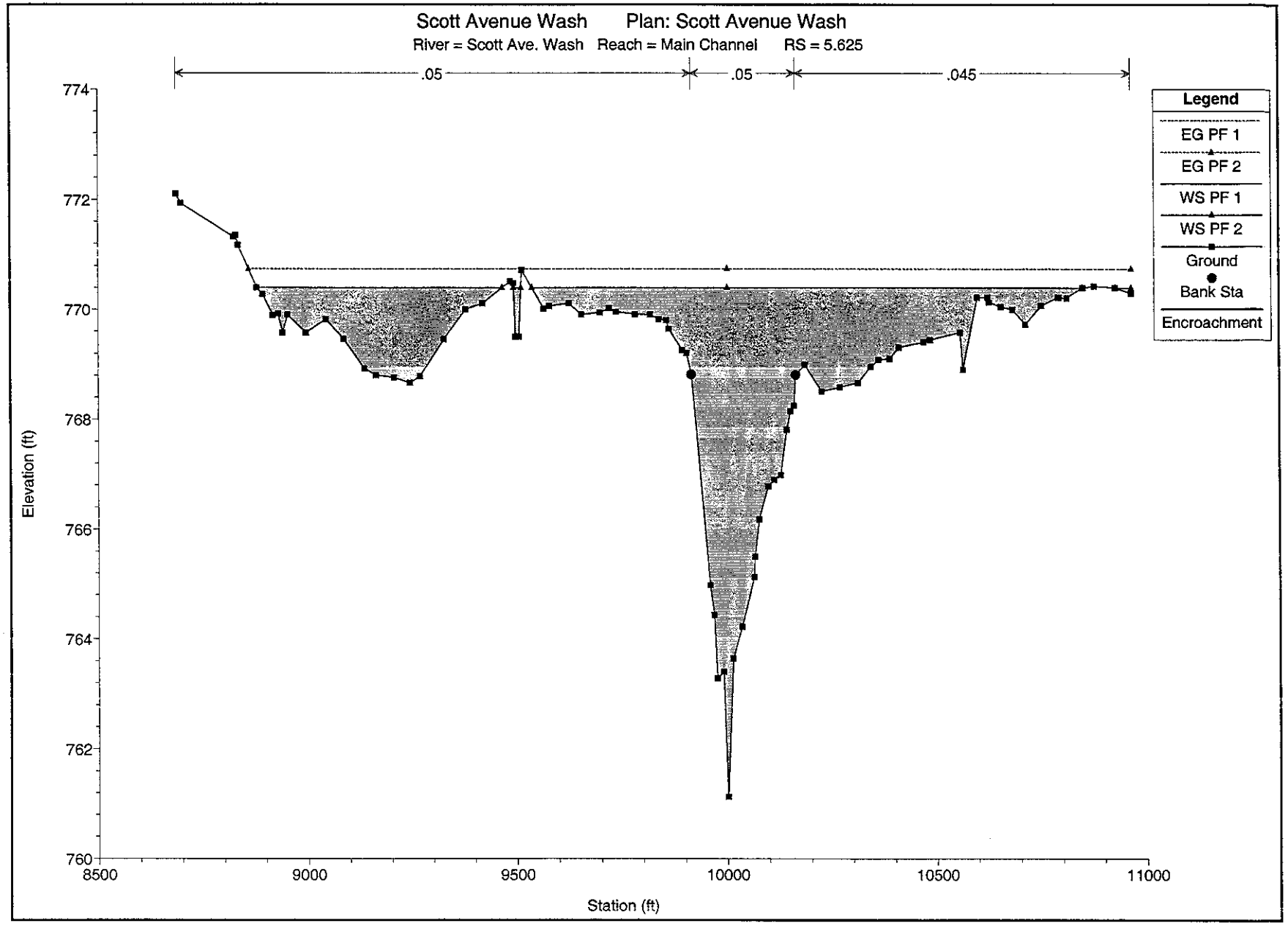

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 6.104
.035
.06
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Elevation (ft)
784
782
780
778
776
774
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

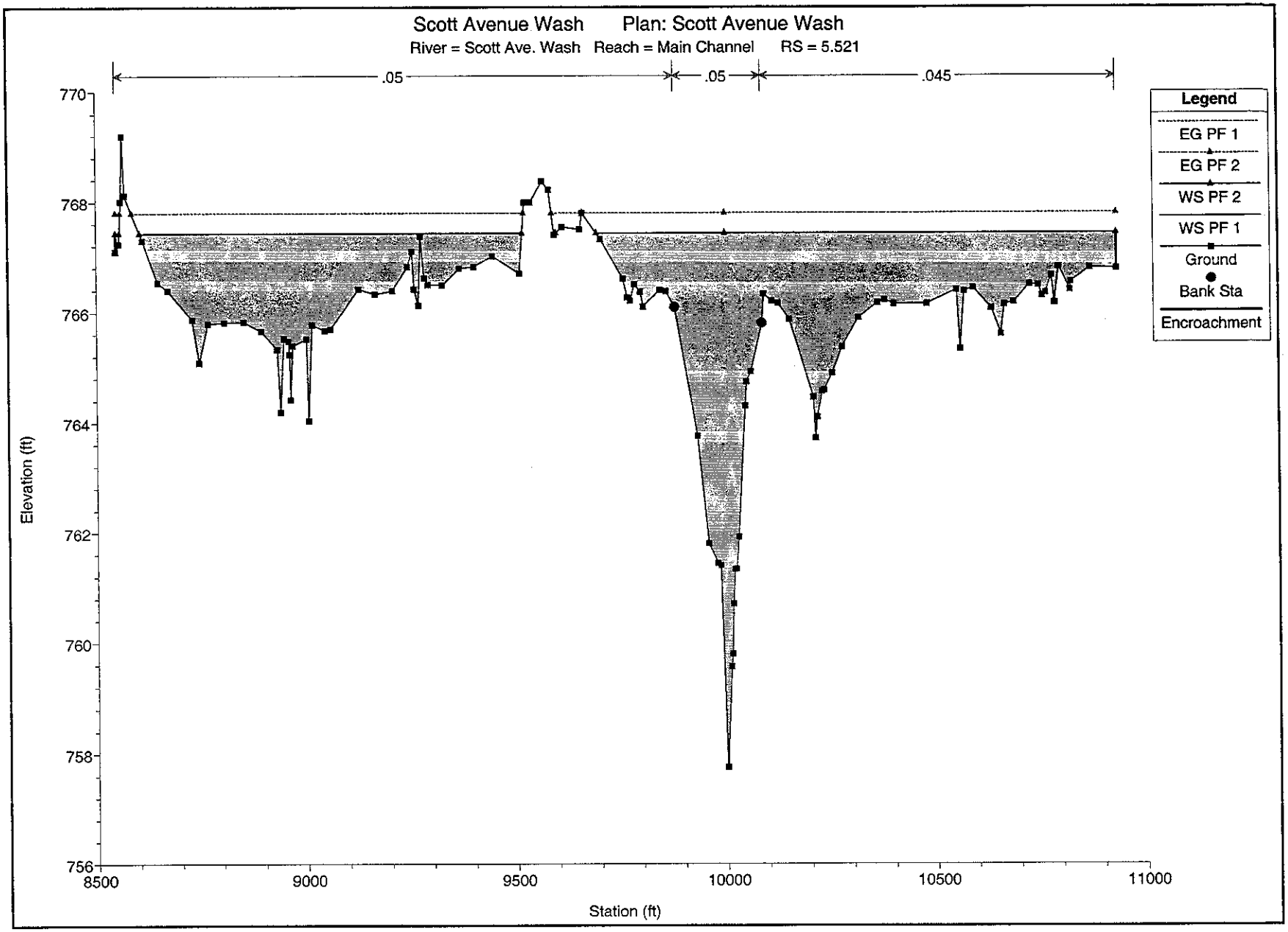

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 6.012
.035
.06
.04
Legend
EG PF 1
EG PF 2
WS PF 2
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
782
780
778
776
774
772
770
8500
9000
9500
10000
10500
11000
Station (ft)

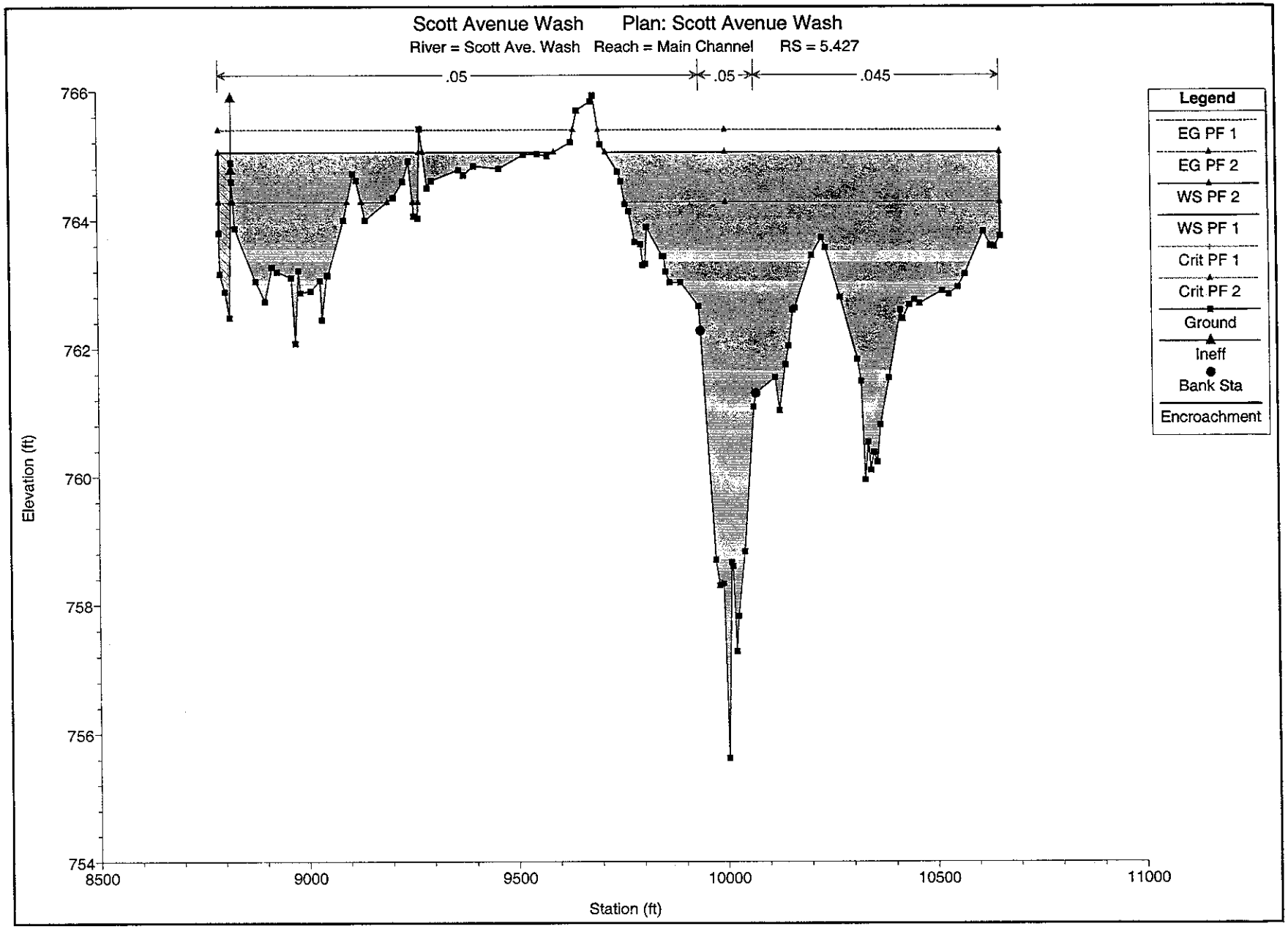

Scott Avenue Wash
Plan: Scott Avenue Wash
River = Scott Ave. Wash
Reach = Main Channel
RS = 5.909
.035
.06
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
780
778
776
774
772
770
8500
9000
9500
10000
10500
11000
Station (ft)

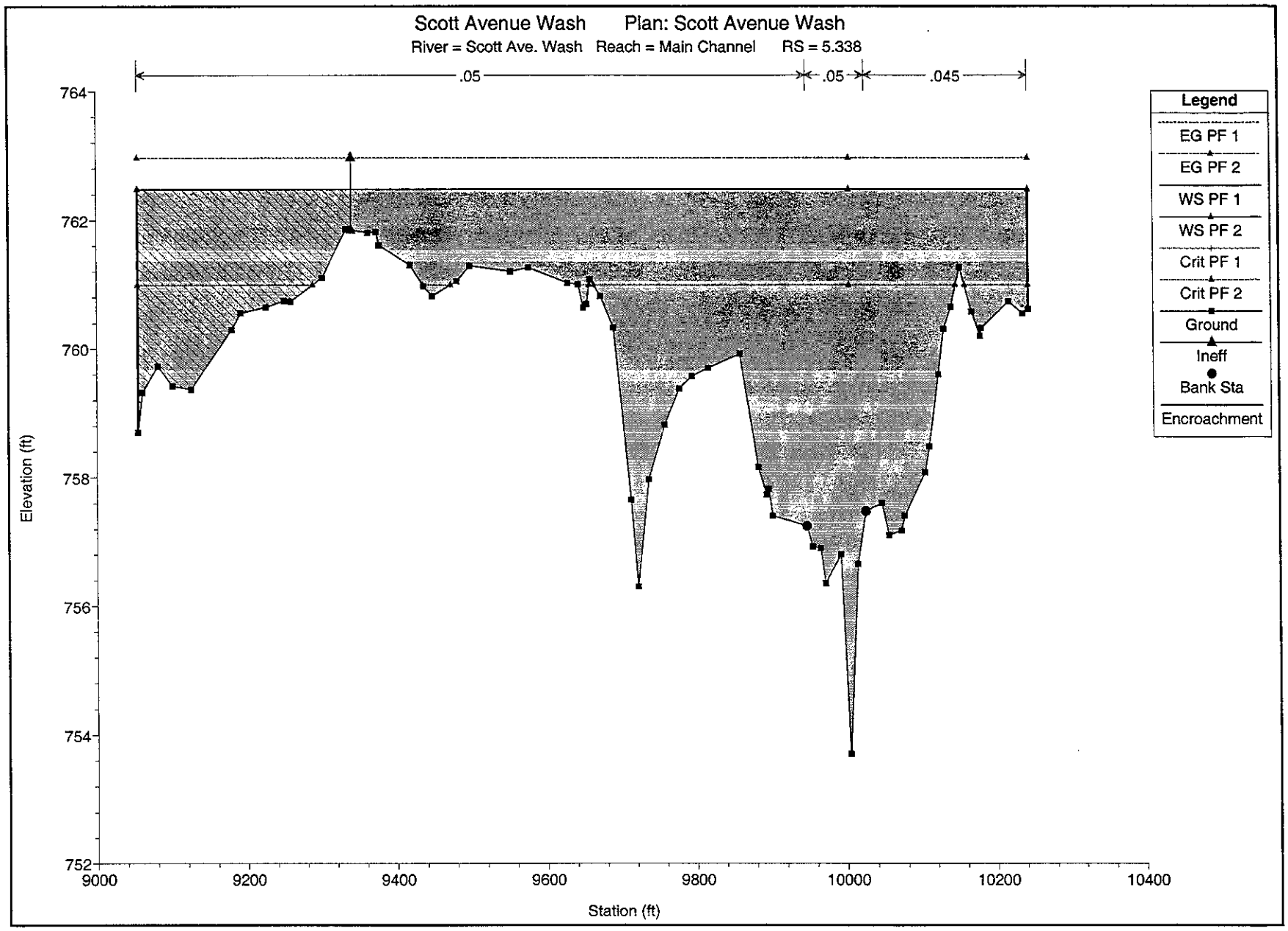

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 5.819
.05
.05
.045
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
778
776
774
772
770
768
766
8500
9000
9500
10000
10500
11000
Station (ft)

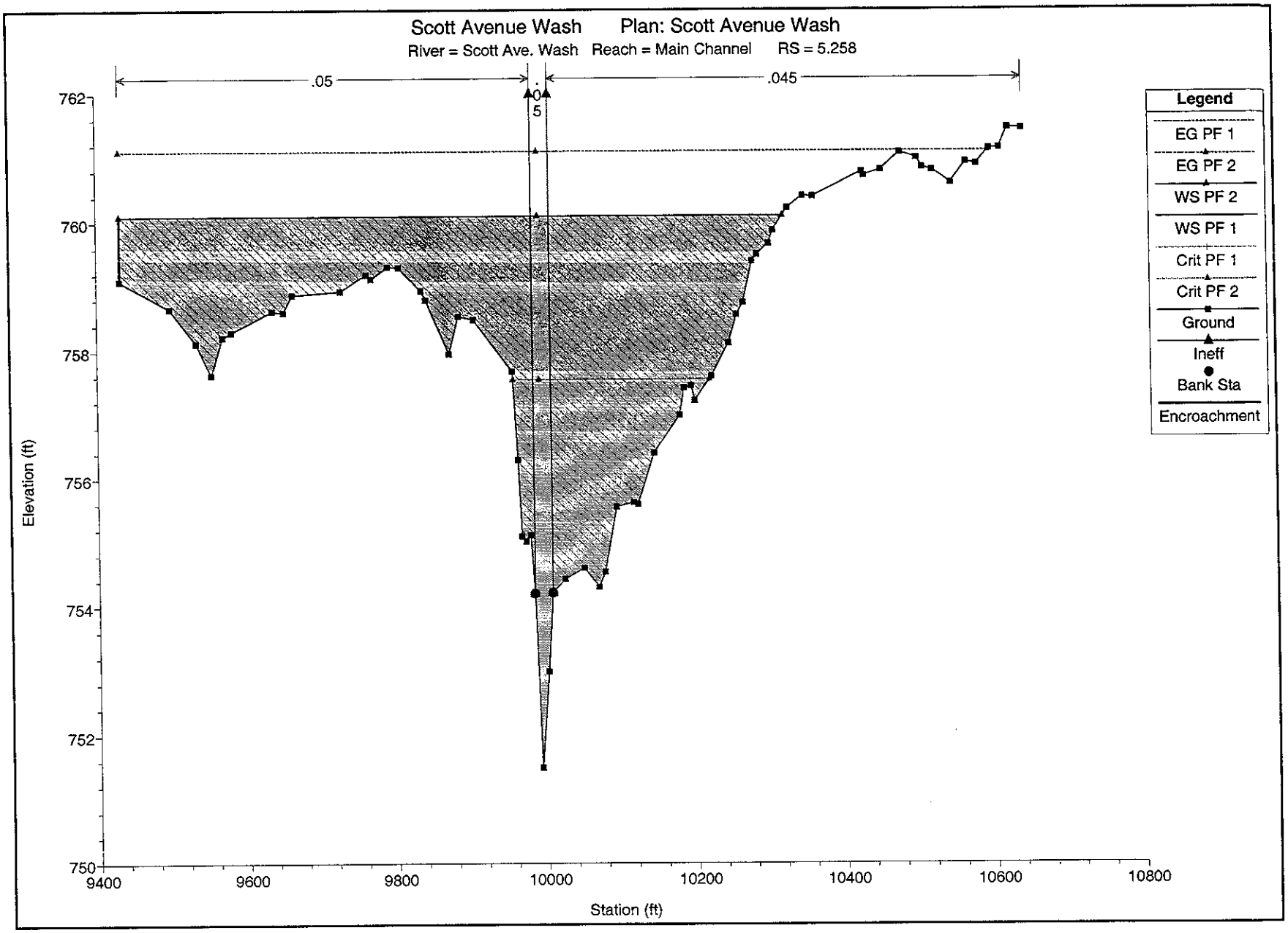

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 5.724
.05
.05
.045
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
776
774
772
770
768
766
764
762
8500
9000
9500
10000
10500
11000
Station (ft)

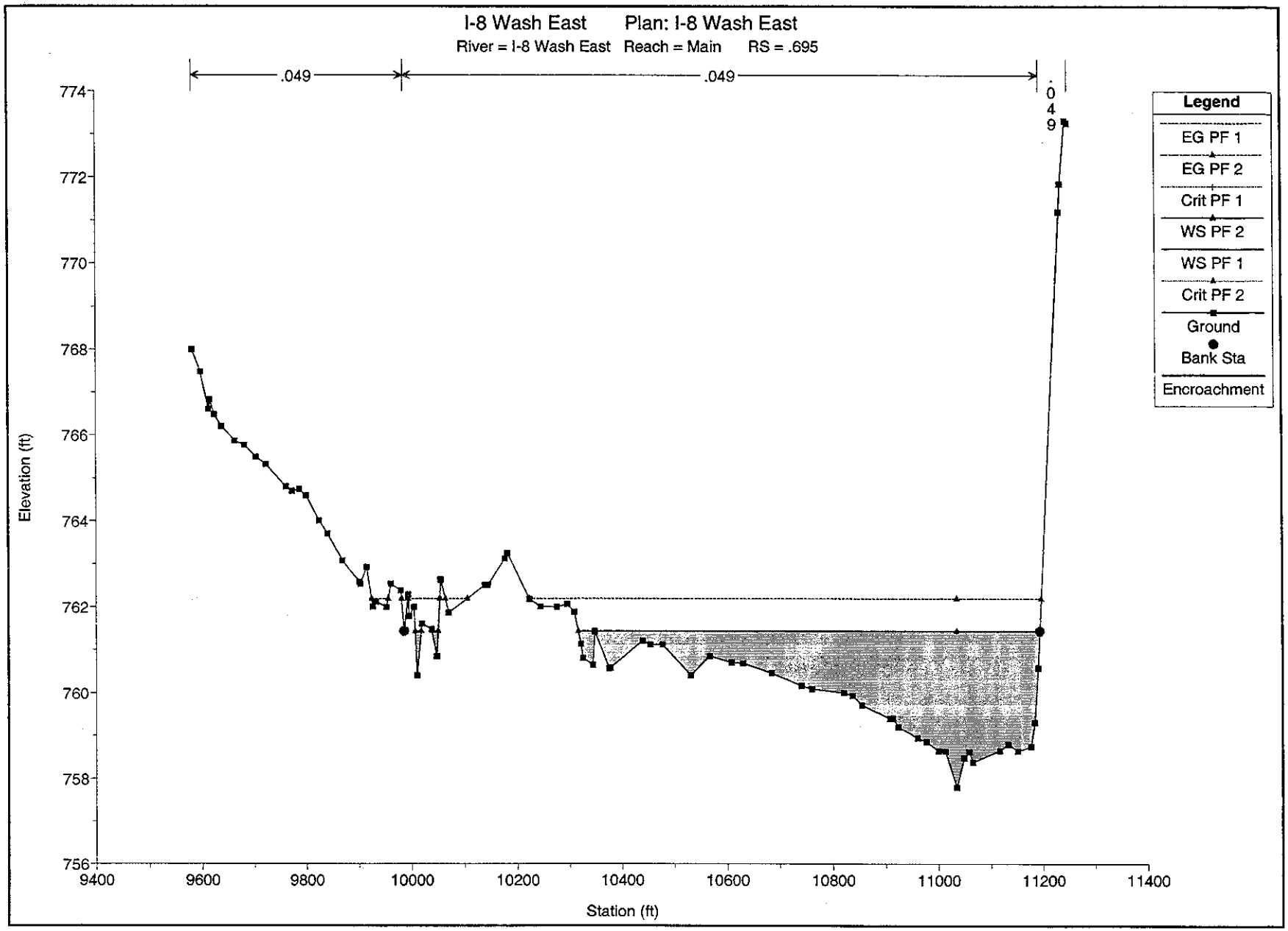

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 5.625
.05
.05
.045
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
774
772
770
768
766
764
762
760
8500
9000
9500
10000
10500
11000
Station (ft)

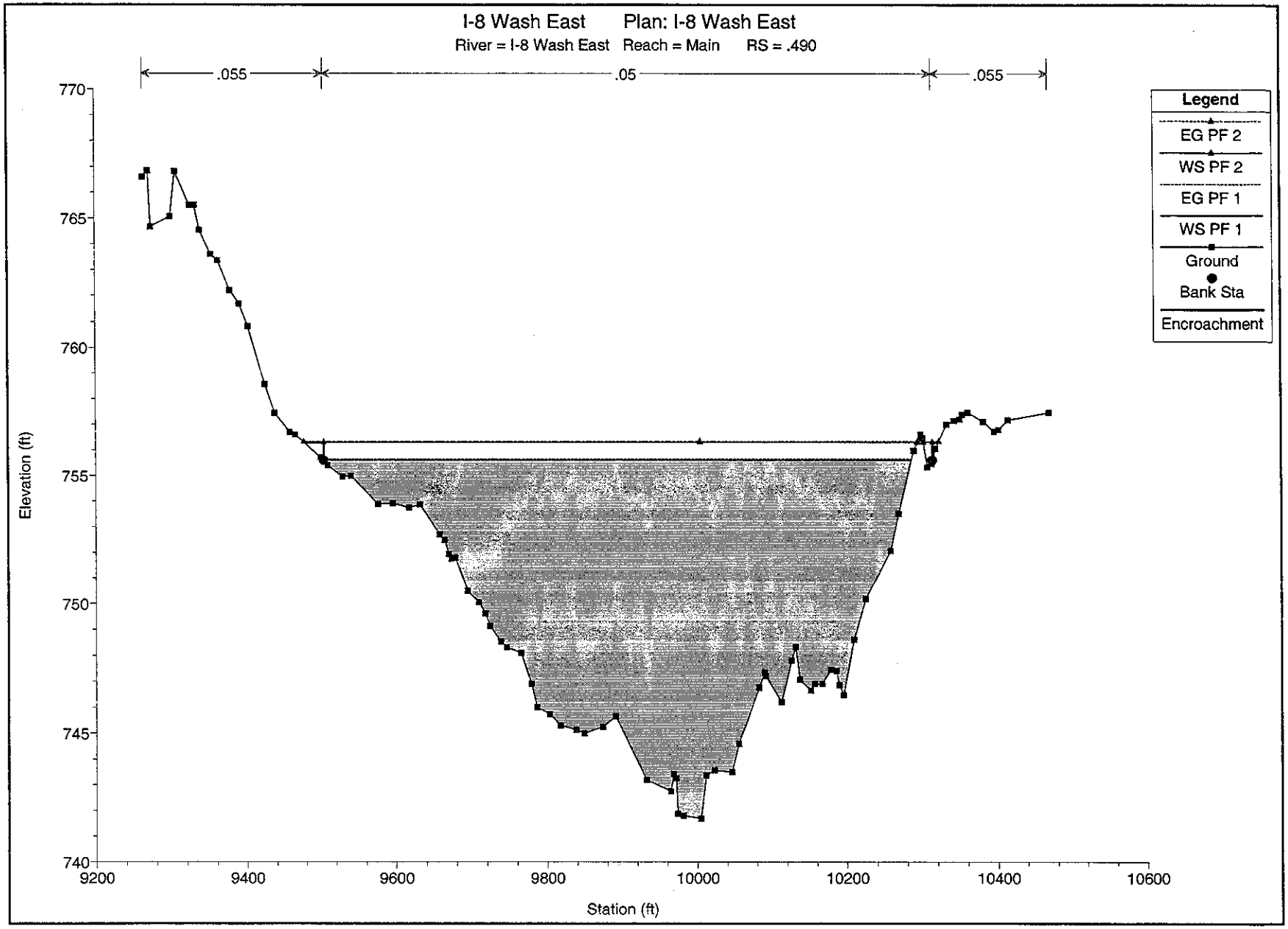

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 5.521
.05
.05
.045
Legend
EG PF 1
EG PF 2
WS PF 2
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
770
768
766
764
762
760
758
756
8500
9000
9500
10000
10500
11000
Station (ft)

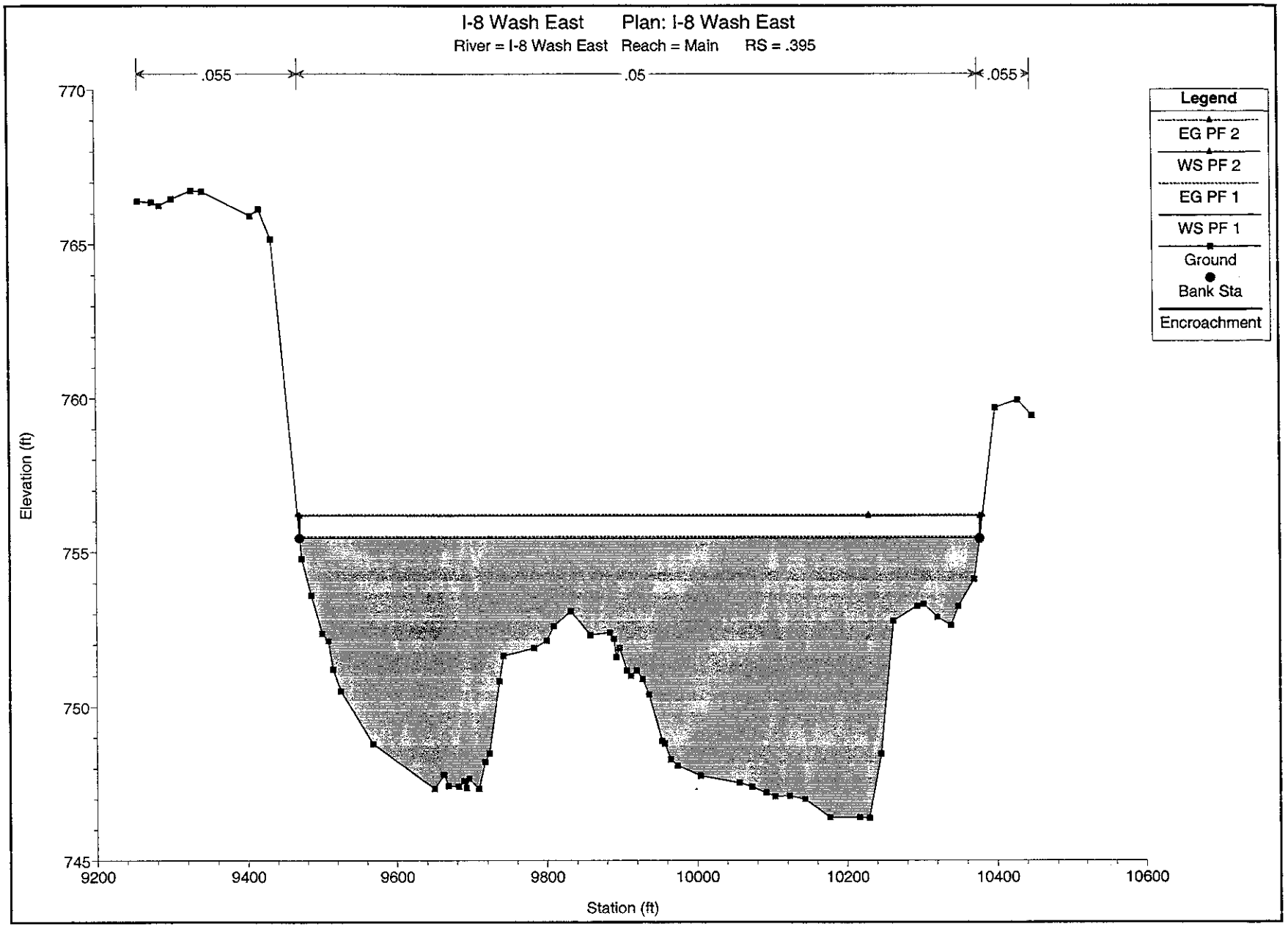

Scott Avenue Wash
Plan: Scott Avenue Wash
River = Scott Ave. Wash
Reach = Main Channel
RS = 5.427
.05
.05
.045
Legend
EG PF 1
EG PF 2
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
766
764
762
760
758
756
754
8500
9000
9500
10000
10500
11000
Station (ft)

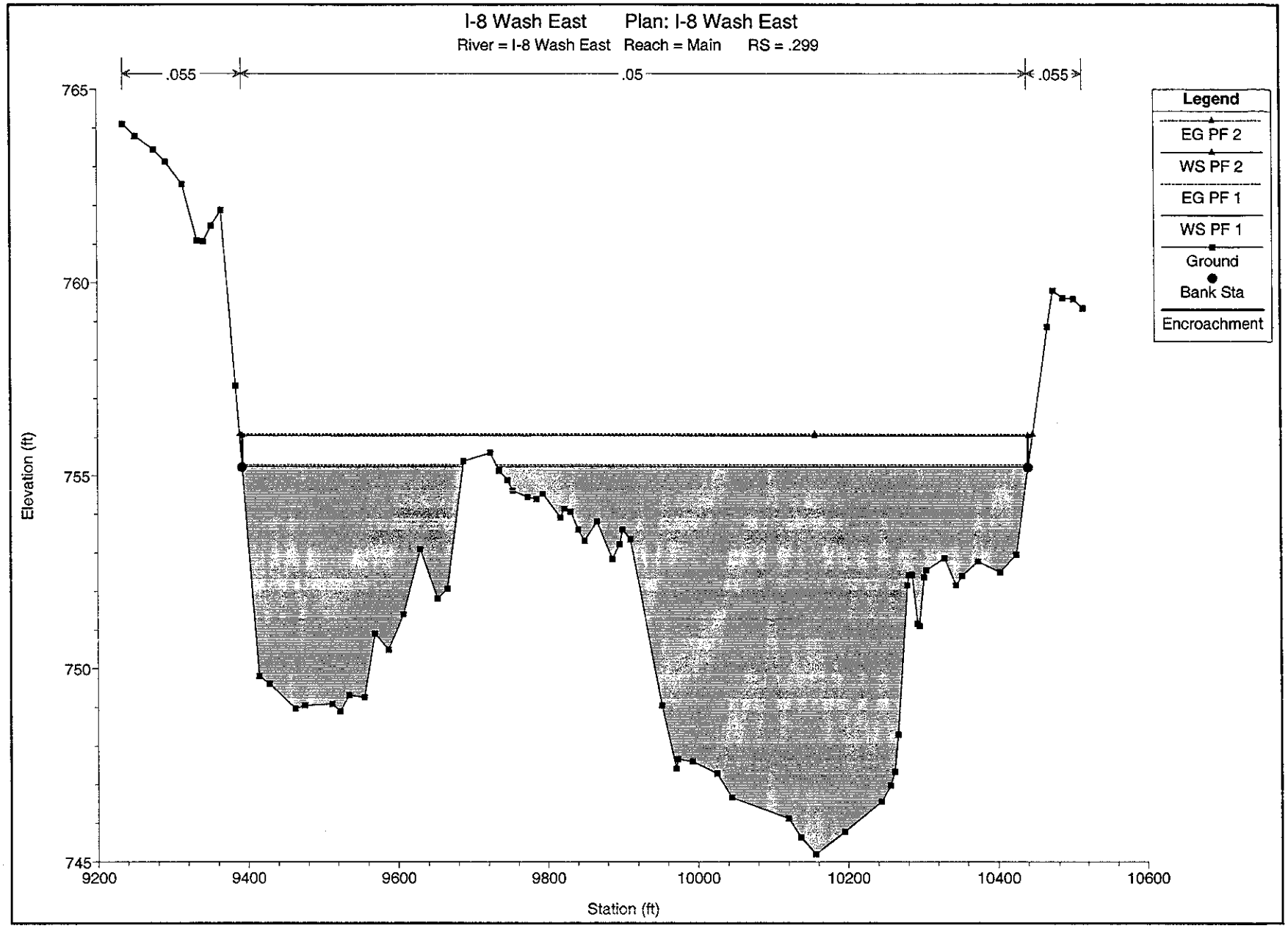

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 5.338
.05
.05
.045
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
764
762
760
758
756
754
752
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

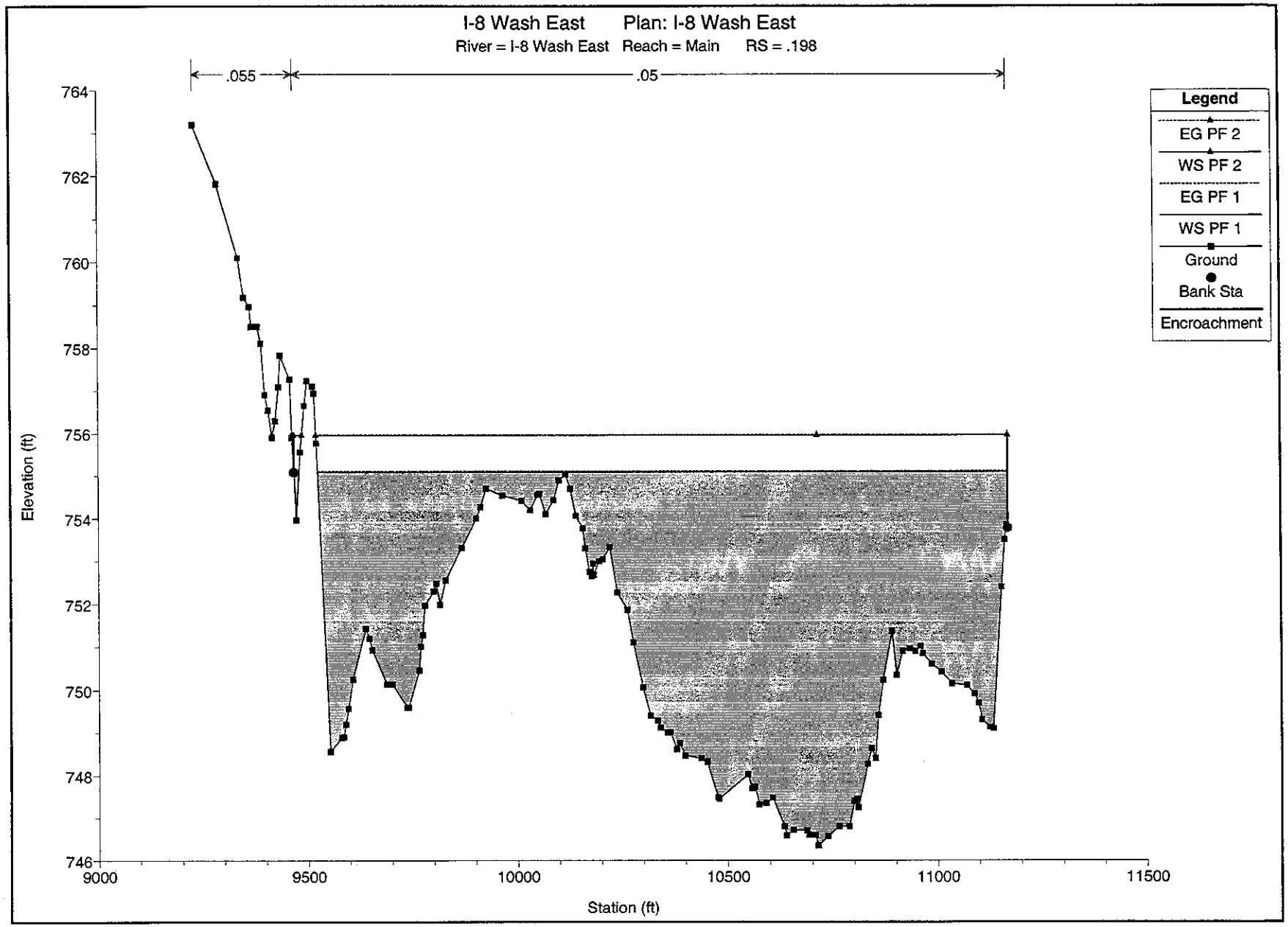

Scott Avenue Wash Plan: Scott Avenue Wash
River = Scott Ave. Wash Reach = Main Channel RS = 5.258
.05
.045
.05
Legend
EG PF 1
EG PF 2
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
762
760
758
756
754
752
750
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

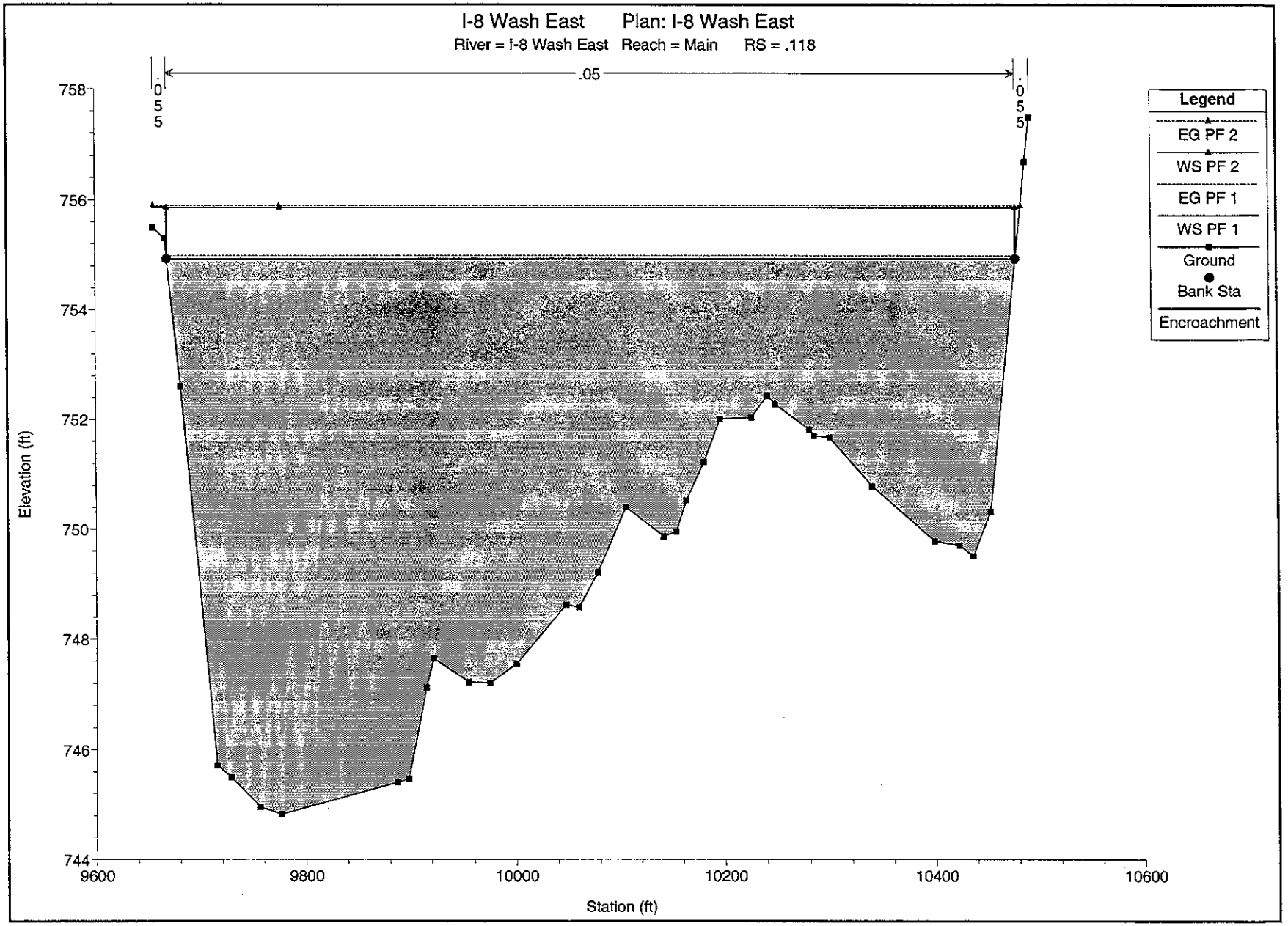

I-8 Wash East Plan: I-8 Wash East
River = I-8 Wash East Reach = Main RS = .695
.049
.049
.049
Legend
EG PF 1
EG PF 2
Crit PF 1
WS PF 2
WS PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
774
772
770
768
766
764
762
760
758
756
9400
9600
9800
10000
10200
10400
10600
10800
11000
11200
11400
Station (ft)

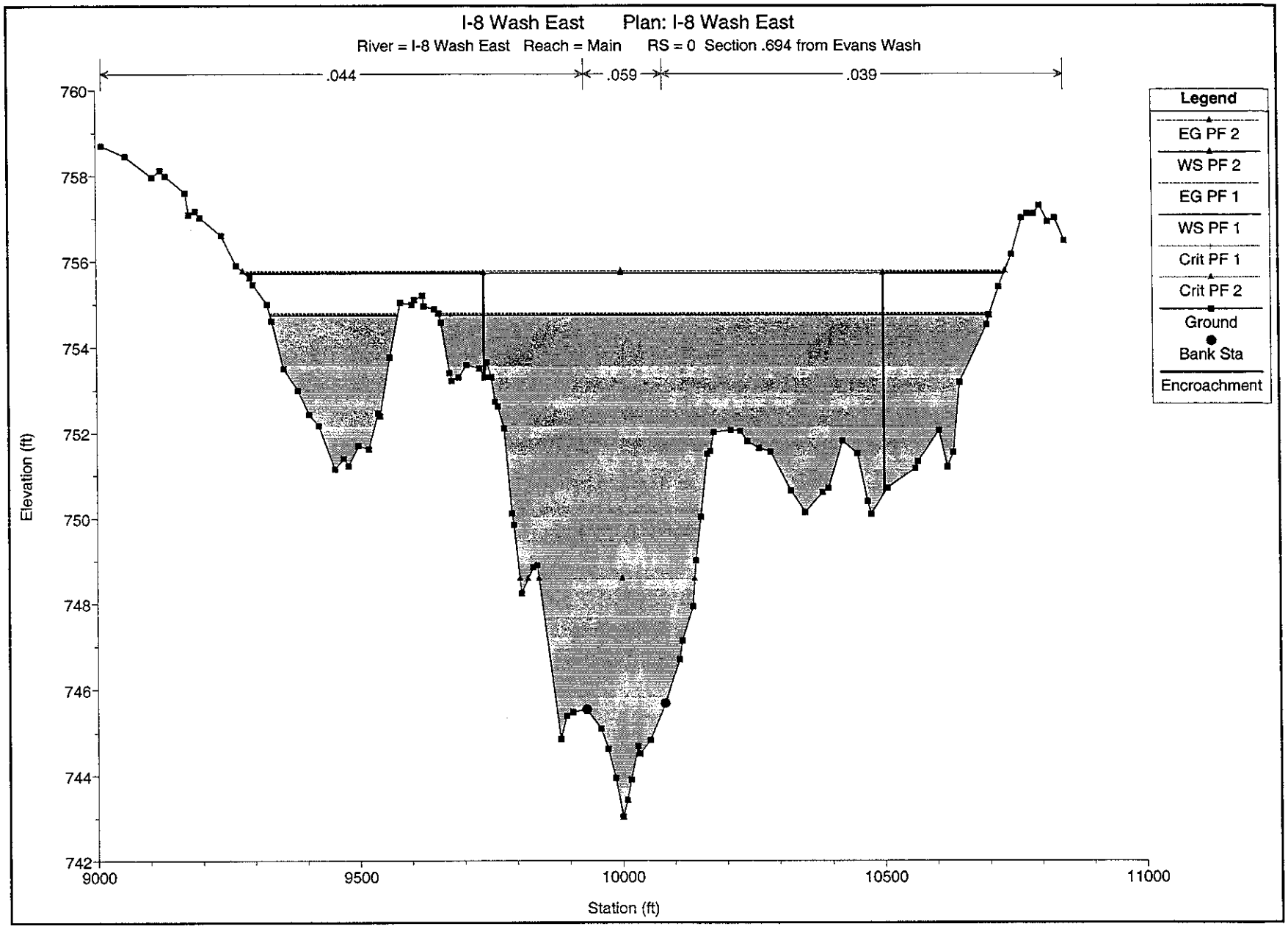

I-8 Wash East Plan: I-8 Wash East
River = I-8 Wash East Reach = Main RS = .490
.055
.05
.055
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
770
765
760
755
750
745
740
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

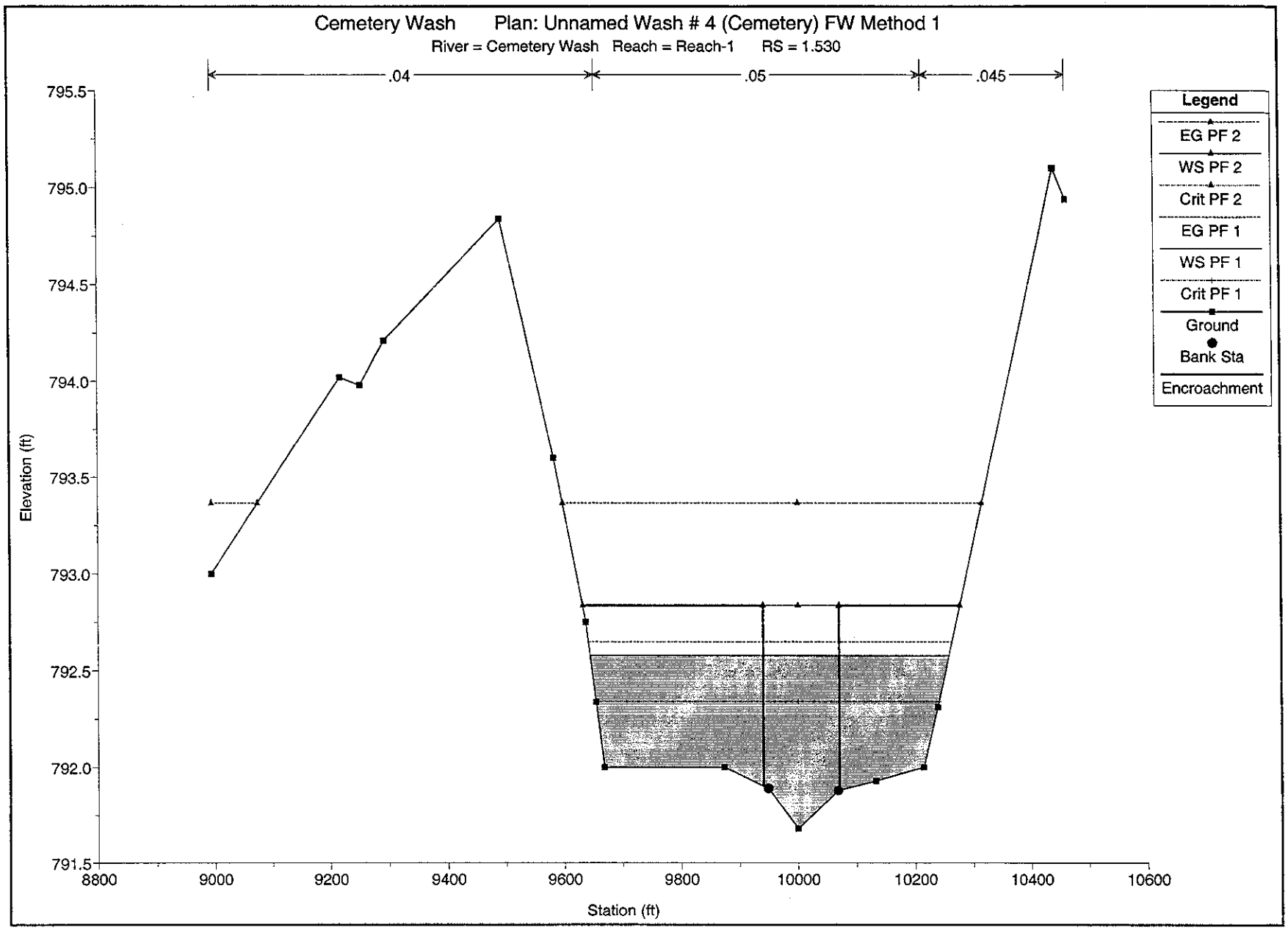

I-8 Wash East Plan: I-8 Wash East
River = I-8 Wash East Reach = Main RS = .395
.055
.05
.055
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
770
765
760
755
750
745
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

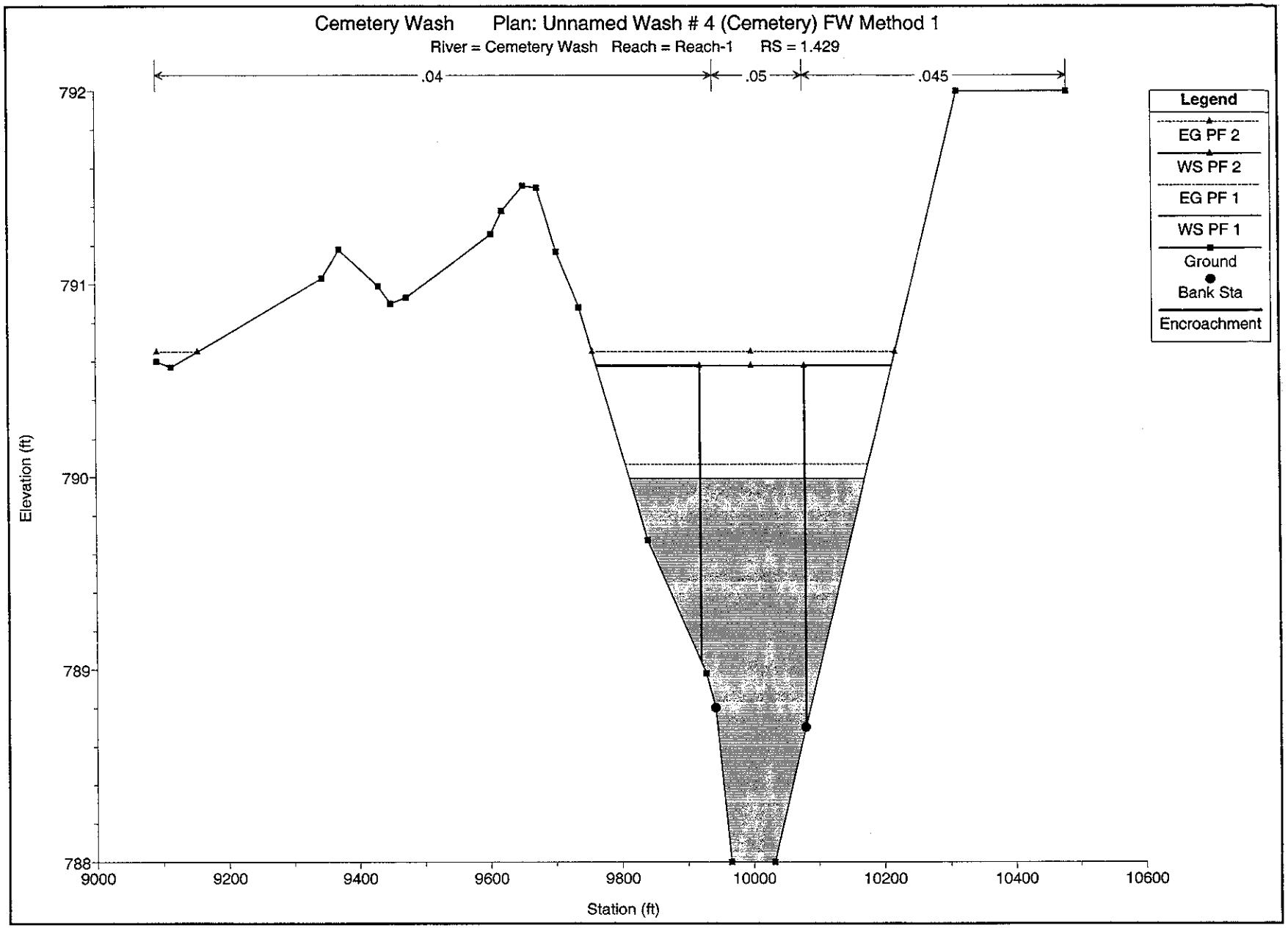

I-8 Wash East Plan: I-8 Wash East
River = I-8 Wash East Reach = Main RS = .299
.055
.05
.055
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
765
760
755
750
745
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

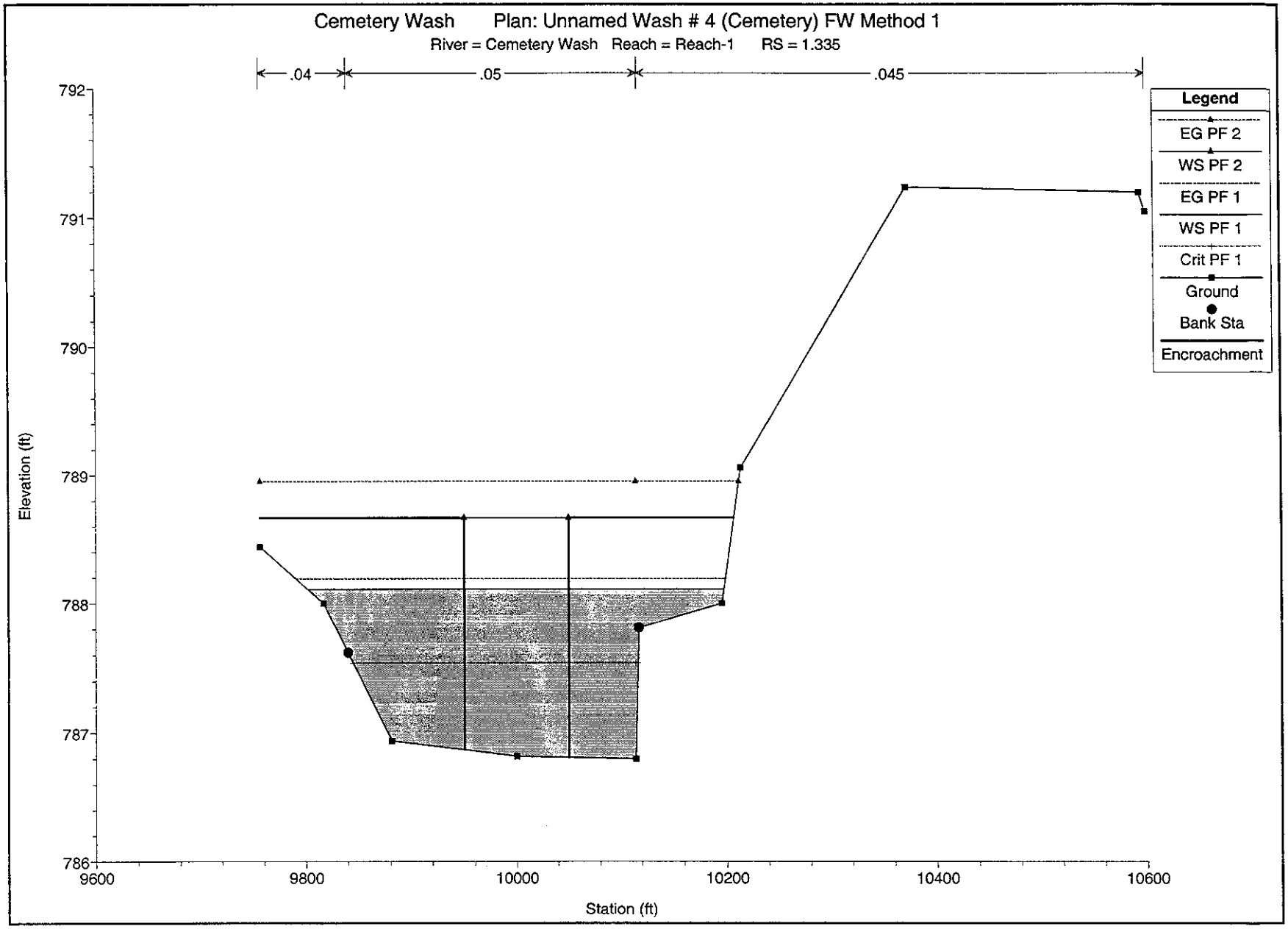

I-8 Wash East Plan: I-8 Wash East
River = I-8 Wash East Reach = Main RS = .198
.055
.05
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
764
762
760
758
756
754
752
750
748
746
9000
9500
10000
10500
11000
11500
Station (ft)

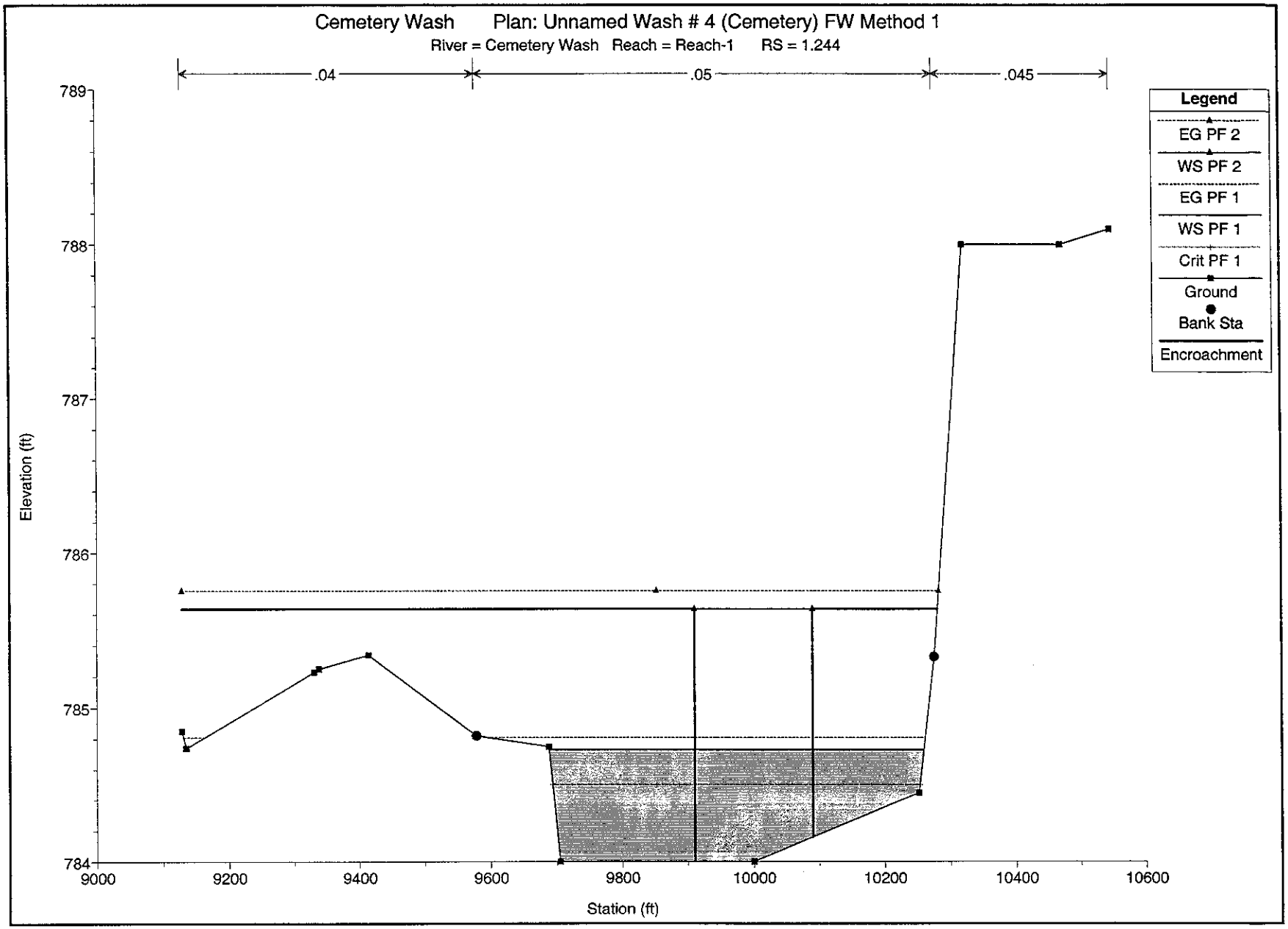

I-8 Wash East Plan: I-8 Wash East
River = I-8 Wash East Reach = Main RS = .118
.05
.055
.055
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
758
756
754
752
750
748
746
744
9600
9800
10000
10200
10400
10600
Station (ft)

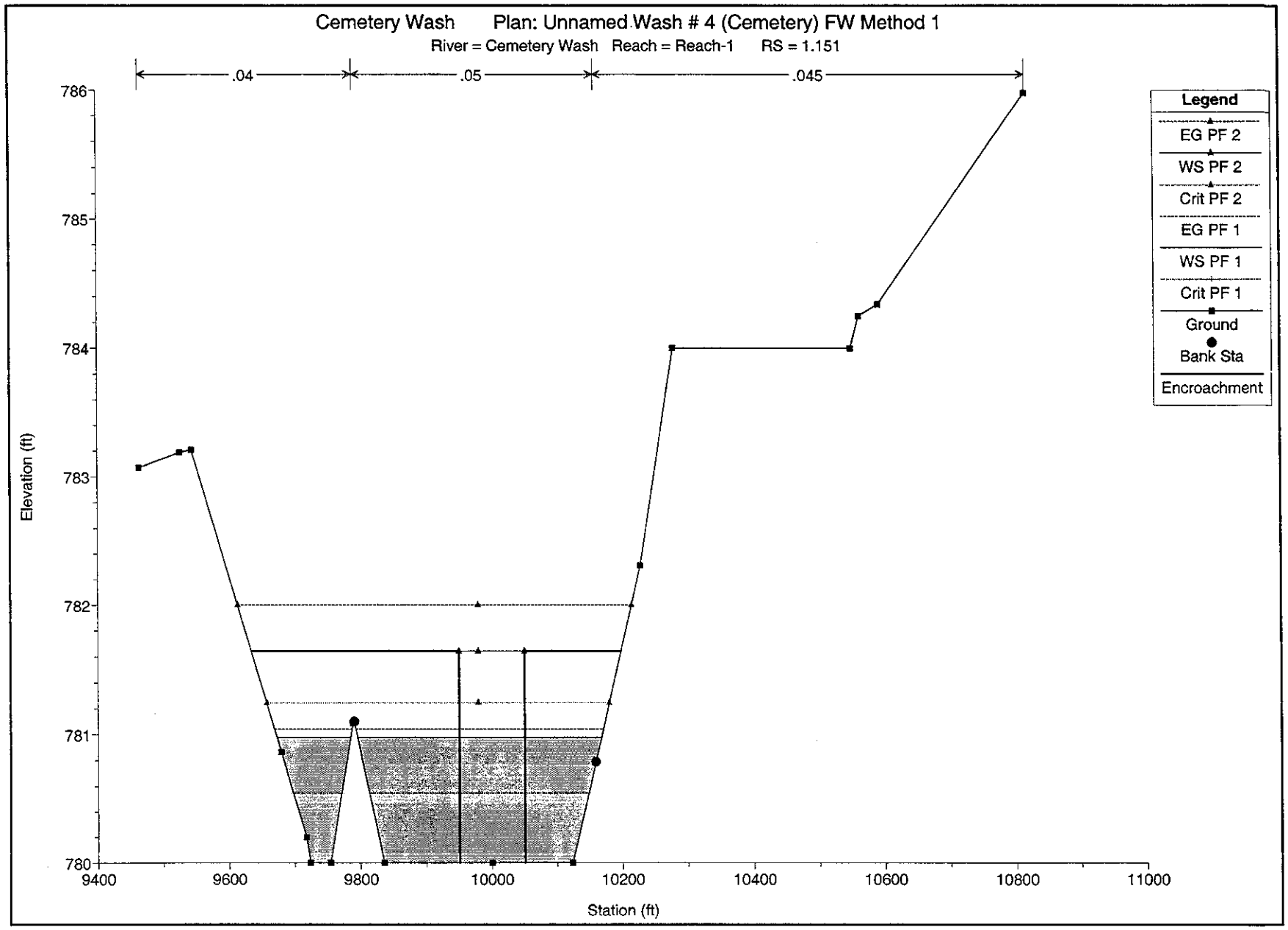

I-8 Wash East Plan: I-8 Wash East
River = I-8 Wash East Reach = Main RS = 0 Section .694 from Evans Wash
.044
.059
.039
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
760
758
756
754
752
750
748
746
744
742
9000
9500
10000
10500
11000
Station (ft)

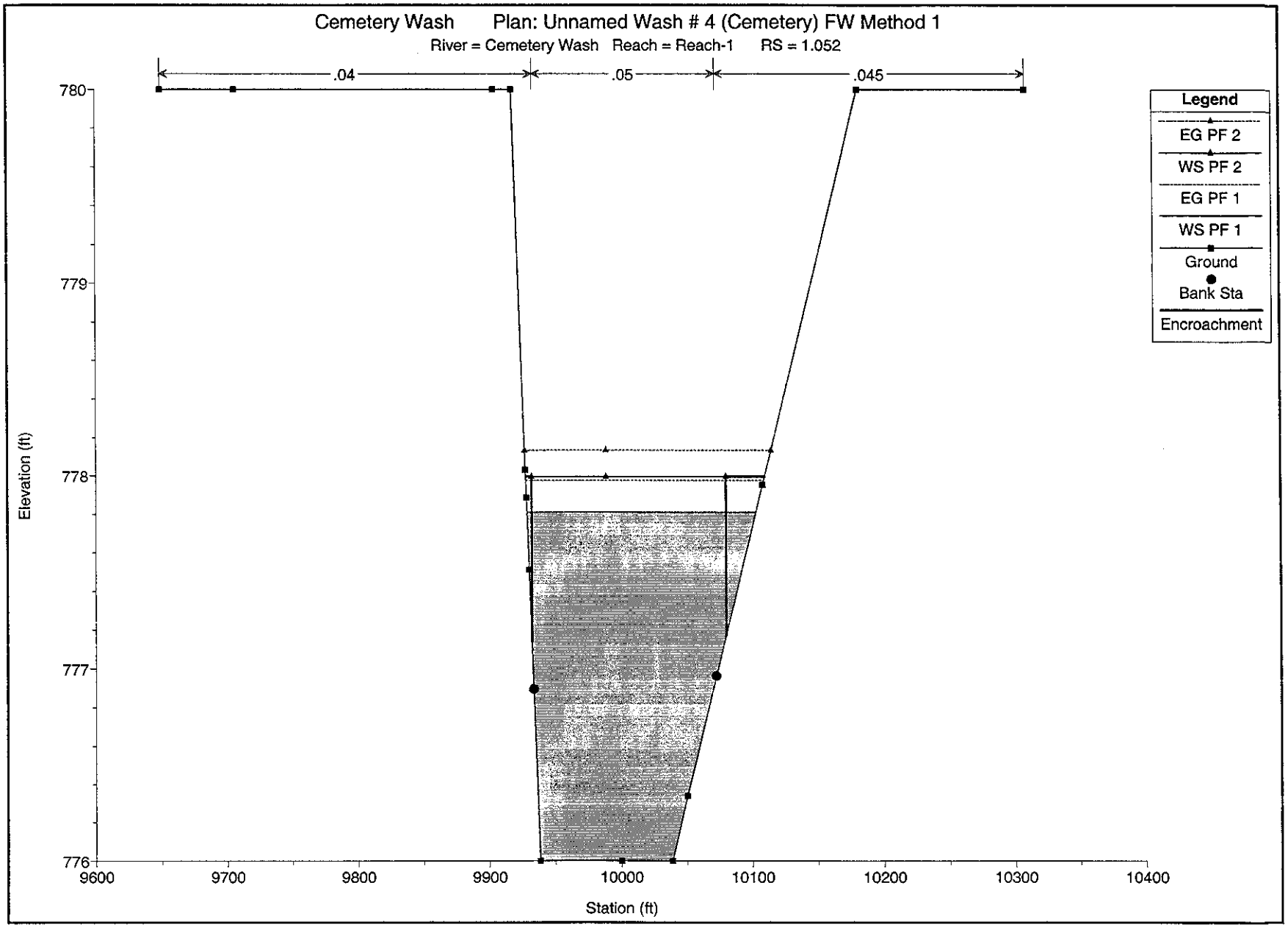

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = 1.530
.04
.05
.045
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
795.5
795.0
794.5
794.0
793.5
793.0
792.5
792.0
791.5
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

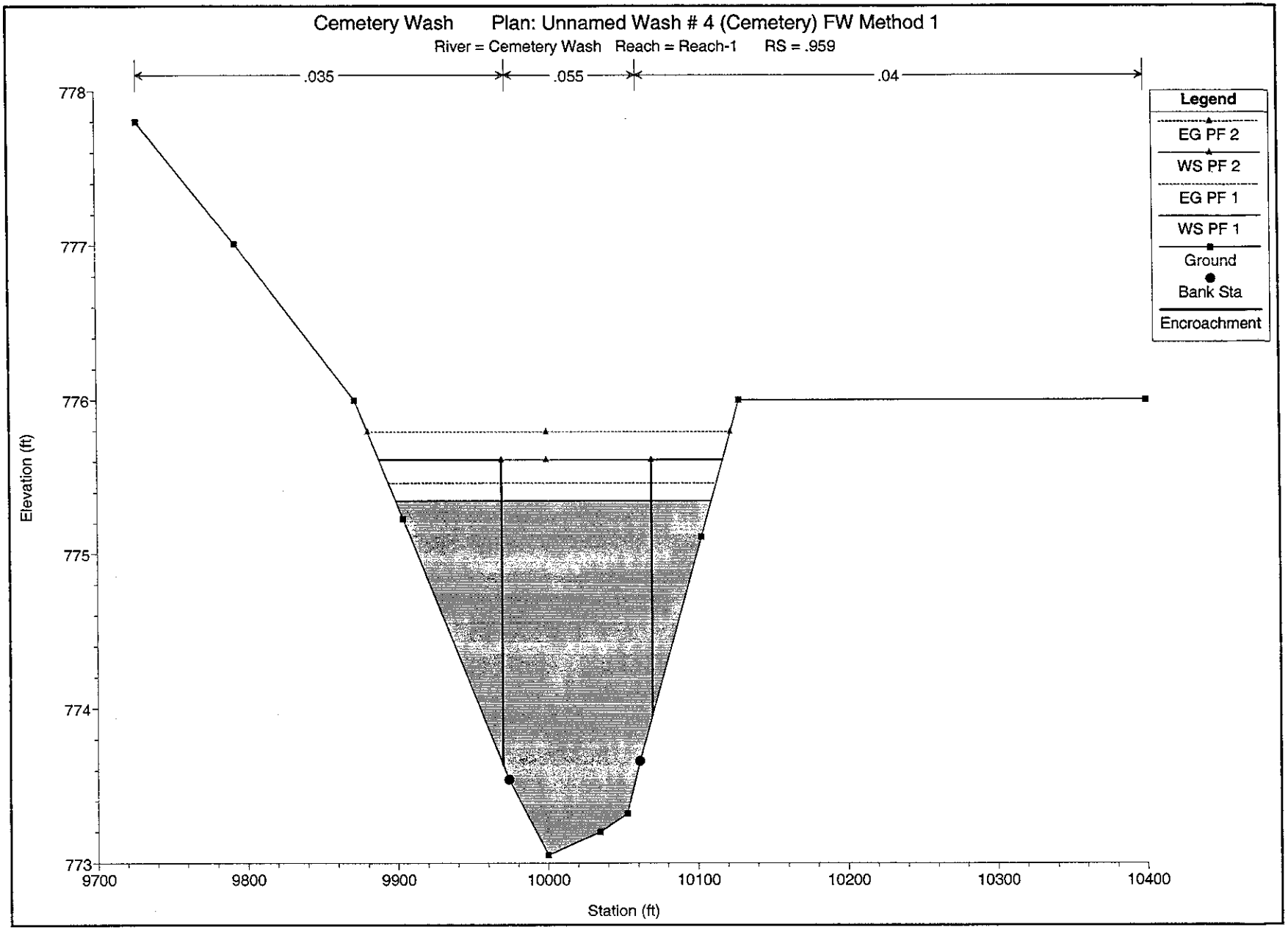

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = 1.429
.04
.05
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
792
791
790
789
788
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

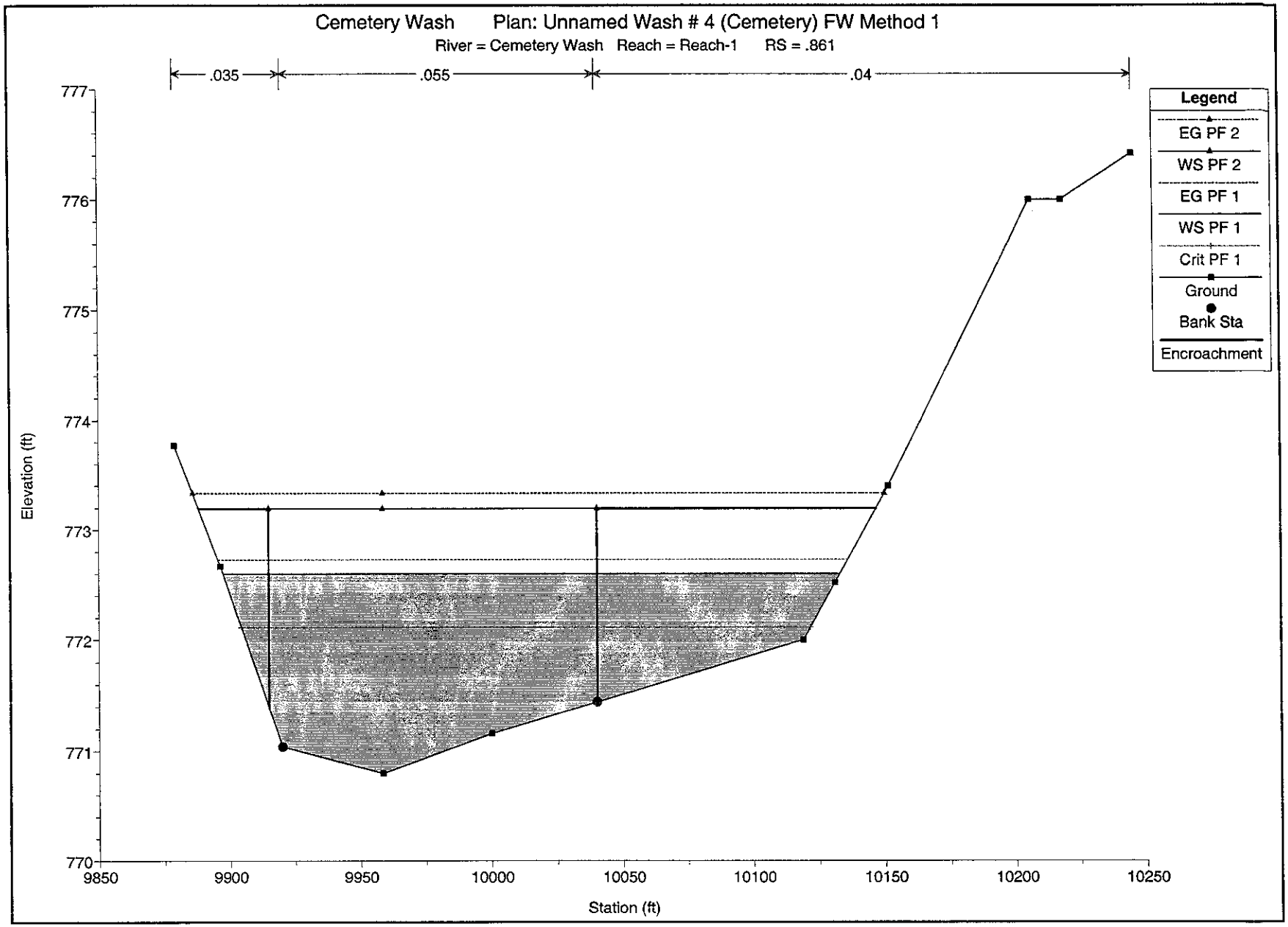

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = 1.335
.04
.05
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
792
791
790
789
788
787
786
9600
9800
10000
10200
10400
10600
Station (ft)

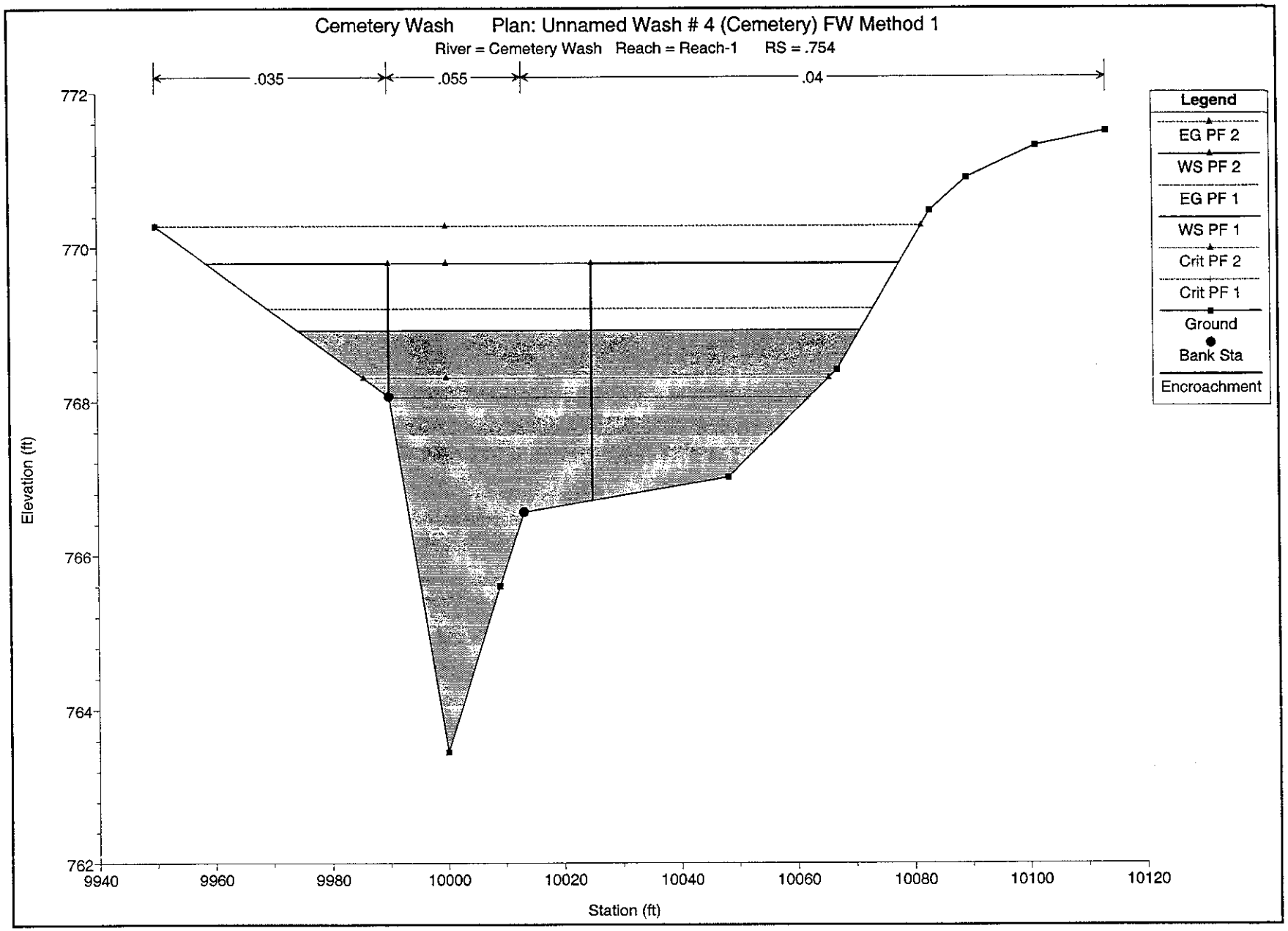

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = 1.244
.04
.05
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
789
788
787
786
785
784
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

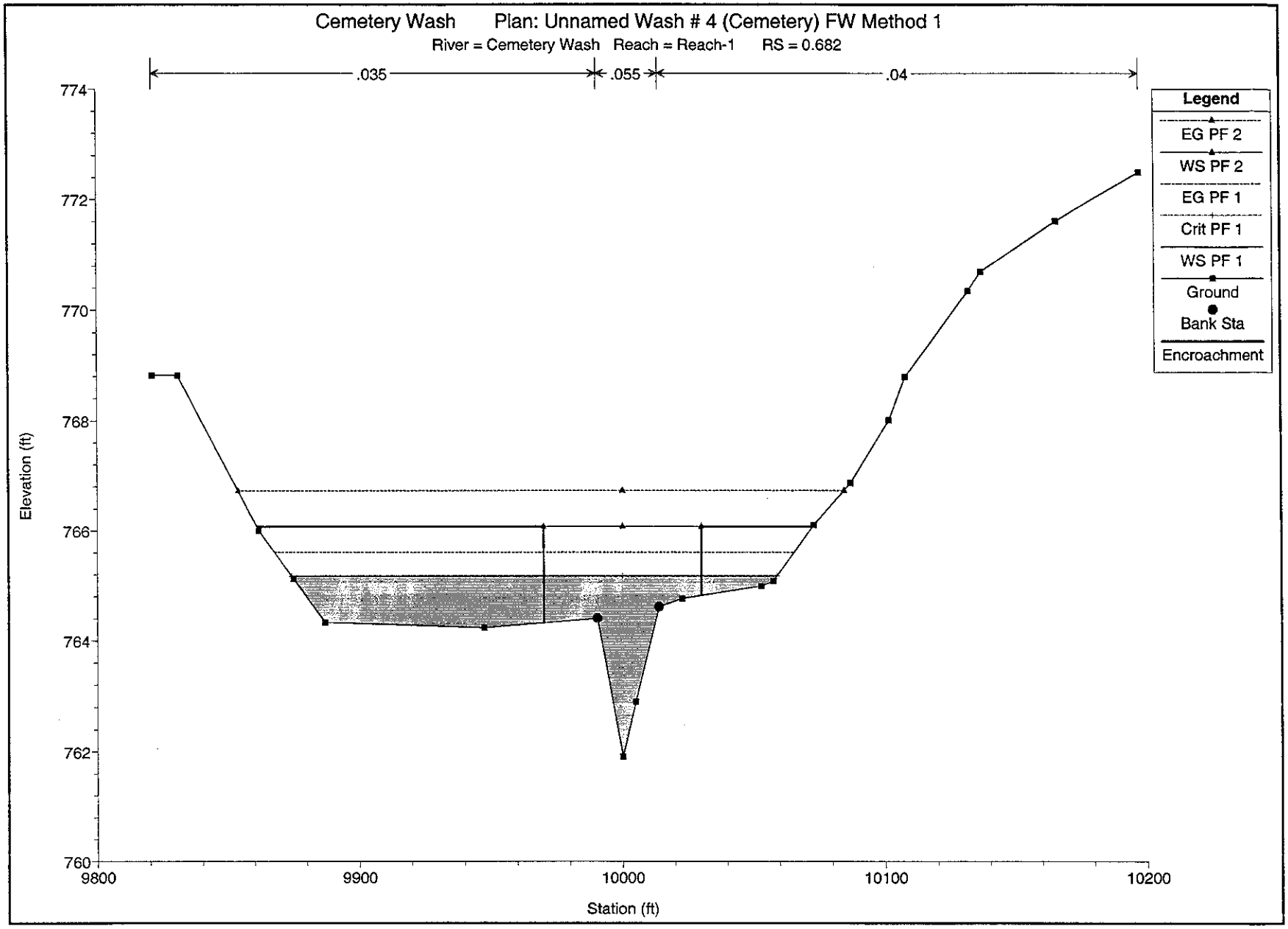

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = 1.151
.04
.05
.045
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
786
785
784
783
782
781
780
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

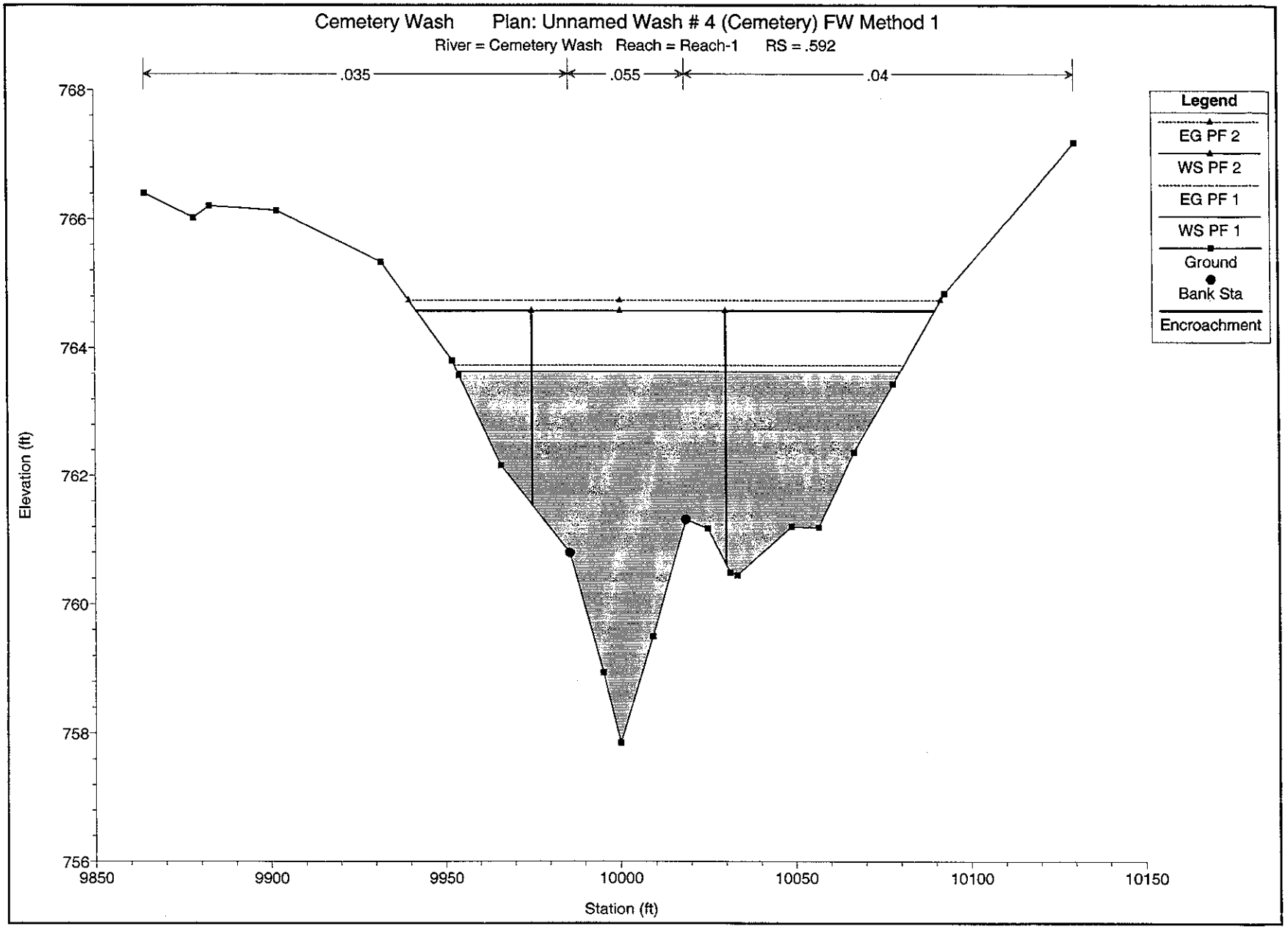

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = 1.052
.04
.05
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
780
779
778
777
776
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

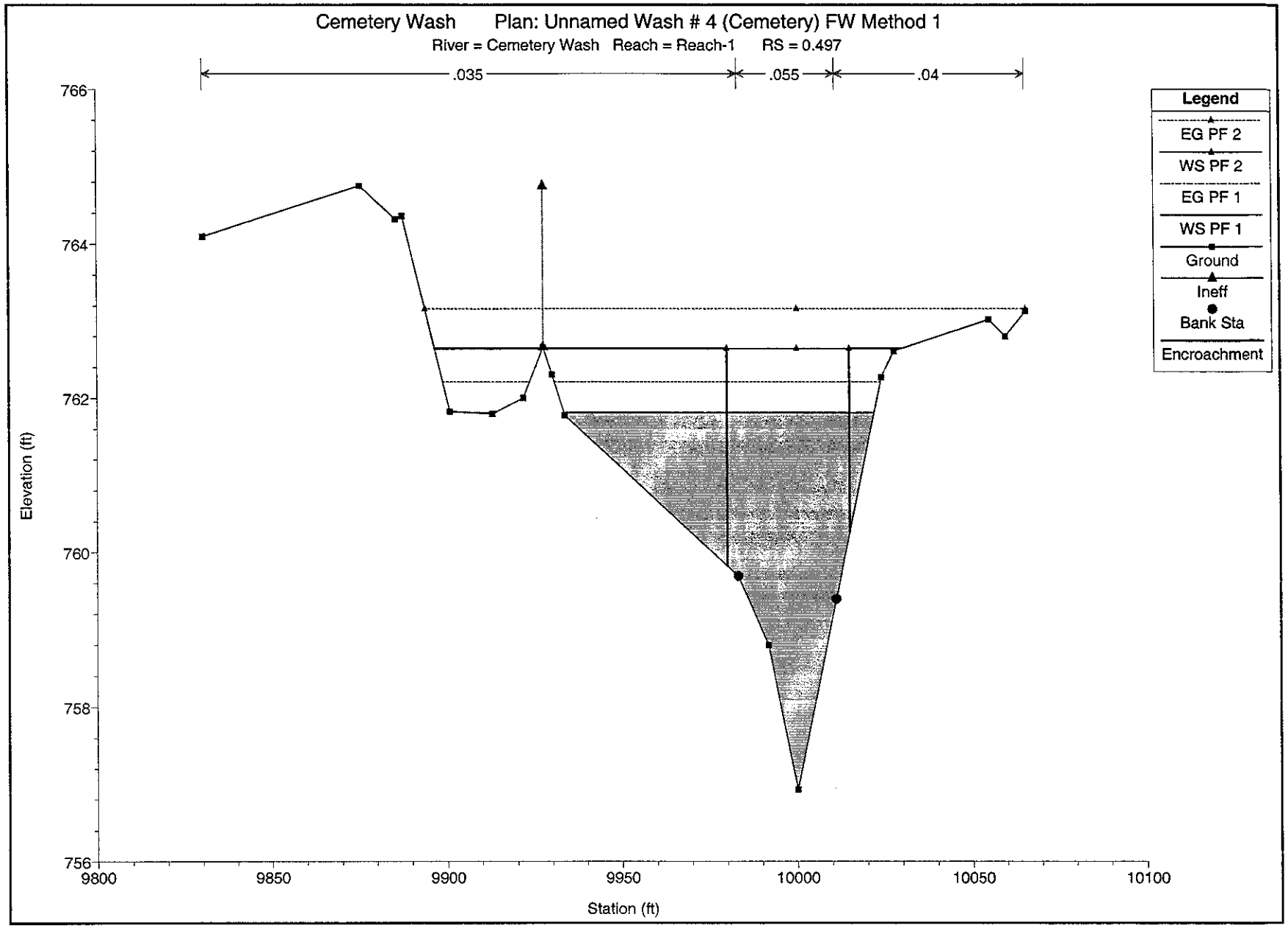

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = .959
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
778
777
776
775
774
773
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

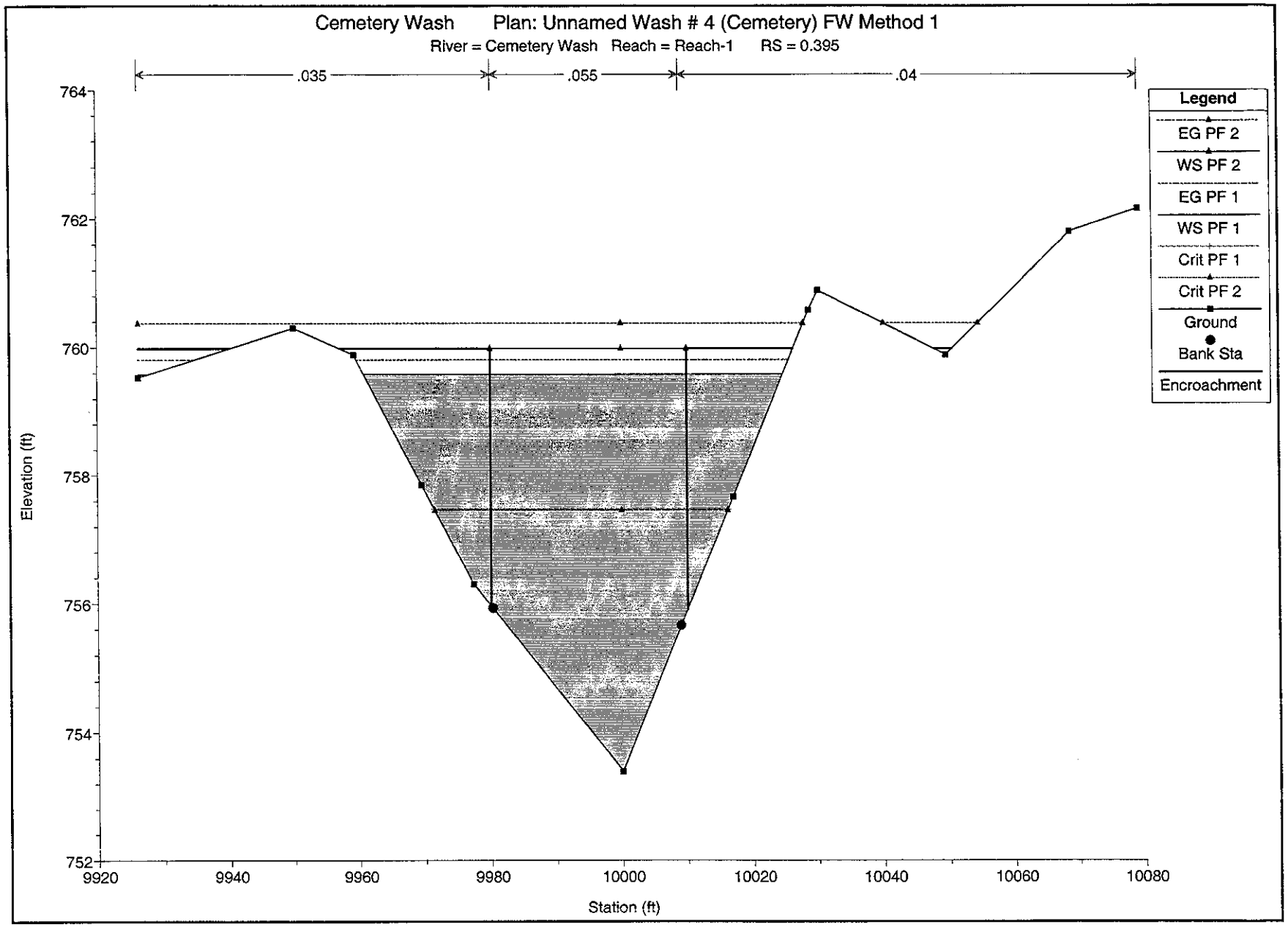

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = .861
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
777
776
775
774
773
772
771
770
9850
9900
9950
10000
10050
10100
10150
10200
10250
Station (ft)

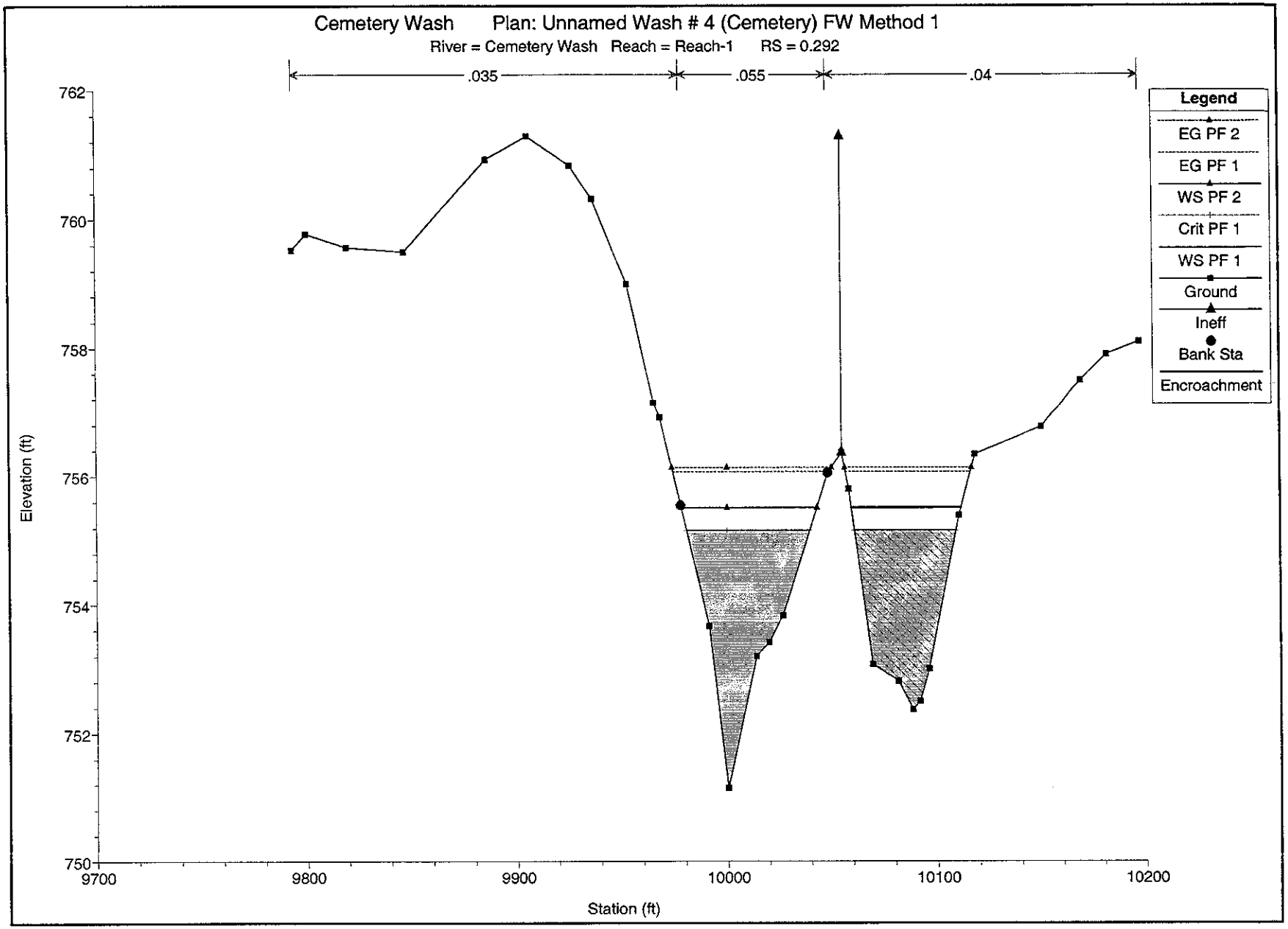

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = .754
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
772
770
768
766
764
762
9940
9960
9980
10000
10020
10040
10060
10080
10100
10120
Station (ft)

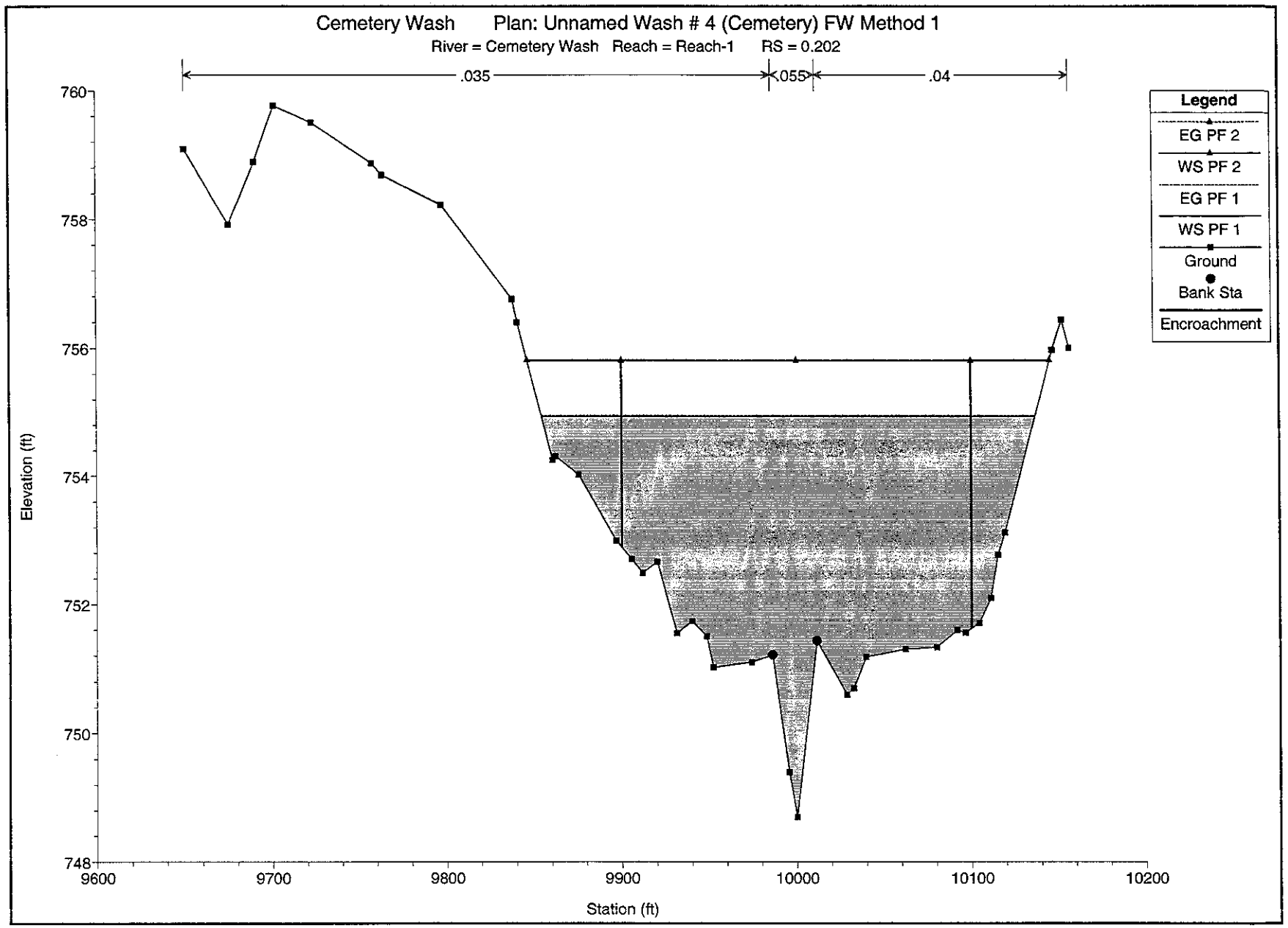

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = 0.682
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
774
772
770
768
766
764
762
760
9800
9900
10000
10100
10200
Station (ft)

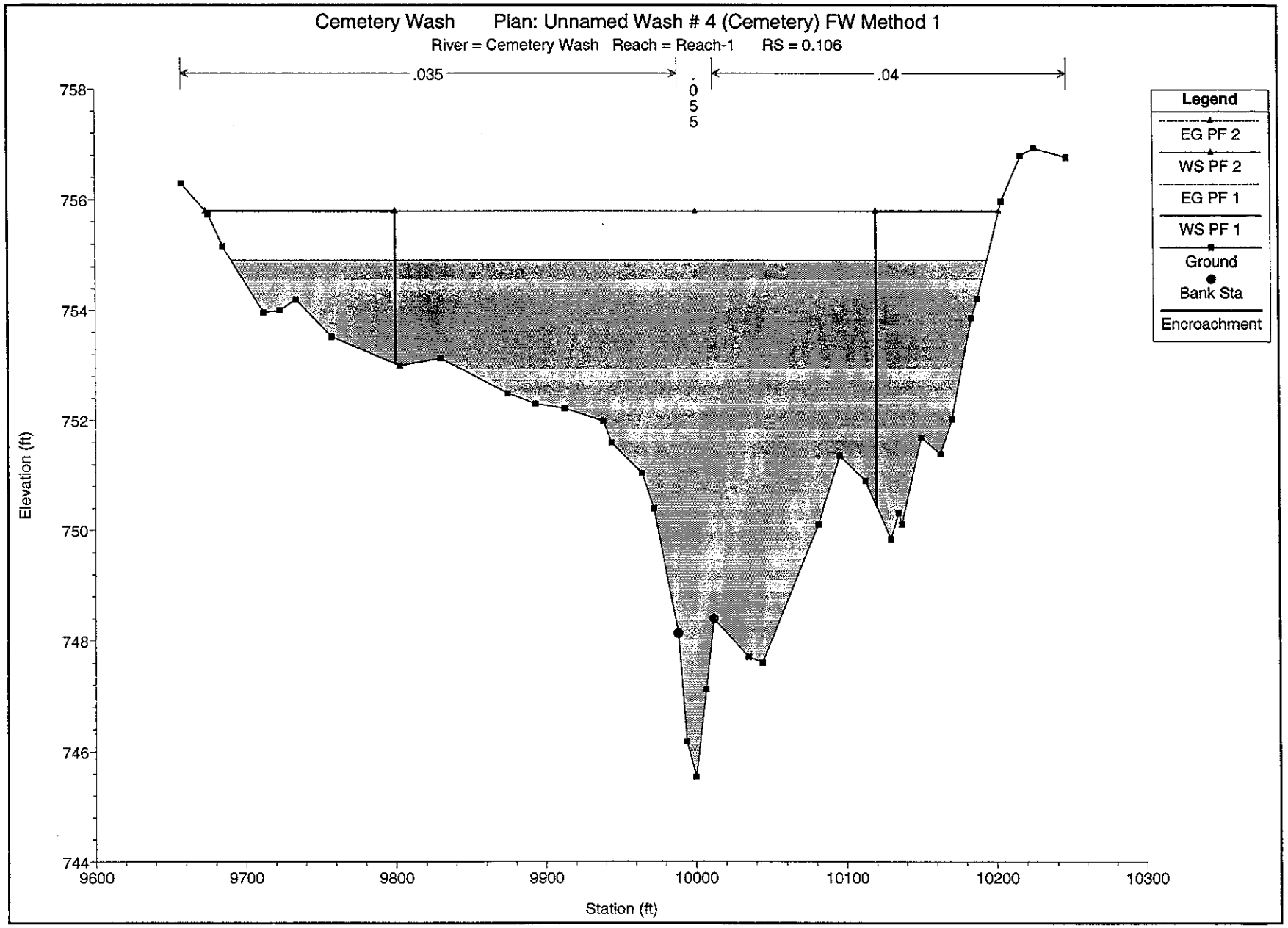

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = .592
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
768
766
764
762
760
758
756
9850
9900
9950
10000
10050
10100
10150
Station (ft)

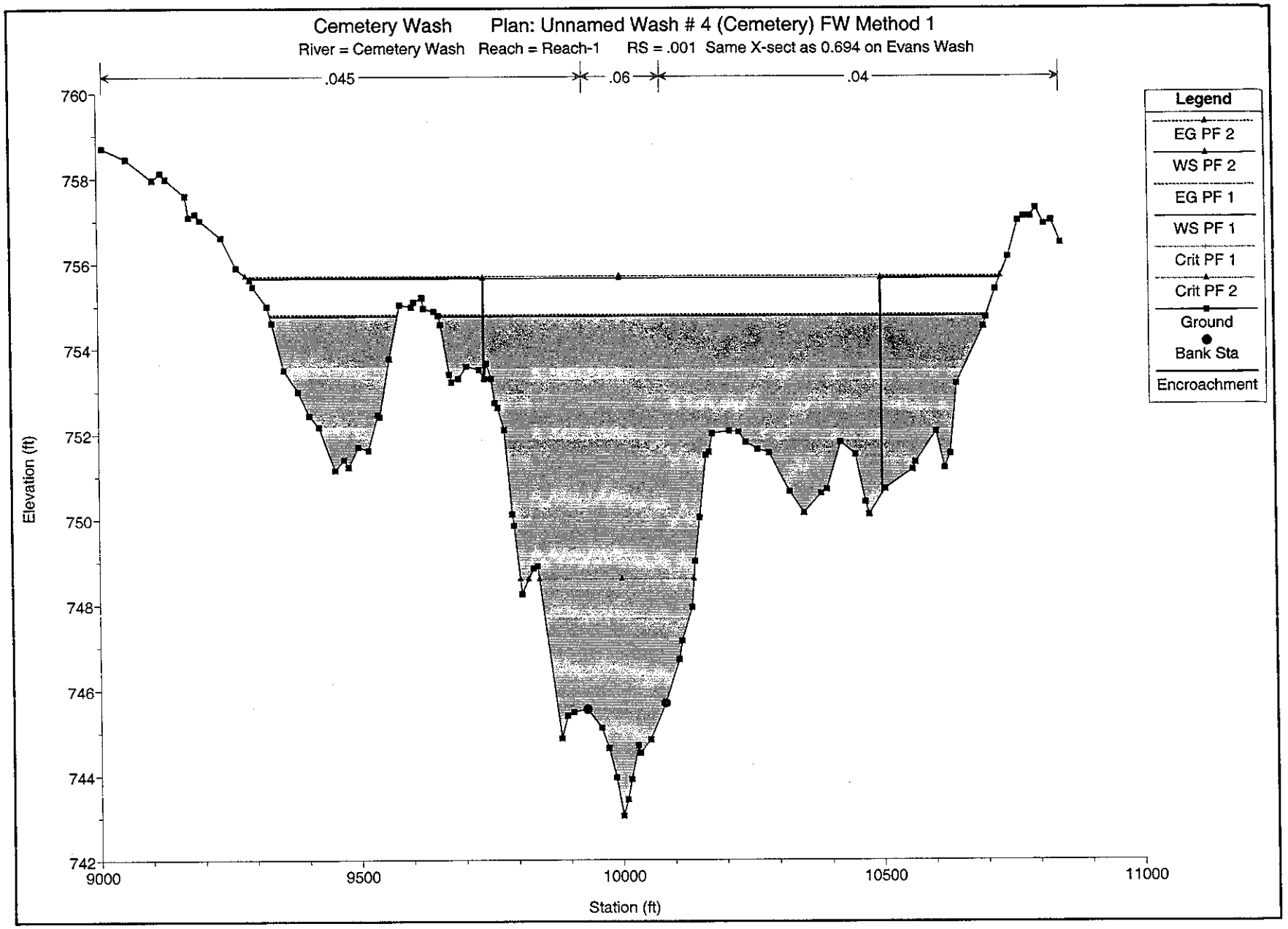

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = 0.497
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
766
764
762
760
758
756
9800
9850
9900
9950
10000
10050
10100
Station (ft)

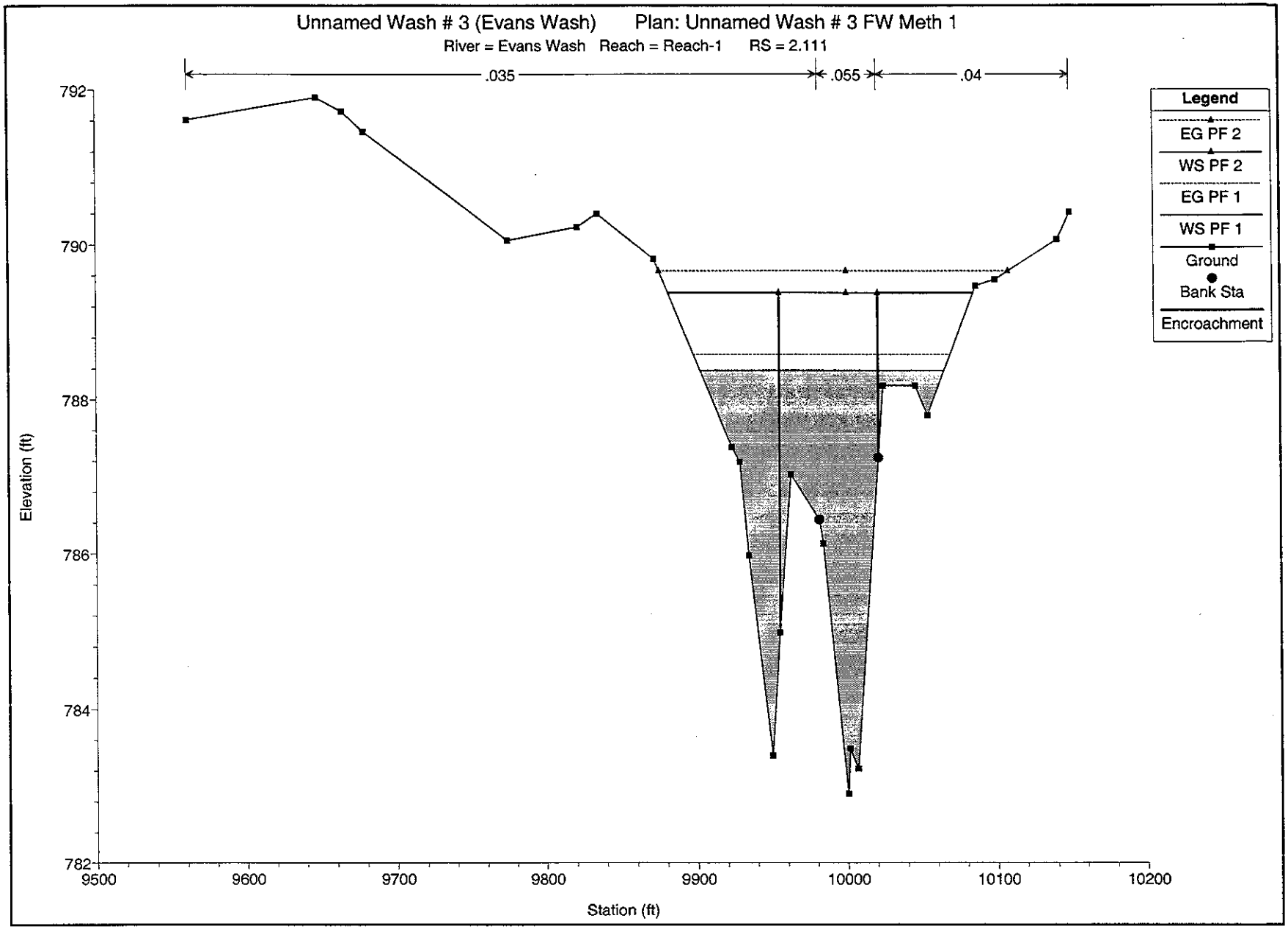

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = 0.395
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
764
762
760
758
756
754
752
9920
9940
9960
9980
10000
10020
10040
10060
10080
Station (ft)

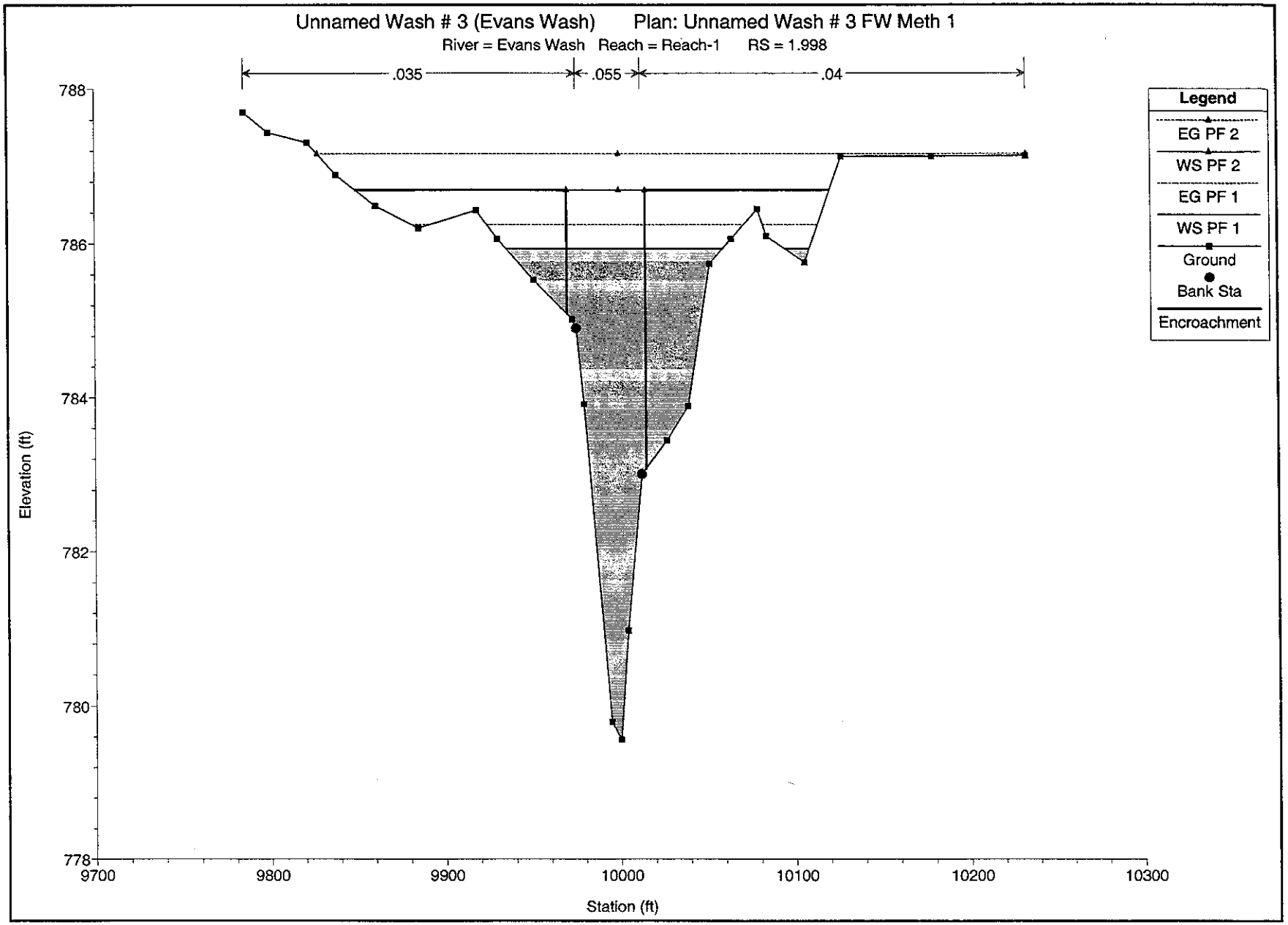

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = 0.292
.035
.055
.04
Legend
EG PF 2
EG PF 1
WS PF 2
Crit PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
762
760
758
756
754
752
750
9700
9800
9900
10000
10100
10200
Station (ft)

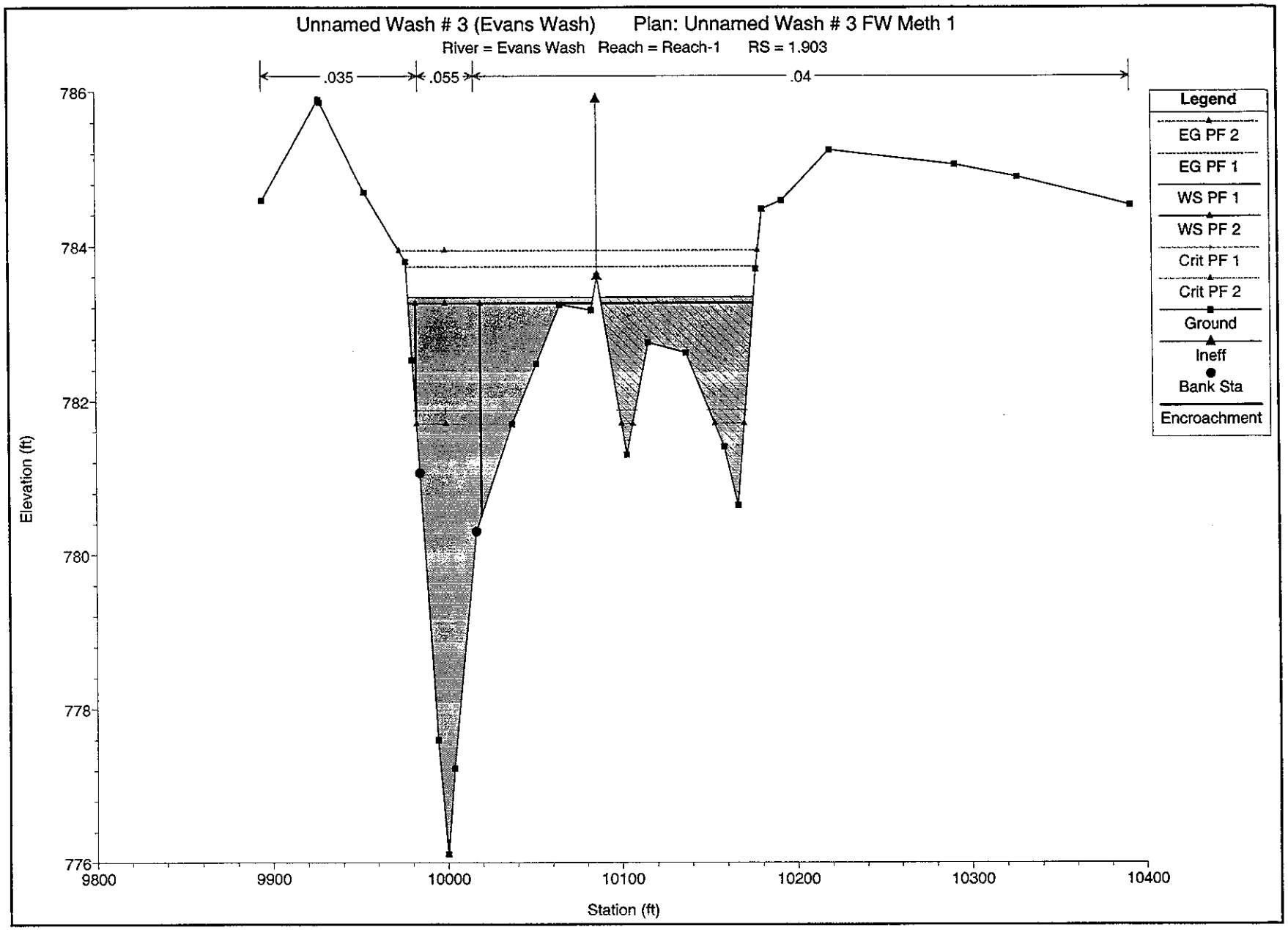

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = 0.202
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
760
758
756
754
752
750
748
9600
9700
9800
9900
10000
10100
10200
Station (ft)

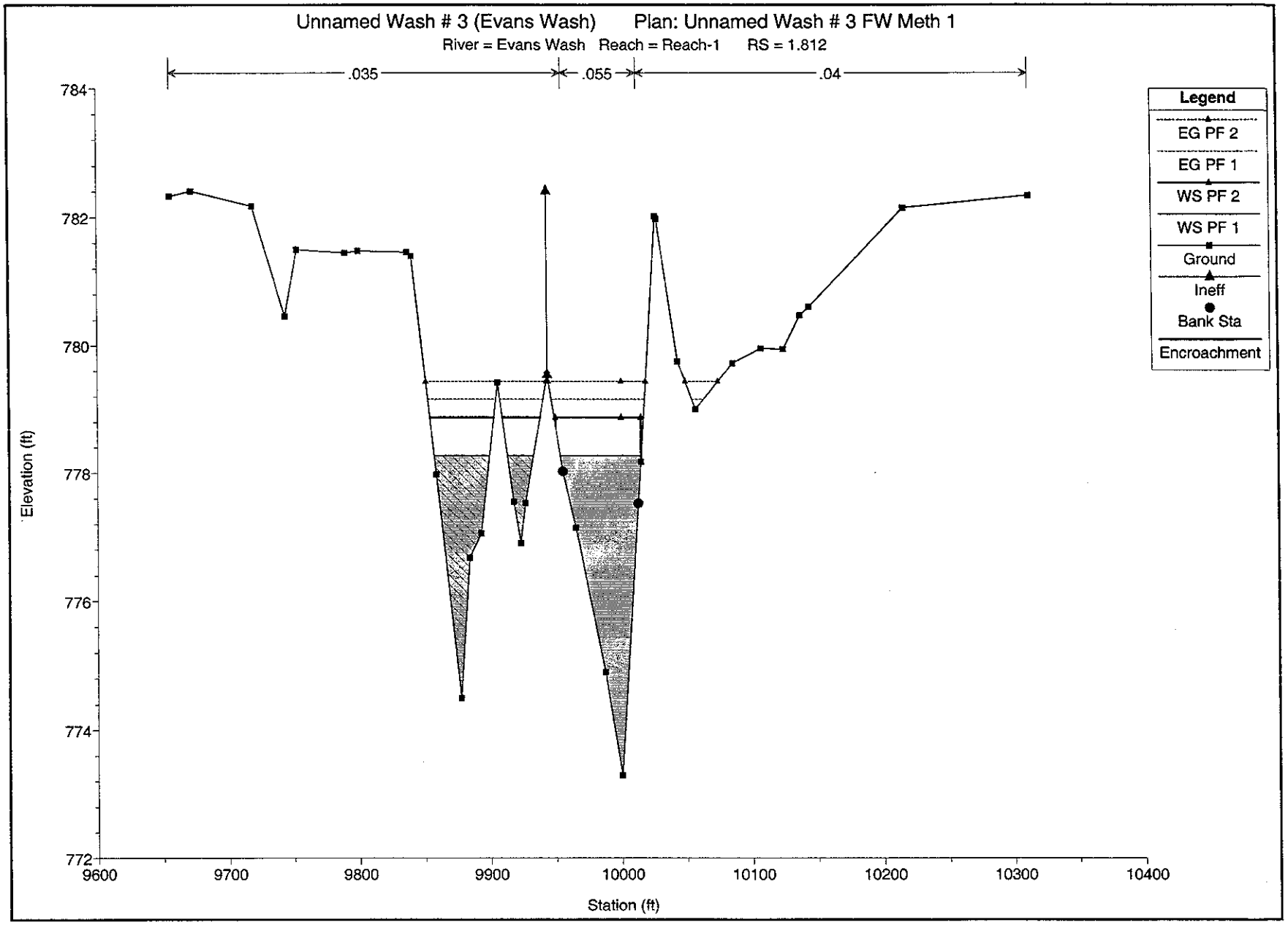

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = 0.106
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
758
756
754
752
750
748
746
744
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

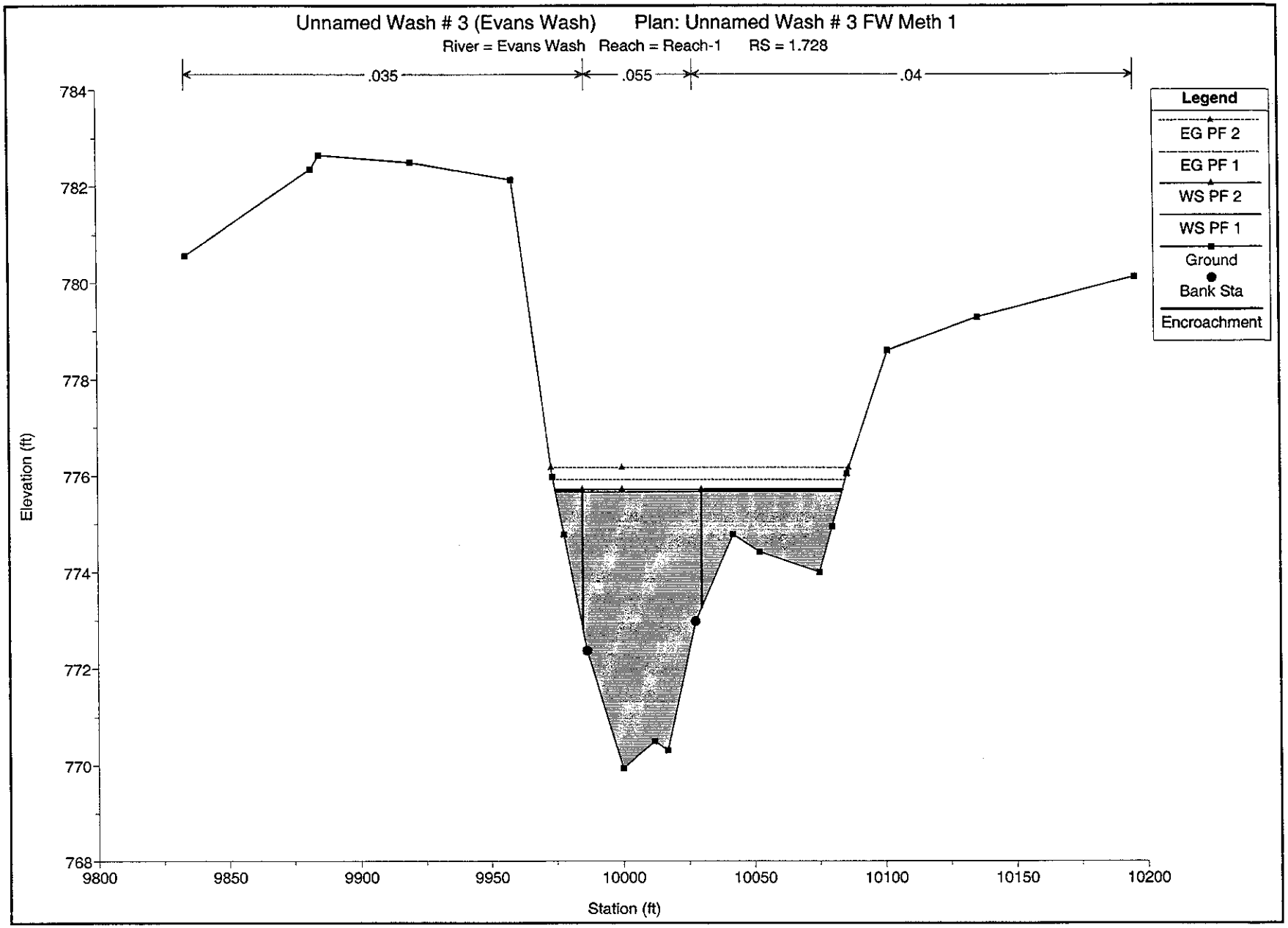

Cemetery Wash Plan: Unnamed Wash # 4 (Cemetery) FW Method 1
River = Cemetery Wash Reach = Reach-1 RS = .001 Same X-sect as 0.694 on Evans Wash
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
760
758
756
754
752
750
748
746
744
742
9000
9500
10000
10500
11000
Station (ft)

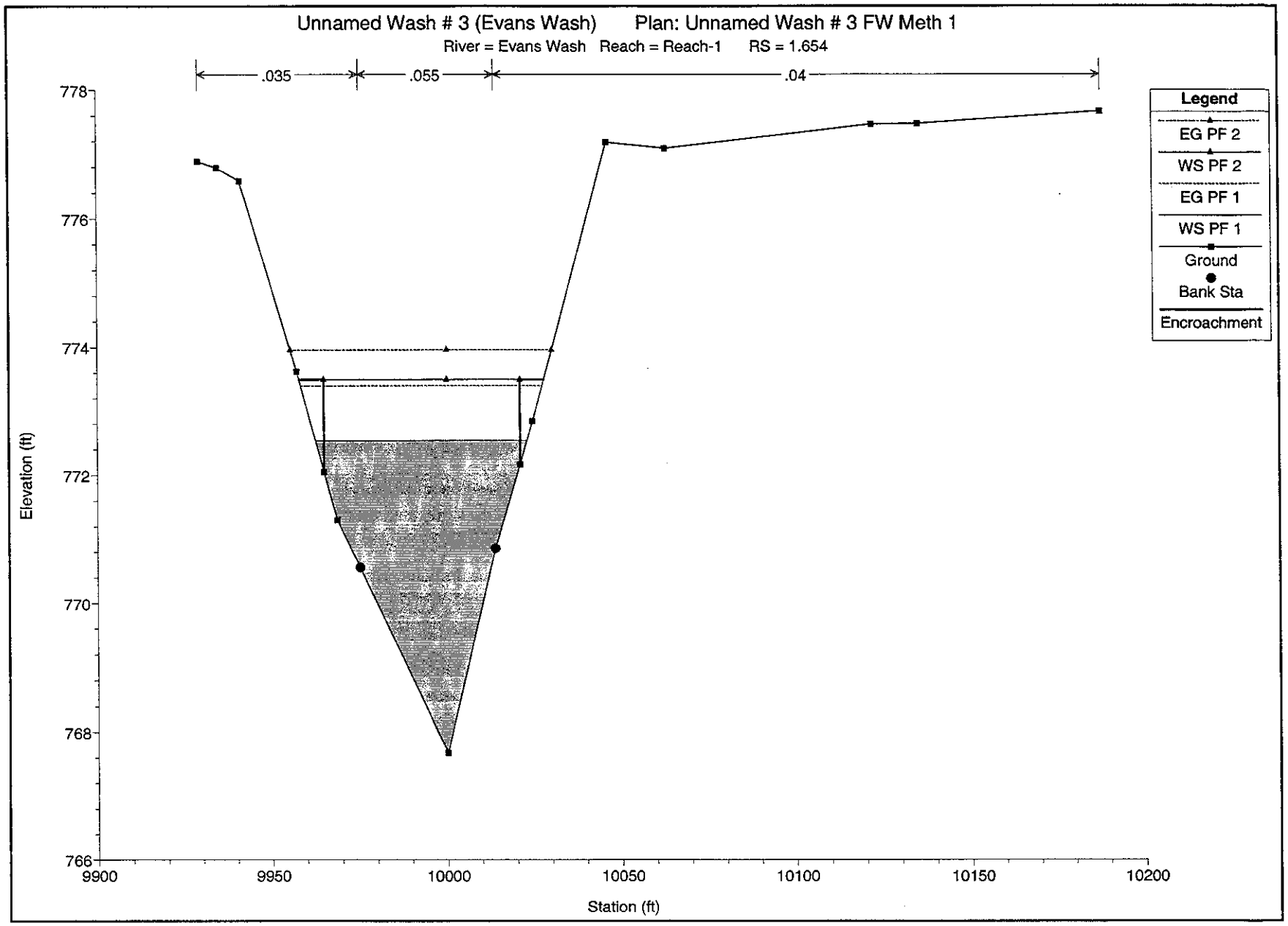

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 2.111
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
792
790
788
786
784
782
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

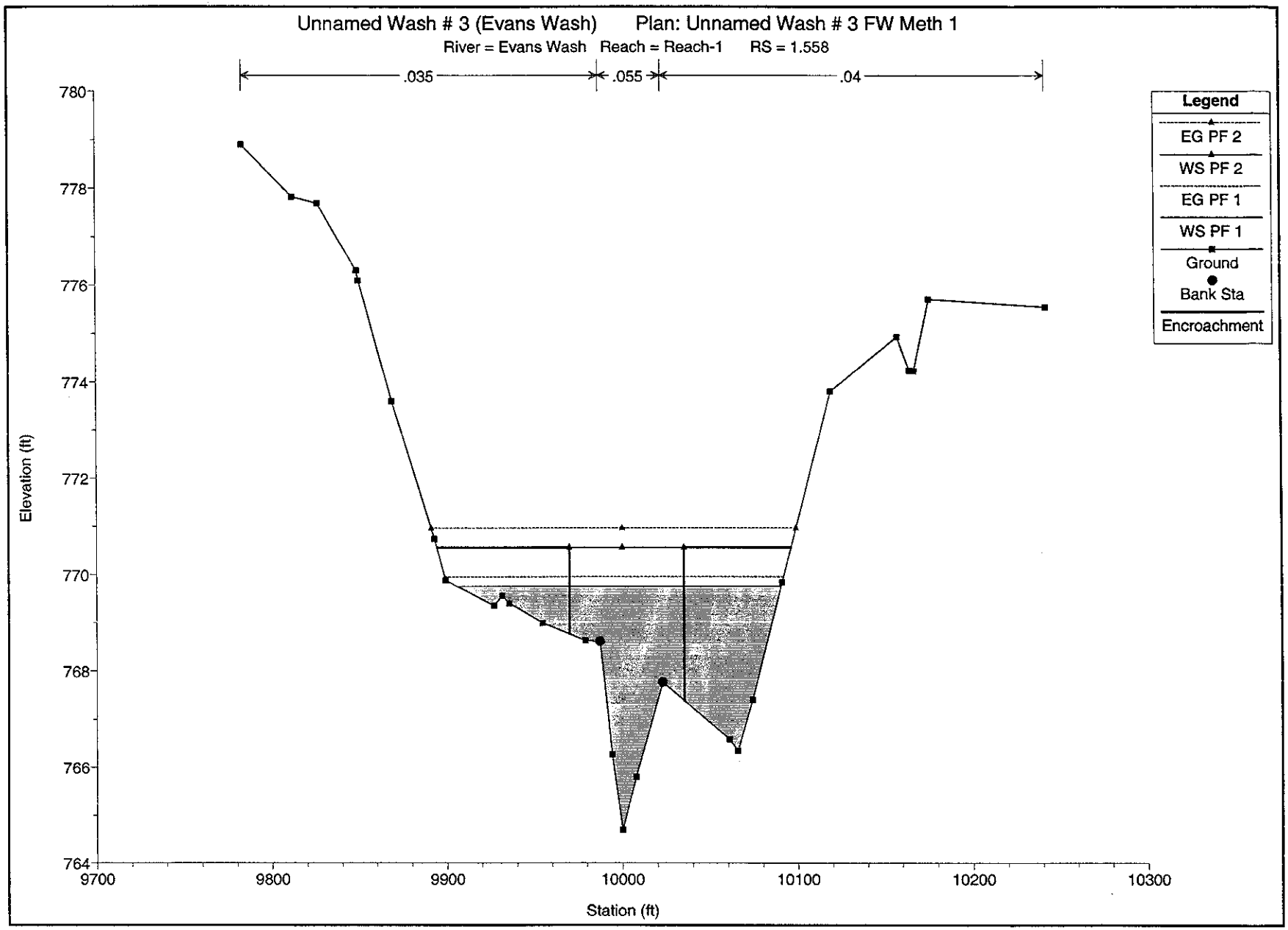

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 1.998
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
788
786
784
782
780
778
9700
9800
9900
10000
10100
10200
10300
Station (ft)

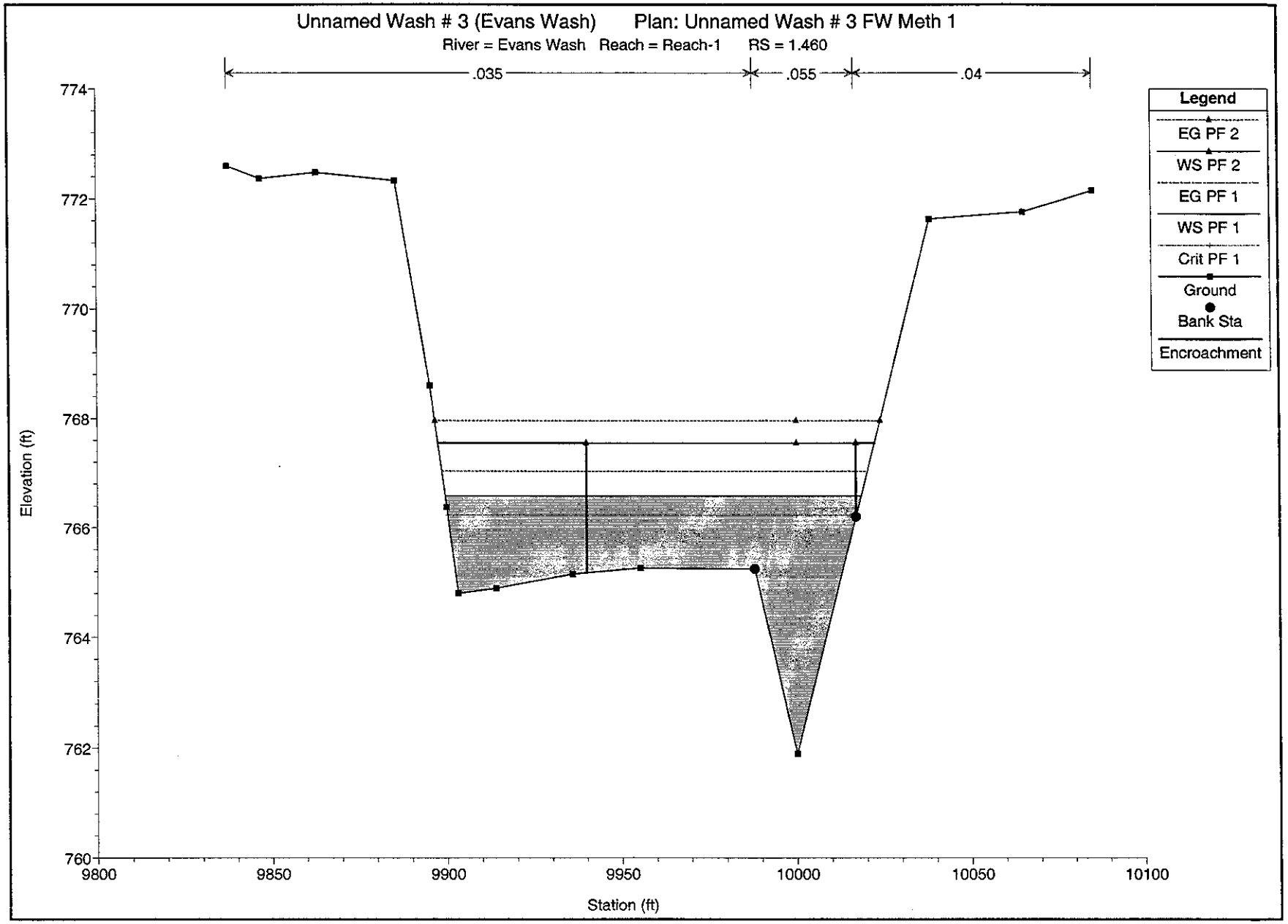

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 1.903
.035
.055
.04
Legend
EG PF 2
EG PF 1
WS PF 1
WS PF 2
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
786
784
782
780
778
776
9800
9900
10000
10100
10200
10300
10400
Station (ft)

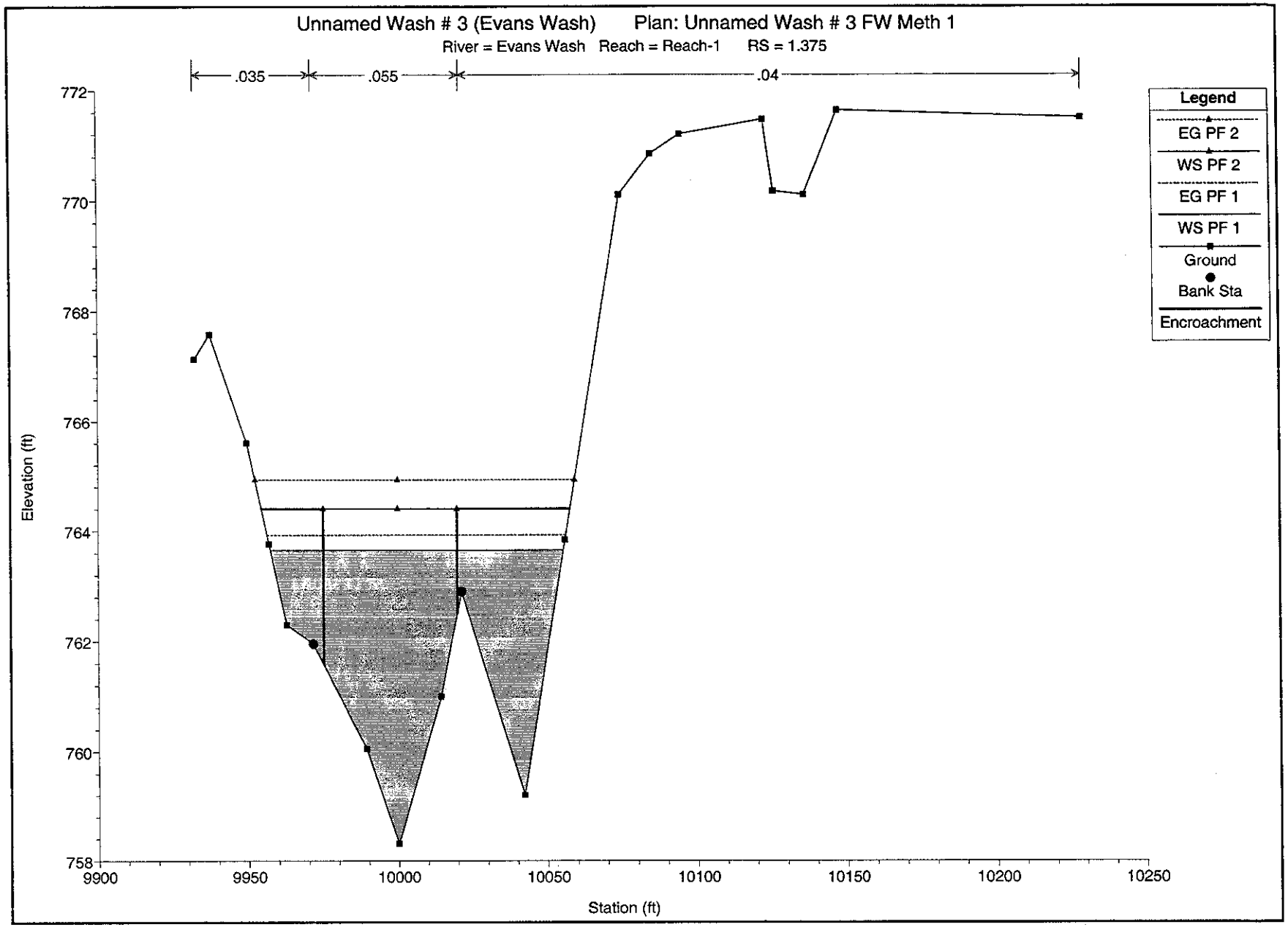

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 1.812
.035
.055
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
784
782
780
778
776
774
772
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

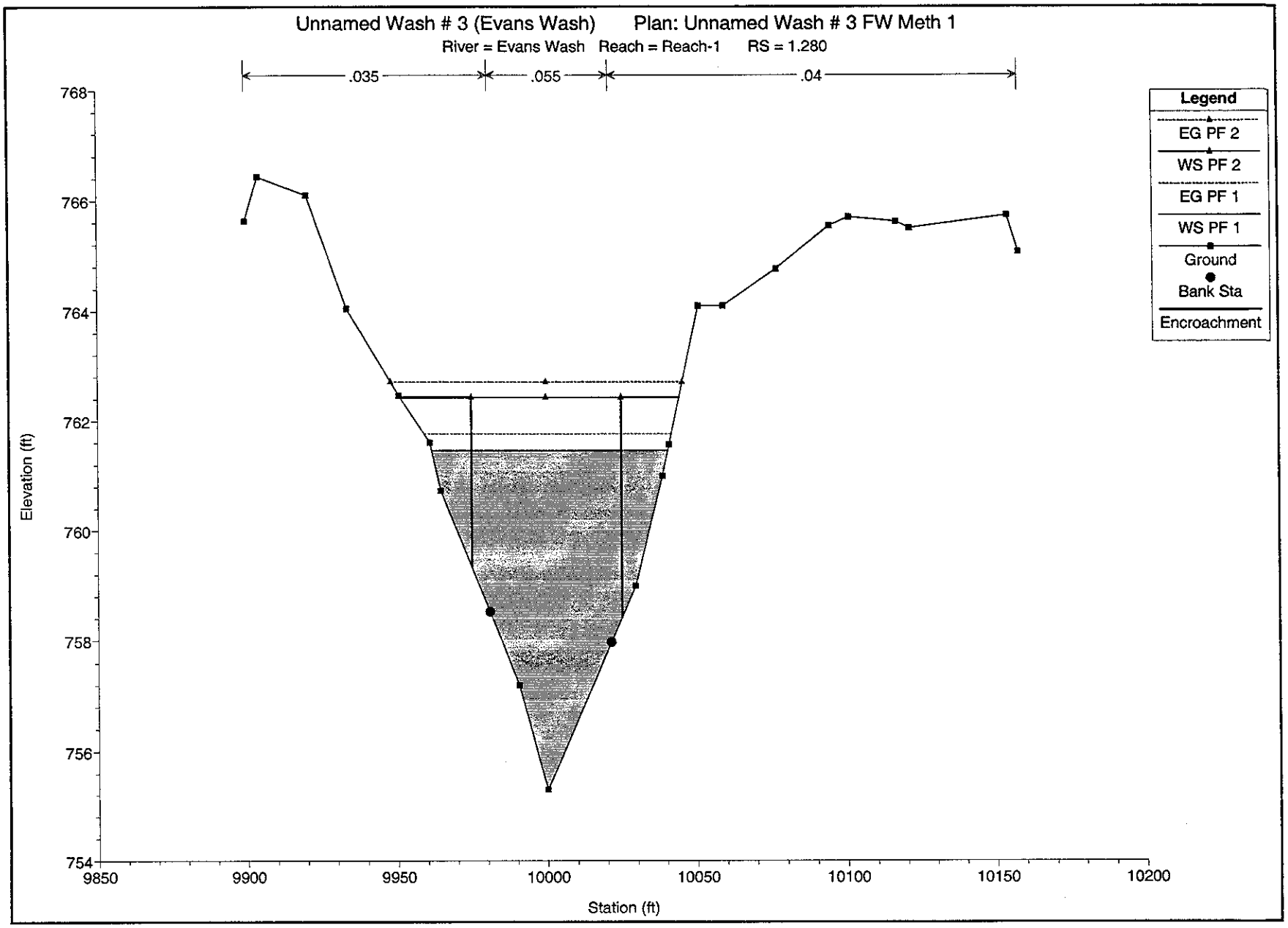

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 1.728
.035
.055
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
784
782
780
778
776
774
772
770
768
9800
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)

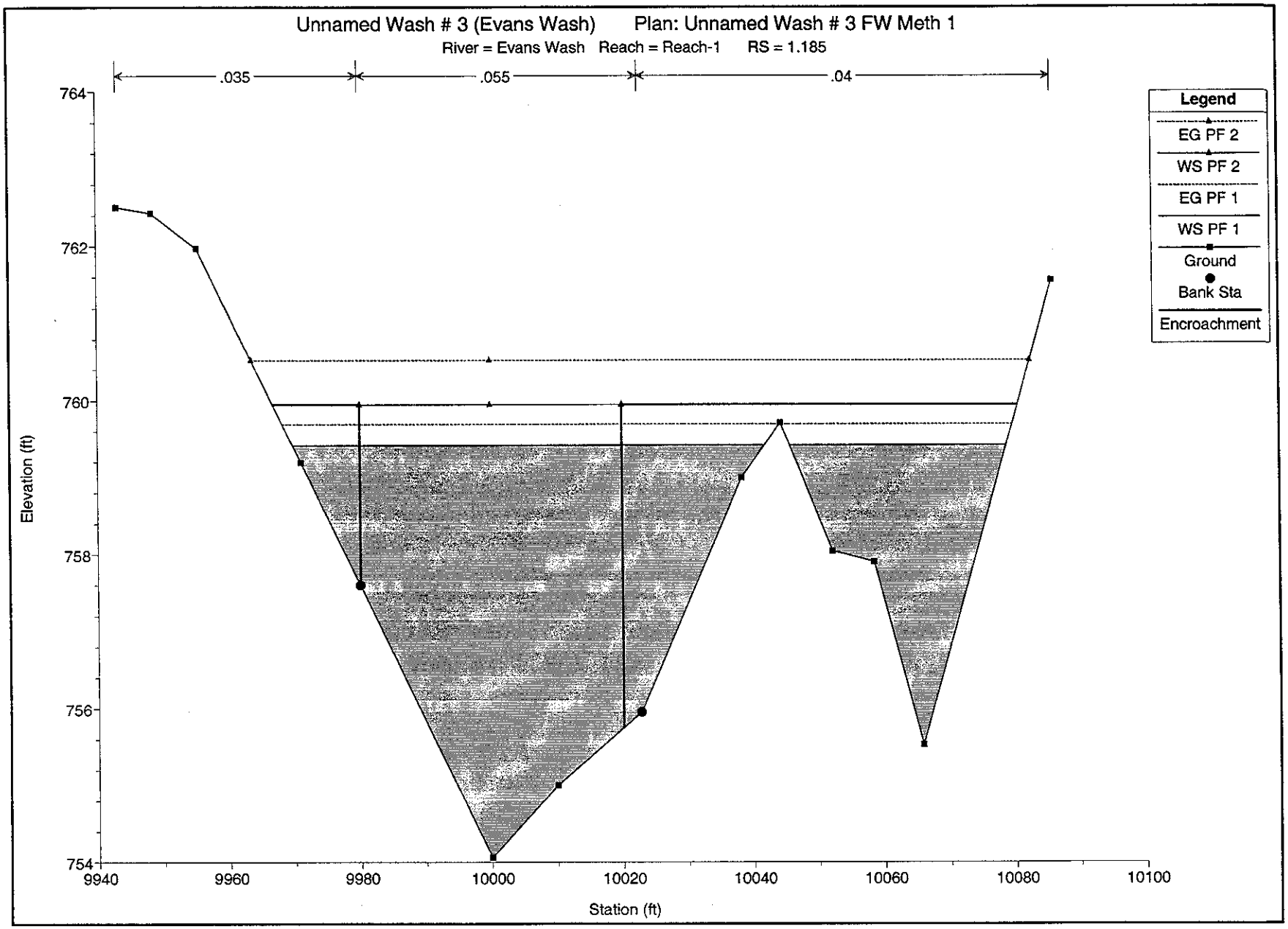

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 1.654
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
778
776
774
772
770
768
766
9900
9950
10000
10050
10100
10150
10200
Station (ft)

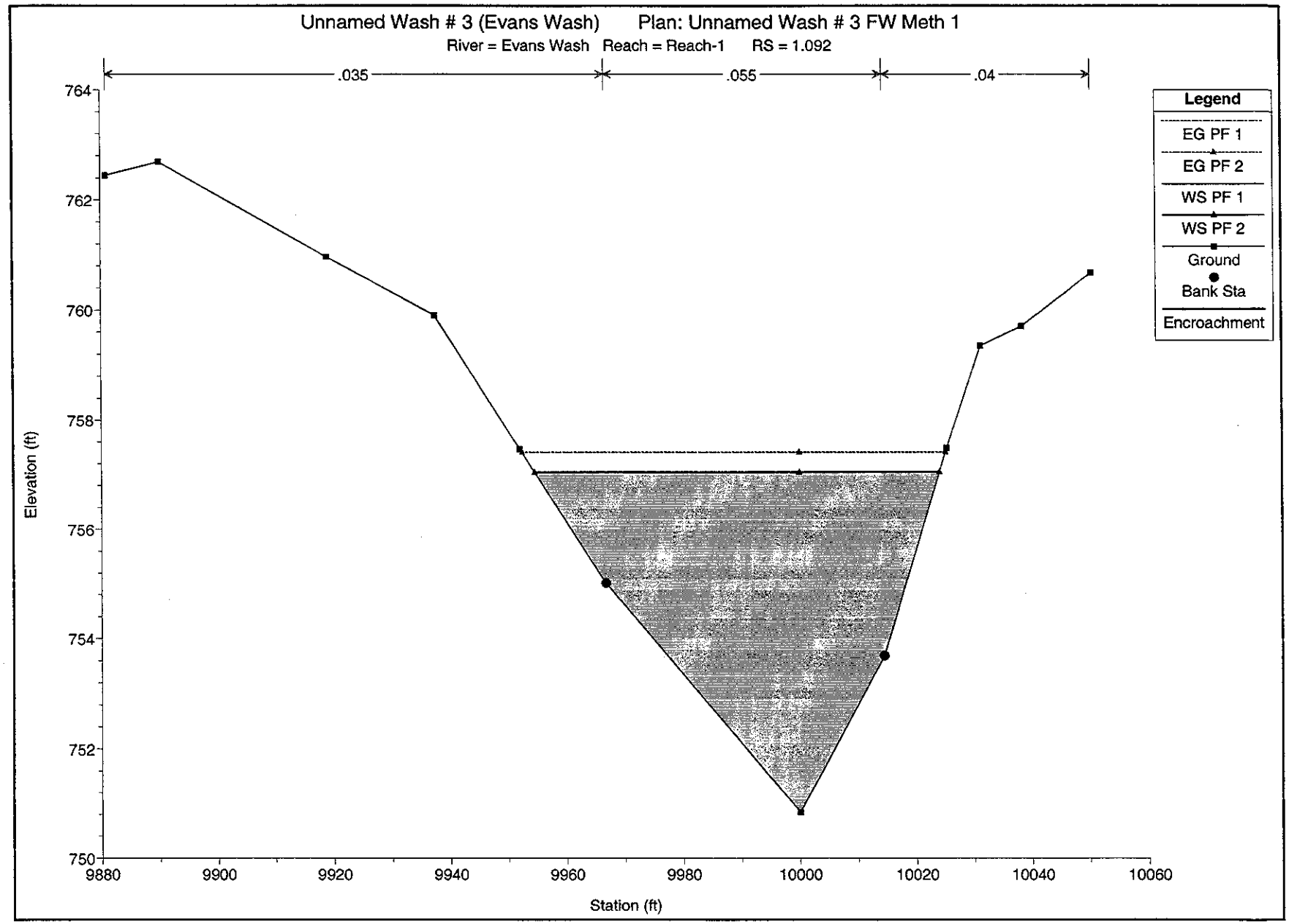

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 1.558
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
780
778
776
774
772
770
768
766
764
9700
9800
9900
10000
10100
10200
10300
Station (ft)

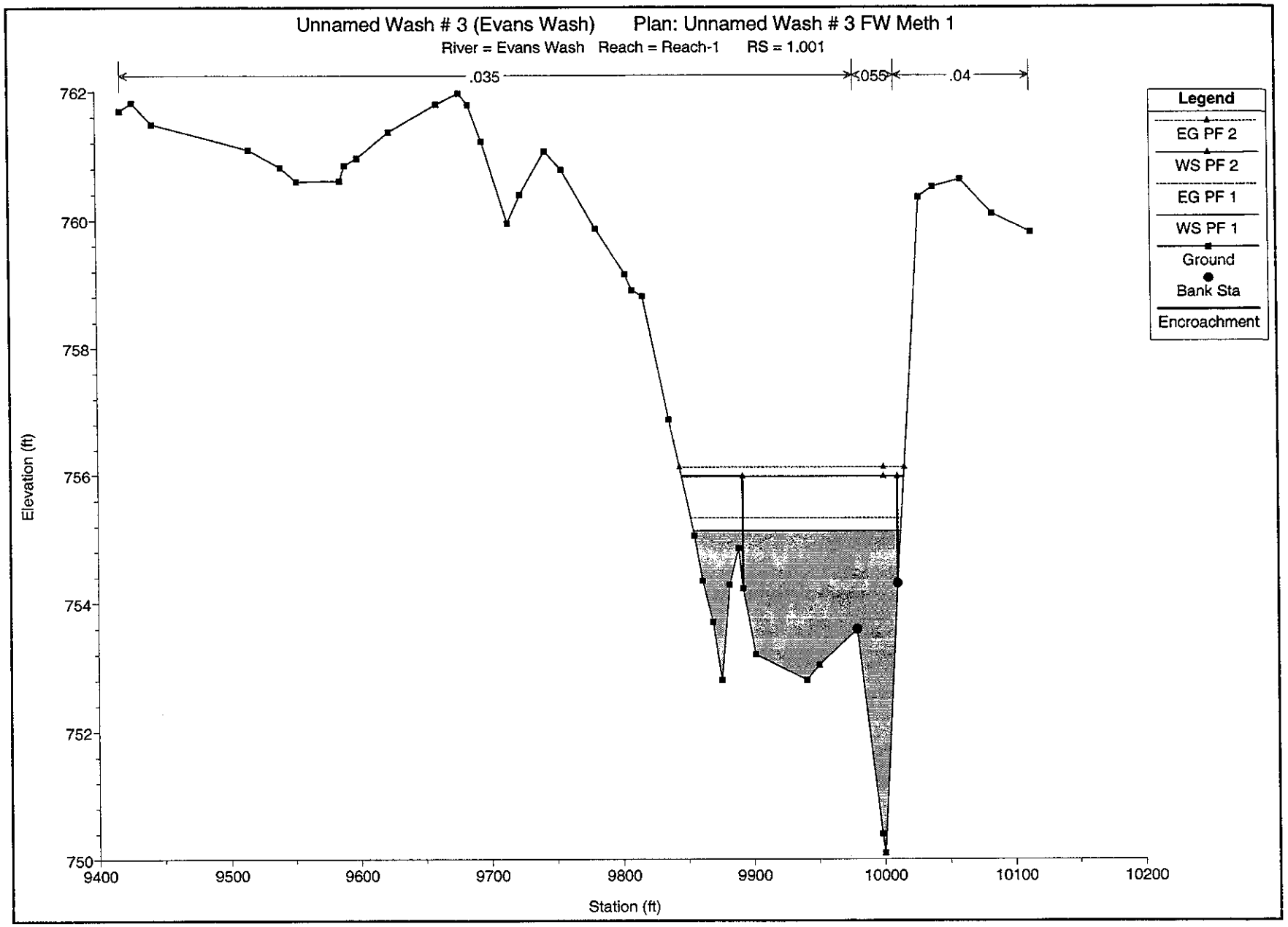

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 1.460
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
774
772
770
768
766
764
762
760
9800
9850
9900
9950
10000
10050
10100
Station (ft)

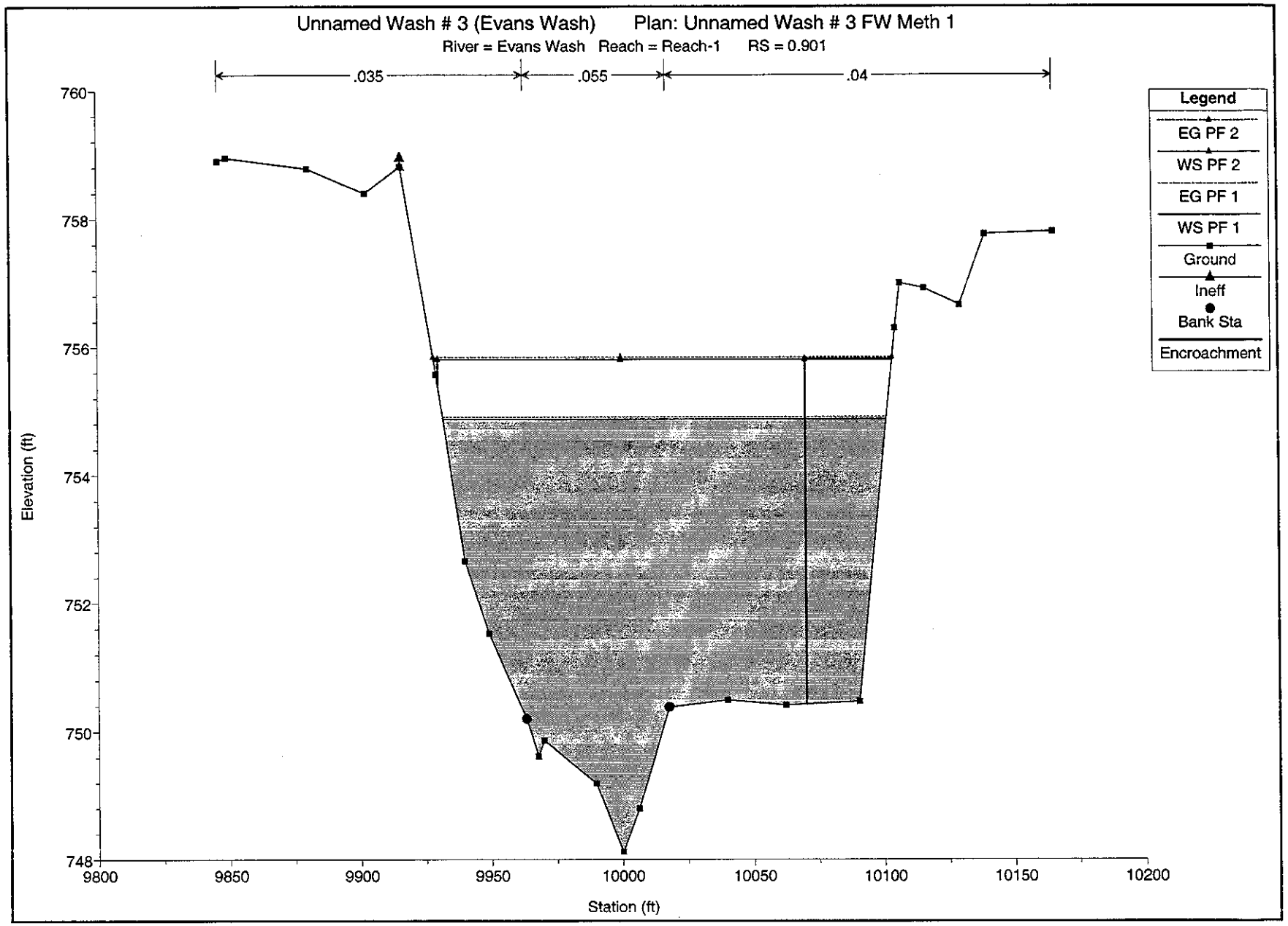

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 1.375
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
772
770
768
766
764
762
760
758
9900
9950
10000
10050
10100
10150
10200
10250
Station (ft)

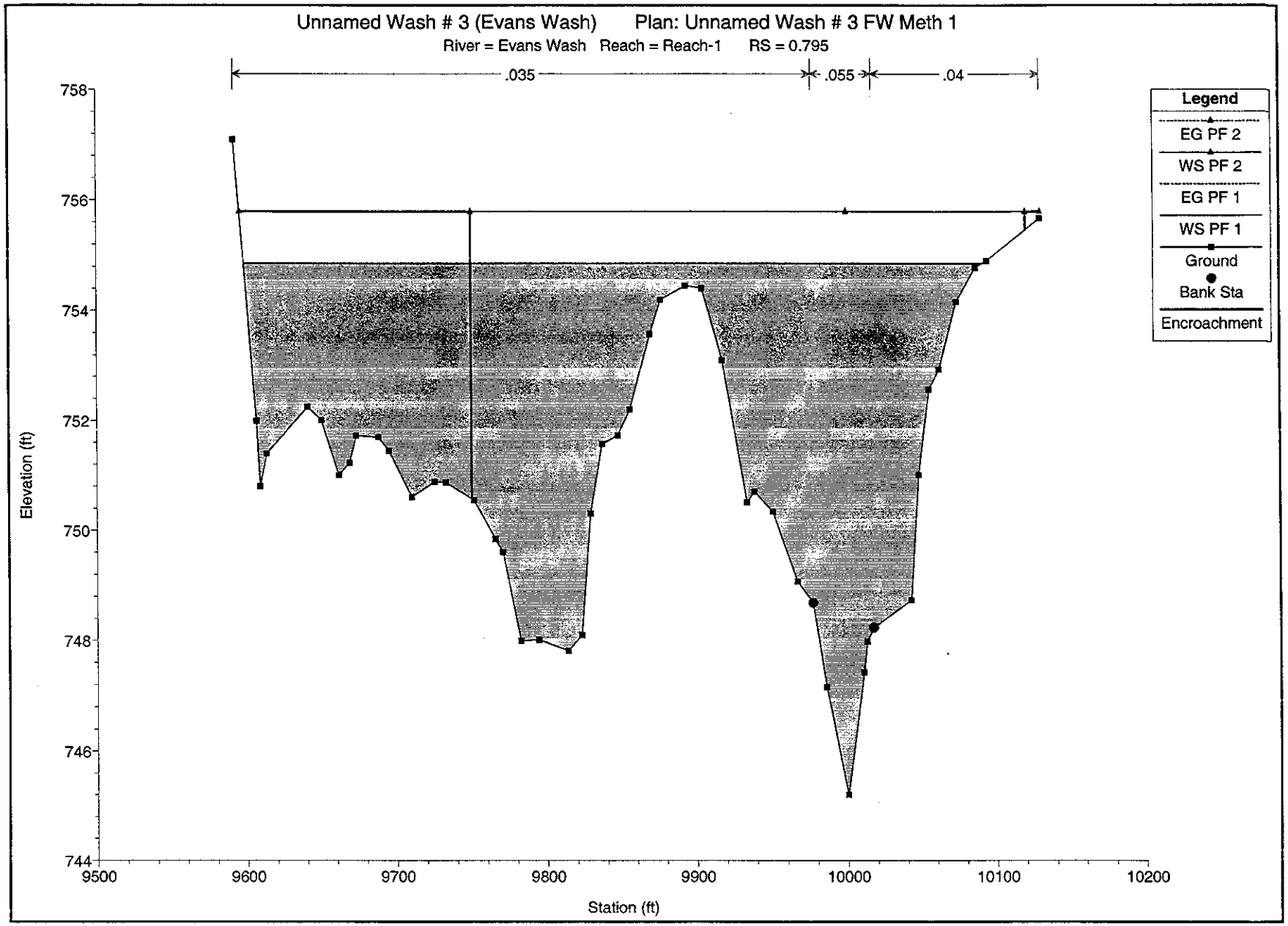

Unnamed Wash # 3 (Evans Wash)
Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash
Reach = Reach-1
RS = 1.280
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
768
766
764
762
760
758
756
754
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)

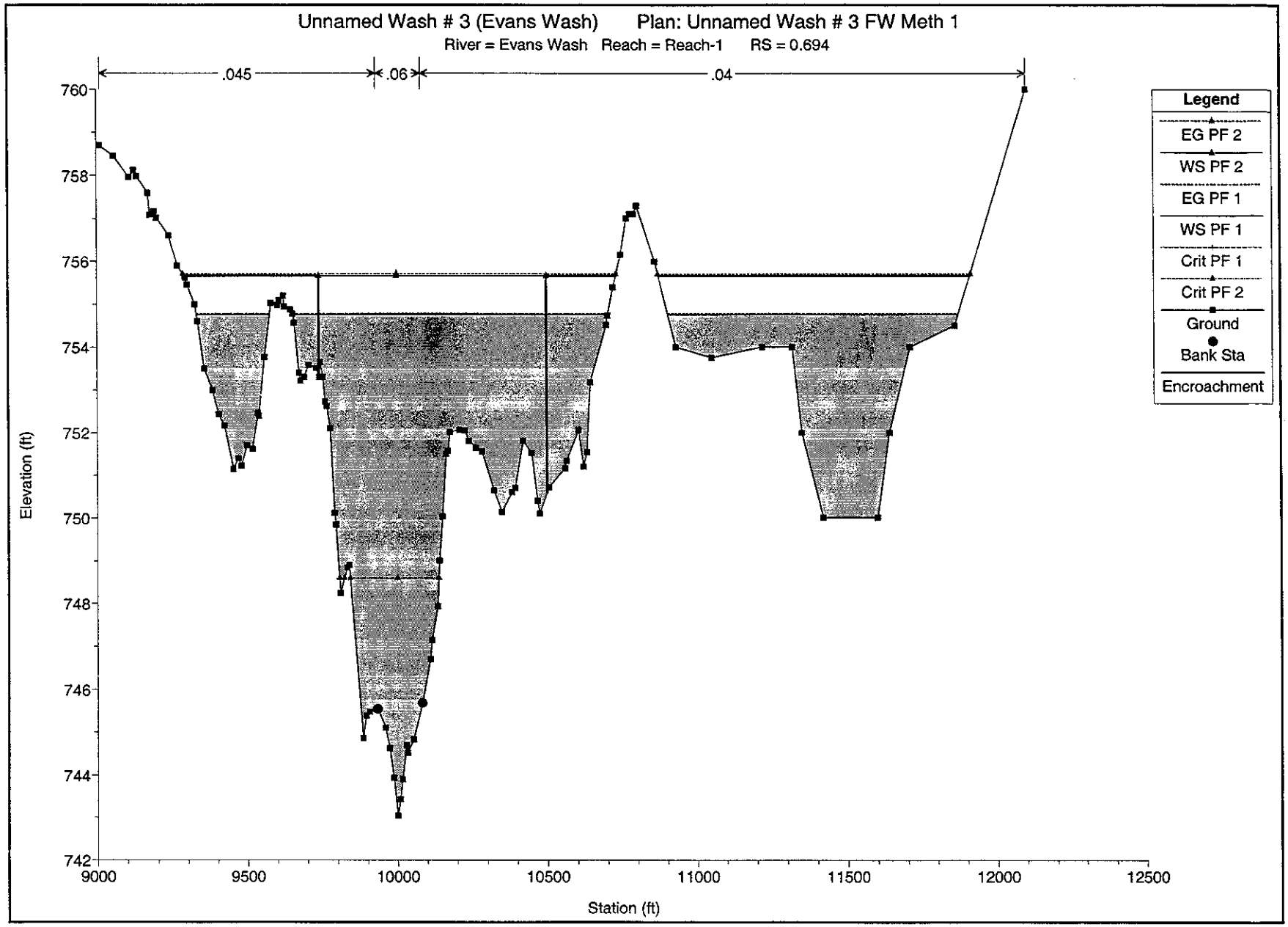

Unnamed Wash # 3 (Evans Wash)
Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 1.185
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
764
762
760
758
756
754
9940
9960
9980
10000
10020
10040
10060
10080
10100
Station (ft)

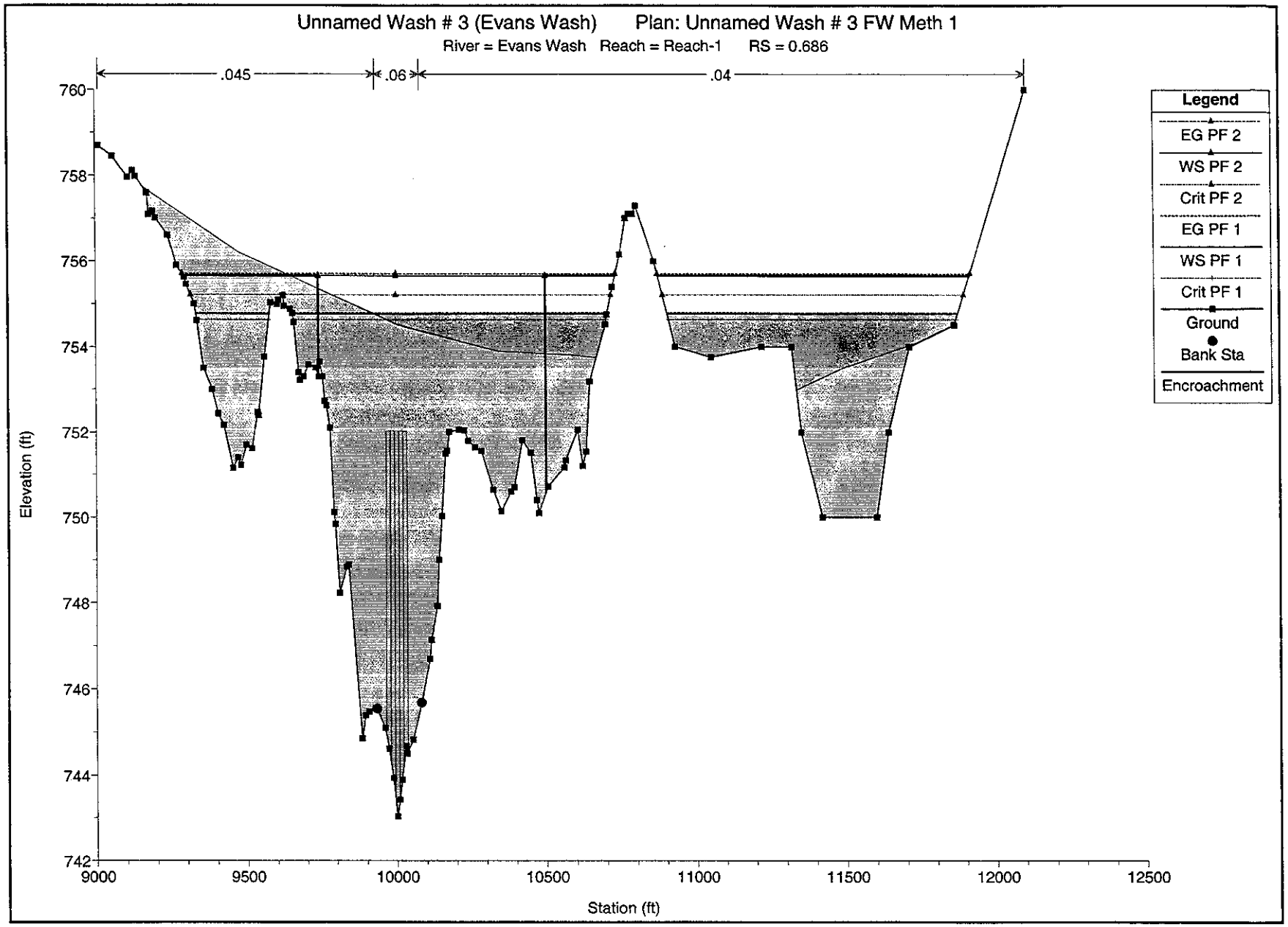

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 1.092
.035
.055
.04
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
764
762
760
758
756
754
752
750
9880
9900
9920
9940
9960
9980
10000
10020
10040
10060
Station (ft)

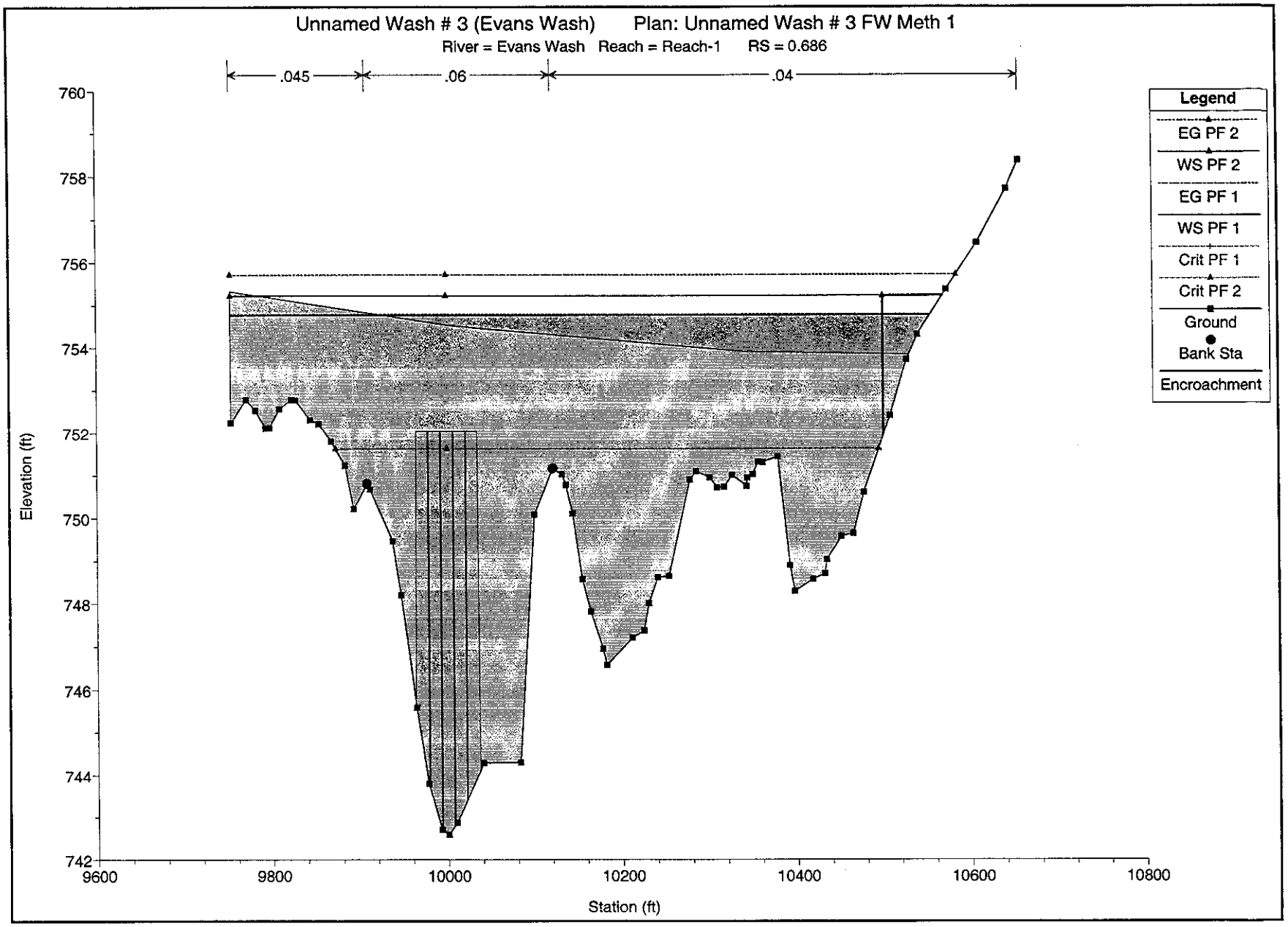

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 1.001
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
762
760
758
756
754
752
750
9400
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

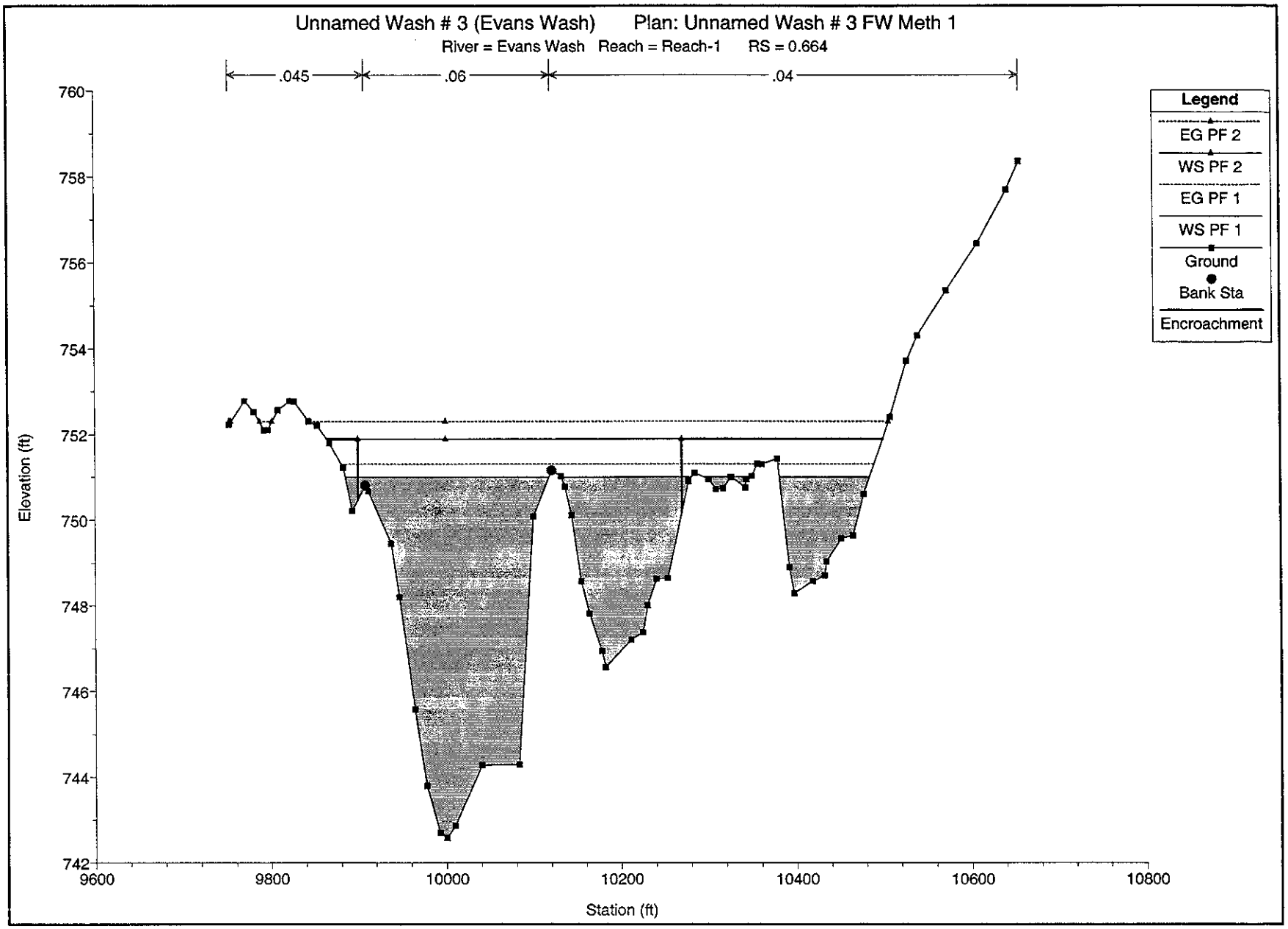

Unnamed Wash # 3 (Evans Wash)
Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 0.901
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
760
758
756
754
752
750
748
9800
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)

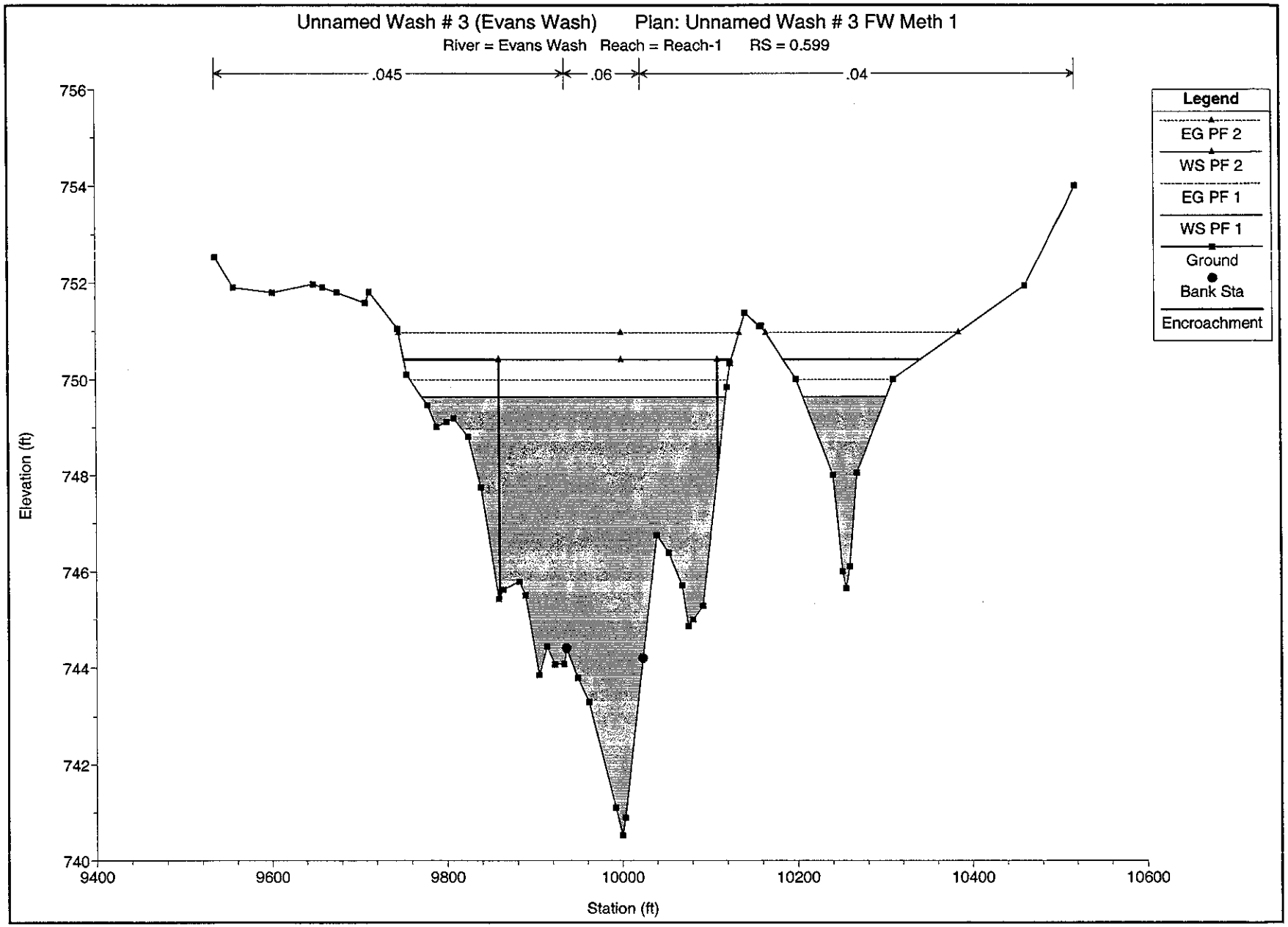

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 0.795
.035
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
758
756
754
752
750
748
746
744
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

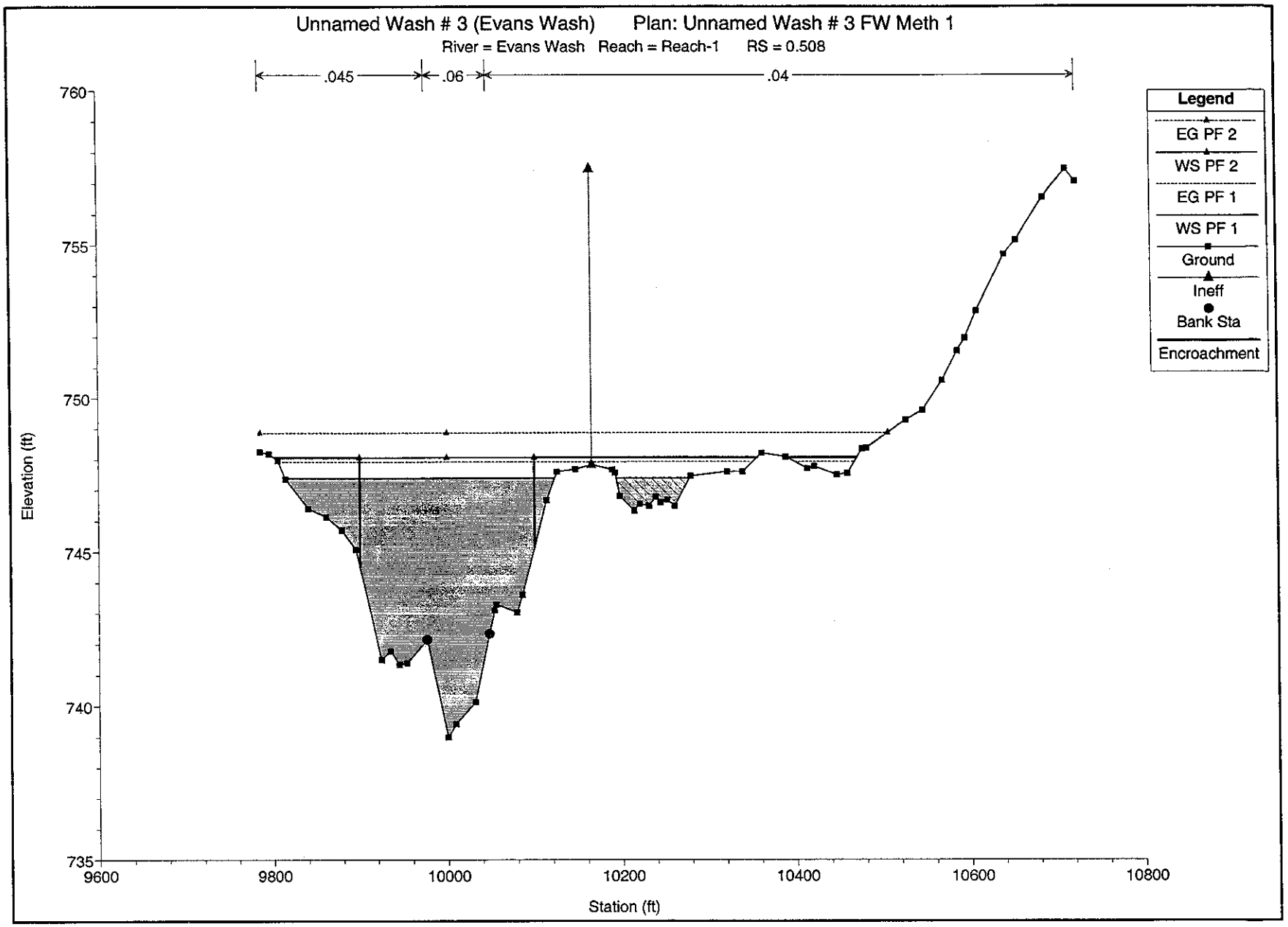

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 0.694
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
760
758
756
754
752
750
748
746
744
742
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)

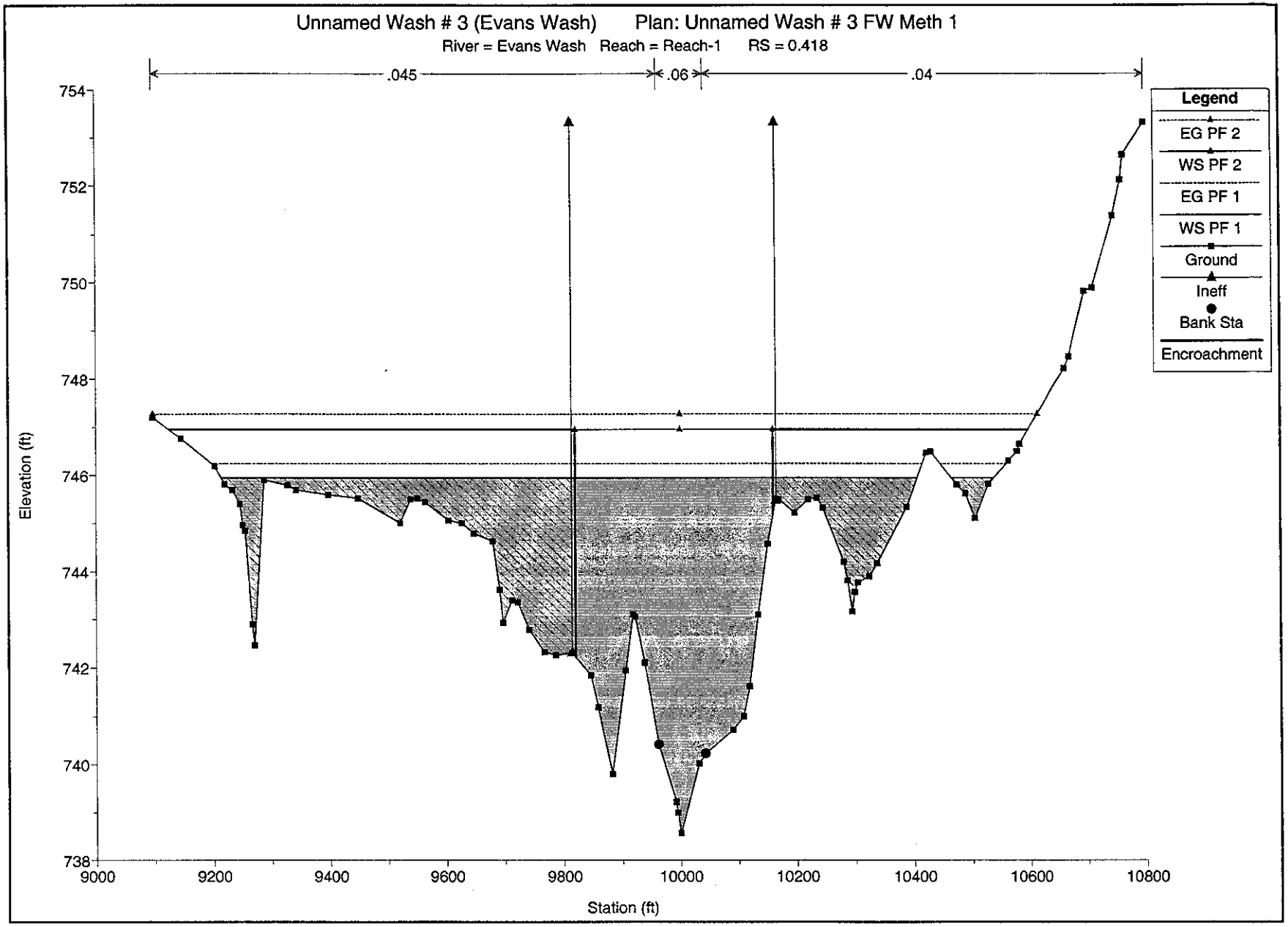

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 0.686
.045
.06
.04
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
760
758
756
754
752
750
748
746
744
742
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)

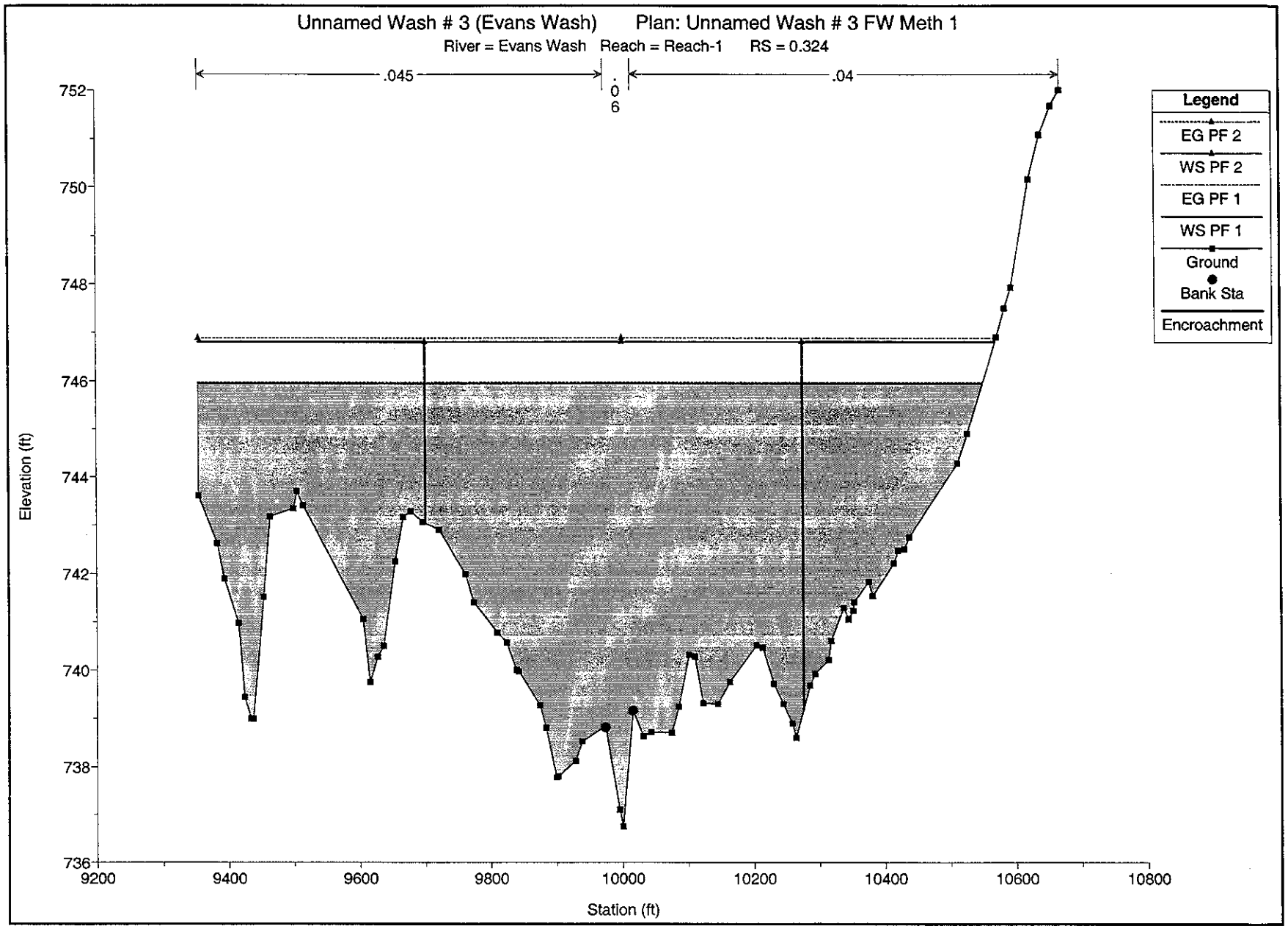

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 0.686
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
760
758
756
754
752
750
748
746
744
742
9600
9800
10000
10200
10400
10600
10800
Station (ft)

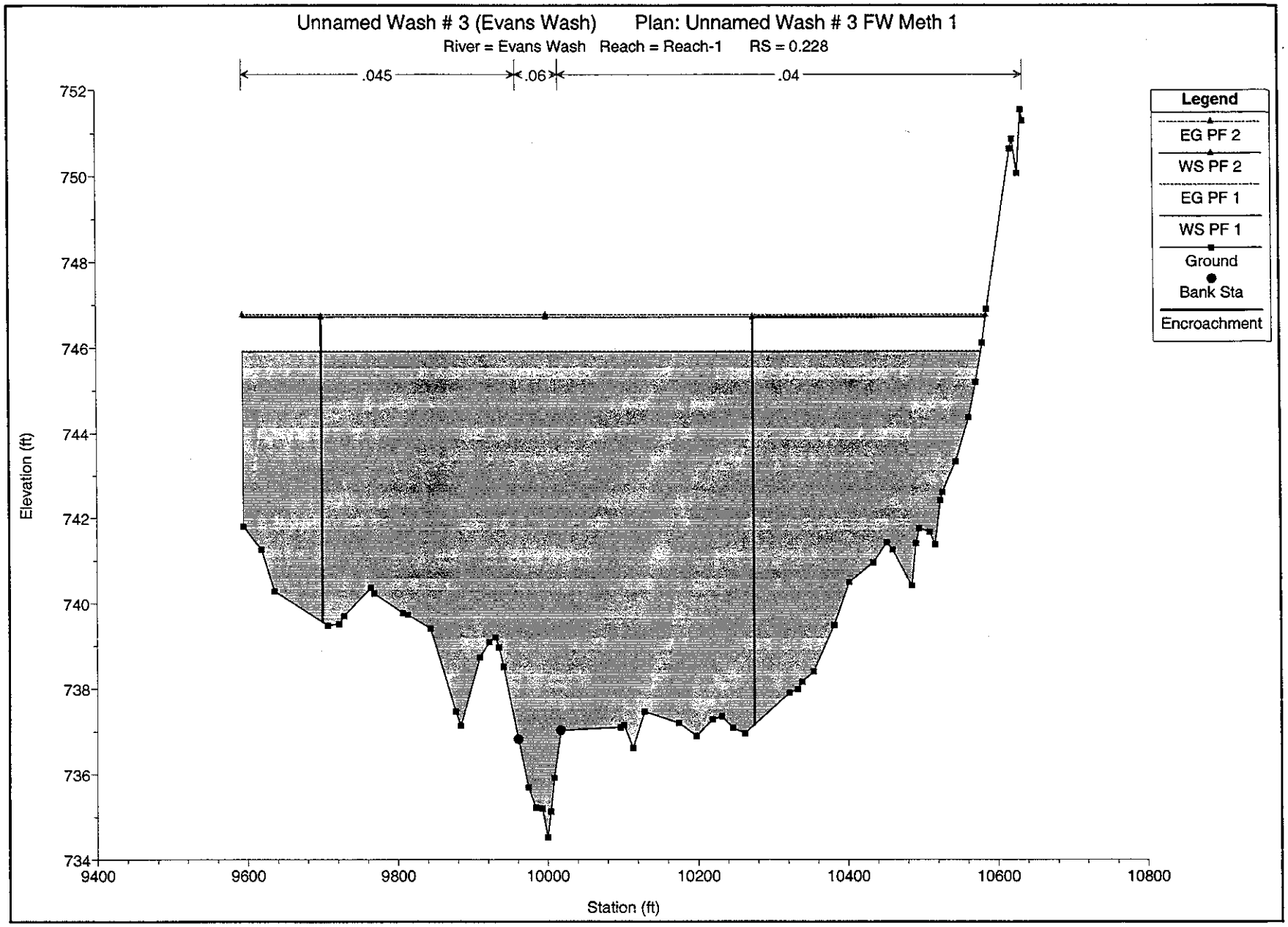

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 0.664
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
760
758
756
754
752
750
748
746
744
742
9600
9800
10000
10200
10400
10600
10800
Station (ft)

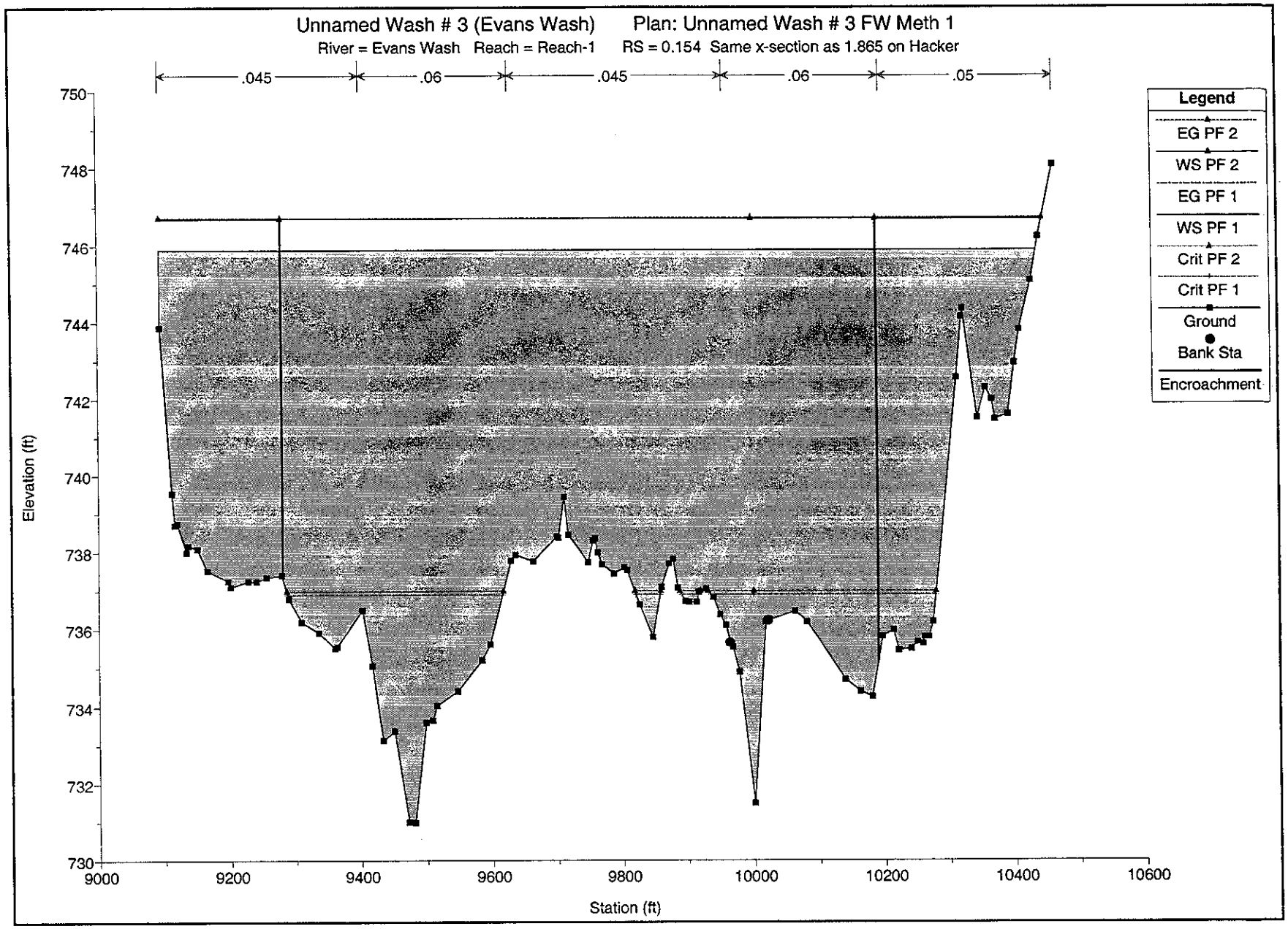

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 0.599
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
756
754
752
750
748
746
744
742
740
9400
9600
9800
10000
10200
10400
10600
Station (ft)

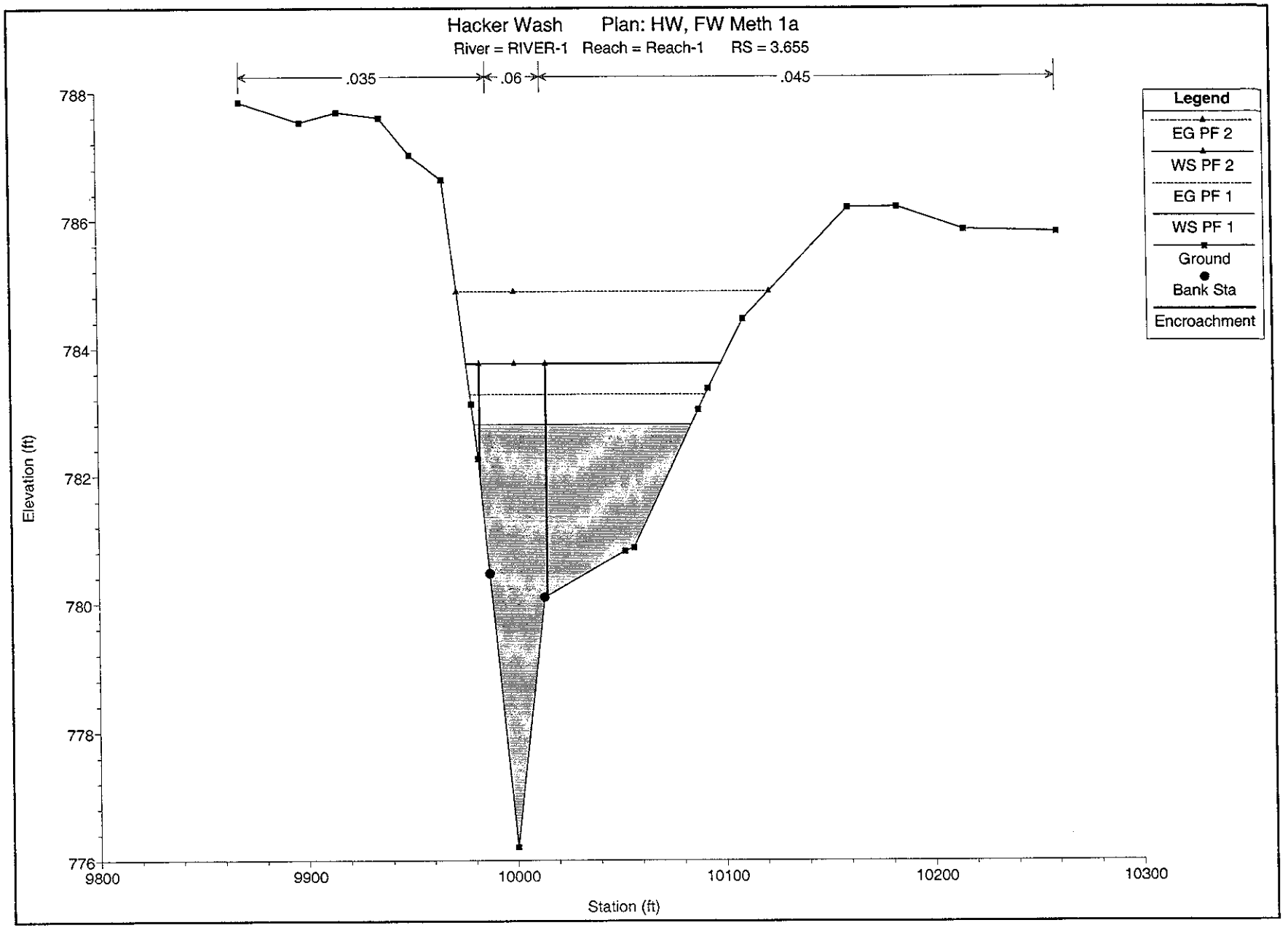

Unnamed Wash # 3 (Evans Wash)
Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 0.508
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
760
755
750
745
740
735
9600
9800
10000
10200
10400
10600
10800
Station (ft)

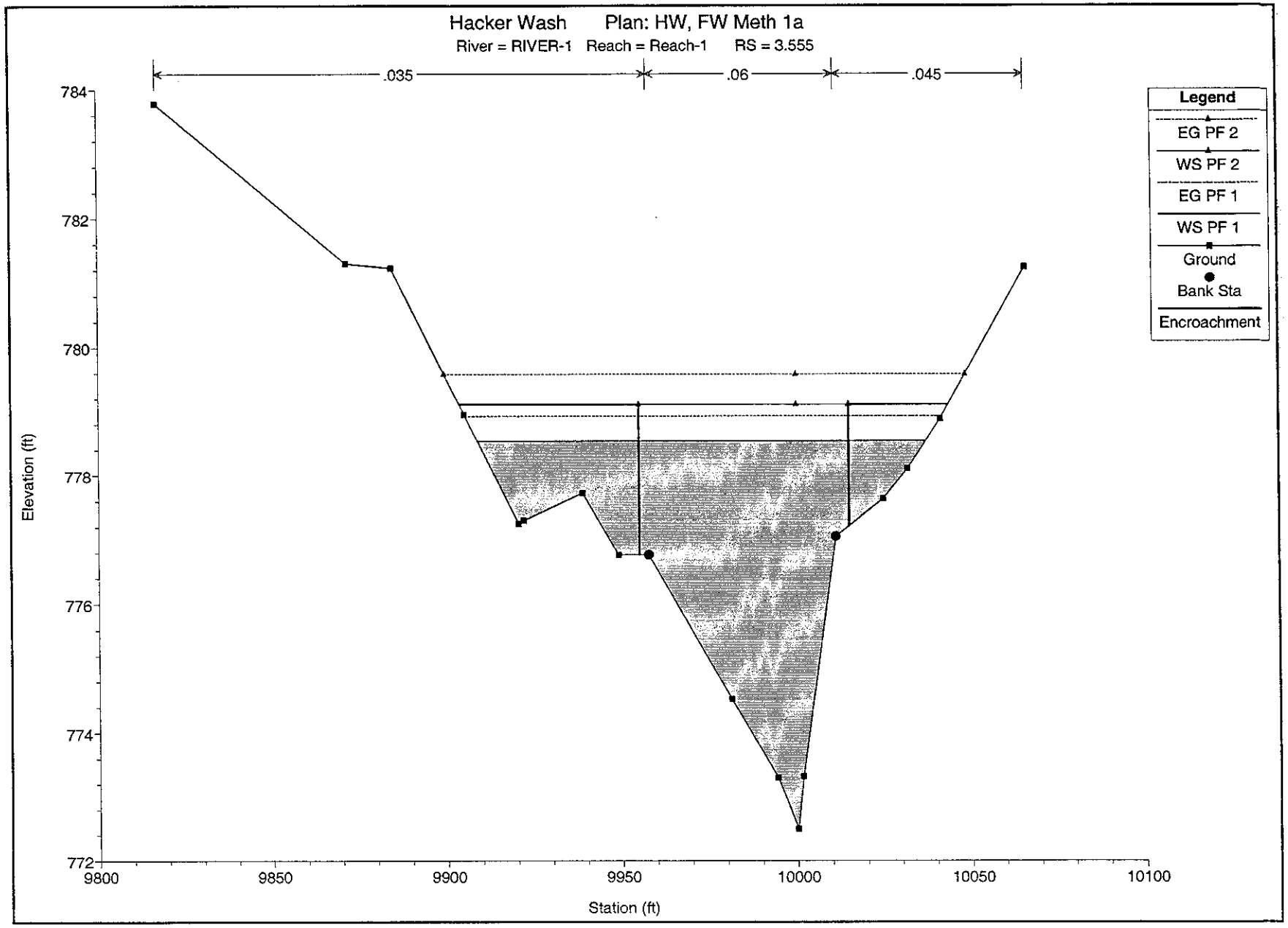

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 0.418
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
754
752
750
748
746
744
742
740
738
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

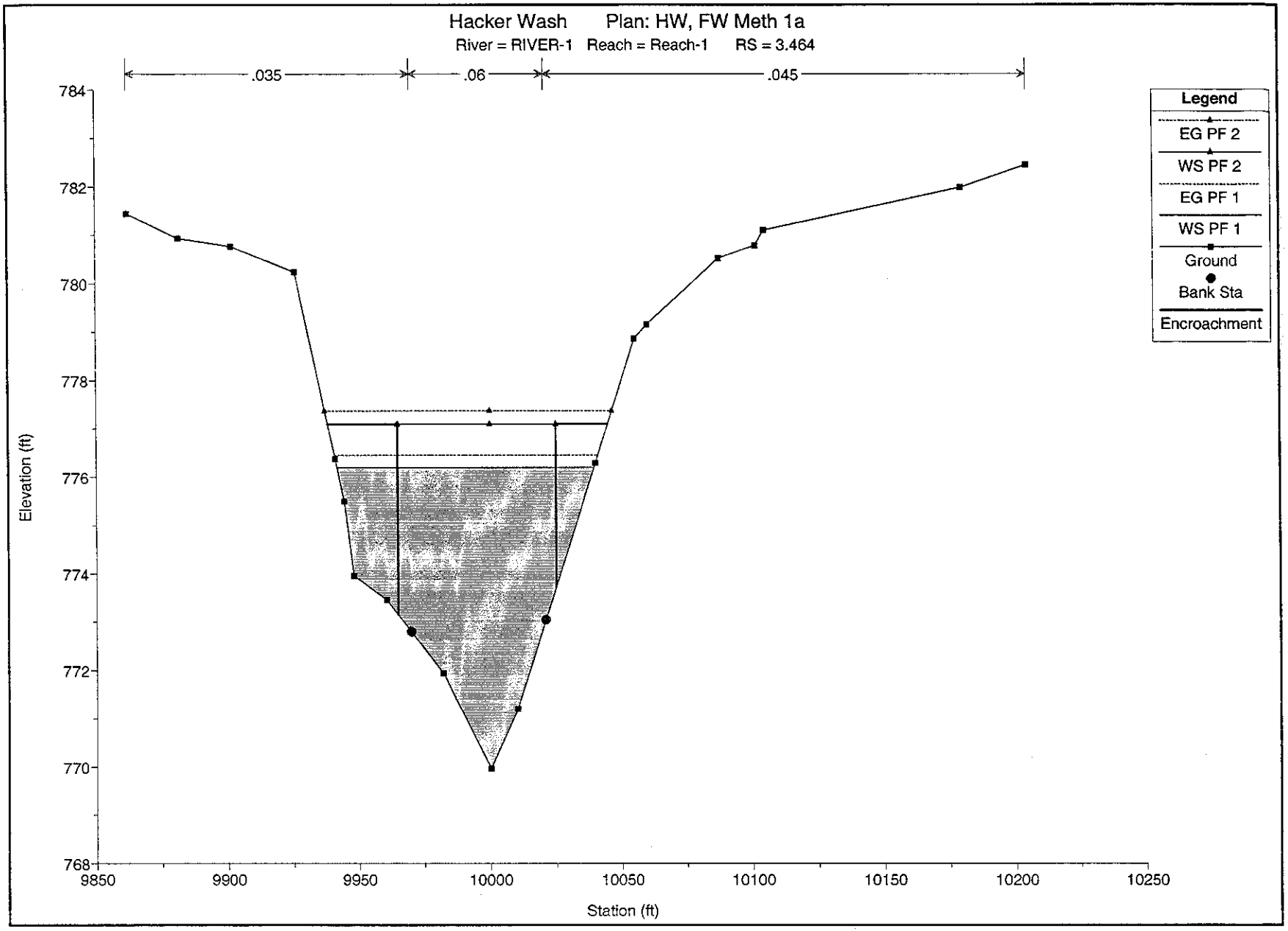

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 0.324
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
752
750
748
746
744
742
740
738
736
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

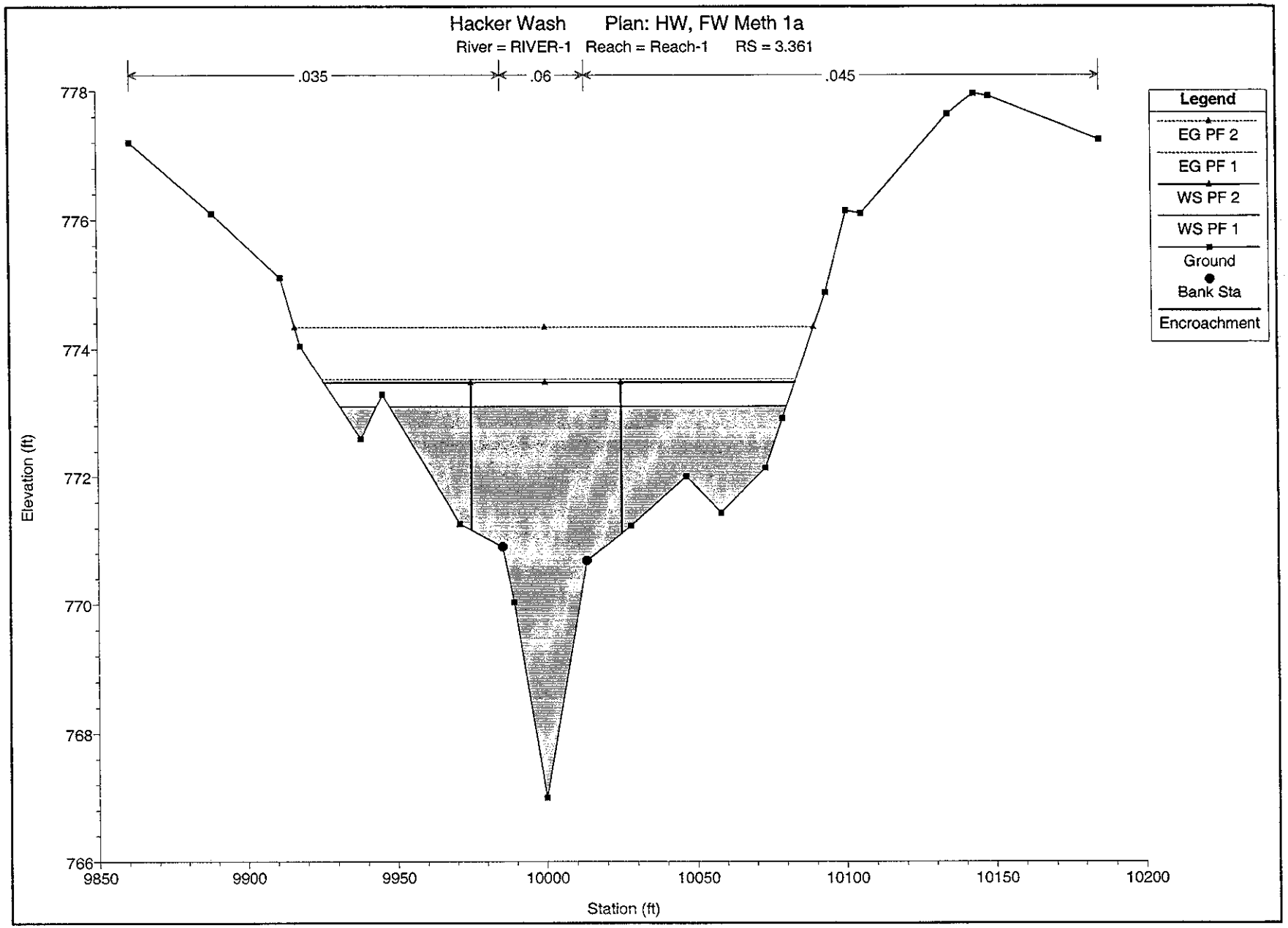

Unnamed Wash # 3 (Evans Wash) Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1 RS = 0.228
.045
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
752
750
748
746
744
742
740
738
736
734
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

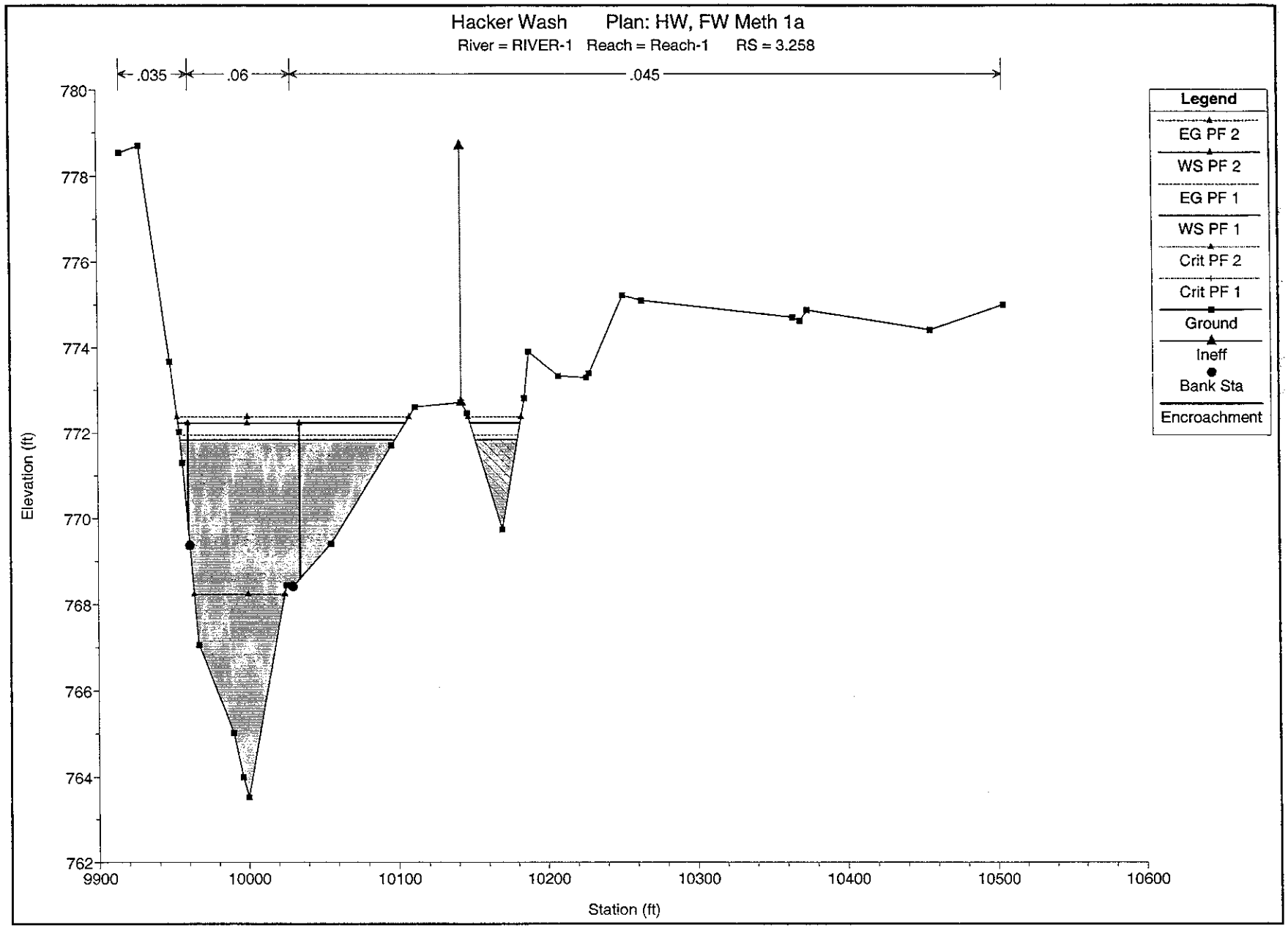

Unnamed Wash # 3 (Evans Wash)
Plan: Unnamed Wash # 3 FW Meth 1
River = Evans Wash Reach = Reach-1
RS = 0.154 Same x-section as 1.865 on Hacker
.045
.06
.045
.06
.05
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
750
748
746
744
742
740
738
736
734
732
730
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

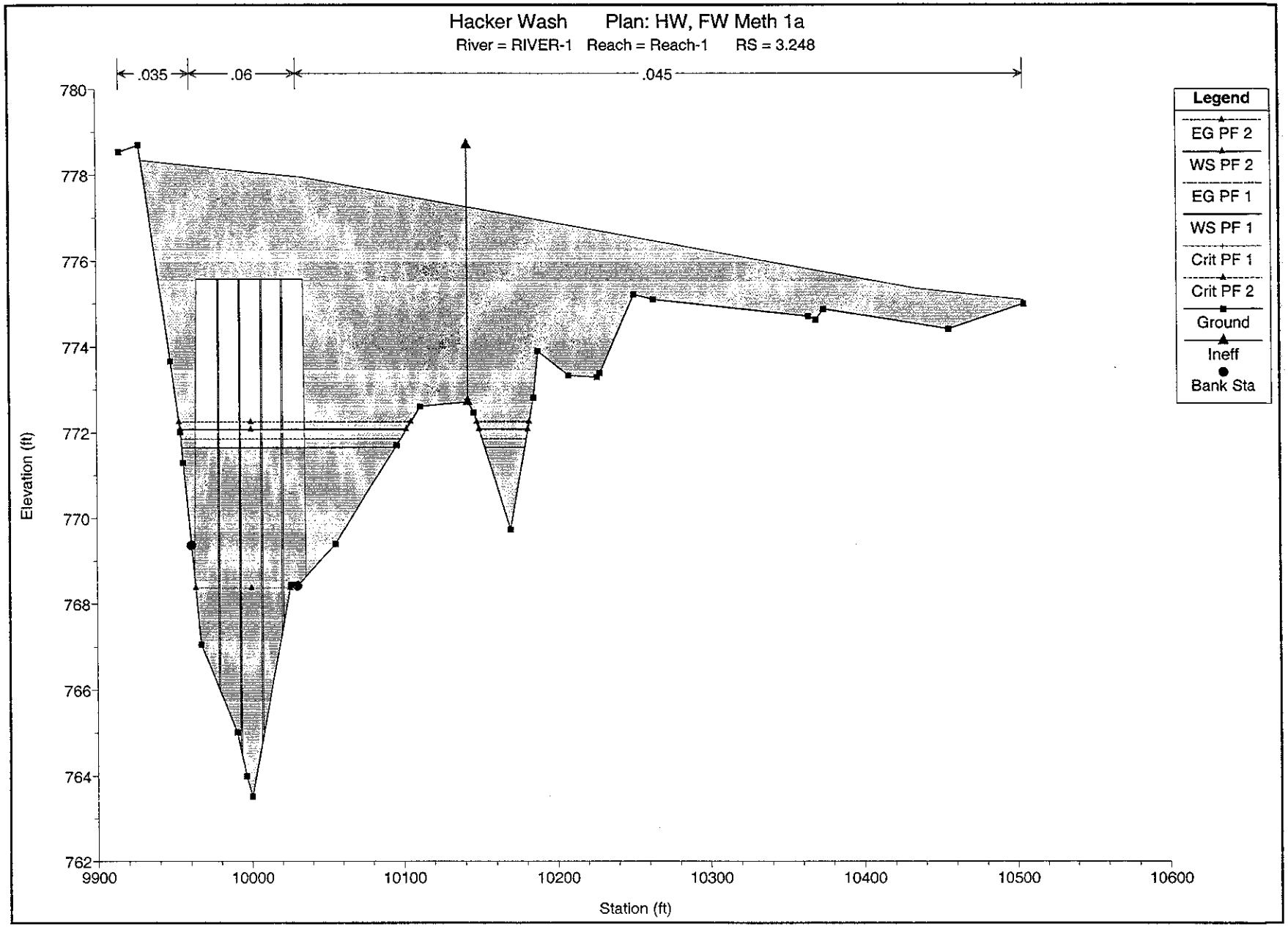

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 3.655
.035
.06
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
788
786
784
782
780
778
776
9800
9900
10000
10100
10200
10300
Station (ft)

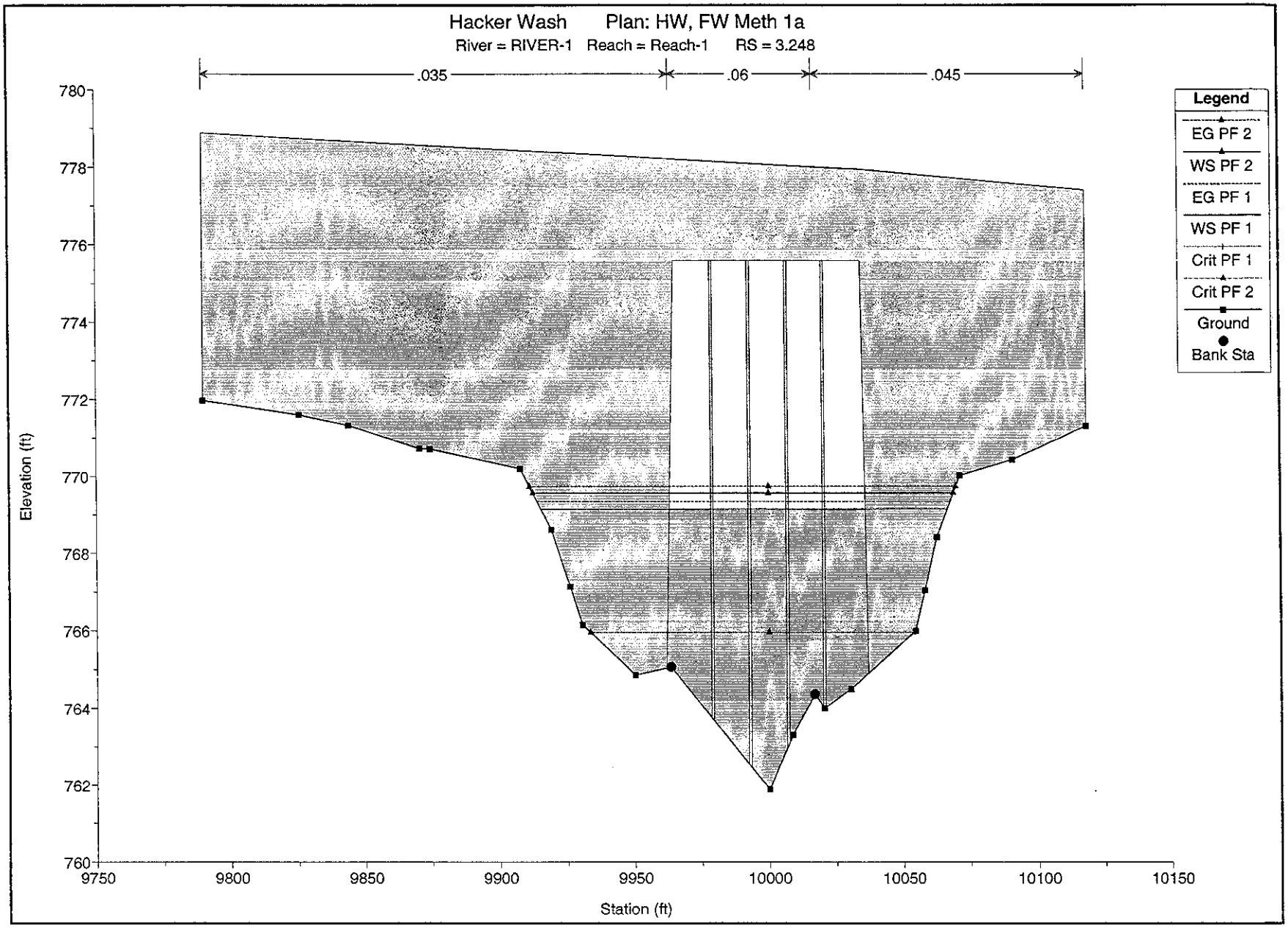

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 3.555
.035
.06
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
784
782
780
778
776
774
772
9800
9850
9900
9950
10000
10050
10100
Station (ft)

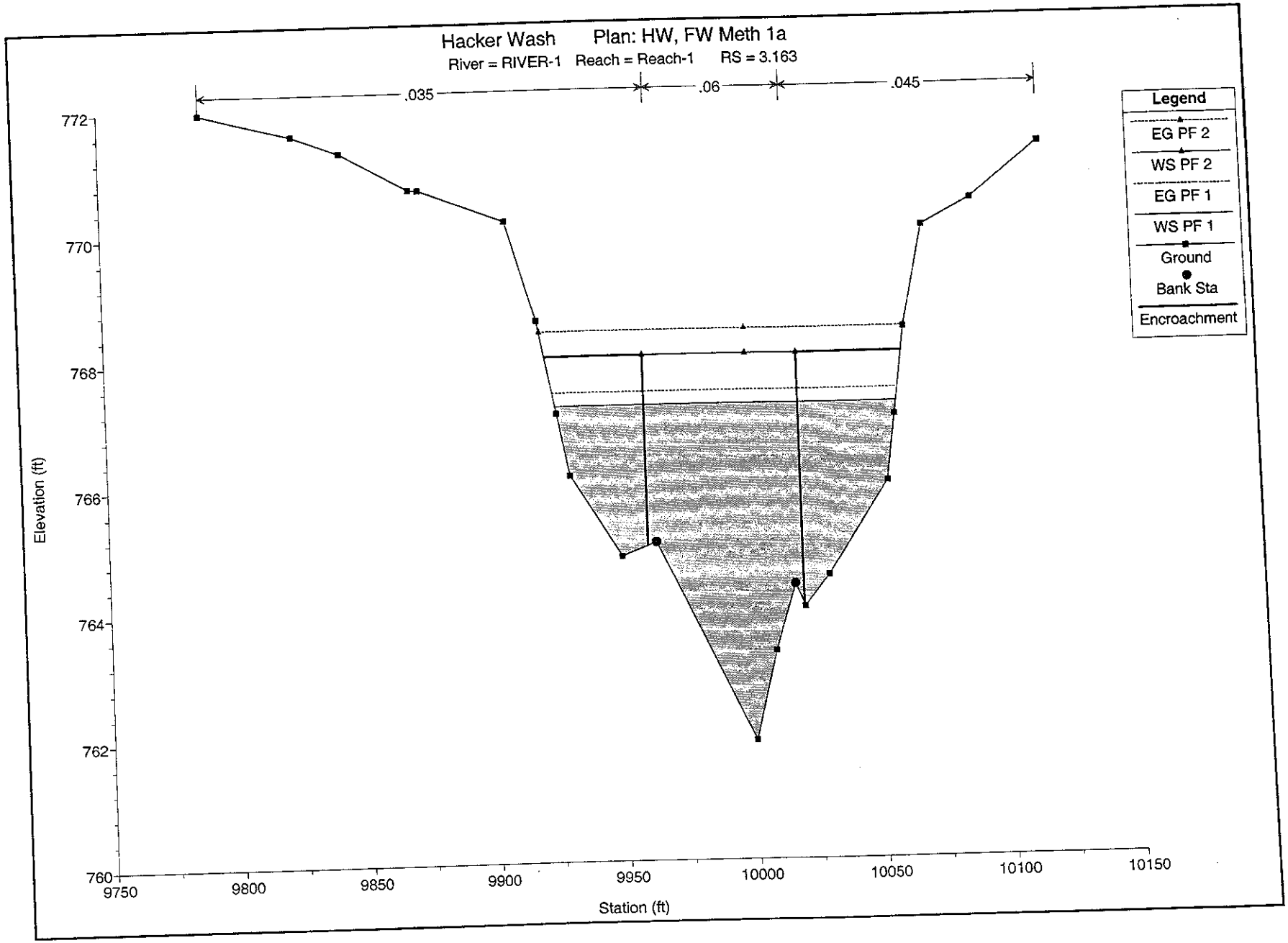

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 3.464
.035
.06
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
784
782
780
778
776
774
772
770
768
9850
9900
9950
10000
10050
10100
10150
10200
10250
Station (ft)

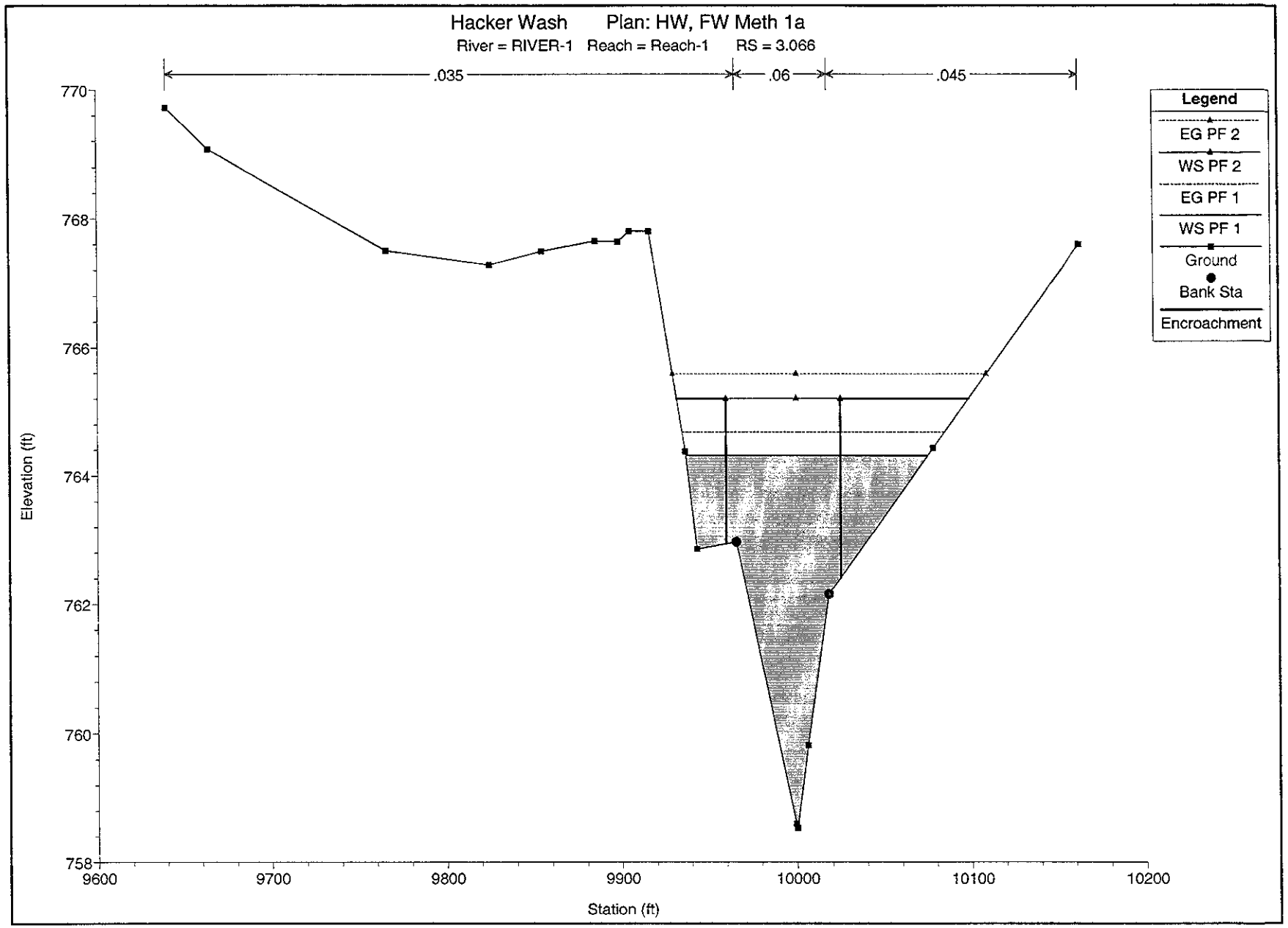

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 3.361
.035
.06
.045
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
778
776
774
772
770
768
766
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)

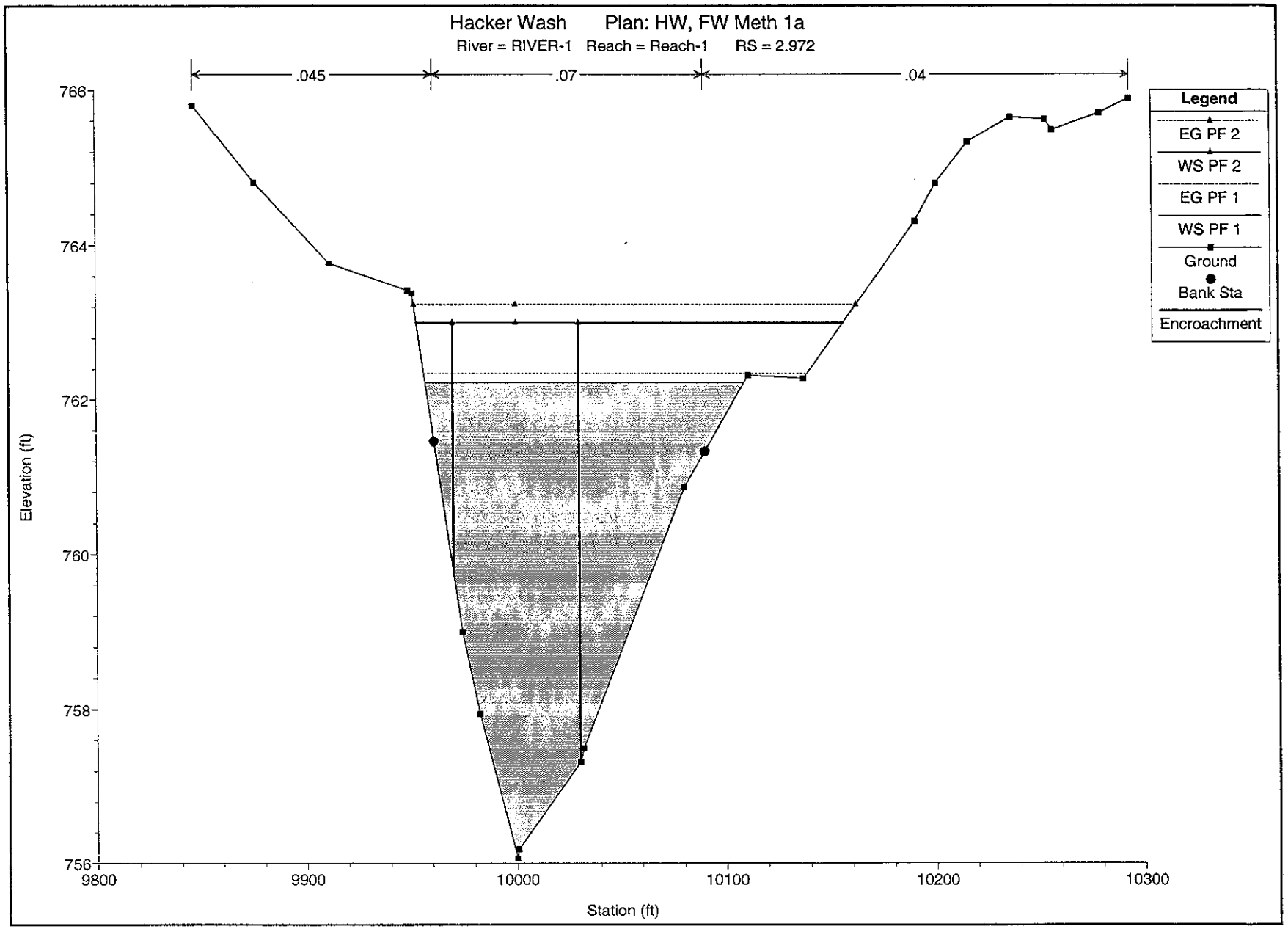

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 3.258
.035
.06
.045
Elevation (ft)
780
778
776
774
772
770
768
766
764
762
9900
10000
10100
10200
10300
10400
10500
10600
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment

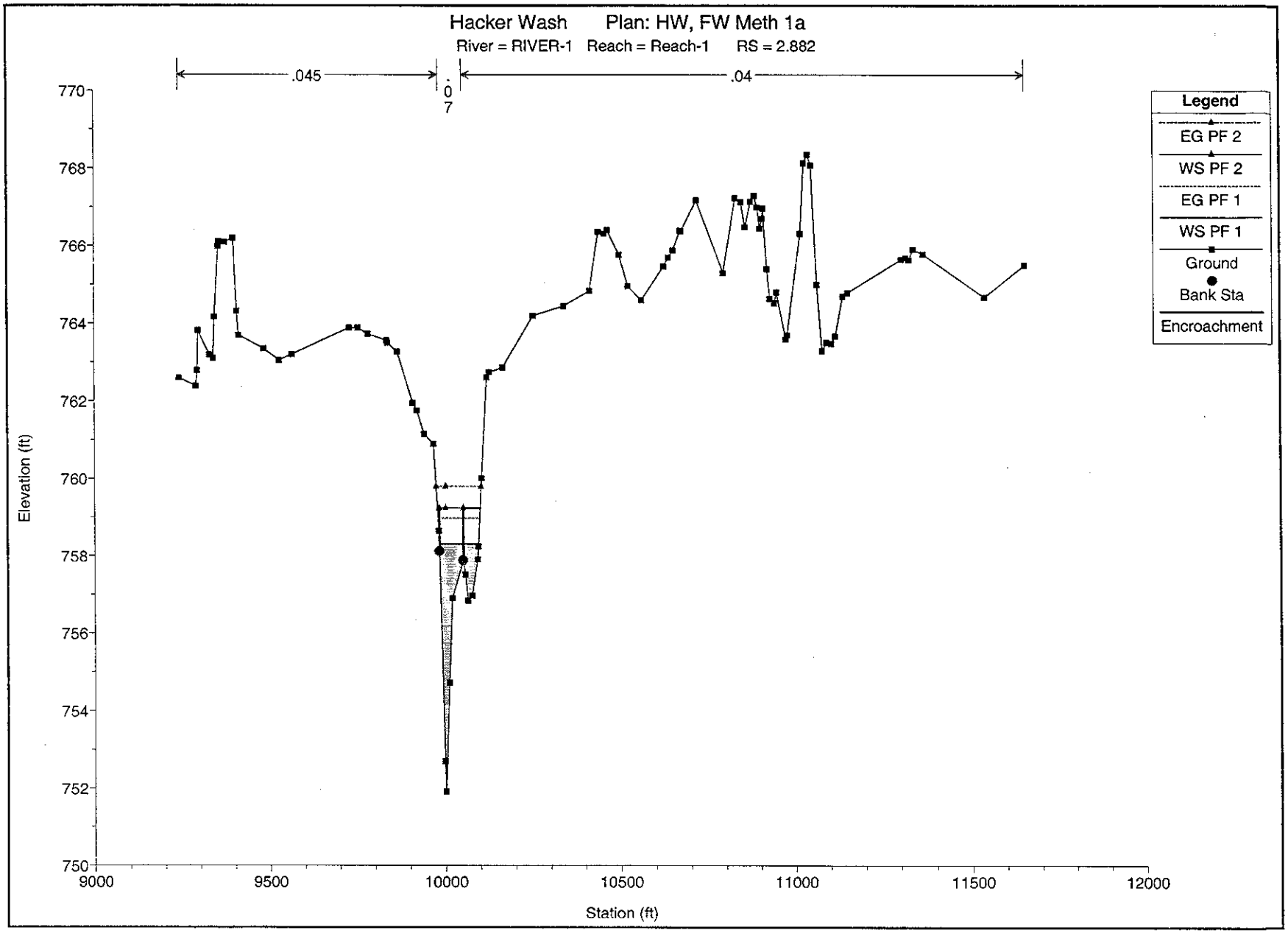

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 3.248
.035
.06
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Elevation (ft)
780
778
776
774
772
770
768
766
764
762
9900
10000
10100
10200
10300
10400
10500
10600
Station (ft)

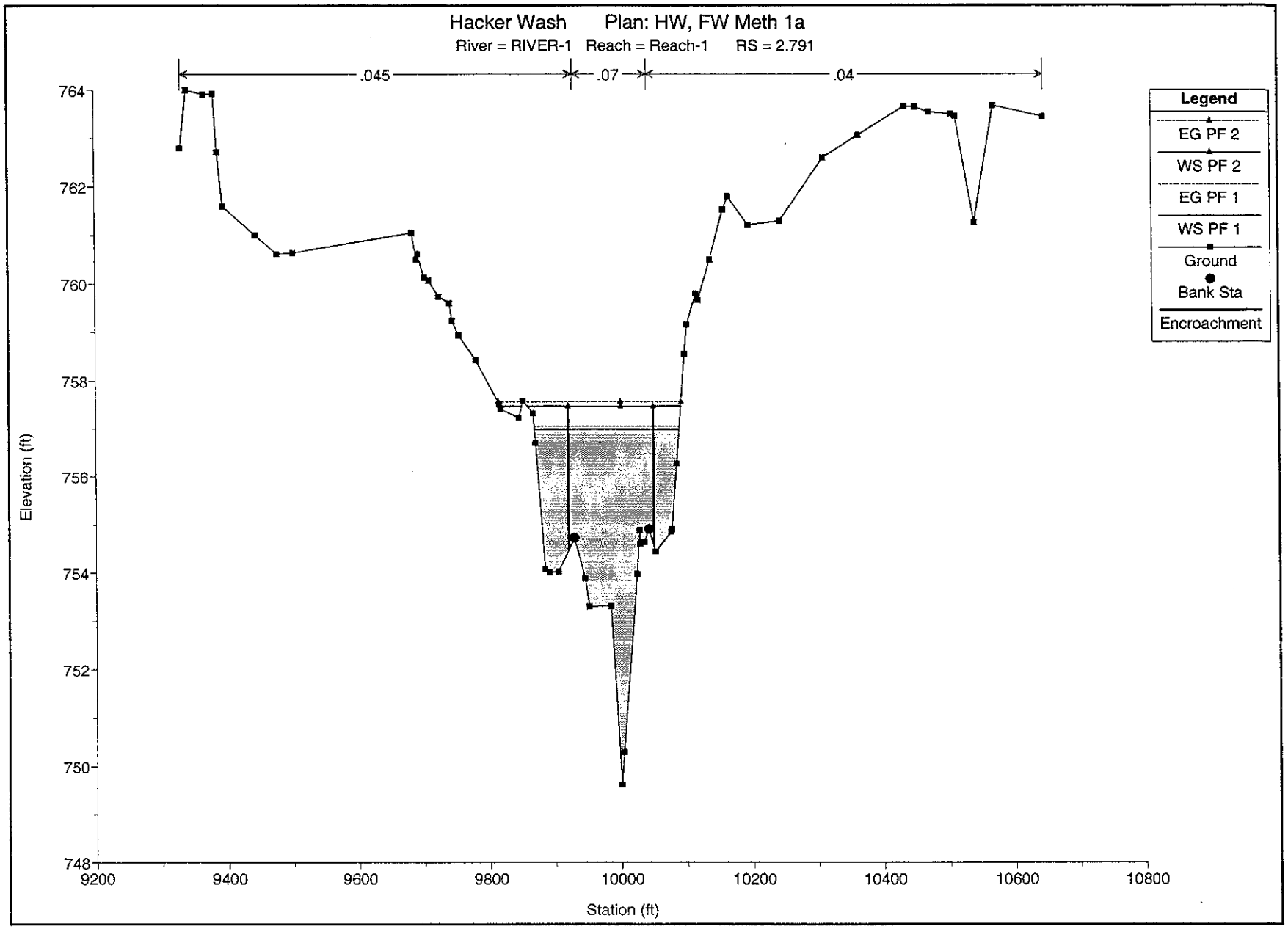

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 3.248
.035
.06
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Elevation (ft)
780
778
776
774
772
770
768
766
764
762
760
9750
9800
9850
9900
9950
10000
10050
10100
10150
Station (ft)

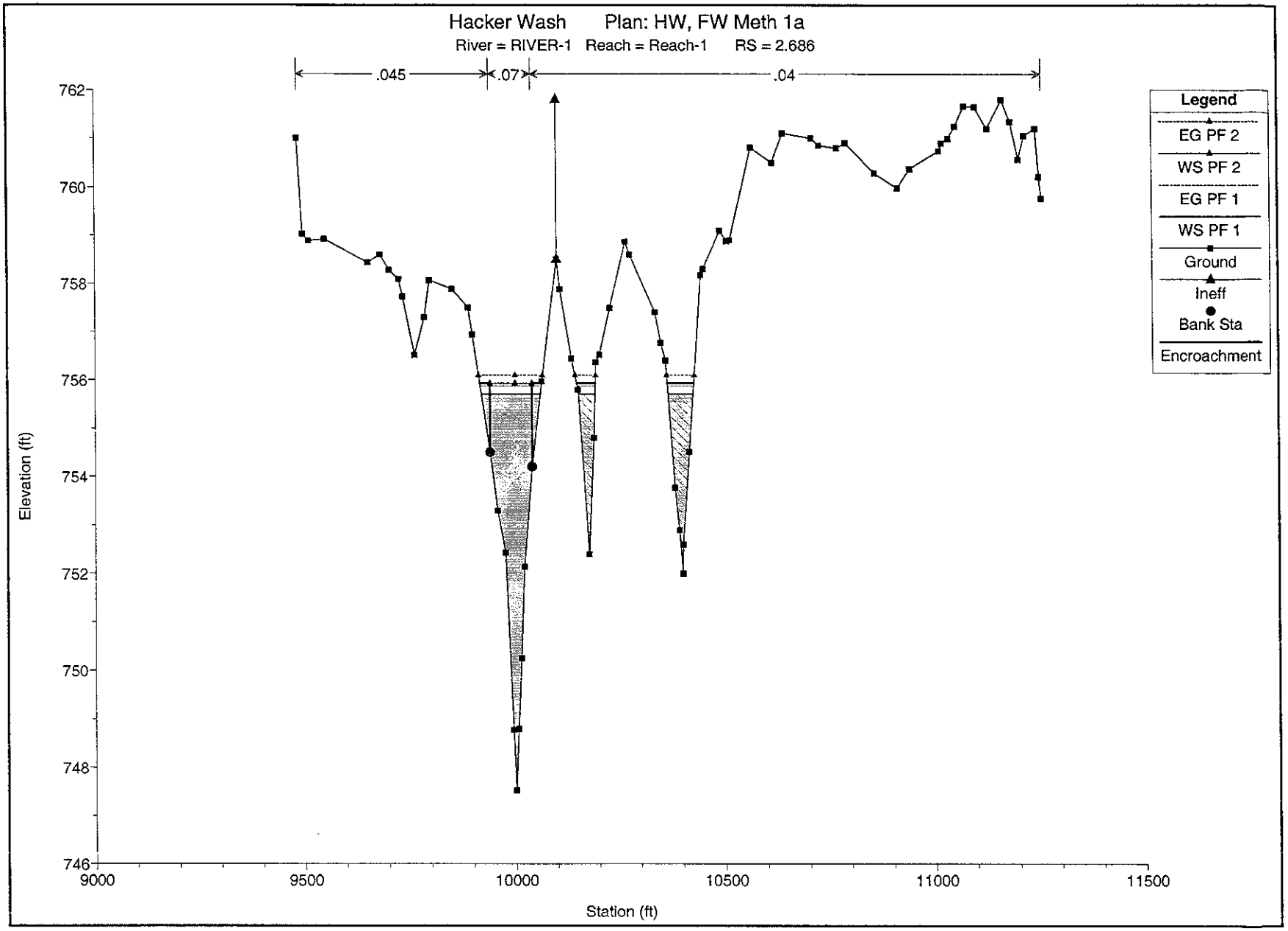

Hacker Wash
Plan: HW, FW Meth 1a
River = RIVER-1
Reach = Reach-1
RS = 3.163
.035
.06
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
772
770
768
766
764
762
760
9750
9800
9850
9900
9950
10000
10050
10100
10150
Station (ft)

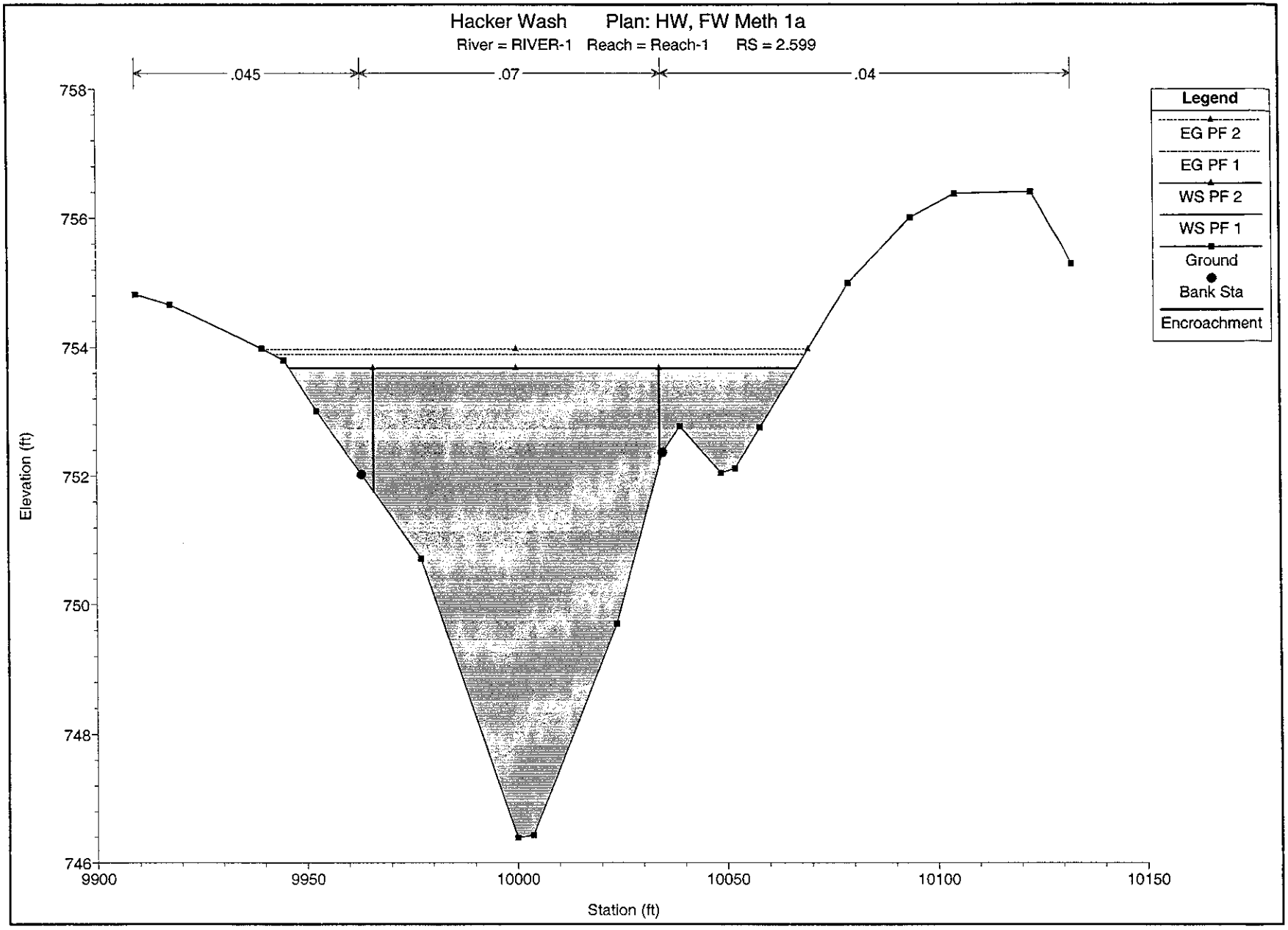

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 3.066
.035
.06
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
770
768
766
764
762
760
758
9600
9700
9800
9900
10000
10100
10200
Station (ft)

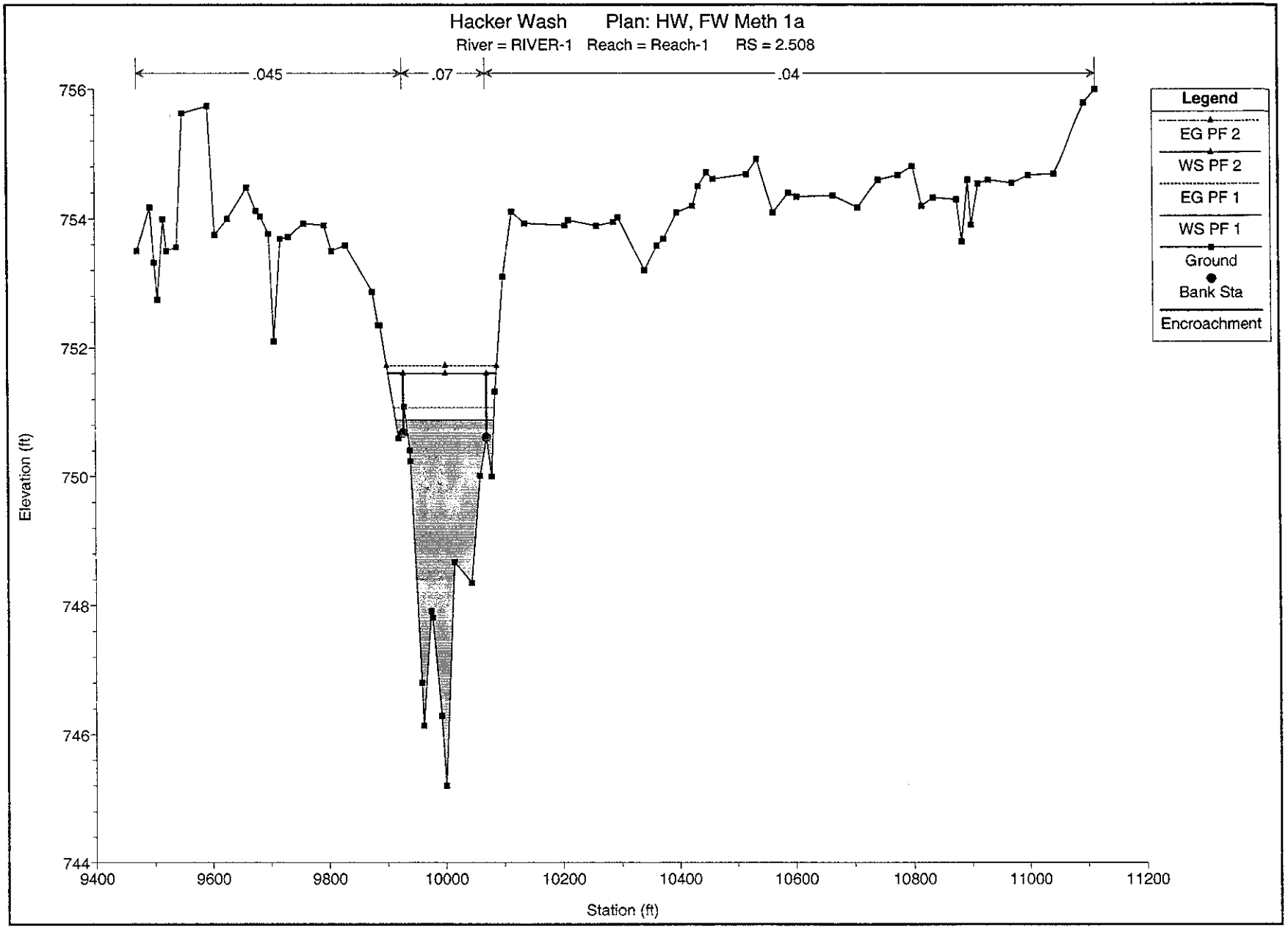

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 2.972
.045
.07
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
766
764
762
760
758
756
9800
9900
10000
10100
10200
10300
Station (ft)

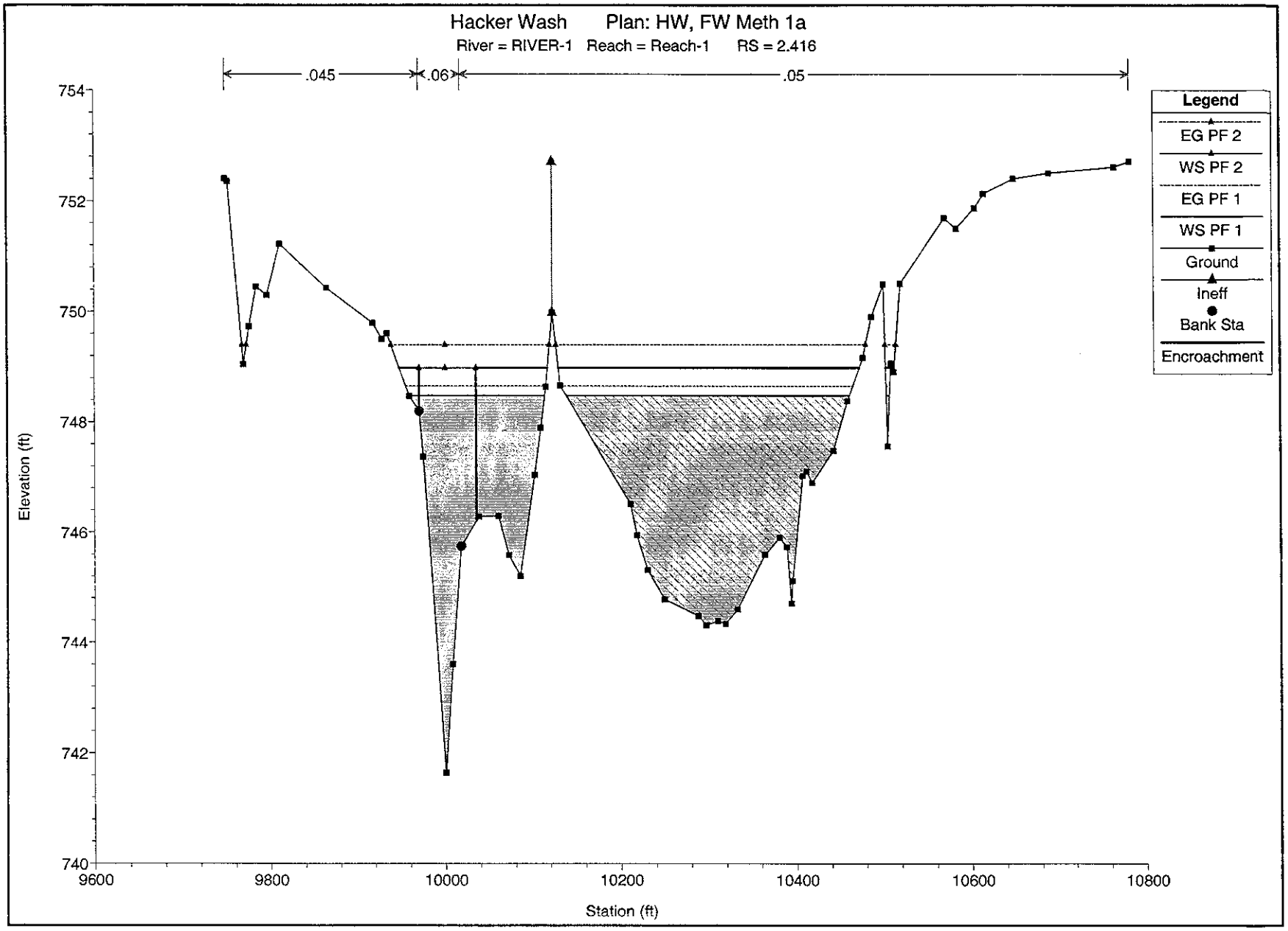

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 2.882
.045
.07
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
770
768
766
764
762
760
758
756
754
752
750
9000
9500
10000
10500
11000
11500
12000
Station (ft)

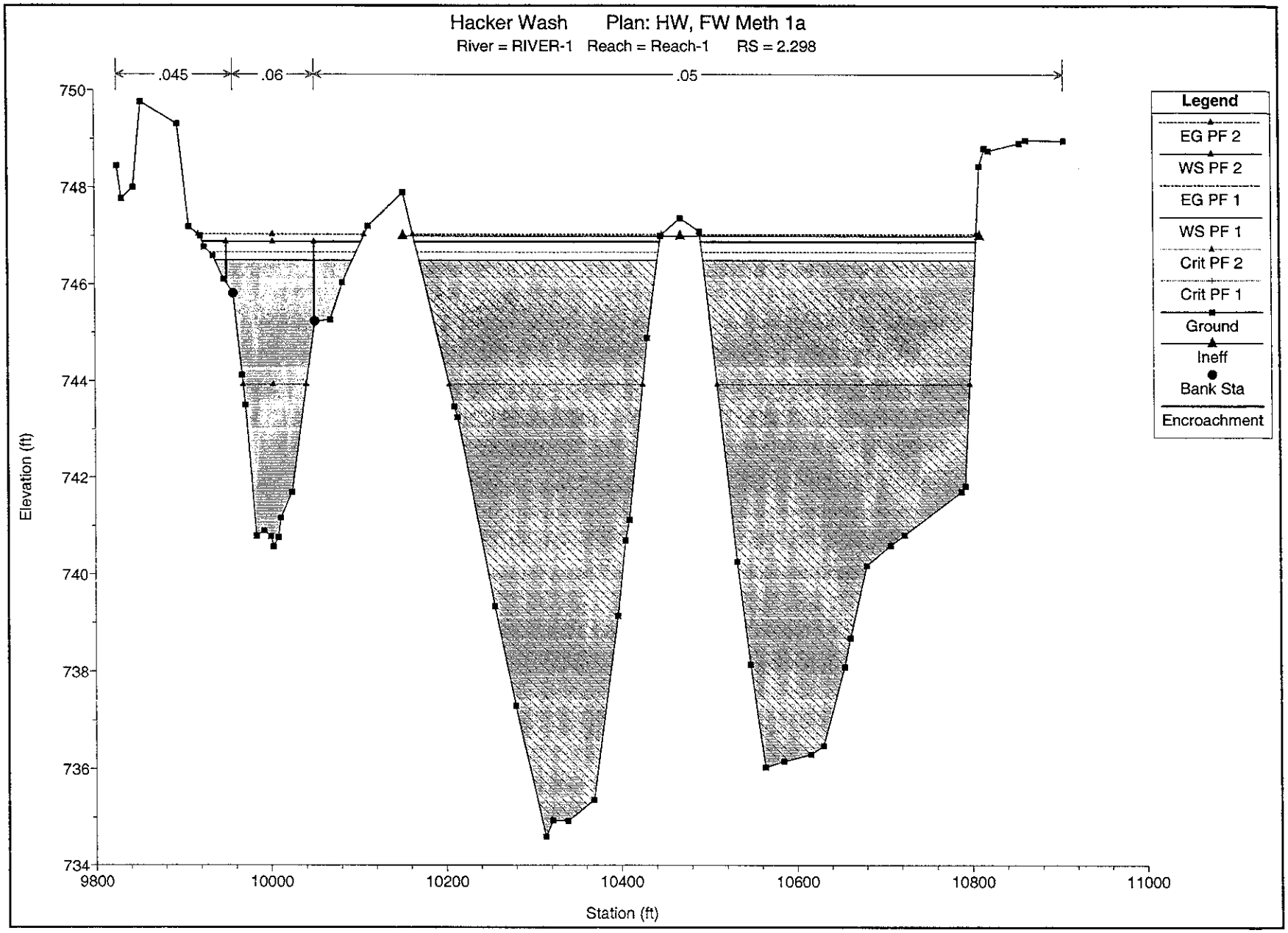

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 2.791
.045
.07
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
764
762
760
758
756
754
752
750
748
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

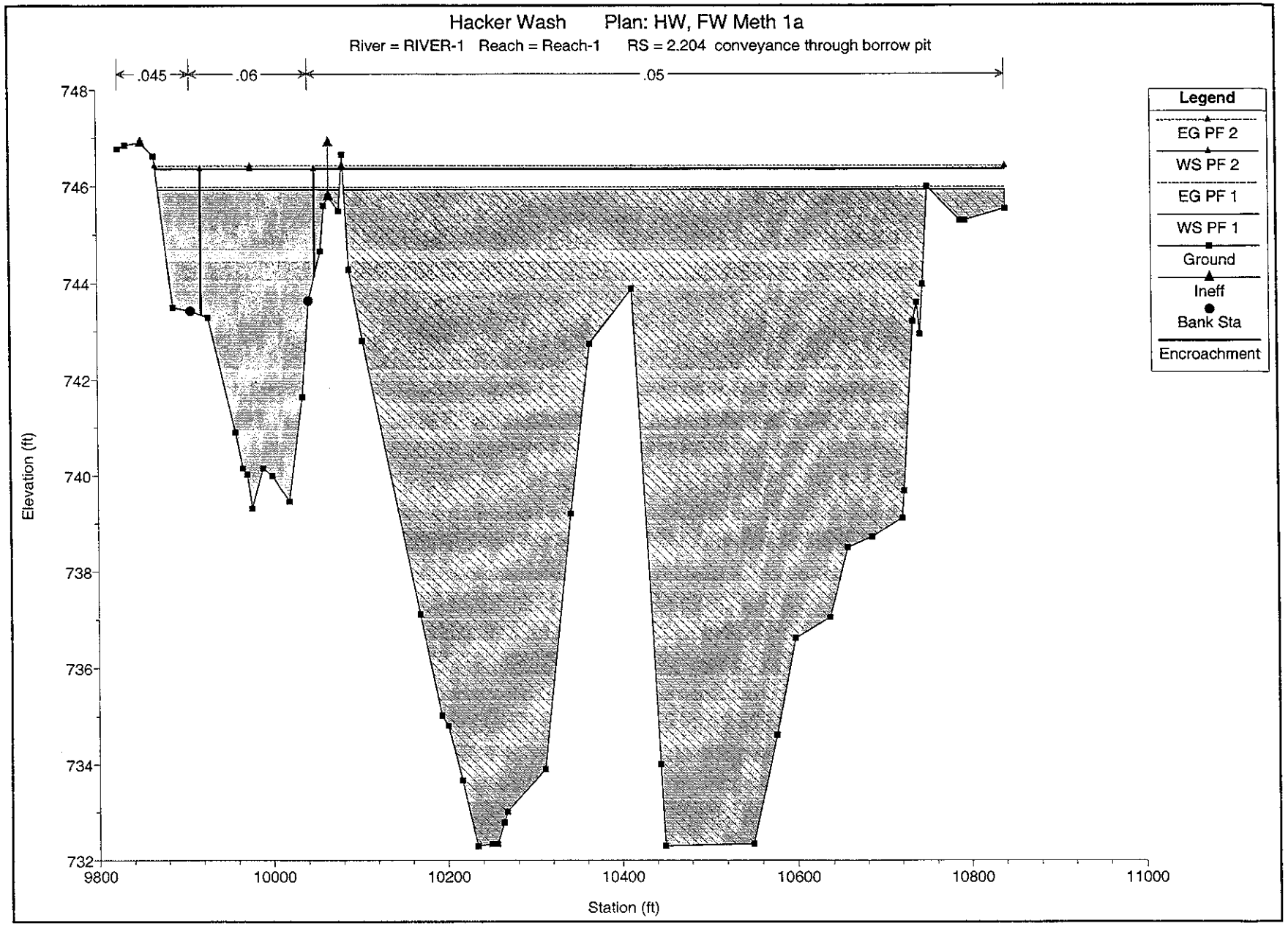

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 2.686
.045
.07
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
762
760
758
756
754
752
750
748
746
9000
9500
10000
10500
11000
11500
Station (ft)

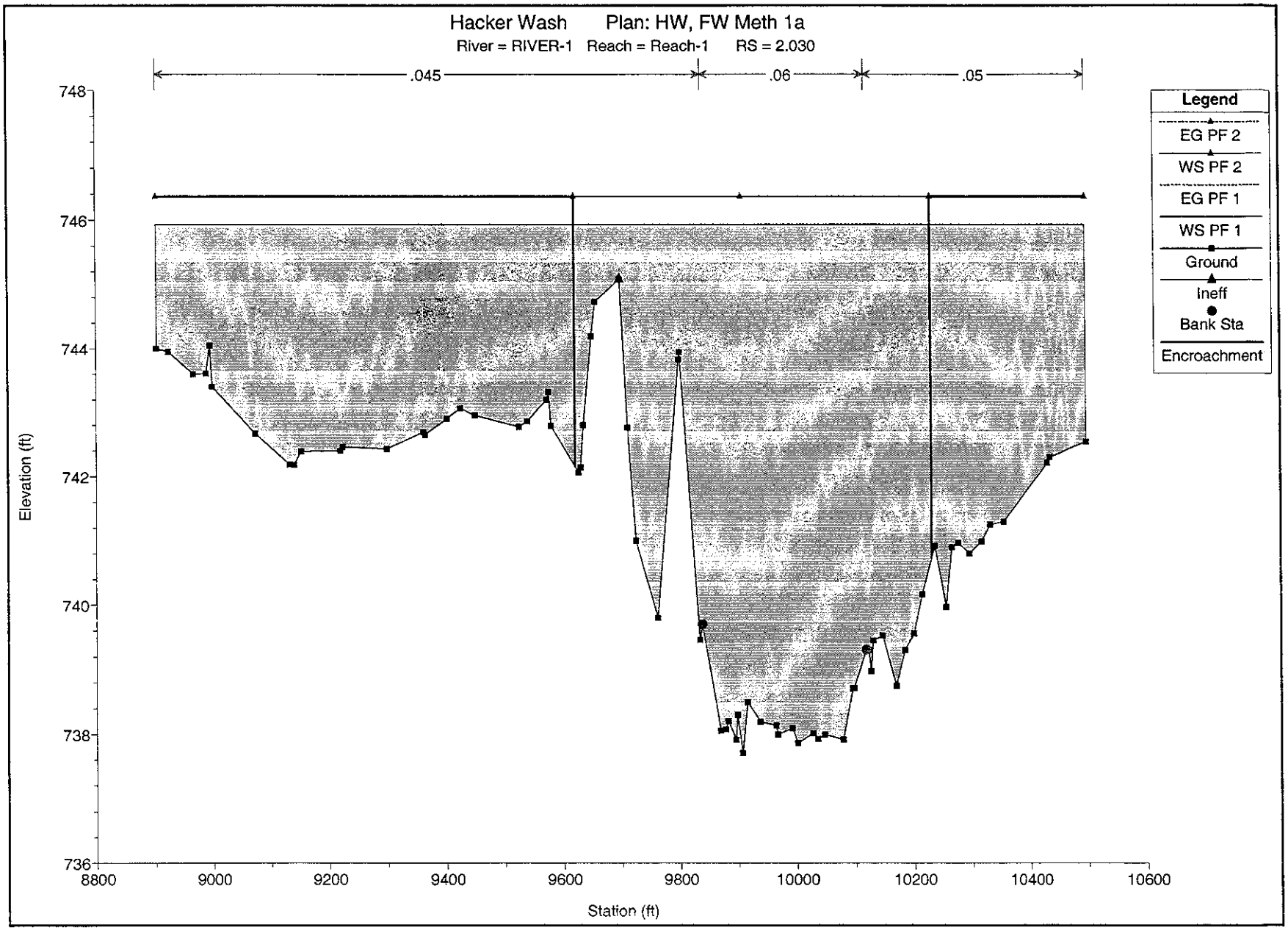

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 2.599
.045
.07
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
758
756
754
752
750
748
746
9900
9950
10000
10050
10100
10150
Station (ft)

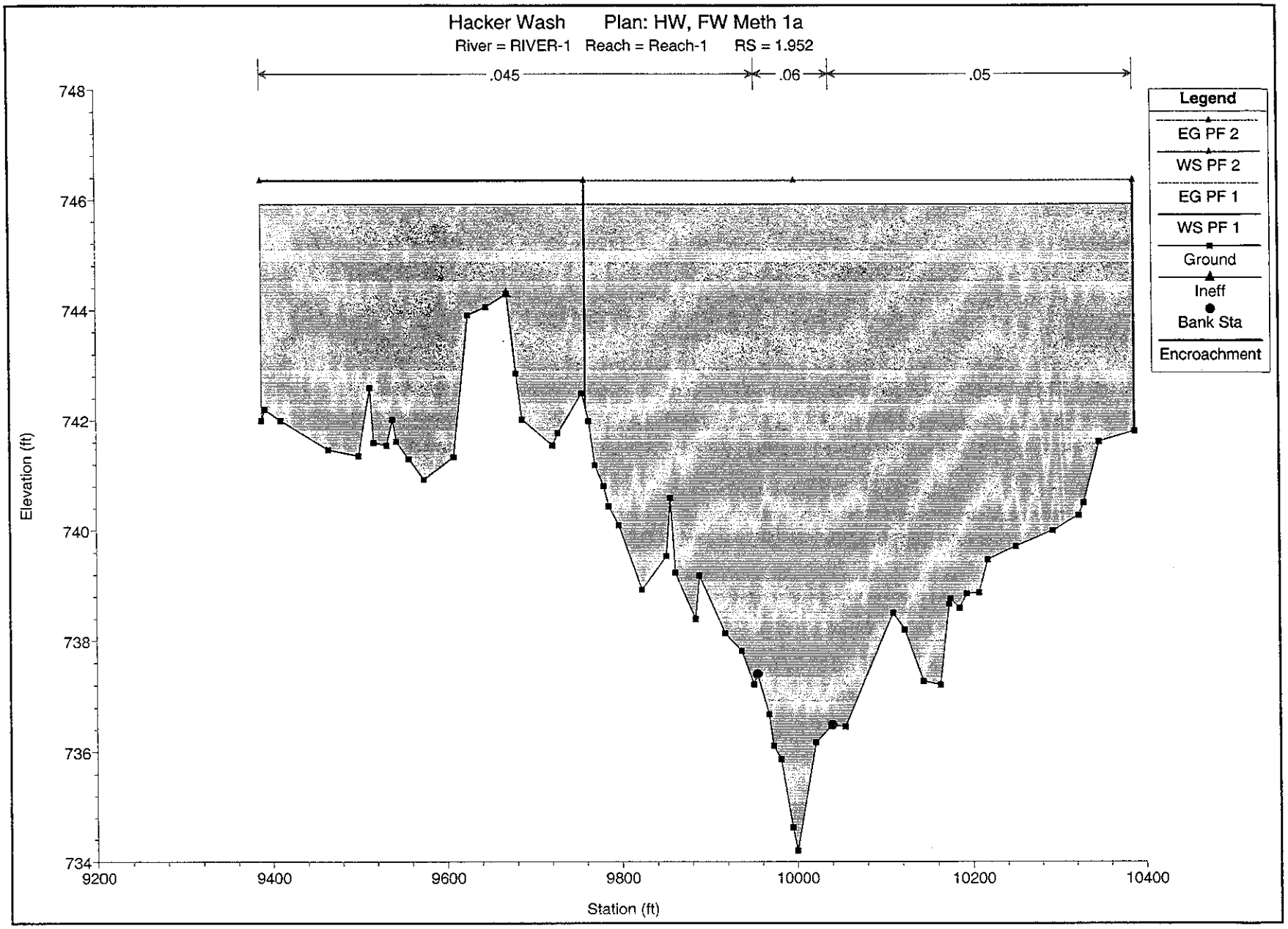

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 2.508
.045
.07
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
756
754
752
750
748
746
744
9400
9600
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

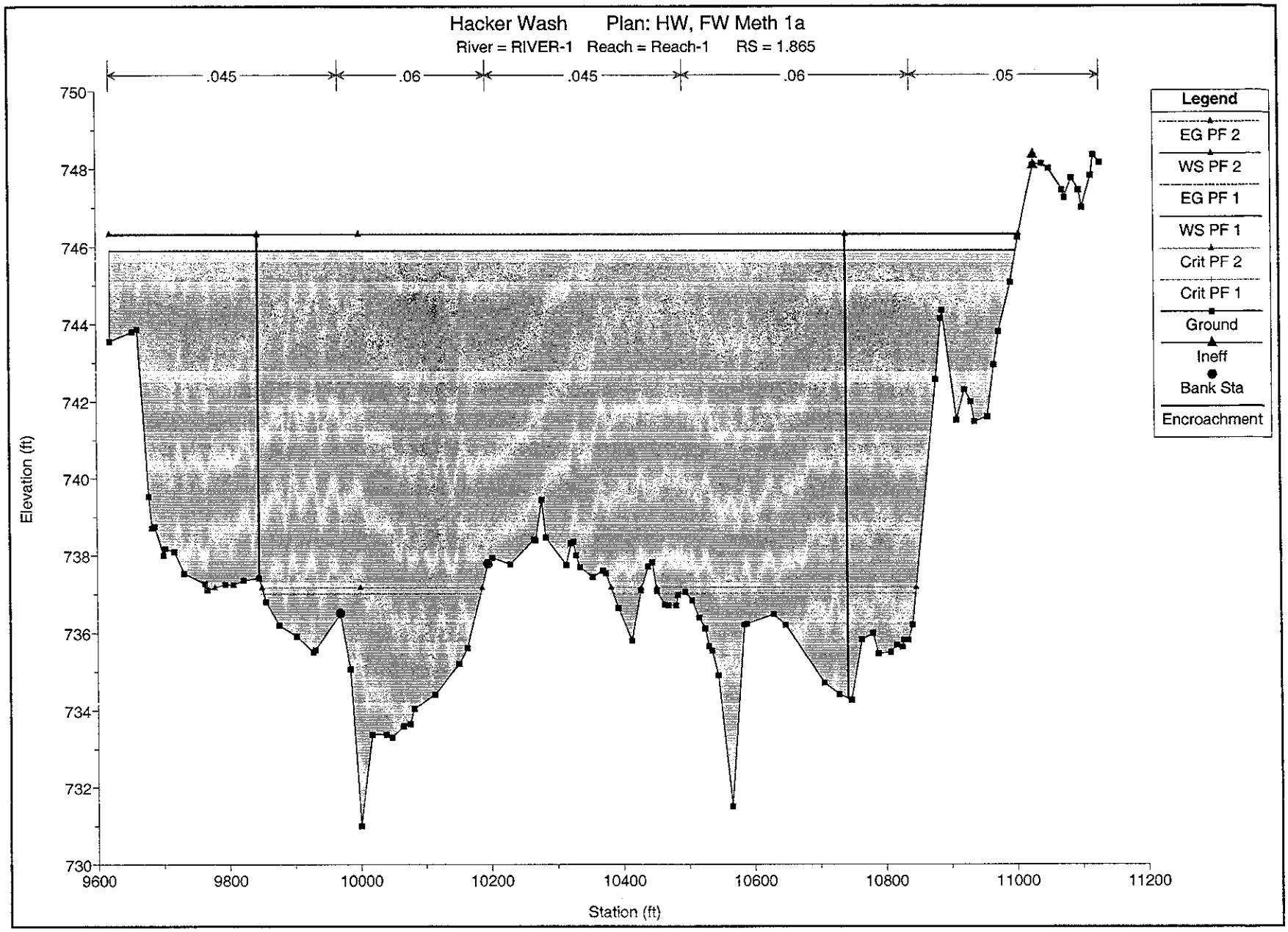

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 2.416
.045
.06
.05
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
754
752
750
748
746
744
742
740
9600
9800
10000
10200
10400
10600
10800
Station (ft)

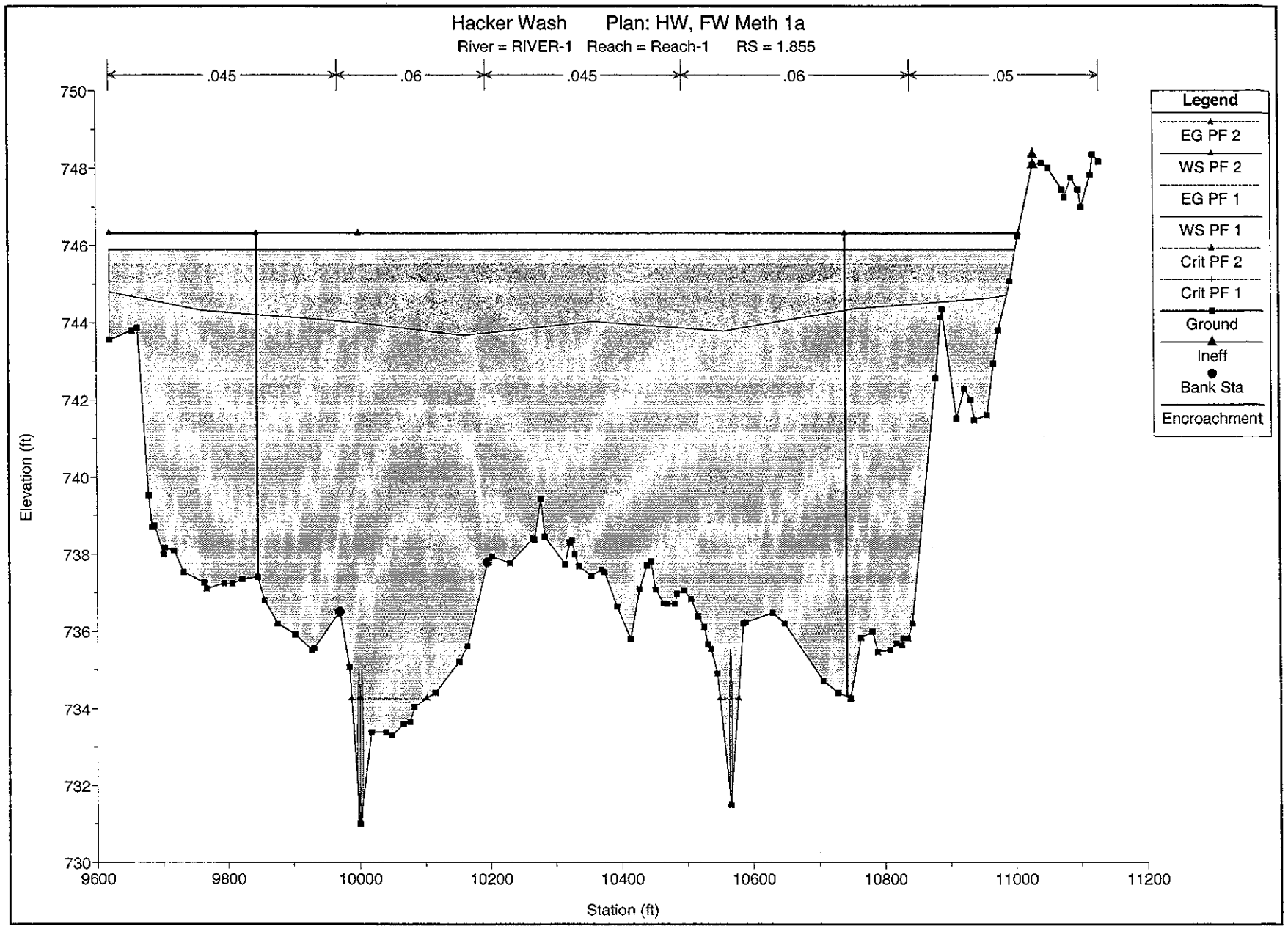

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 2.298
.045
.06
.05
Elevation (ft)
750
748
746
744
742
740
738
736
734
9800
10000
10200
10400
10600
10800
11000
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment

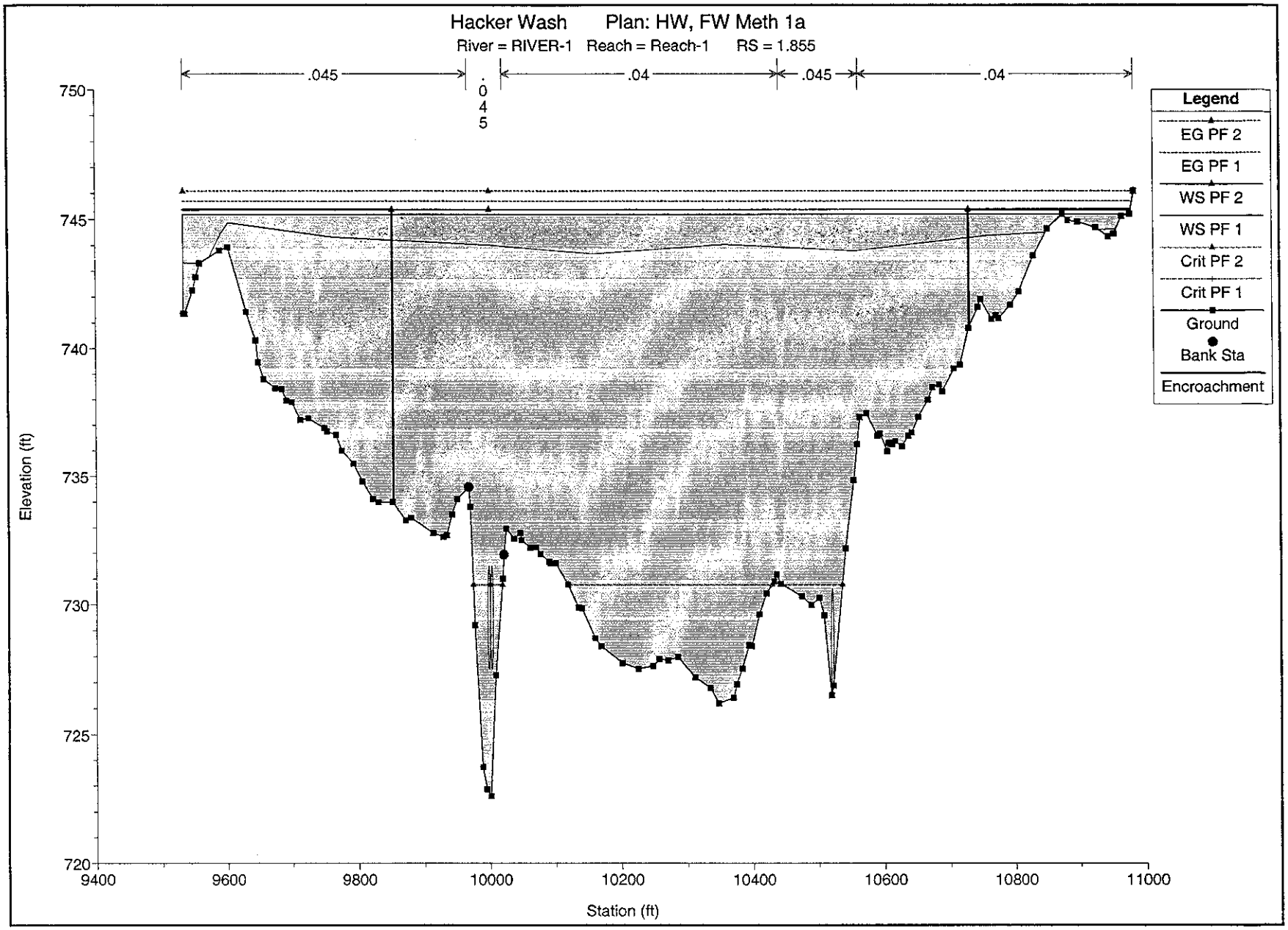

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 2.204 conveyance through borrow pit
.045
.06
.05
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
748
746
744
742
740
738
736
734
732
9800
10000
10200
10400
10600
10800
11000
Station (ft)

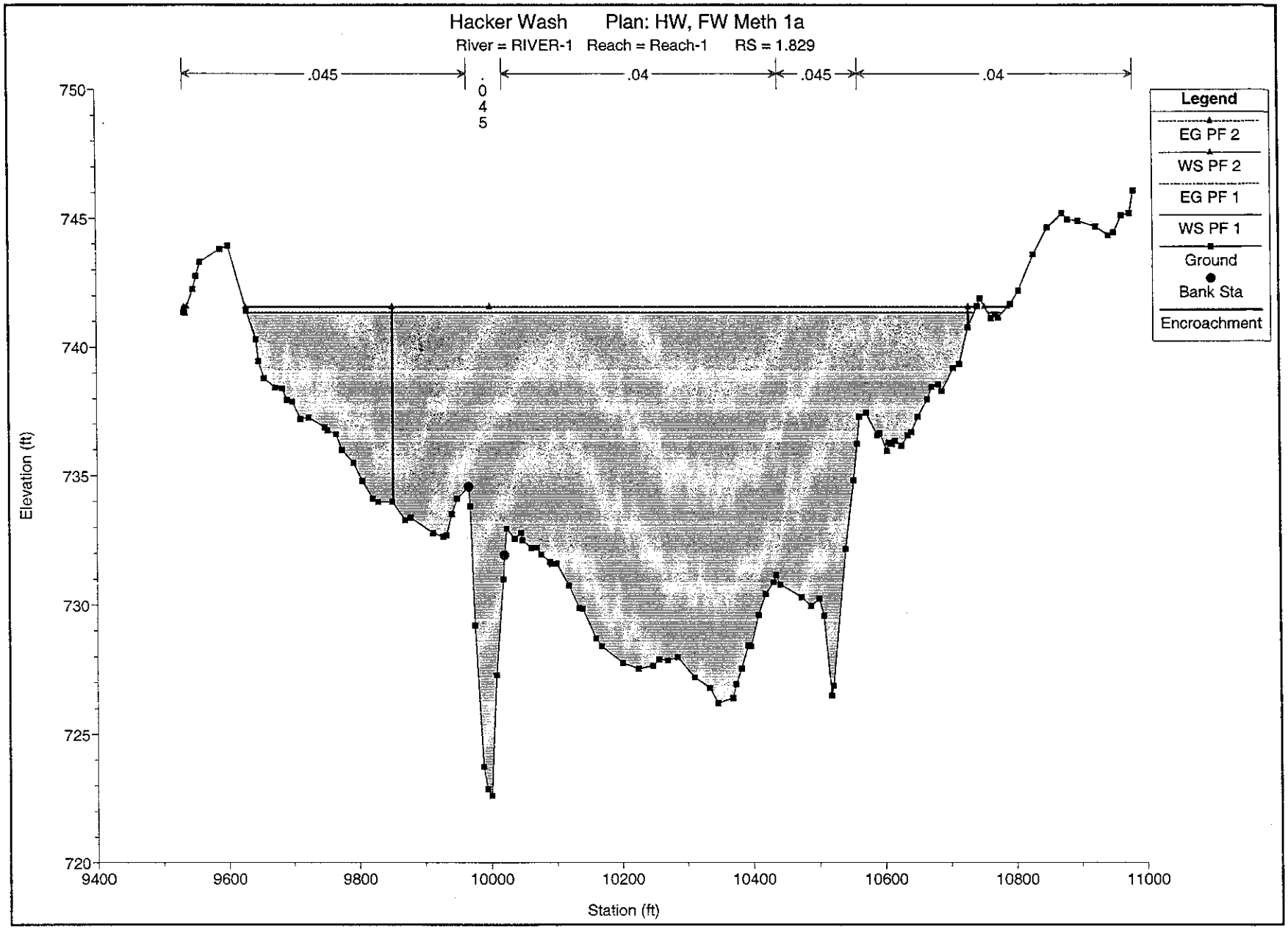

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 2.030
.045
.06
.05
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
748
746
744
742
740
738
736
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

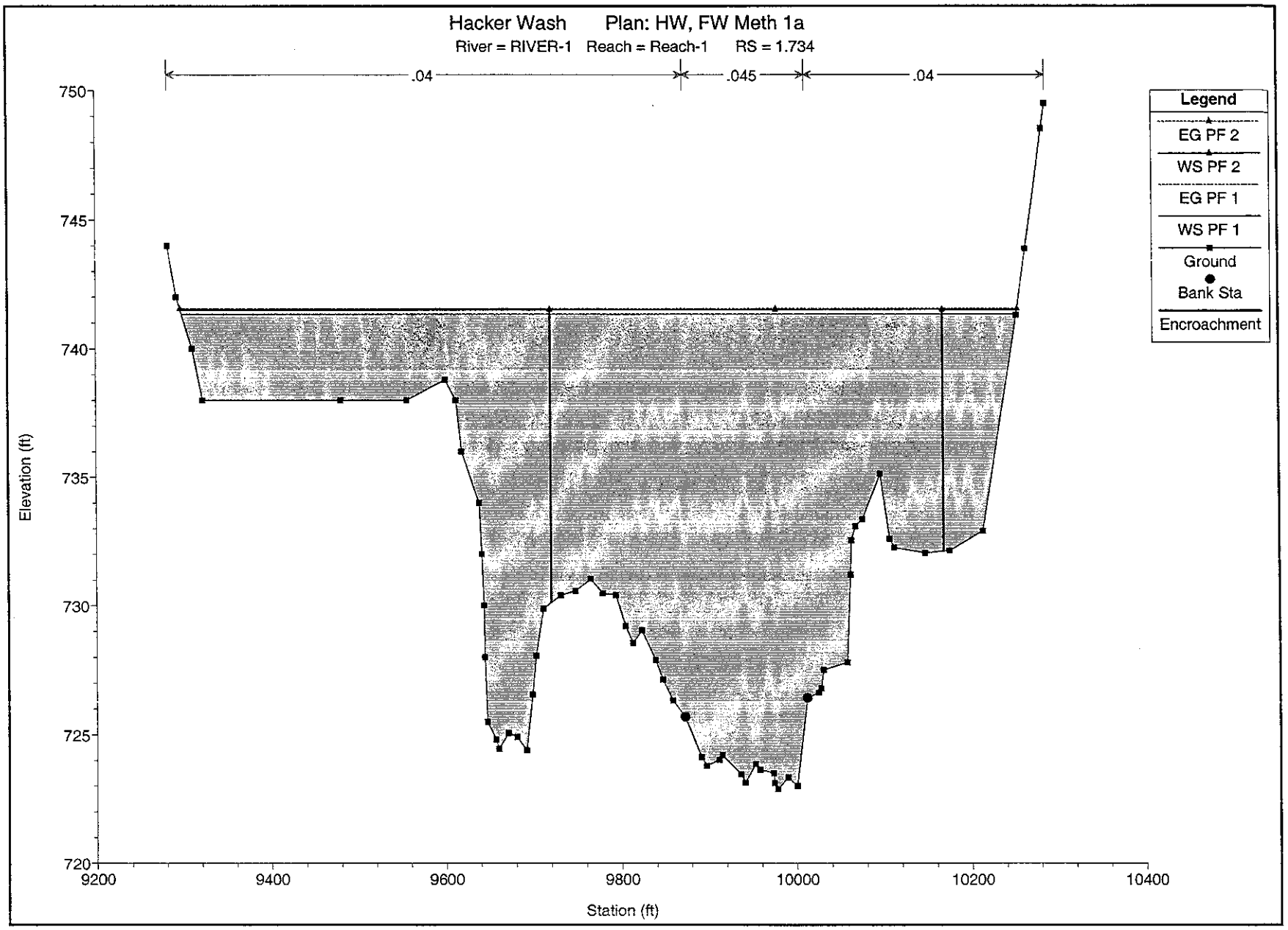

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.952
.045
.06
.05
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
748
746
744
742
740
738
736
734
9200
9400
9600
9800
10000
10200
10400
Station (ft)

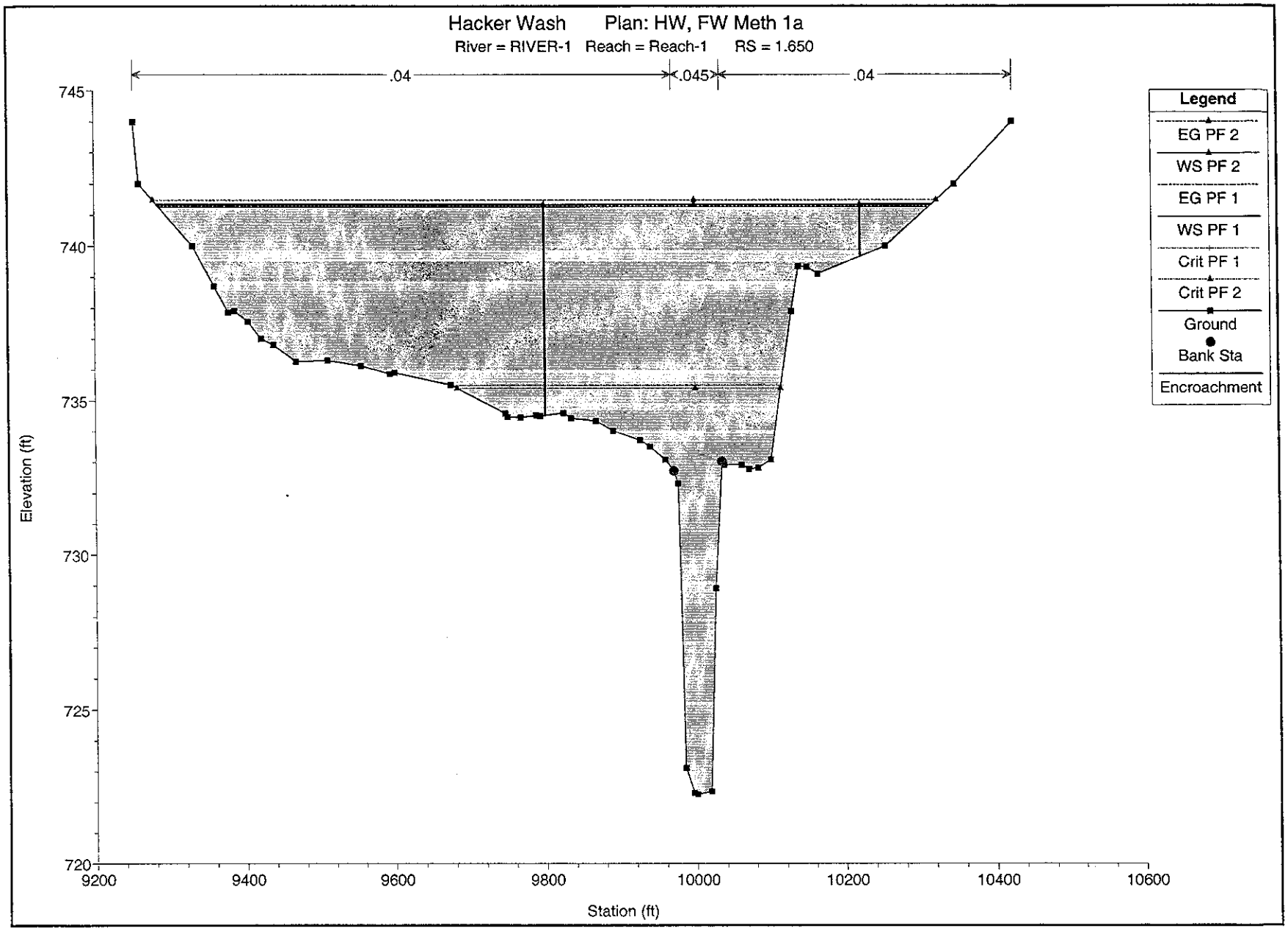

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.865
.045
.06
.045
.06
.05
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
750
748
746
744
742
740
738
736
734
732
730
9600
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

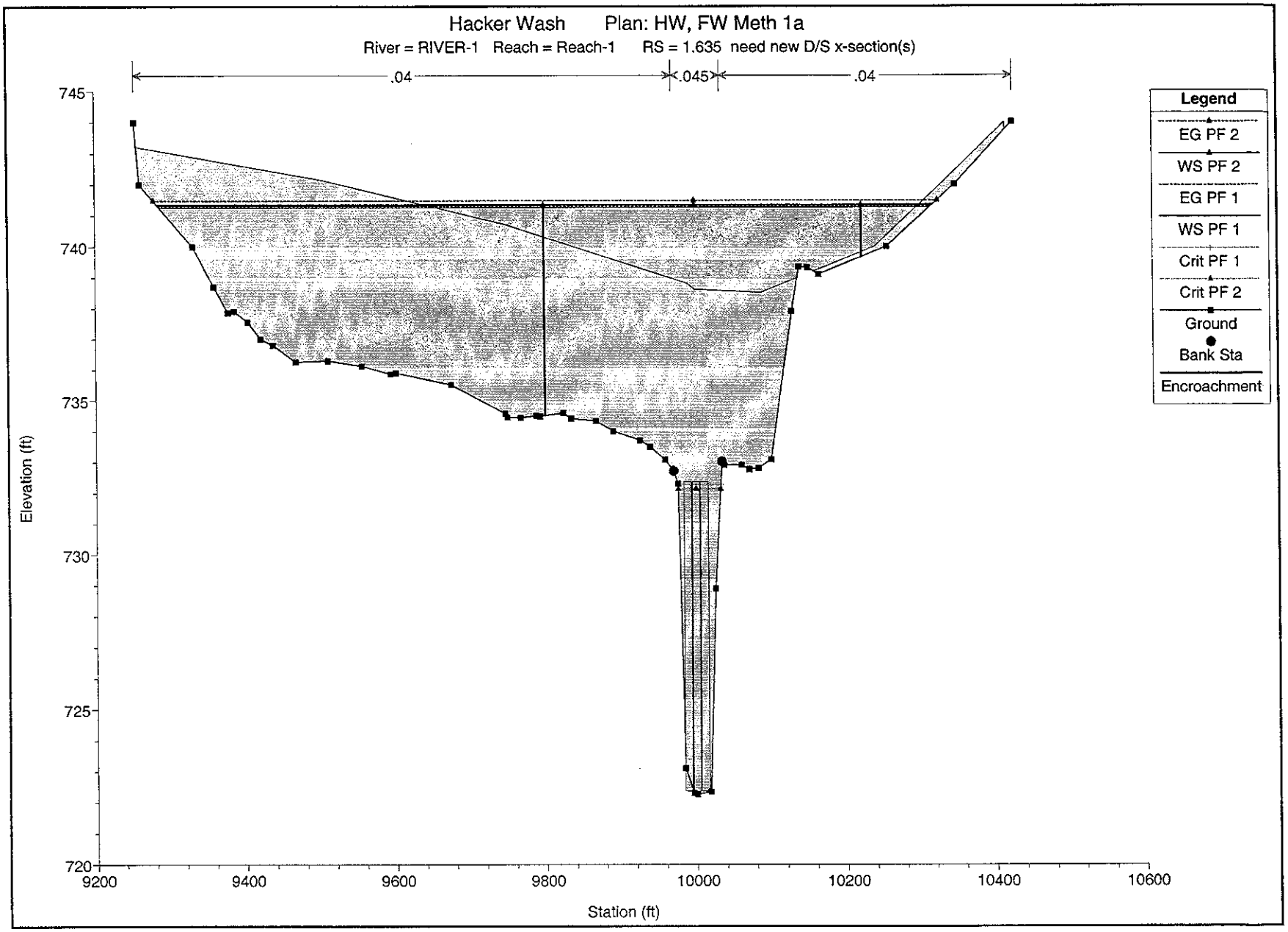

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.855
.045
.06
.045
.06
.05
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
750
748
746
744
742
740
738
736
734
732
730
9600
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

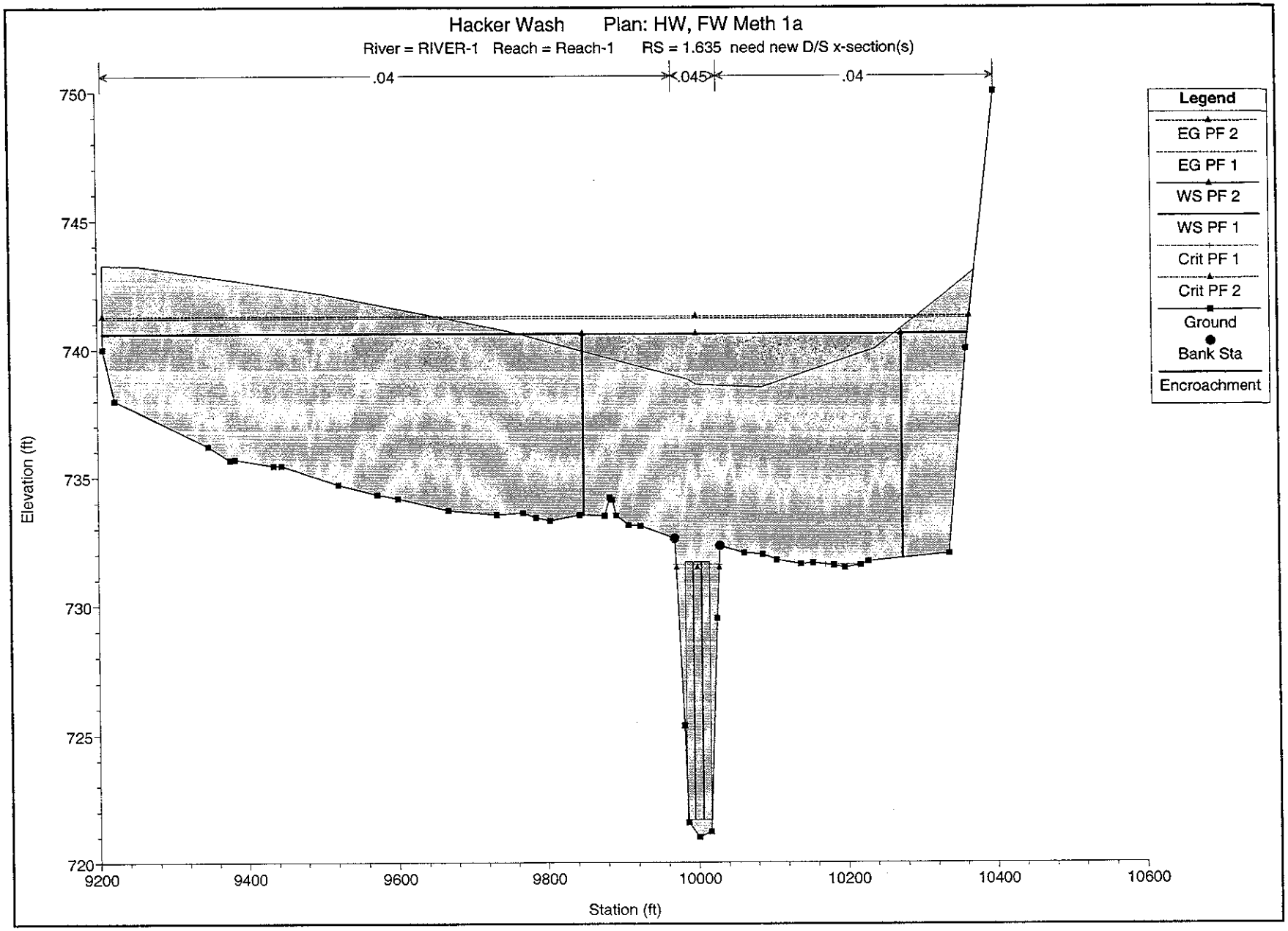

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.855
.045
.045
.04
.045
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
750
745
740
735
730
725
720
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

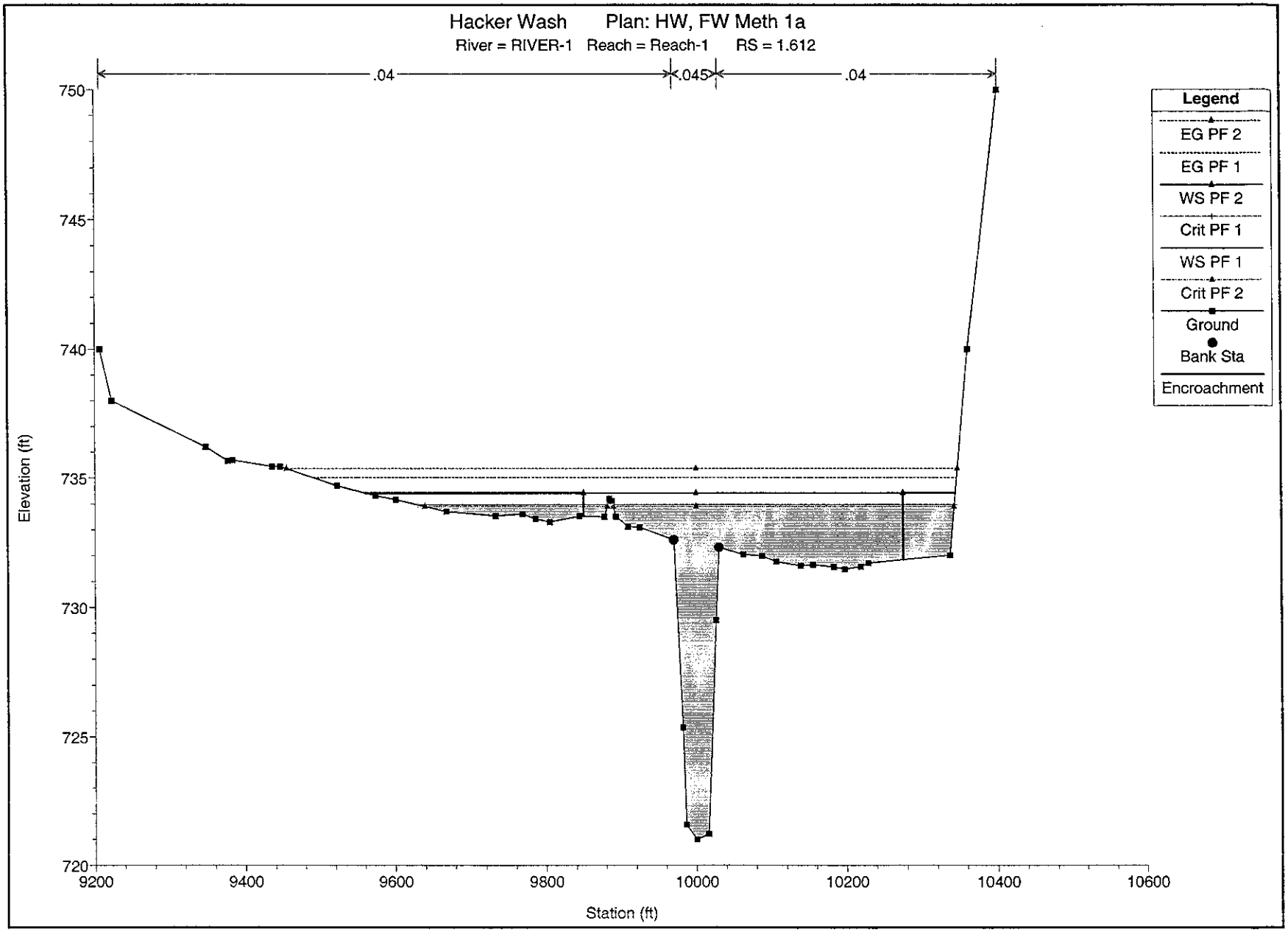

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.829
.045
.045
.04
.045
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
750
745
740
735
730
725
720
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

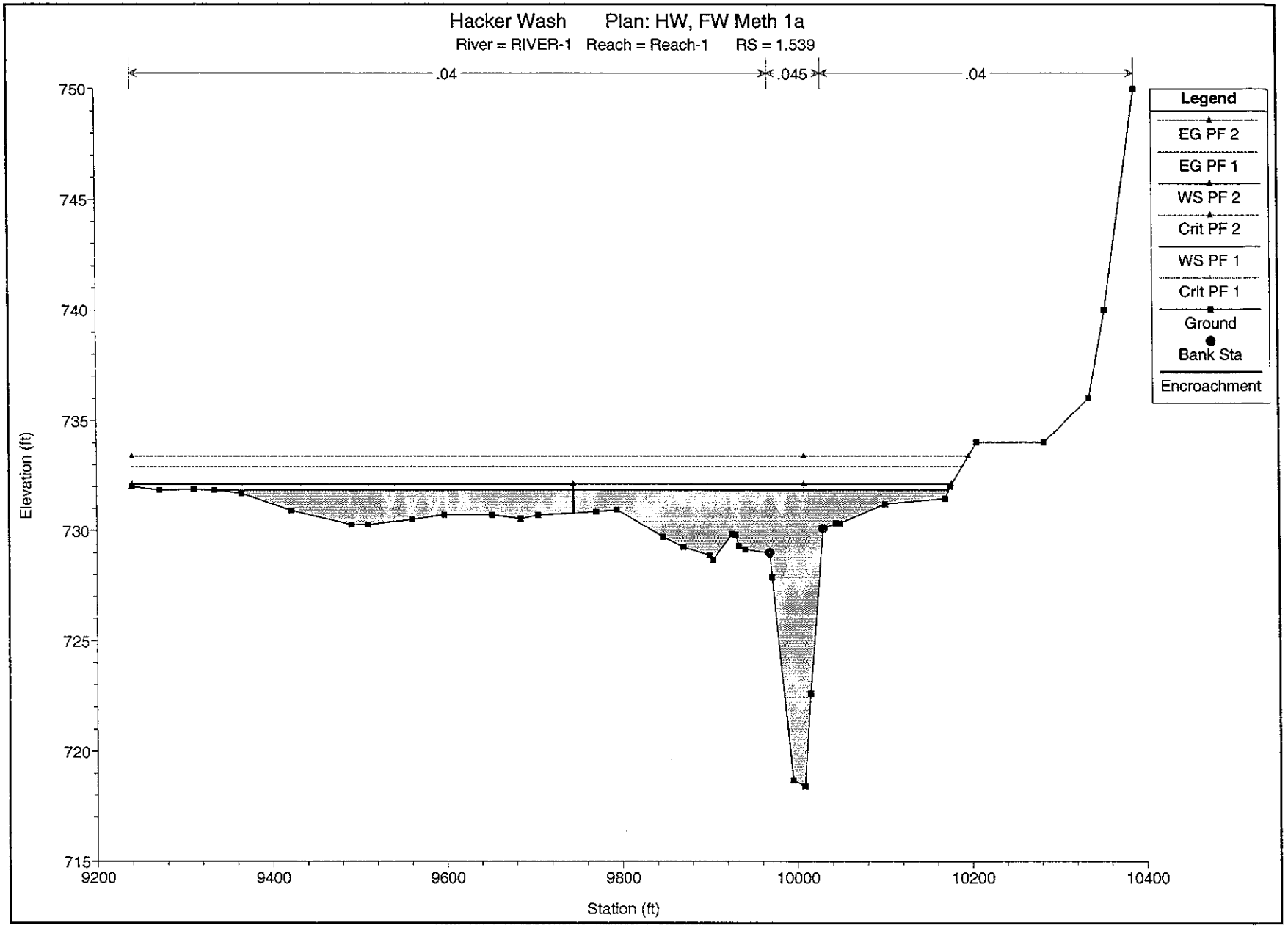

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.734
.04
.045
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
750
745
740
735
730
725
720
9200
9400
9600
9800
10000
10200
10400
Station (ft)

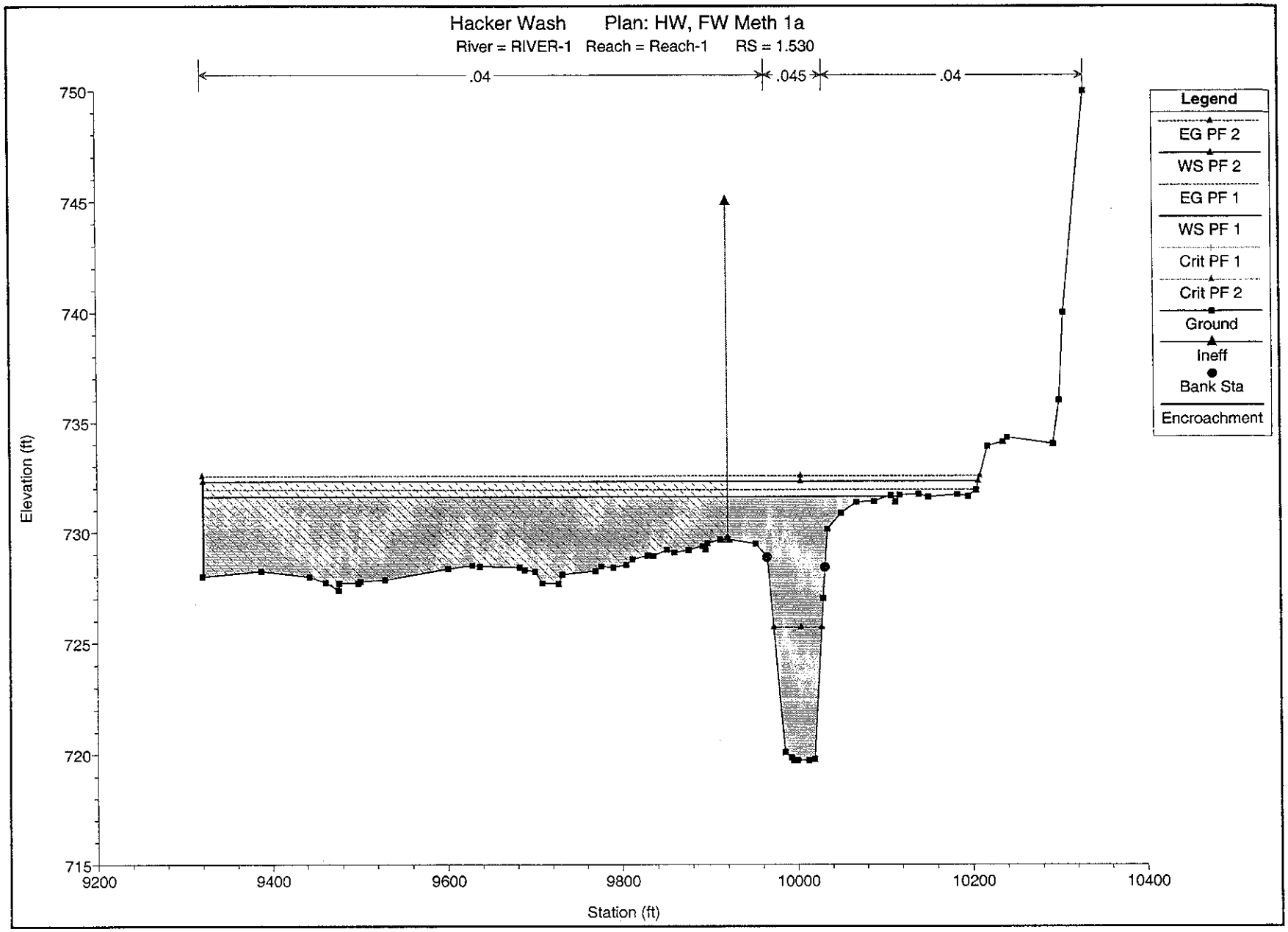

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.650
.04
.045
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
745
740
735
730
725
720
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

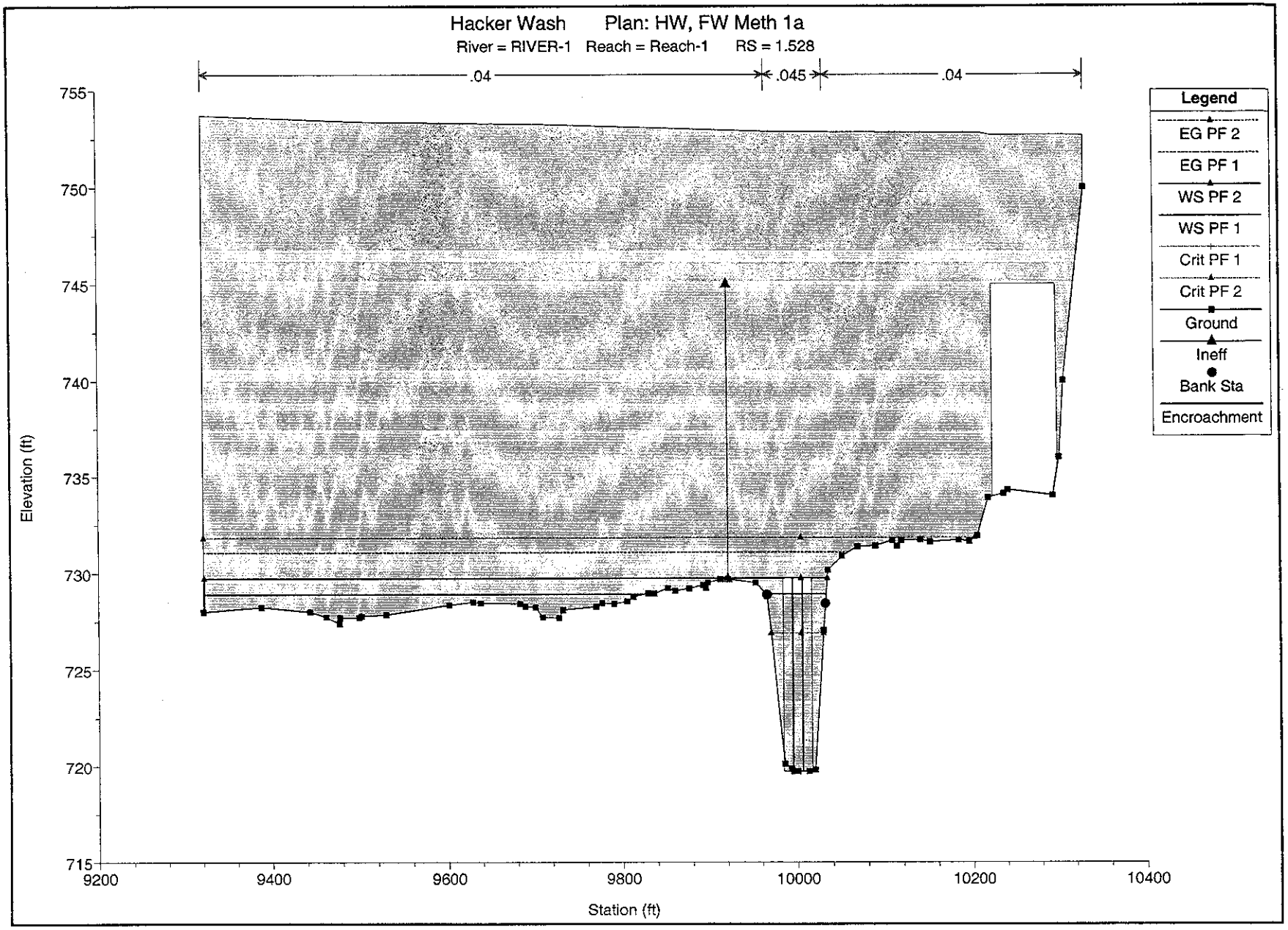

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.635 need new D/S x-section(s)
.04
.045
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
745
740
735
730
725
720
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

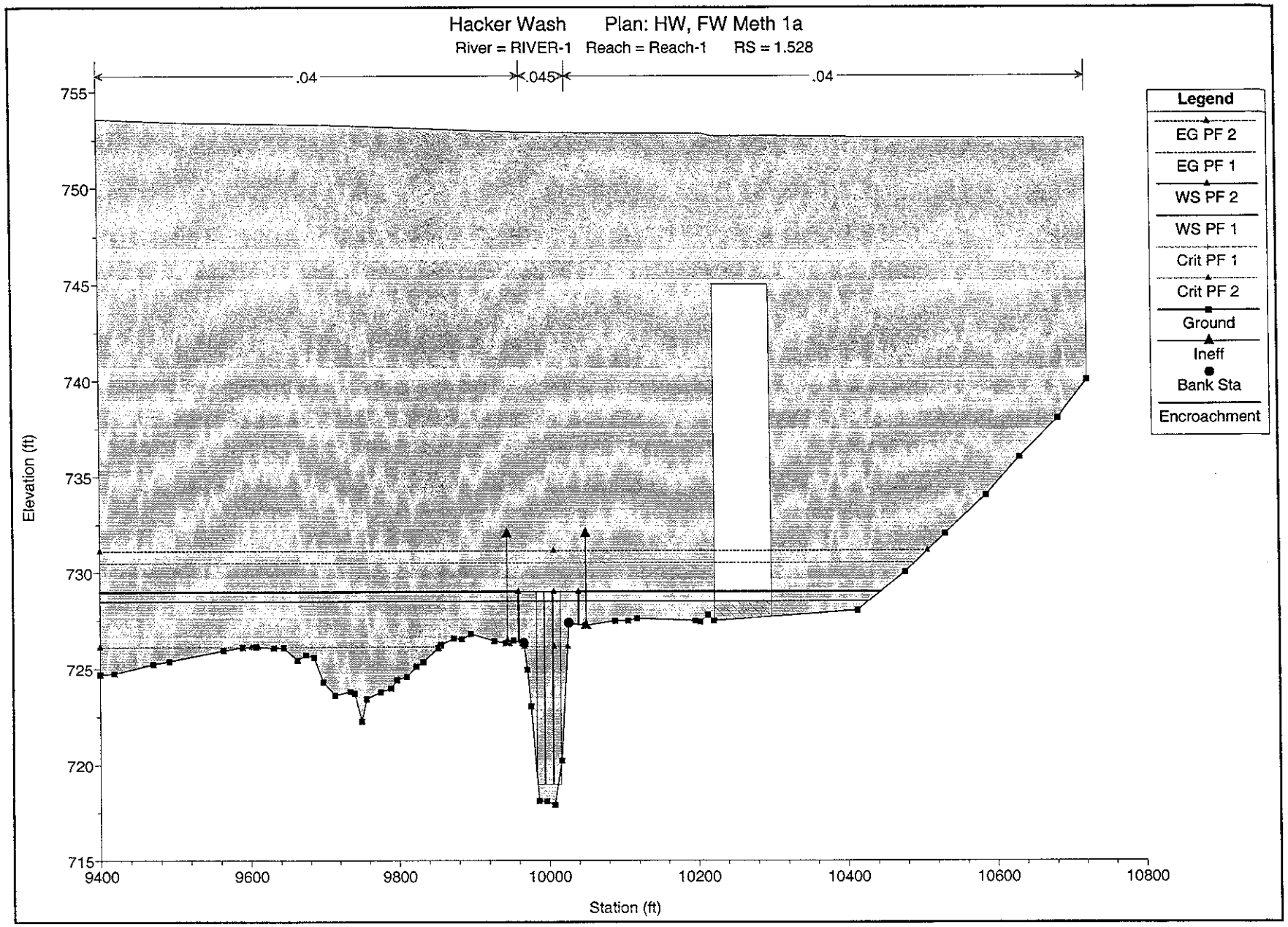

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.635 need new D/S x-section(s)
.04
.045
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
750
745
740
735
730
725
720
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

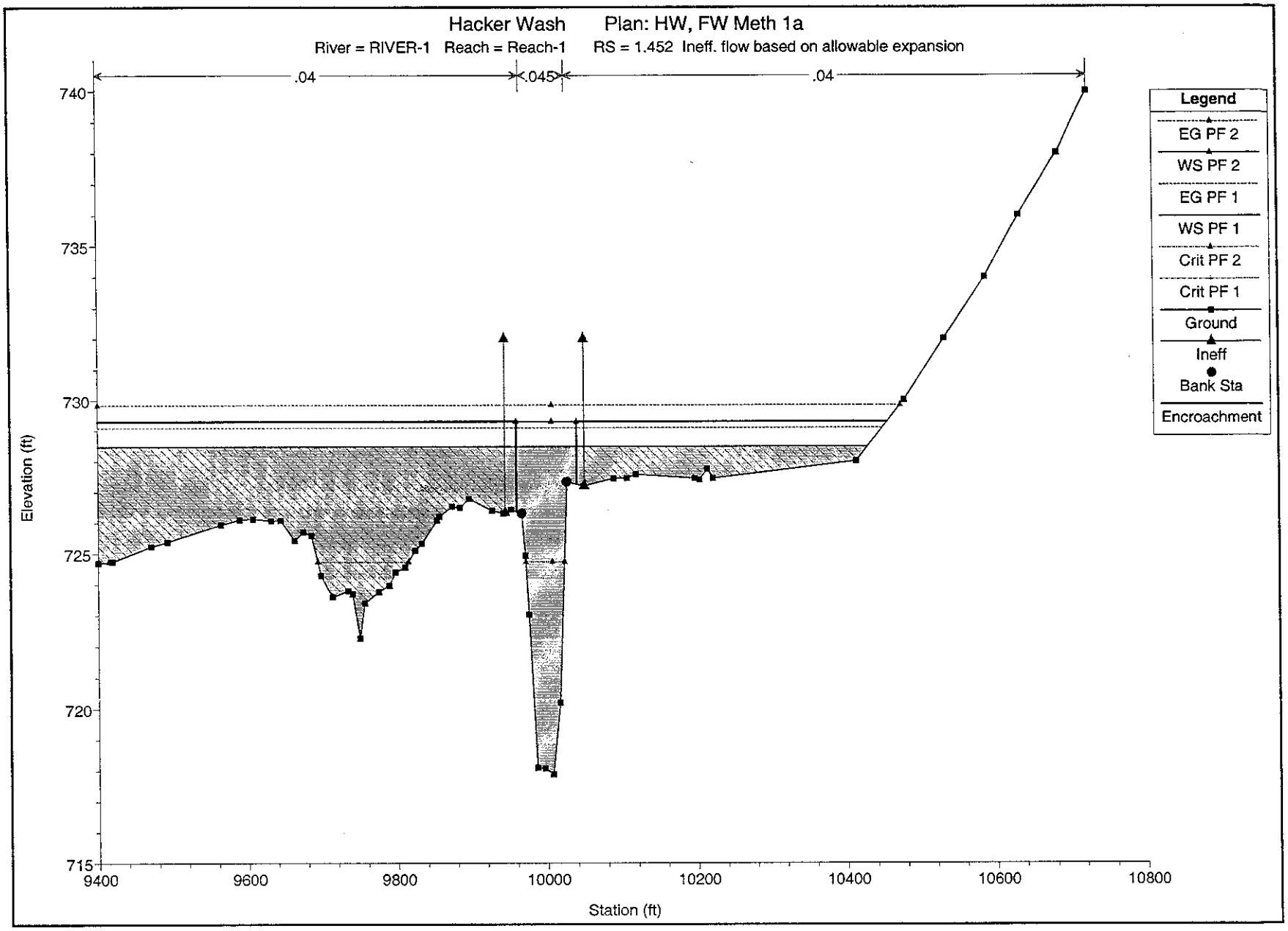

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.612
.04
.045
.04
Legend
EG PF 2
EG PF 1
WS PF 2
Crit PF 1
WS PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
750
745
740
735
730
725
720
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

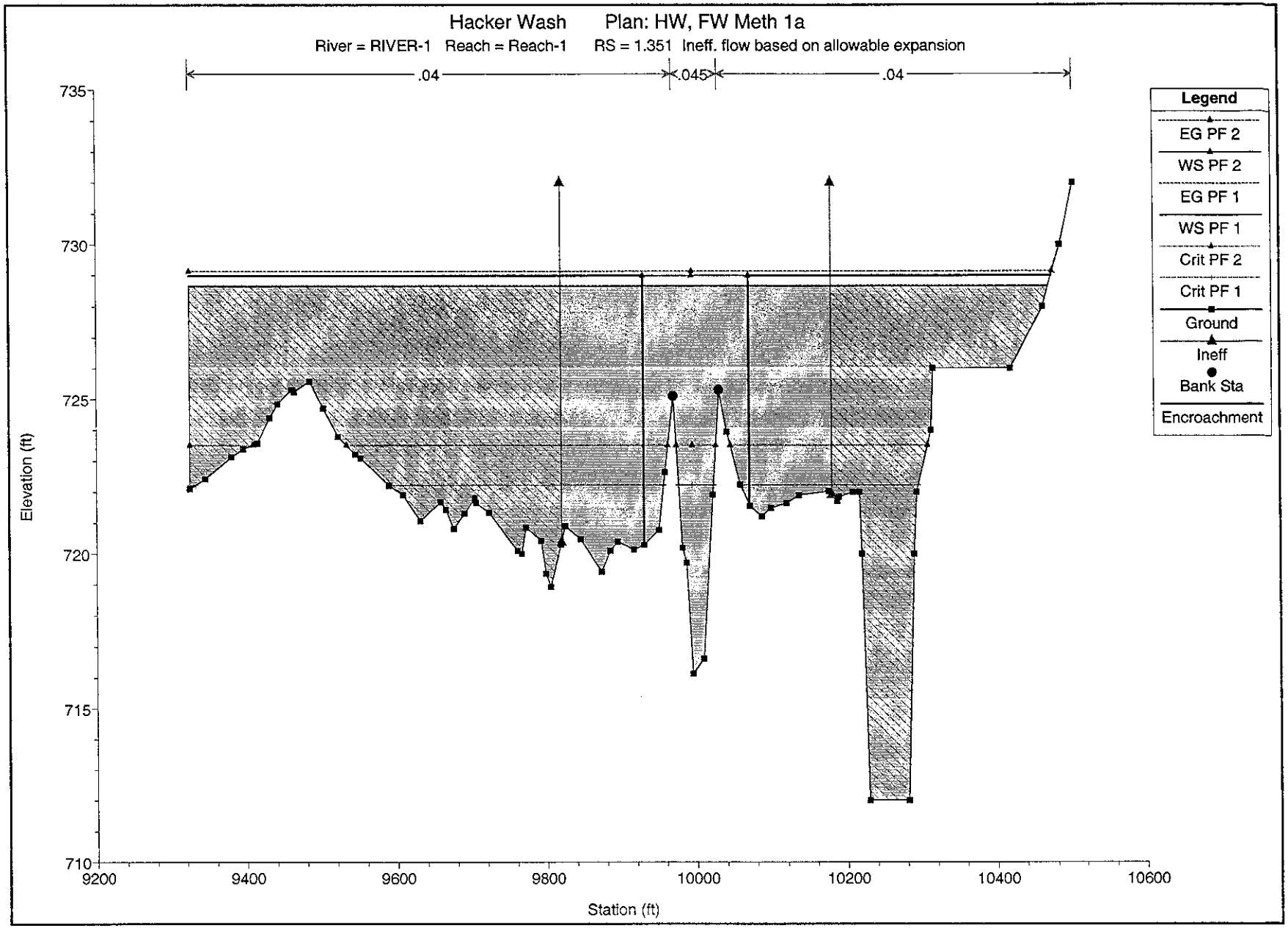

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.539
.04
.045
.04
Legend
EG PF 2
EG PF 1
WS PF 2
Crit PF 2
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
750
745
740
735
730
725
720
715
9200
9400
9600
9800
10000
10200
10400
Station (ft)

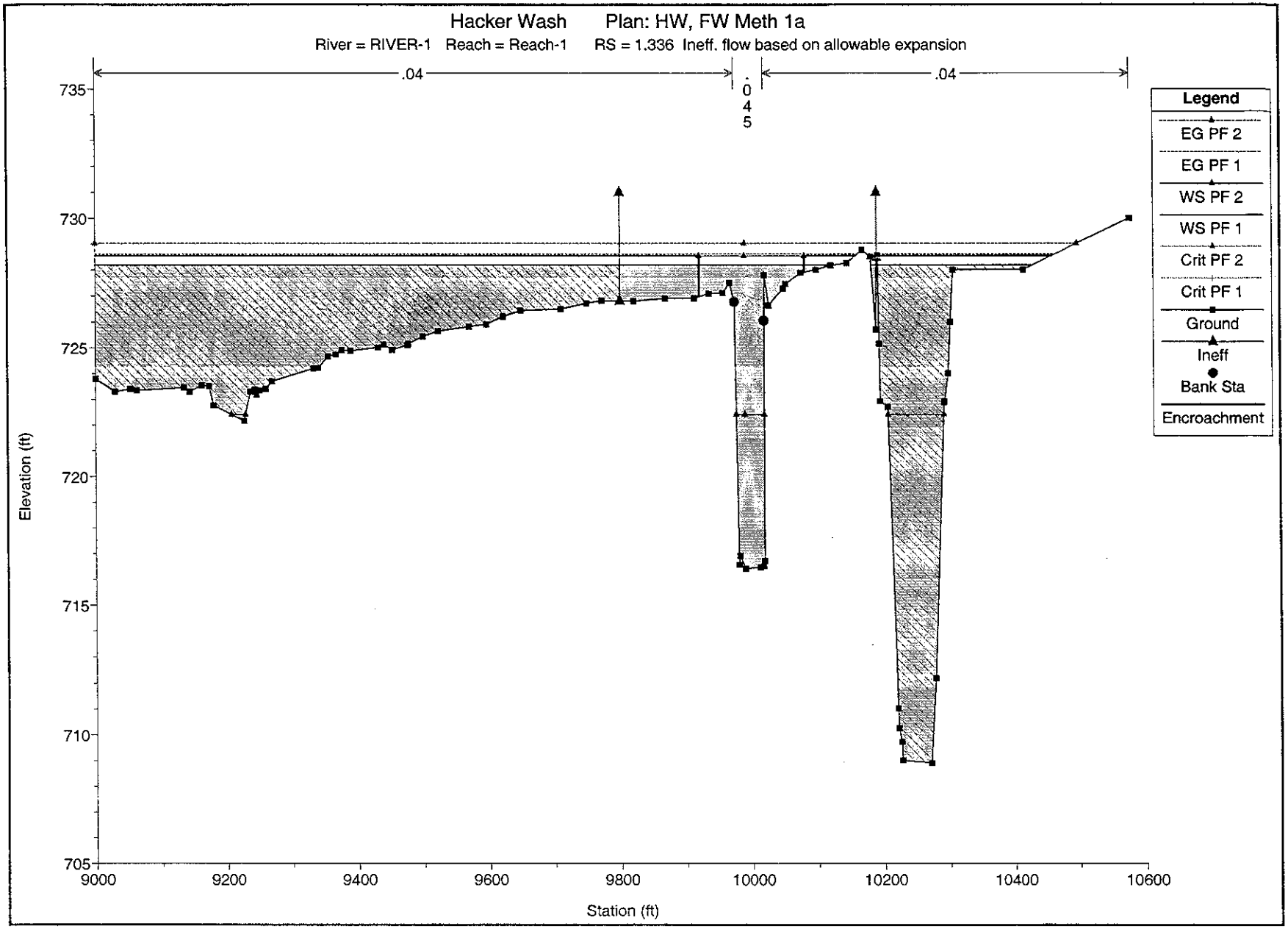

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.530
.04
.045
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
750
745
740
735
730
725
720
715
9200
9400
9600
9800
10000
10200
10400
Station (ft)

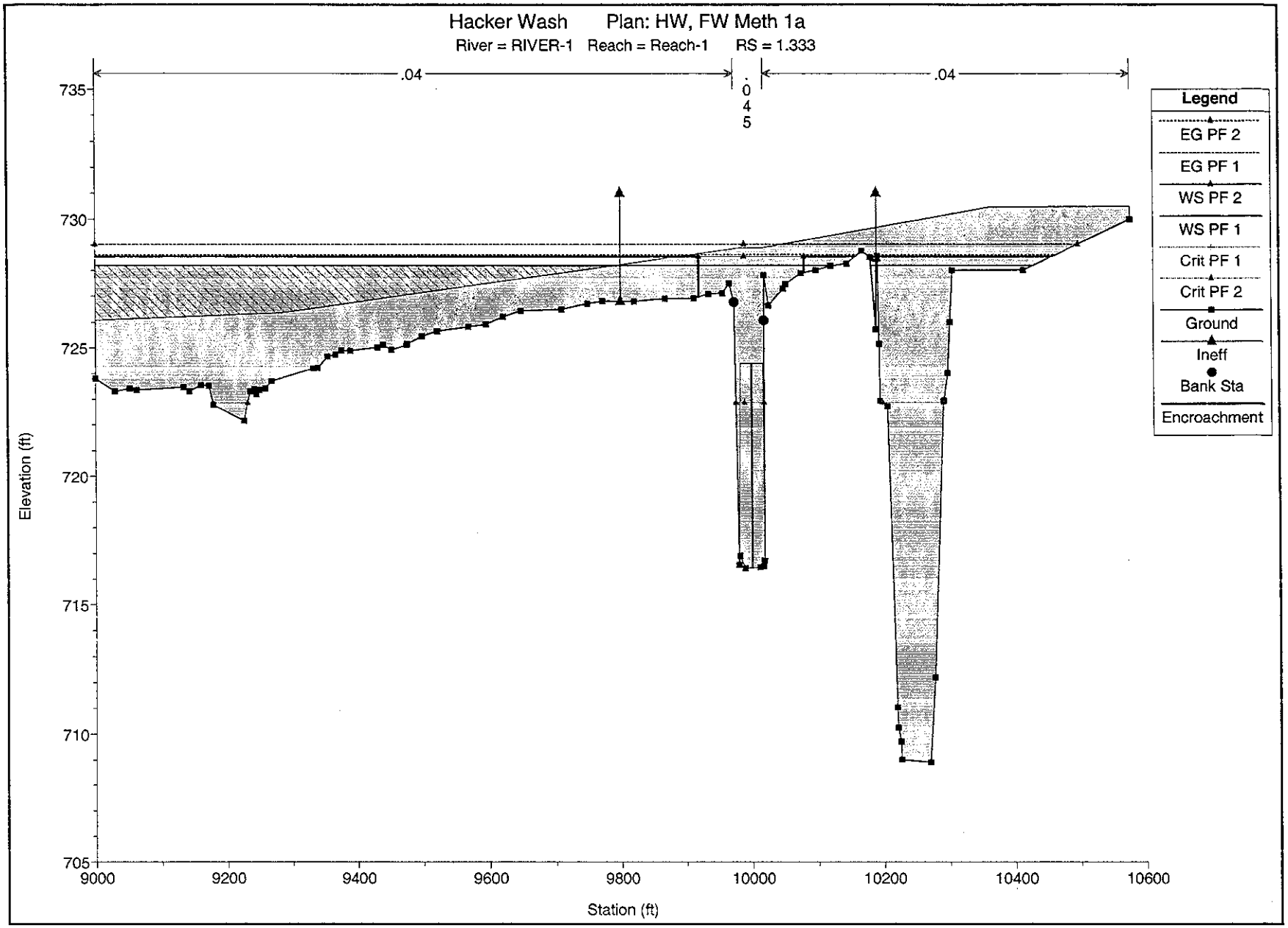

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.528
.04
.045
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
755
750
745
740
735
730
725
720
715
9200
9400
9600
9800
10000
10200
10400
Station (ft)

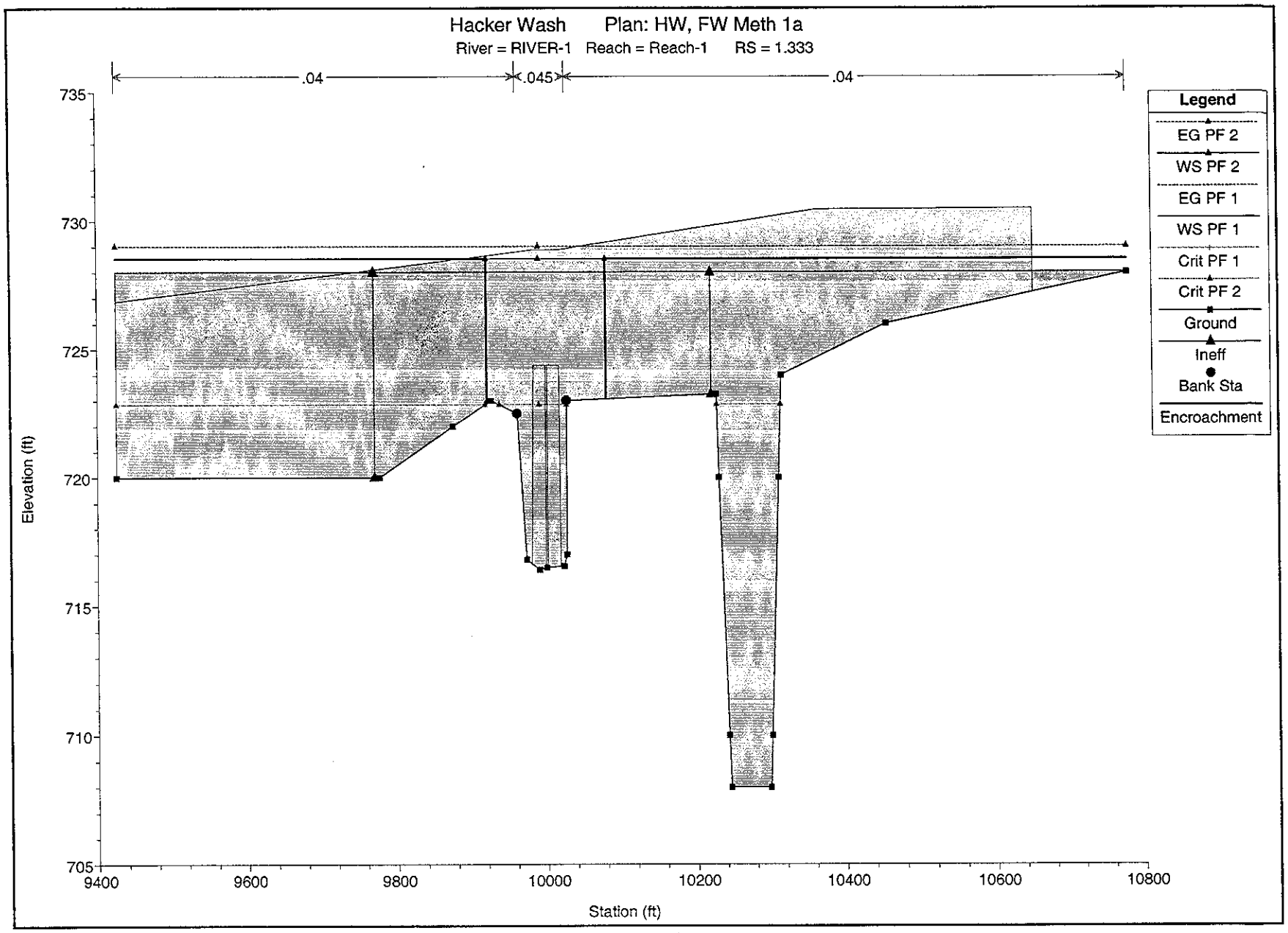

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.528
.04
.045
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
755
750
745
740
735
730
725
720
715
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

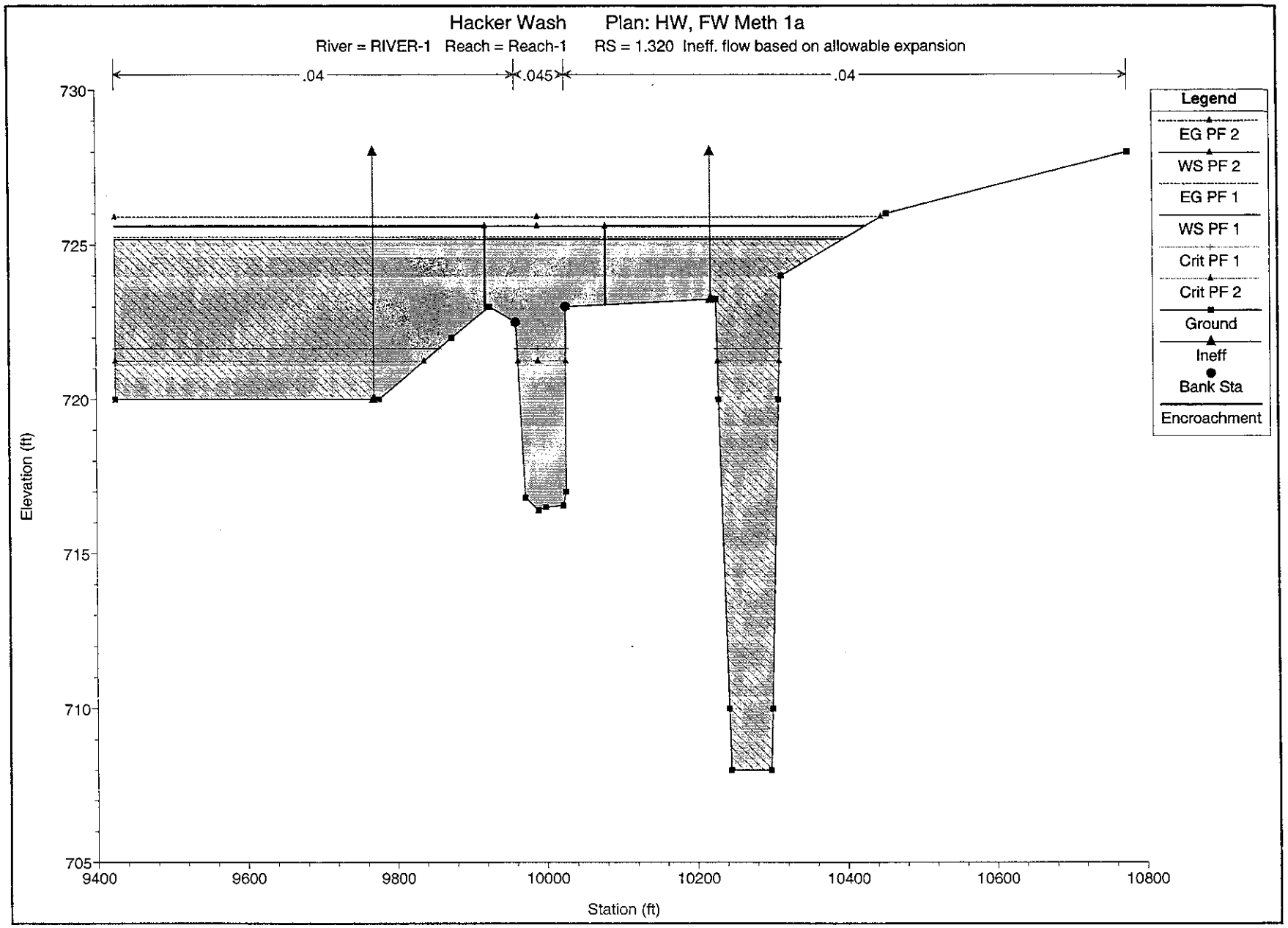

Hacker Wash
Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.452 Ineff. flow based on allowable expansion
.04
.045
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
740
735
730
725
720
715
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

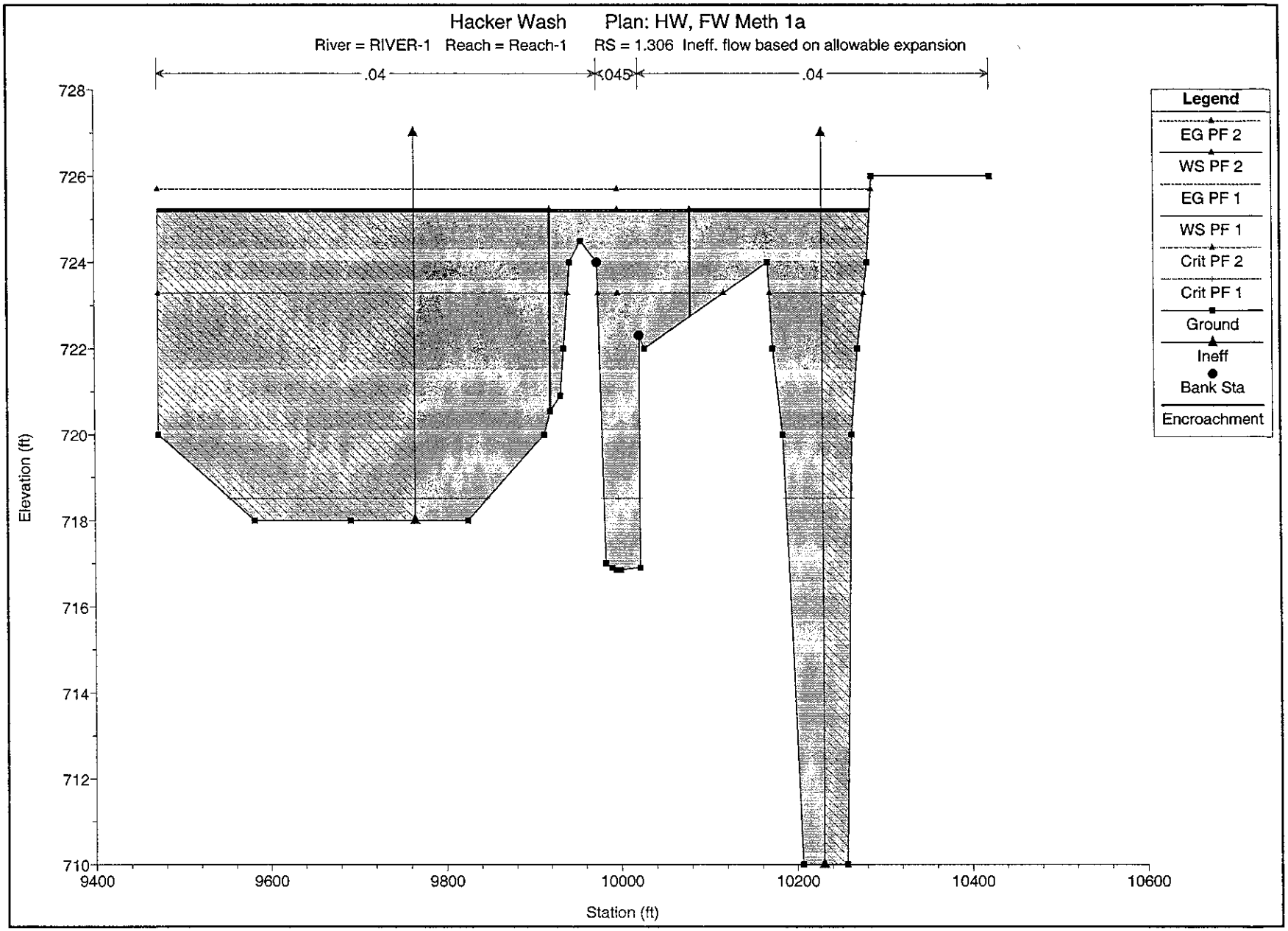

Hacker Wash
Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.351 Ineff. flow based on allowable expansion
.04
.045
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
735
730
725
720
715
710
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

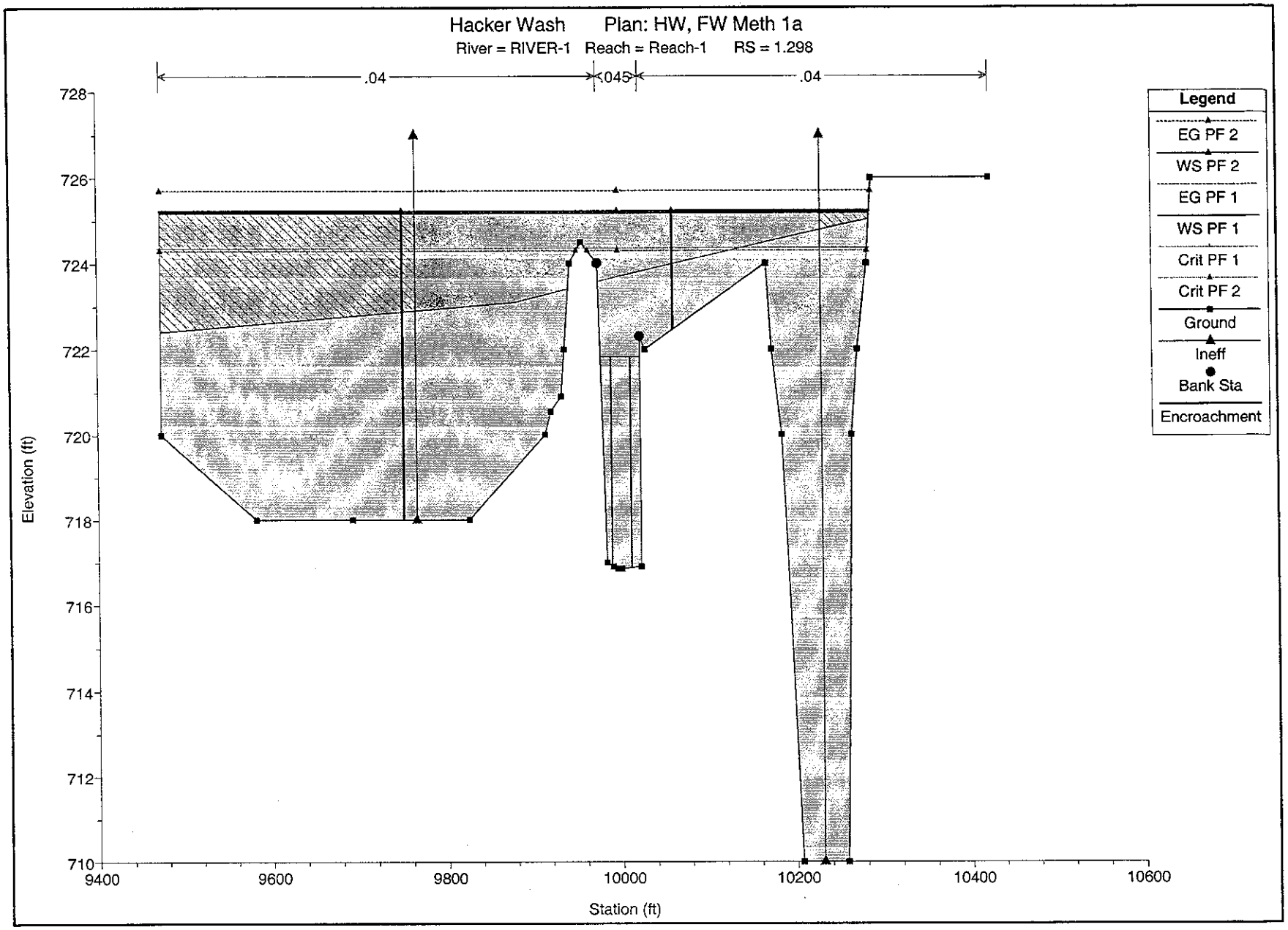

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.336 Ineff. flow based on allowable expansion
.04
.045
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
735
730
725
720
715
710
705
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

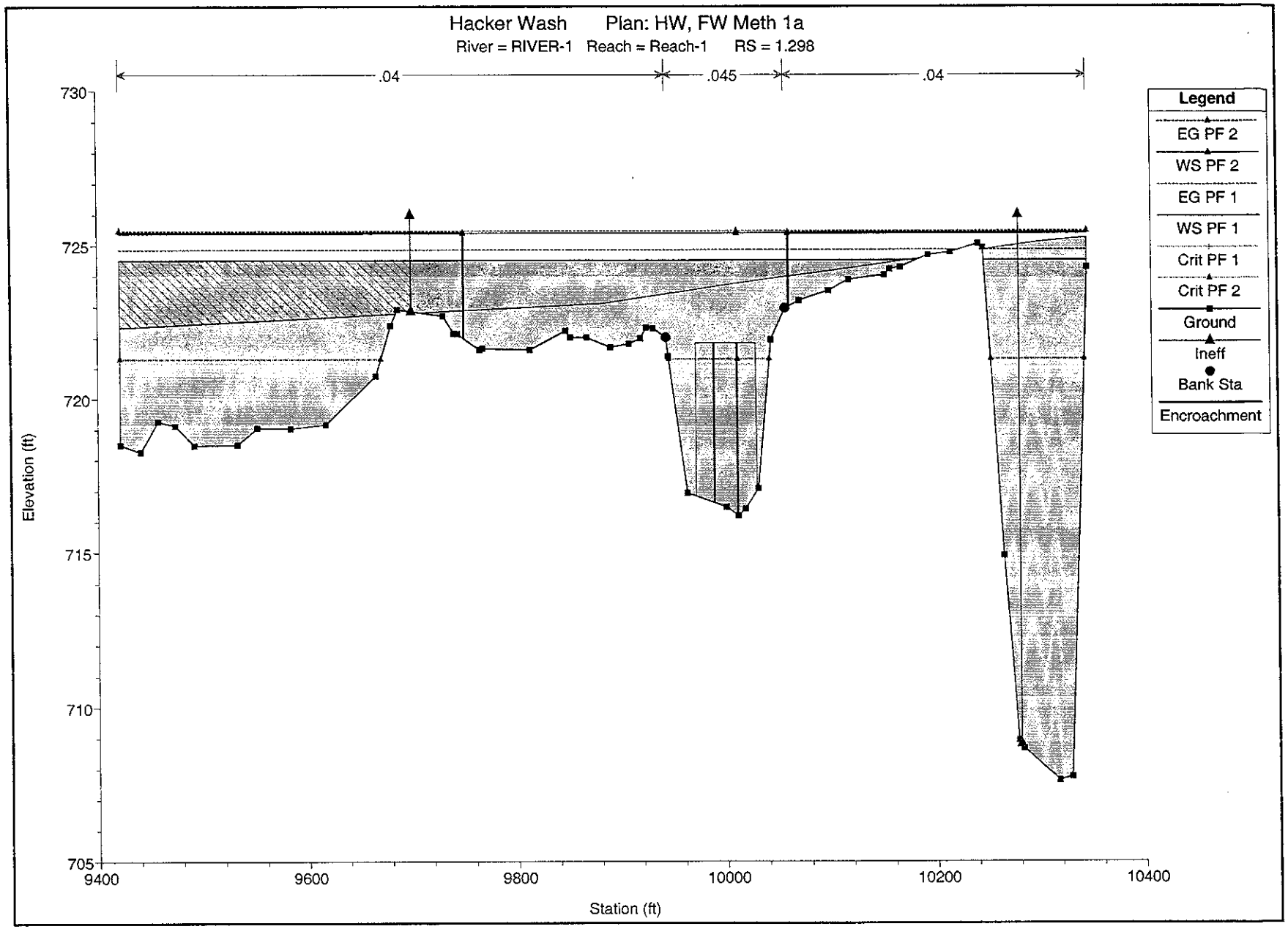

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.333
.04
.045
.04
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
735
730
725
720
715
710
705
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

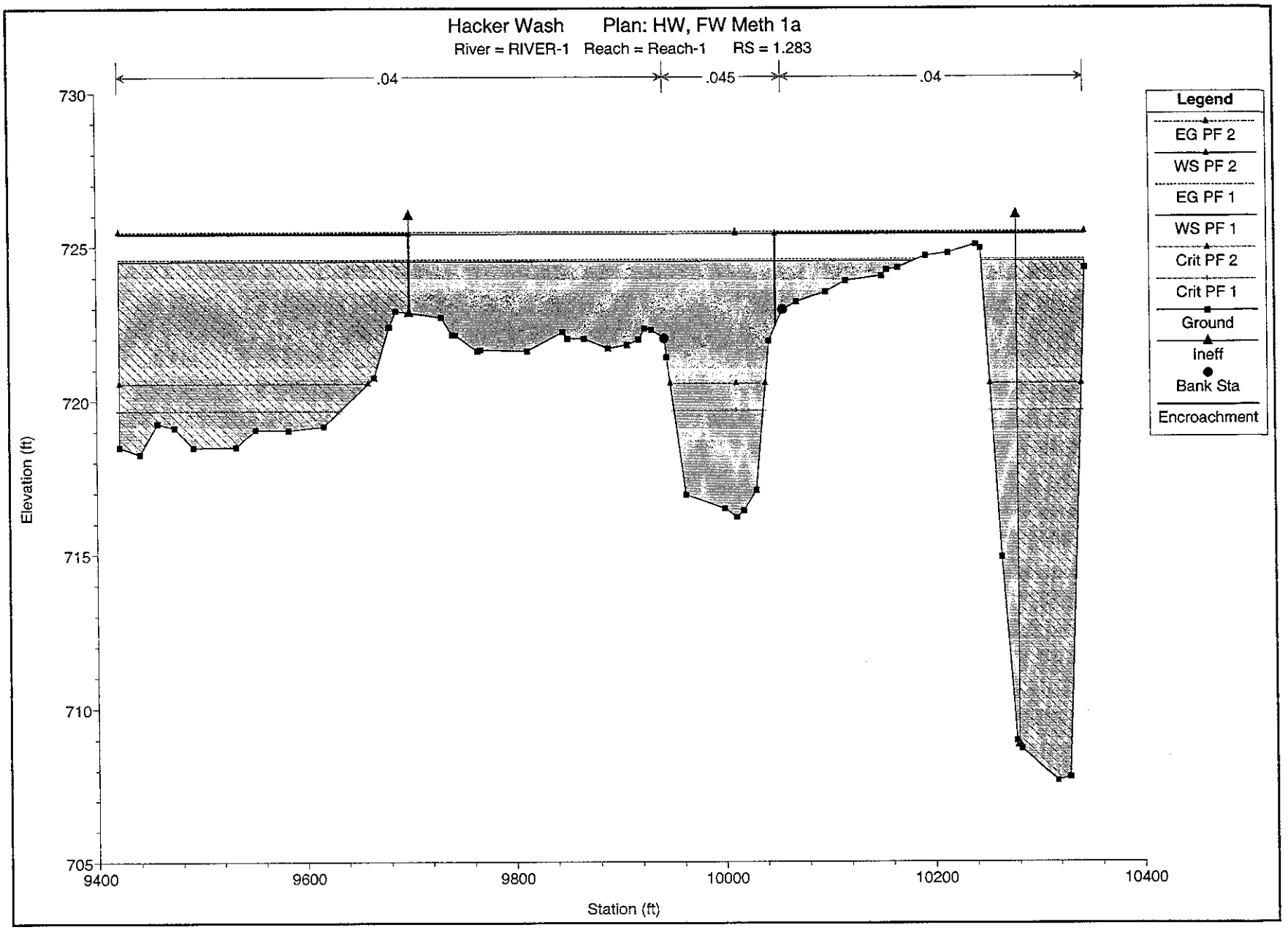

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.333
.04
.045
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
735
730
725
720
715
710
705
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

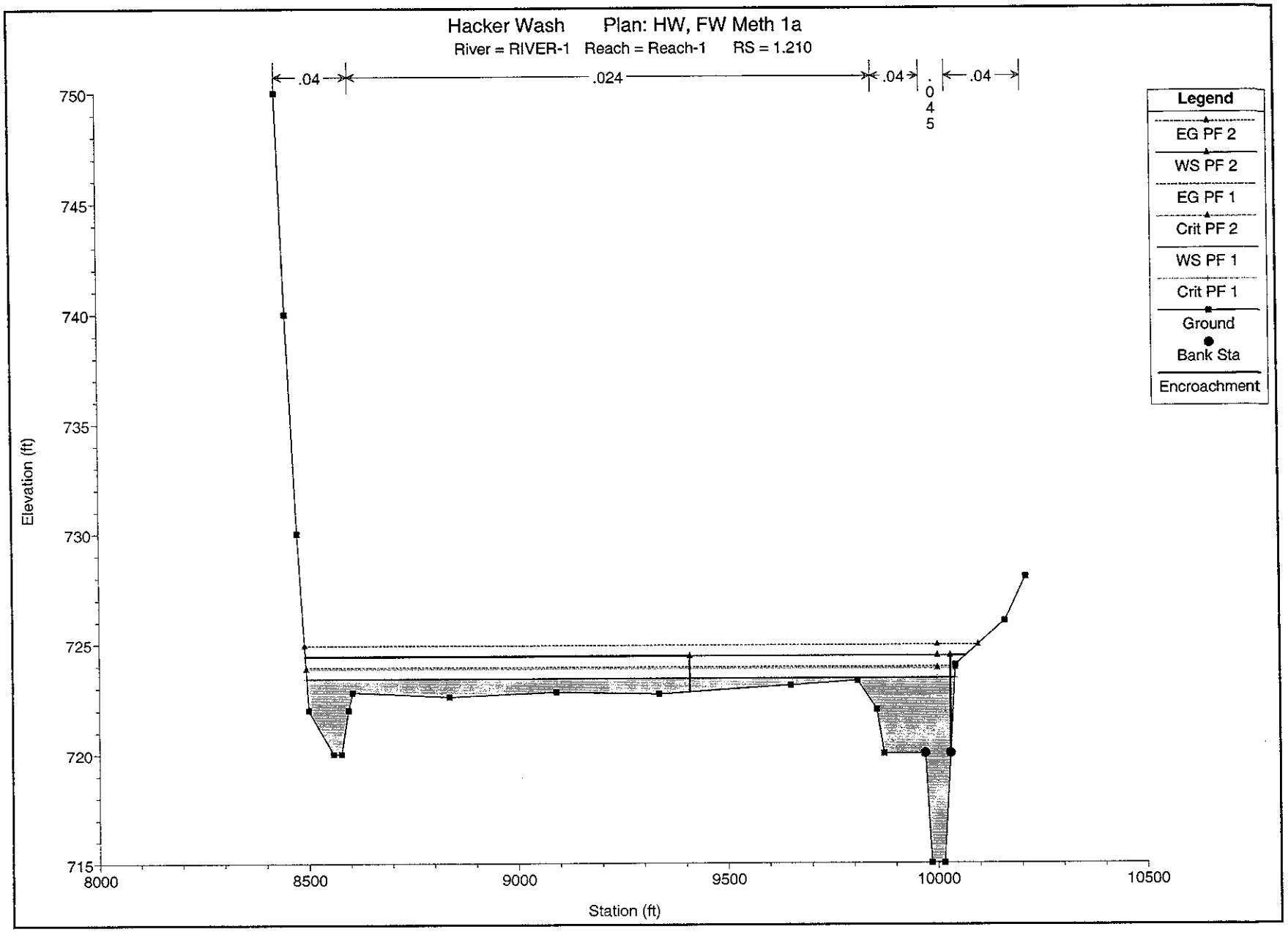

Hacker Wash
Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.320 Ineff. flow based on allowable expansion
.04
.045
.04
730
725
720
715
710
705
Elevation (ft)
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment

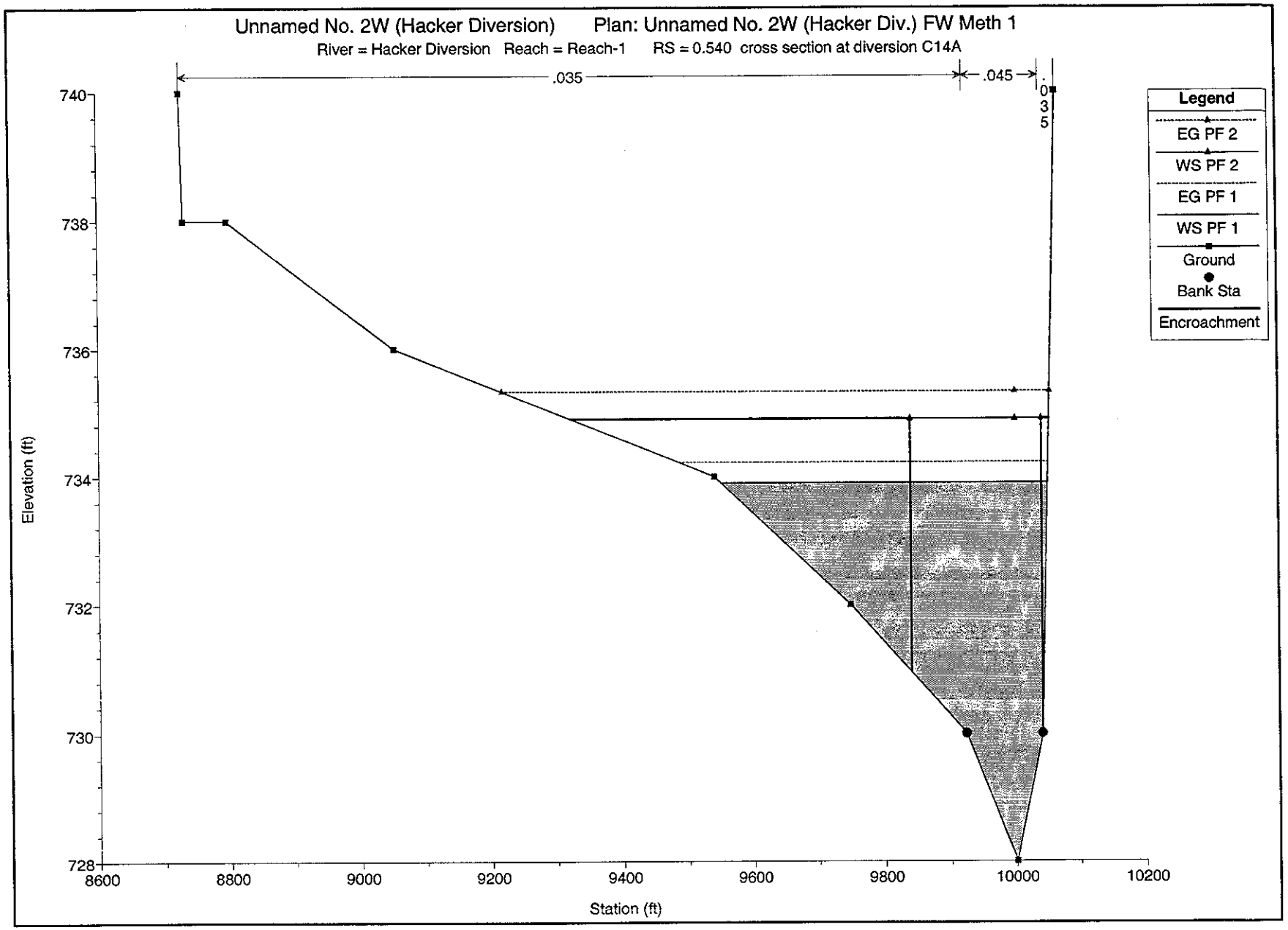

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.306 Ineff. flow based on allowable expansion
.04
.045
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
728
726
724
722
720
718
716
714
712
710
9400
9600
9800
10000
10200
10400
10600
Station (ft)

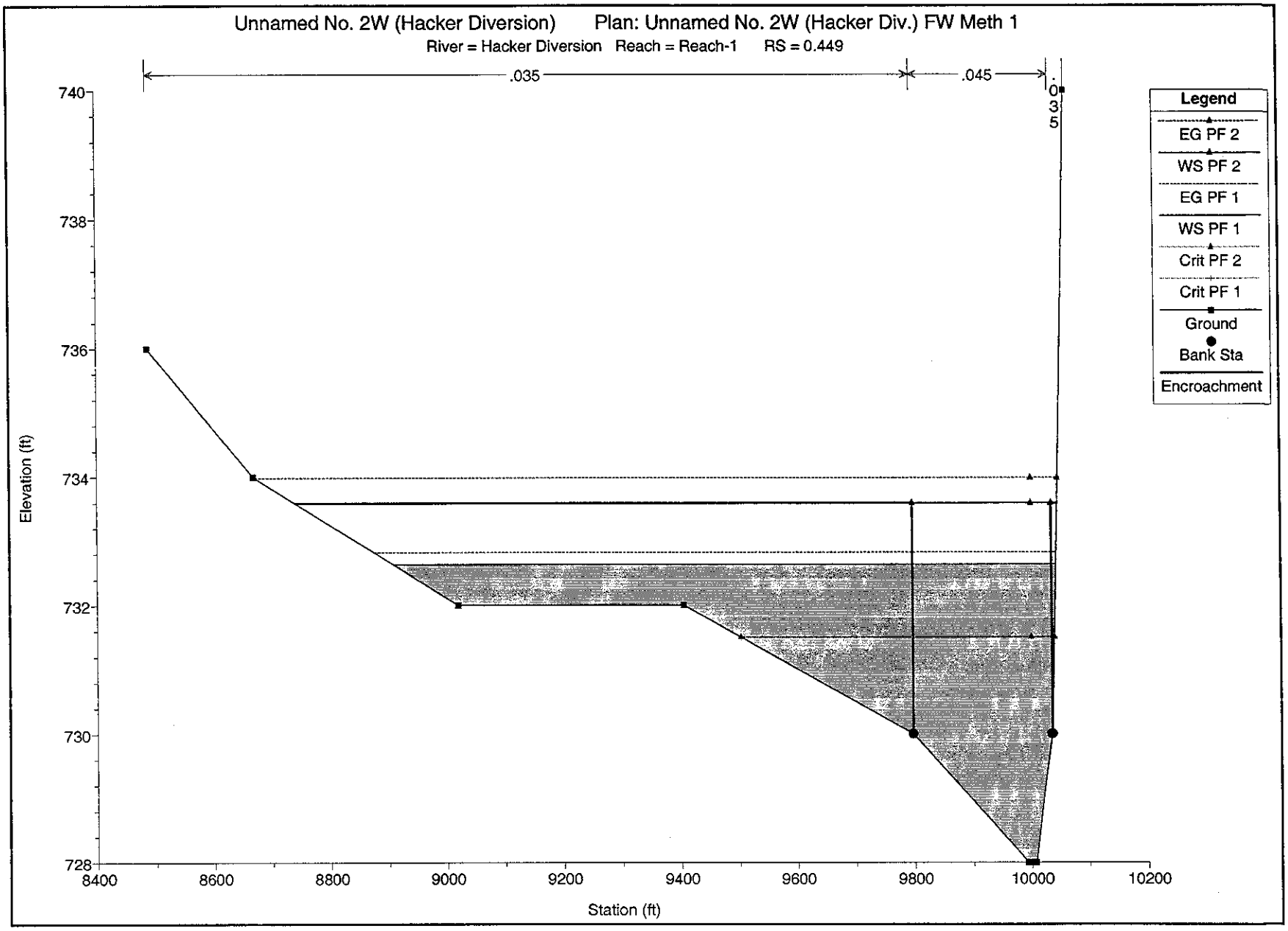

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.298
.04
.045
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
728
726
724
722
720
718
716
714
712
710
9400
9600
9800
10000
10200
10400
10600
Station (ft)

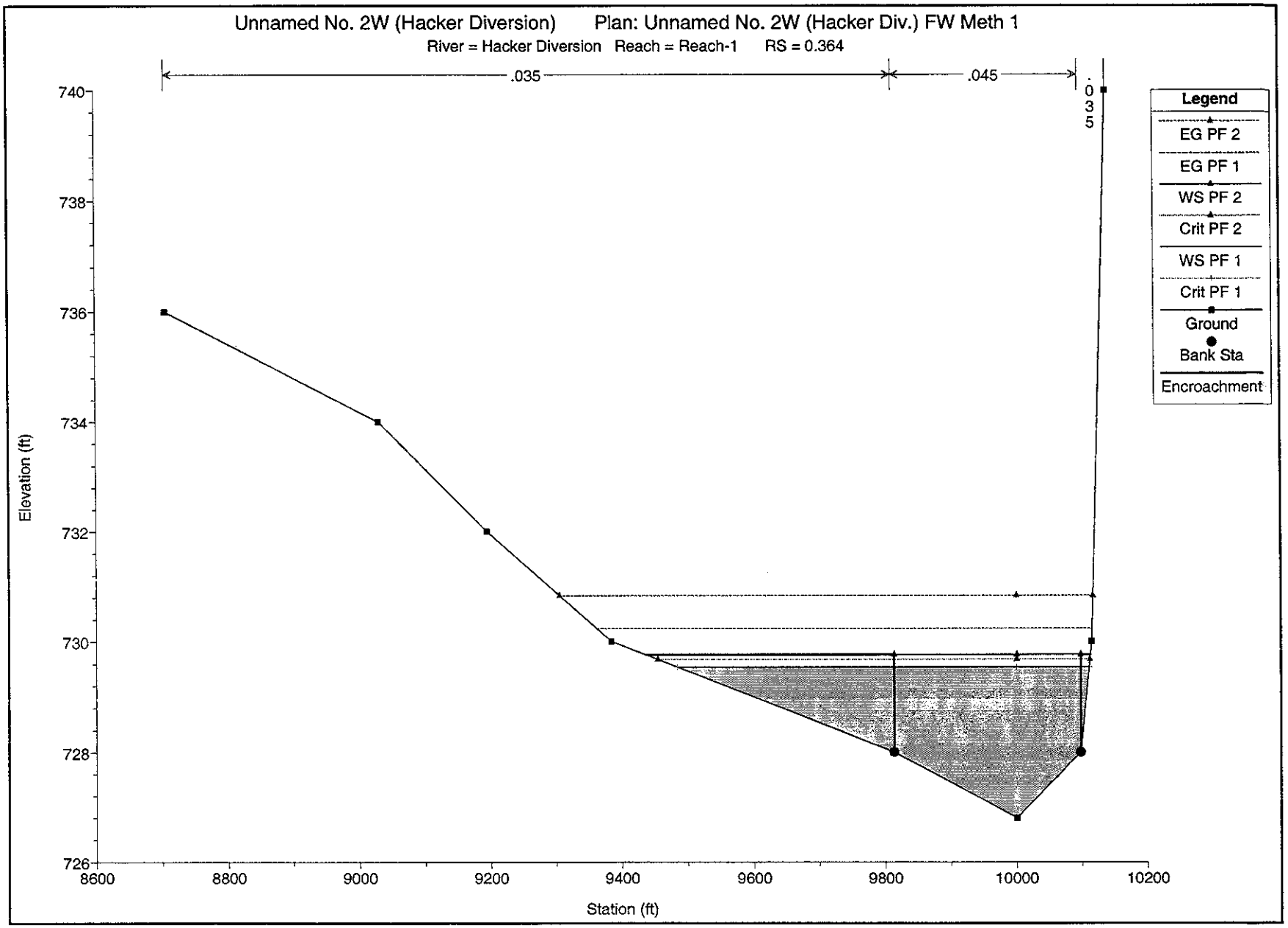

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.298
.04
.045
.04
730
725
720
715
710
705
Elevation (ft)
9400
9600
9800
10000
10200
10400
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment

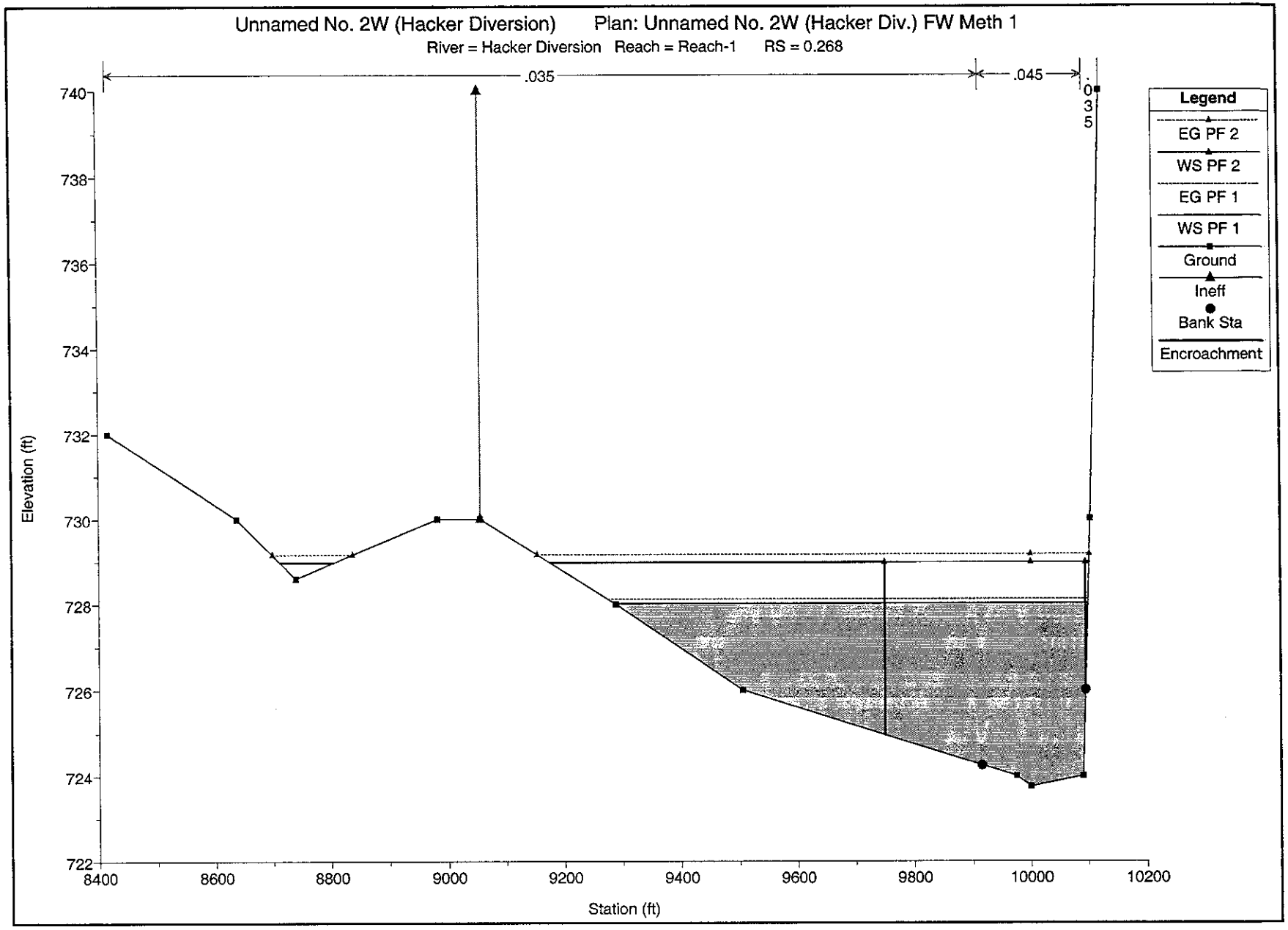

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.283
.04
.045
.04
730
725
720
715
710
705
Elevation (ft)
9400
9600
9800
10000
10200
10400
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment

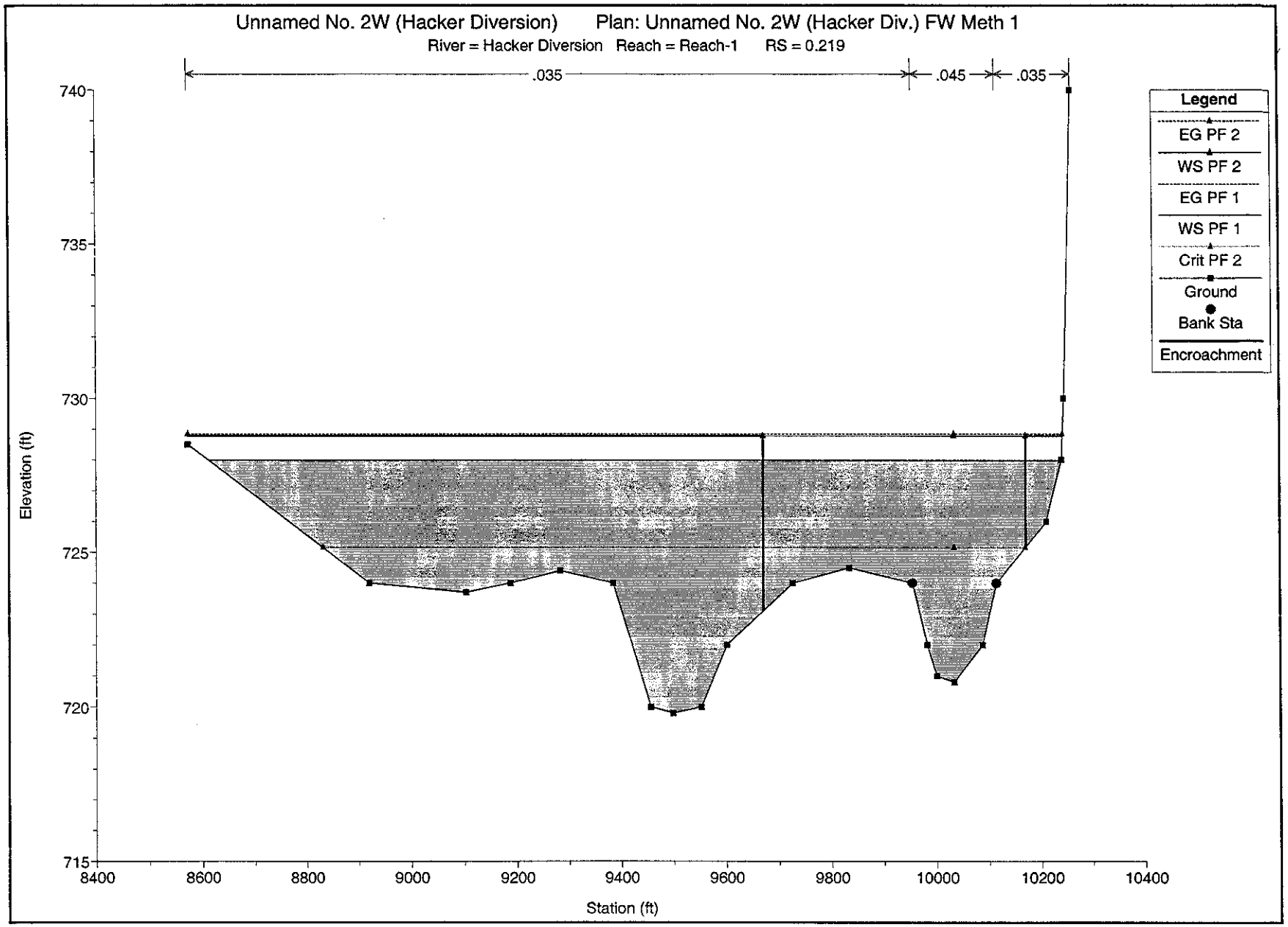

Hacker Wash Plan: HW, FW Meth 1a
River = RIVER-1 Reach = Reach-1 RS = 1.210
.04
.024
.04
.045
.04
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 2
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
750
745
740
735
730
725
720
715
8000
8500
9000
9500
10000
10500
Station (ft)

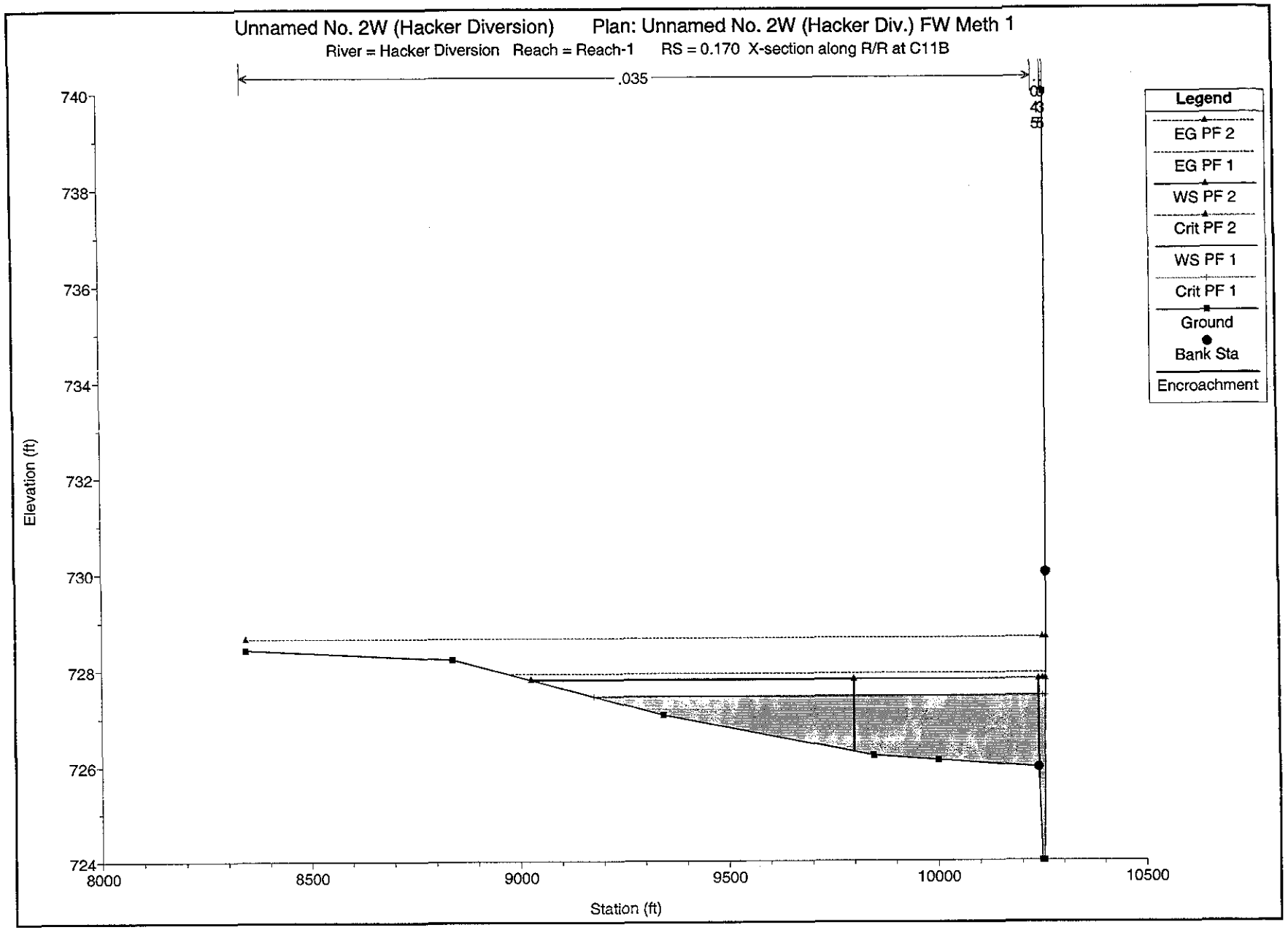

Unnamed No. 2W (Hacker Diversion)
Plan: Unnamed No. 2W (Hacker Div.) FW Meth 1
River = Hacker Diversion Reach = Reach-1 RS = 0.540 cross section at diversion C14A
.035
.045
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
740
738
736
734
732
730
728
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

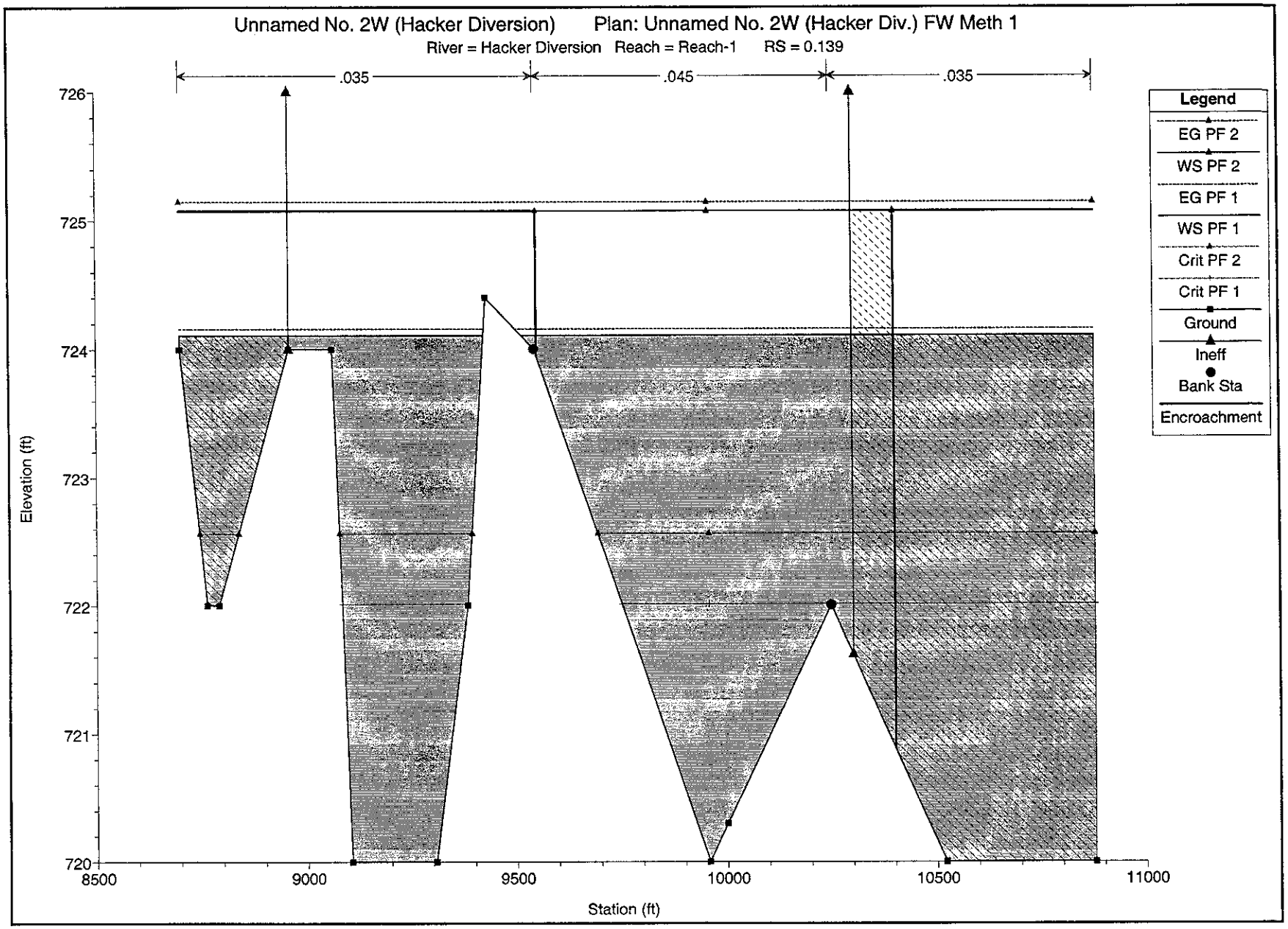

Unnamed No. 2W (Hacker Diversion) Plan: Unnamed No. 2W (Hacker Div.) FW Meth 1
River = Hacker Diversion Reach = Reach-1 RS = 0.449
.035
.045
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
740
738
736
734
732
730
728
8400
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

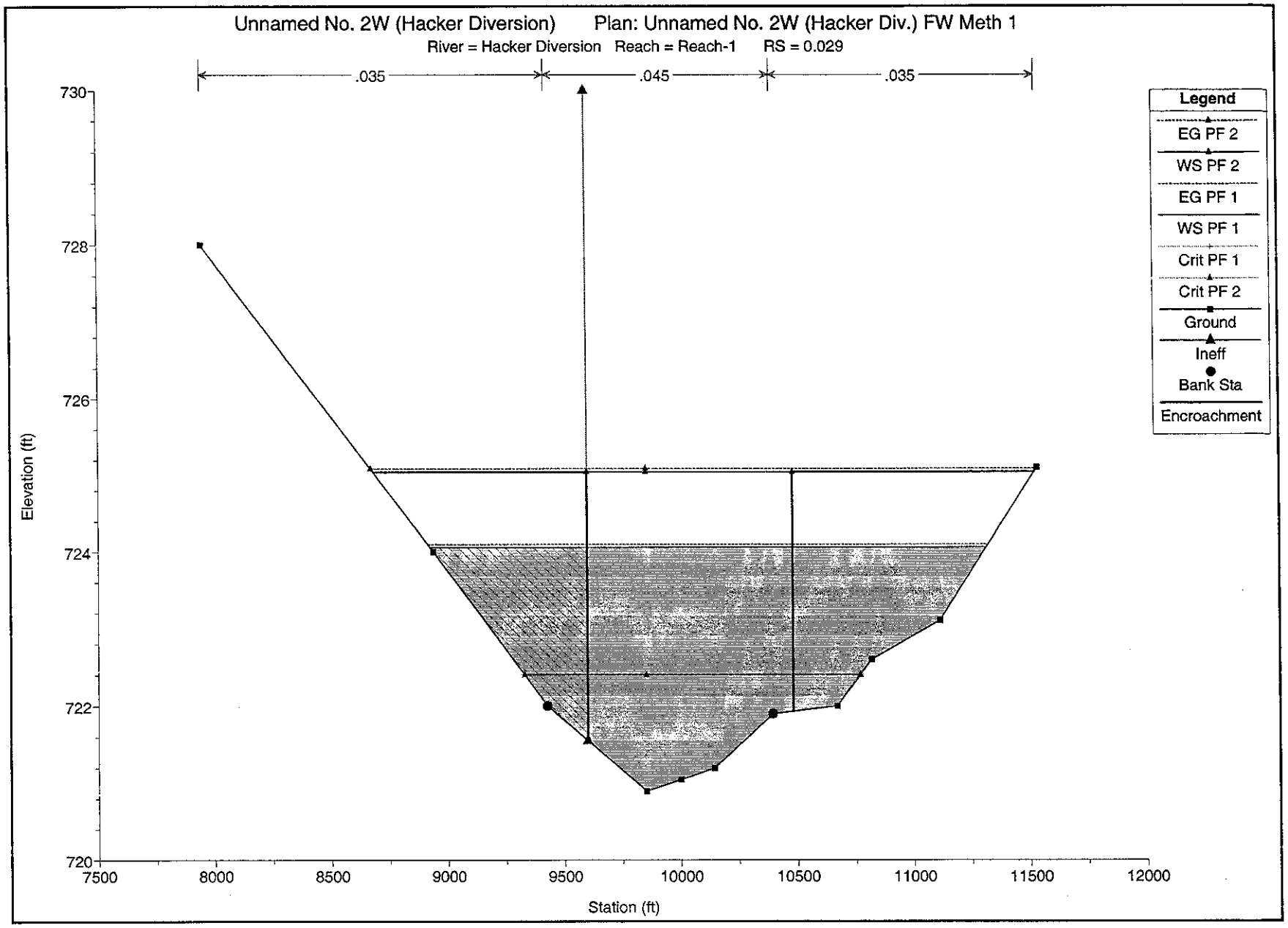

Unnamed No. 2W (Hacker Diversion) Plan: Unnamed No. 2W (Hacker Div.) FW Meth 1
River = Hacker Diversion Reach = Reach-1 RS = 0.364
.035
.045
.035
Legend
EG PF 2
EG PF 1
WS PF 2
Crit PF 2
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
740
738
736
734
732
730
728
726
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

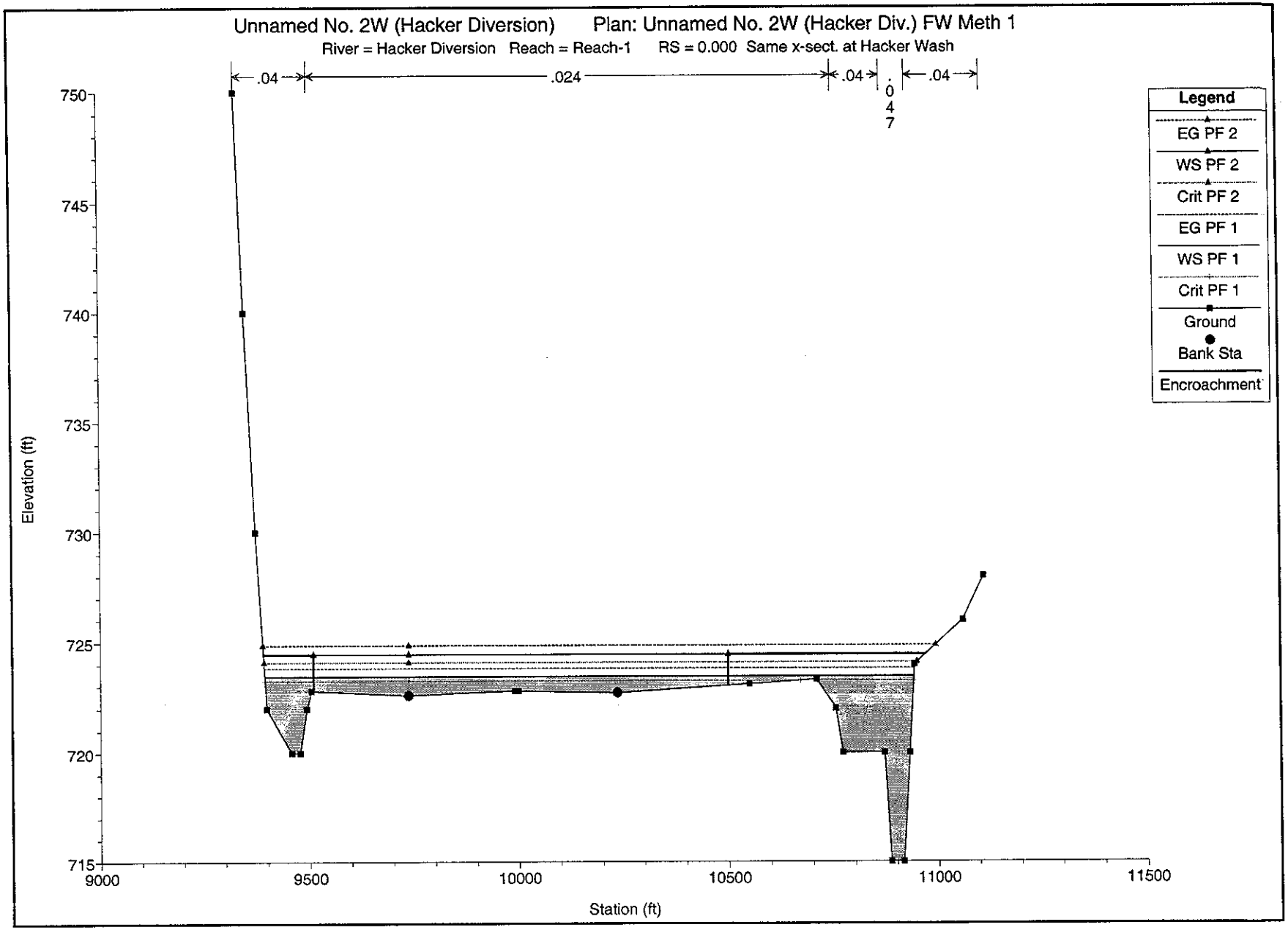

Unnamed No. 2W (Hacker Diversion) Plan: Unnamed No. 2W (Hacker Div.) FW Meth 1
River = Hacker Diversion Reach = Reach-1 RS = 0.268
.035
.045
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
740
738
736
734
732
730
728
726
724
722
8400
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

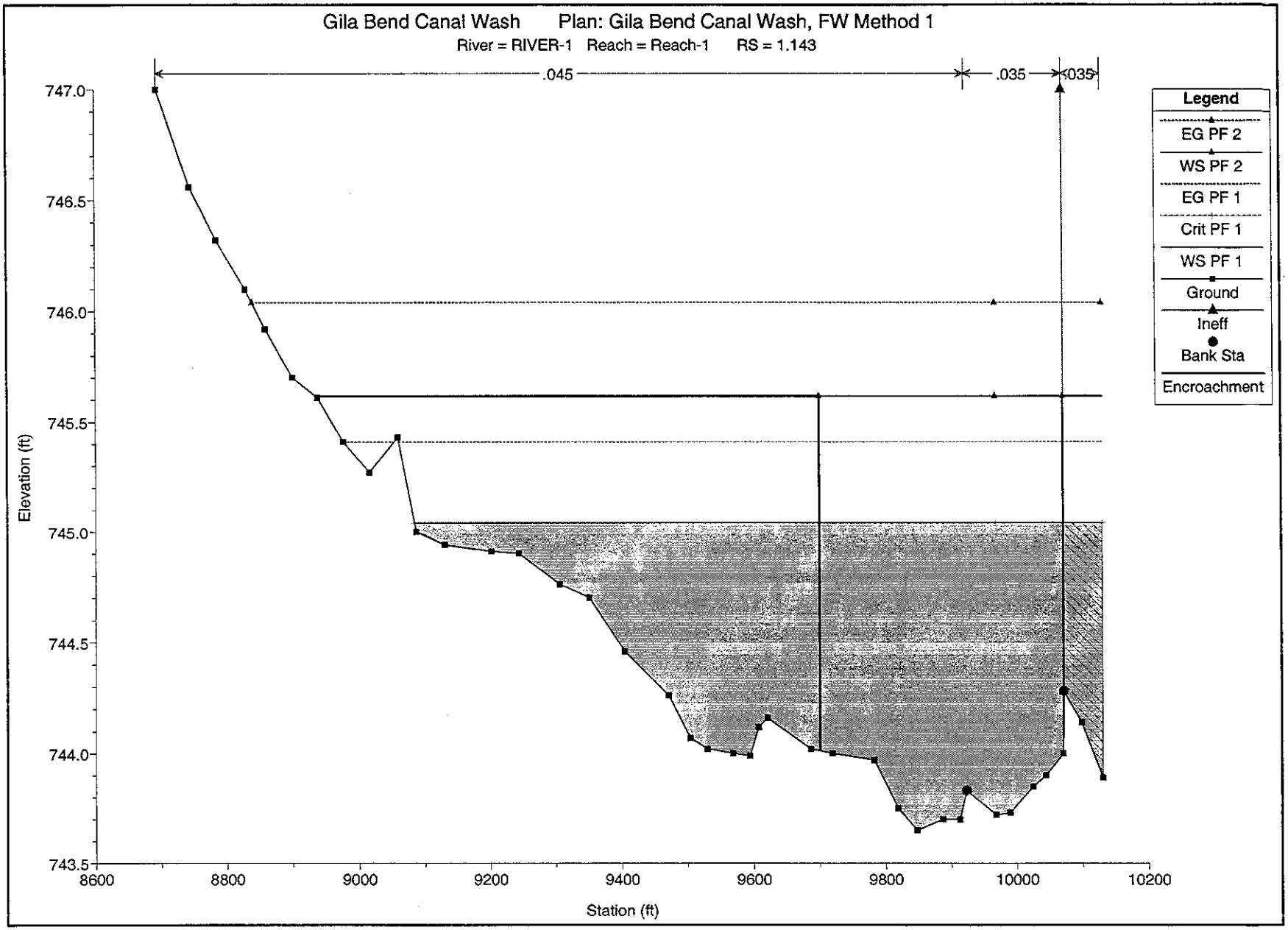

Unnamed No. 2W (Hacker Diversion) Plan: Unnamed No. 2W (Hacker Div.) FW Meth 1
River = Hacker Diversion Reach = Reach-1 RS = 0.219
.035
.045
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
740
735
730
725
720
715
8400
8600
8800
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

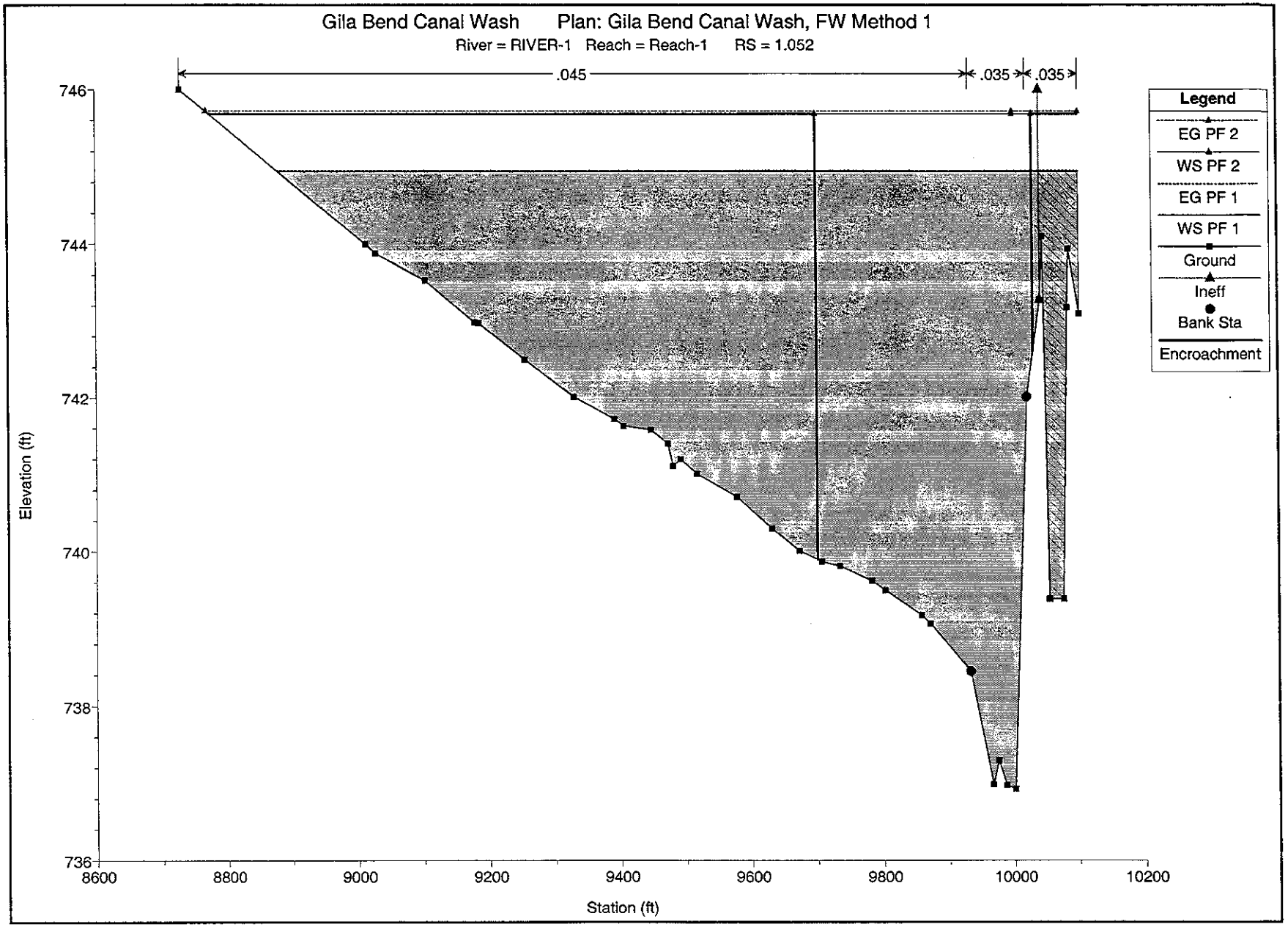

Unnamed No. 2W (Hacker Diversion)
Plan: Unnamed No. 2W (Hacker Div.) FW Meth 1
River = Hacker Diversion Reach = Reach-1 RS = 0.170 X-section along R/R at C11B
.035
Legend
EG PF 2
EG PF 1
WS PF 2
Crit PF 2
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
740
738
736
734
732
730
728
726
724
8000
8500
9000
9500
10000
10500
Station (ft)

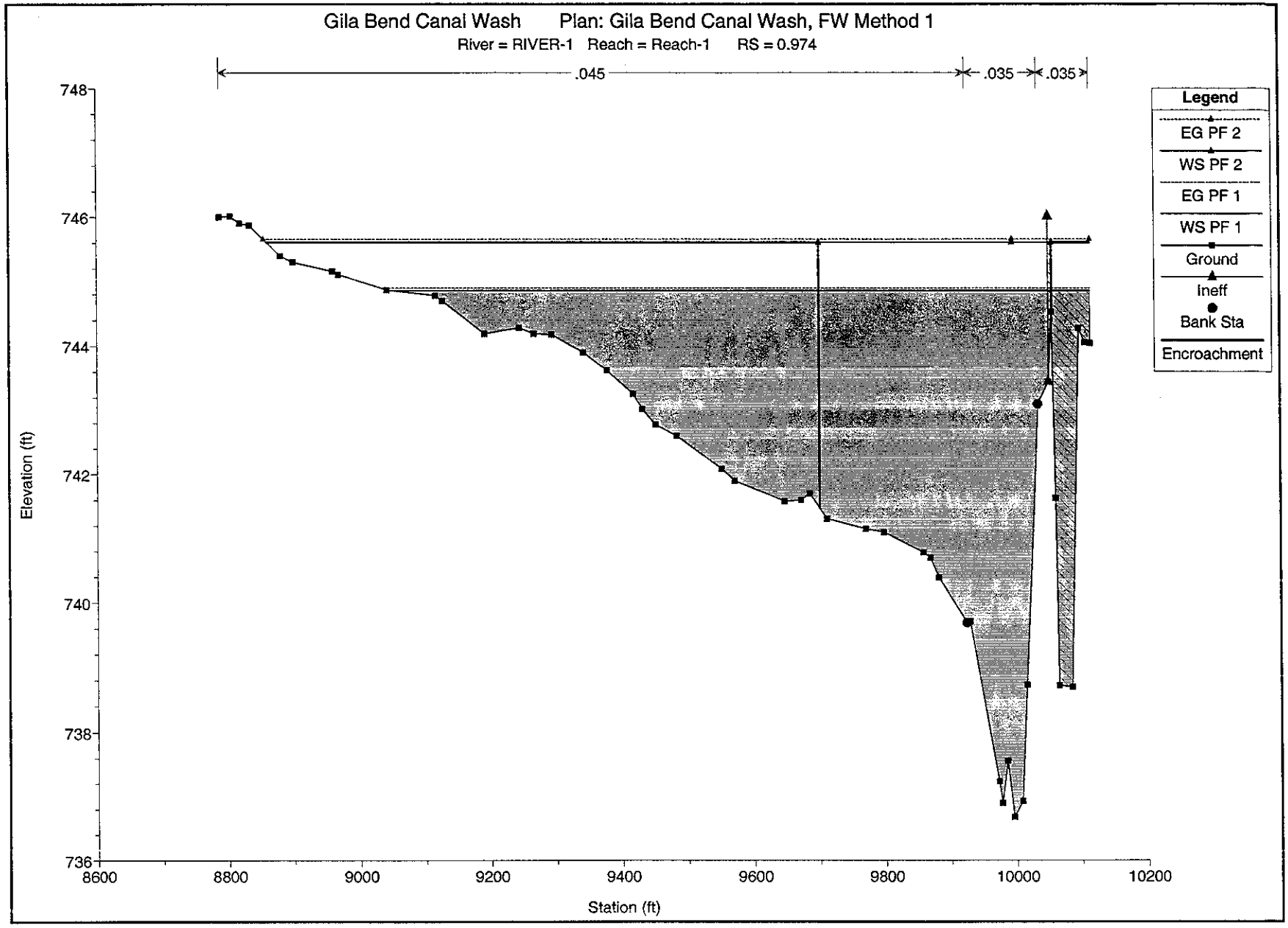

Unnamed No. 2W (Hacker Diversion) Plan: Unnamed No. 2W (Hacker Div.) FW Meth 1
River = Hacker Diversion Reach = Reach-1 RS = 0.139
.035
.045
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
726
725
724
723
722
721
720
8500
9000
9500
10000
10500
11000
Station (ft)

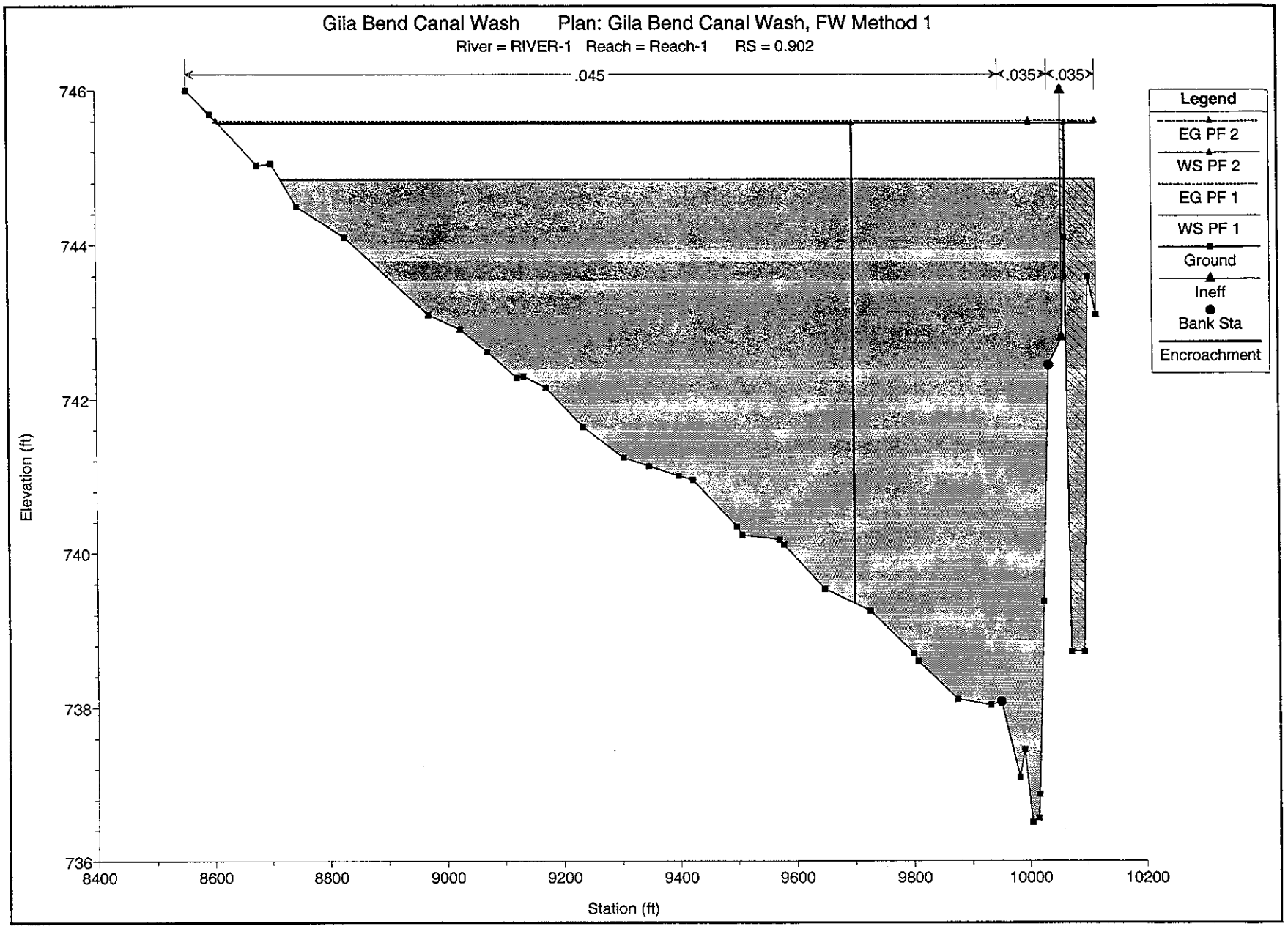

Unnamed No. 2W (Hacker Diversion) Plan: Unnamed No. 2W (Hacker Div.) FW Meth 1
River = Hacker Diversion Reach = Reach-1 RS = 0.029
.035
.045
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
7500
8000
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

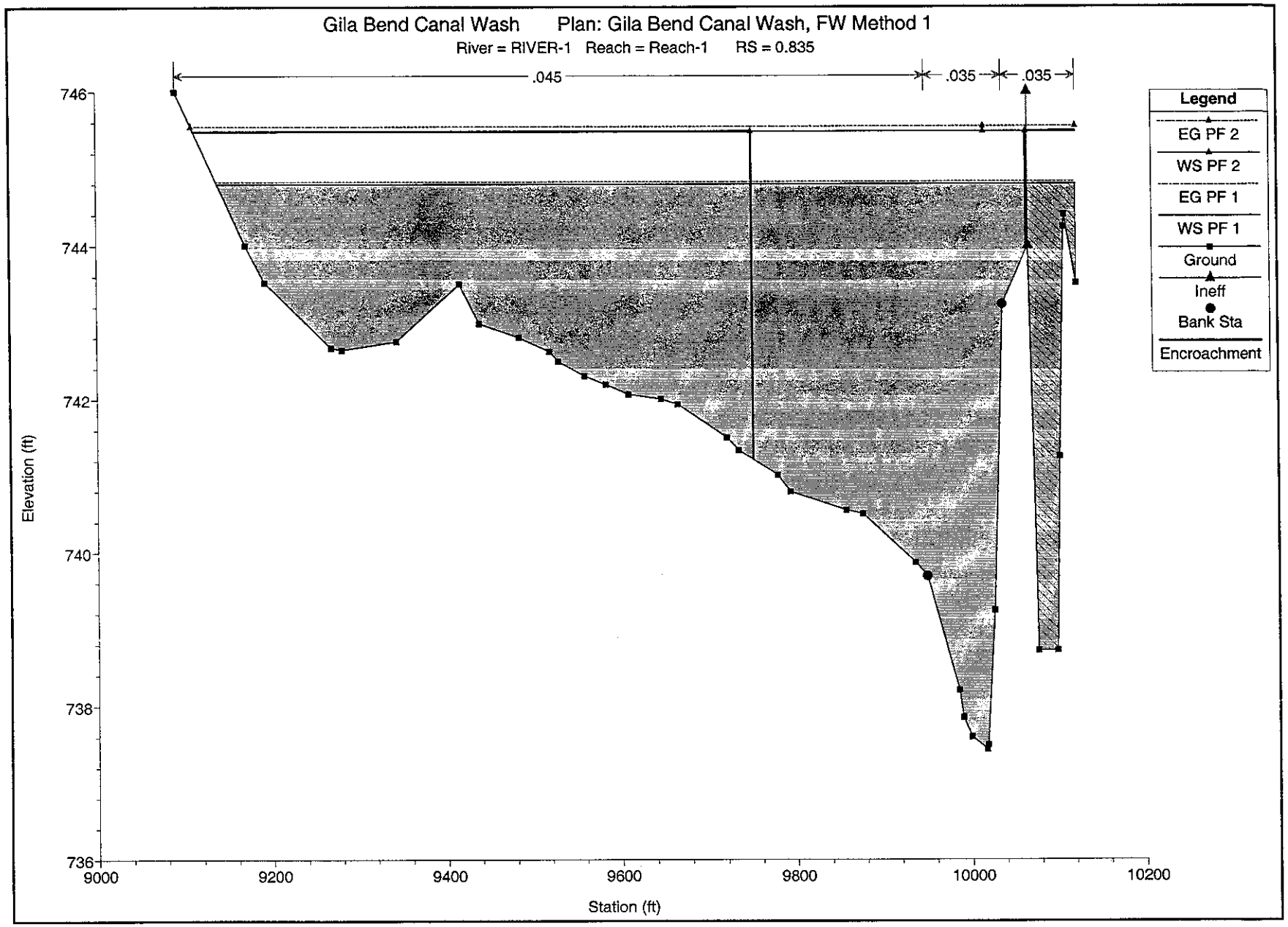

Unnamed No. 2W (Hacker Diversion)
Plan: Unnamed No. 2W (Hacker Div.) FW Meth 1
River = Hacker Diversion Reach = Reach-1 RS = 0.000 Same x-sect. at Hacker Wash
.04
.024
.04
.047
.04
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
750
745
740
735
730
725
720
715
9000
9500
10000
10500
11000
11500
Station (ft)

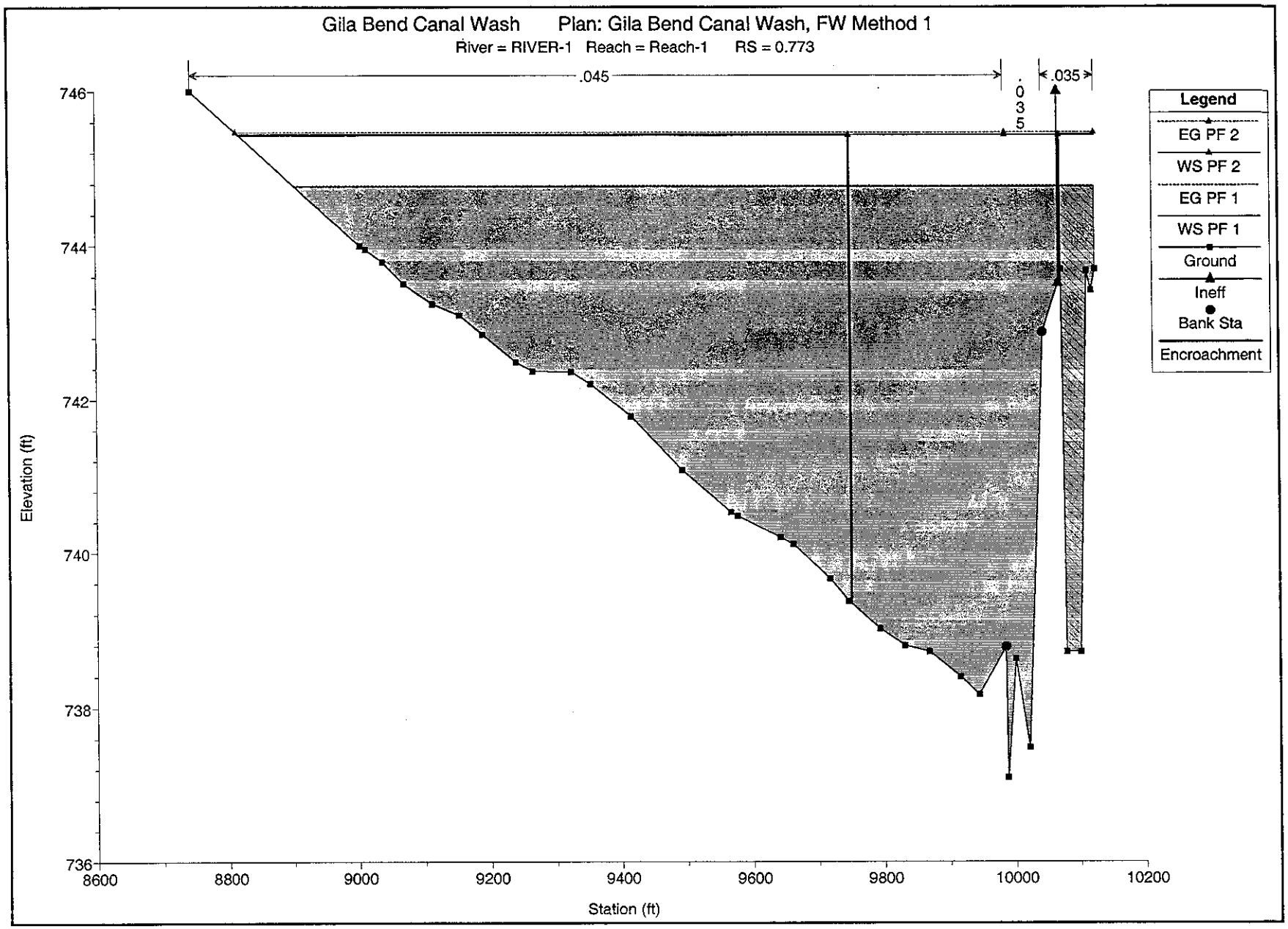

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 1.143
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
747.0
746.5
746.0
745.5
745.0
744.5
744.0
743.5
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

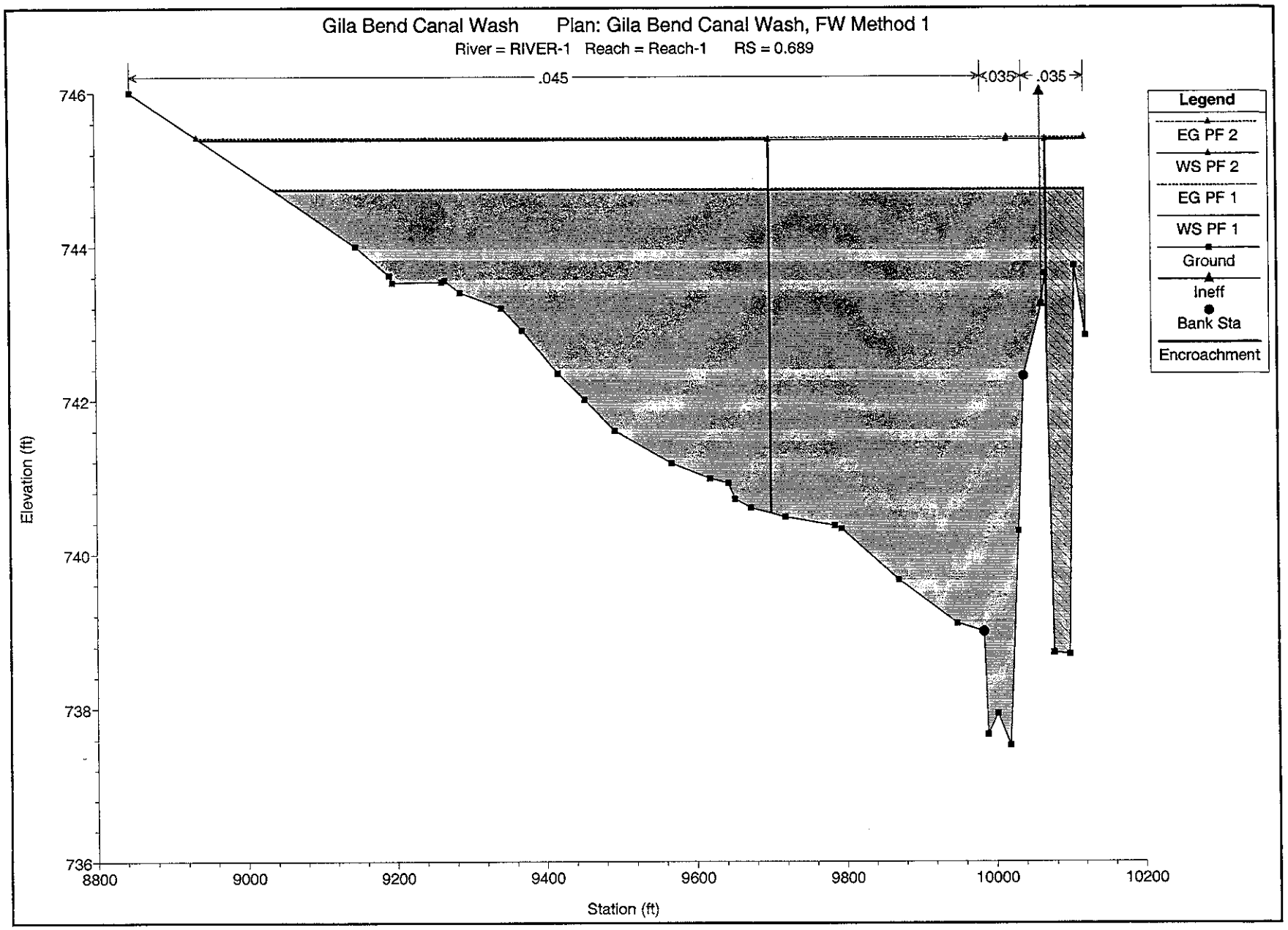

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 1.052
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

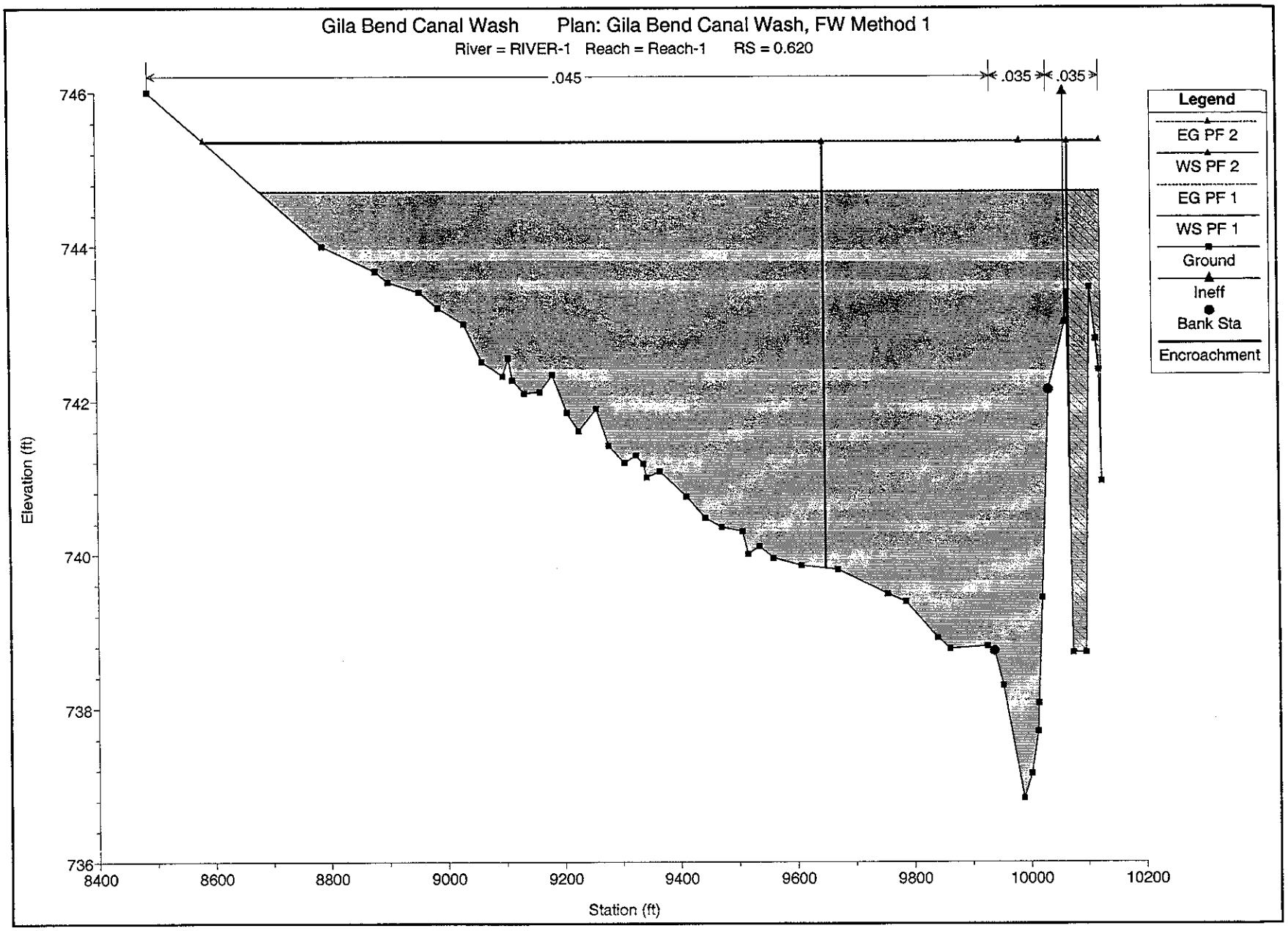

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 0.974
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
748
746
744
742
740
738
736
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

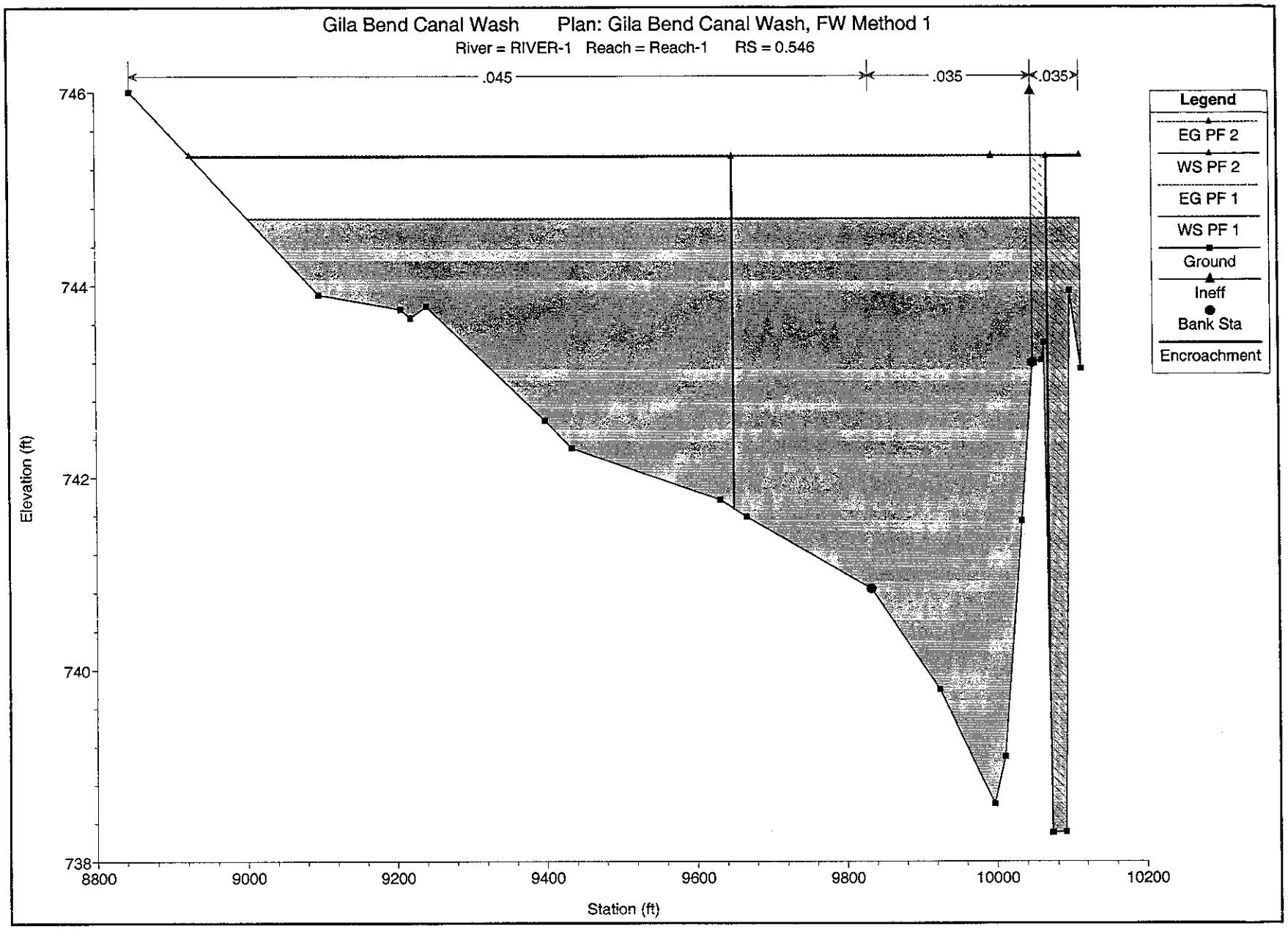

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 0.902
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
8400
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

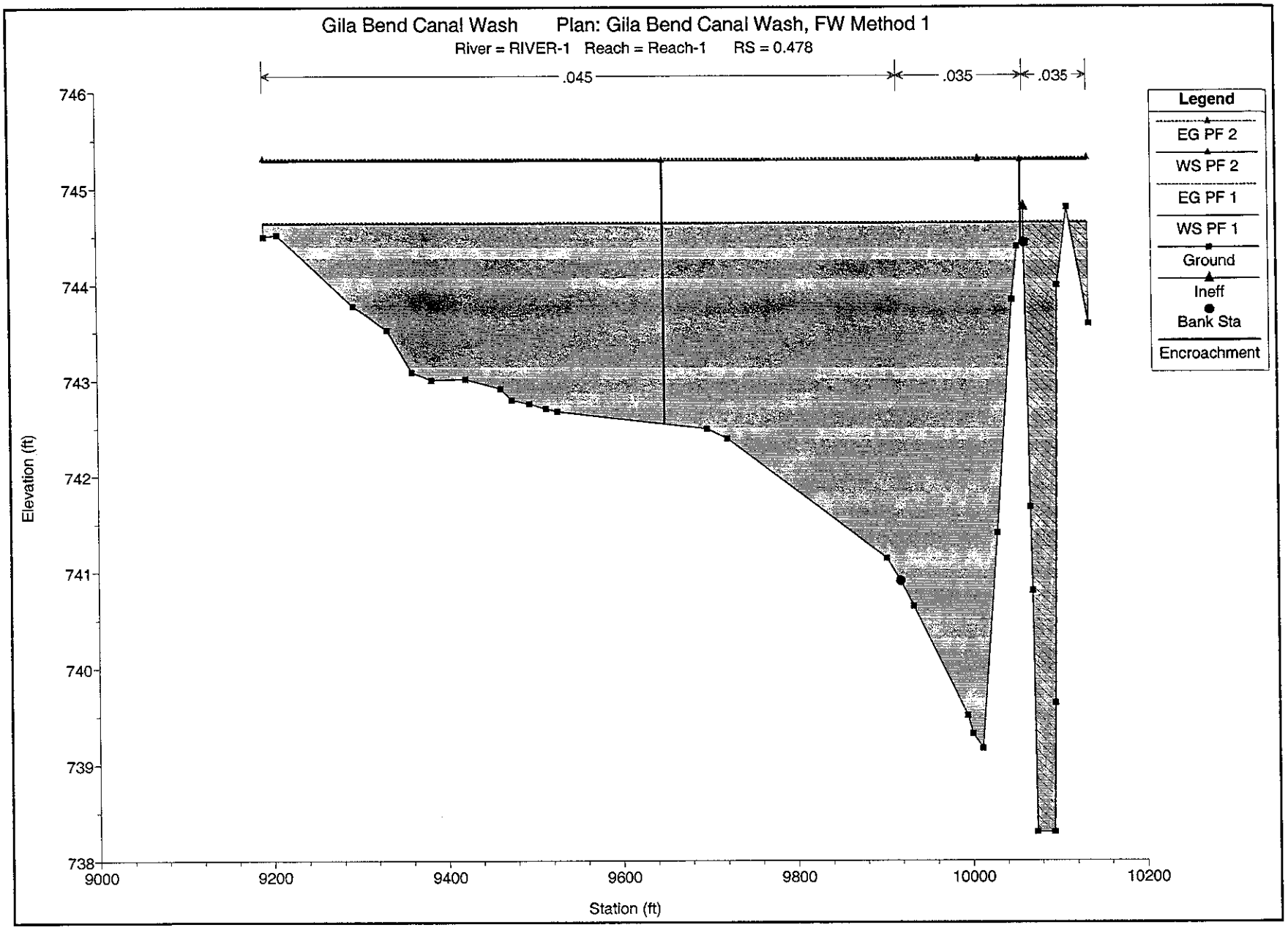

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 0.835
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
9000
9200
9400
9600
9800
10000
10200
Station (ft)

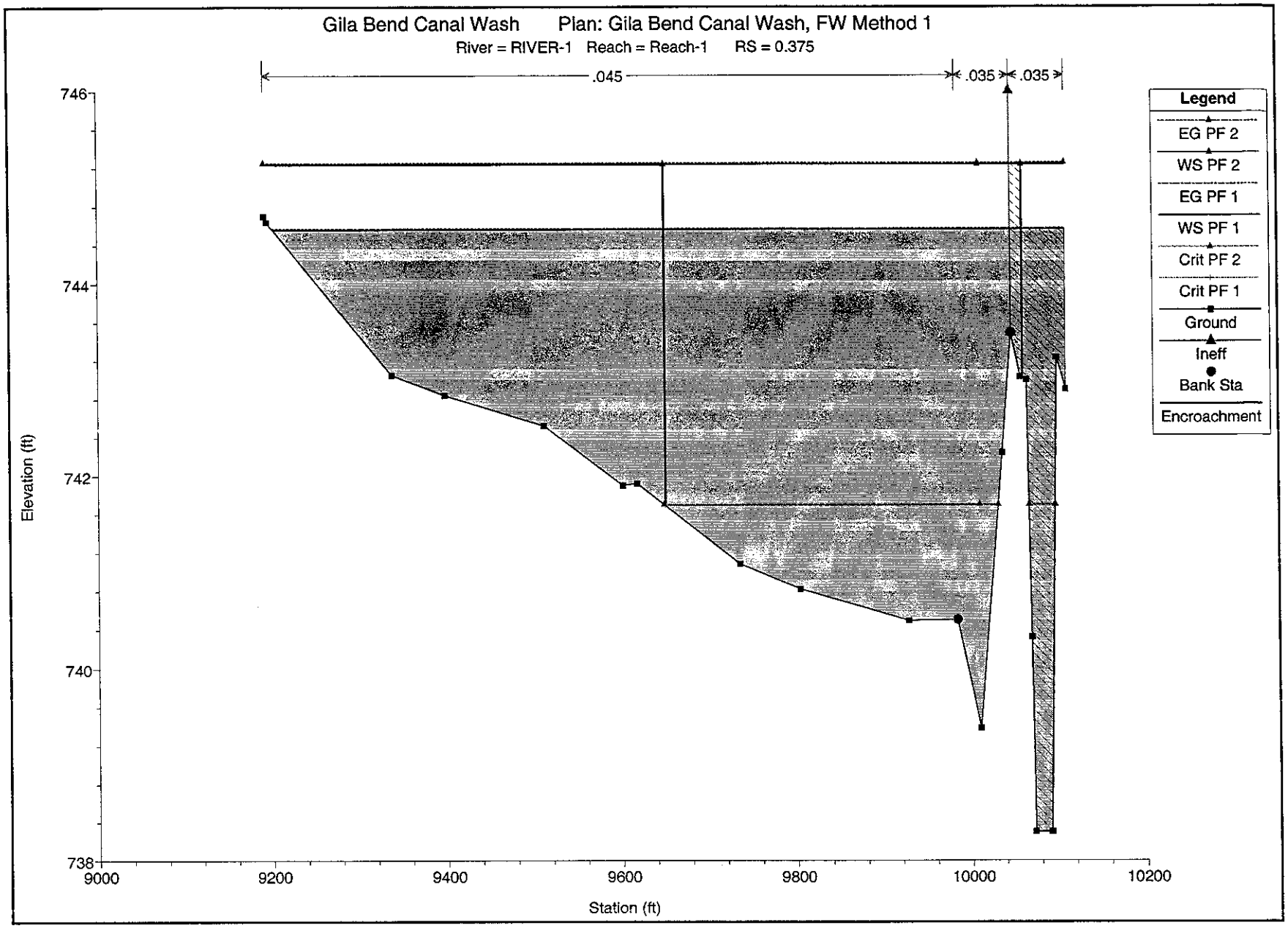

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 0.773
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

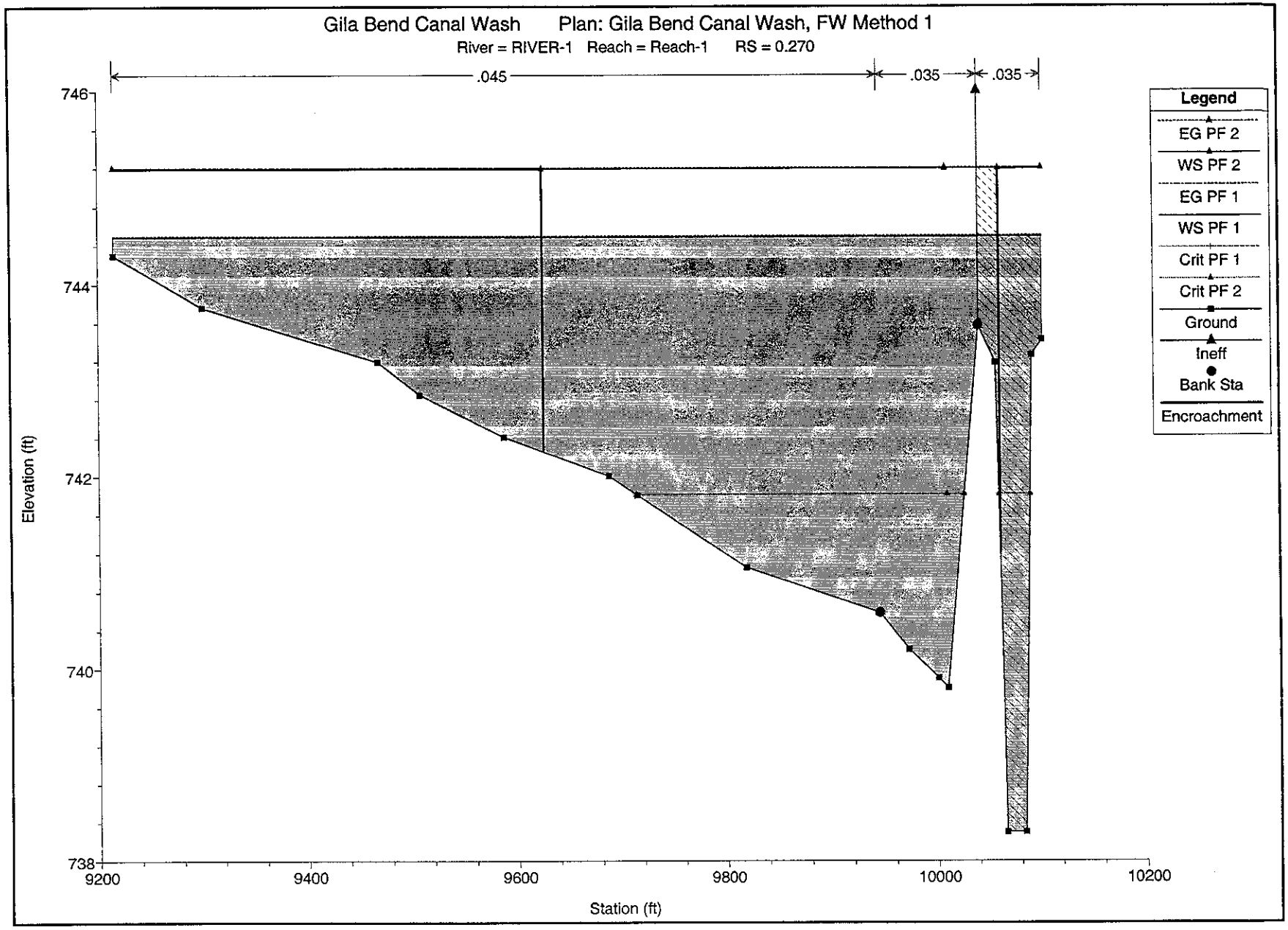

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 0.689
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

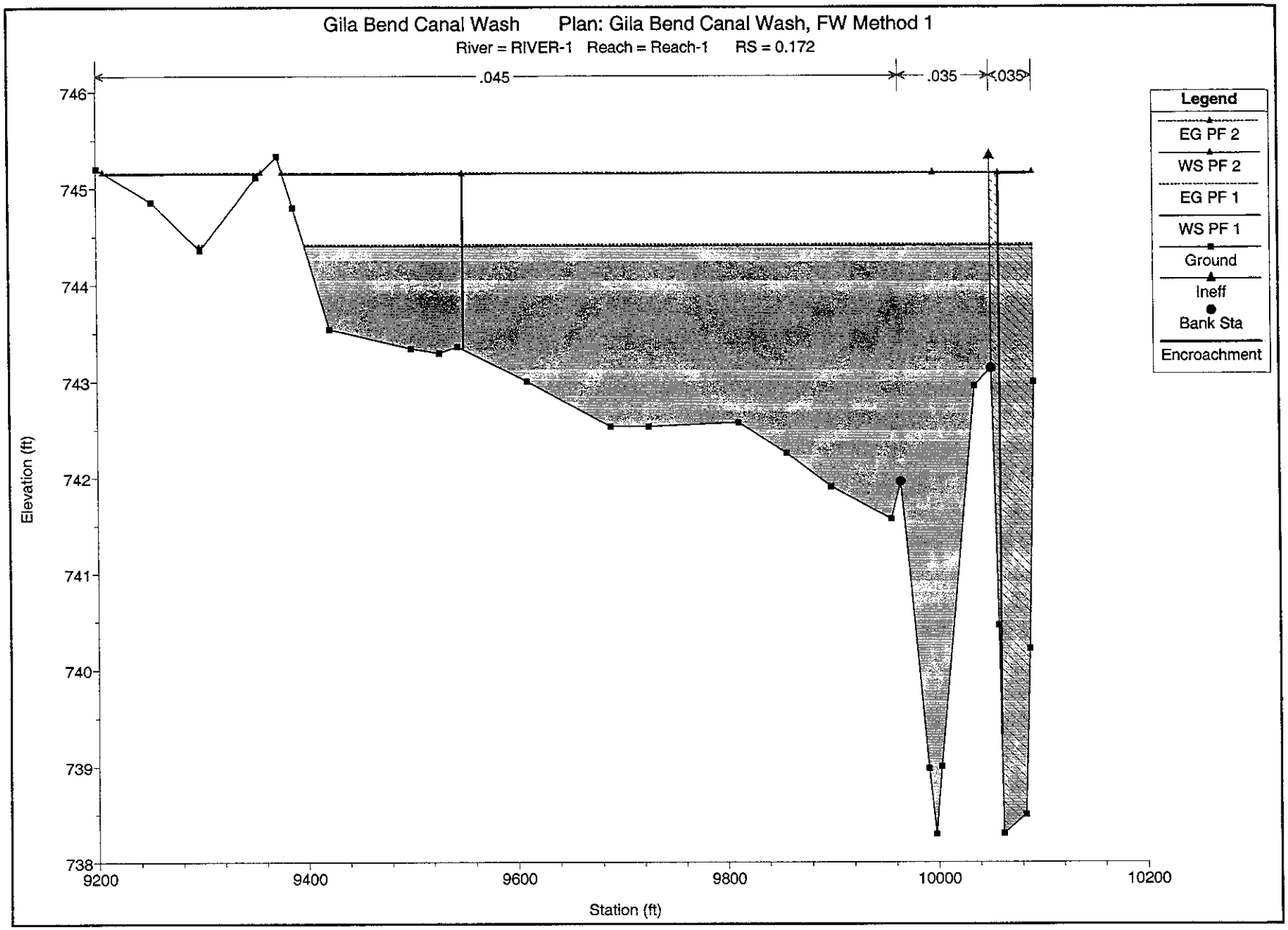

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 0.620
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
8400
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

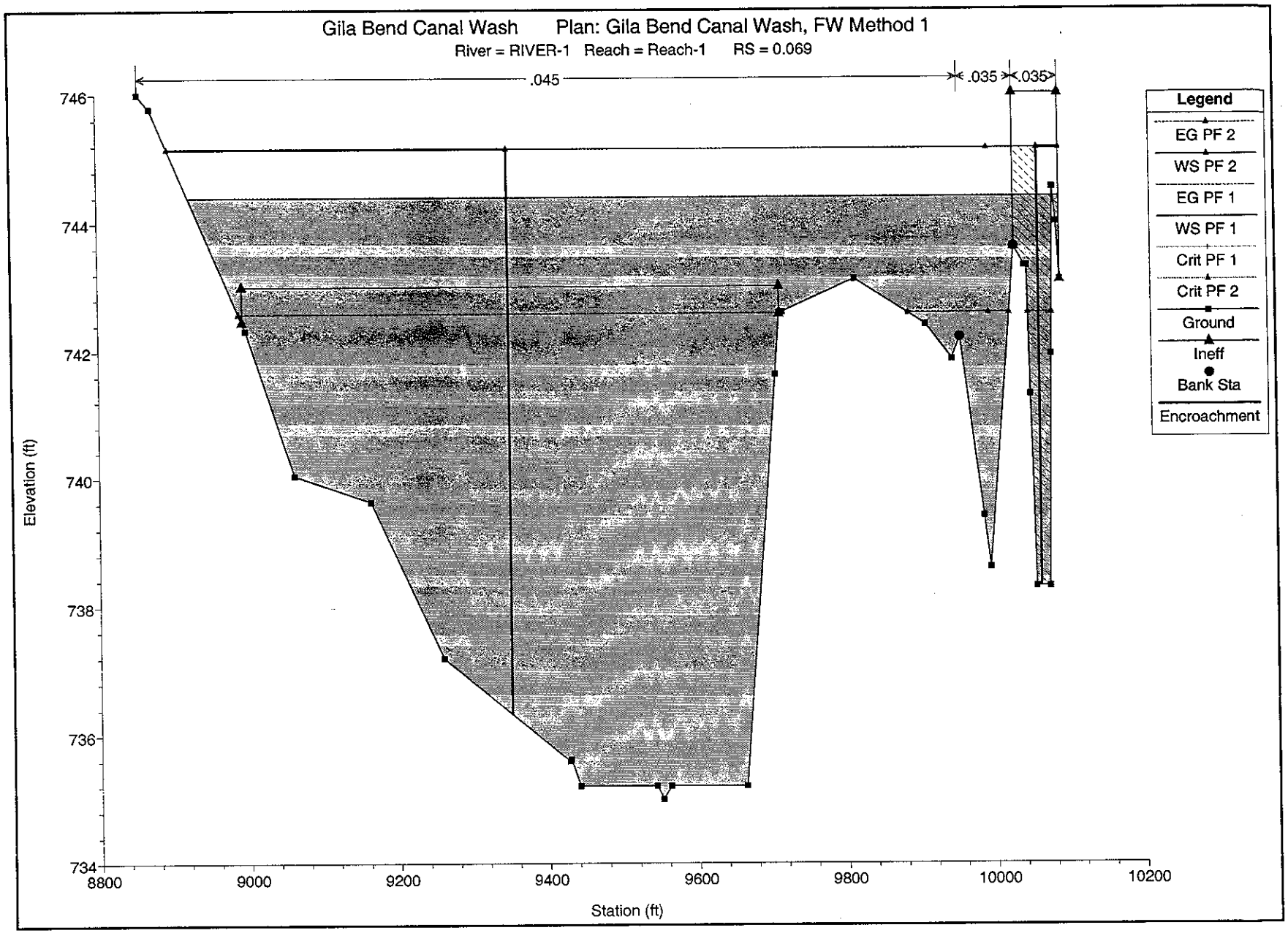

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 0.546
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

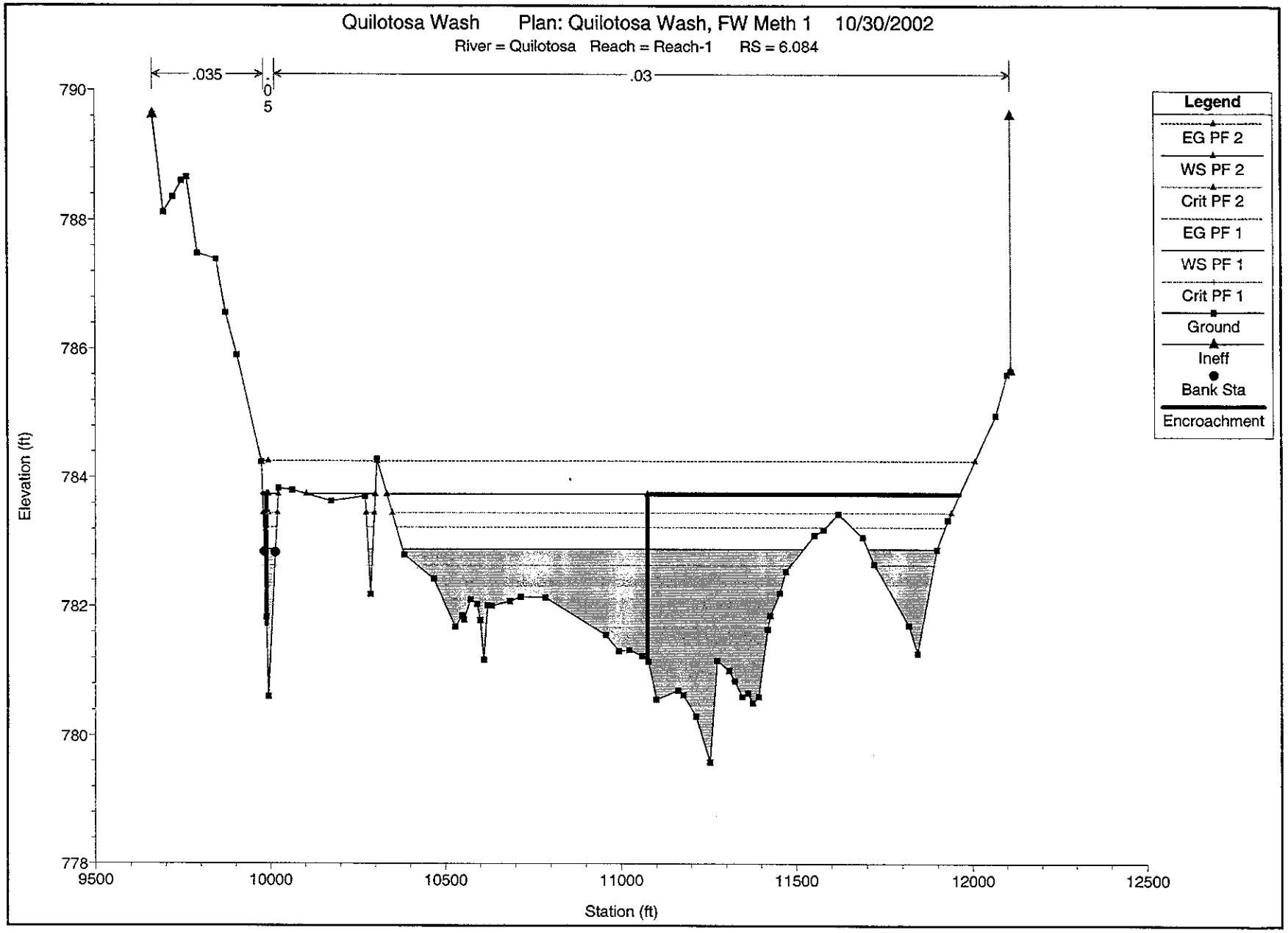

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 0.478
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
745
744
743
742
741
740
739
738
9000
9200
9400
9600
9800
10000
10200
Station (ft)

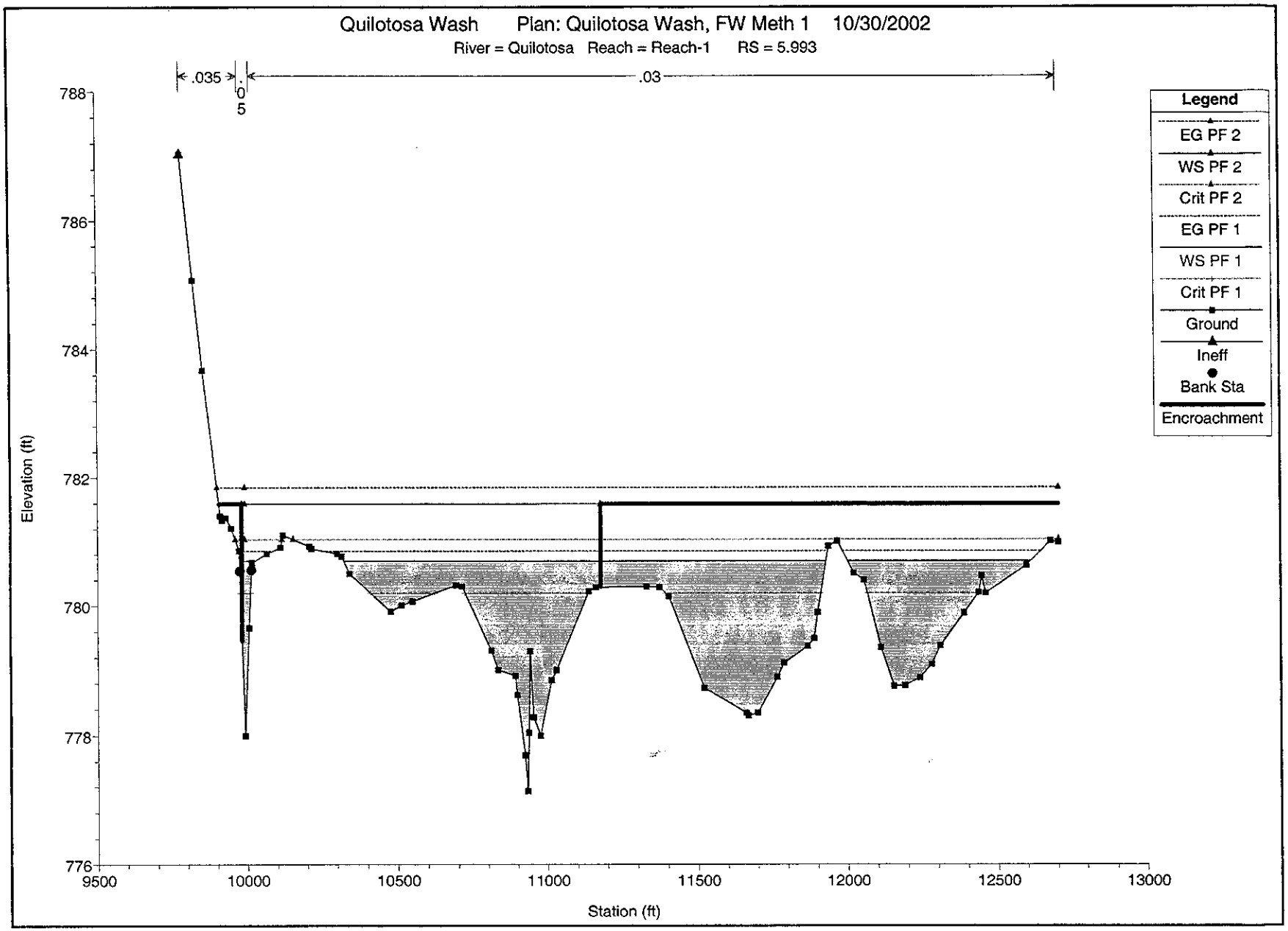

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 0.375
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
9000
9200
9400
9600
9800
10000
10200
Station (ft)

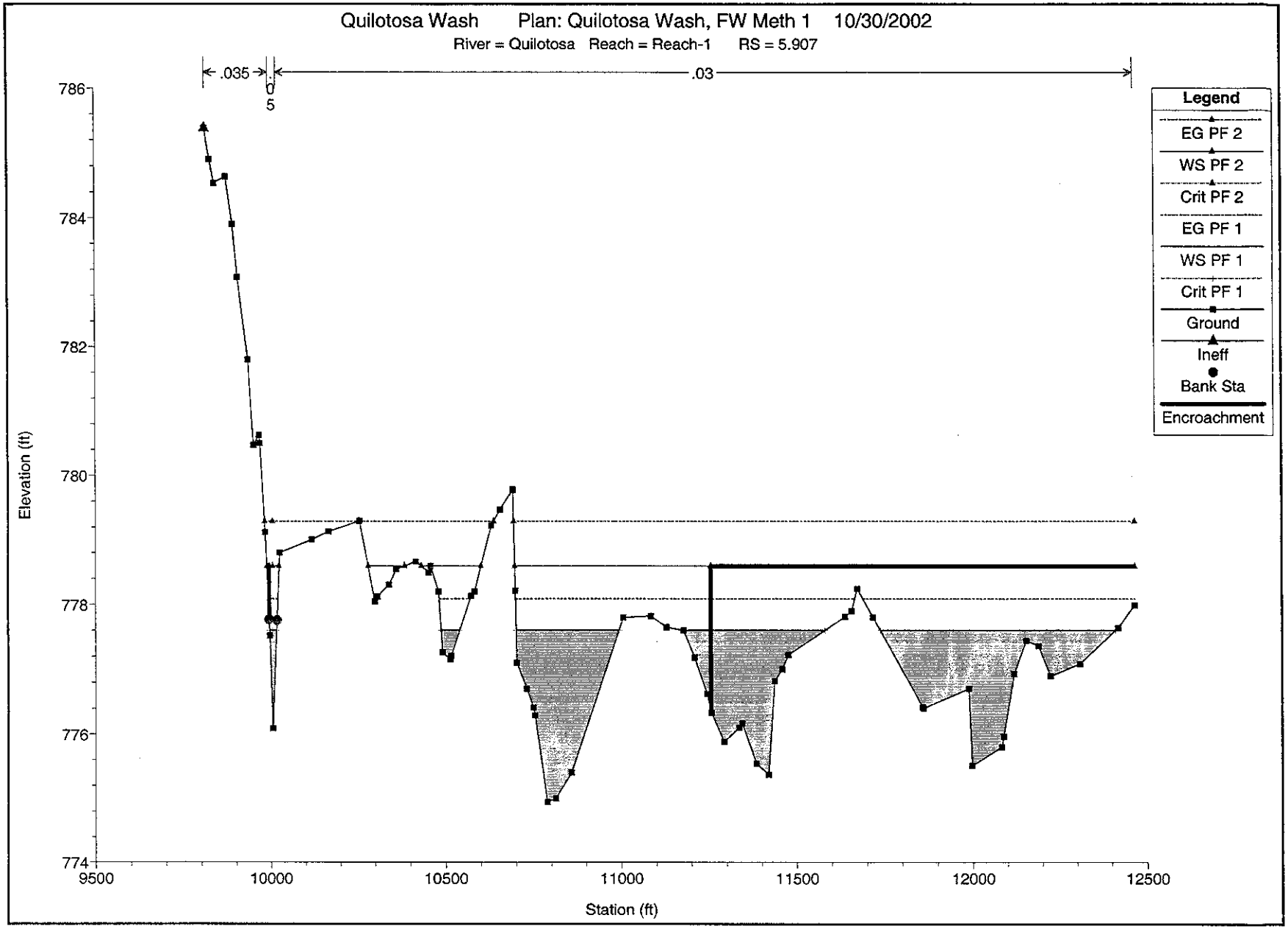

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 0.270
.045
.035
.035
Elevation (ft)
746
744
742
740
738
9200
9400
9600
9800
10000
10200
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment

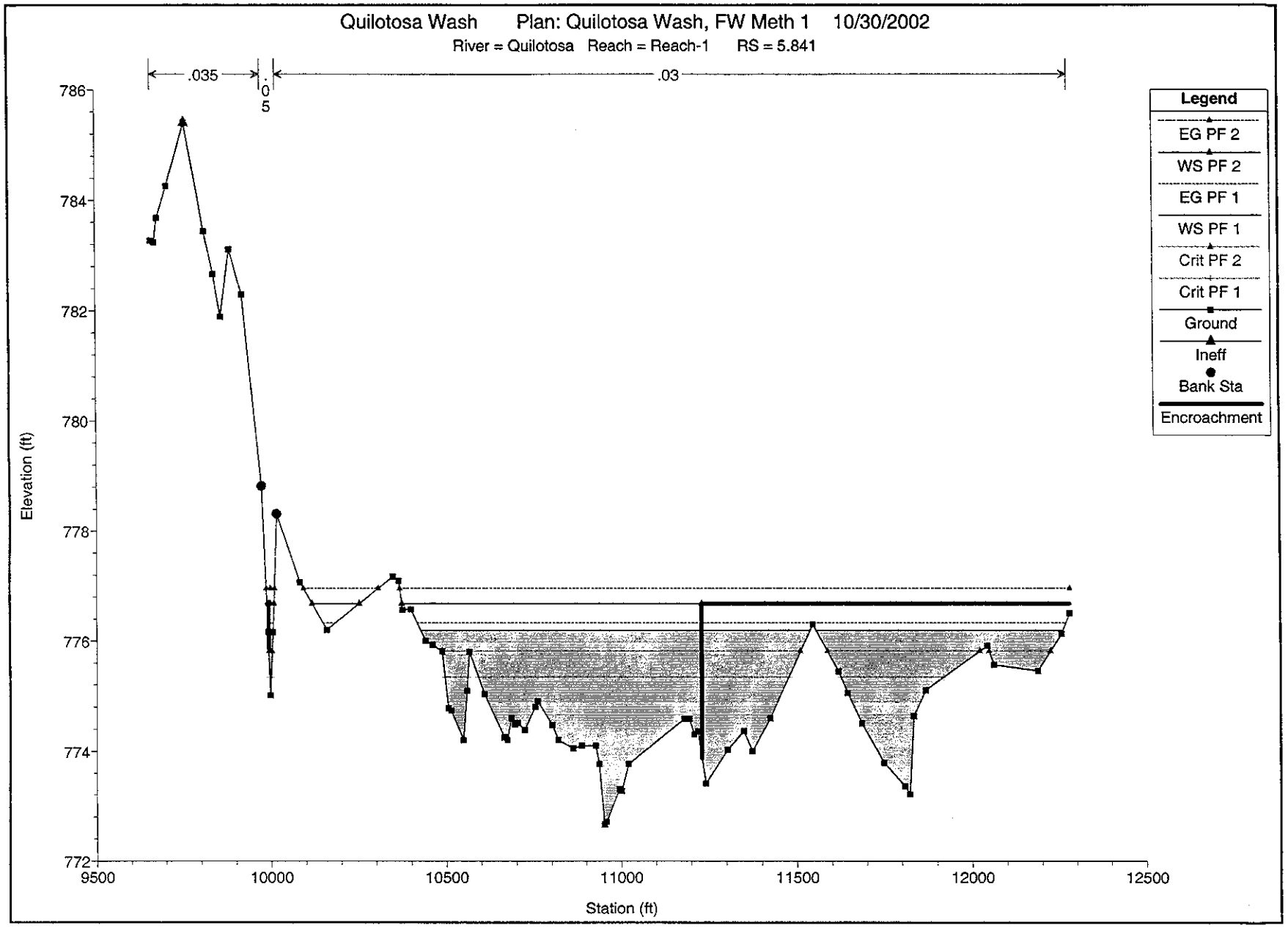

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 0.172
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
745
744
743
742
741
740
739
738
9200
9400
9600
9800
10000
10200
Station (ft)

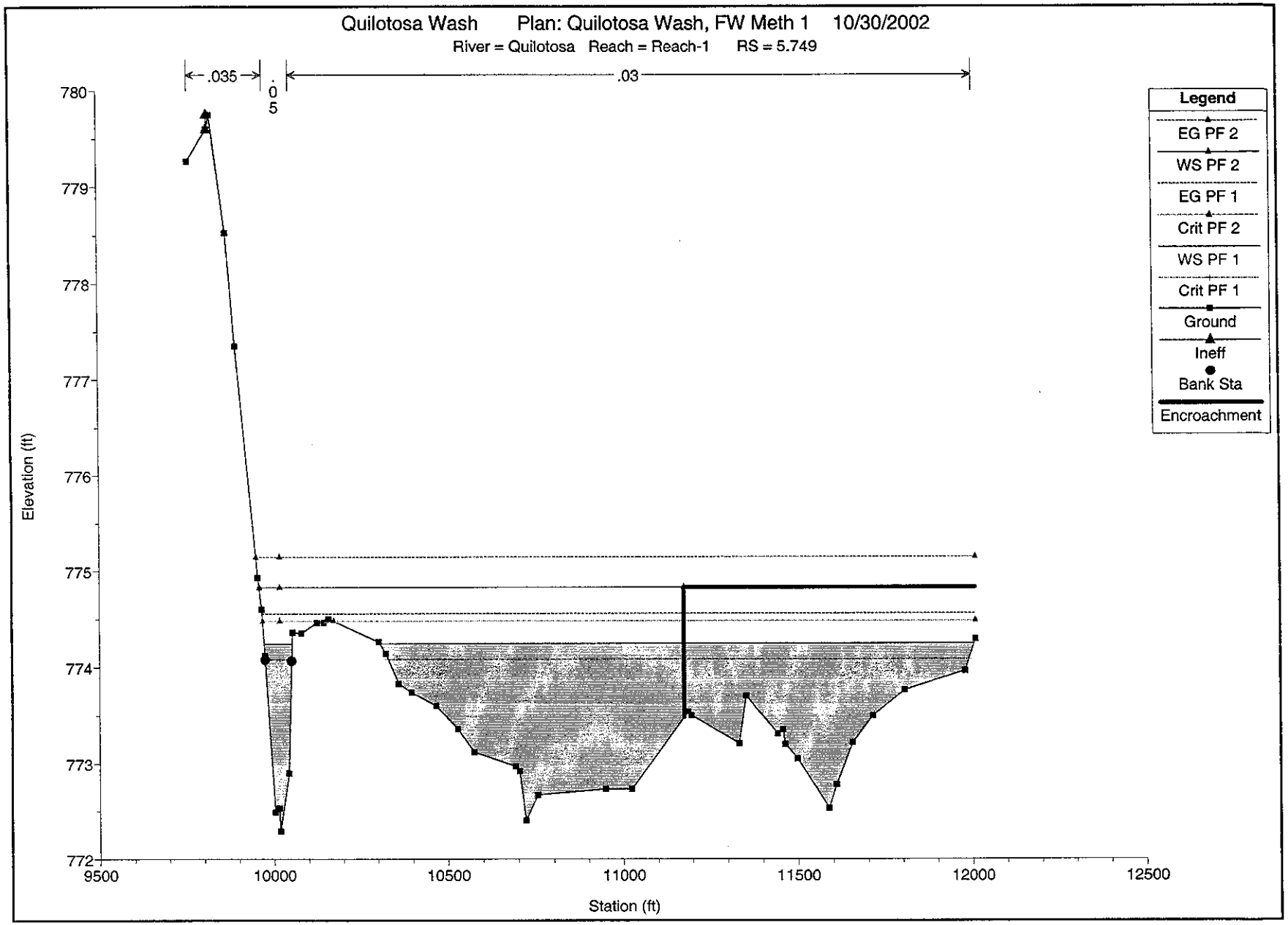

Gila Bend Canal Wash Plan: Gila Bend Canal Wash, FW Method 1
River = RIVER-1 Reach = Reach-1 RS = 0.069
.045
.035
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
734
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

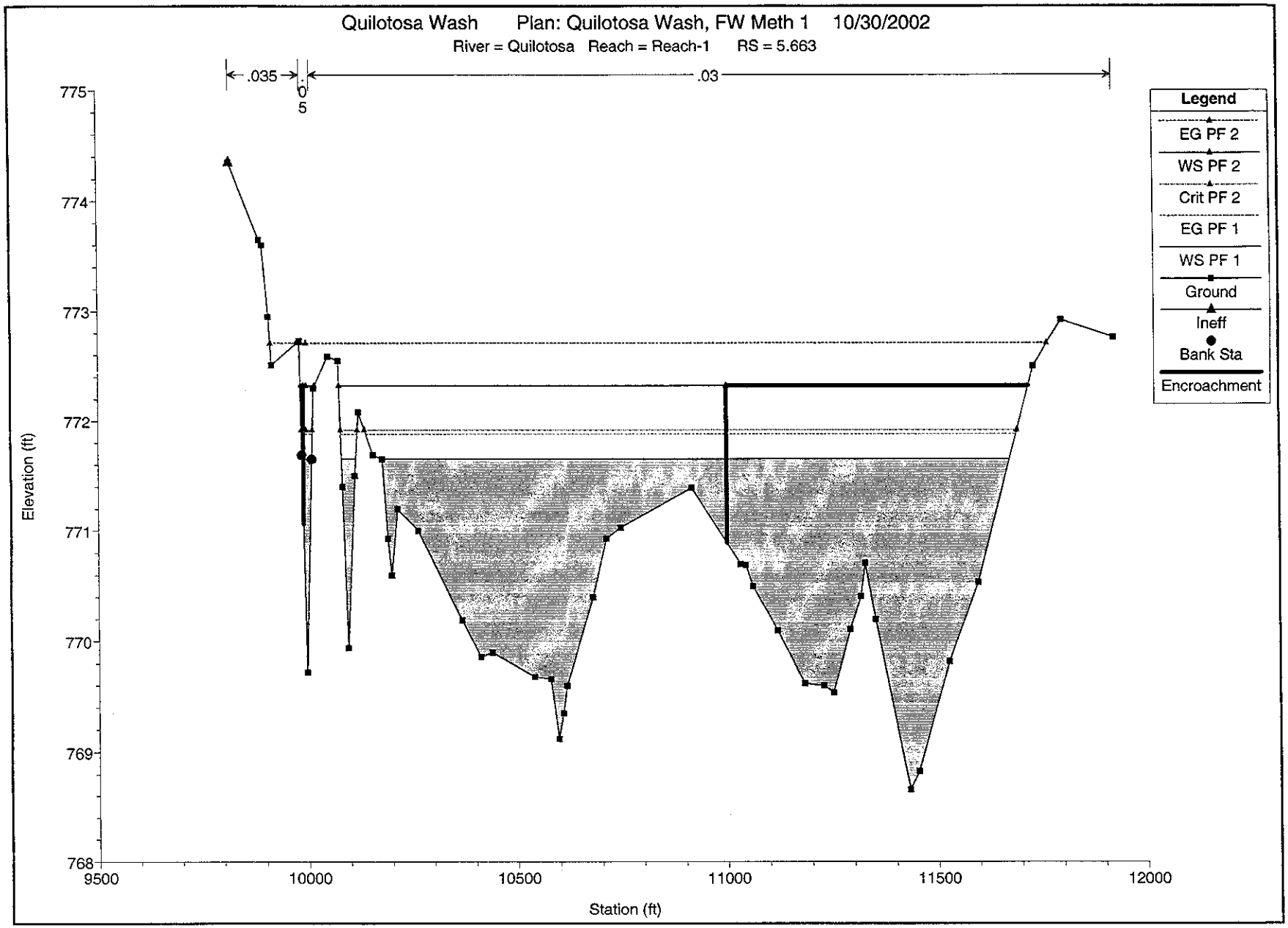

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-1 RS = 6.084
.035
.05
.03
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
790
788
786
784
782
780
778
9500
10000
10500
11000
11500
12000
12500
Station (ft)

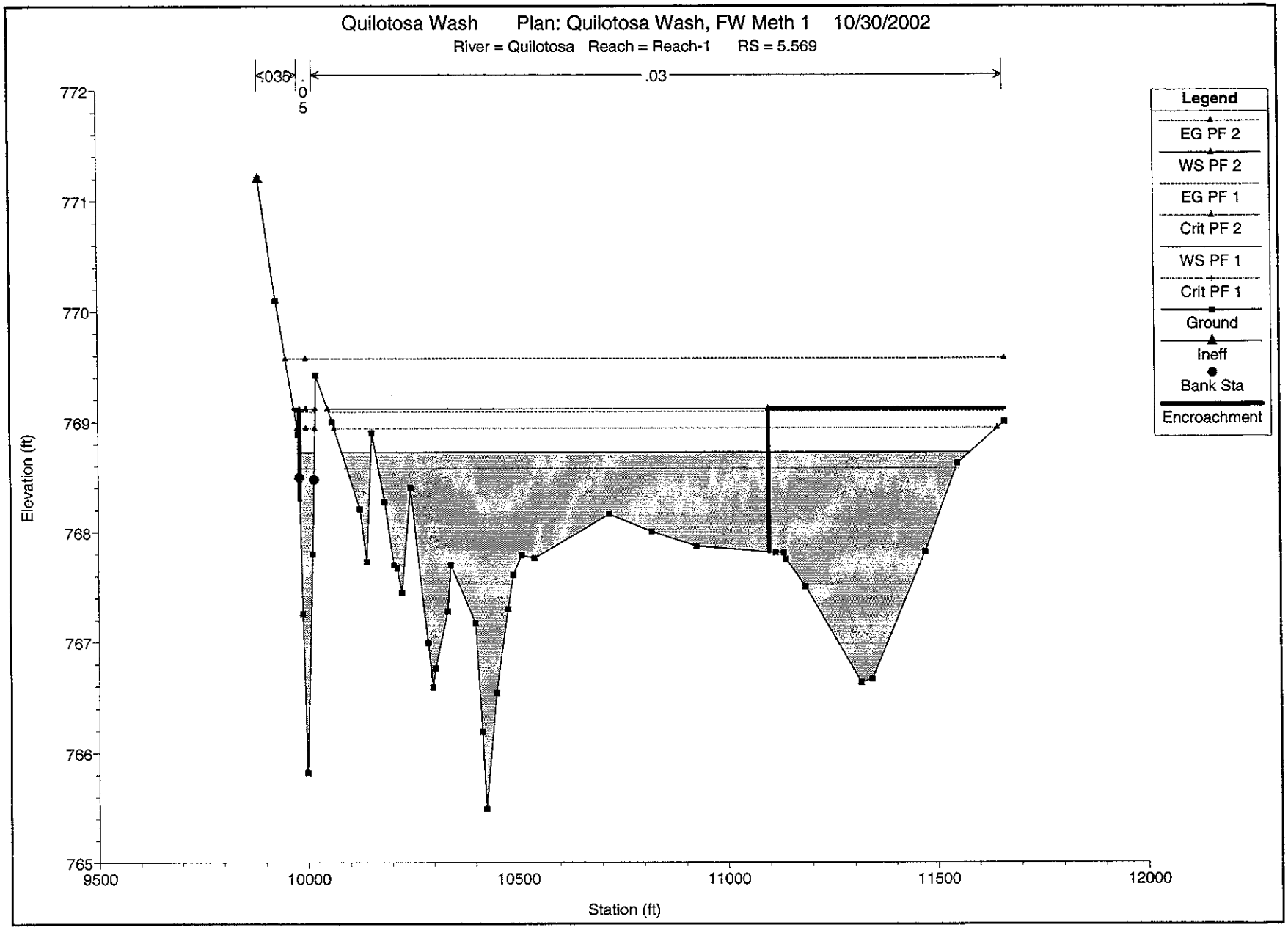

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-1 RS = 5.993
.035
.05
.03
Elevation (ft)
788
786
784
782
780
778
776
9500
10000
10500
11000
11500
12000
12500
13000
Station (ft)
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment

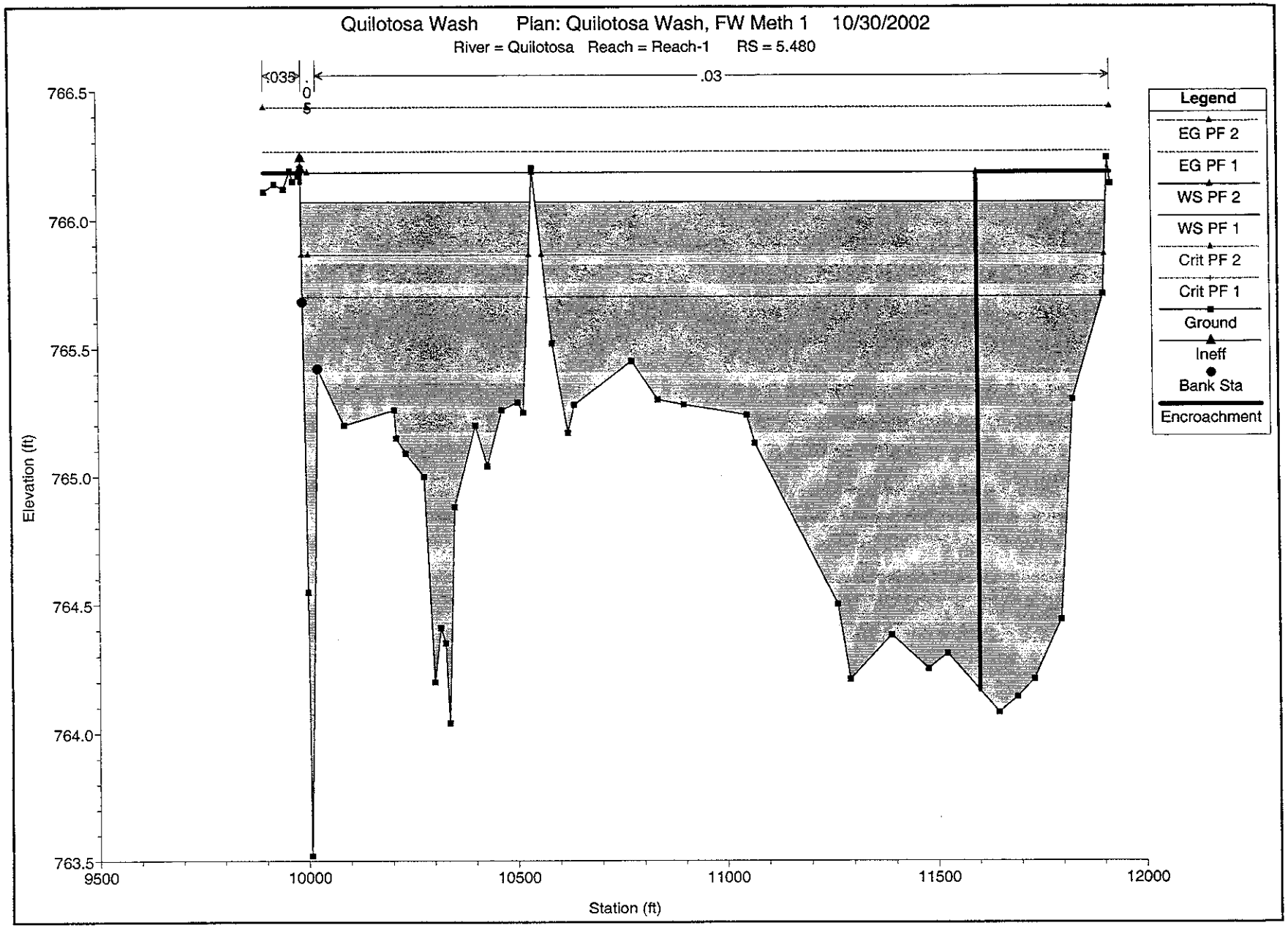

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-1 RS = 5.907
.035
0
5
.03
Elevation (ft)
786
784
782
780
778
776
774
9500
10000
10500
11000
11500
12000
12500
Station (ft)
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment

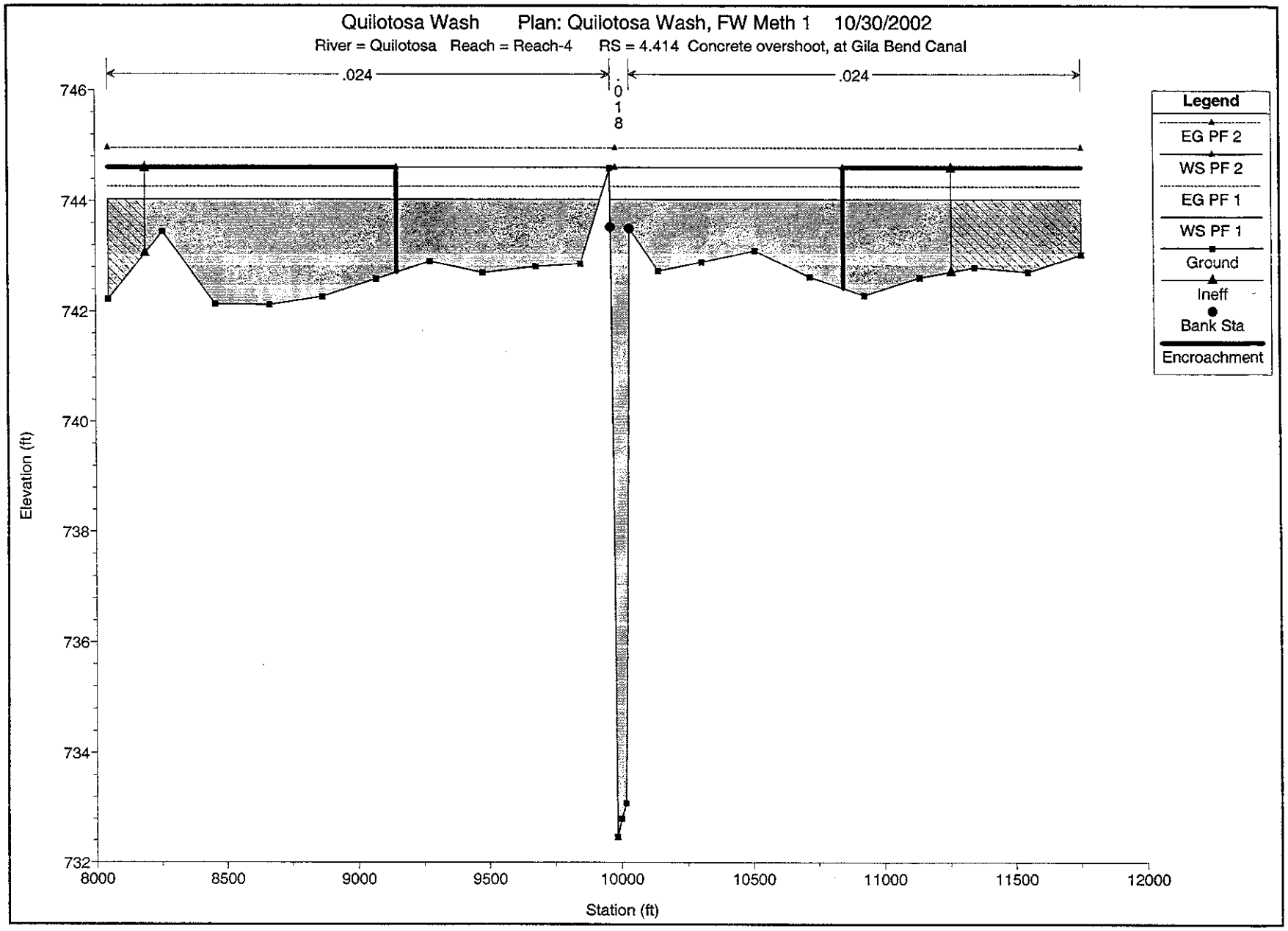

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-1 RS = 5.841
.035
.05
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
786
784
782
780
778
776
774
772
9500
10000
10500
11000
11500
12000
12500
Station (ft)

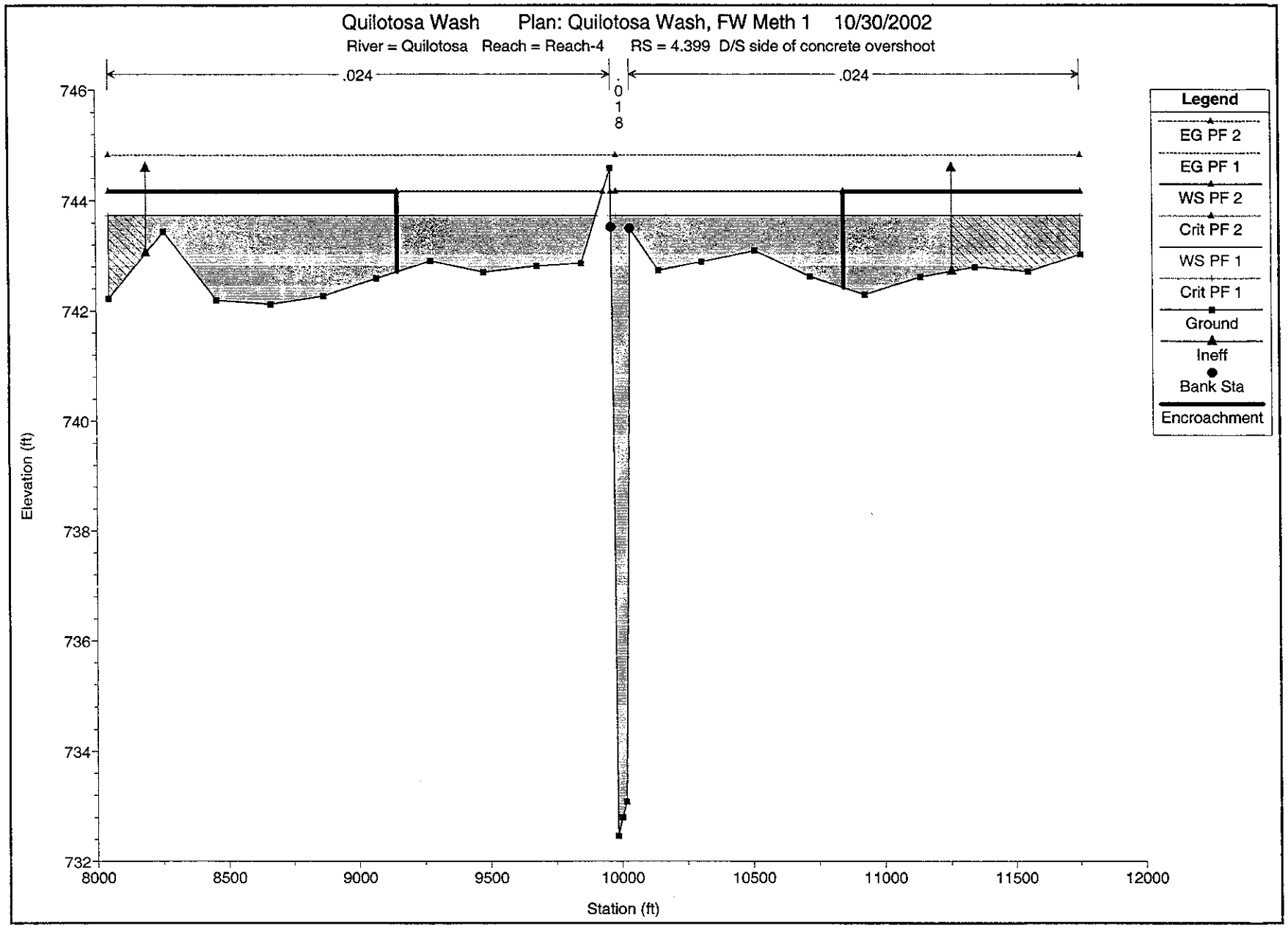

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-1 RS = 5.749
.035
.05
.03
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 2
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
780
779
778
777
776
775
774
773
772
9500
10000
10500
11000
11500
12000
12500
Station (ft)

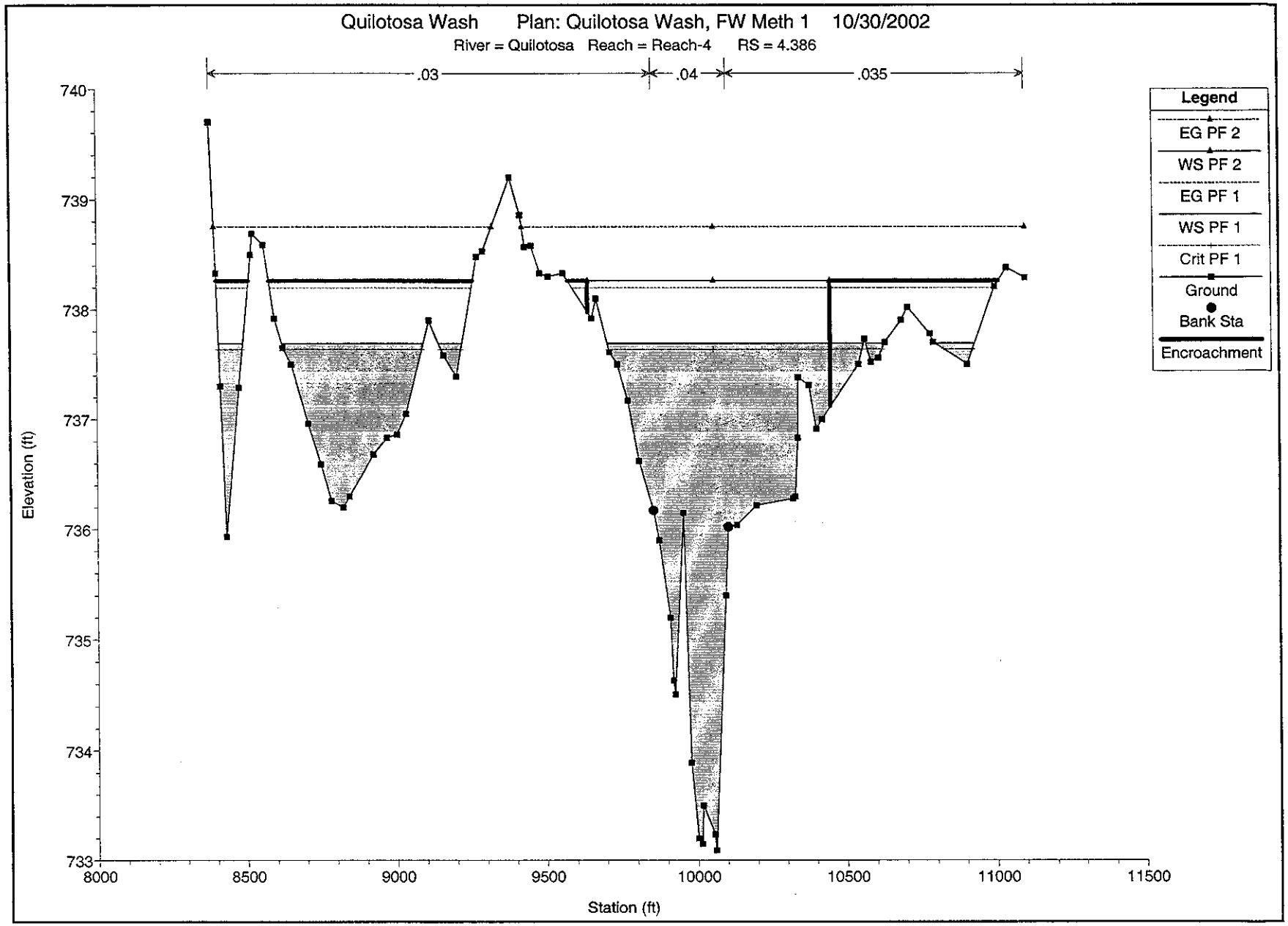

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-1 RS = 5.663
.035
0
5
.03
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
775
774
773
772
771
770
769
768
9500
10000
10500
11000
11500
12000
Station (ft)

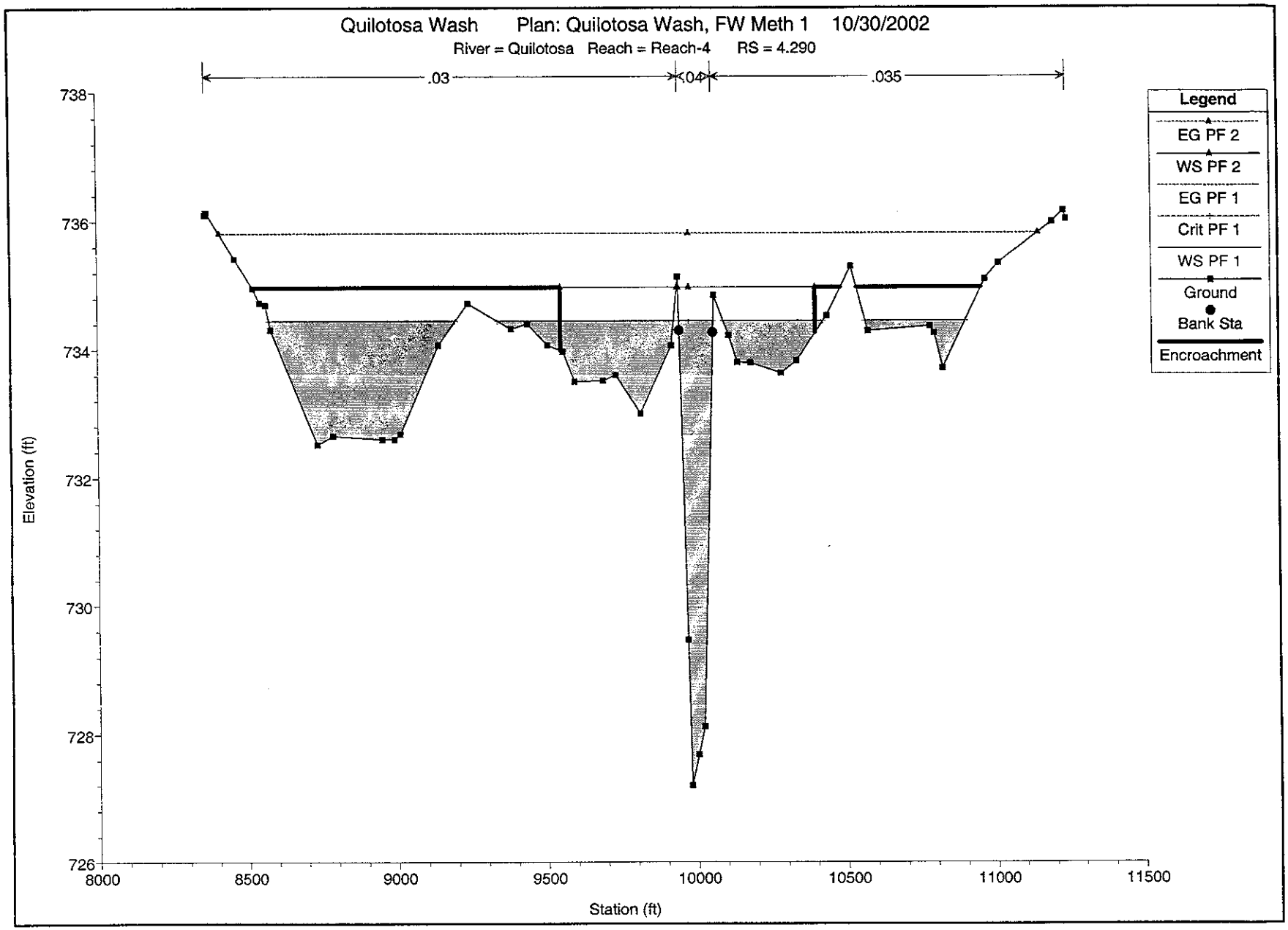

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-1 RS = 5.569
.035
.05
.03
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 2
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
772
771
770
769
768
767
766
765
9500
10000
10500
11000
11500
12000
Station (ft)

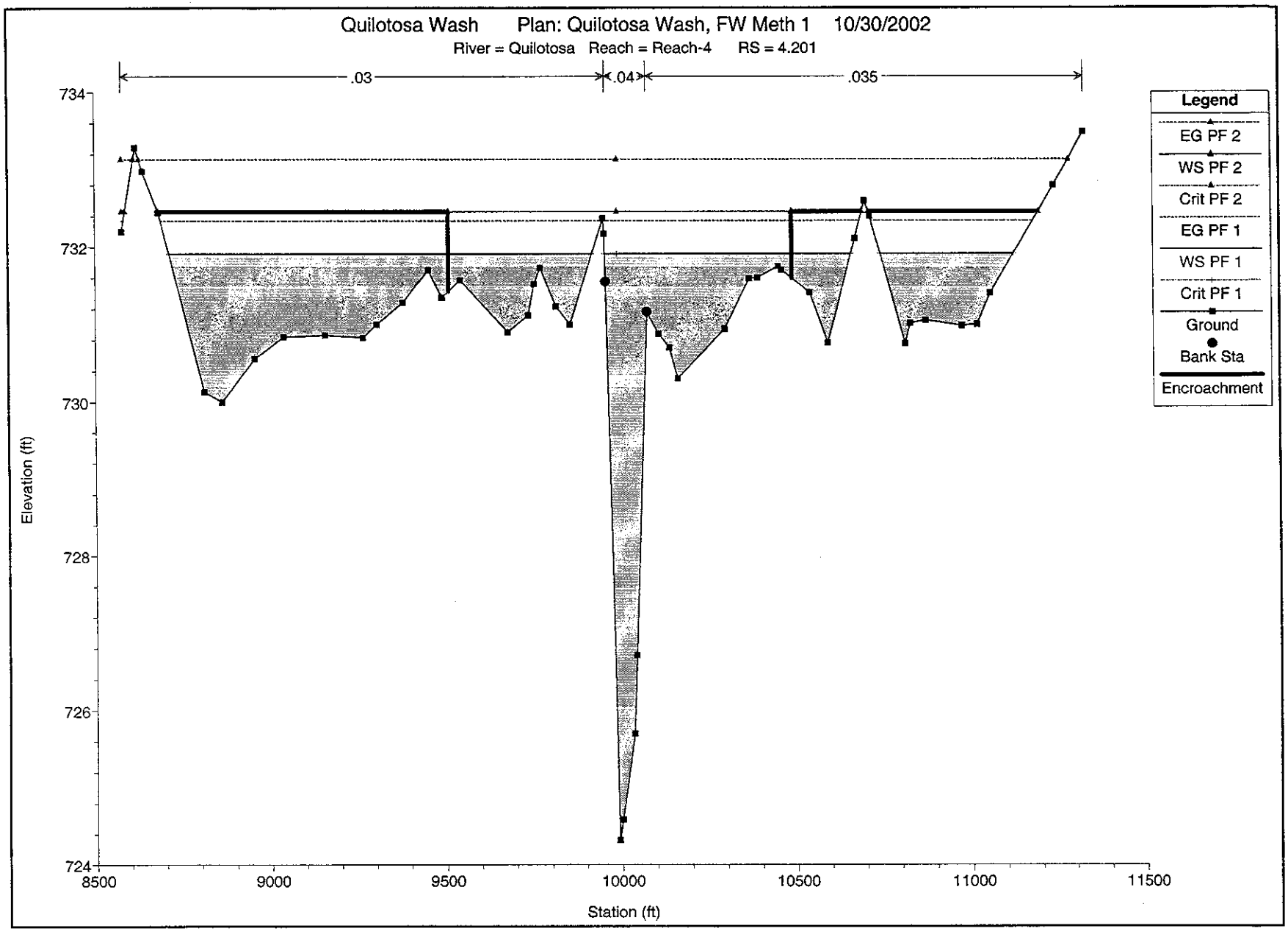

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-1 RS = 5.480
.035
.03
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
766.5
766.0
765.5
765.0
764.5
764.0
763.5
9500
10000
10500
11000
11500
12000
Station (ft)

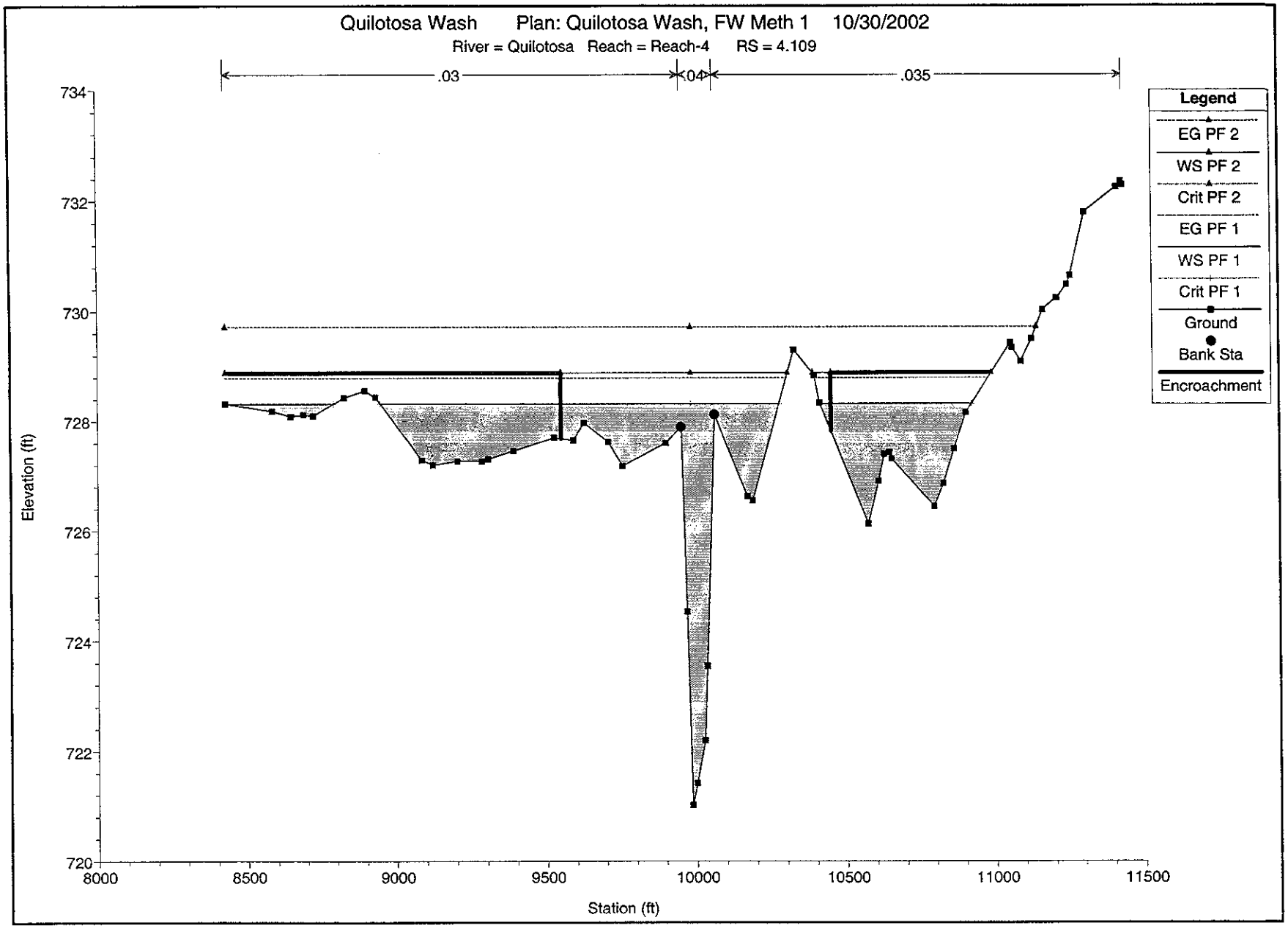

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 4.414 Concrete overshoot, at Gila Bend Canal
.024
.018
.024
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
734
732
8000
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

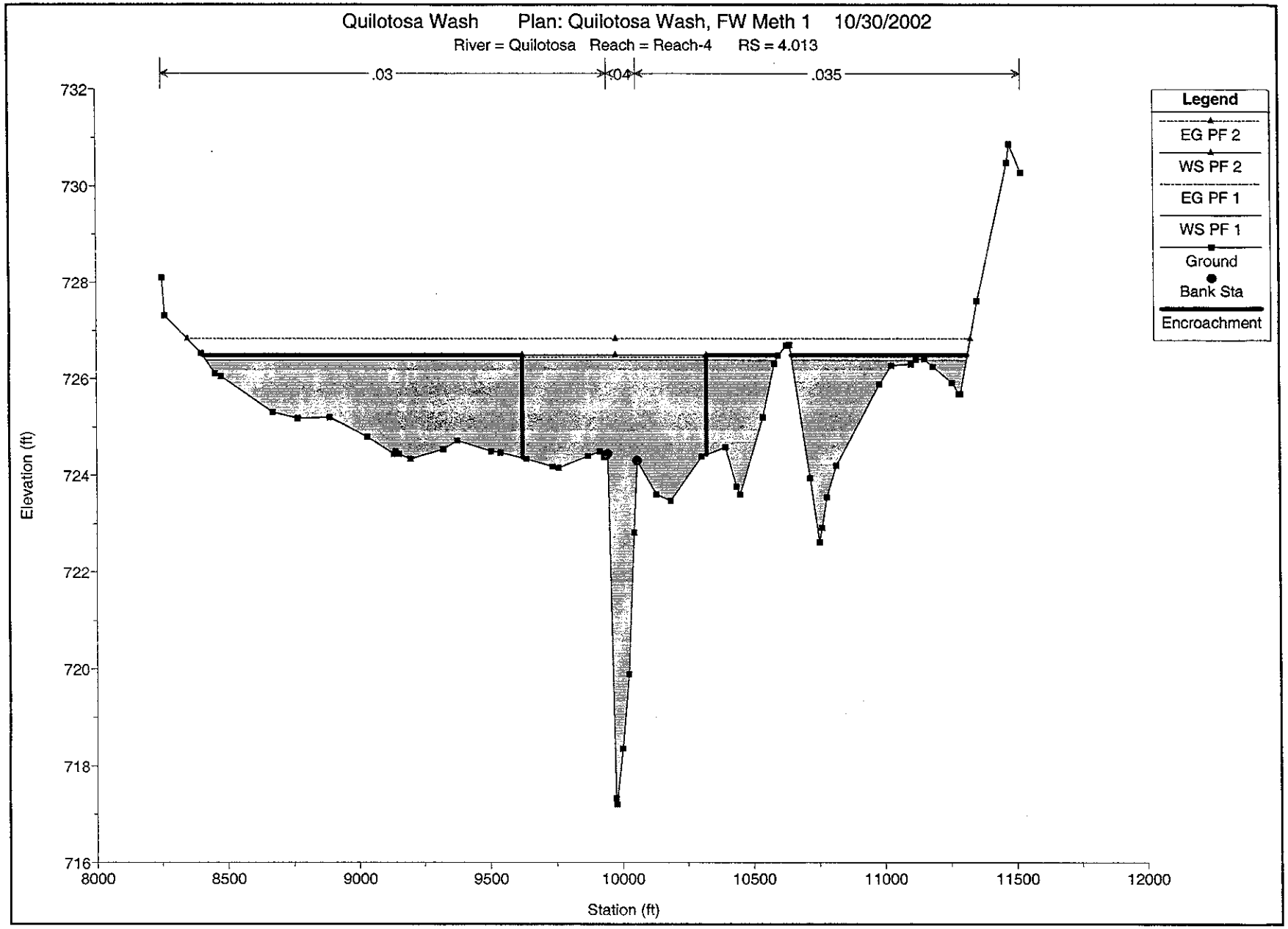

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 4.399 D/S side of concrete overshoot
.024
.018
.024
Legend
EG PF 2
EG PF 1
WS PF 2
Crit PF 2
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
734
732
8000
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

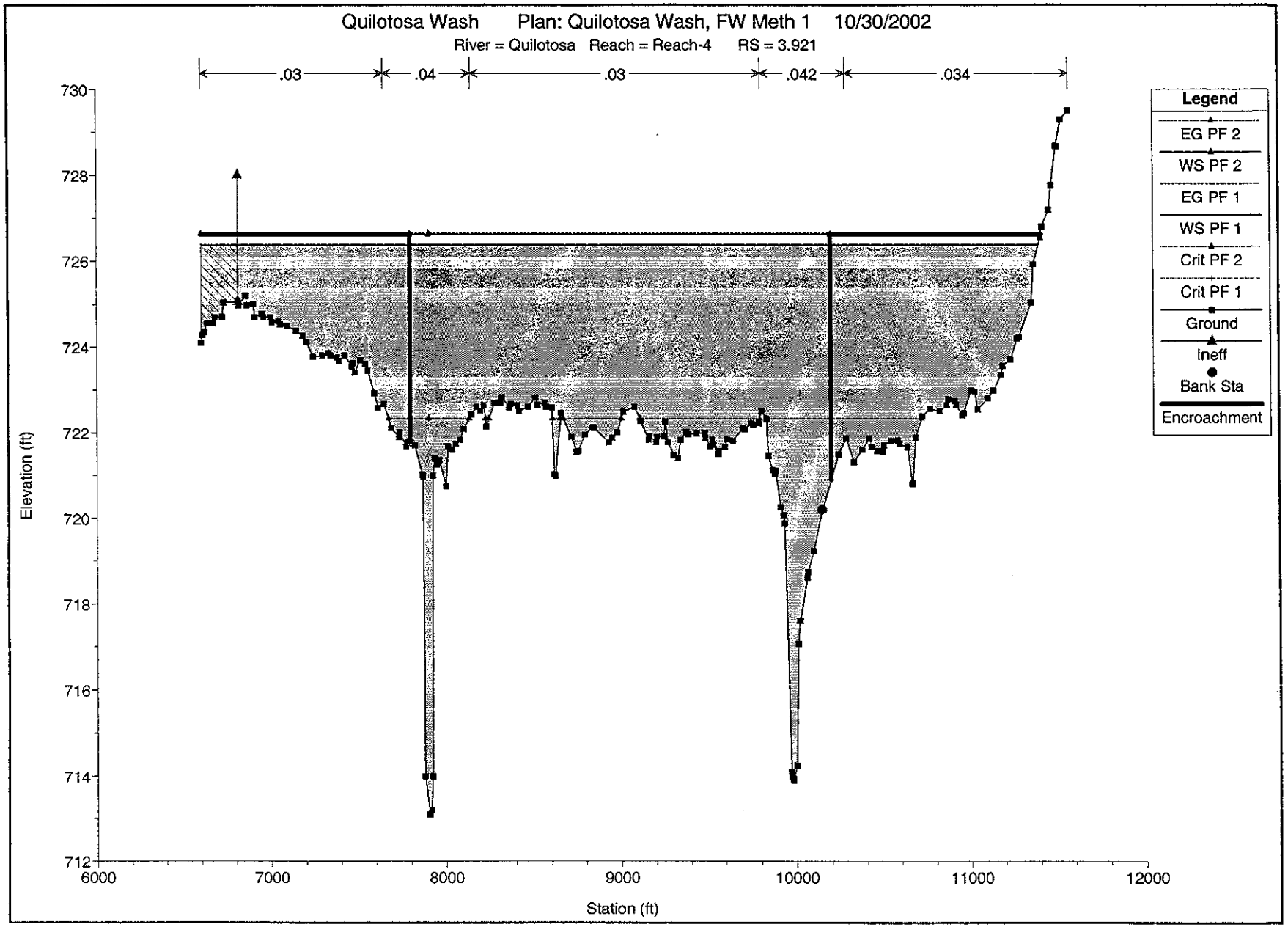

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 4.386
.03
.04
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
740
739
738
737
736
735
734
733
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

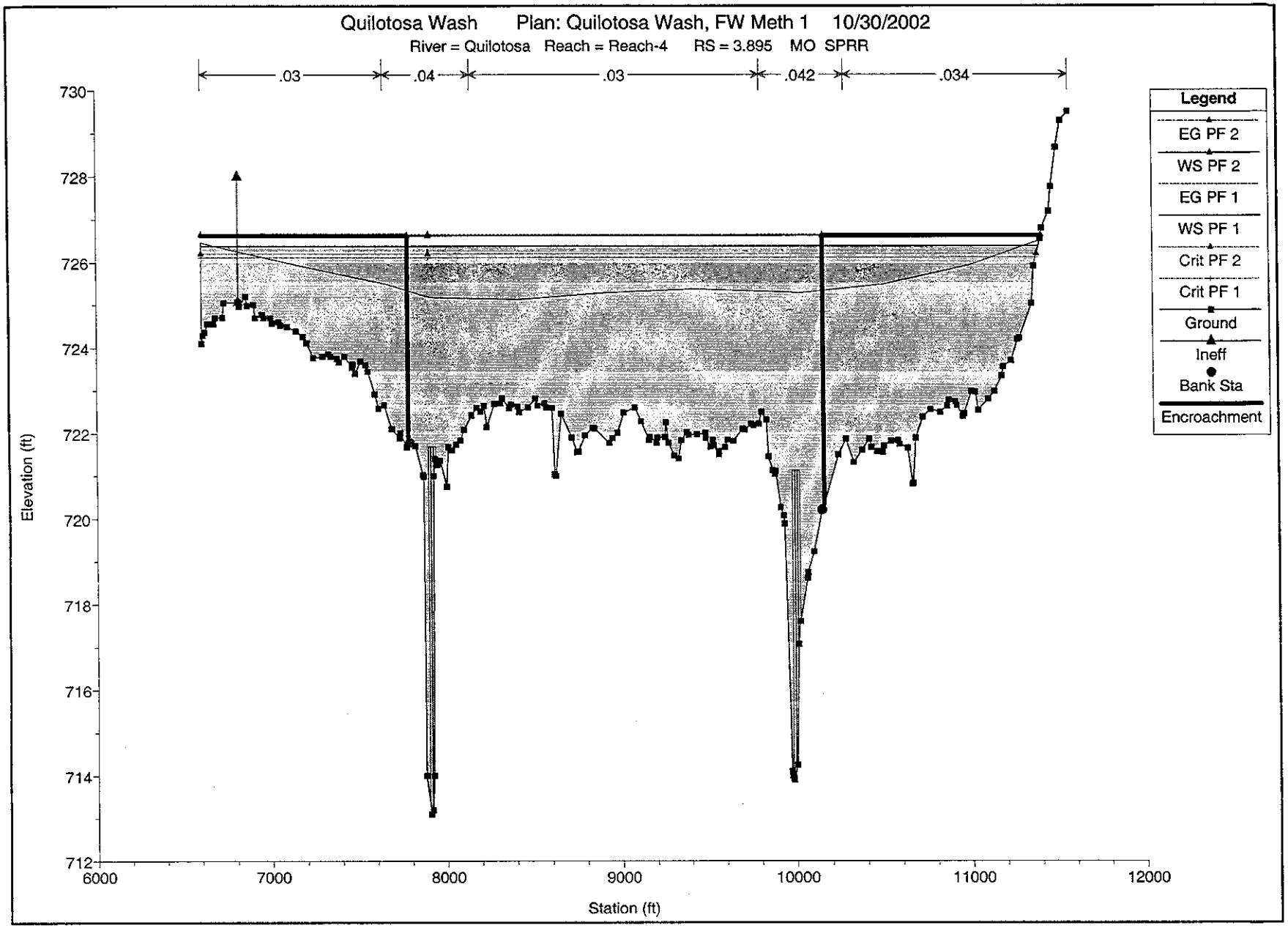

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 4.290
.03
.04
.035
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
738
736
734
732
730
728
726
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

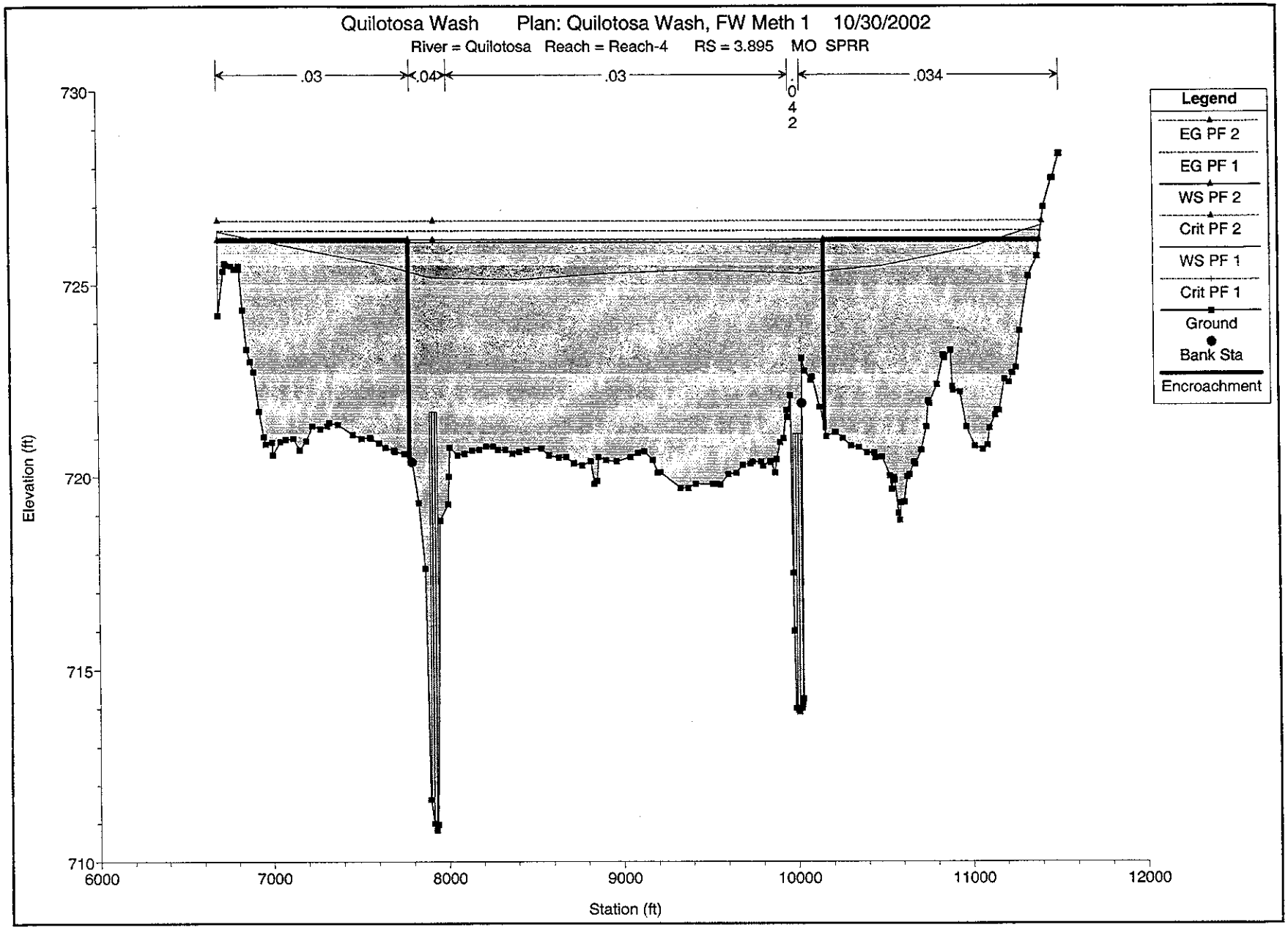

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 4.201
.03
.04
.035
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
734
732
730
728
726
724
8500
9000
9500
10000
10500
11000
11500
Station (ft)

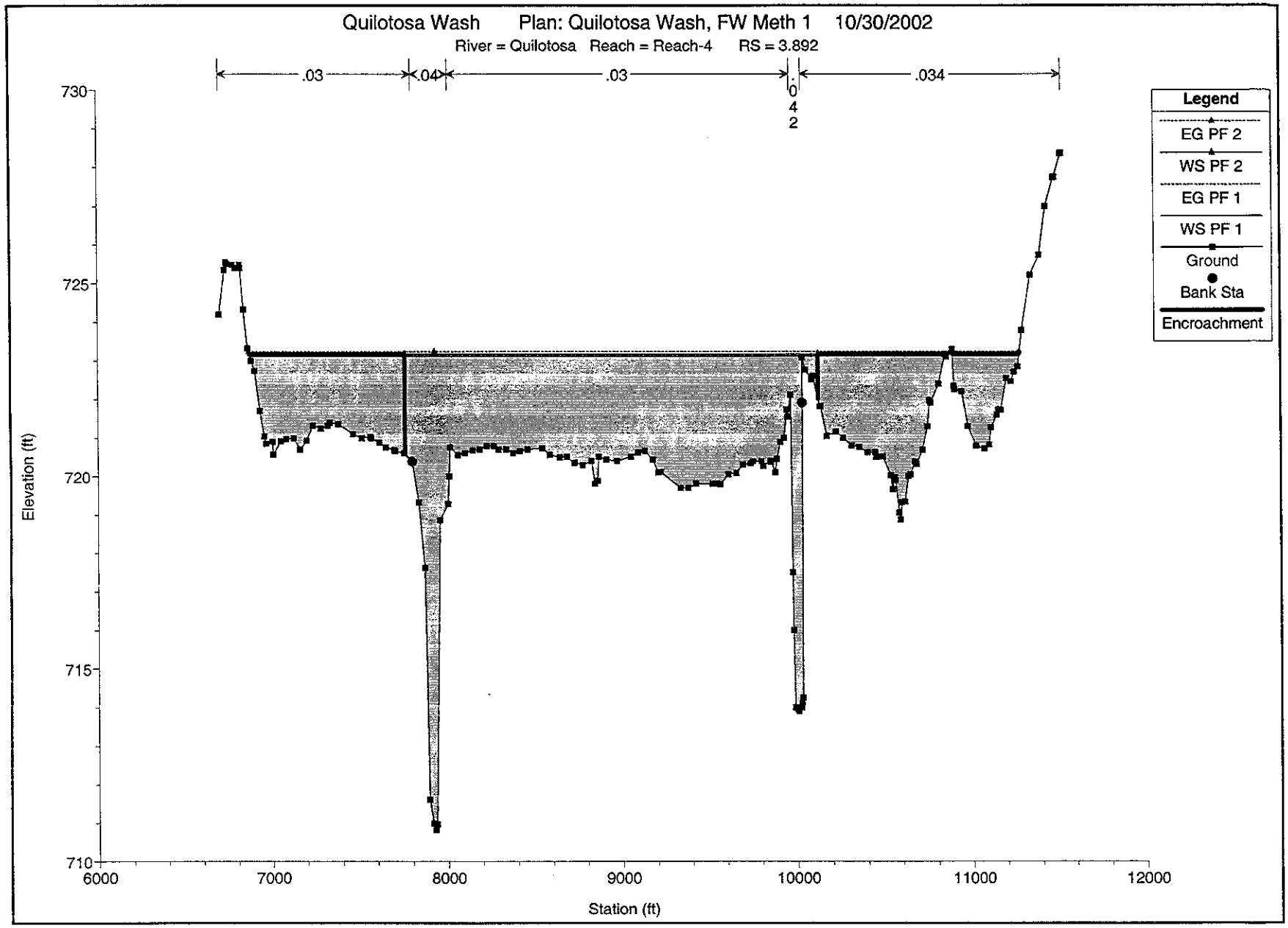

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 4.109
.03
.04
.035
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
734
732
730
728
726
724
722
720
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

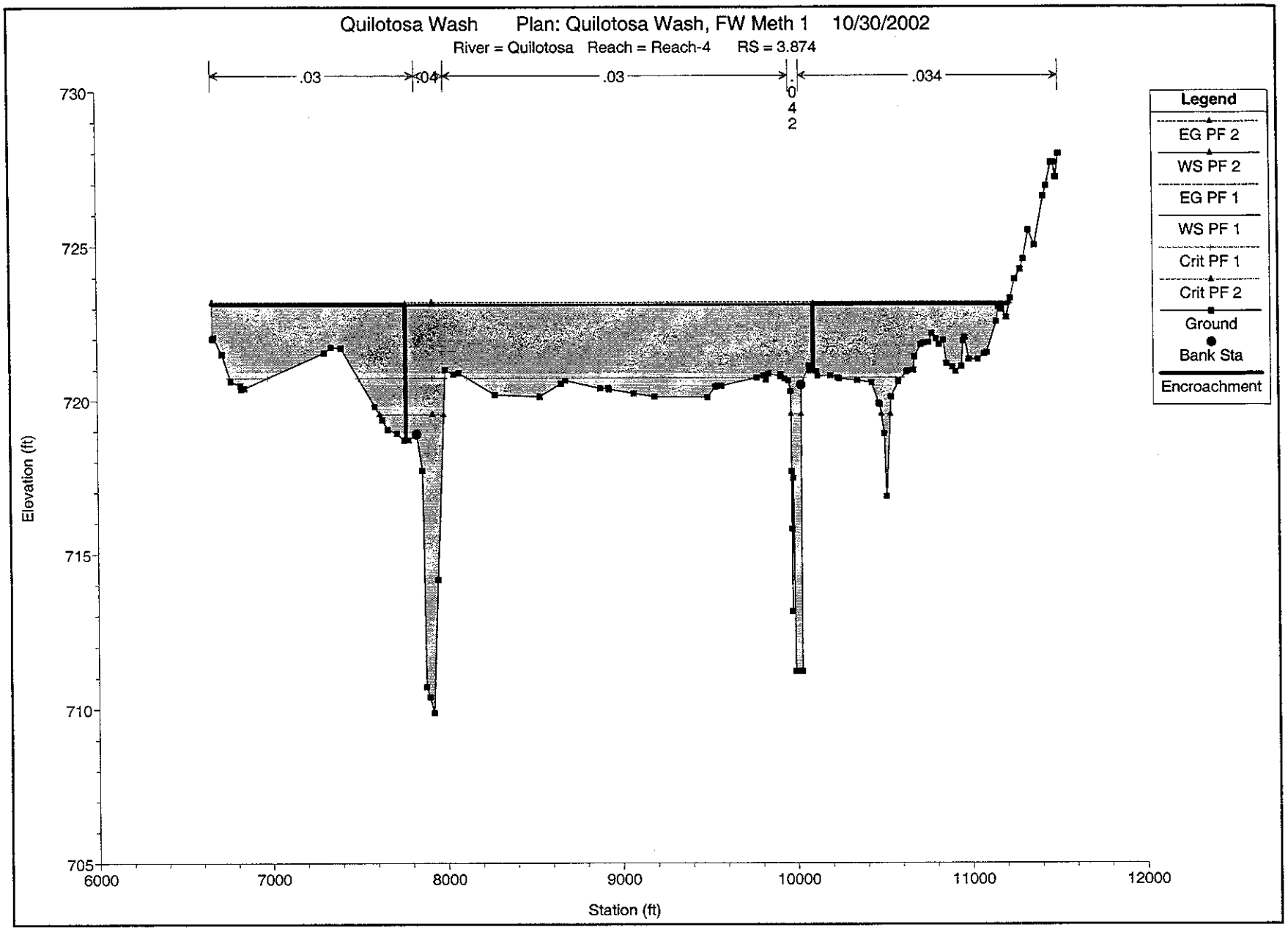

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 4.013
.03
.04
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
732
730
728
726
724
722
720
718
716
8000
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

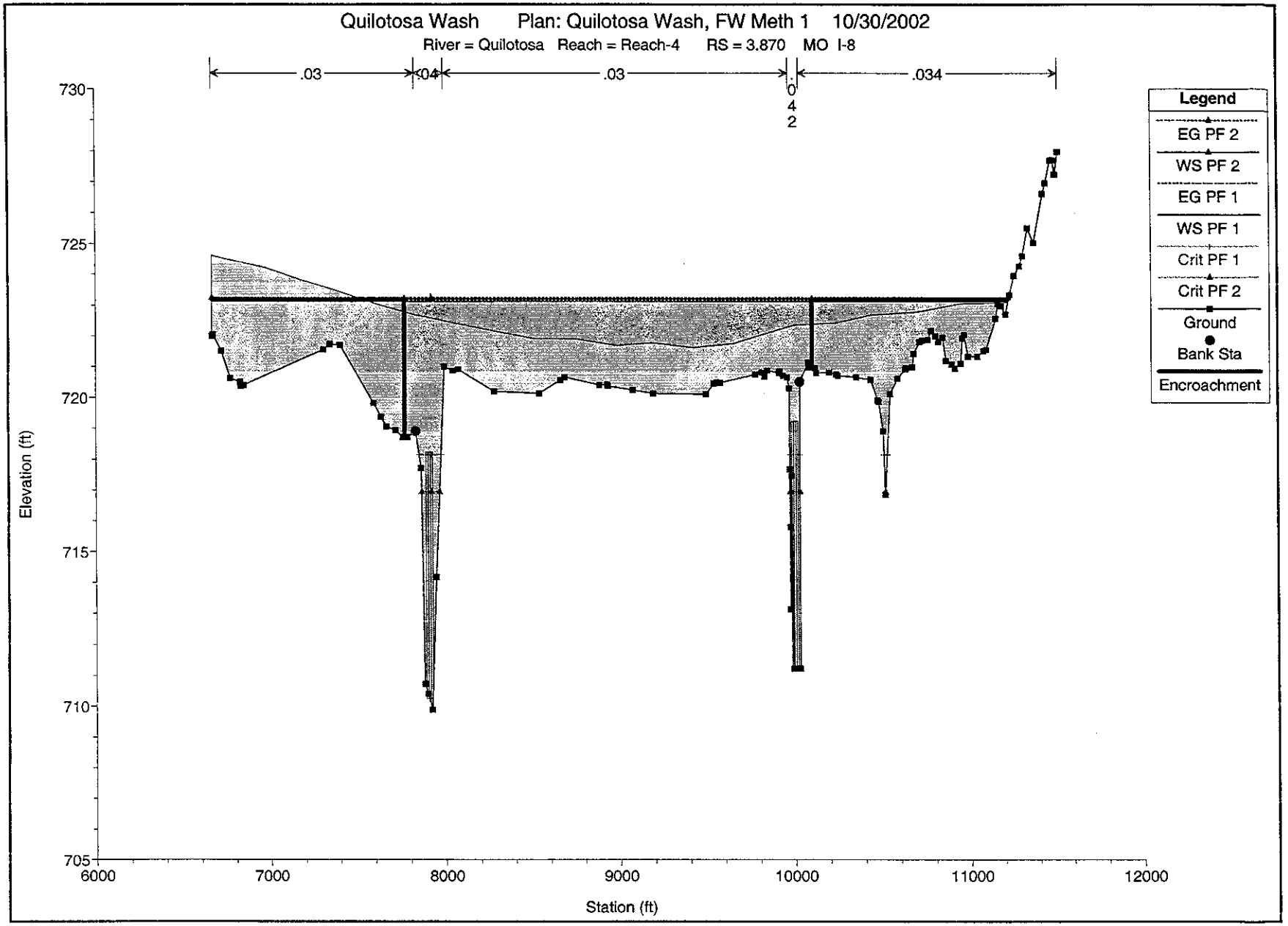

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 3.921
.03
.04
.03
.042
.034
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
718
716
714
712
6000
7000
8000
9000
10000
11000
12000
Station (ft)

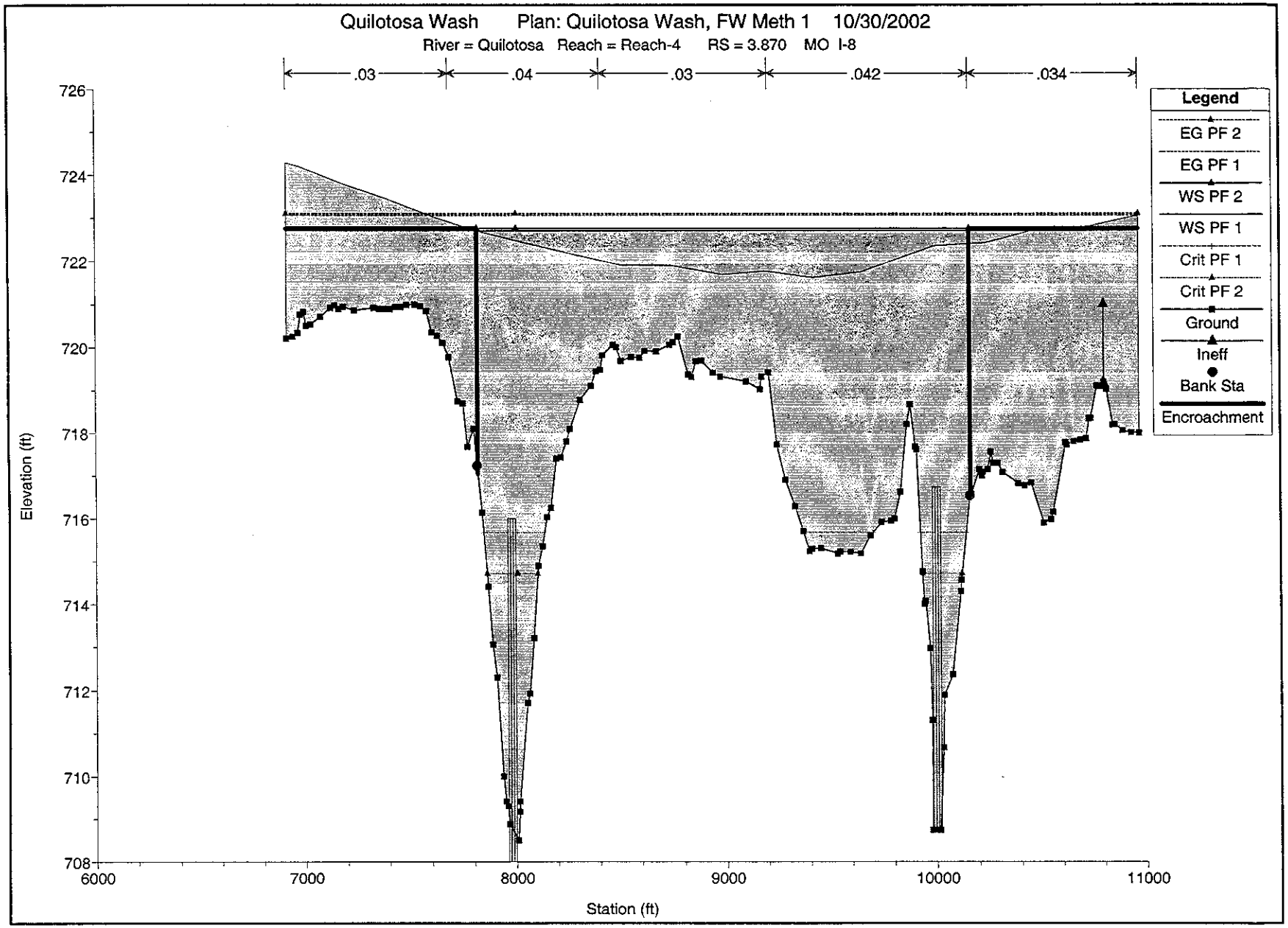

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 3.895 MO SPRR
.03
.04
.03
.042
.034
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
718
716
714
712
6000
7000
8000
9000
10000
11000
12000
Station (ft)

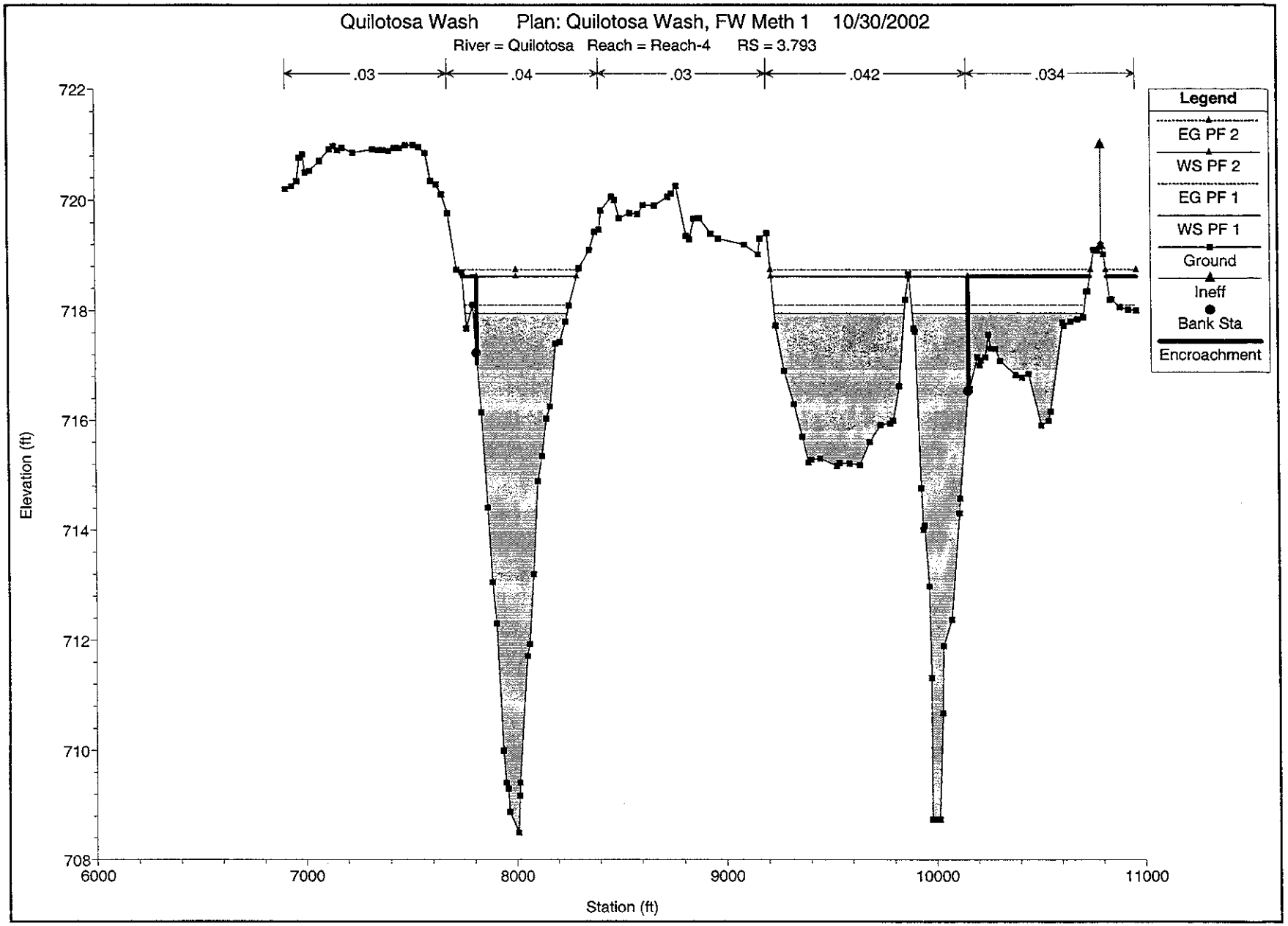

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 3.895 MO SPRR
.03
.04
.03
.042
.034
Legend
EG PF 2
EG PF 1
WS PF 2
Crit PF 2
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
730
725
720
715
710
6000
7000
8000
9000
10000
11000
12000
Station (ft)

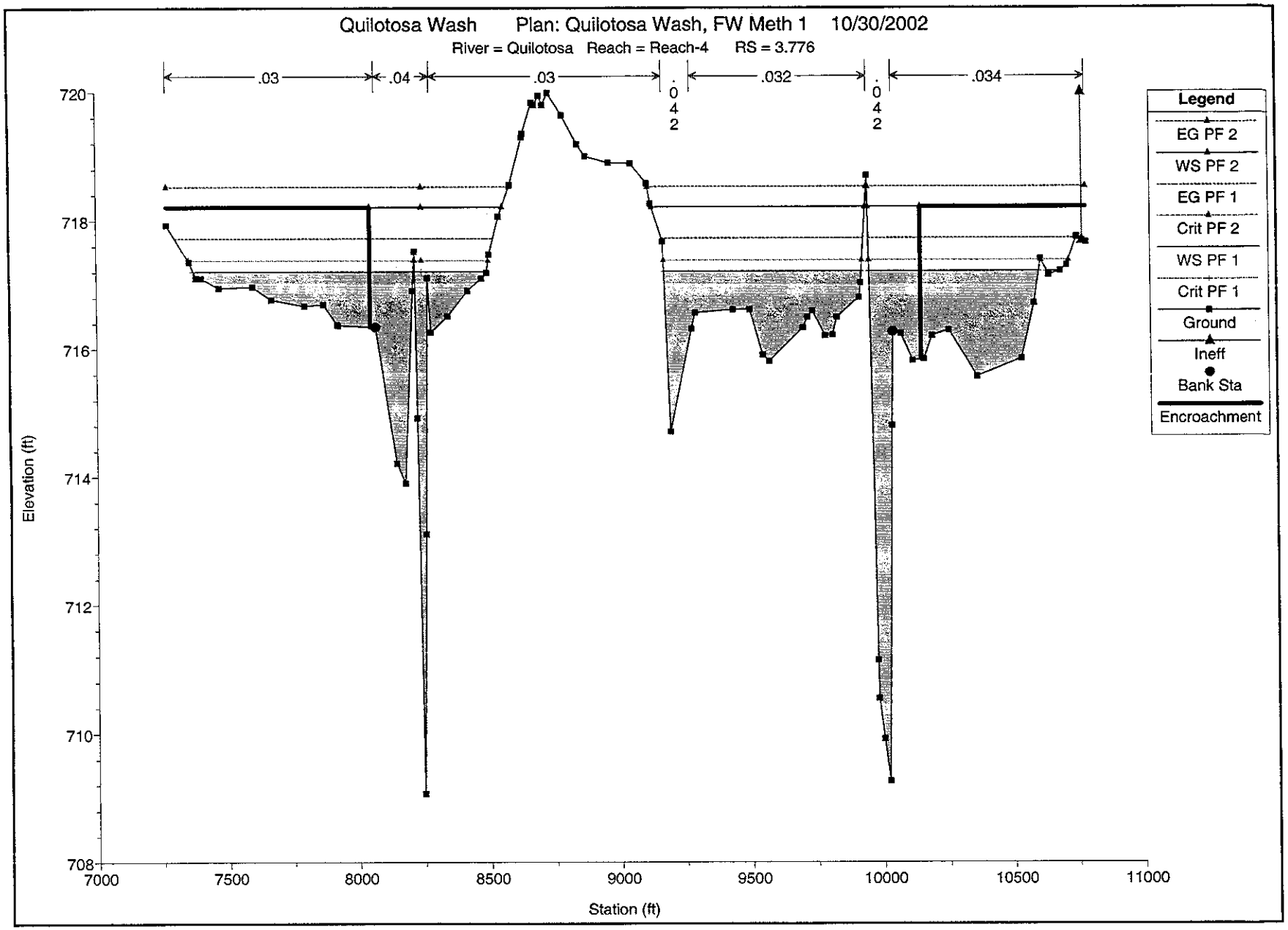

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 3.892
.03
.04
.03
.042
.034
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
730
725
720
715
710
6000
7000
8000
9000
10000
11000
12000
Station (ft)

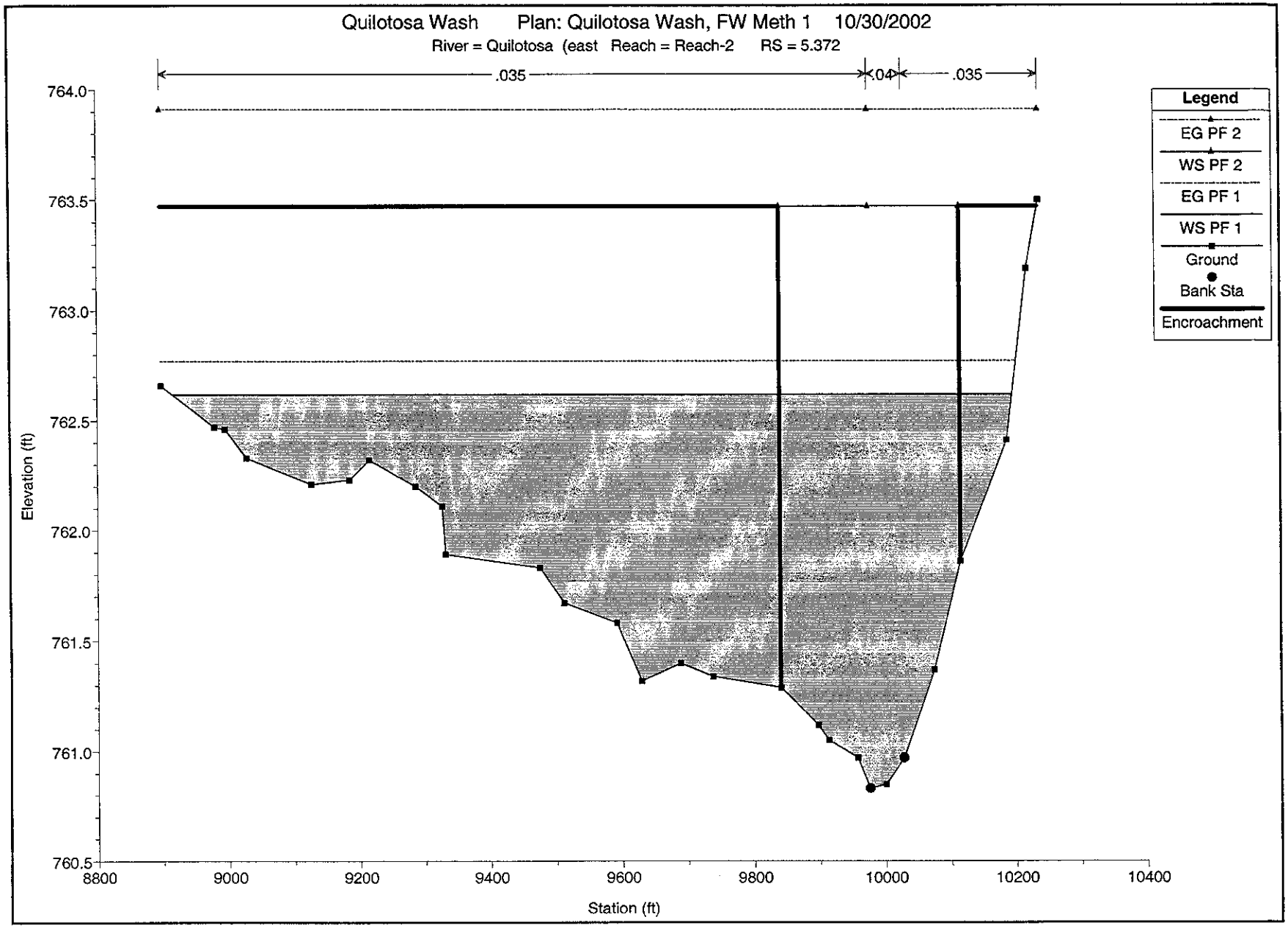

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 3.874
.03
.04
.03
.042
.034
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
730
725
720
715
710
705
6000
7000
8000
9000
10000
11000
12000
Station (ft)

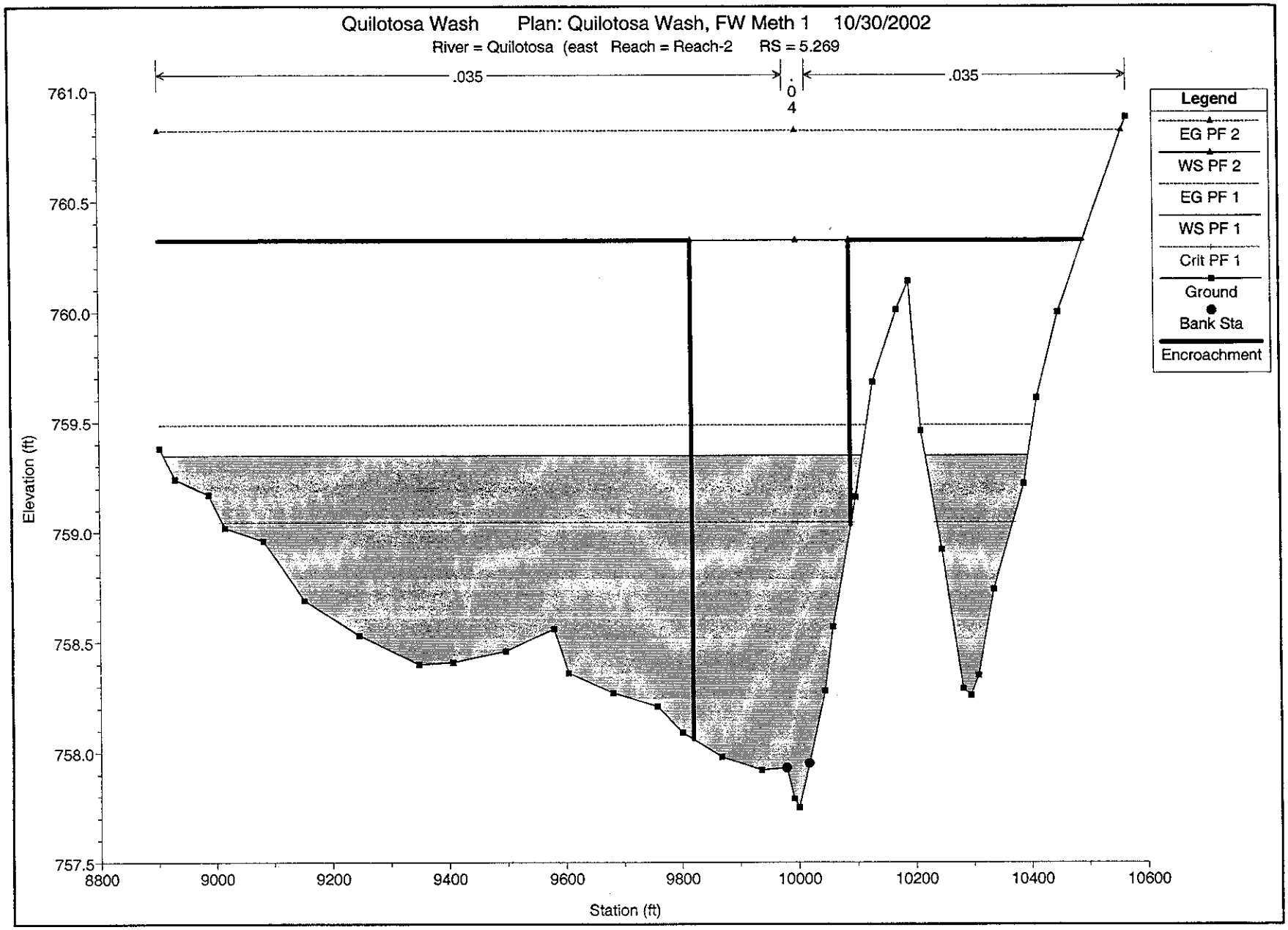

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 3.870 MO I-8
.03
.04
.03
.042
.034
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
730
725
720
715
710
705
6000
7000
8000
9000
10000
11000
12000
Station (ft)

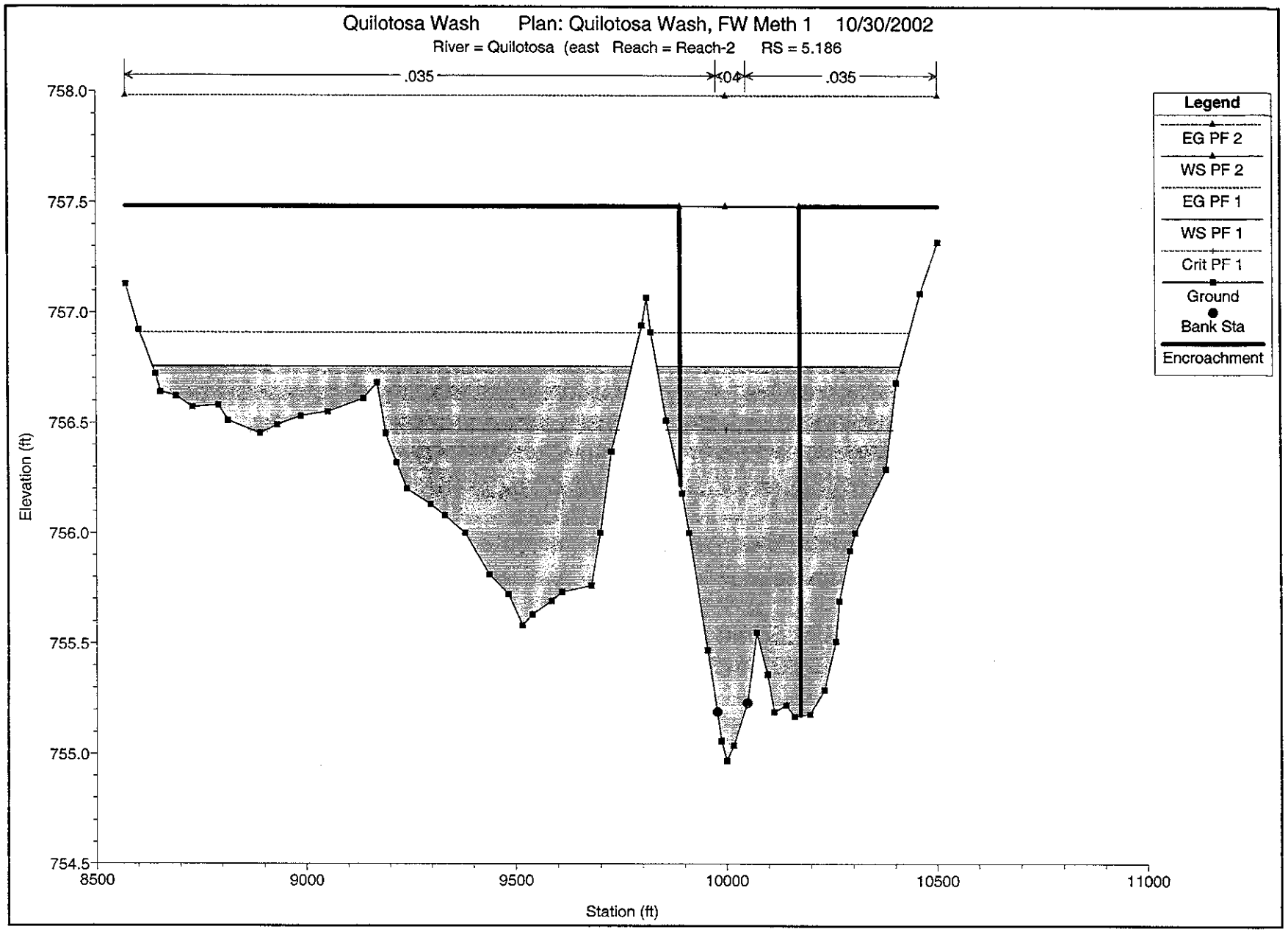

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 3.870 MO I-8
.03
.04
.03
.042
.034
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
726
724
722
720
718
716
714
712
710
708
6000
7000
8000
9000
10000
11000
Station (ft)

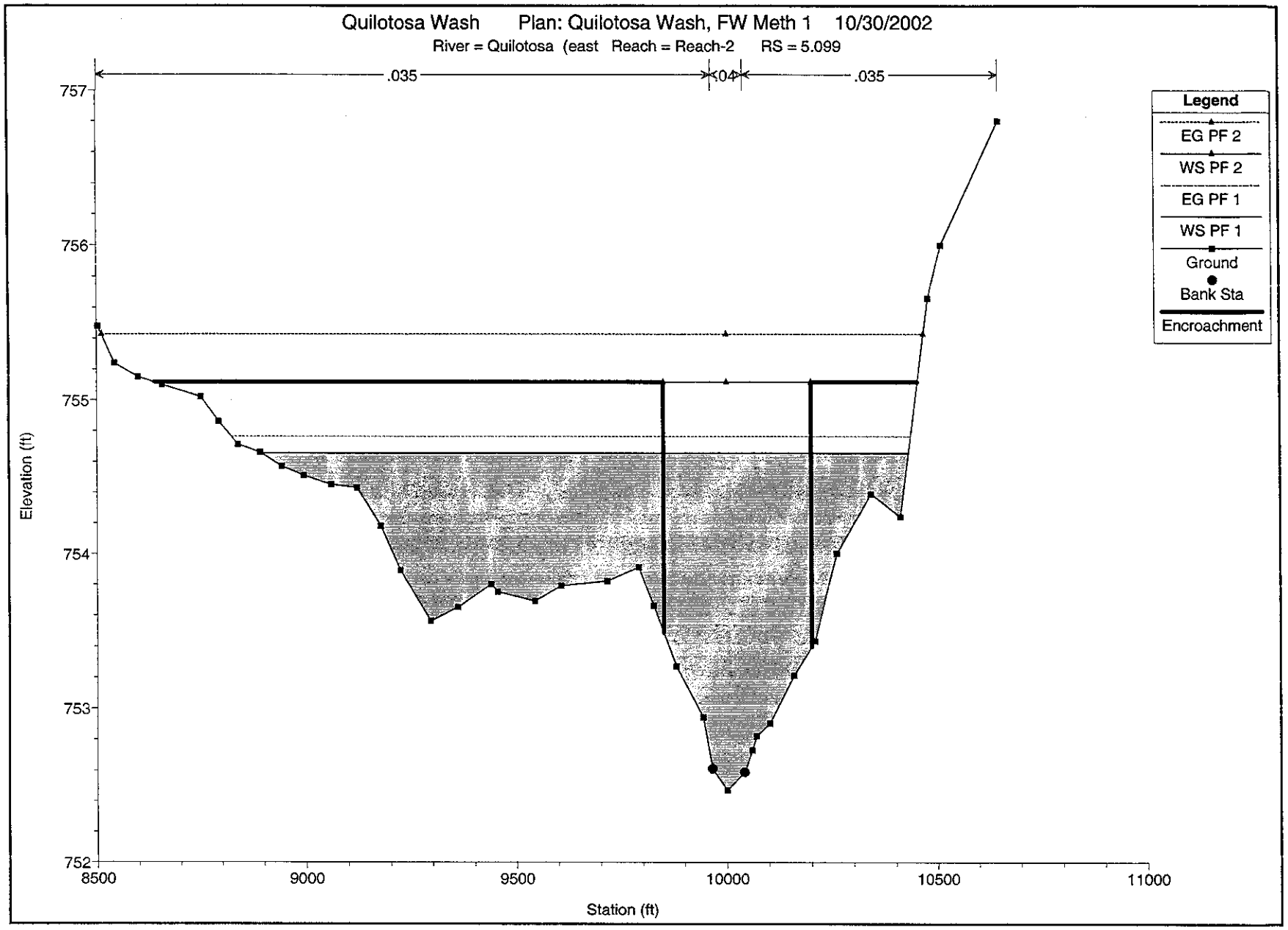

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 3.793
.03
.04
.03
.042
.034
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
722
720
718
716
714
712
710
708
6000
7000
8000
9000
10000
11000
Station (ft)

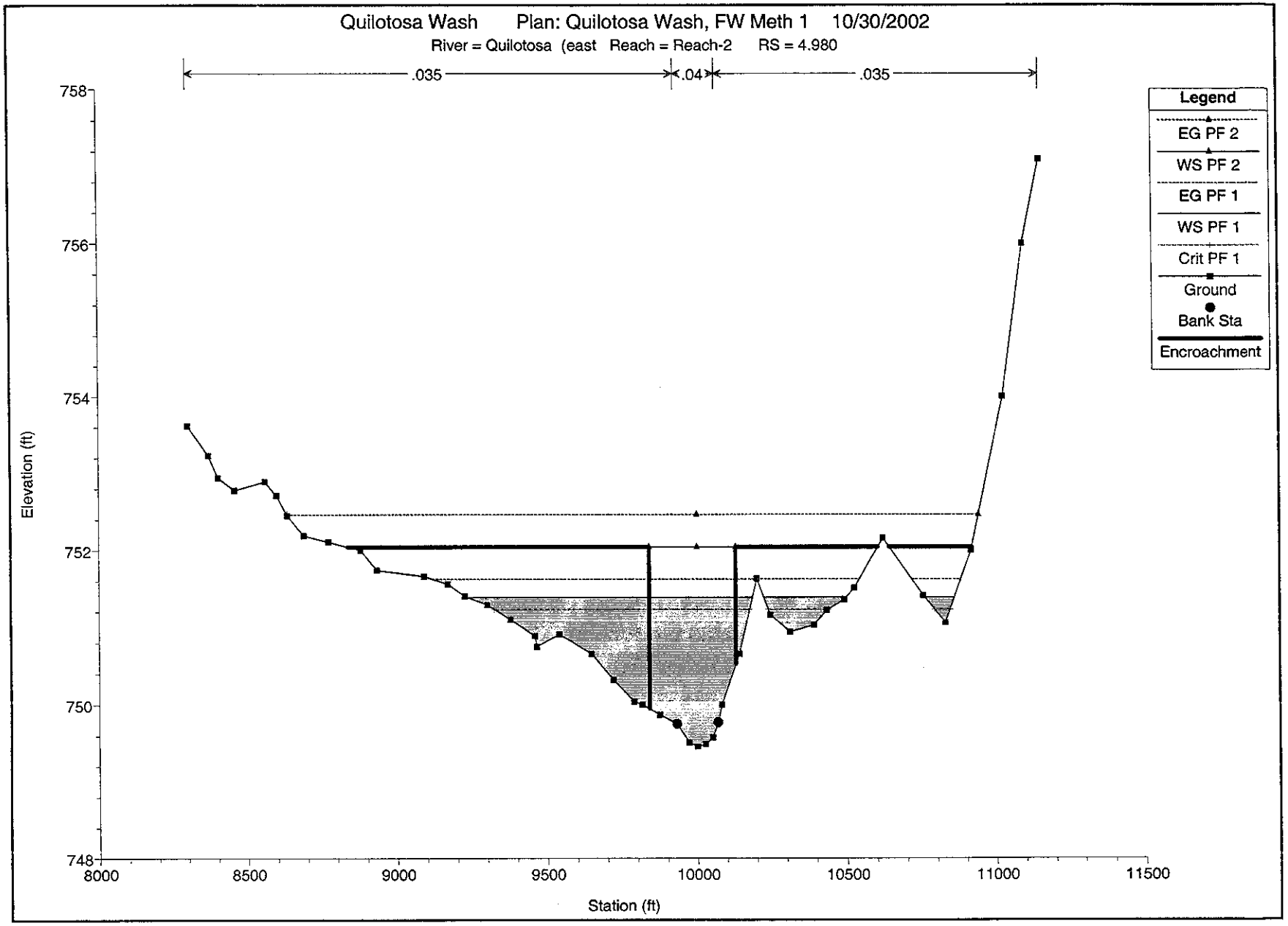

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa Reach = Reach-4 RS = 3.776
.03
.04
.03
.042
.032
.042
.034
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 2
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
720
718
716
714
712
710
708
7000
7500
8000
8500
9000
9500
10000
10500
11000
Station (ft)

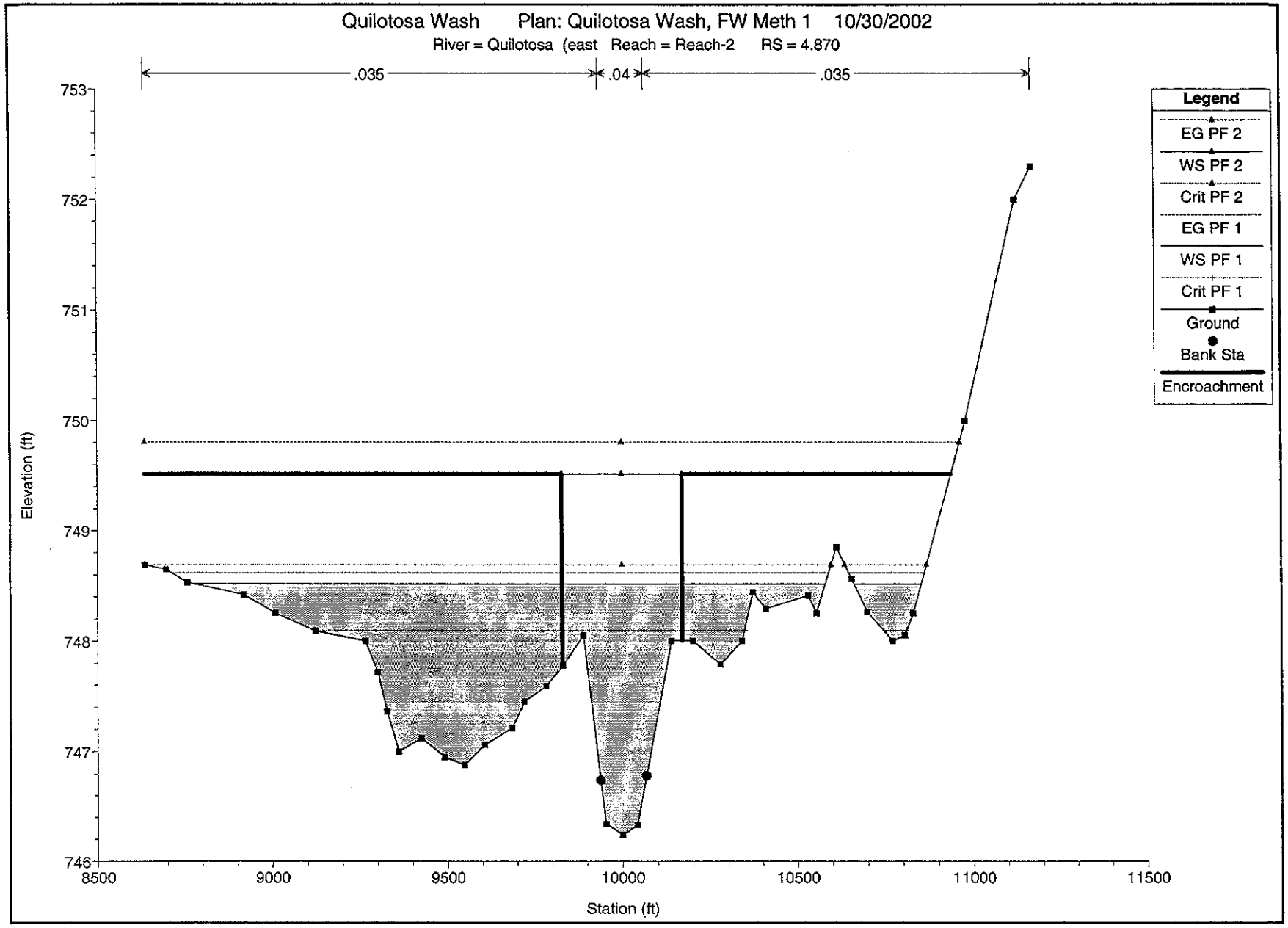

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (east Reach = Reach-2 RS = 5.372
.035
.04
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
764.0
763.5
763.0
762.5
762.0
761.5
761.0
760.5
8800
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

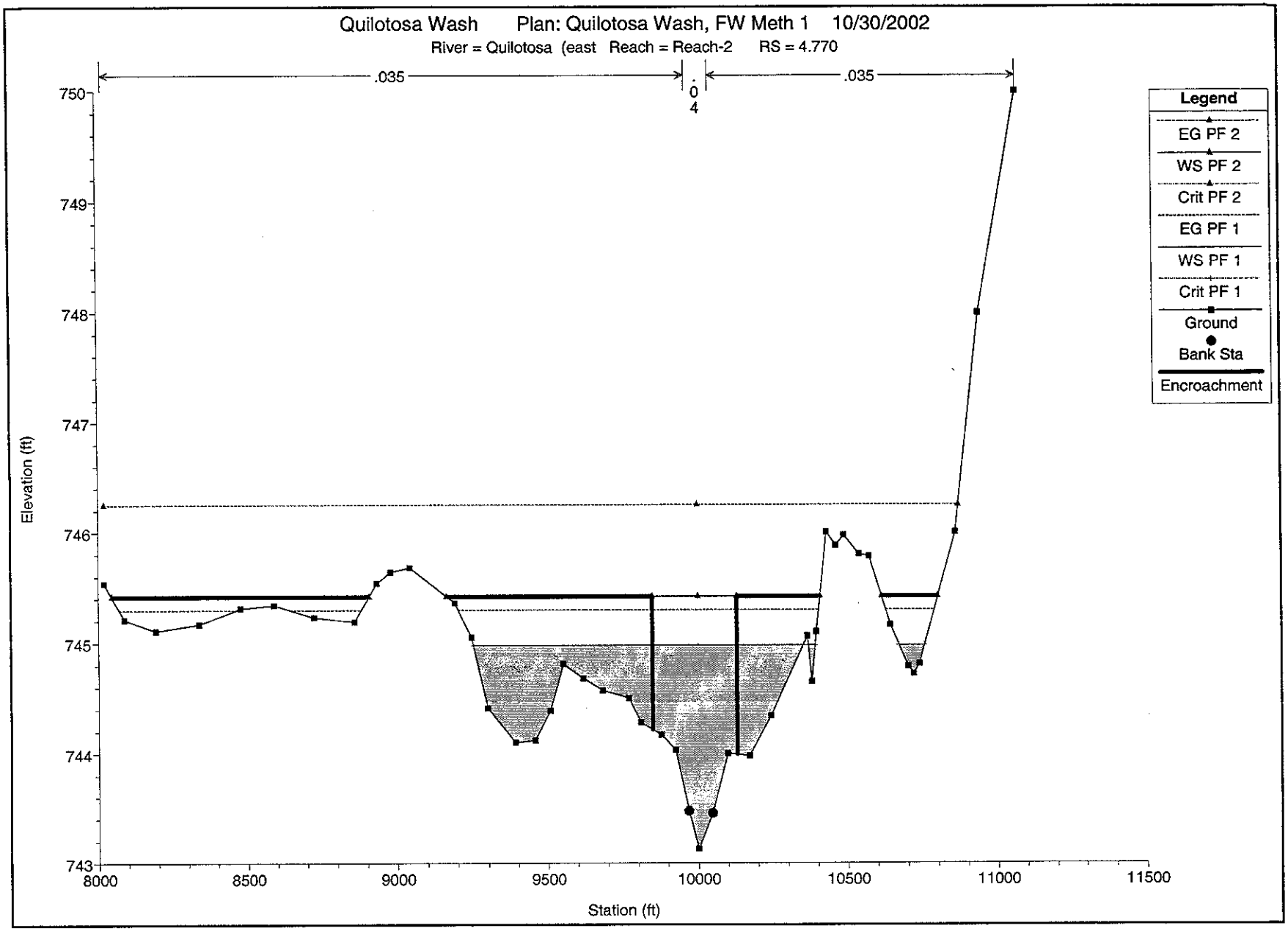

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (east Reach = Reach-2 RS = 5.269
.035
.04
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
761.0
760.5
760.0
759.5
759.0
758.5
758.0
757.5
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

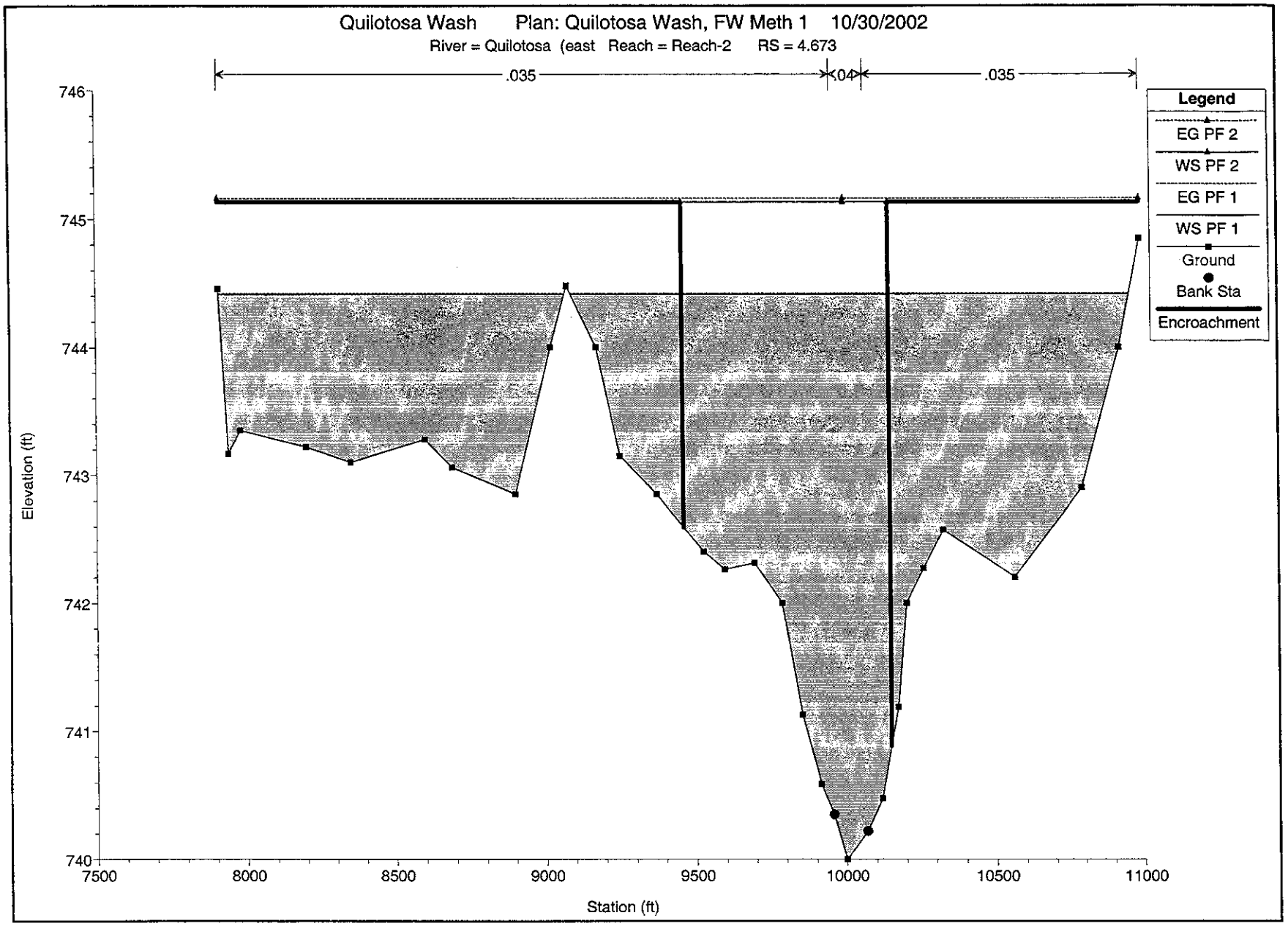

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (east Reach = Reach-2 RS = 5.186
.035
.04
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
758.0
757.5
757.0
756.5
756.0
755.5
755.0
754.5
8500
9000
9500
10000
10500
11000
Station (ft)

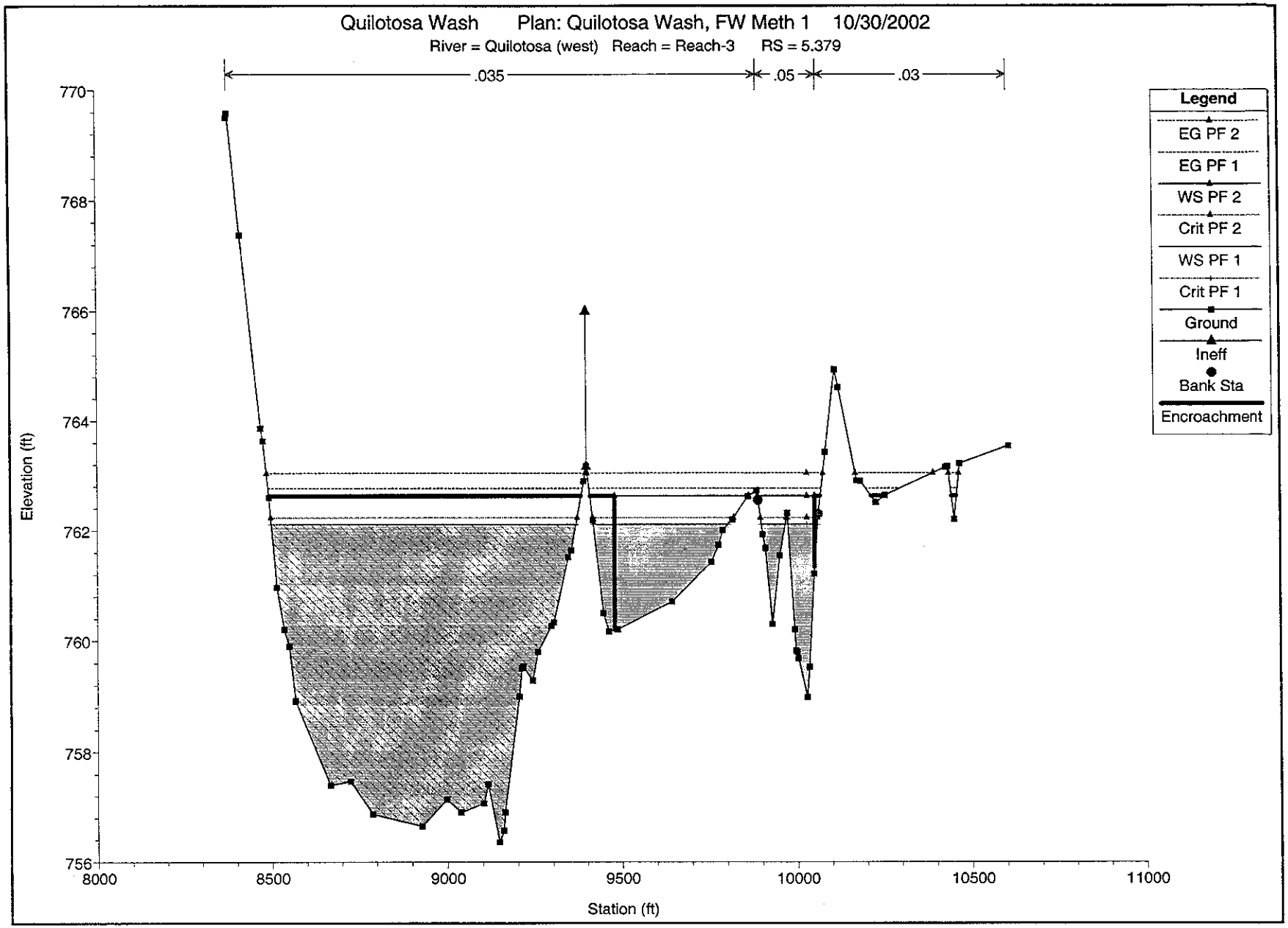

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (east Reach = Reach-2 RS = 5.099
.035
.04
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
757
756
755
754
753
752
8500
9000
9500
10000
10500
11000
Station (ft)

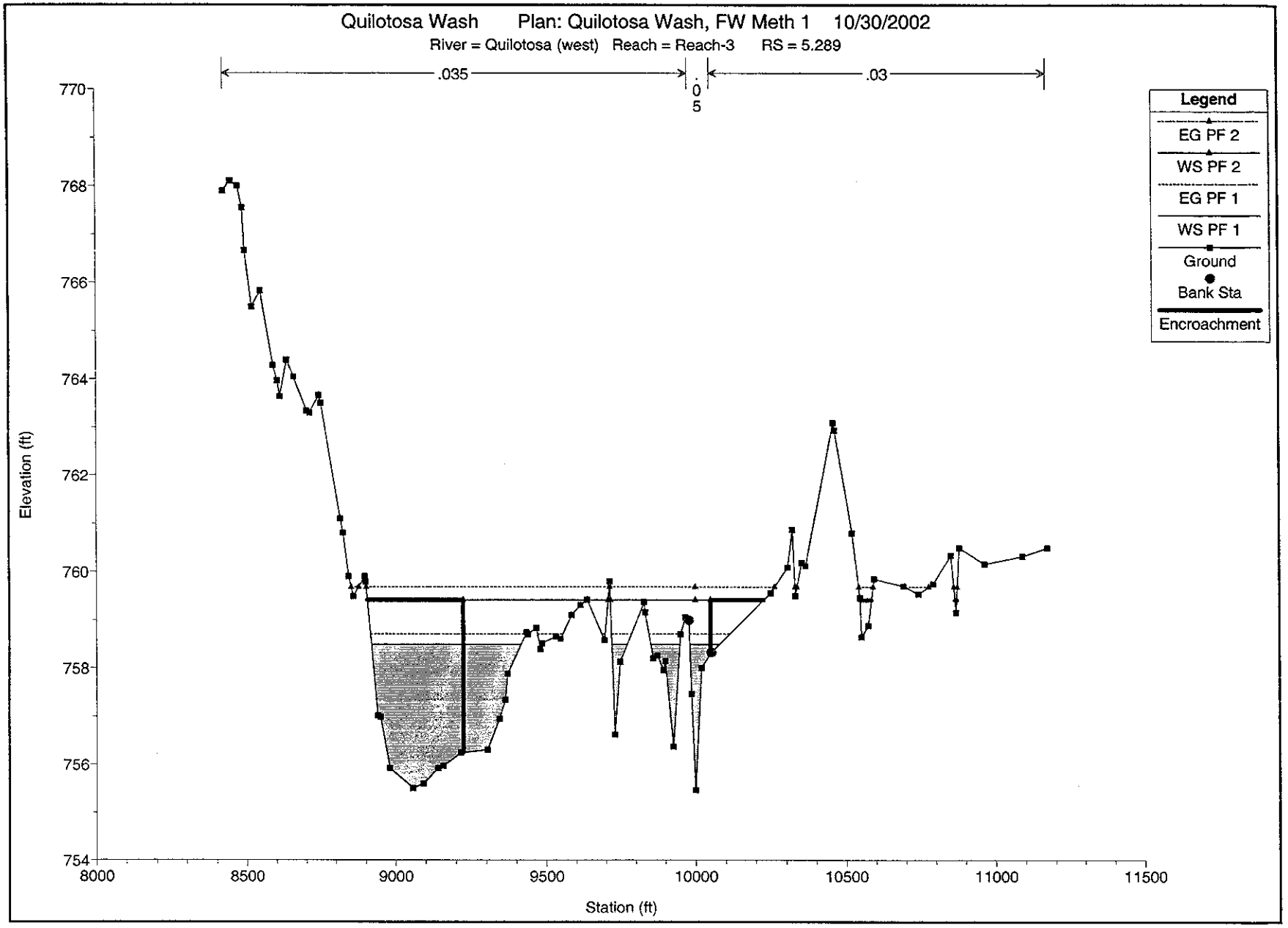

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (east Reach = Reach-2 RS = 4.980
.035
.04
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
758
756
754
752
750
748
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

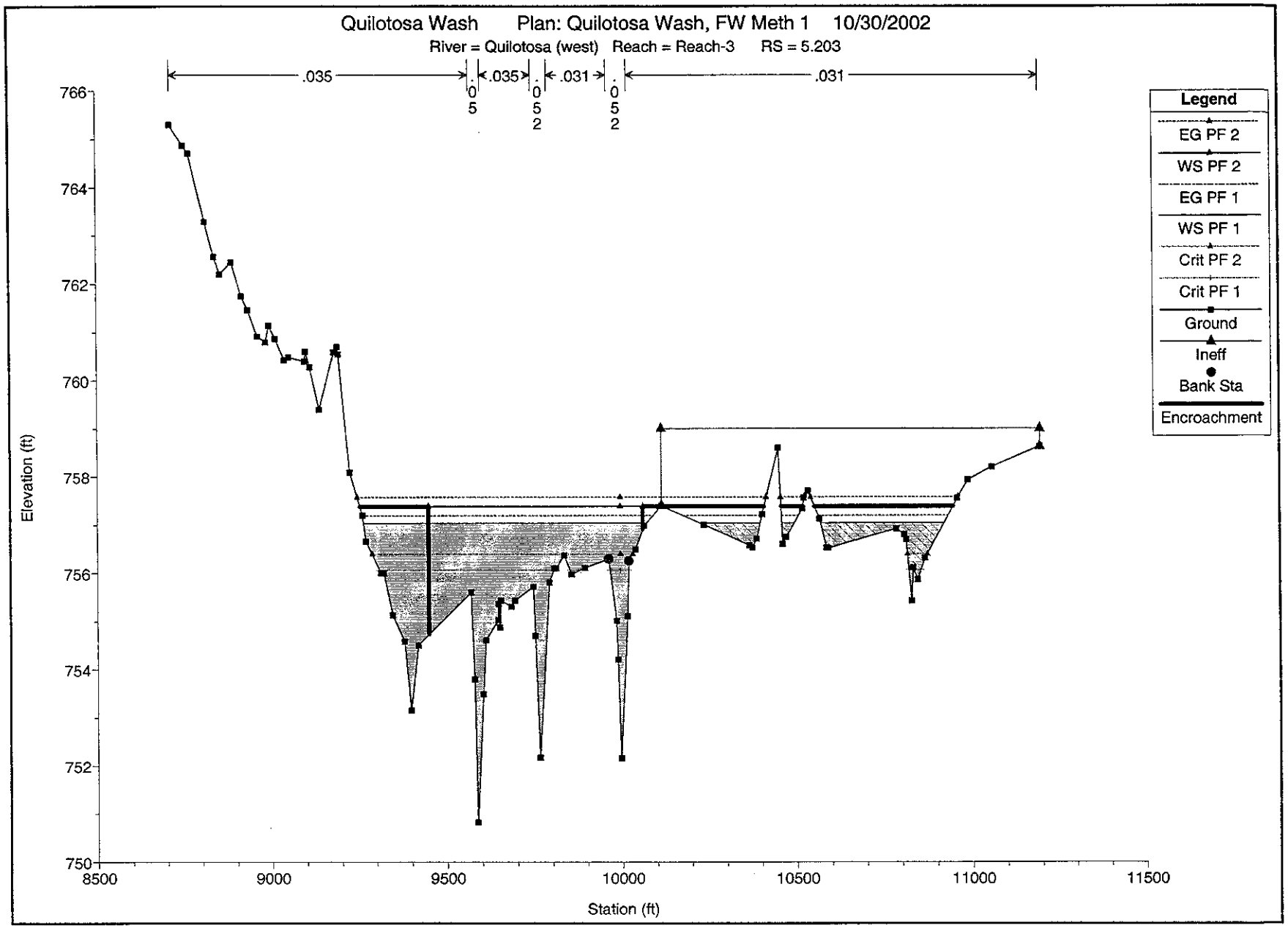

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (east Reach = Reach-2 RS = 4.870
.035
.04
.035
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
753
752
751
750
749
748
747
746
8500
9000
9500
10000
10500
11000
11500
Station (ft)

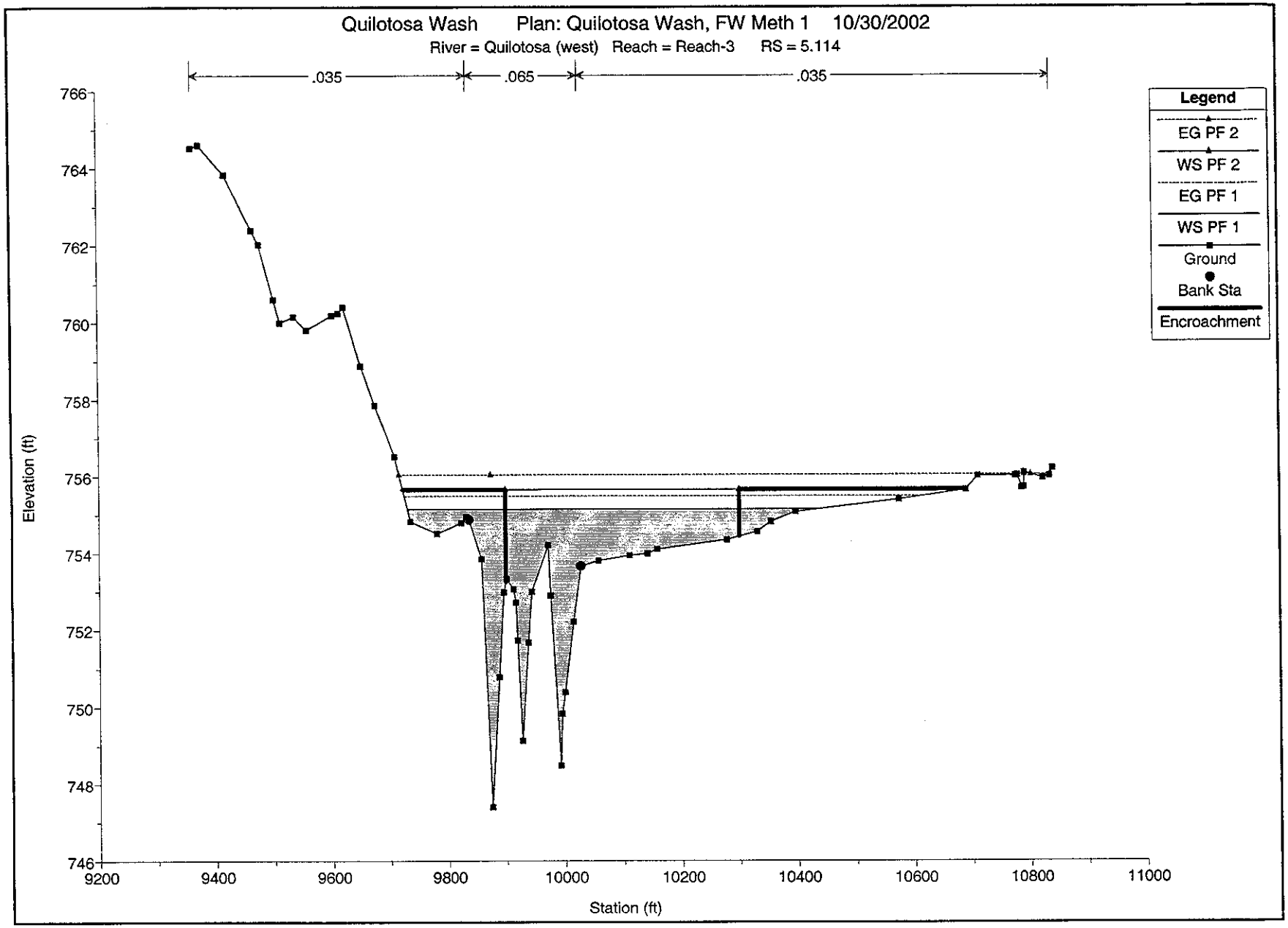

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (east Reach = Reach-2 RS = 4.770
.035
.04
.035
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
750
749
748
747
746
745
744
743
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

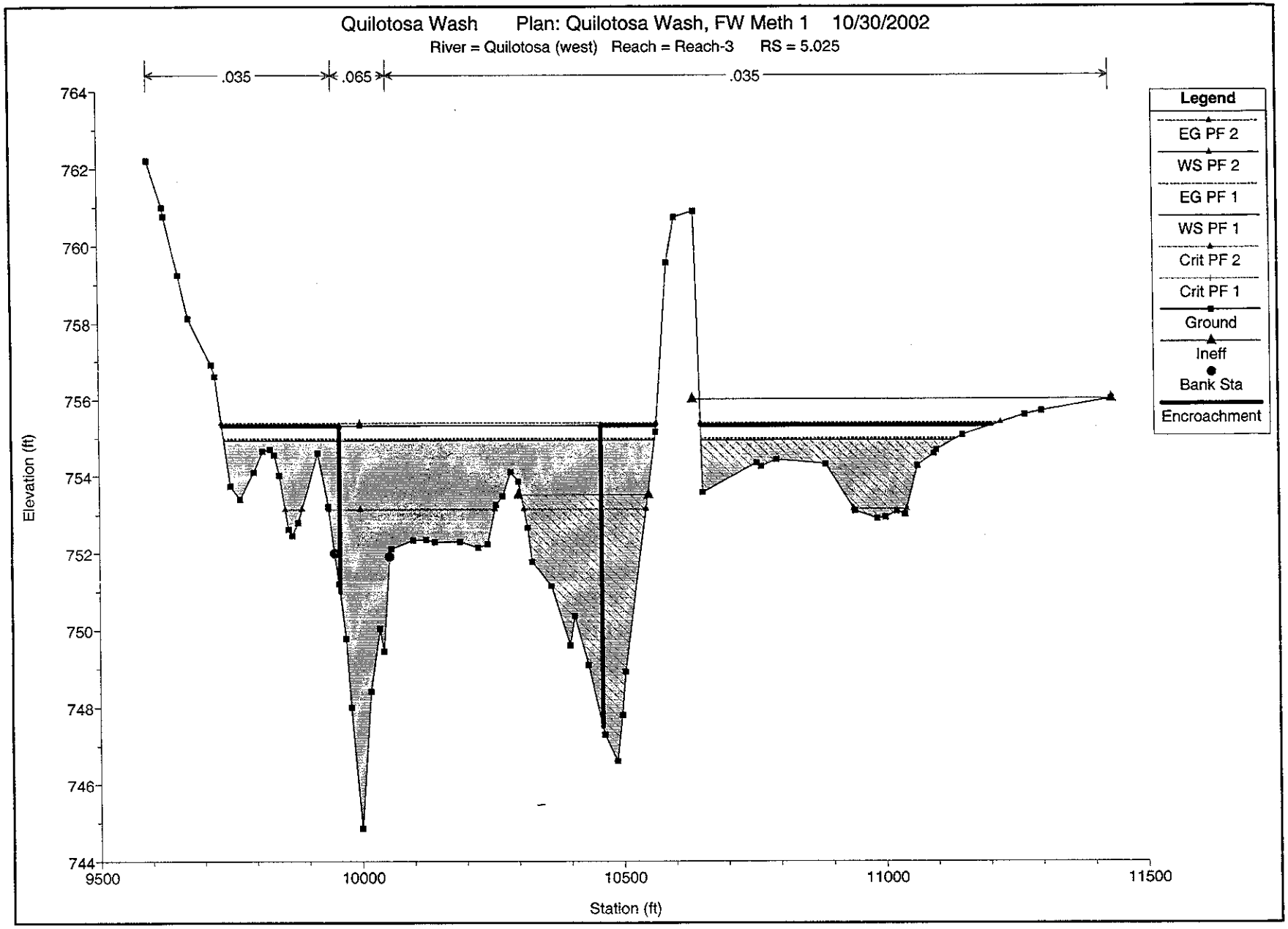

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (east Reach = Reach-2 RS = 4.673
.035
.04
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
746
745
744
743
742
741
740
7500
8000
8500
9000
9500
10000
10500
11000
Station (ft)

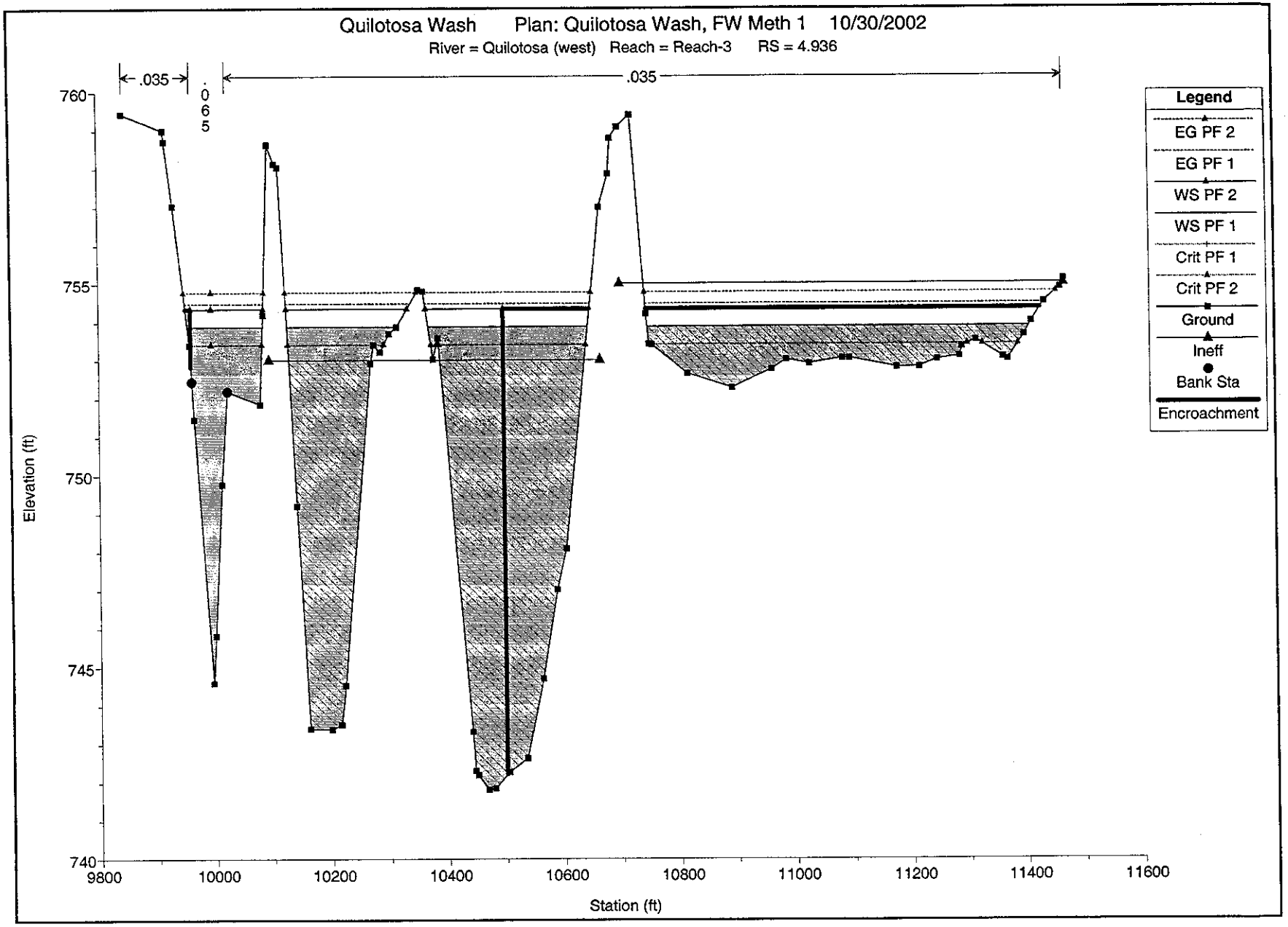

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (west) Reach = Reach-3 RS = 5.379
.035
.05
.03
Legend
EG PF 2
EG PF 1
WS PF 2
Crit PF 2
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
770
768
766
764
762
760
758
756
8000
8500
9000
9500
10000
10500
11000
Station (ft)

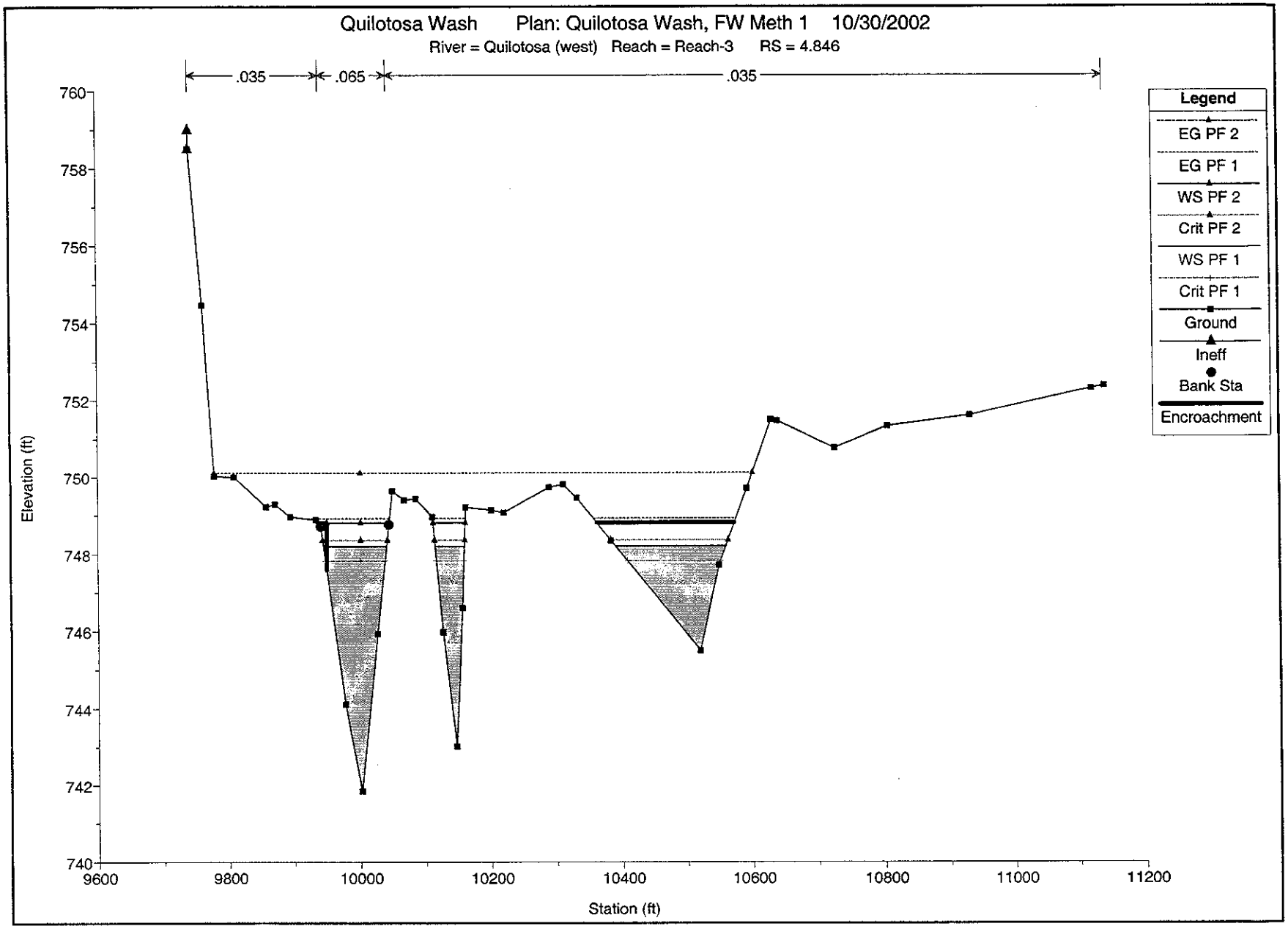

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (west) Reach = Reach-3 RS = 5.289
.035
.05
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
770
768
766
764
762
760
758
756
754
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

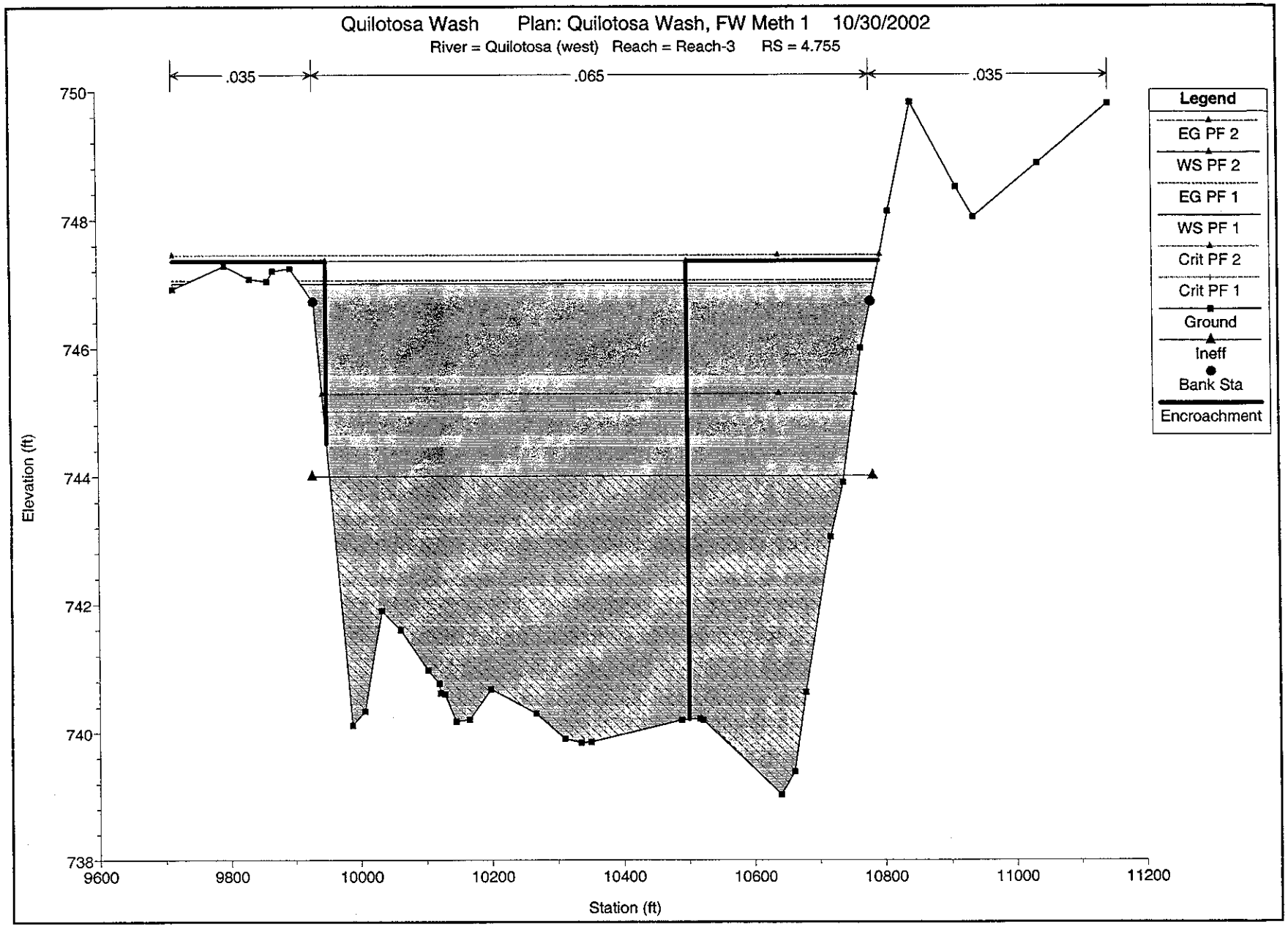

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (west) Reach = Reach-3 RS = 5.203
.035
.035
.031
.031
.05
.052
.052
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
766
764
762
760
758
756
754
752
750
8500
9000
9500
10000
10500
11000
11500
Station (ft)

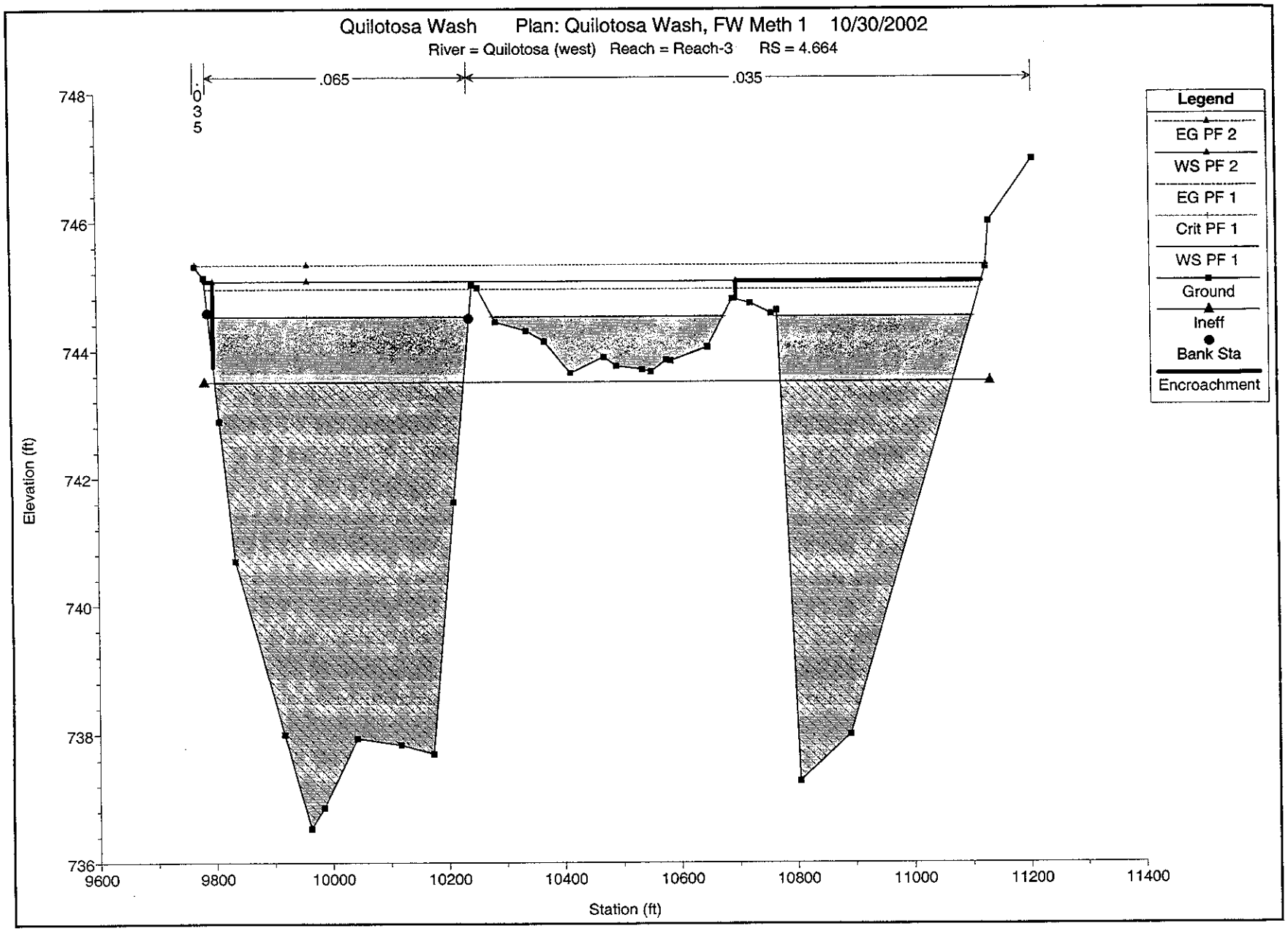

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (west) Reach = Reach-3 RS = 5.114
.035
.065
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
766
764
762
760
758
756
754
752
750
748
746
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

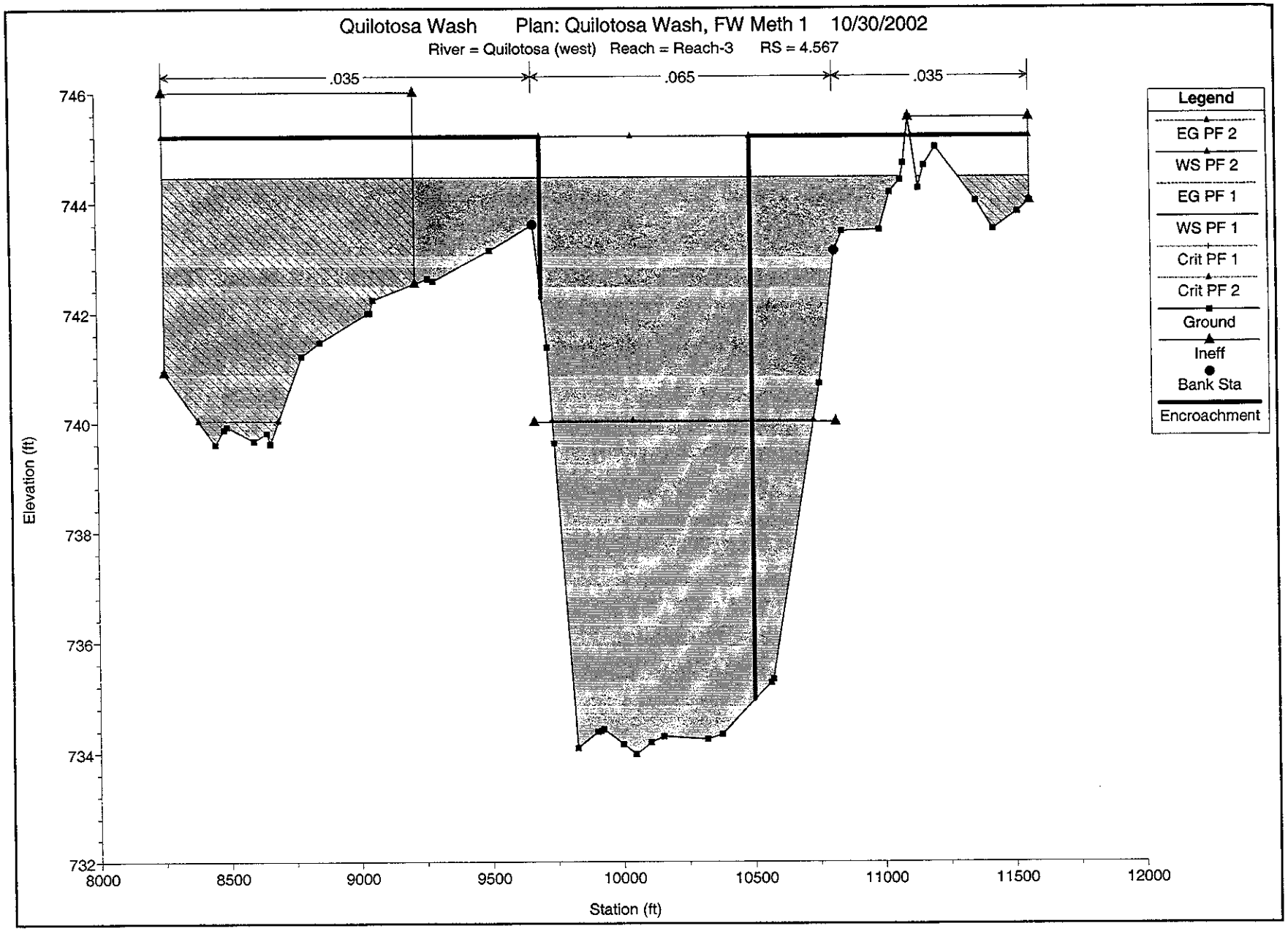

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (west) Reach = Reach-3 RS = 5.025
.035
.065
.035
Elevation (ft)
764
762
760
758
756
754
752
750
748
746
744
9500
10000
10500
11000
11500
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment

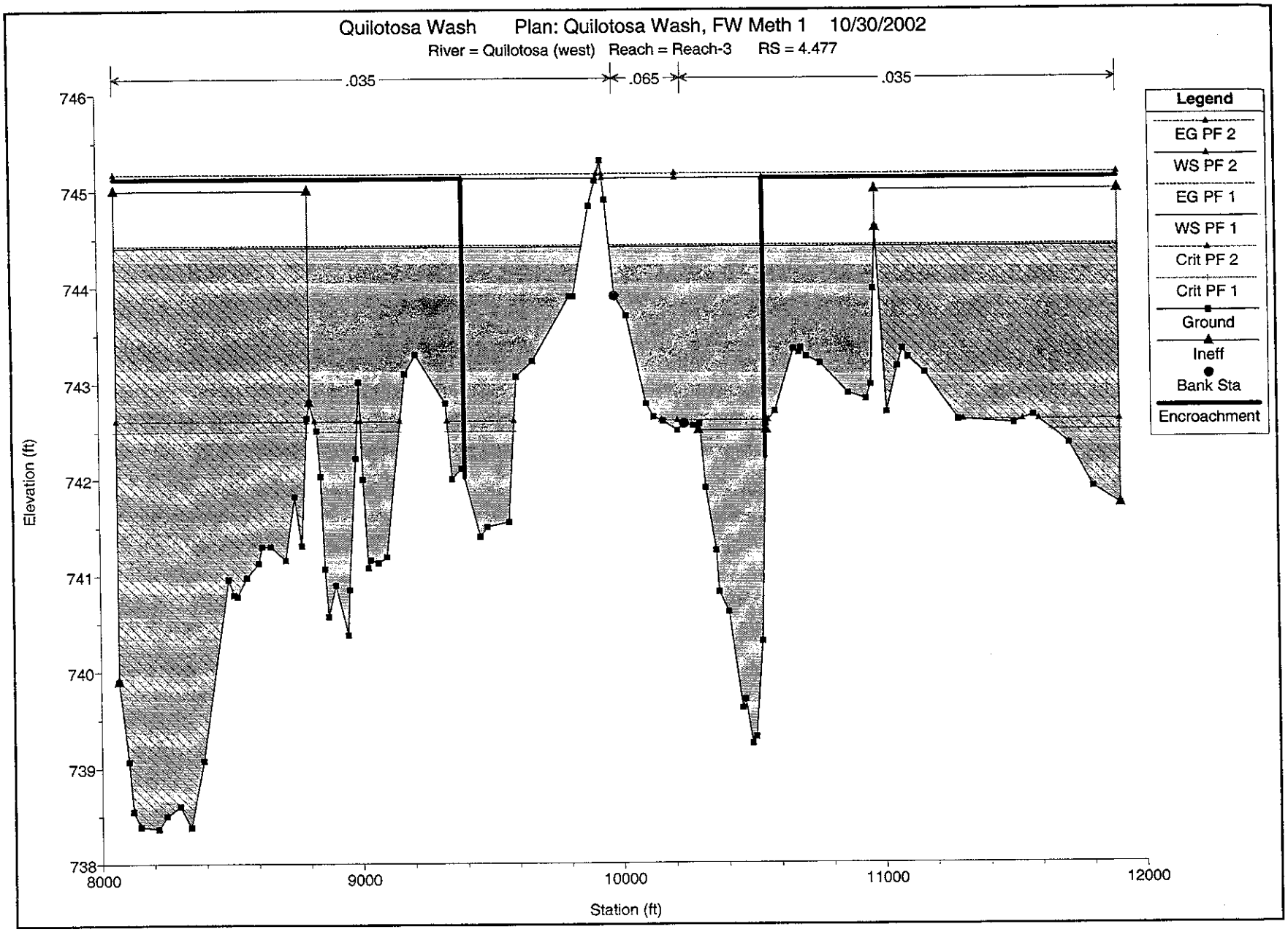

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (west) Reach = Reach-3 RS = 4.936
.035
.065
.035
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
760
755
750
745
740
9800
10000
10200
10400
10600
10800
11000
11200
11400
11600
Station (ft)

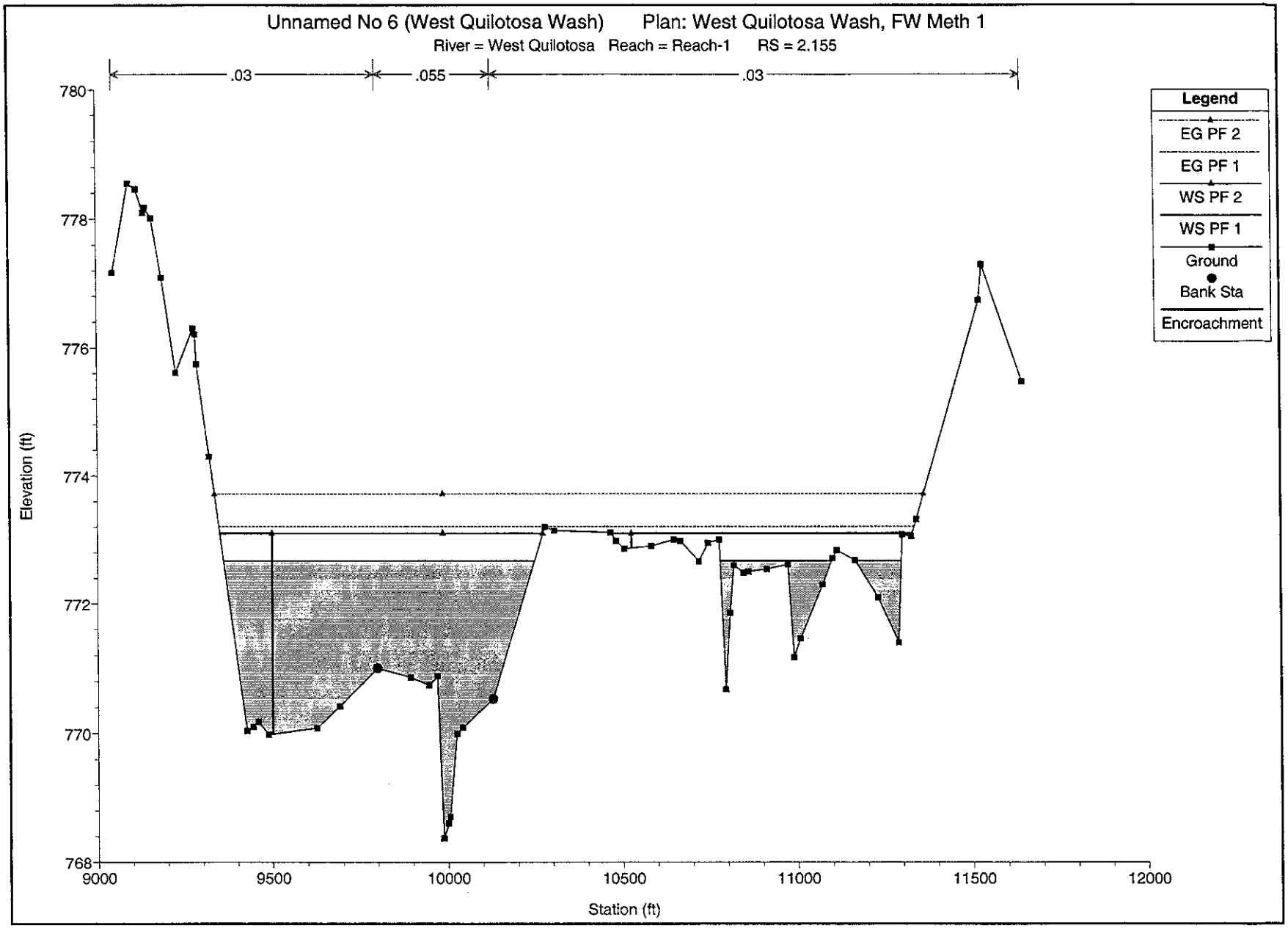

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (west) Reach = Reach-3 RS = 4.846
.035
.065
.035
Legend
EG PF 2
EG PF 1
WS PF 2
Crit PF 2
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
760
758
756
754
752
750
748
746
744
742
740
9600
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

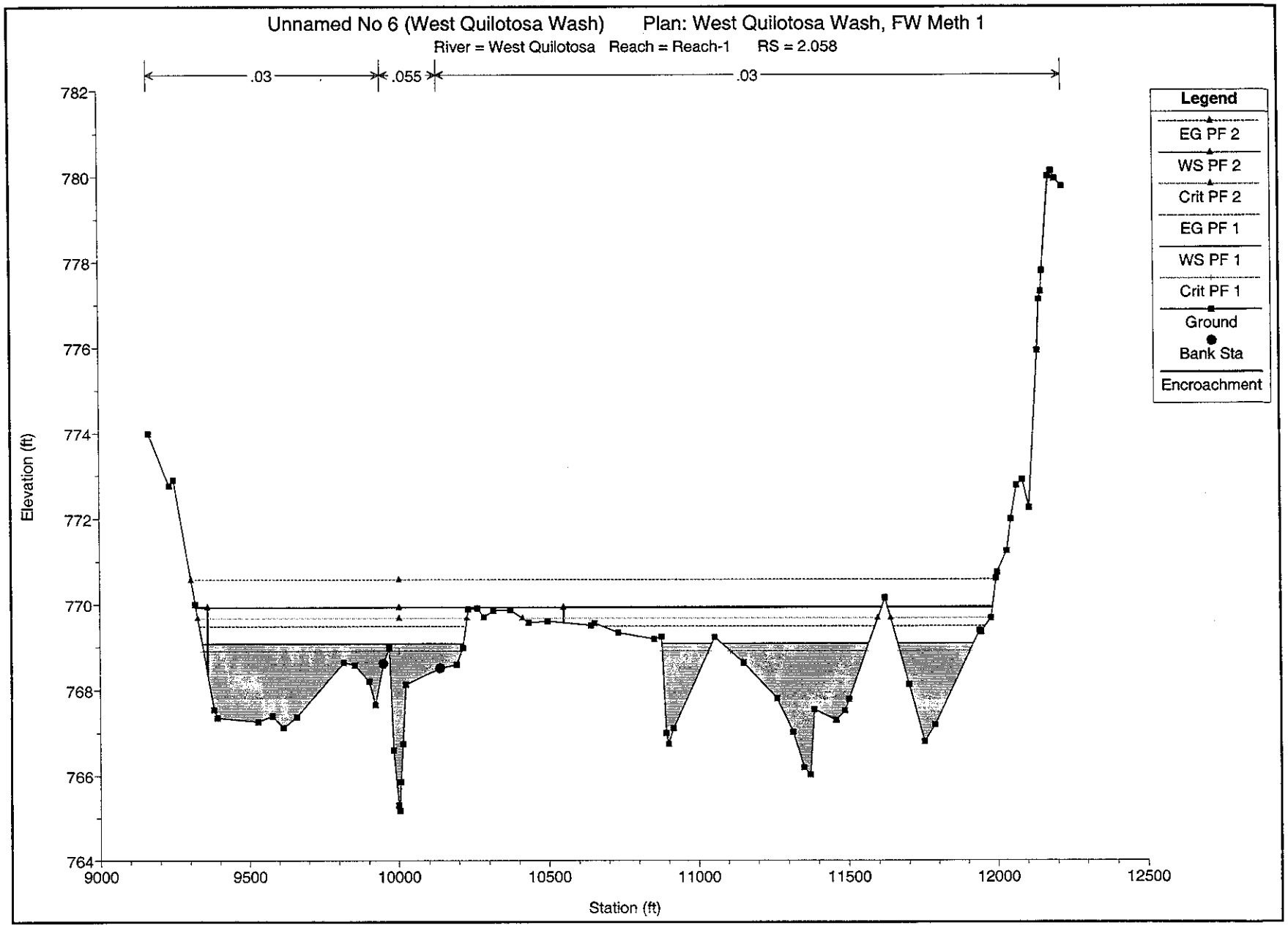

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (west) Reach = Reach-3 RS = 4.755
.035
.065
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
750
748
746
744
742
740
738
9600
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

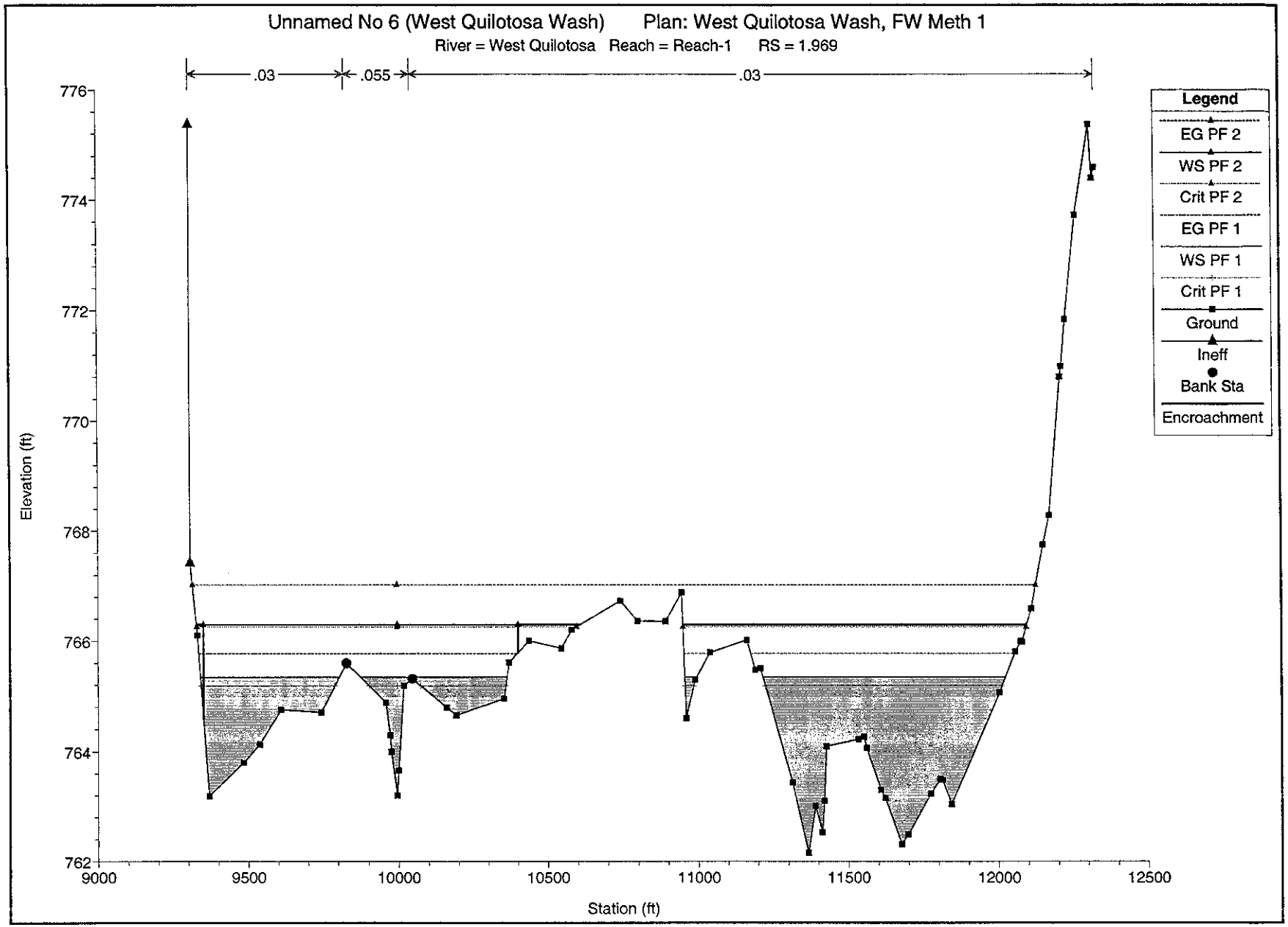

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (west) Reach = Reach-3 RS = 4.664
.035
.065
.035
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
748
746
744
742
740
738
736
9600
9800
10000
10200
10400
10600
10800
11000
11200
11400
Station (ft)

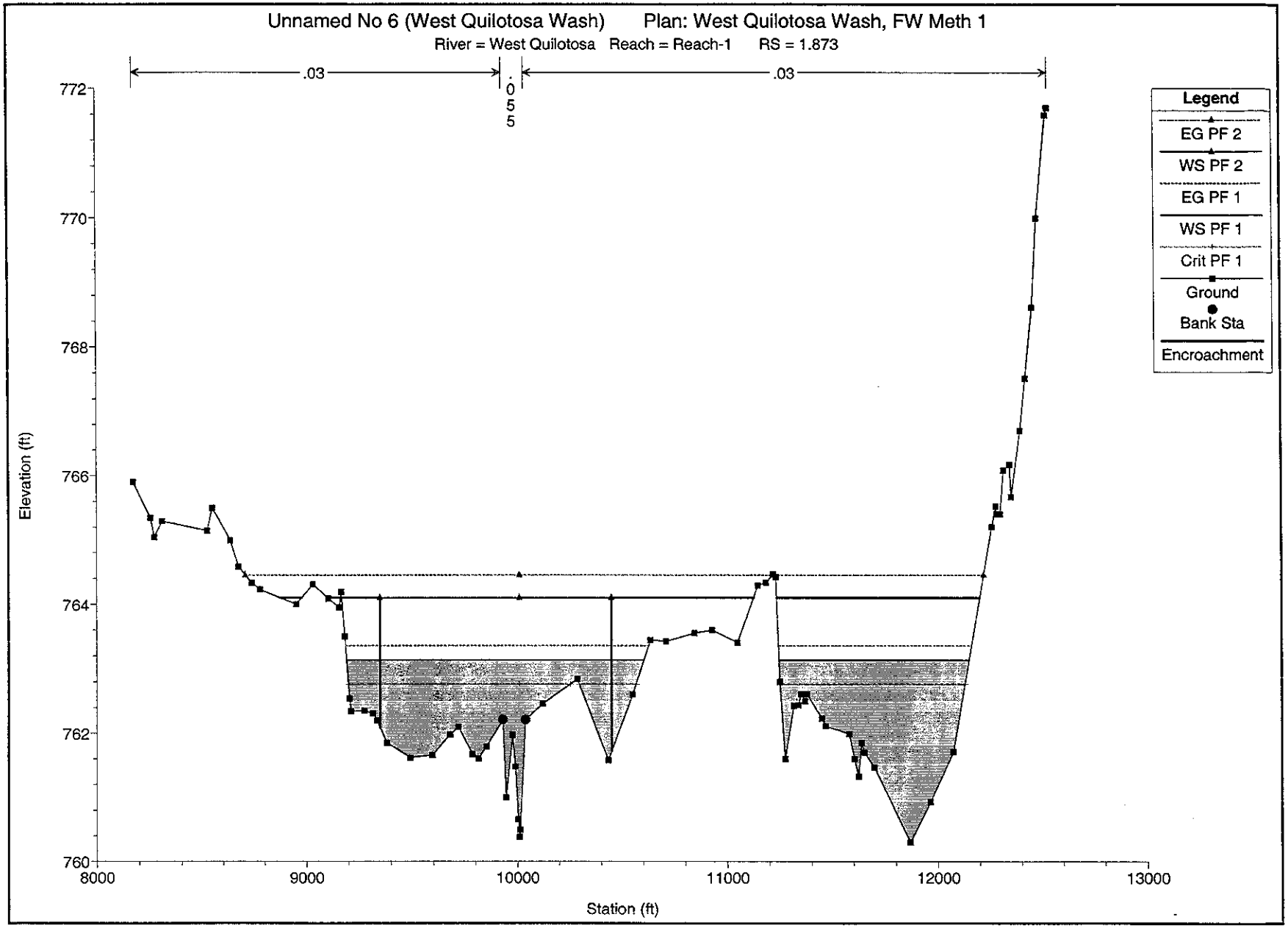

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (west) Reach = Reach-3 RS = 4.567
.035
.065
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
734
732
8000
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

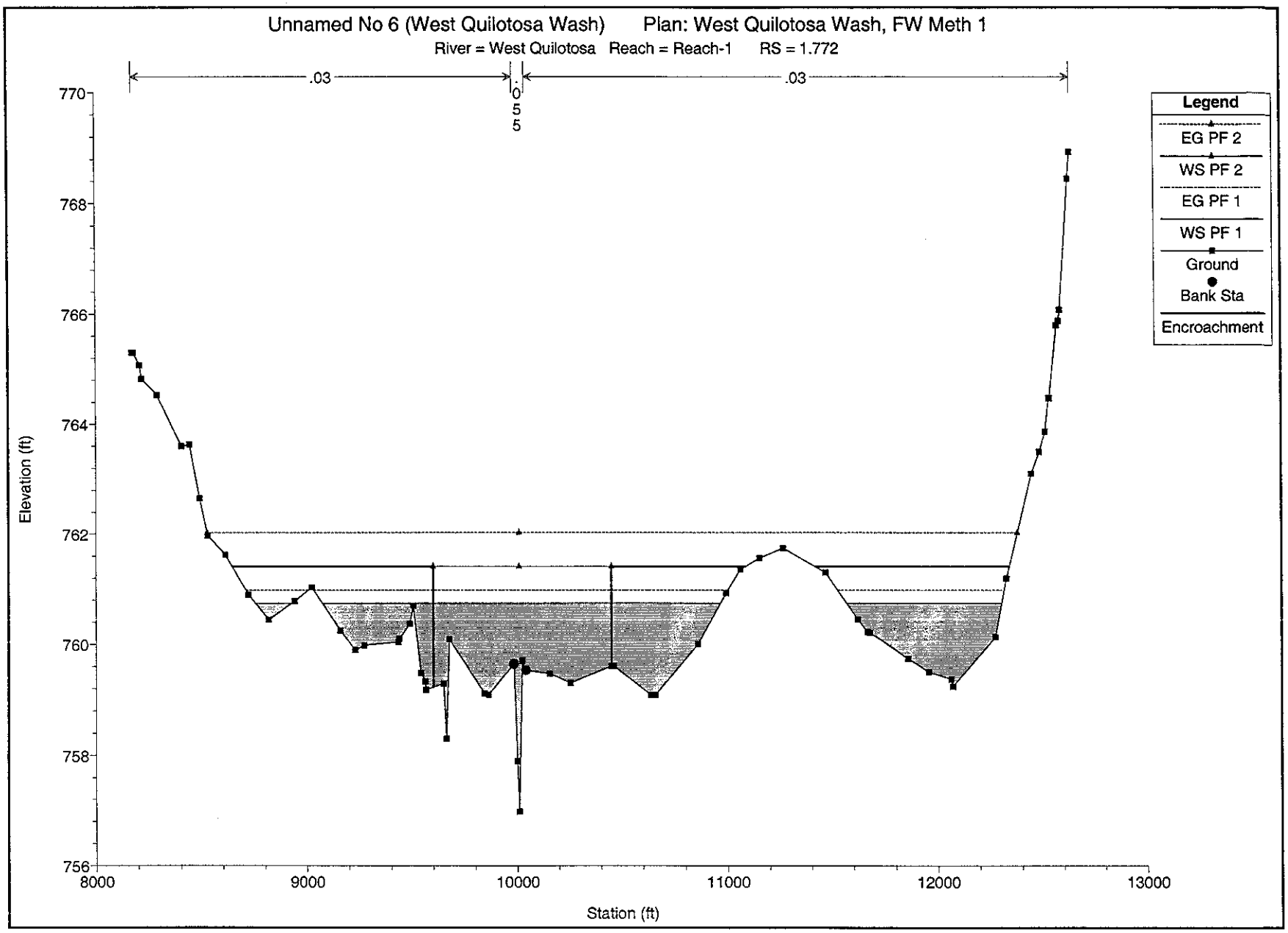

Quilotosa Wash Plan: Quilotosa Wash, FW Meth 1 10/30/2002
River = Quilotosa (west) Reach = Reach-3 RS = 4.477
.035
.065
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
745
744
743
742
741
740
739
738
8000
9000
10000
11000
12000
Station (ft)

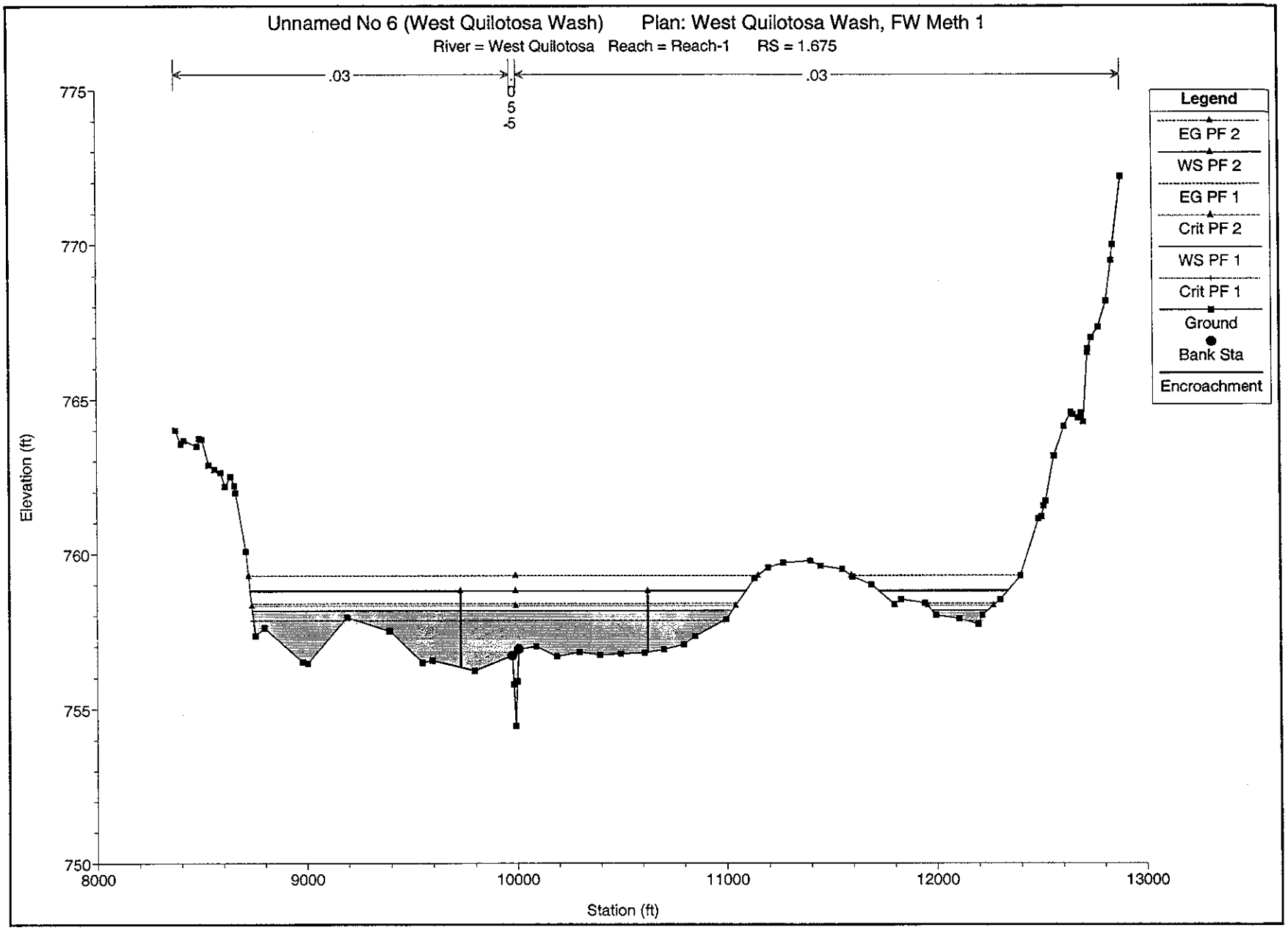

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 2.155
.03
.055
.03
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
780
778
776
774
772
770
768
9000
9500
10000
10500
11000
11500
12000
Station (ft)

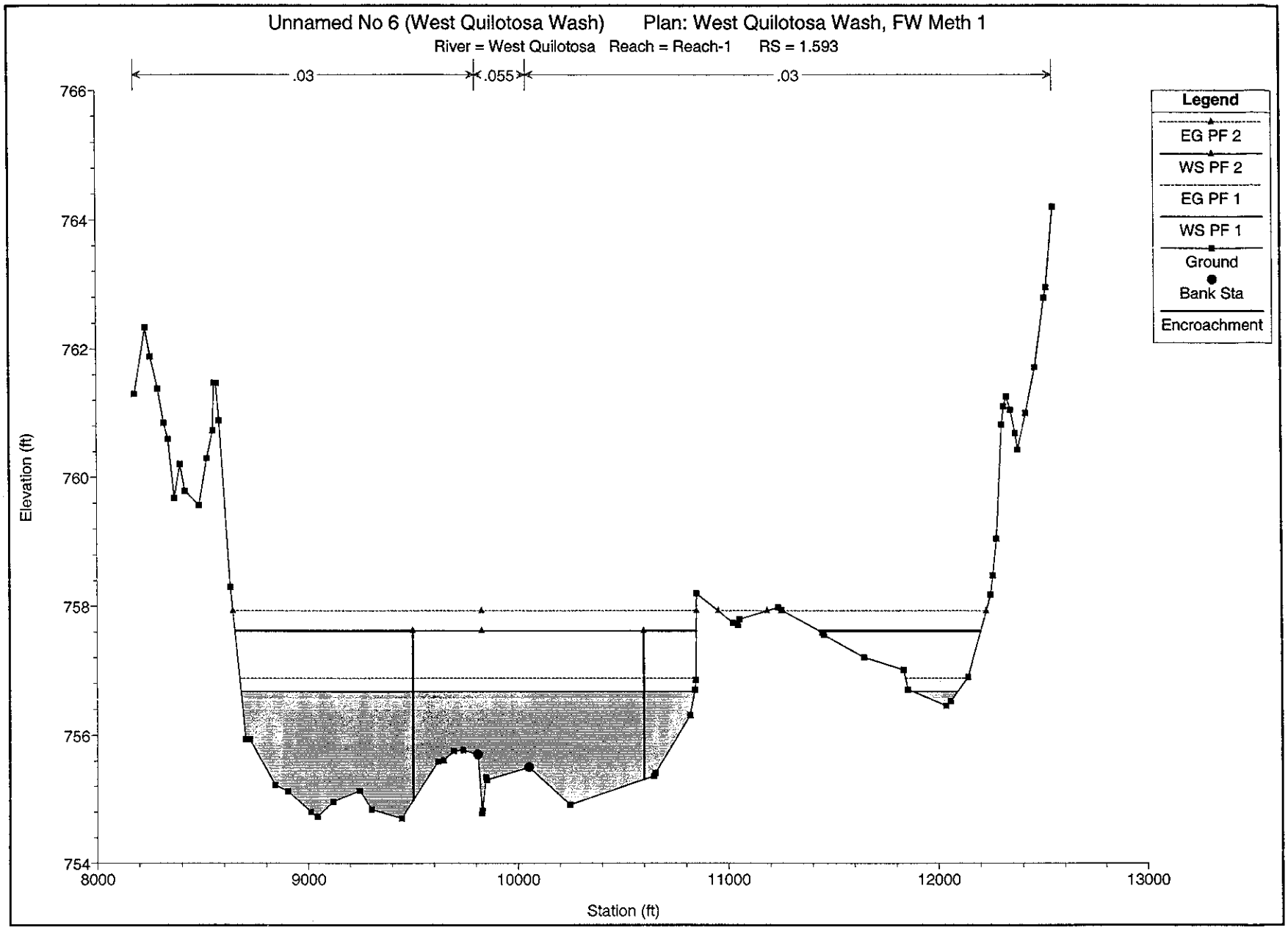

Unnamed No 6 (West Quilotosa Wash) Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 2.058
.03
.055
.03
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
782
780
778
776
774
772
770
768
766
764
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)

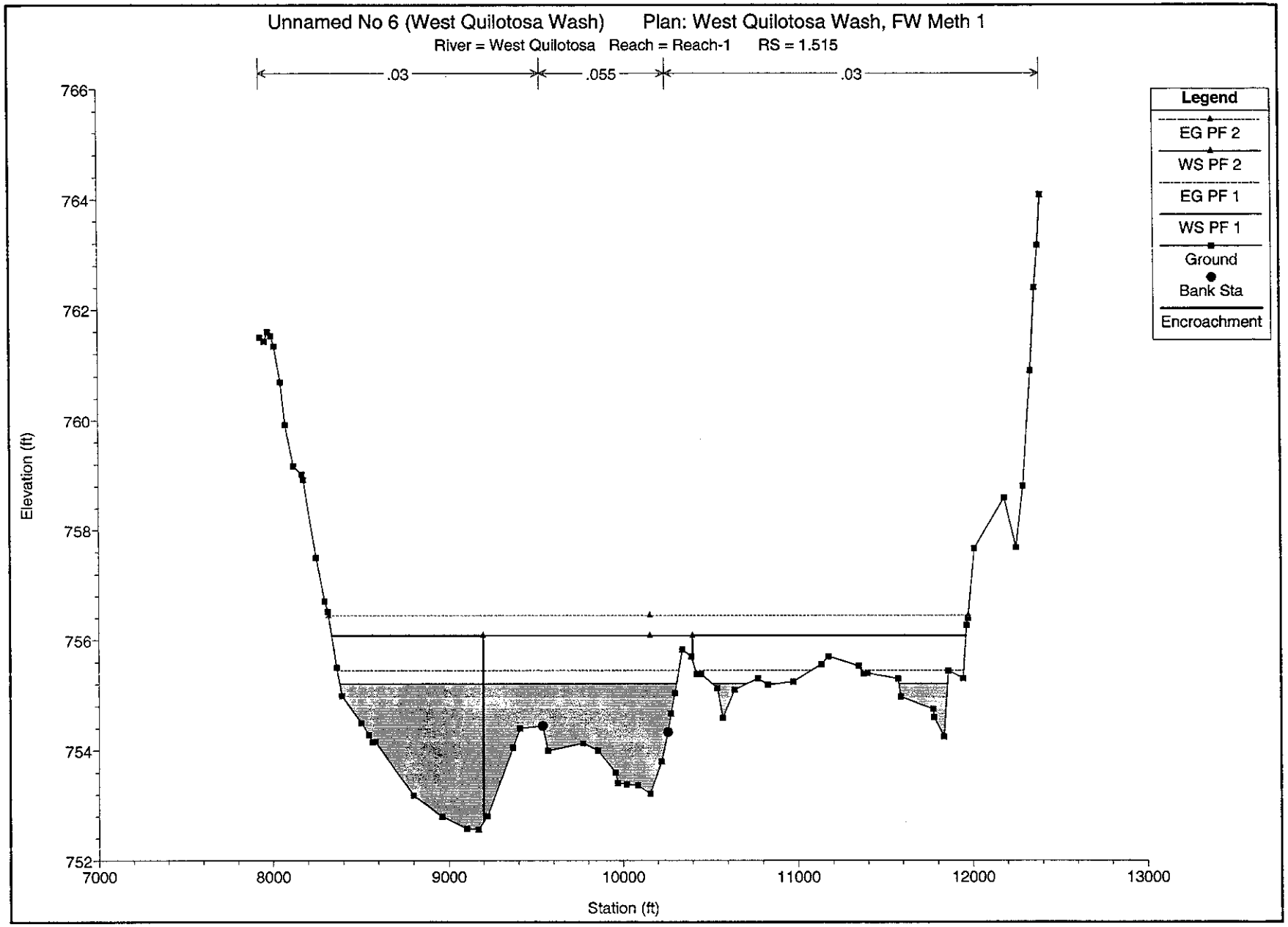

Unnamed No 6 (West Quilotosa Wash) Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 1.969
.03
.055
.03
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
776
774
772
770
768
766
764
762
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)

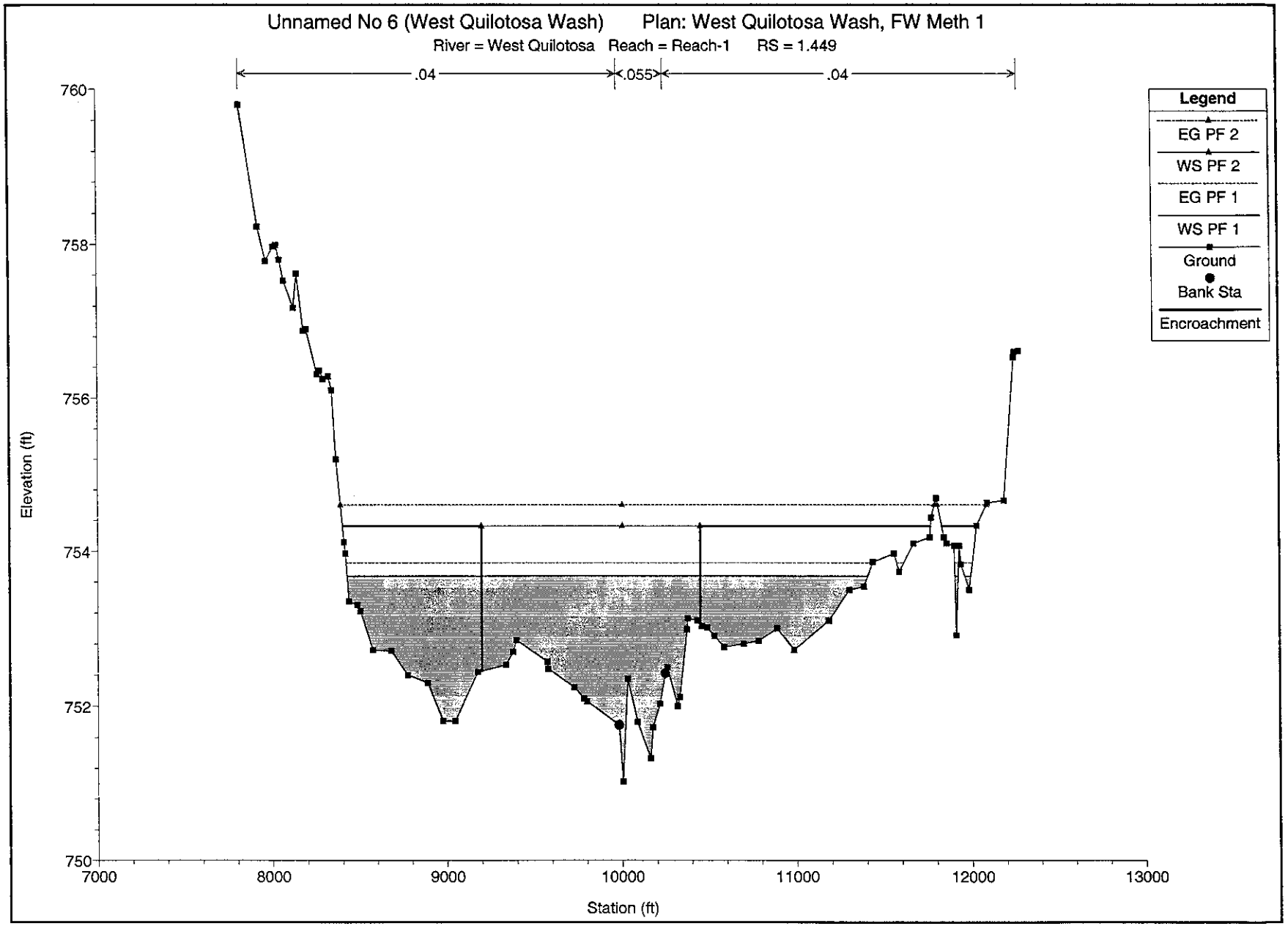

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 1.873
.03
.055
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
772
770
768
766
764
762
760
8000
9000
10000
11000
12000
13000
Station (ft)

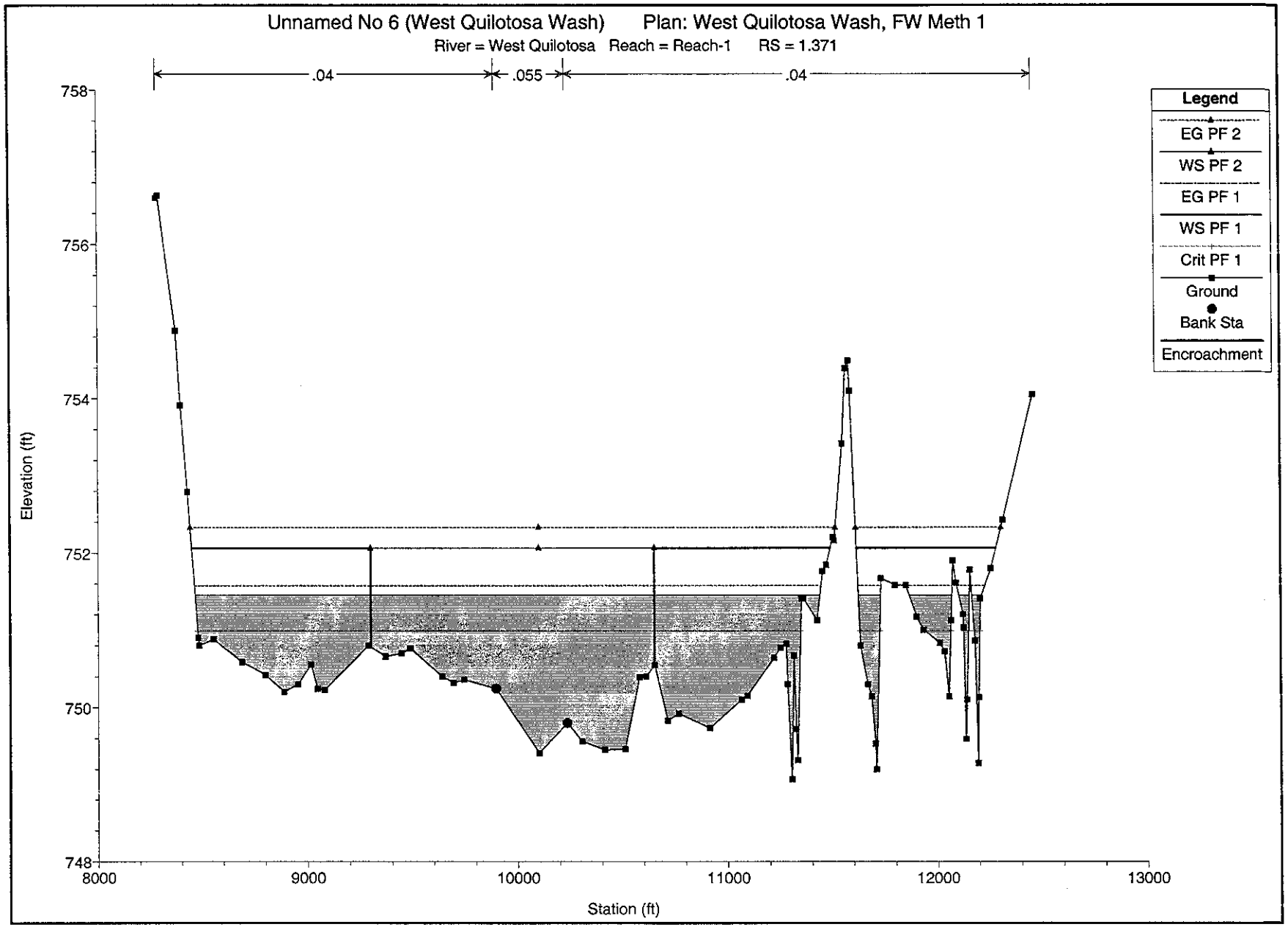

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 1.772
.03
.055
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
770
768
766
764
762
760
758
756
8000
9000
10000
11000
12000
13000
Station (ft)

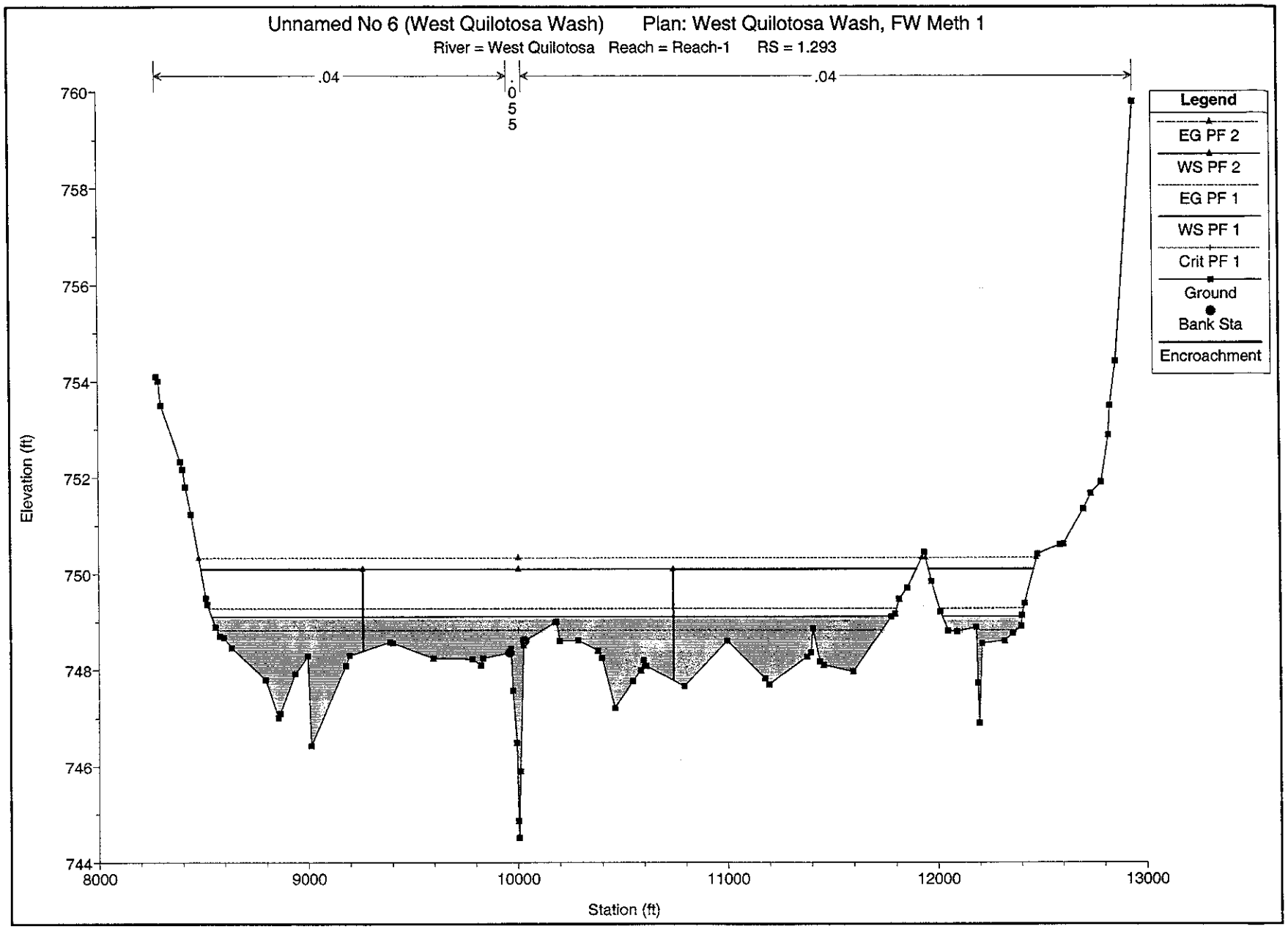

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 1.675
.03
.03
.05
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 2
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
775
770
765
760
755
750
8000
9000
10000
11000
12000
13000
Station (ft)

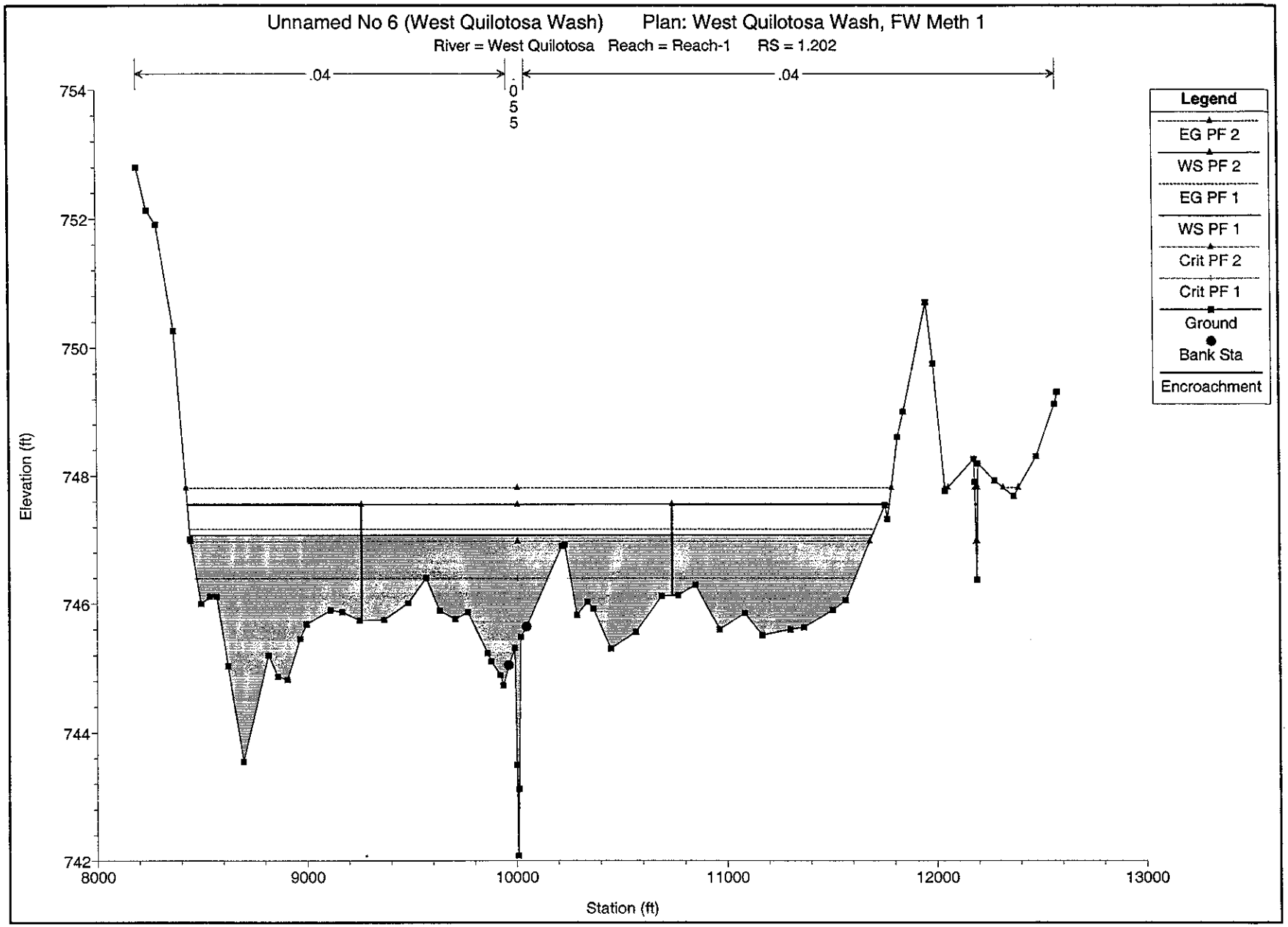

Unnamed No 6 (West Quilotosa Wash) Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 1.593
.03
.055
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
766
764
762
760
758
756
754
8000
9000
10000
11000
12000
13000
Station (ft)

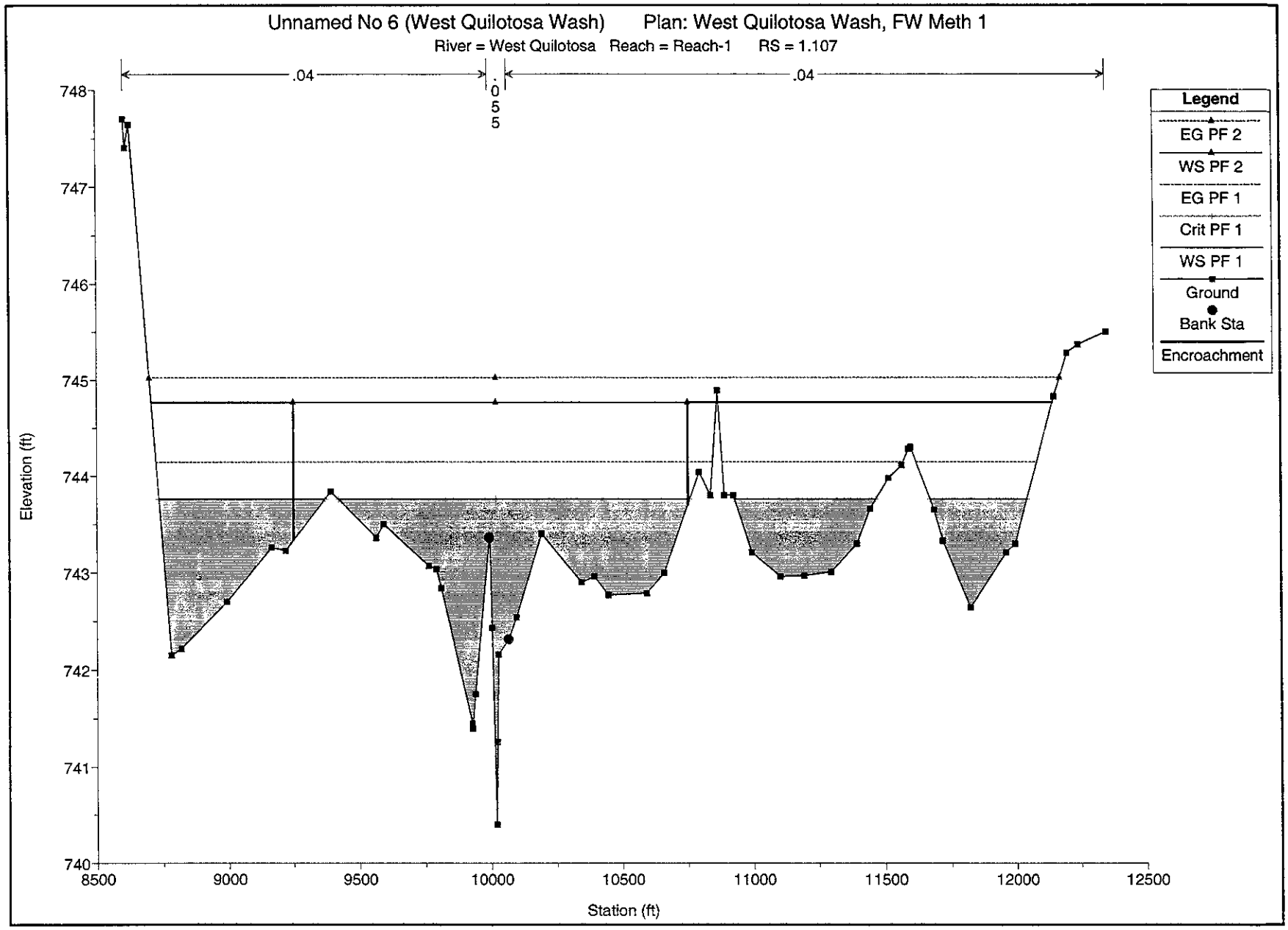

Unnamed No 6 (West Quilotosa Wash) Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 1.515
.03
.055
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
766
764
762
760
758
756
754
752
7000
8000
9000
10000
11000
12000
13000
Station (ft)

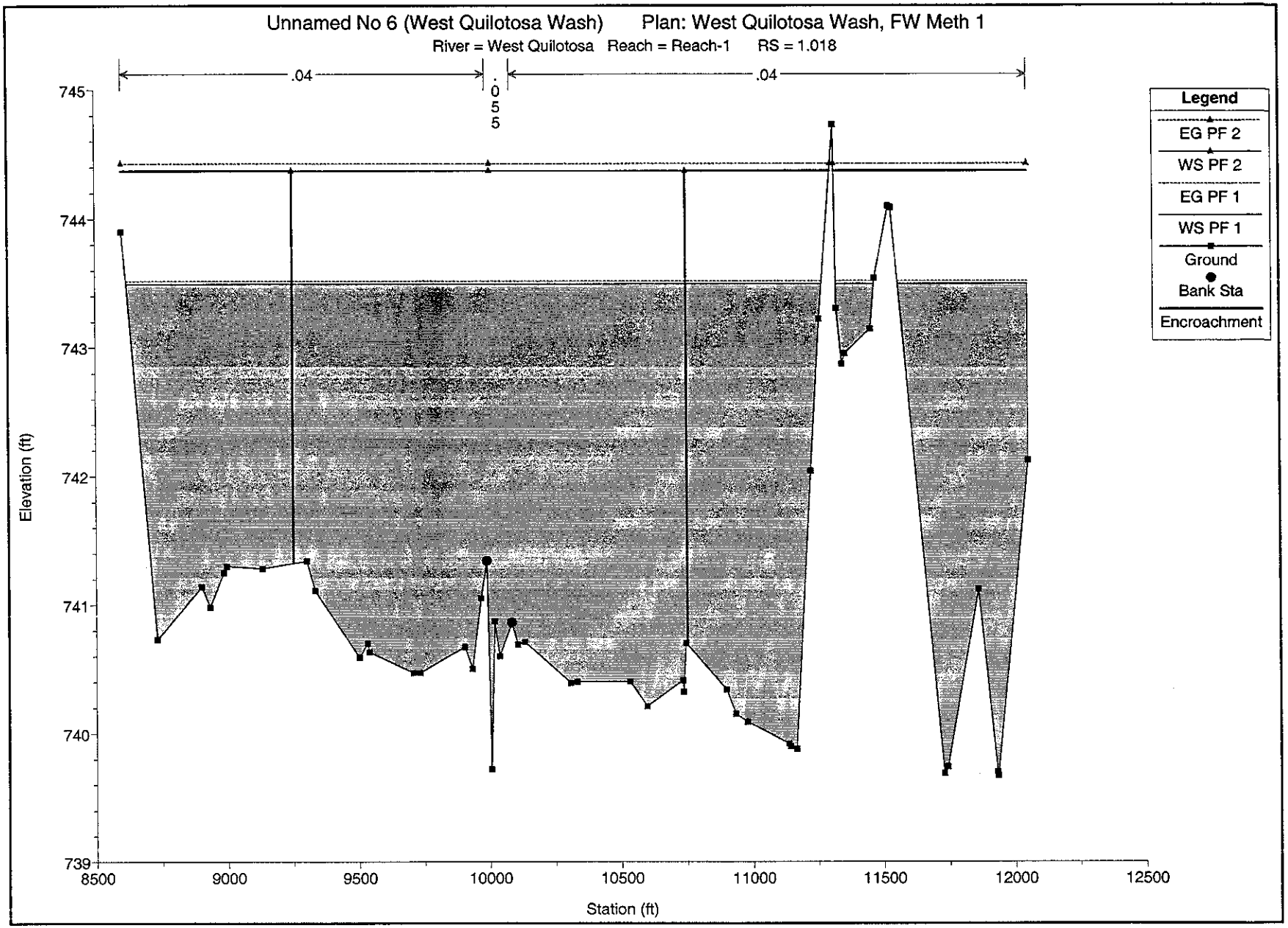

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 1.449
.04
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
760
758
756
754
752
750
7000
8000
9000
10000
11000
12000
13000
Station (ft)

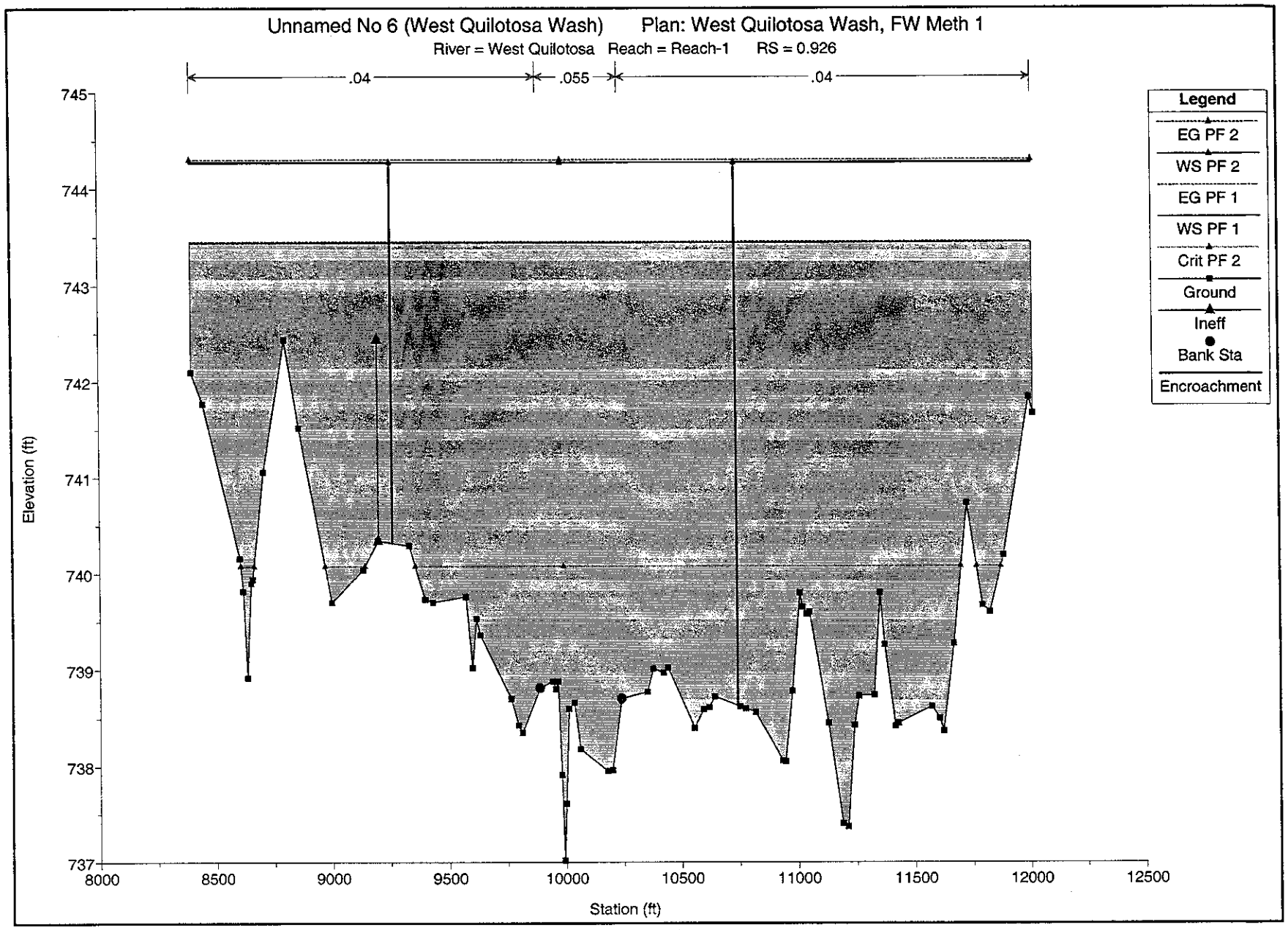

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 1.371
.04
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
758
756
754
752
750
748
8000
9000
10000
11000
12000
13000
Station (ft)

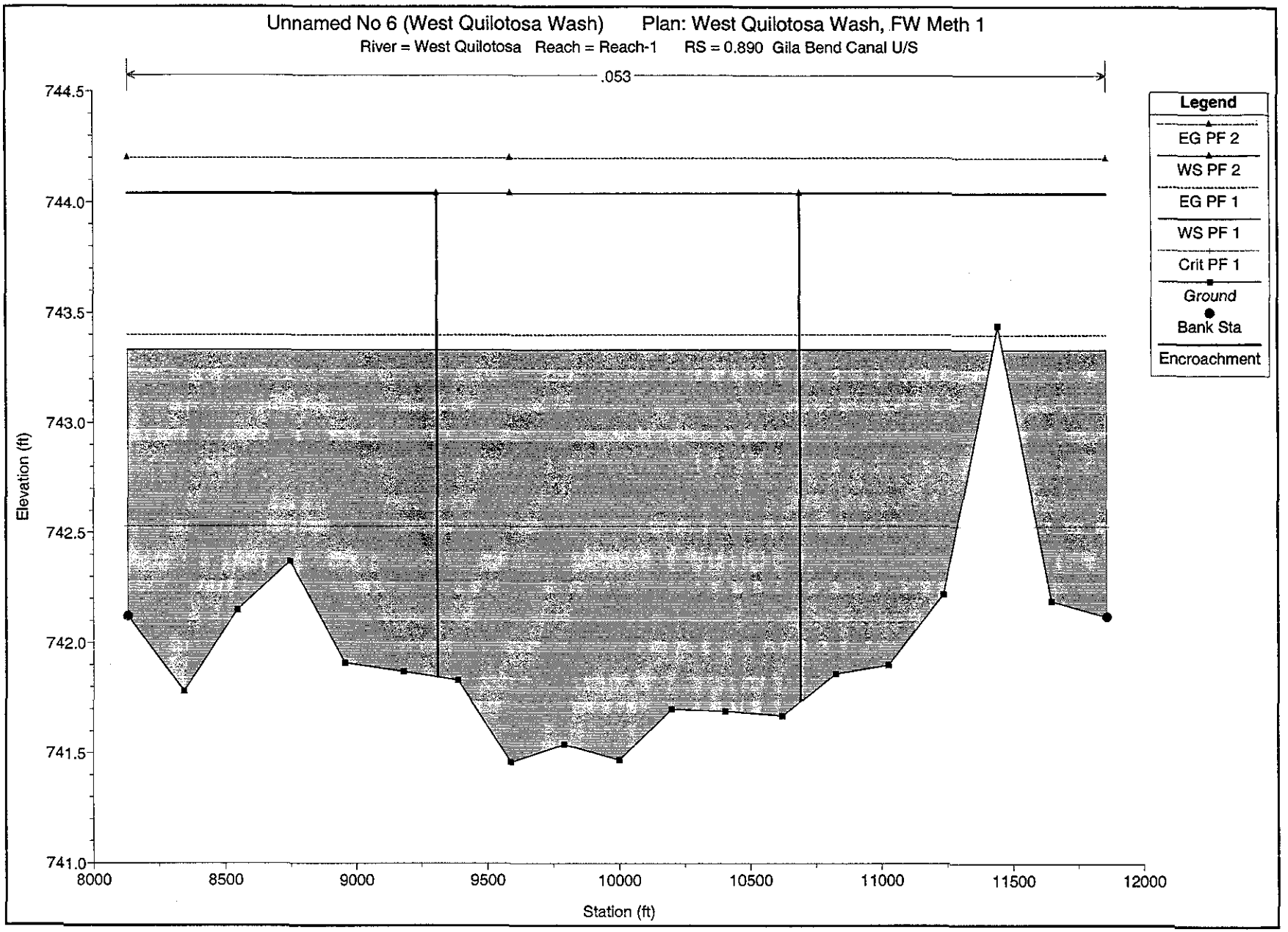

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 1.293
.04
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
760
758
756
754
752
750
748
746
744
8000
9000
10000
11000
12000
13000
Station (ft)

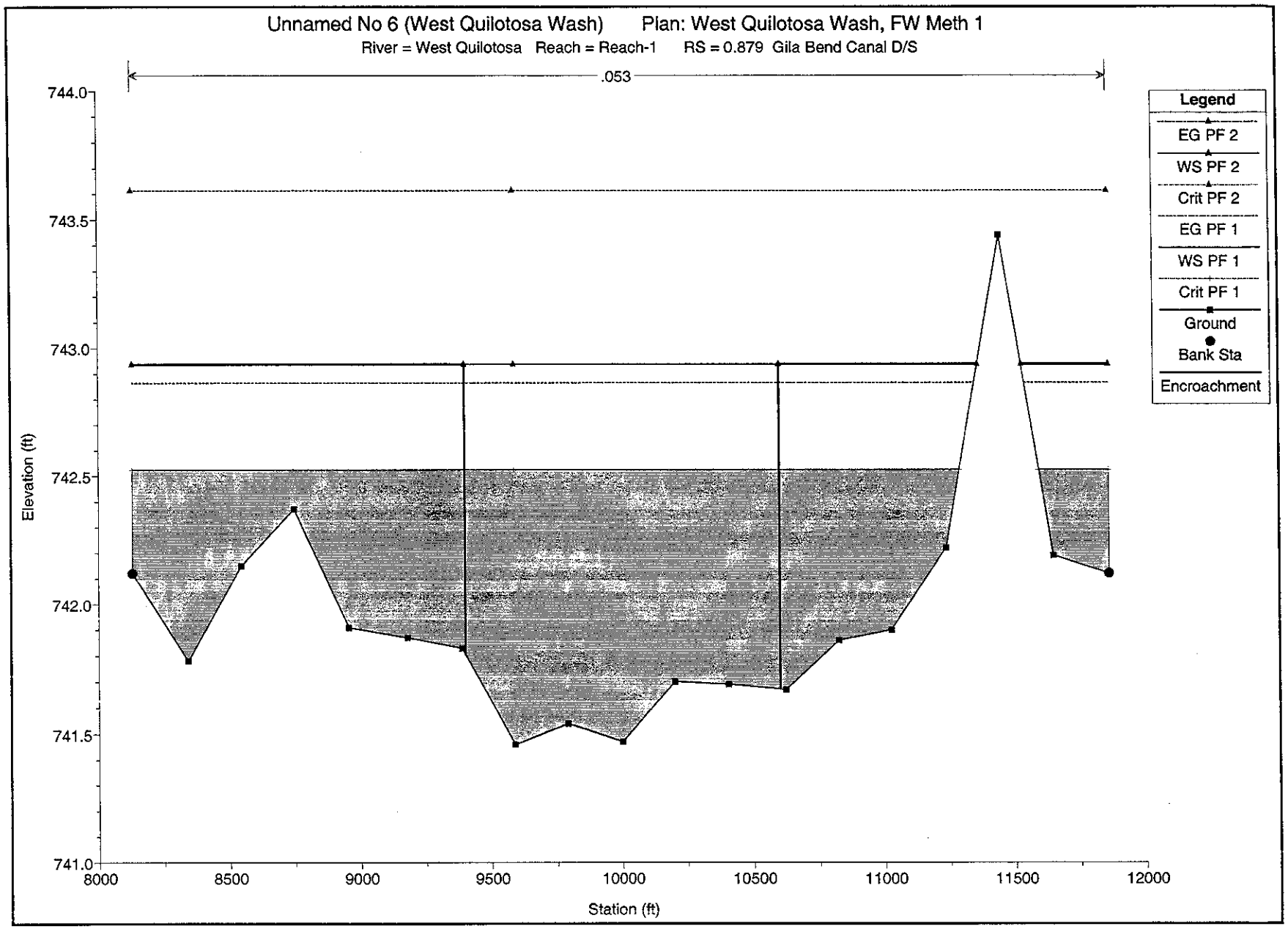

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 1.202
.04
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
754
752
750
748
746
744
742
8000
9000
10000
11000
12000
13000
Station (ft)

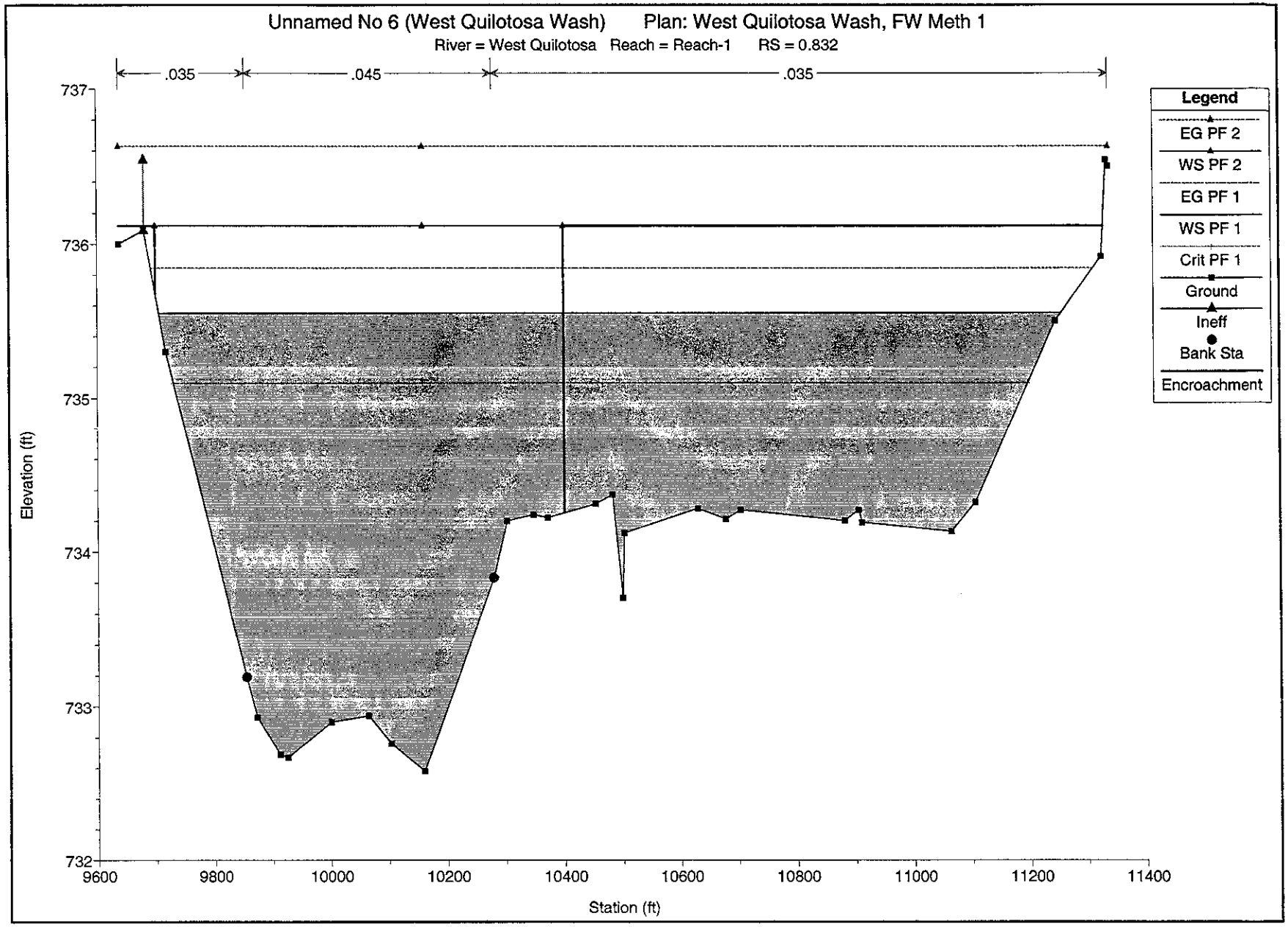

Unnamed No 6 (West Quilotosa Wash) Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 1.107
.04
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
748
747
746
745
744
743
742
741
740
8500
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)

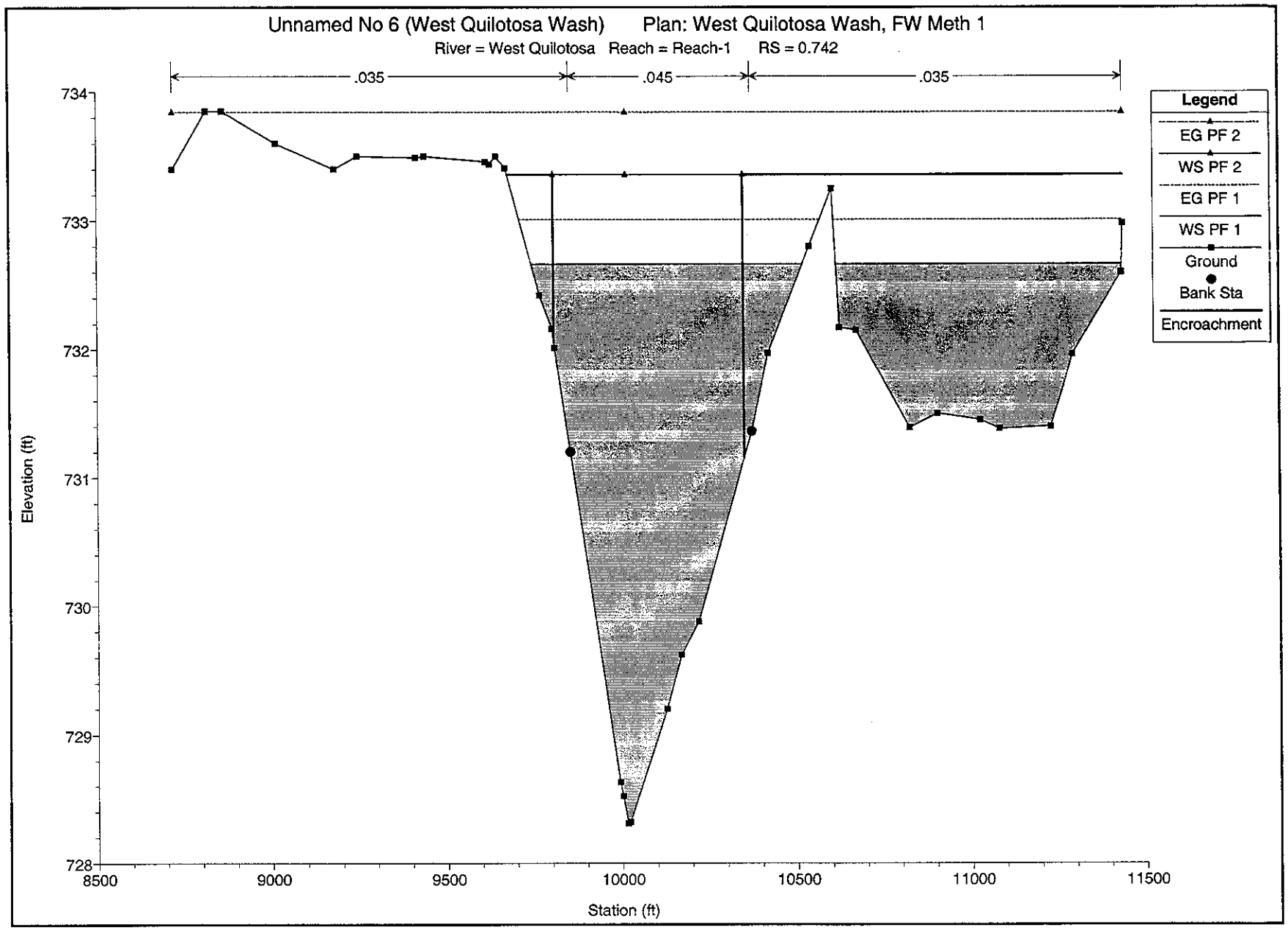

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 1.018
.04
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
745
744
743
742
741
740
739
8500
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)

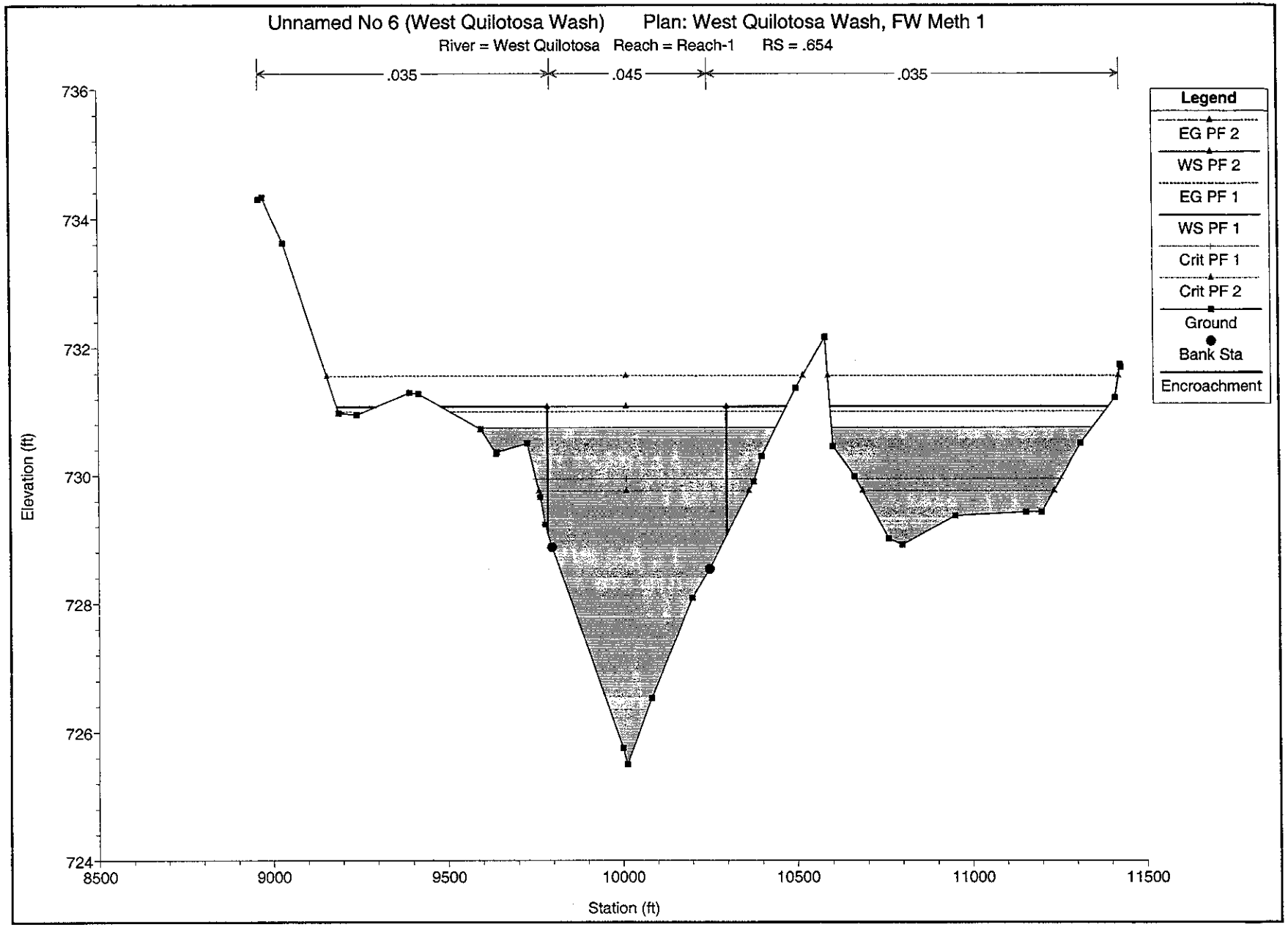

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa
Reach = Reach-1
RS = 0.926
.04
.055
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
745
744
743
742
741
740
739
738
737
8000
8500
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)

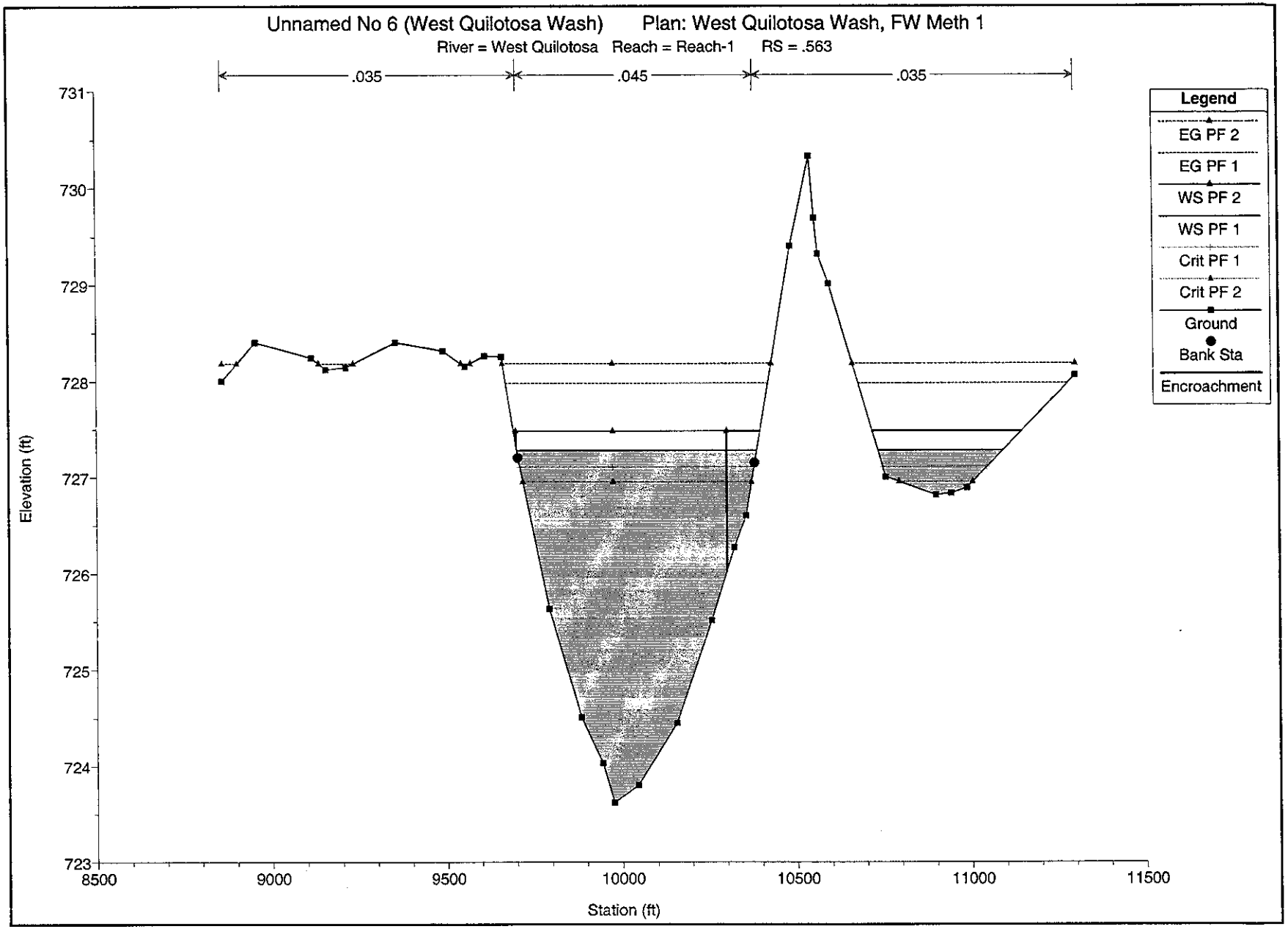

Unnamed No 6 (West Quilotosa Wash) Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.890 Gila Bend Canal U/S
.053
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
744.5
744.0
743.5
743.0
742.5
742.0
741.5
741.0
8000
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

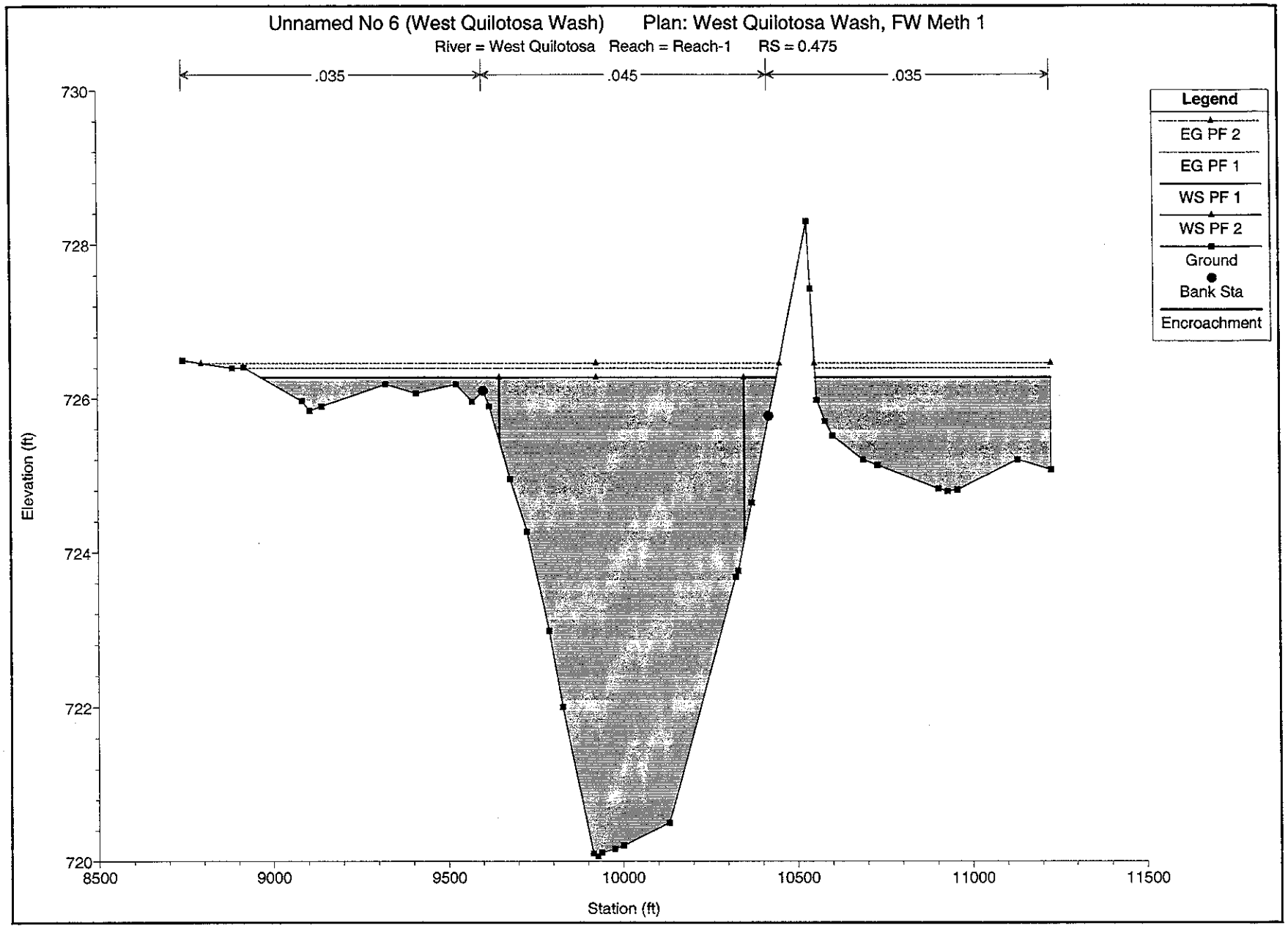

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.879 Gila Bend Canal D/S
.053
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
744.0
743.5
743.0
742.5
742.0
741.5
741.0
8000
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

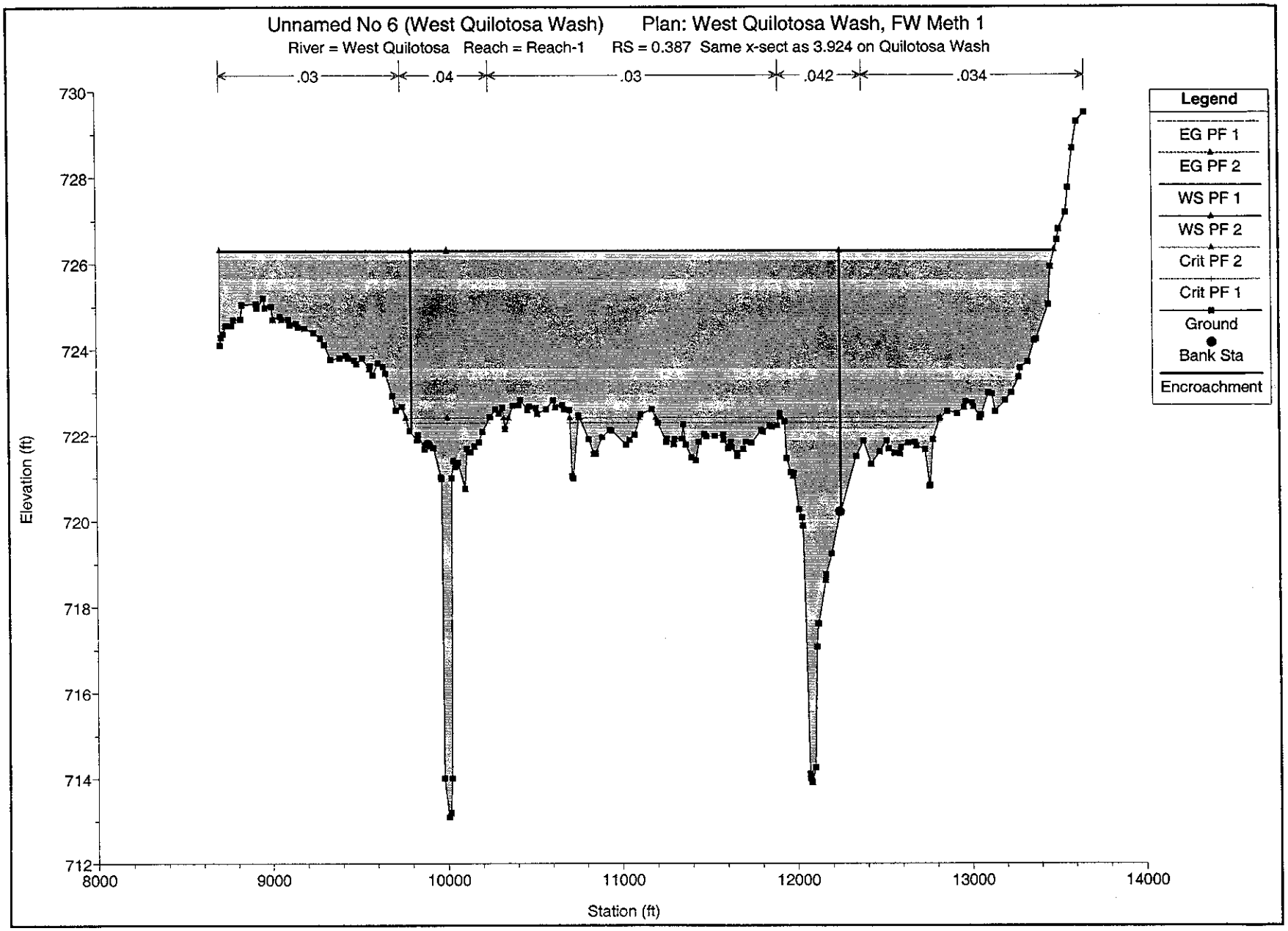

Unnamed No 6 (West Quilotosa Wash) Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.832
.035
.045
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
737
736
735
734
733
732
9600
9800
10000
10200
10400
10600
10800
11000
11200
11400
Station (ft)

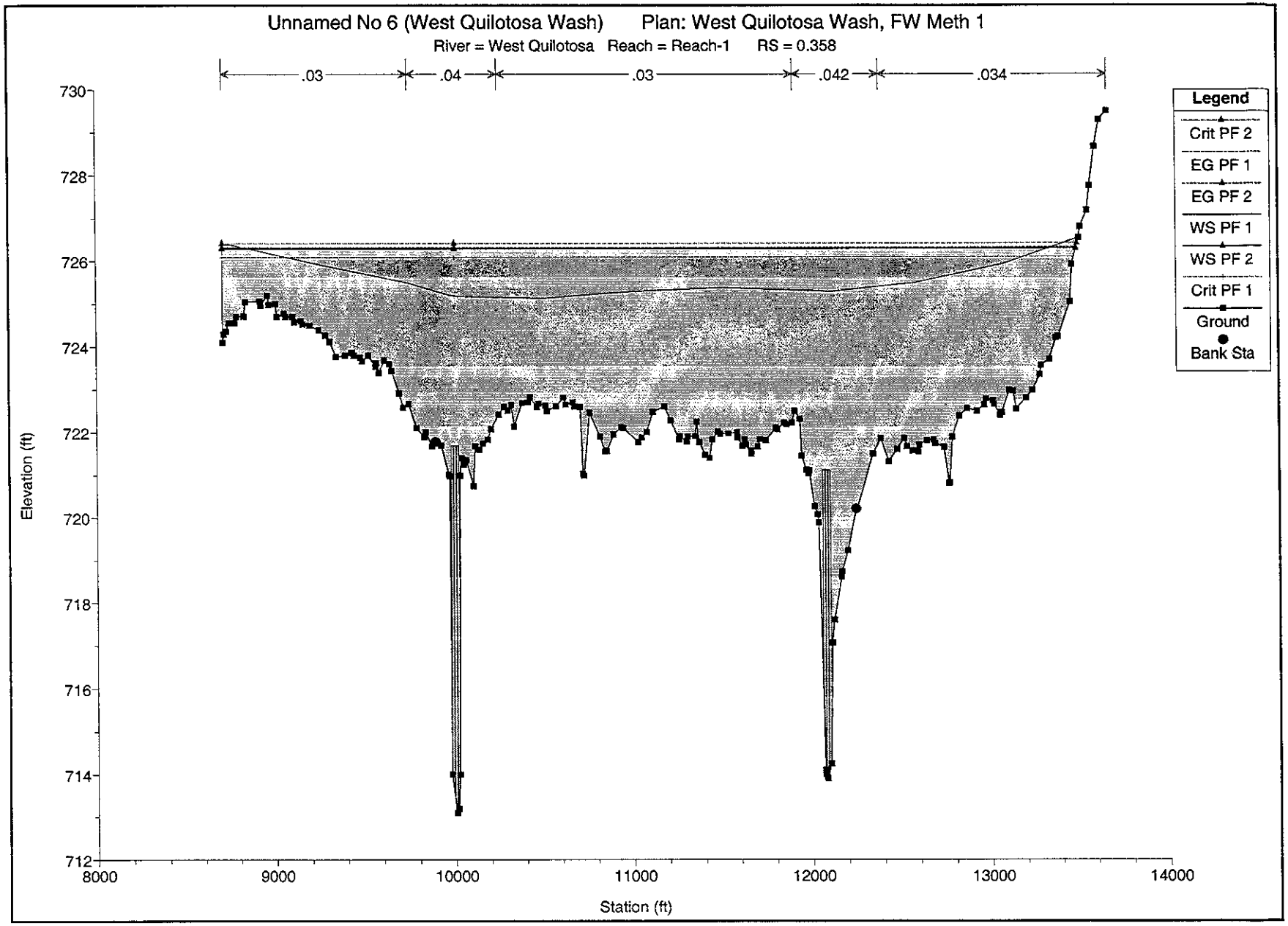

Unnamed No 6 (West Quilotosa Wash) Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.742
.035
.045
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
734
733
732
731
730
729
728
8500
9000
9500
10000
10500
11000
11500
Station (ft)

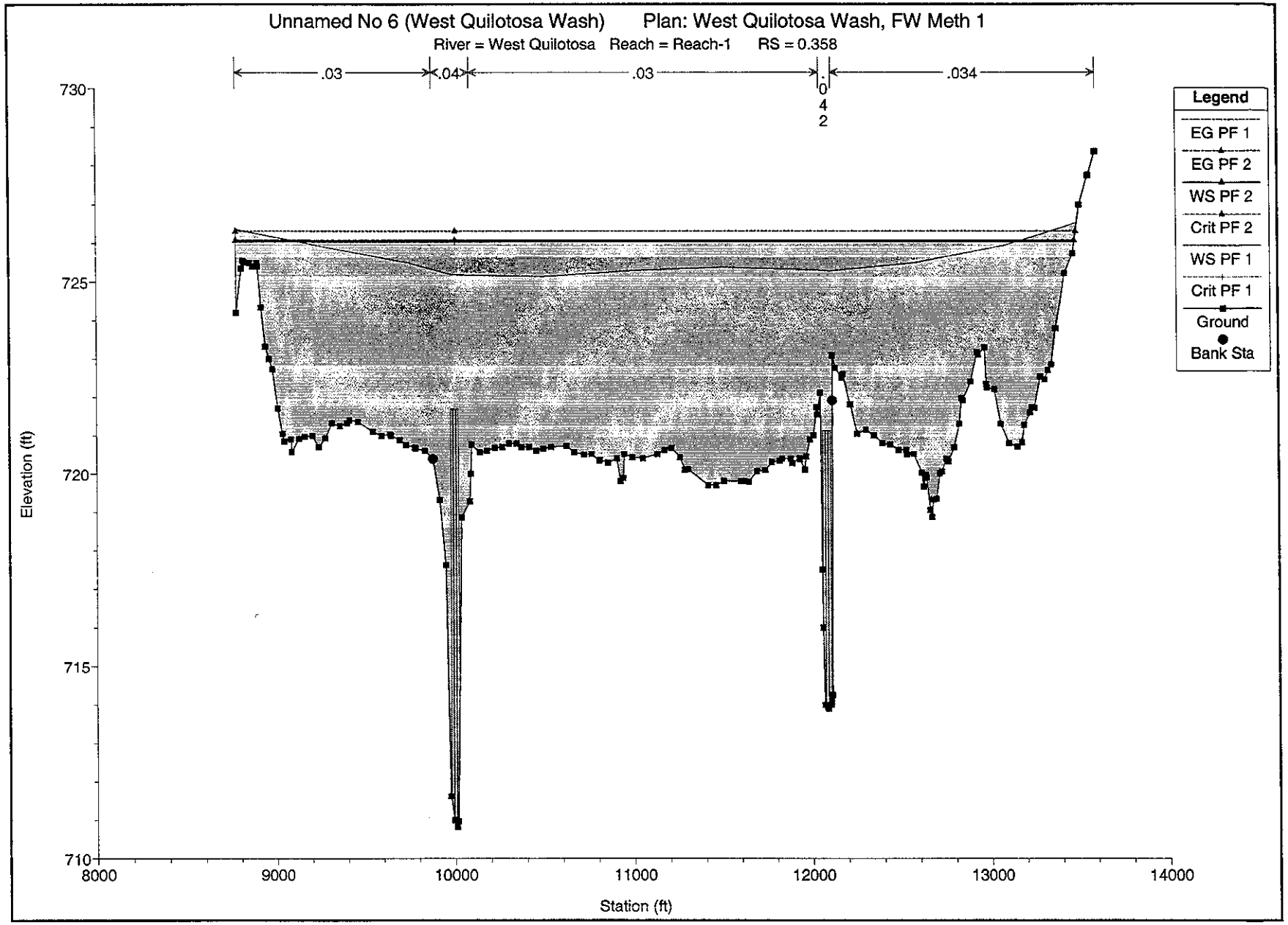

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa
Reach = Reach-1
RS = .654
.035
.045
.035
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
736
734
732
730
728
726
724
8500
9000
9500
10000
10500
11000
11500
Station (ft)

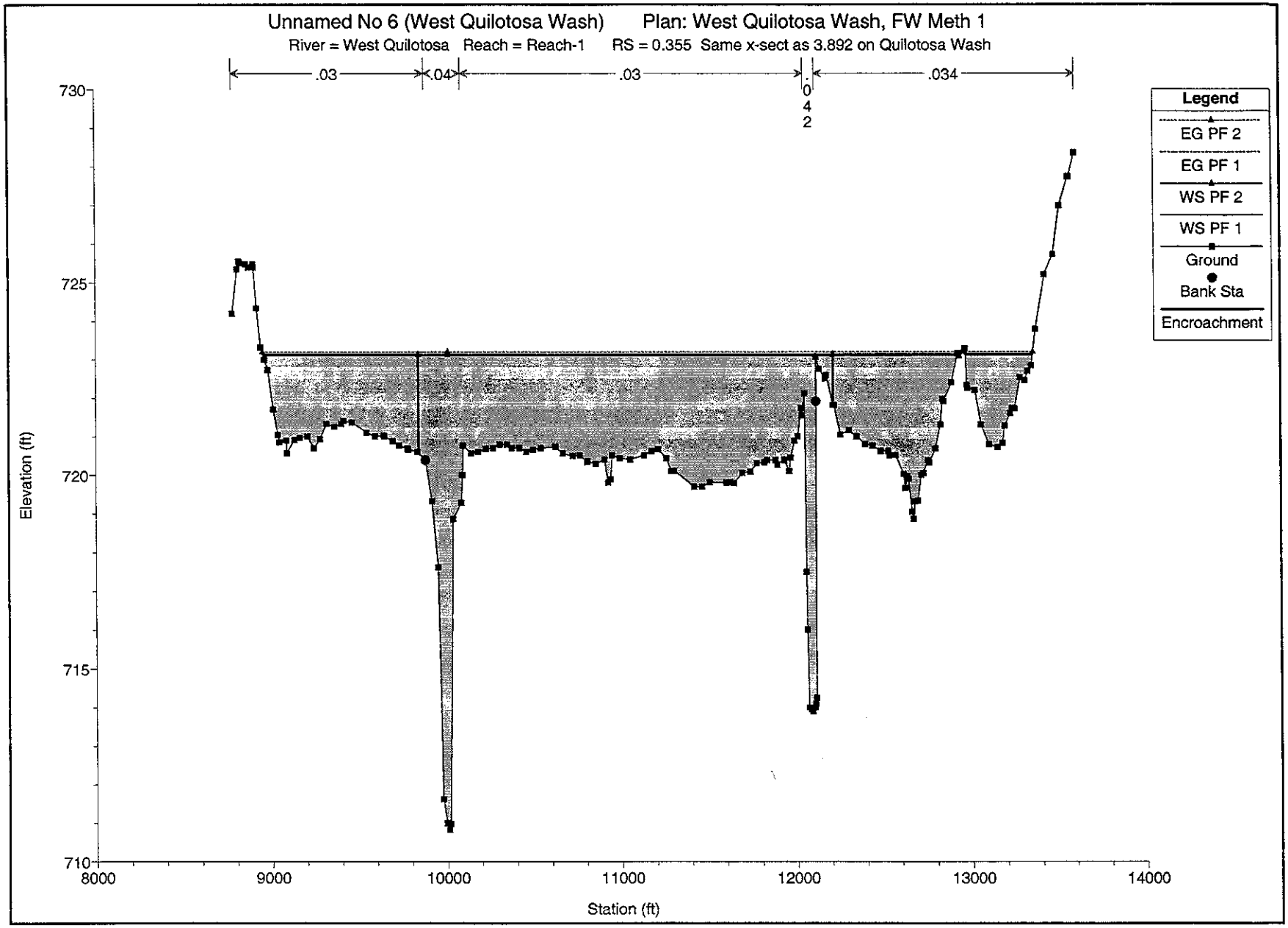

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa
Reach = Reach-1
RS = .563
.035
.045
.035
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
731
730
729
728
727
726
725
724
723
8500
9000
9500
10000
10500
11000
11500
Station (ft)

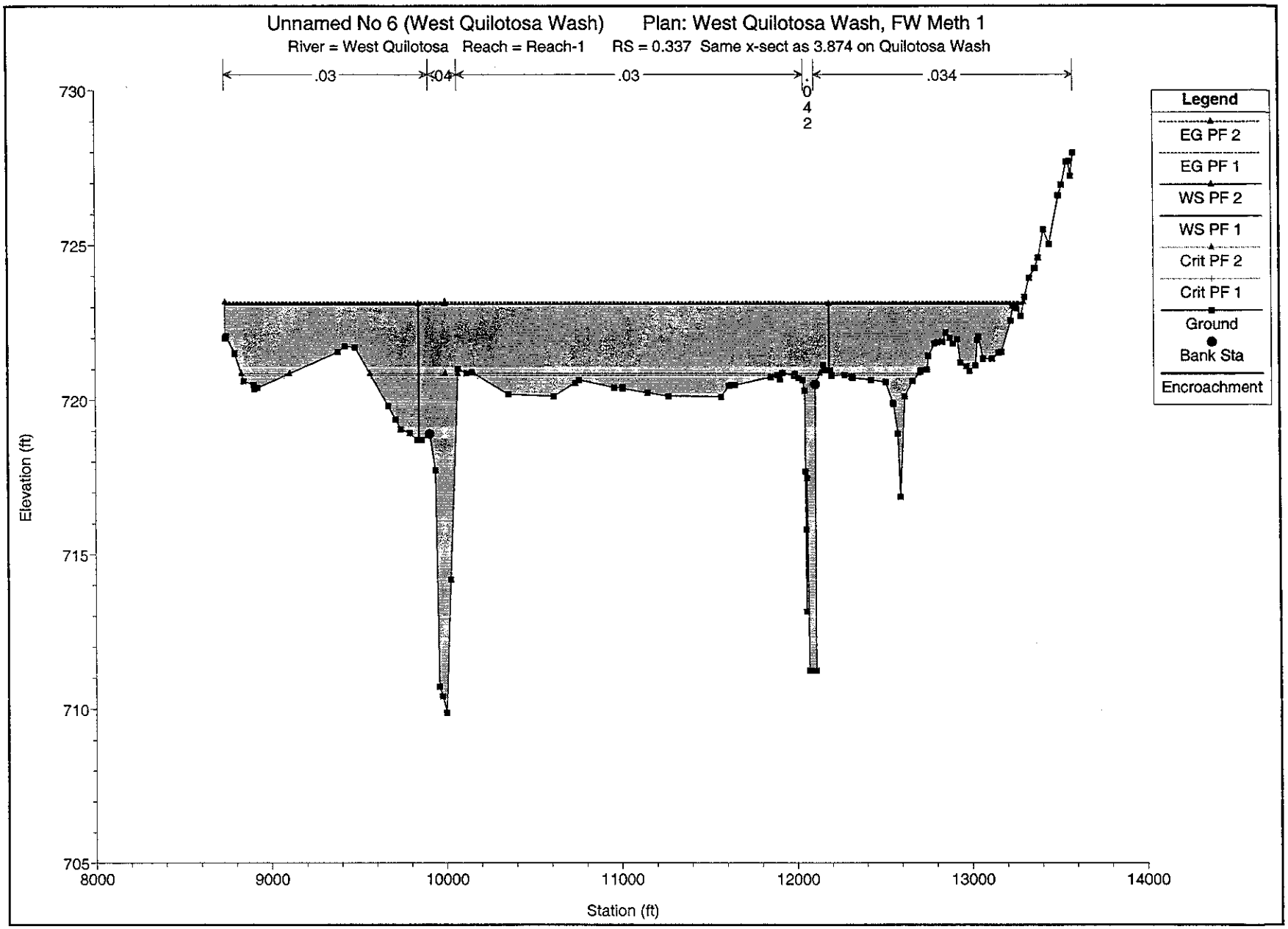

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.475
.035
.045
.035
Legend
EG PF 2
EG PF 1
WS PF 1
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
8500
9000
9500
10000
10500
11000
11500
Station (ft)

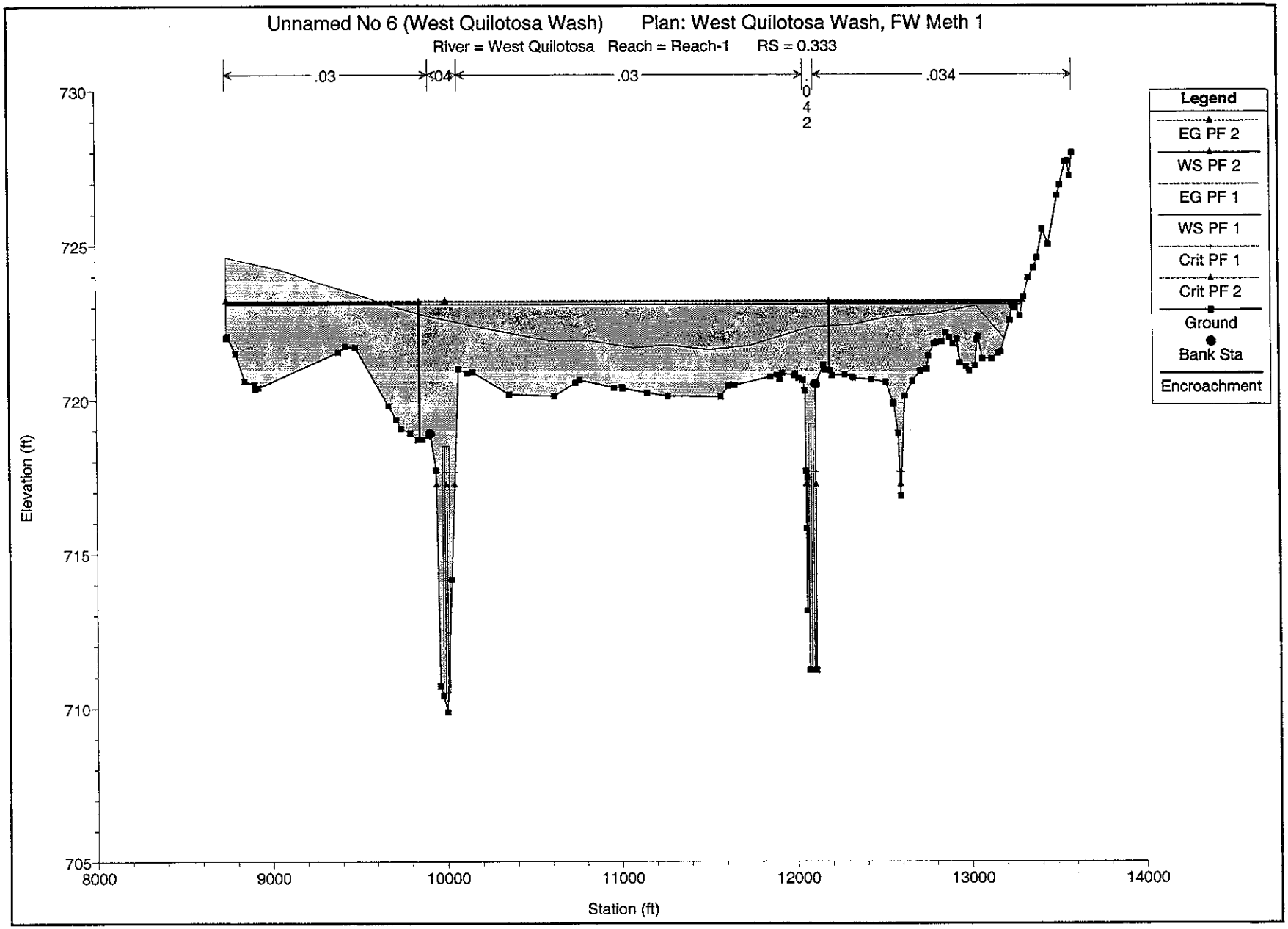

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.387 Same x-sect as 3.924 on Quilotosa Wash
.03
.04
.03
.042
.034
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
718
716
714
712
8000
9000
10000
11000
12000
13000
14000
Station (ft)

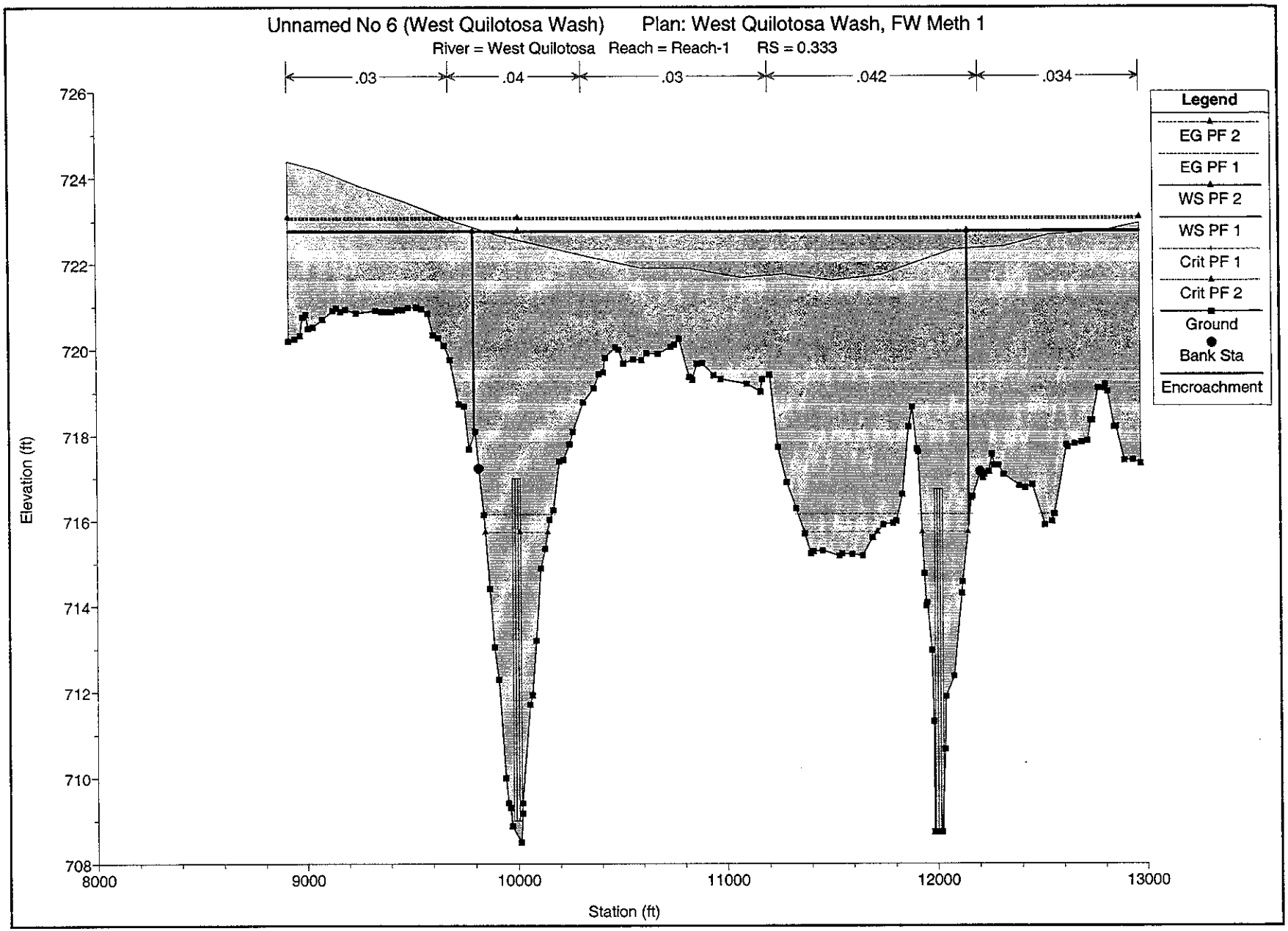

Unnamed No 6 (West Quilotosa Wash) Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.358
.03
.04
.03
.042
.034
Legend
Crit PF 2
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Crit PF 1
Ground
Bank Sta
Elevation (ft)
730
728
726
724
722
720
718
716
714
712
8000
9000
10000
11000
12000
13000
14000
Station (ft)

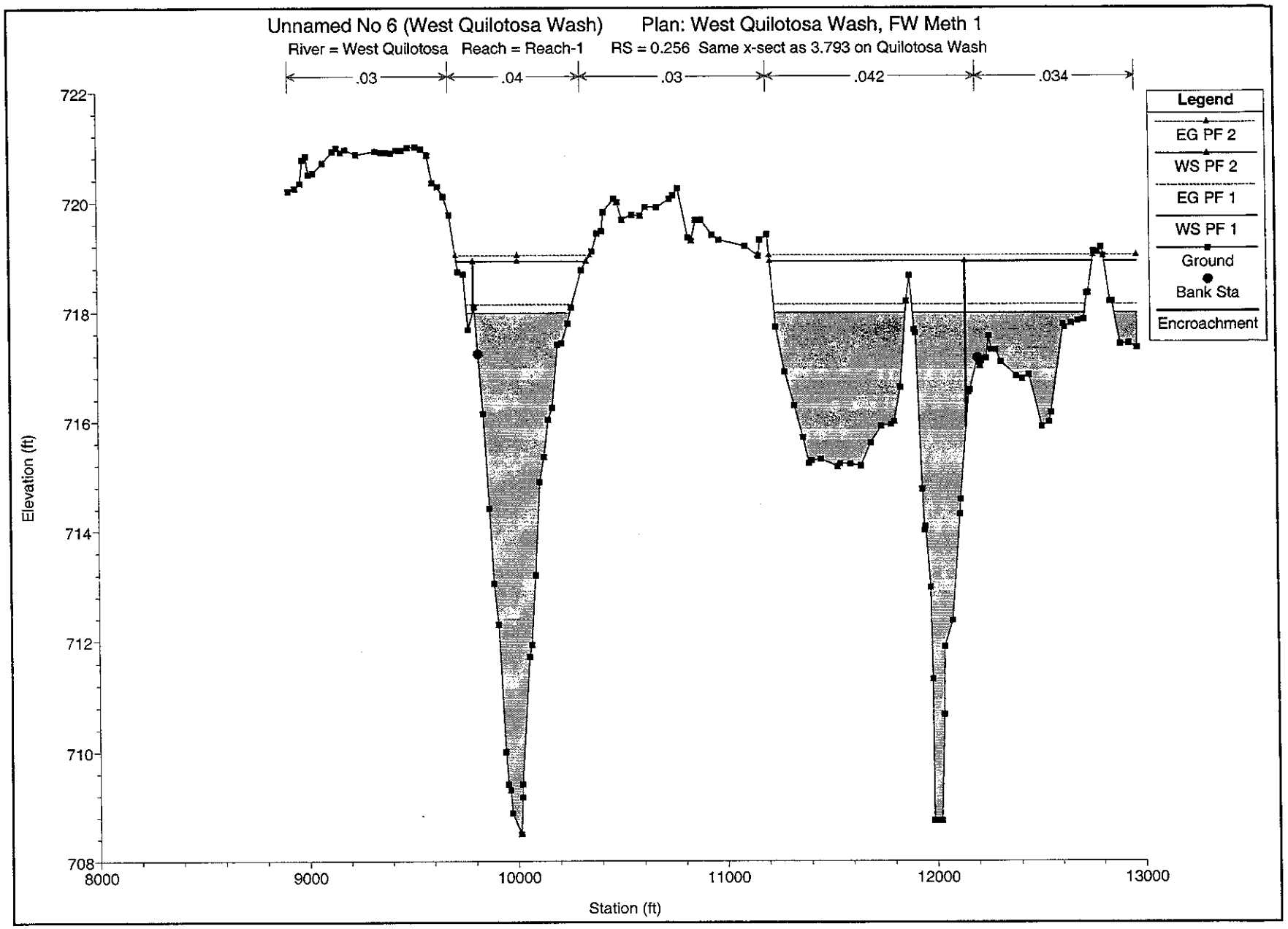

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.358
.03
.04
.03
.042
.034
Legend
EG PF 1
EG PF 2
WS PF 2
Crit PF 2
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
730
725
720
715
710
8000
9000
10000
11000
12000
13000
14000
Station (ft)

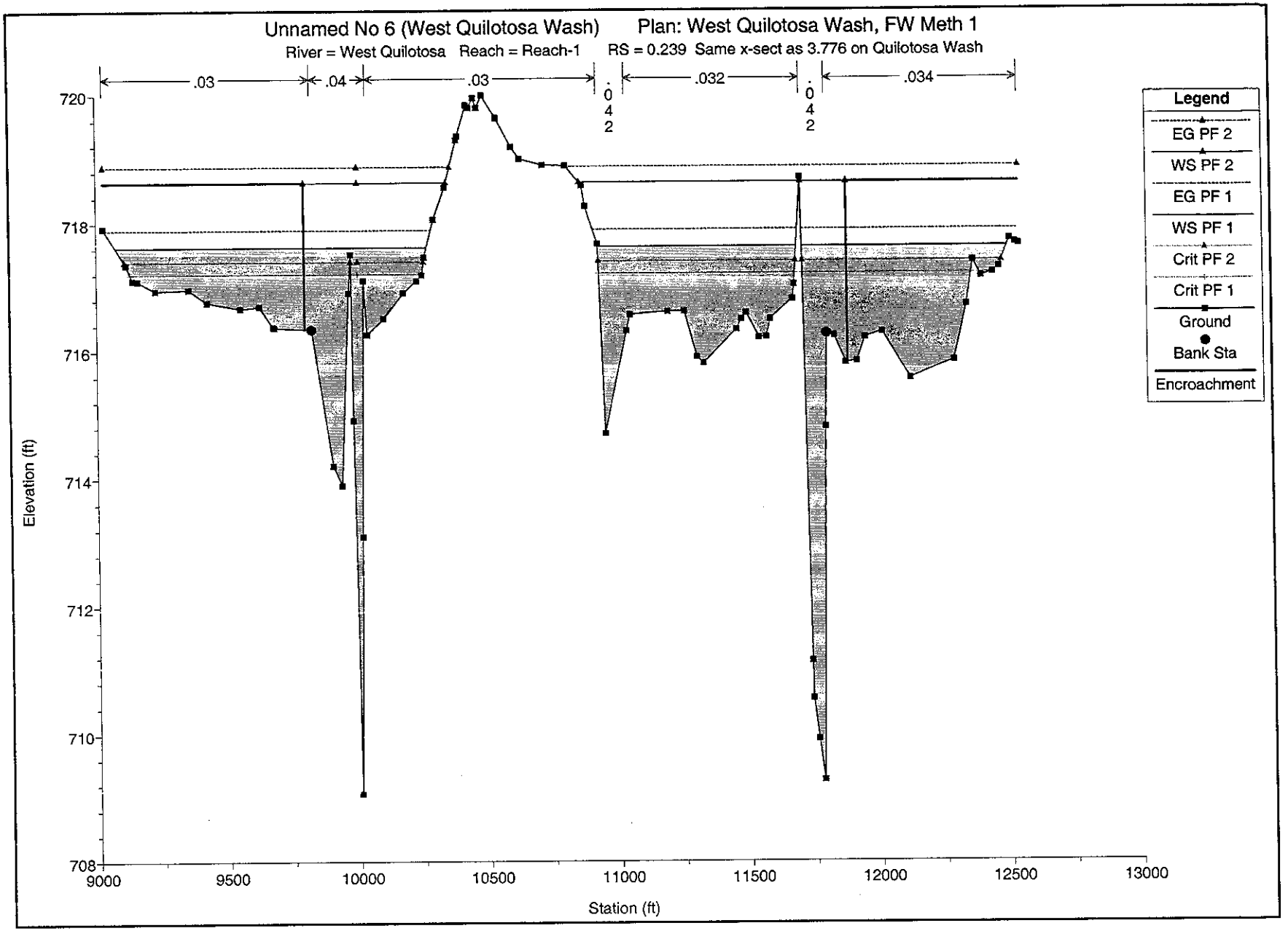

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.355 Same x-sect as 3.892 on Quilotosa Wash
.03
.04
.03
.042
.034
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
730
725
720
715
710
8000
9000
10000
11000
12000
13000
14000
Station (ft)

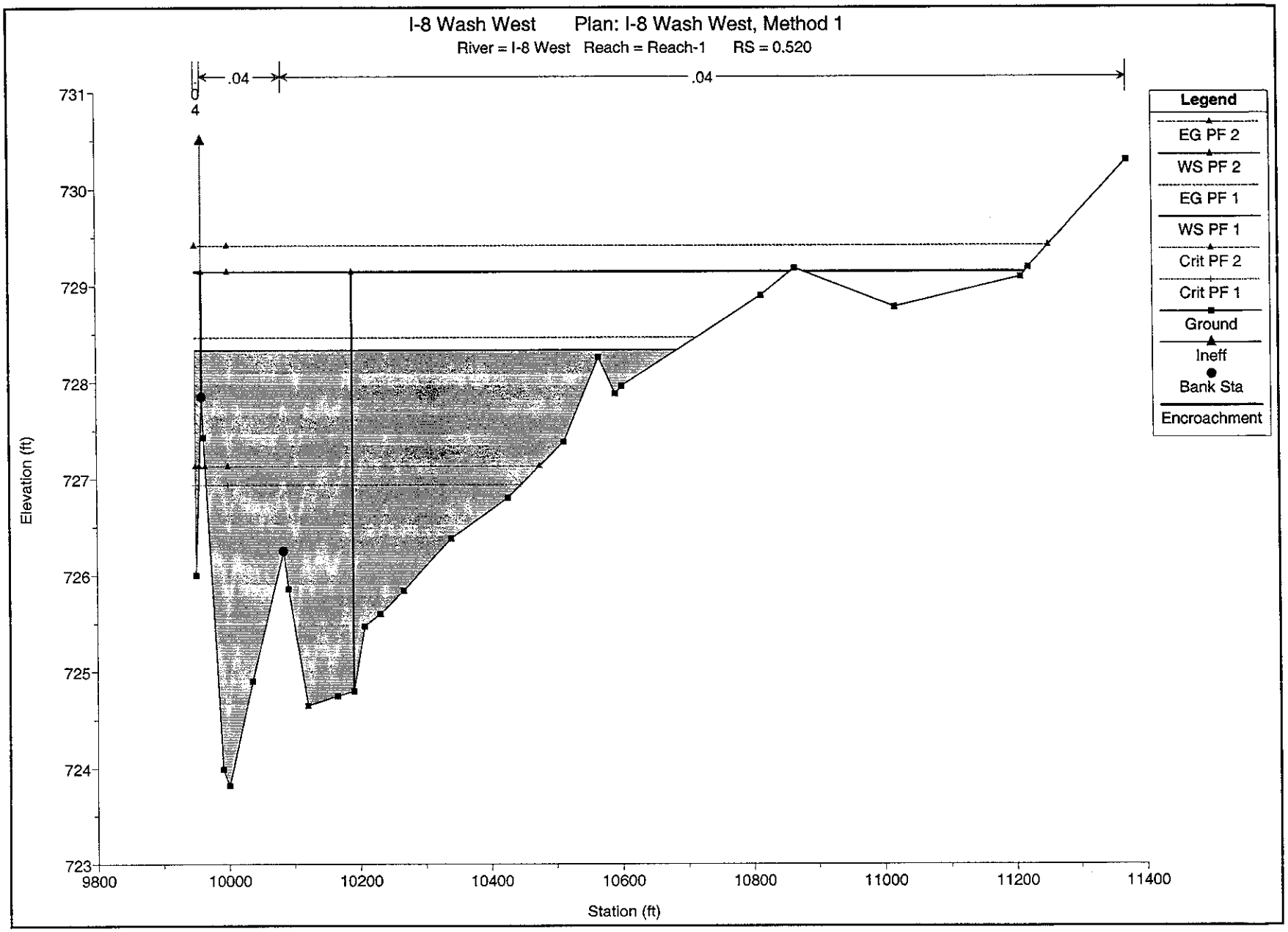

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.337 Same x-sect as 3.874 on Quilotosa Wash
.03
.04
.03
.042
.034
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
730
725
720
715
710
705
8000
9000
10000
11000
12000
13000
14000
Station (ft)

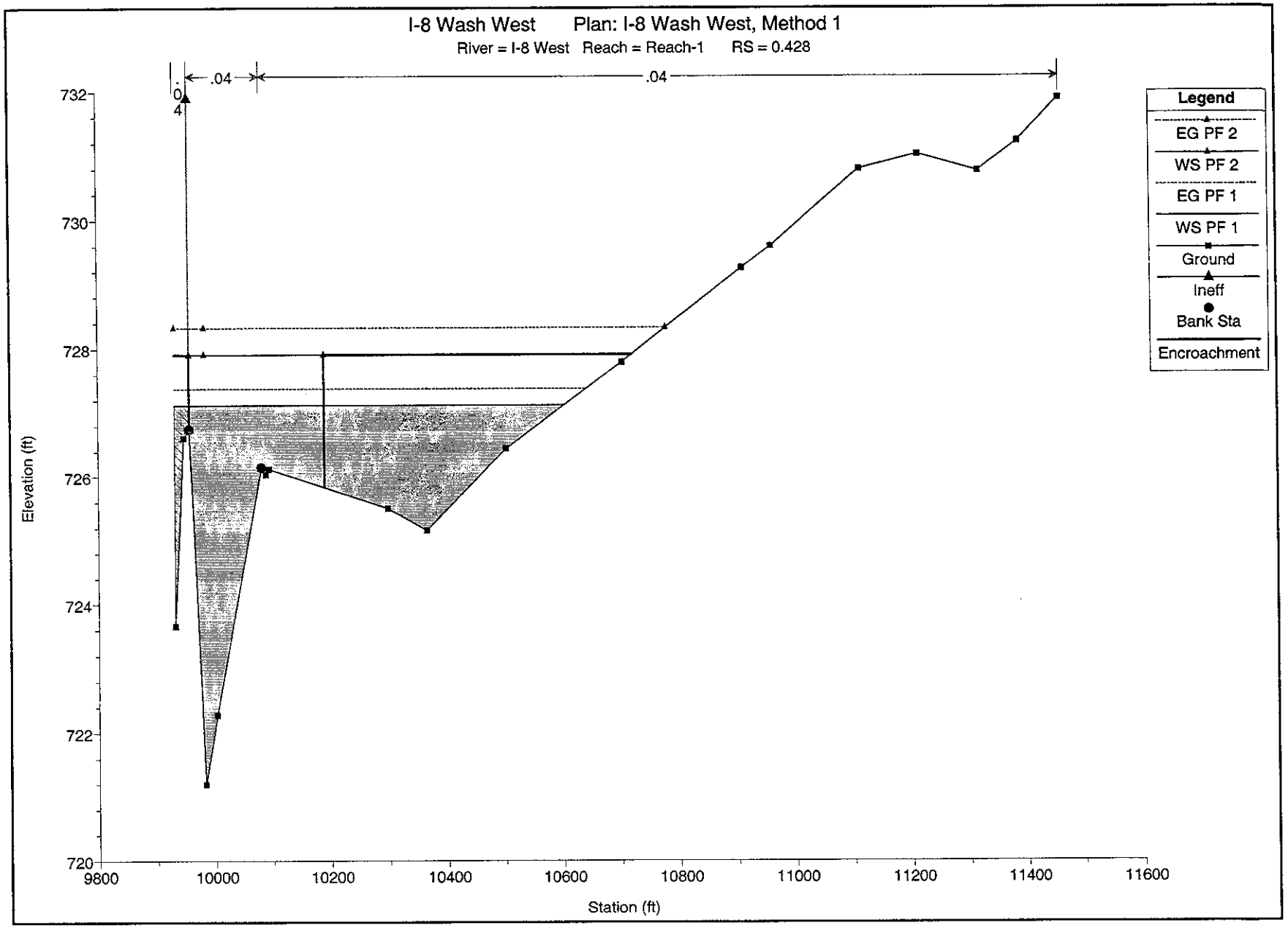

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.333
.03
.04
.03
.042
.034
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
730
725
720
715
710
705
8000
9000
10000
11000
12000
13000
14000
Station (ft)

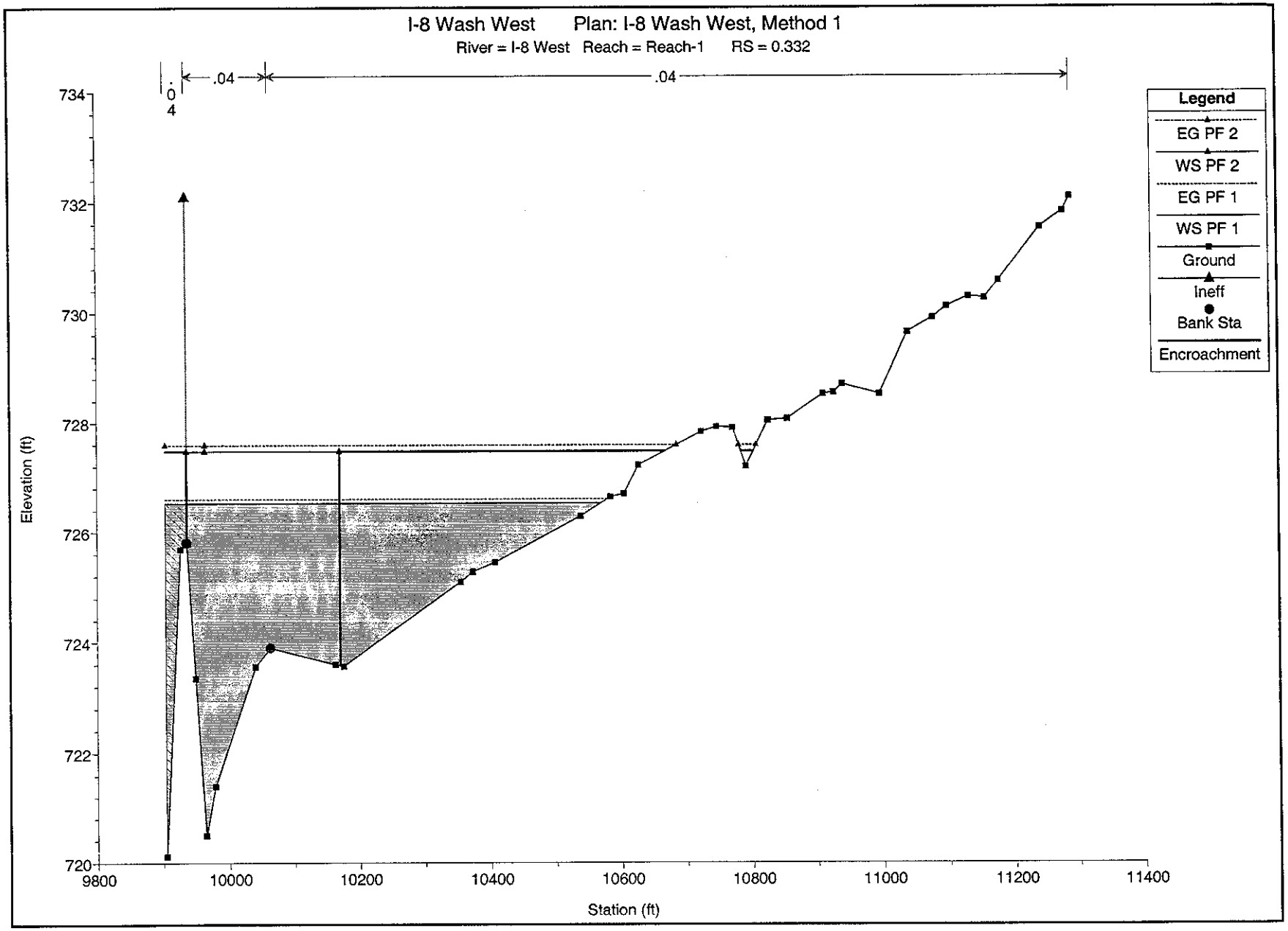

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.333
.03
.04
.03
.042
.034
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
726
724
722
720
718
716
714
712
710
708
8000
9000
10000
11000
12000
13000
Station (ft)

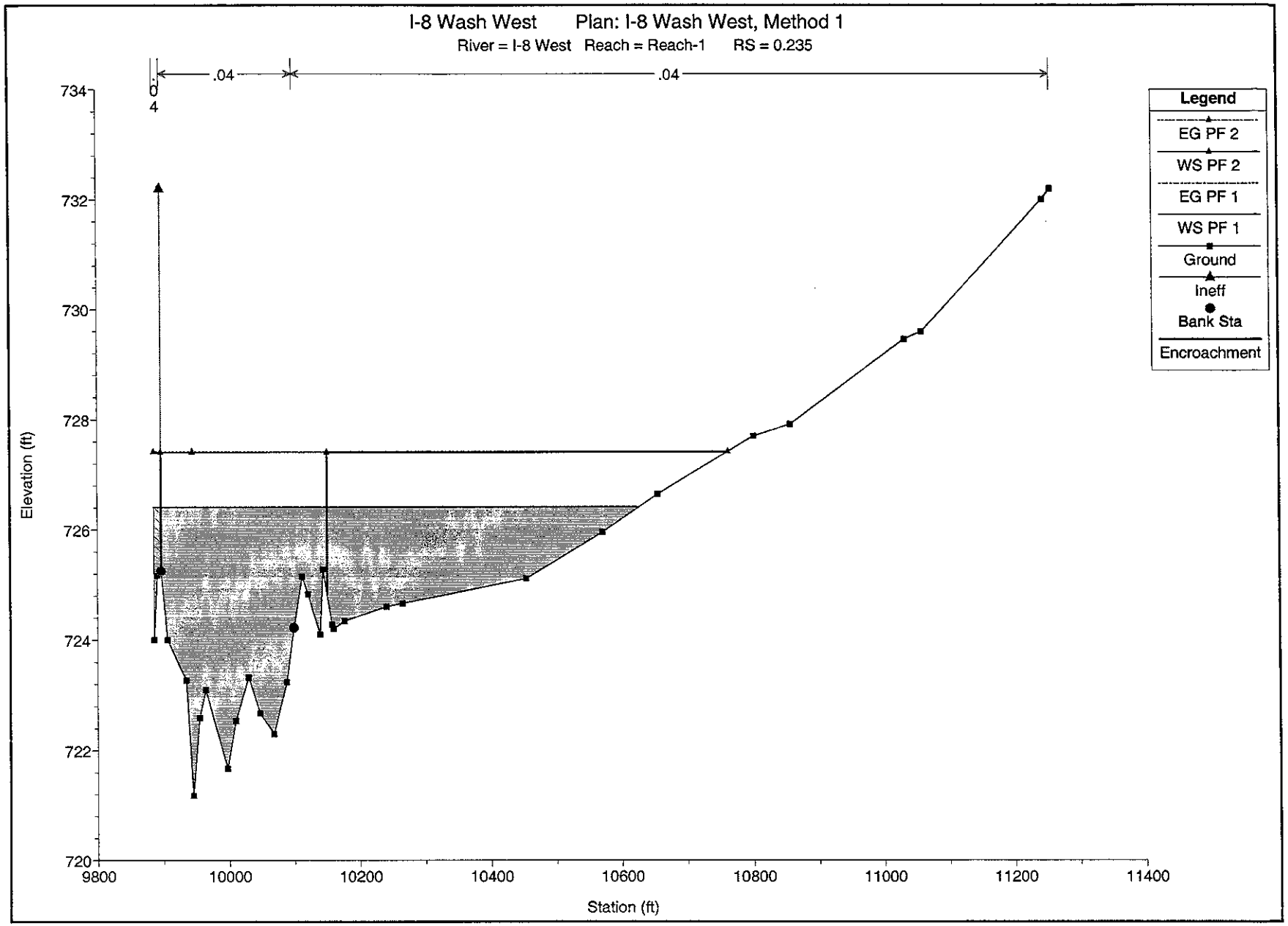

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1 RS = 0.256 Same x-sect as 3.793 on Quilotosa Wash
.03
.04
.03
.042
.034
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
722
720
718
716
714
712
710
708
8000
9000
10000
11000
12000
13000
Station (ft)

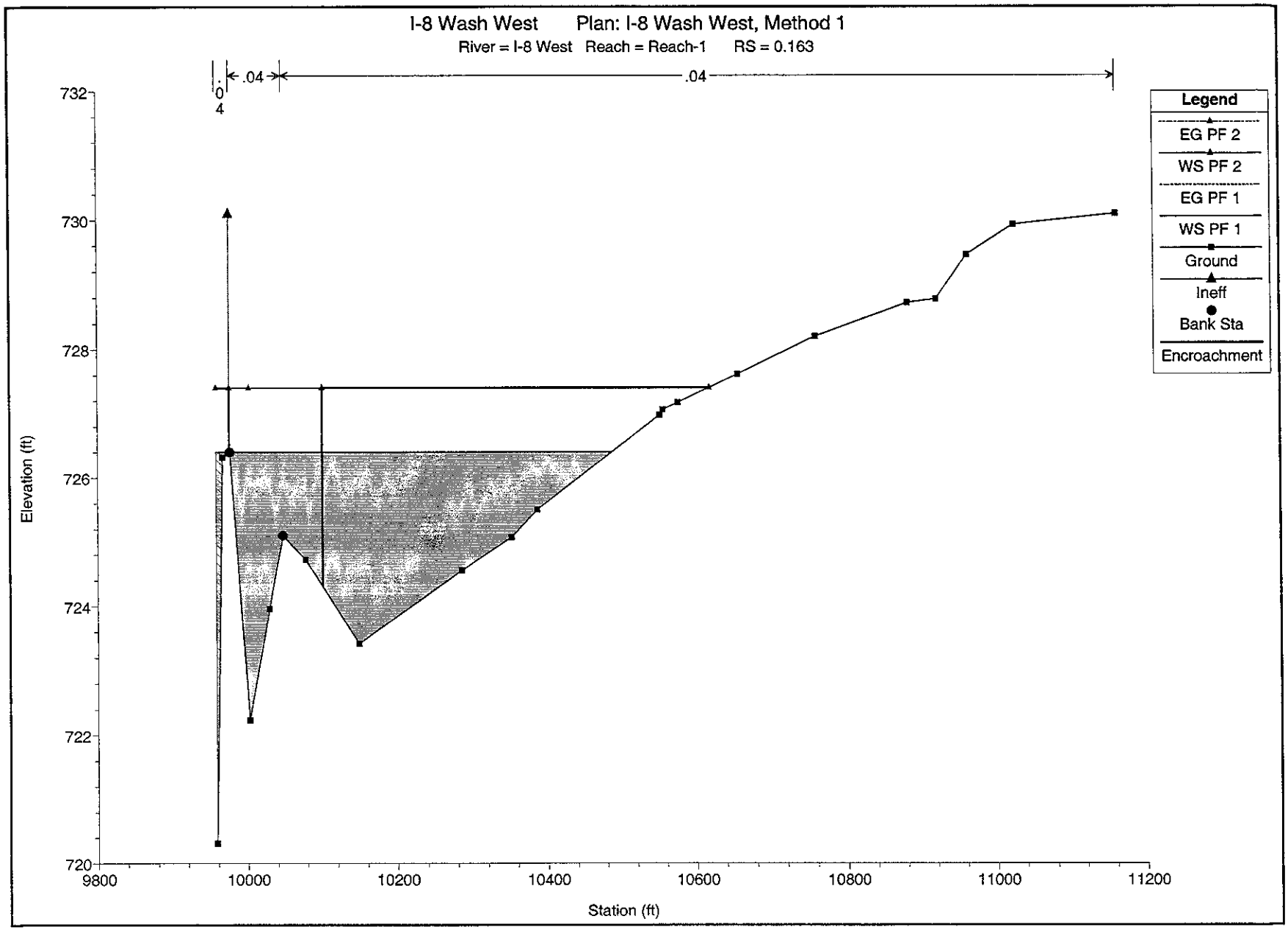

Unnamed No 6 (West Quilotosa Wash)
Plan: West Quilotosa Wash, FW Meth 1
River = West Quilotosa Reach = Reach-1
RS = 0.239 Same x-sect as 3.776 on Quilotosa Wash
.03
.04
.03
.042
.032
.042
.034
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
720
718
716
714
712
710
708
9000
9500
10000
10500
11000
11500
12000
12500
13000
Station (ft)

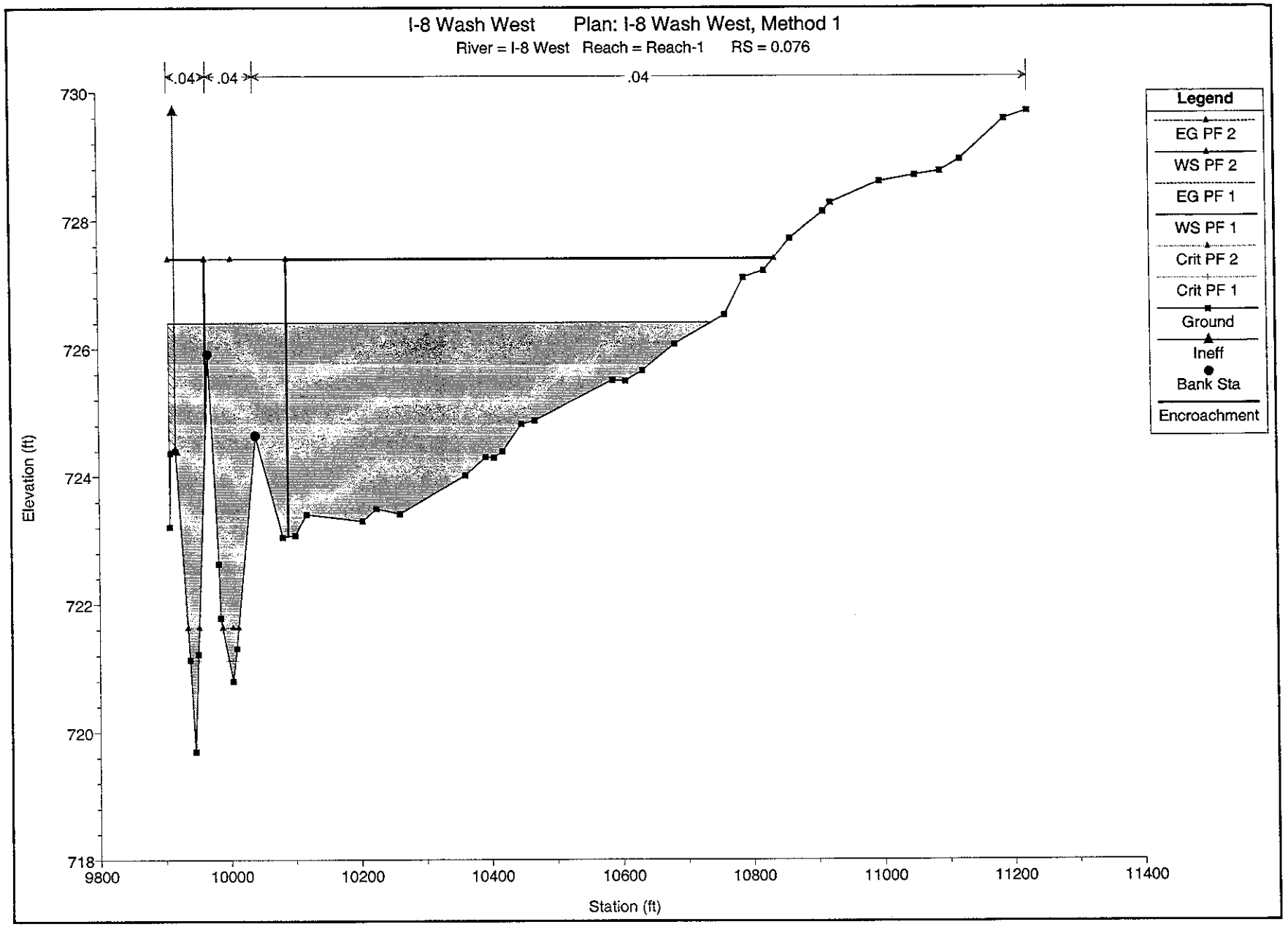

I-8 Wash West Plan: I-8 Wash West, Method 1
River = I-8 West Reach = Reach-1 RS = 0.520
.04
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
731
730
729
728
727
726
725
724
723
9800
10000
10200
10400
10600
10800
11000
11200
11400
Station (ft)

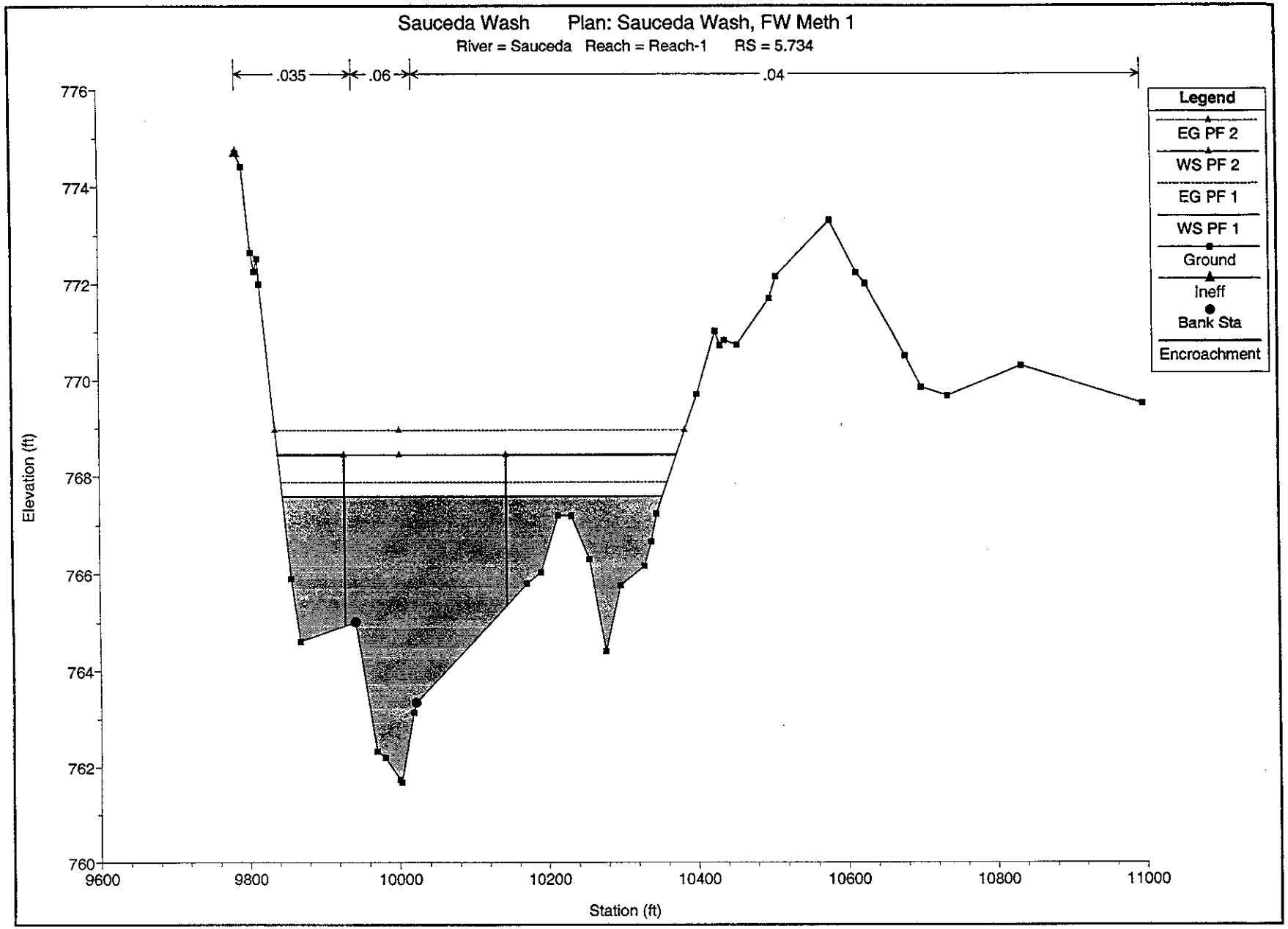

I-8 Wash West Plan: I-8 Wash West, Method 1
River = I-8 West Reach = Reach-1 RS = 0.428
.04
.04
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
732
730
728
726
724
722
720
9800
10000
10200
10400
10600
10800
11000
11200
11400
11600
Station (ft)

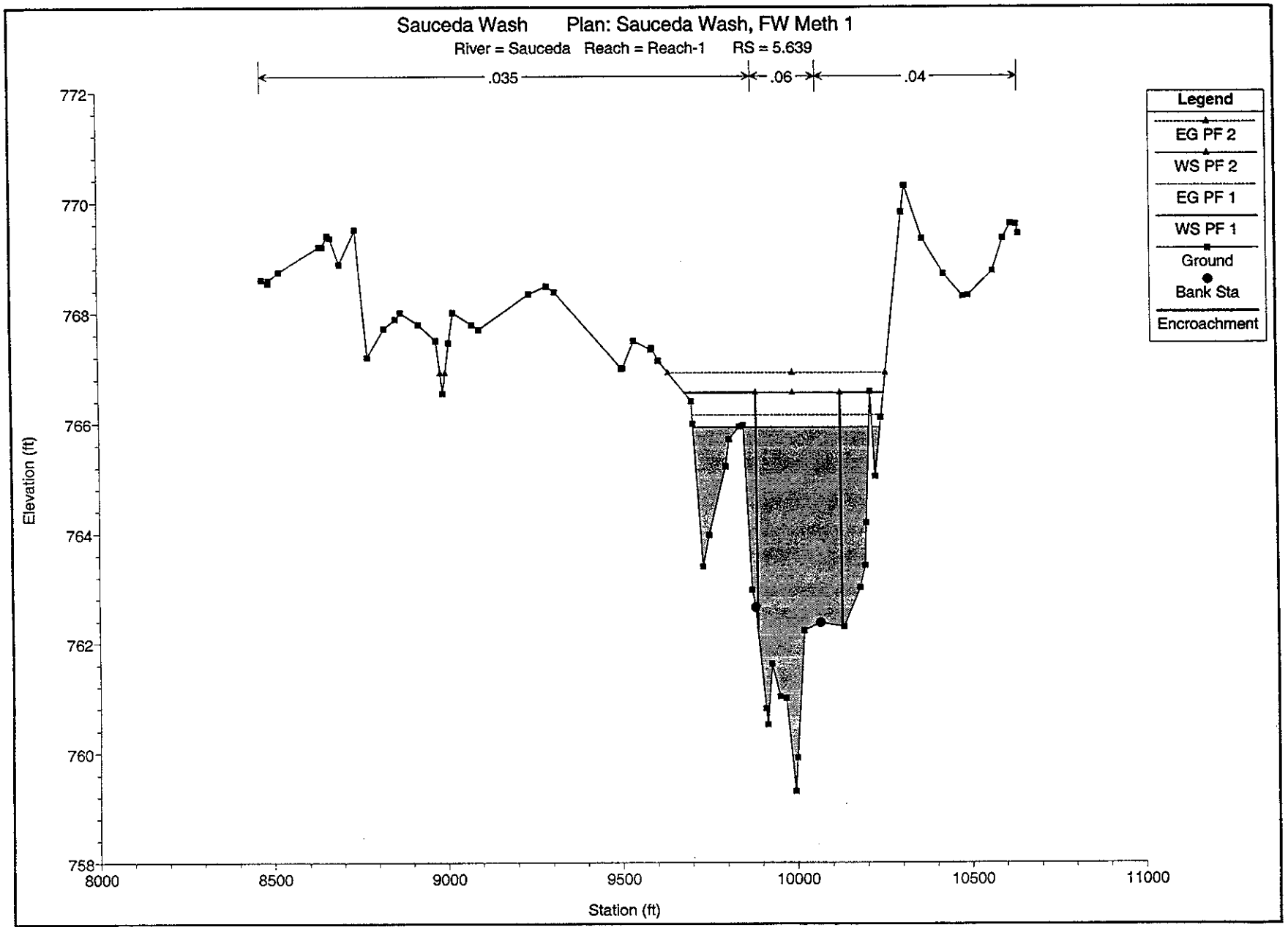

I-8 Wash West Plan: I-8 Wash West, Method 1
River = I-8 West Reach = Reach-1 RS = 0.332
.04
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
734
732
730
728
726
724
722
720
9800
10000
10200
10400
10600
10800
11000
11200
11400

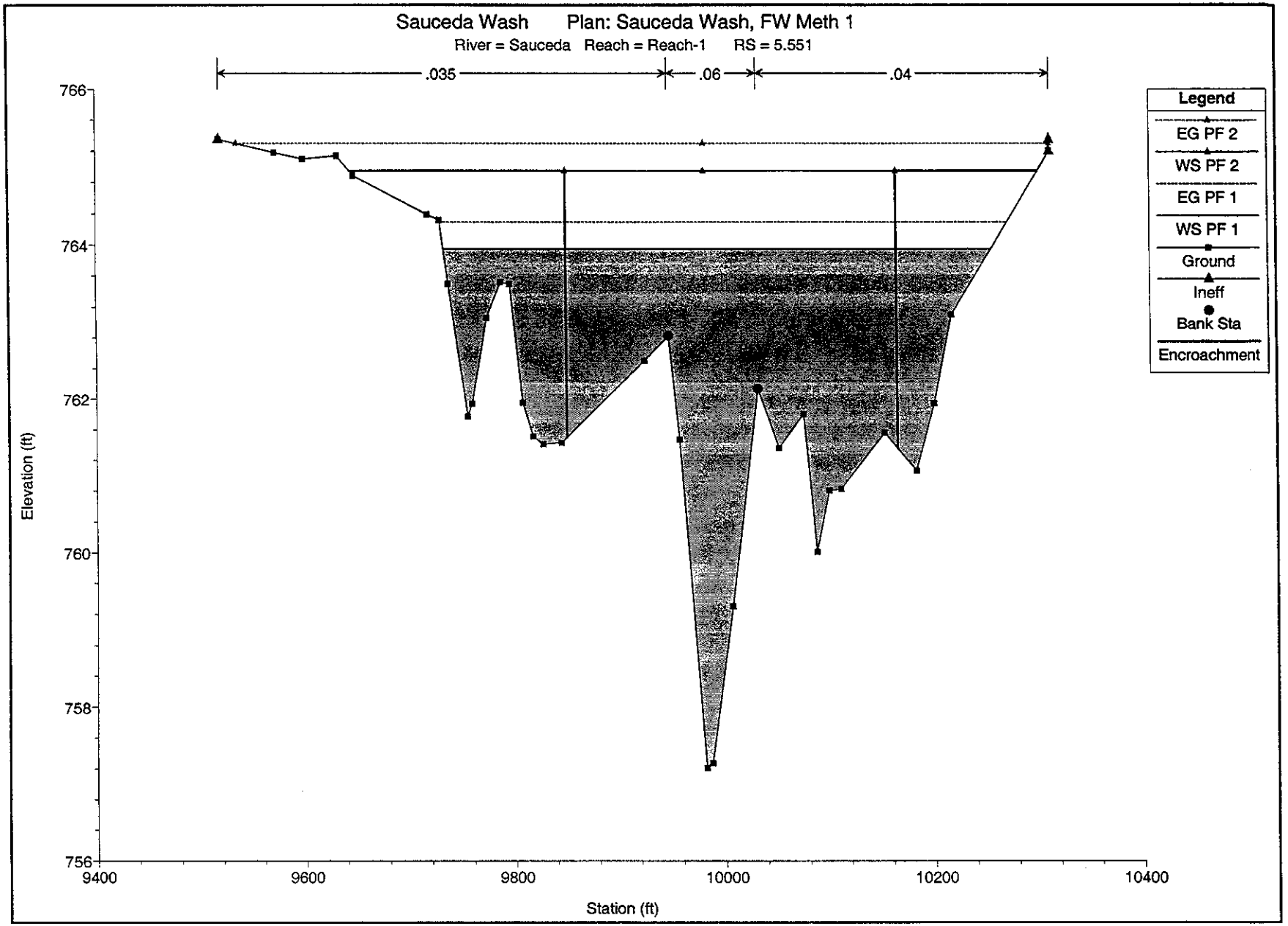

I-8 Wash West Plan: I-8 Wash West, Method 1
River = I-8 West Reach = Reach-1 RS = 0.235
.04
.04
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
734
732
730
728
726
724
722
720
9800
10000
10200
10400
10600
10800
11000
11200
11400
Station (ft)

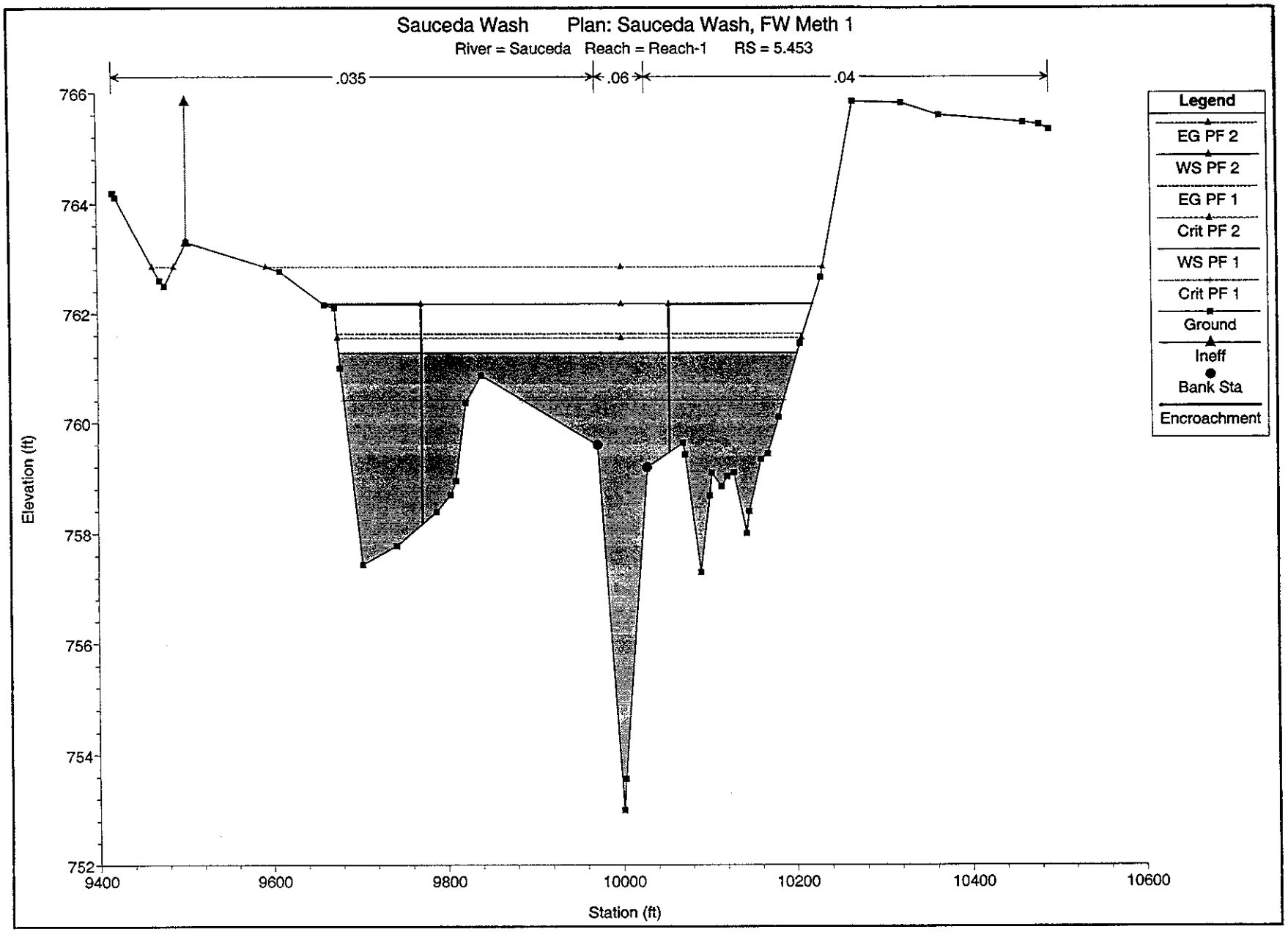

I-8 Wash West Plan: I-8 Wash West, Method 1
River = I-8 West Reach = Reach-1 RS = 0.163
.04
.04
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
732
730
728
726
724
722
720
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

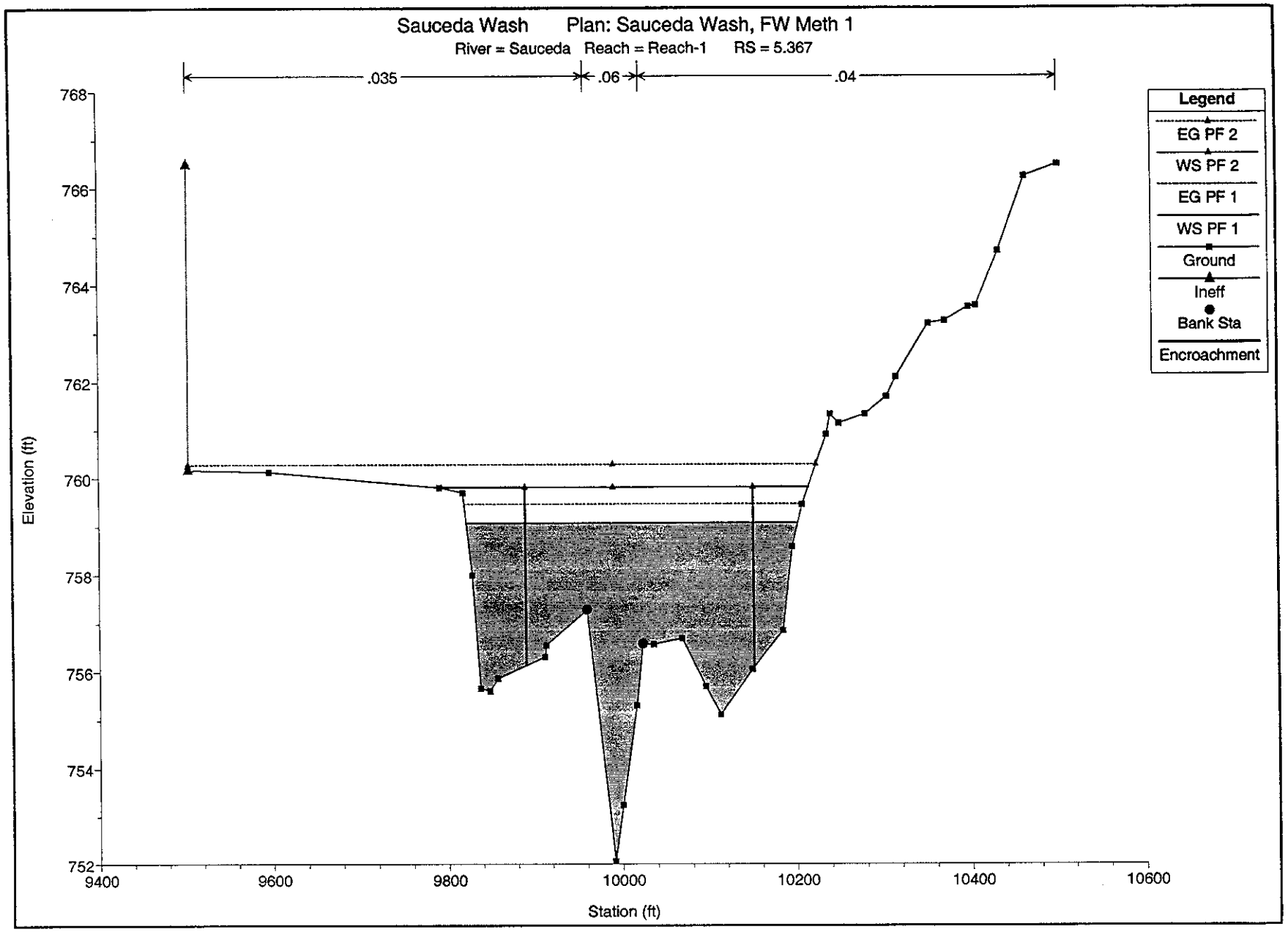

I-8 Wash West Plan: I-8 Wash West, Method 1
River = I-8 West Reach = Reach-1 RS = 0.076
.04
.04
.04
Elevation (ft)
730
728
726
724
722
720
718
9800
10000
10200
10400
10600
10800
11000
11200
11400
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment

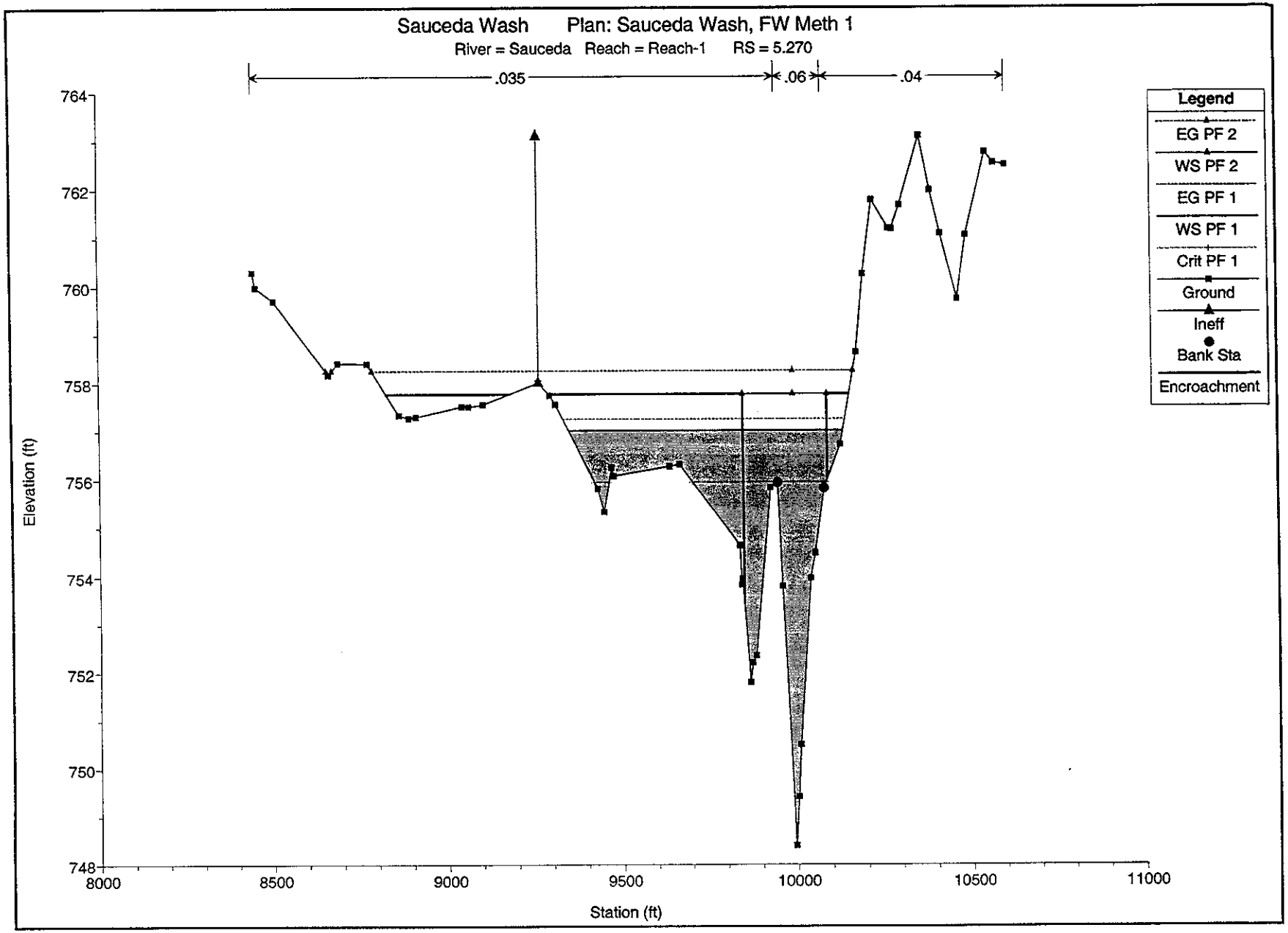

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 5.734
.035
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
776
774
772
770
768
766
764
762
760
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

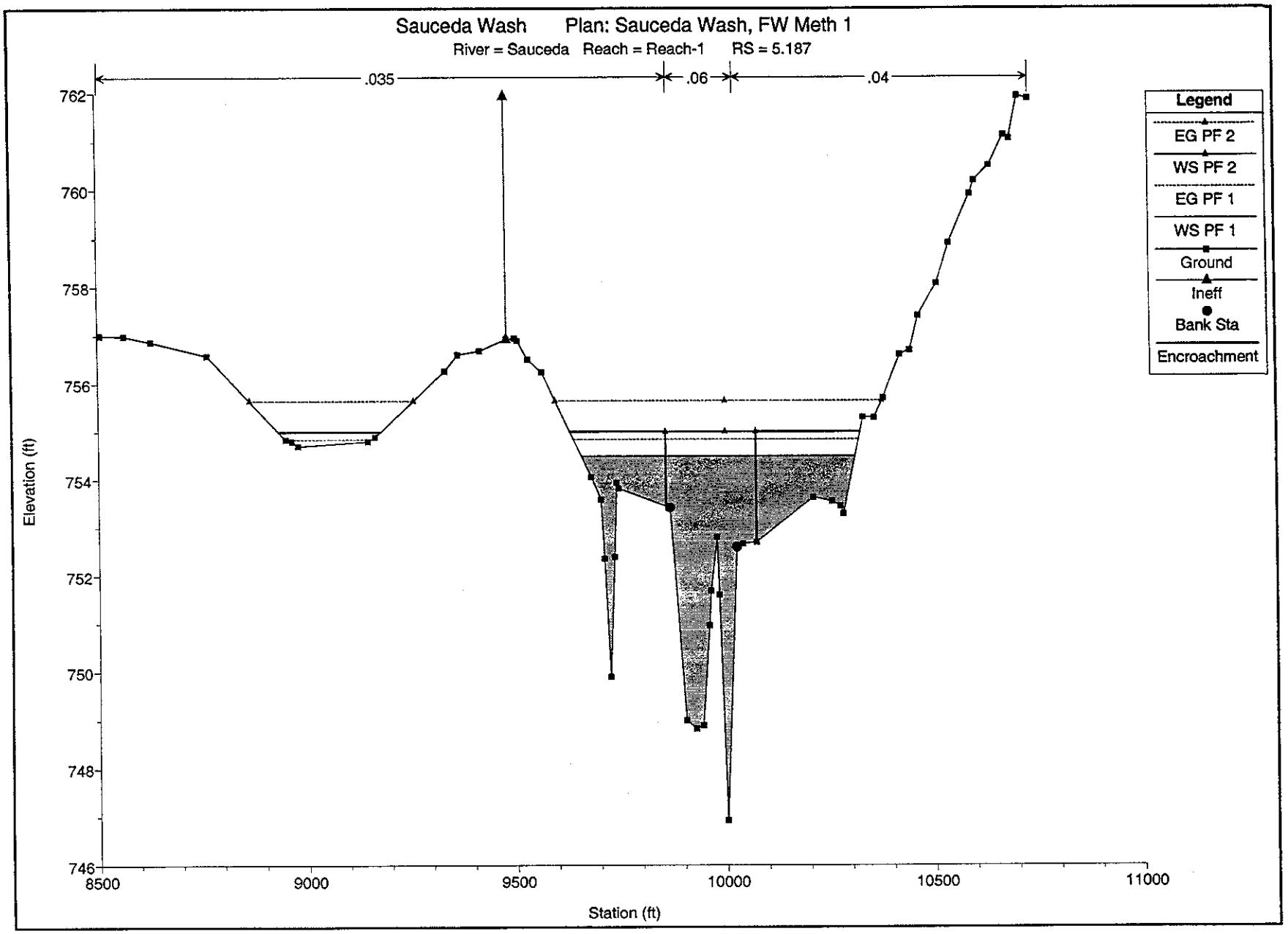

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 5.639
.035
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
772
770
768
766
764
762
760
758
8000
8500
9000
9500
10000
10500
11000
Station (ft)

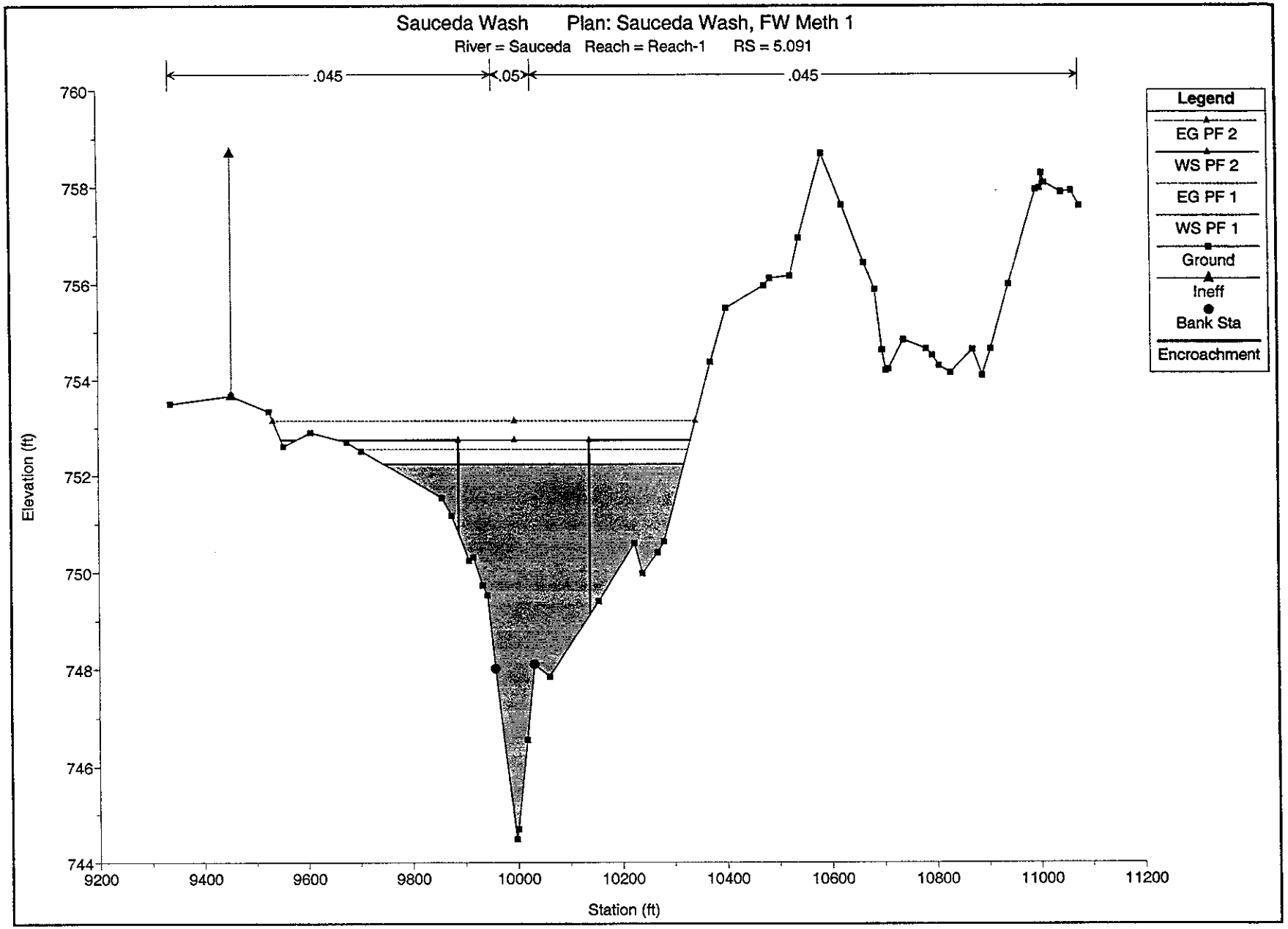

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 5.551
.035
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
766
764
762
760
758
756
9400
9600
9800
10000
10200
10400
Station (ft)

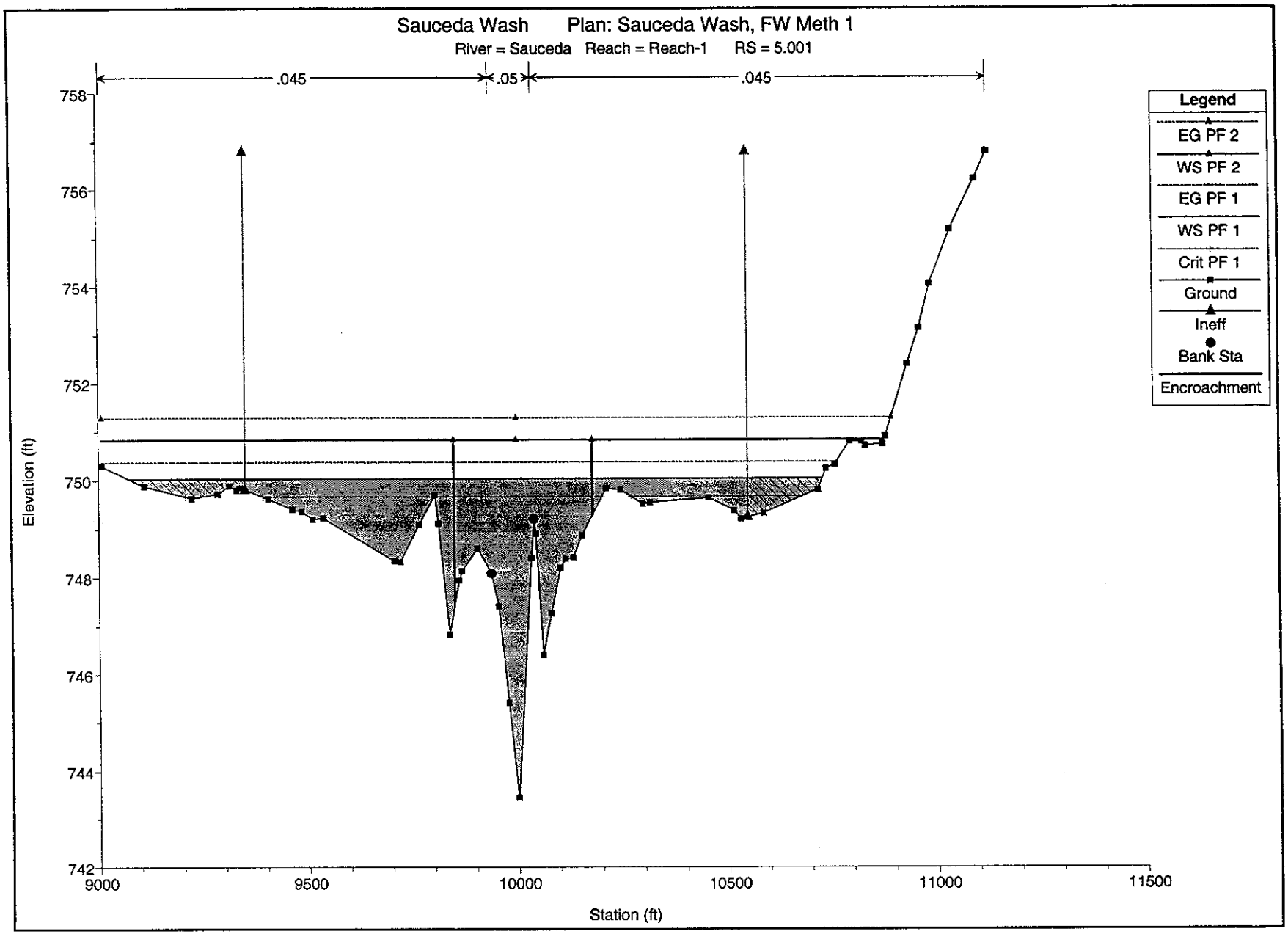

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 5.453
.035
.06
.04
Elevation (ft)
766
764
762
760
758
756
754
752
9400
9600
9800
10000
10200
10400
10600
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 2
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment

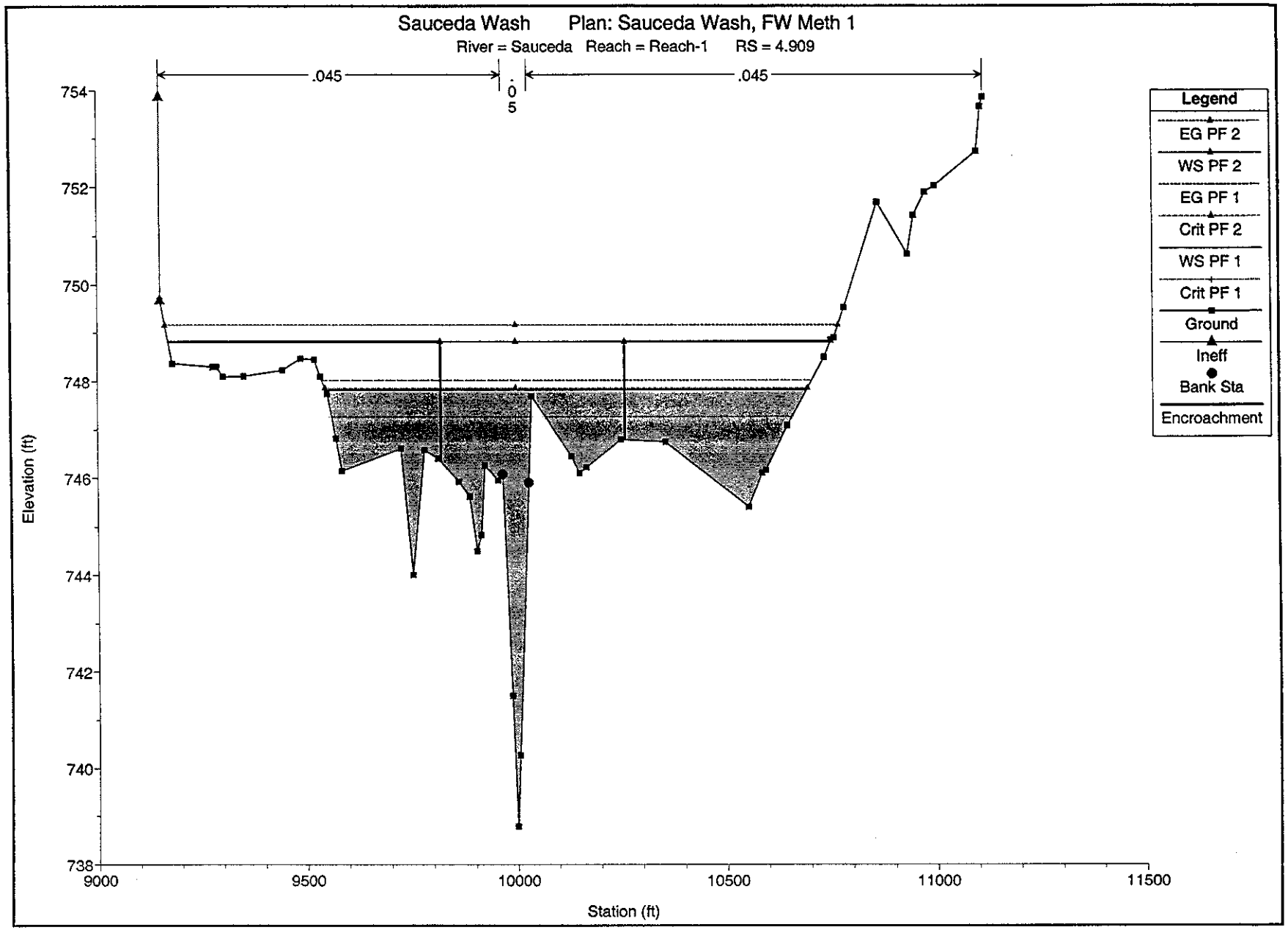

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 5.367
.035
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
768
766
764
762
760
758
756
754
752
9400
9600
9800
10000
10200
10400
10600
Station (ft)

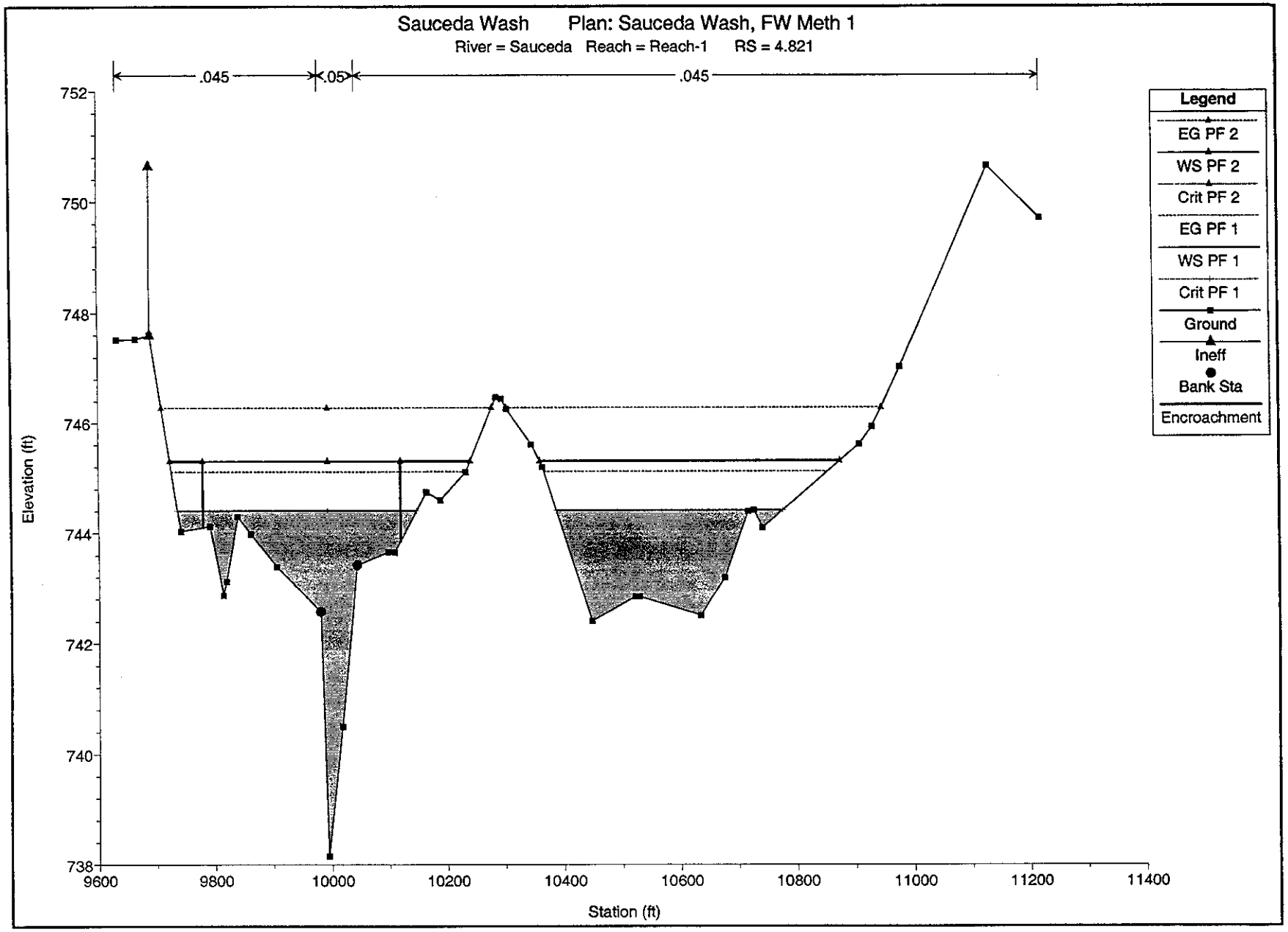

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 5.270
.035
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
764
762
760
758
756
754
752
750
748
8000
8500
9000
9500
10000
10500
11000
Station (ft)

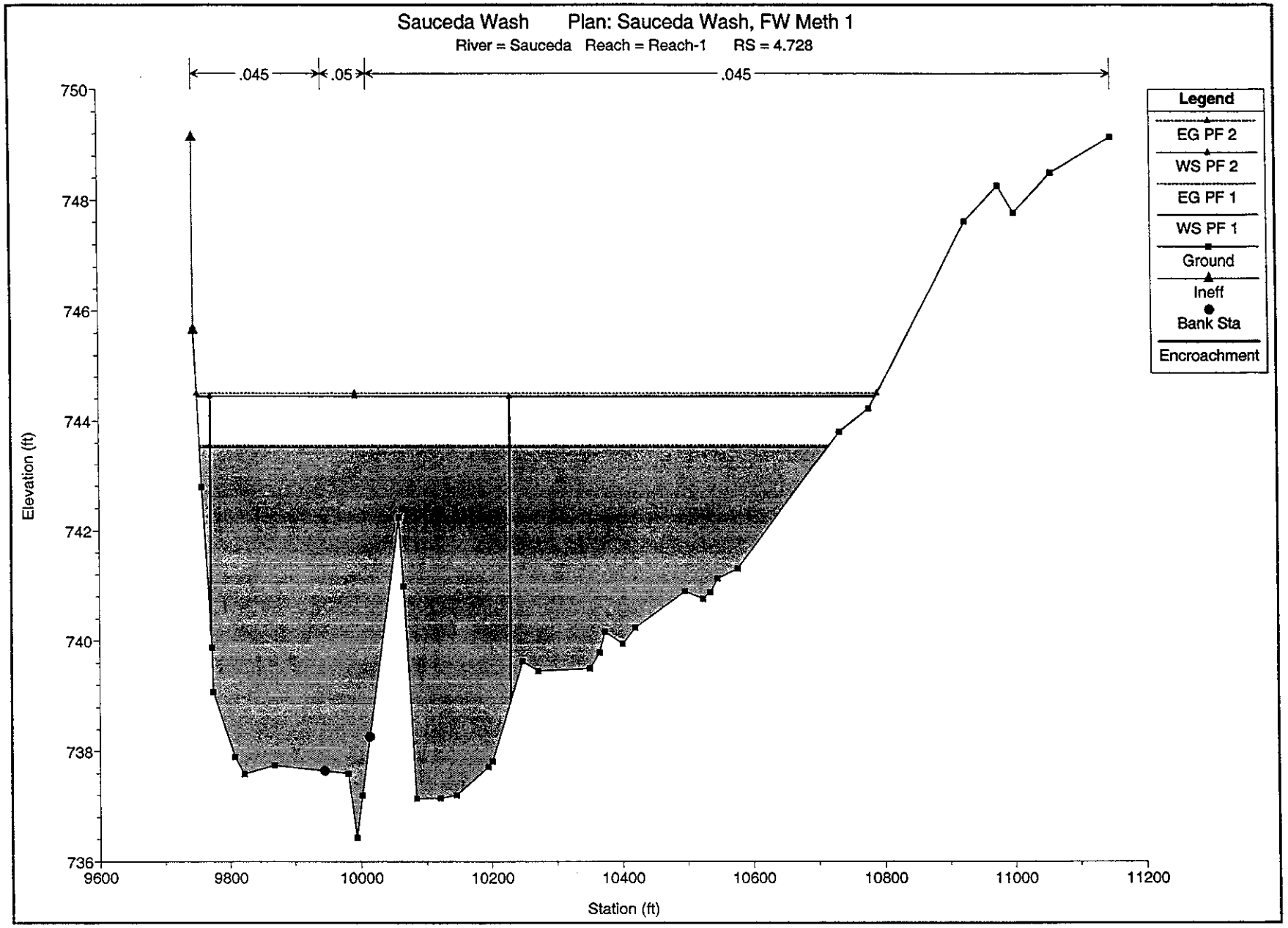

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 5.187
.035
.06
.04
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
762
760
758
756
754
752
750
748
746
8500
9000
9500
10000
10500
11000
Station (ft)

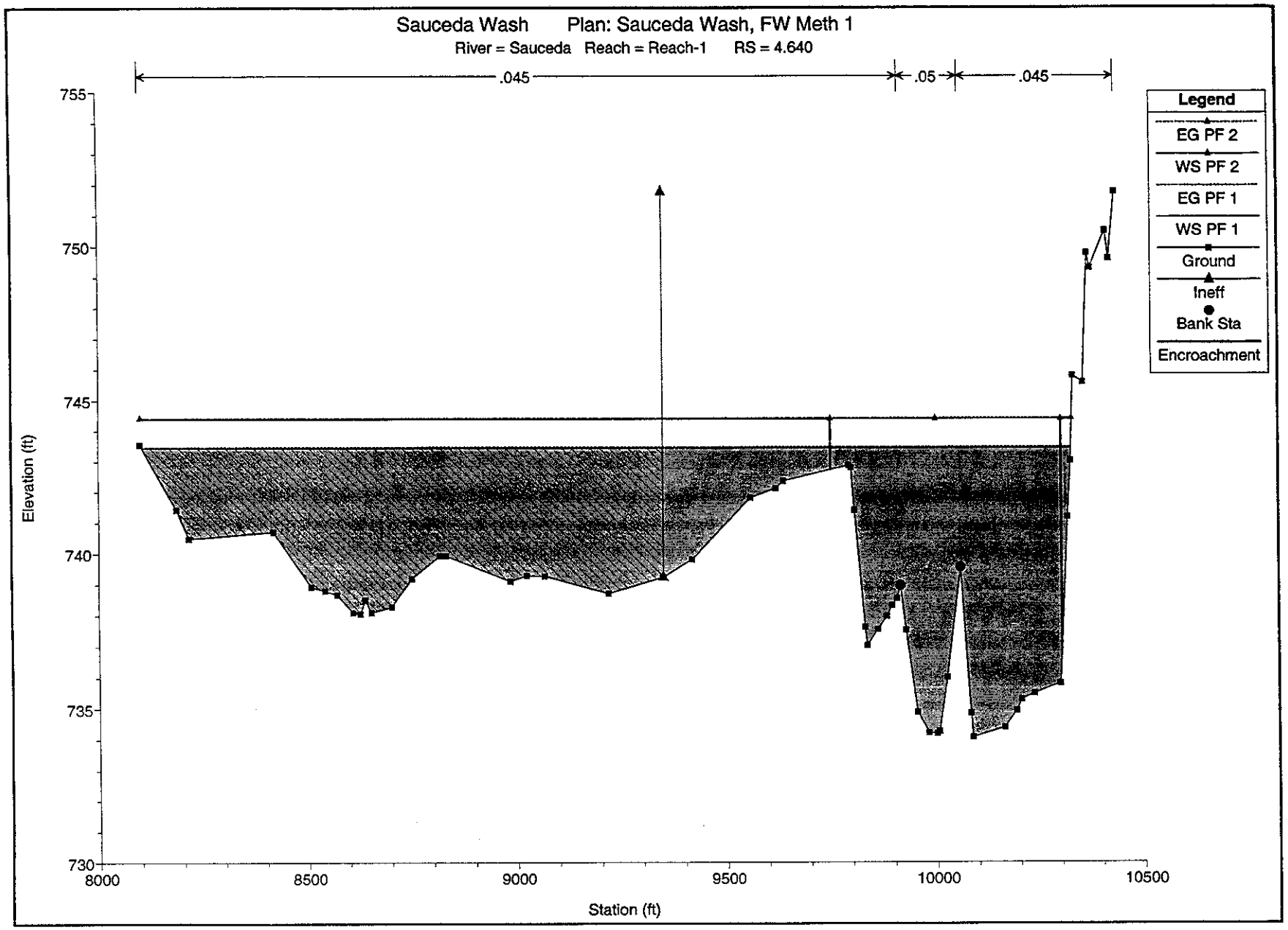

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 5.091
.045
.05
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
760
758
756
754
752
750
748
746
744
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

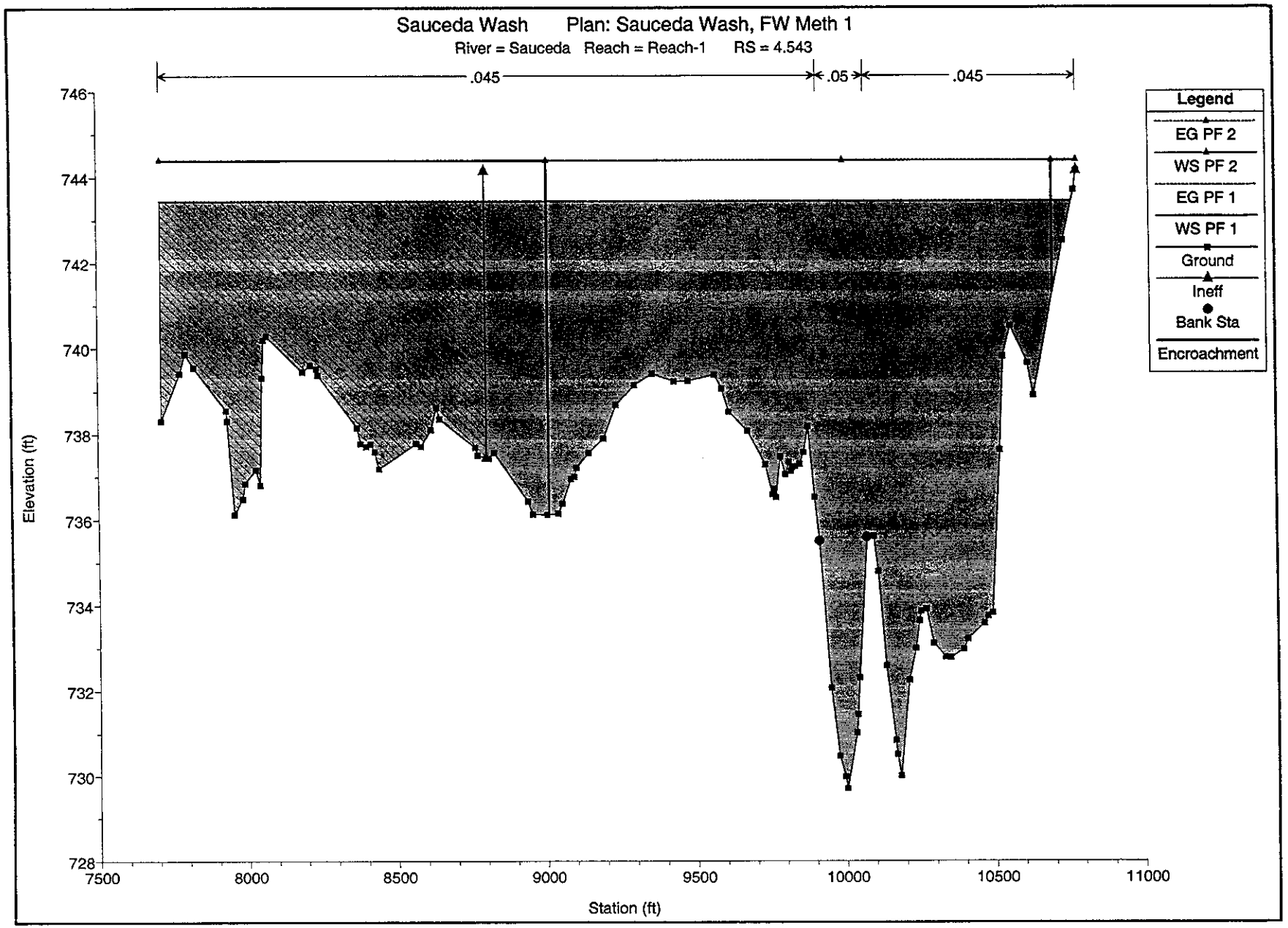

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 5.001
.045
.05
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
758
756
754
752
750
748
746
744
742
9000
9500
10000
10500
11000
11500
Station (ft)

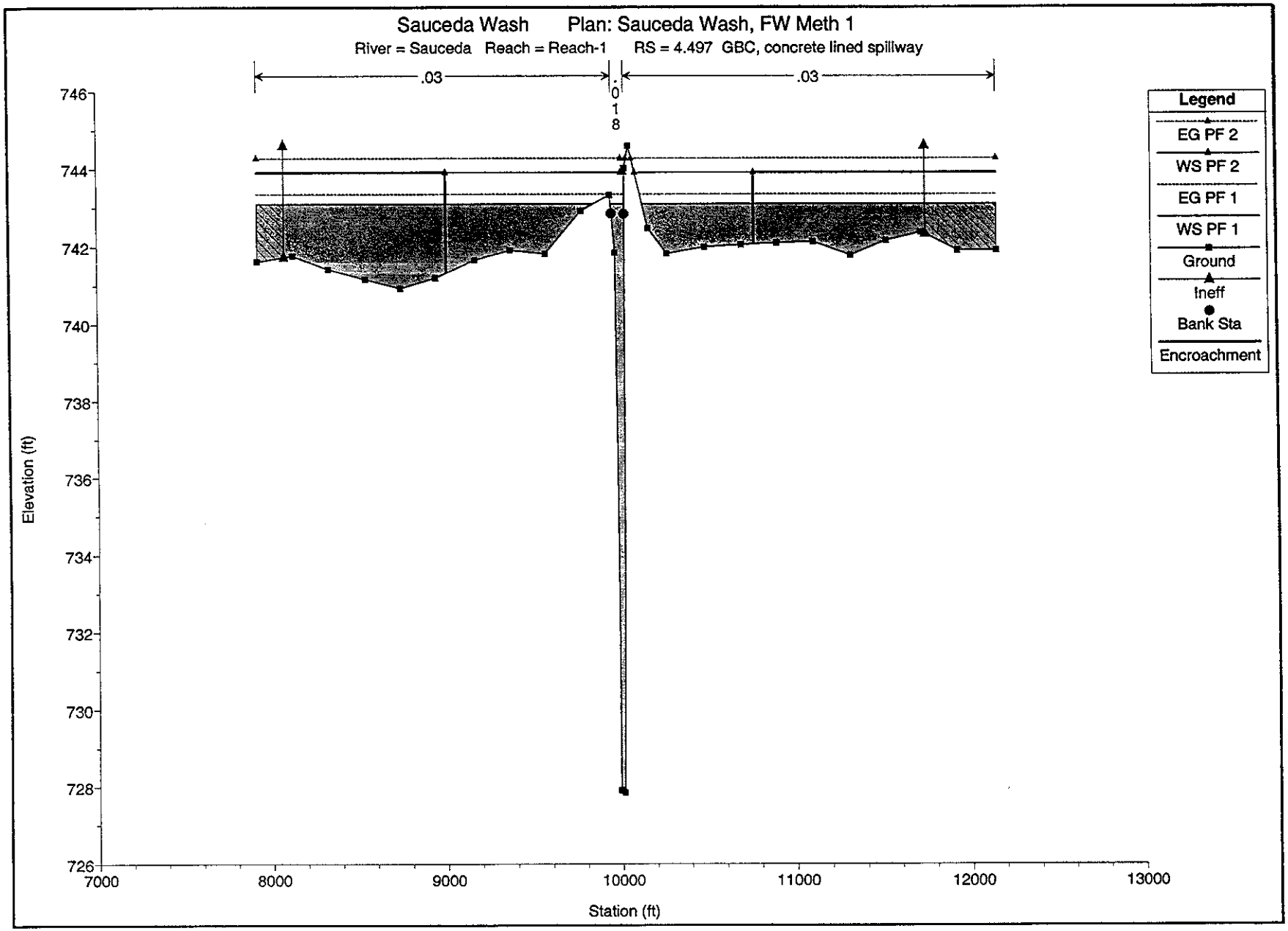

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.909
.045
.045
0.5
Legend
EG PF 2
WS PF 2
EG PF 1
Crit PF 2
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
754
752
750
748
746
744
742
740
738
9000
9500
10000
10500
11000
11500
Station (ft)

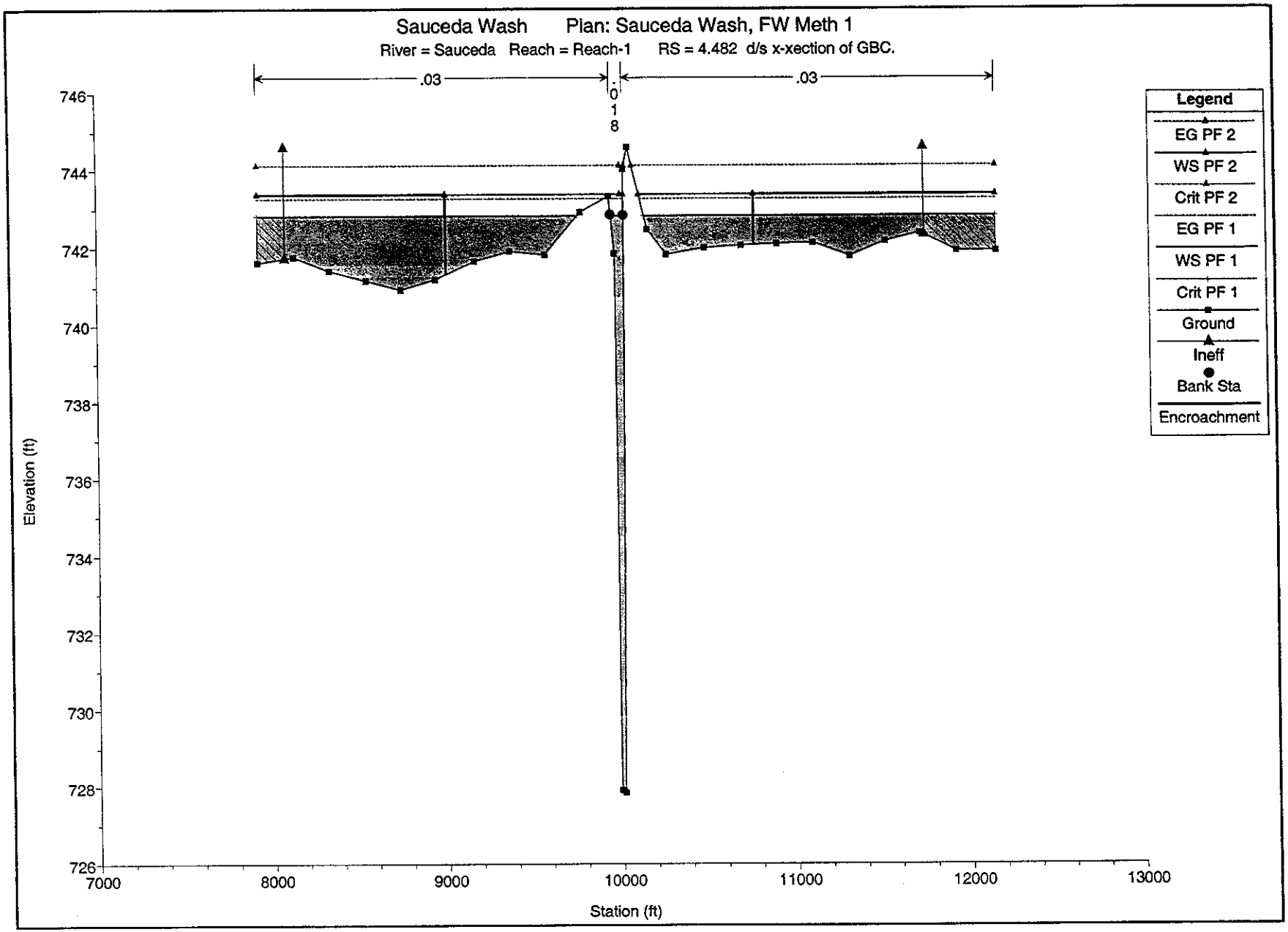

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.821
.045
.05
.045
Elevation (ft)
752
750
748
746
744
742
740
738
9600
9800
10000
10200
10400
10600
10800
11000
11200
11400
Station (ft)
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment

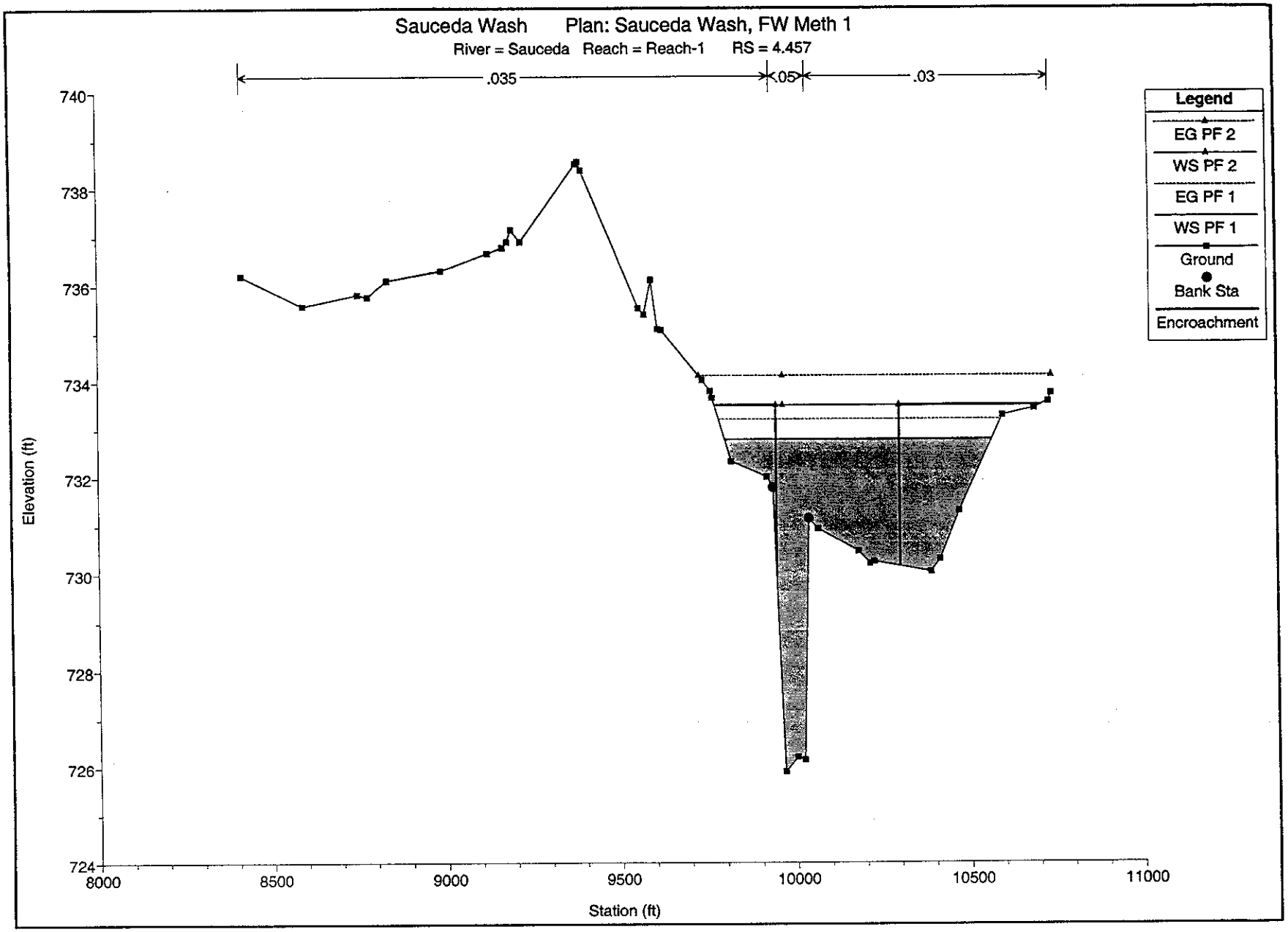

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.728
.045
.05
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
750
748
746
744
742
740
738
736
9600
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

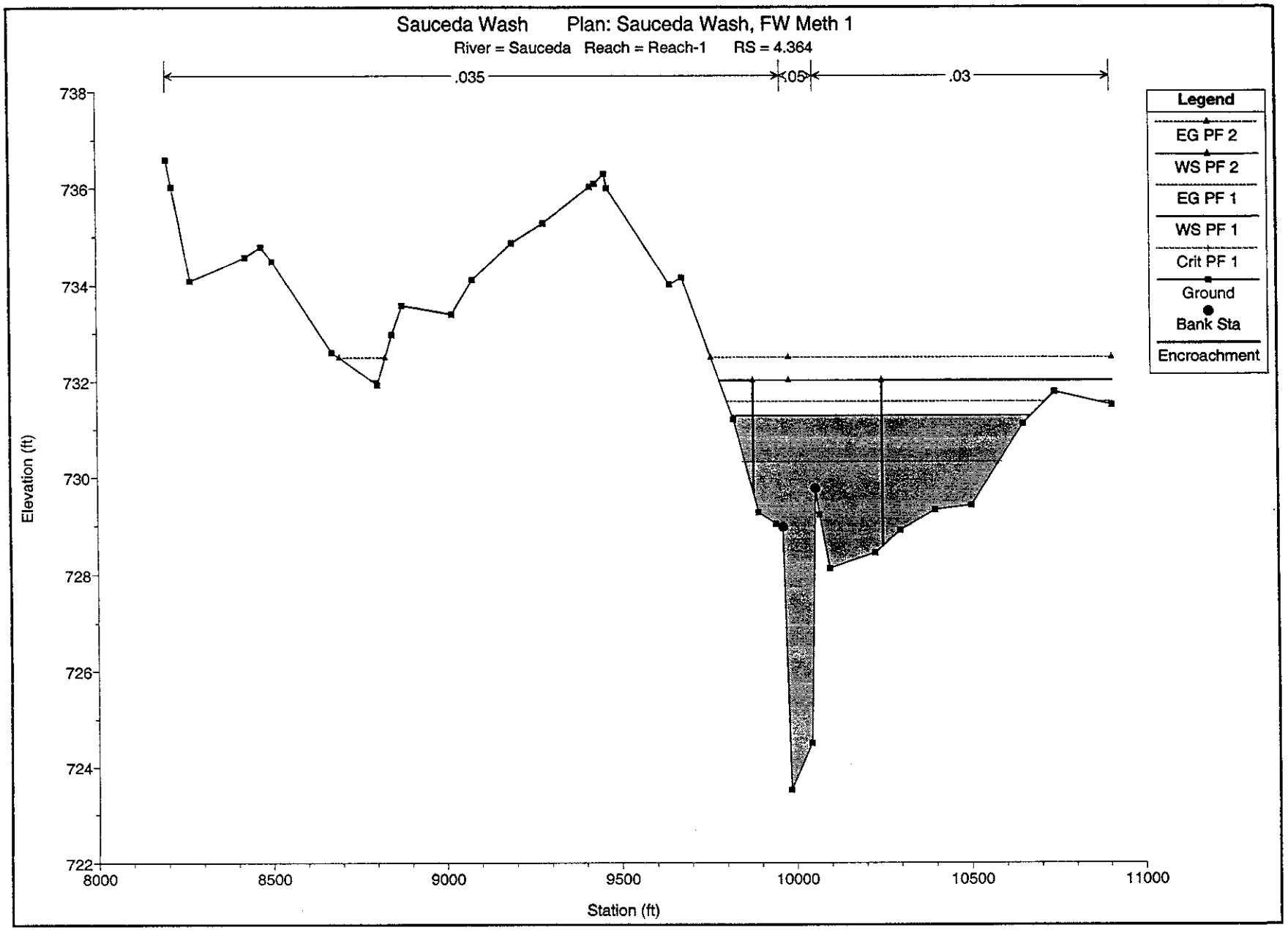

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.640
.045
.05
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
755
750
745
740
735
730
8000
8500
9000
9500
10000
10500
Station (ft)

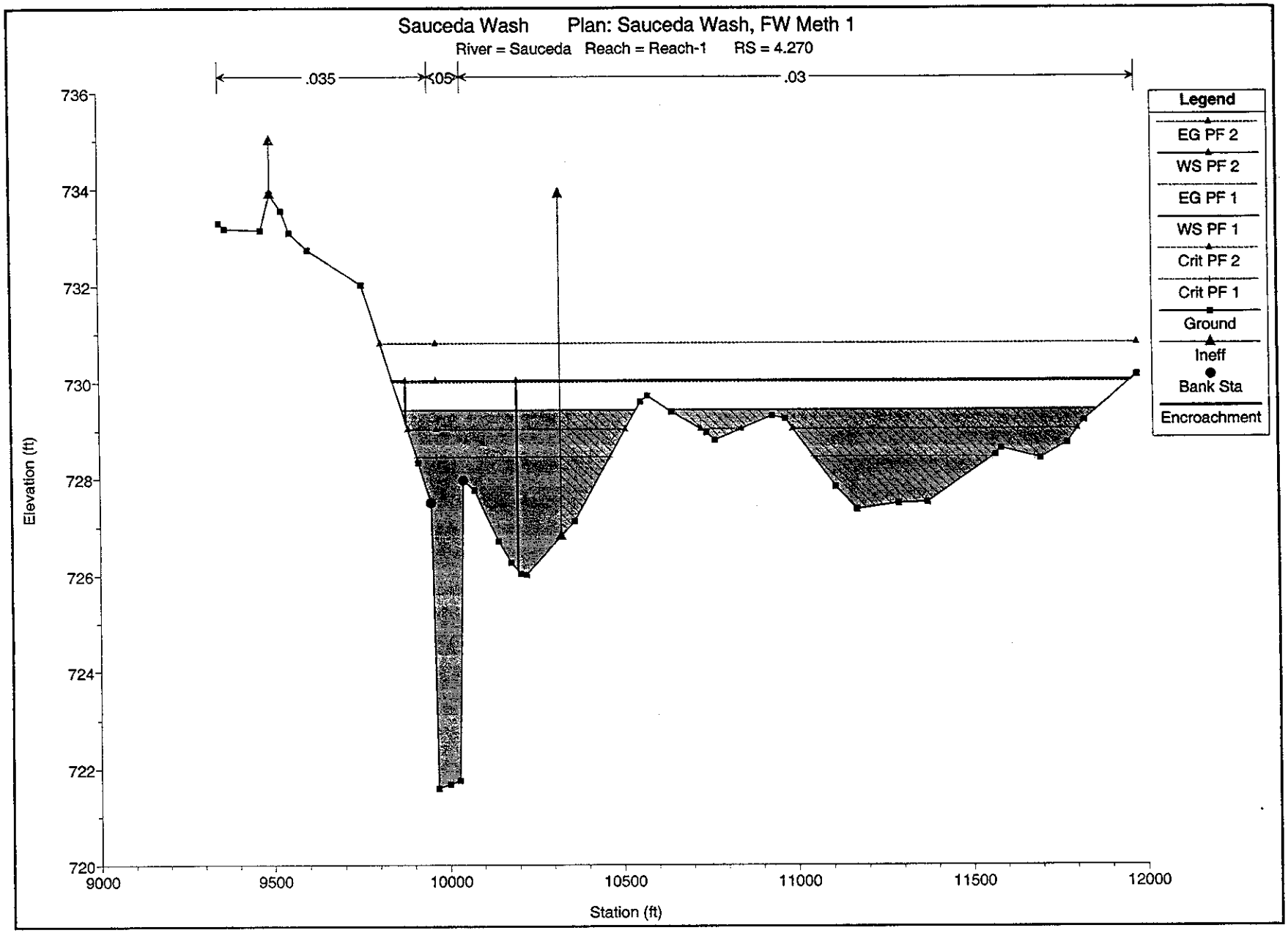

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.543
.045
.05
.045
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
734
732
730
728
7500
8000
8500
9000
9500
10000
10500
11000
Station (ft)

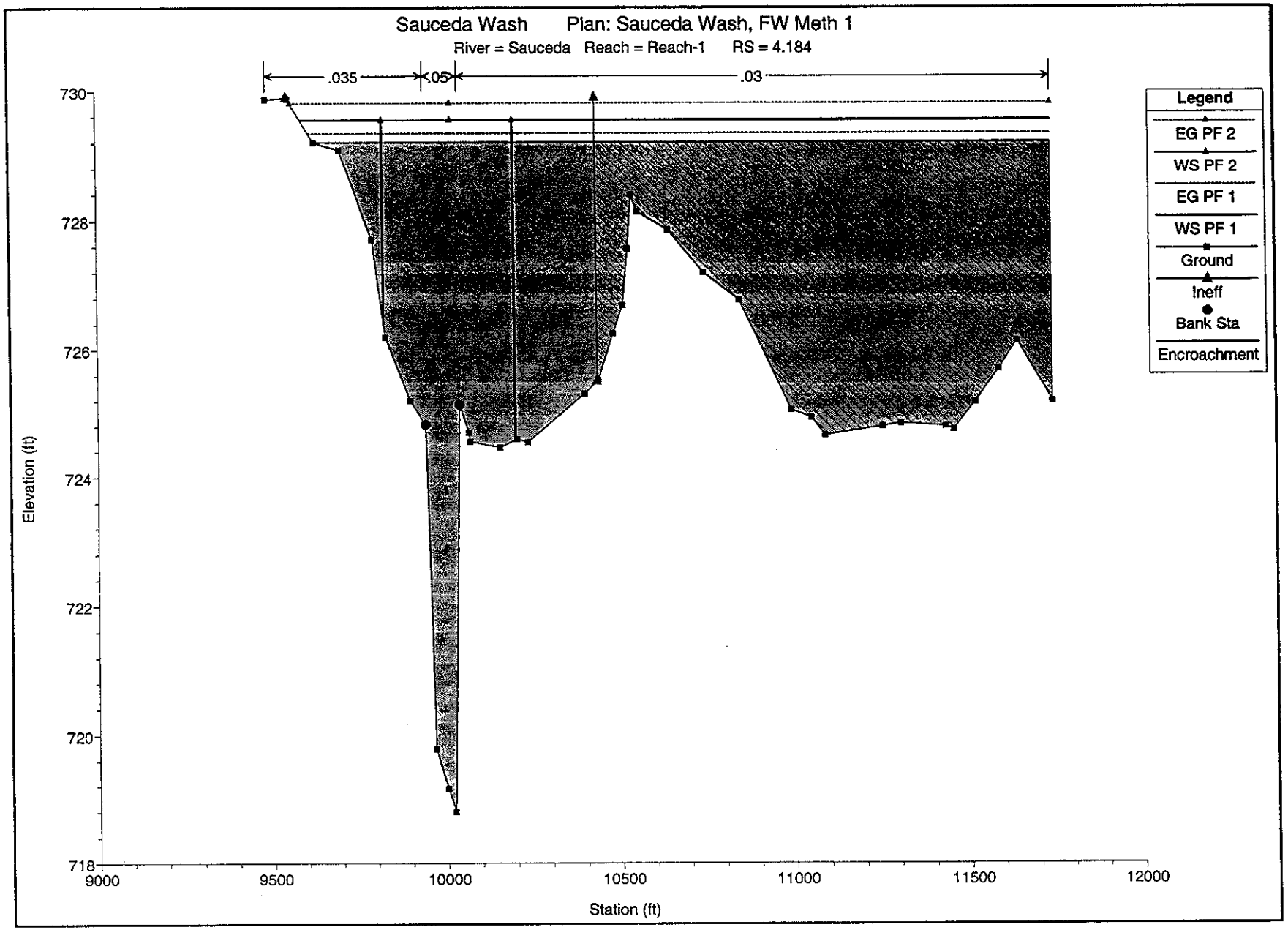

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.497 GBC, concrete lined spillway
.03
.018
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
734
732
730
728
726
7000
8000
9000
10000
11000
12000
13000
Station (ft)

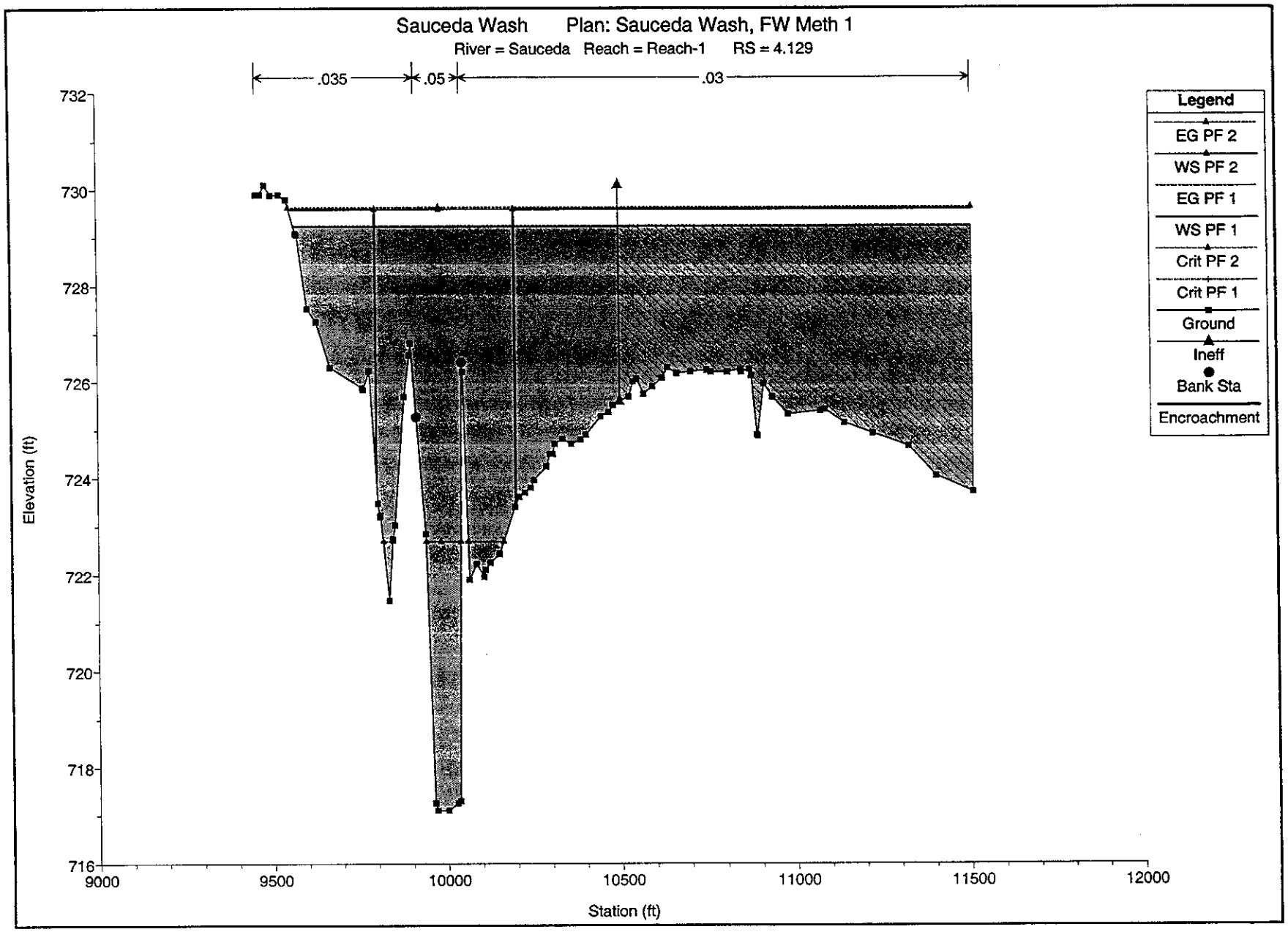

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.482 d/s x-xection of GBC.
.03
.018
.03
Legend
EG PF 2
WS PF 2
Crit PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
746
744
742
740
738
736
734
732
730
728
726
7000
8000
9000
10000
11000
12000
13000
Station (ft)

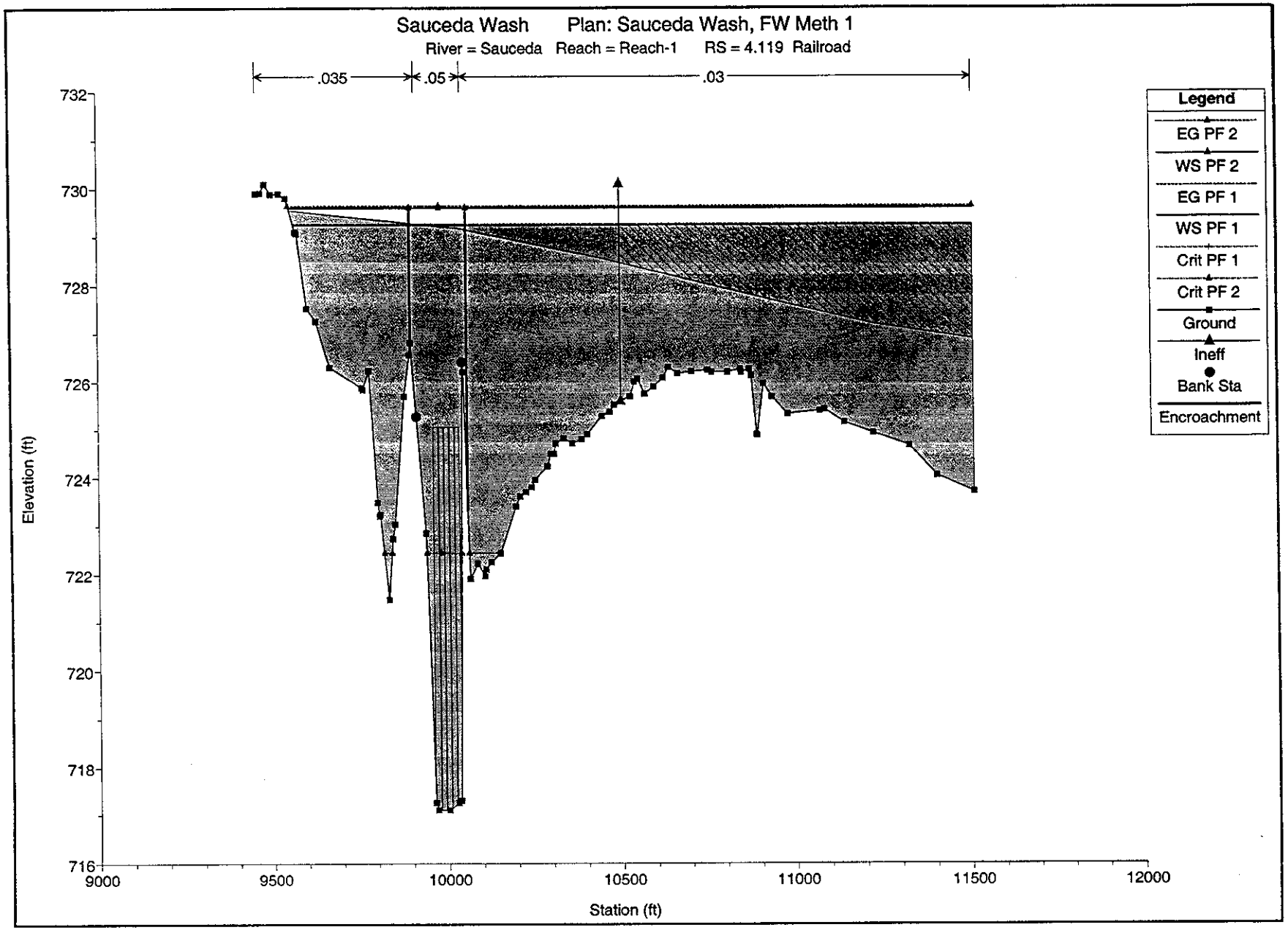

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.457
.035
.05
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
740
738
736
734
732
730
728
726
724
8000
8500
9000
9500
10000
10500
11000
Station (ft)

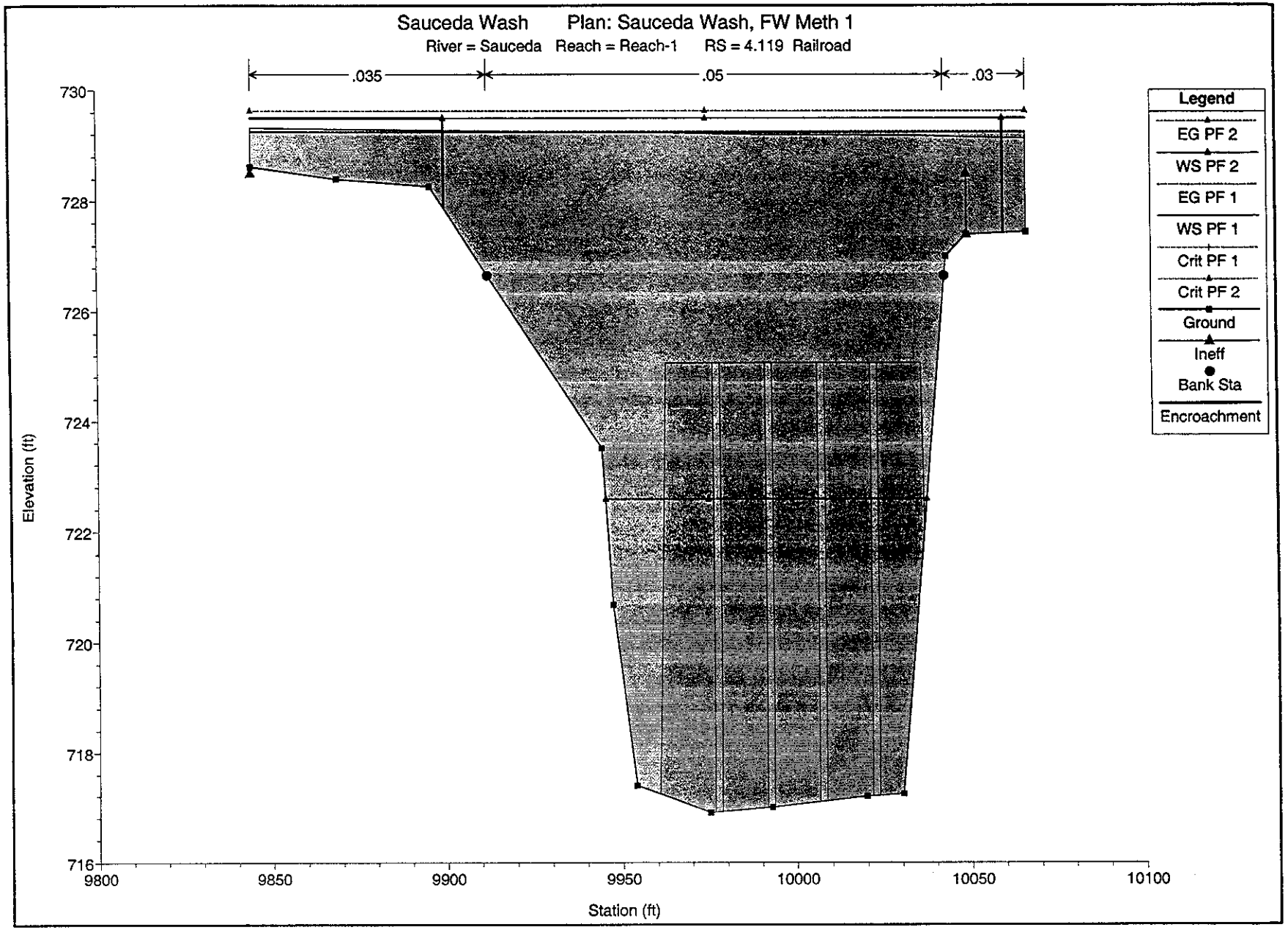

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.364
.035
.05
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
738
736
734
732
730
728
726
724
722
8000
8500
9000
9500
10000
10500
11000
Station (ft)

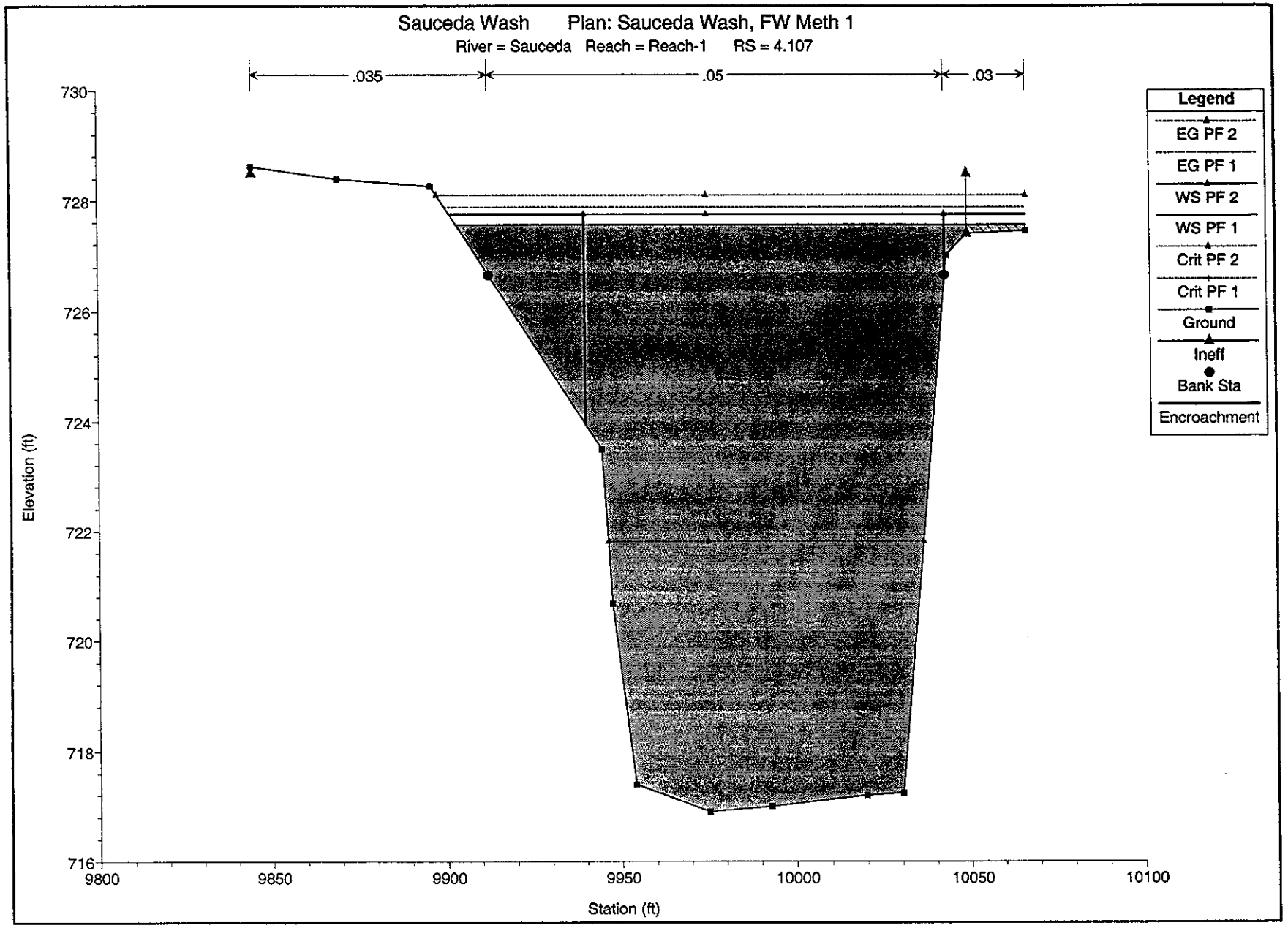

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.270
.035
.05
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
736
734
732
730
728
726
724
722
720
9000
9500
10000
10500
11000
11500
12000
Station (ft)

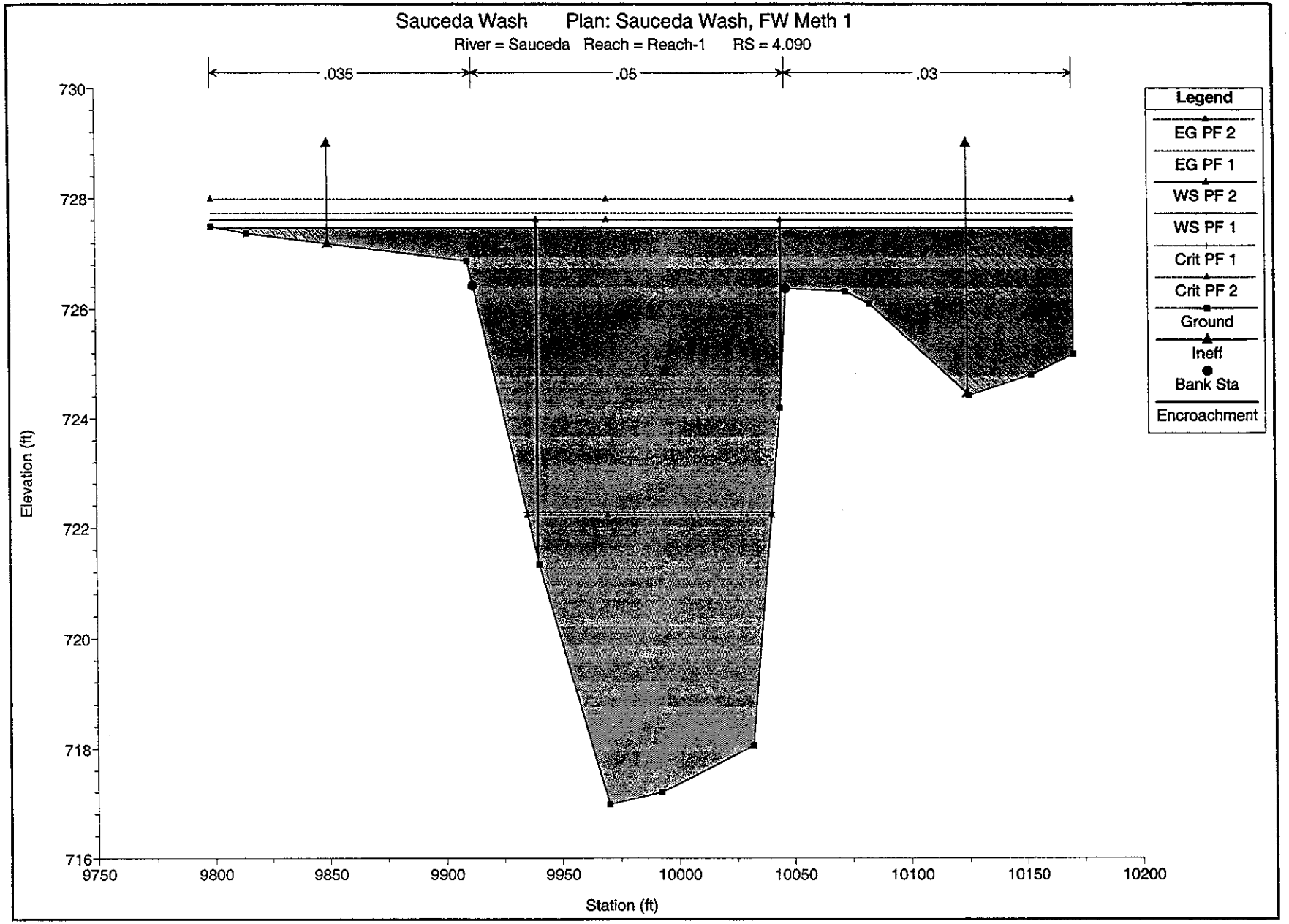

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.184
.035
.05
.03
Elevation (ft)
730
728
726
724
722
720
718
9000
9500
10000
10500
11000
11500
12000
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Ground
Ineff
Bank Sta
Encroachment

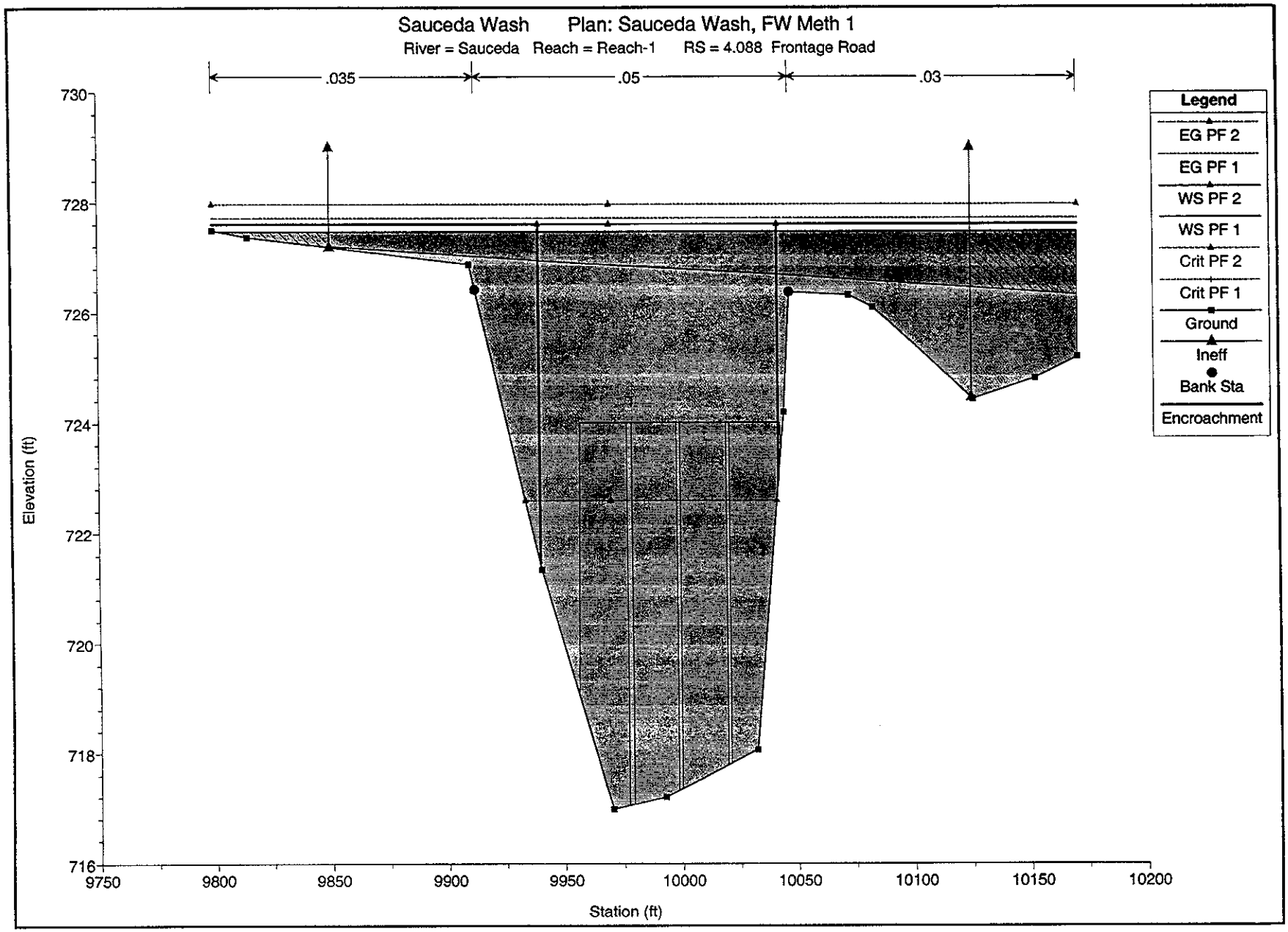

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.129
.035
.05
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
732
730
728
726
724
722
720
718
716
9000
9500
10000
10500
11000
11500
12000
Station (ft)

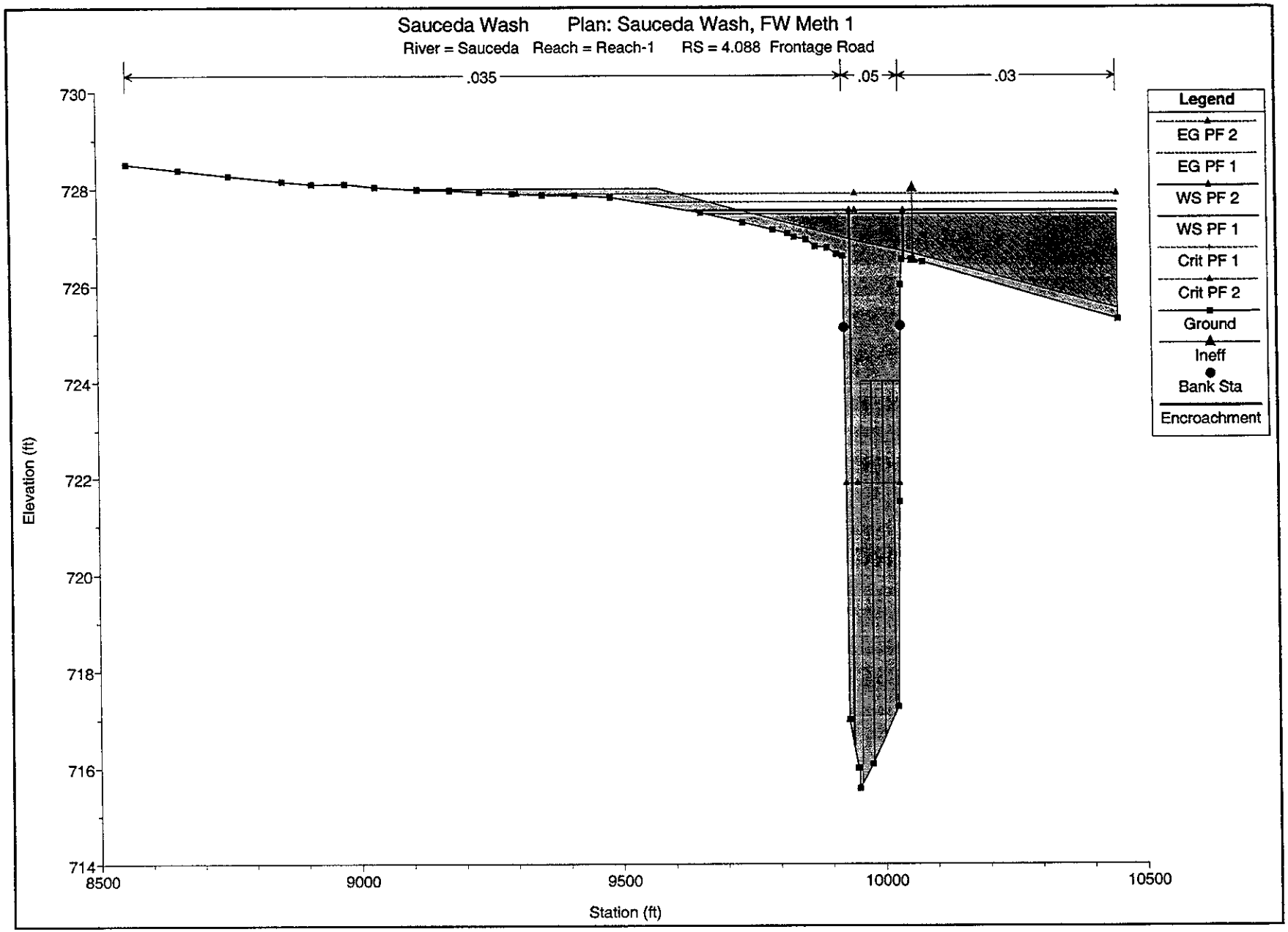

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.119 Railroad
.035
.05
.03
Elevation (ft)
732
730
728
726
724
722
720
718
716
9000
9500
10000
10500
11000
11500
12000
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment

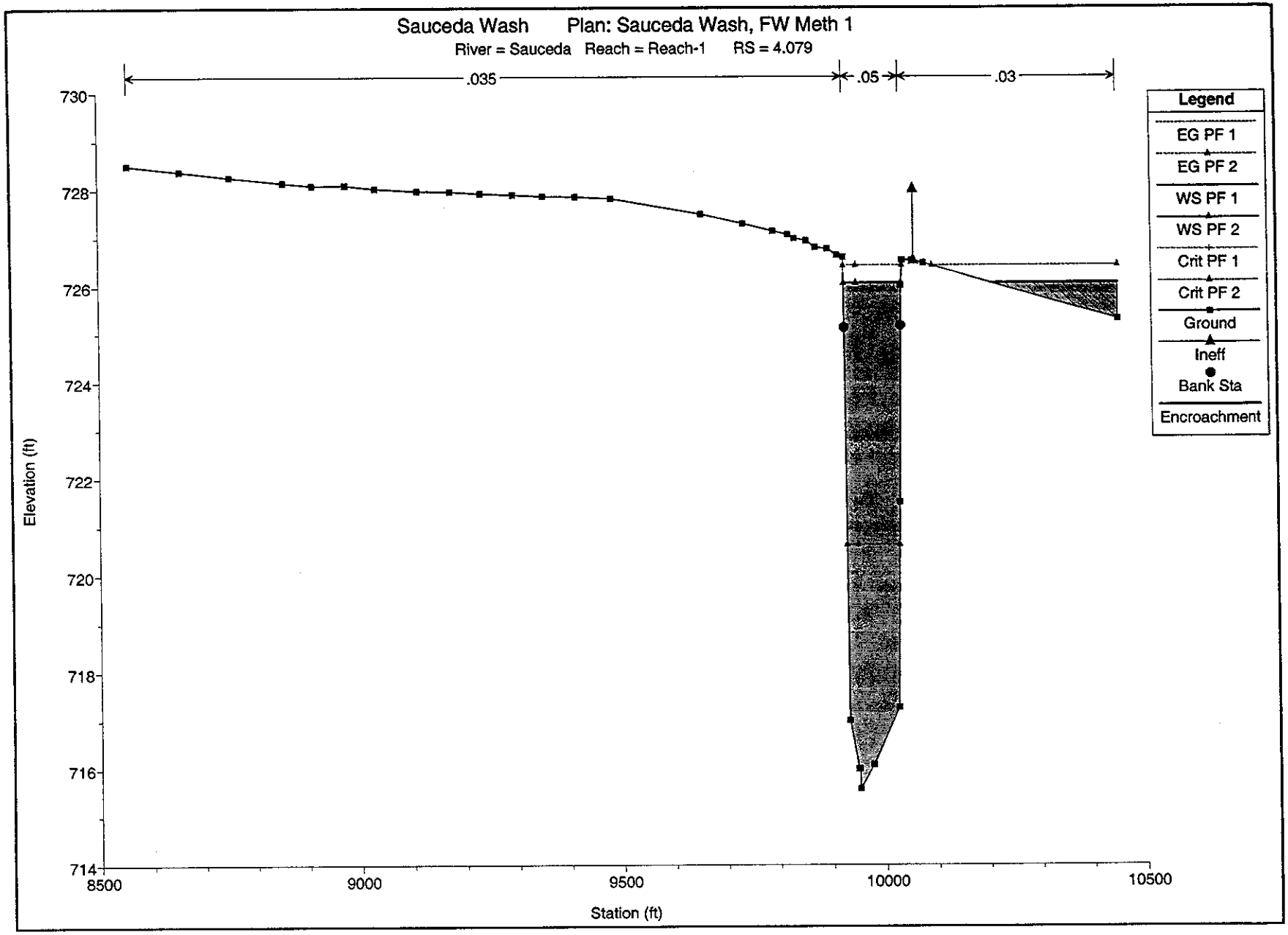

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.119 Railroad
.035
.05
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
718
716
9800
9850
9900
9950
10000
10050
10100
Station (ft)

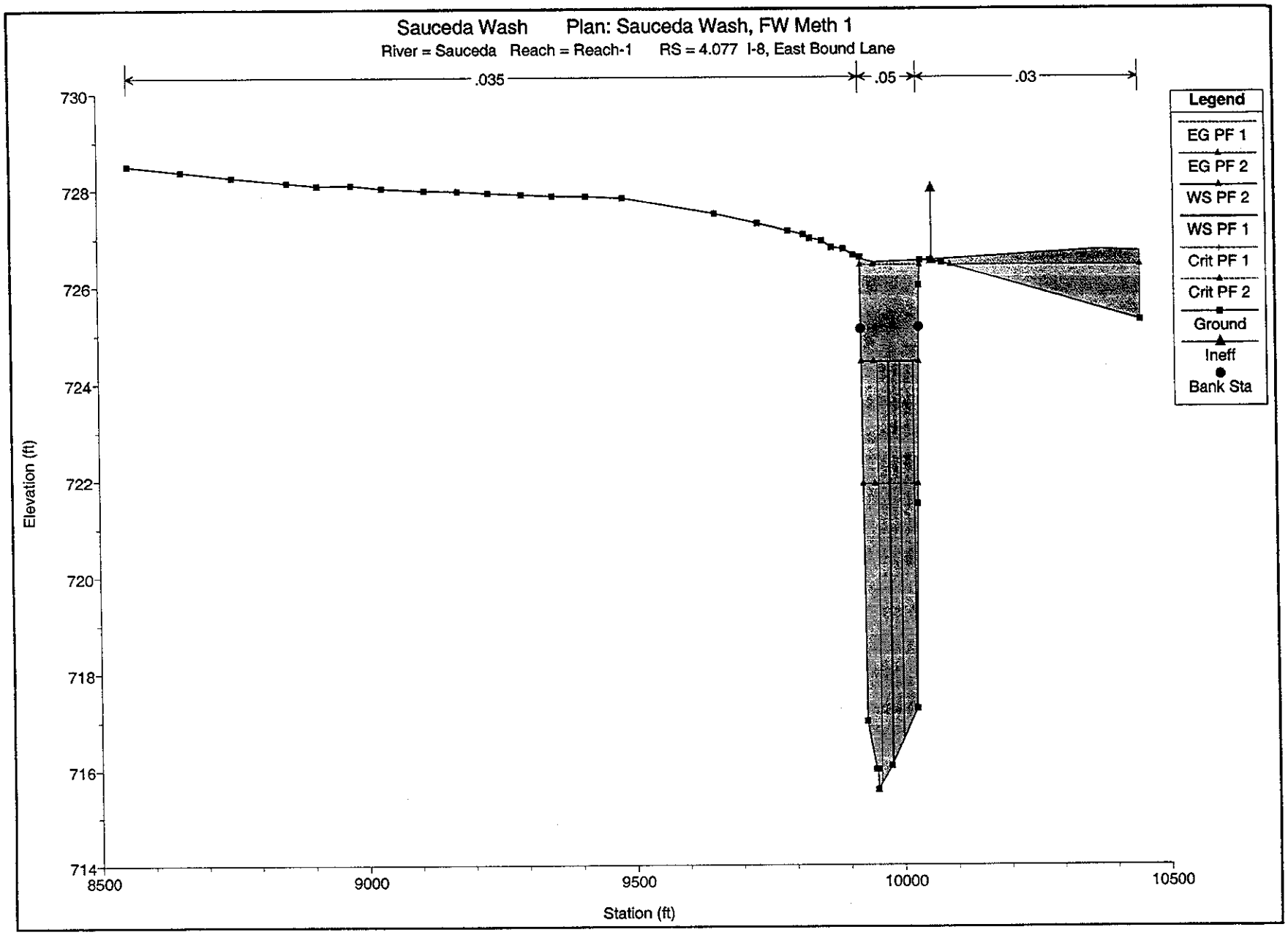

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.107
.035
.05
.03
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
718
716
9800
9850
9900
9950
10000
10050
10100
Station (ft)

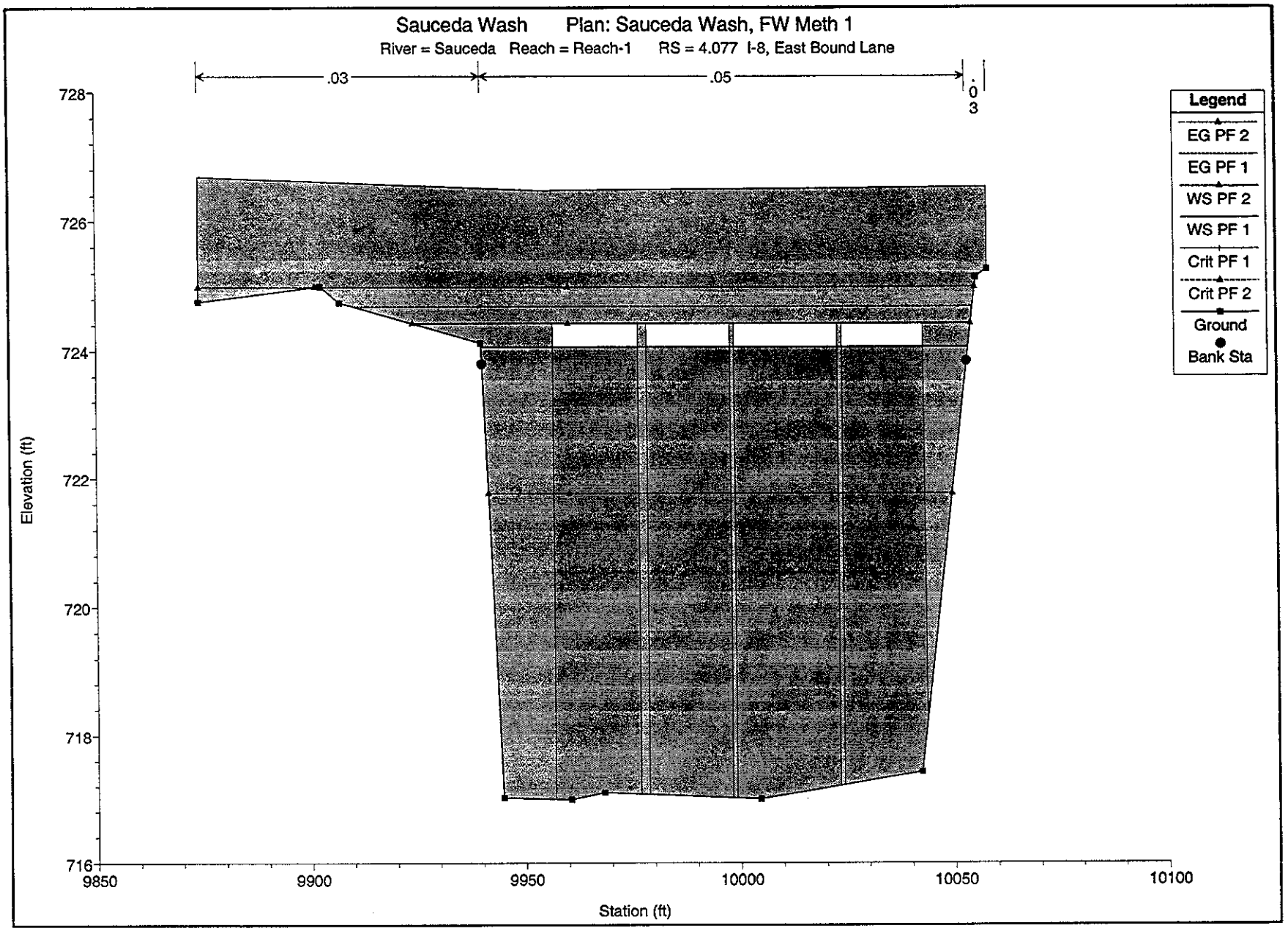

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.090
.035
.05
.03
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
718
716
9750
9800
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)

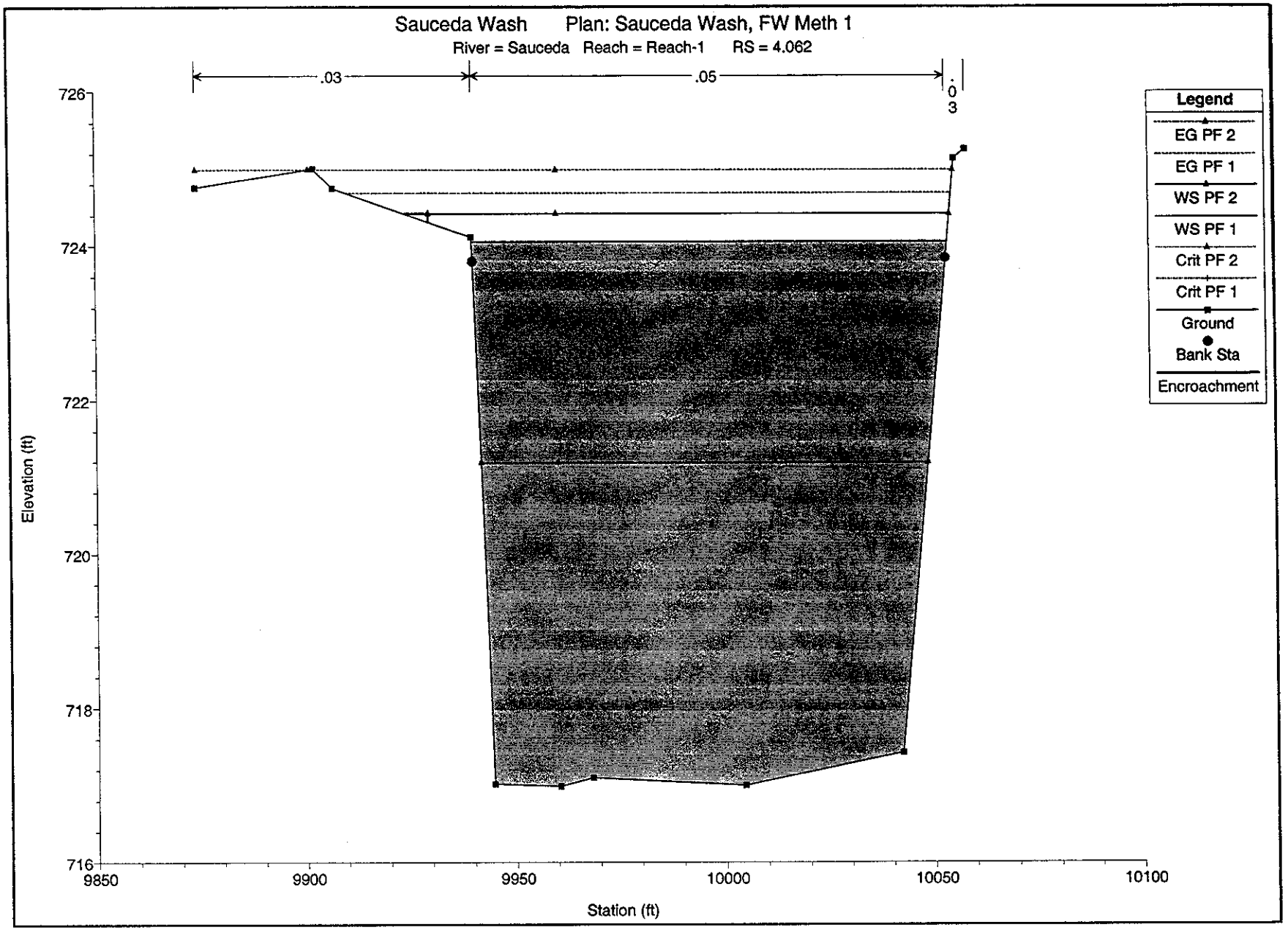

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.088 Frontage Road
.035
.05
.03
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
718
716
9750
9800
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)

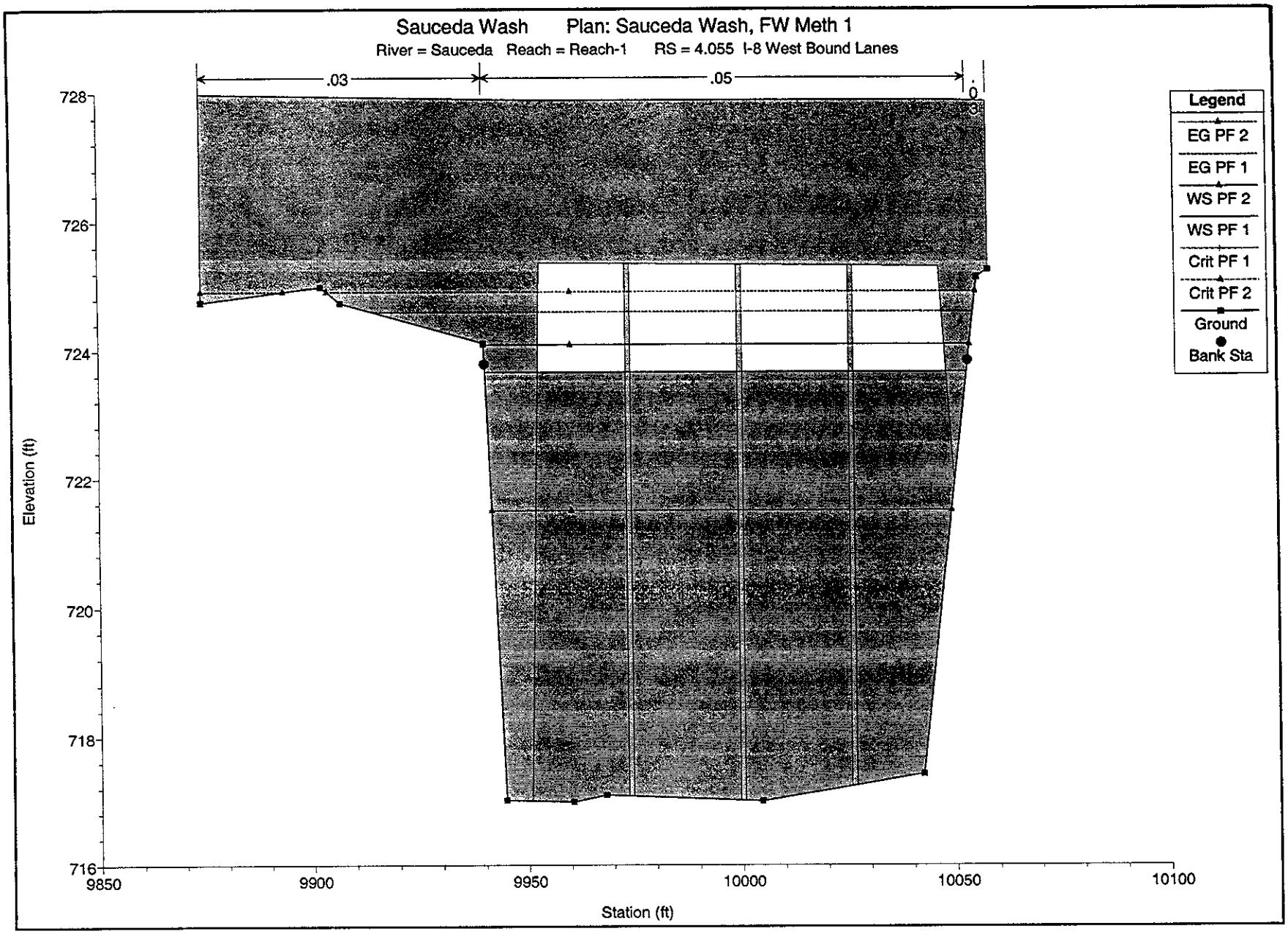

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.088 Frontage Road
.035
.05
.03
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
718
716
714
8500
9000
9500
10000
10500
Station (ft)

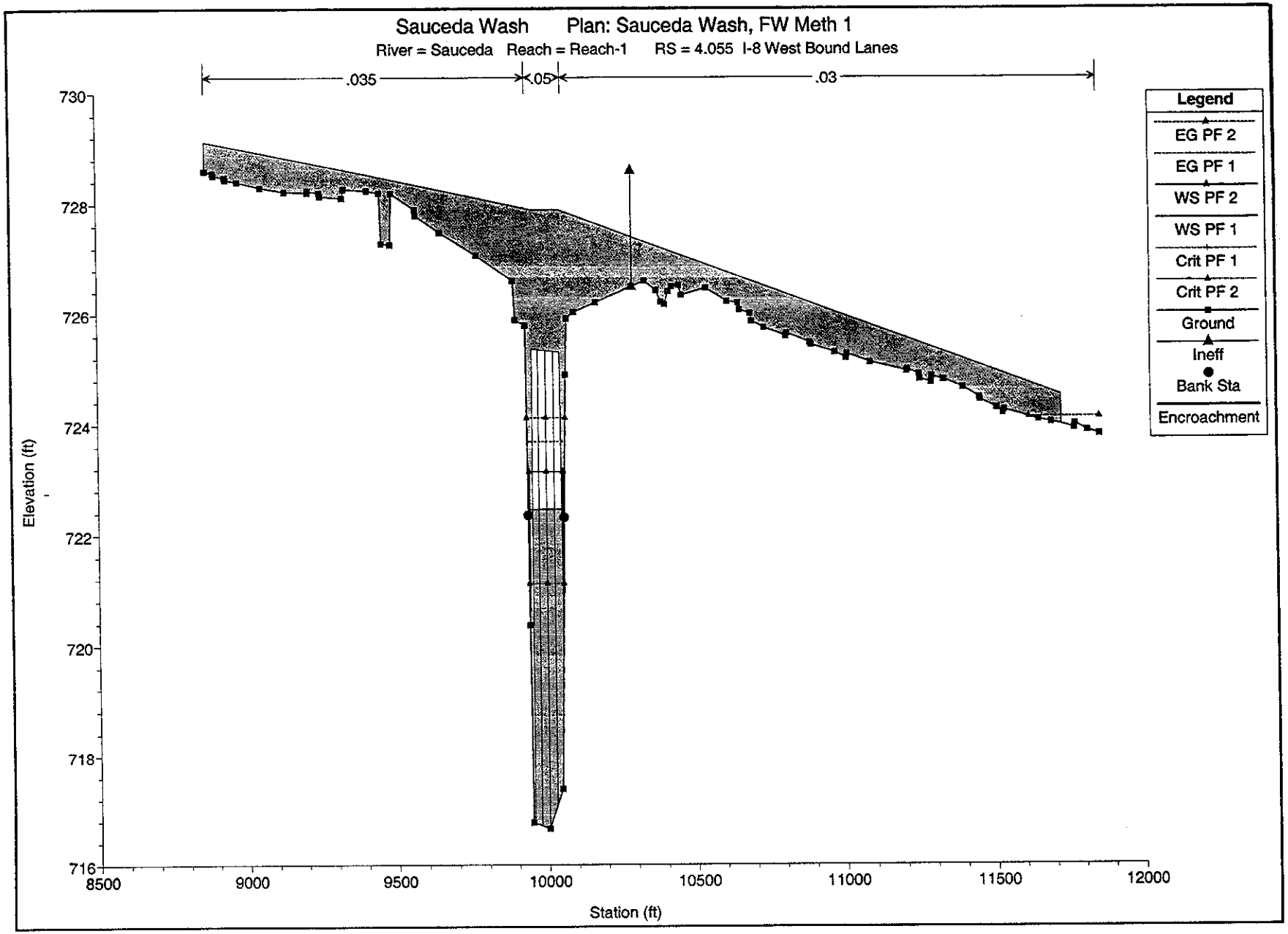

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.079
.035
.05
.03
Legend
EG PF 1
EG PF 2
WS PF 1
WS PF 2
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
718
716
714
8500
9000
9500
10000
10500
Station (ft)

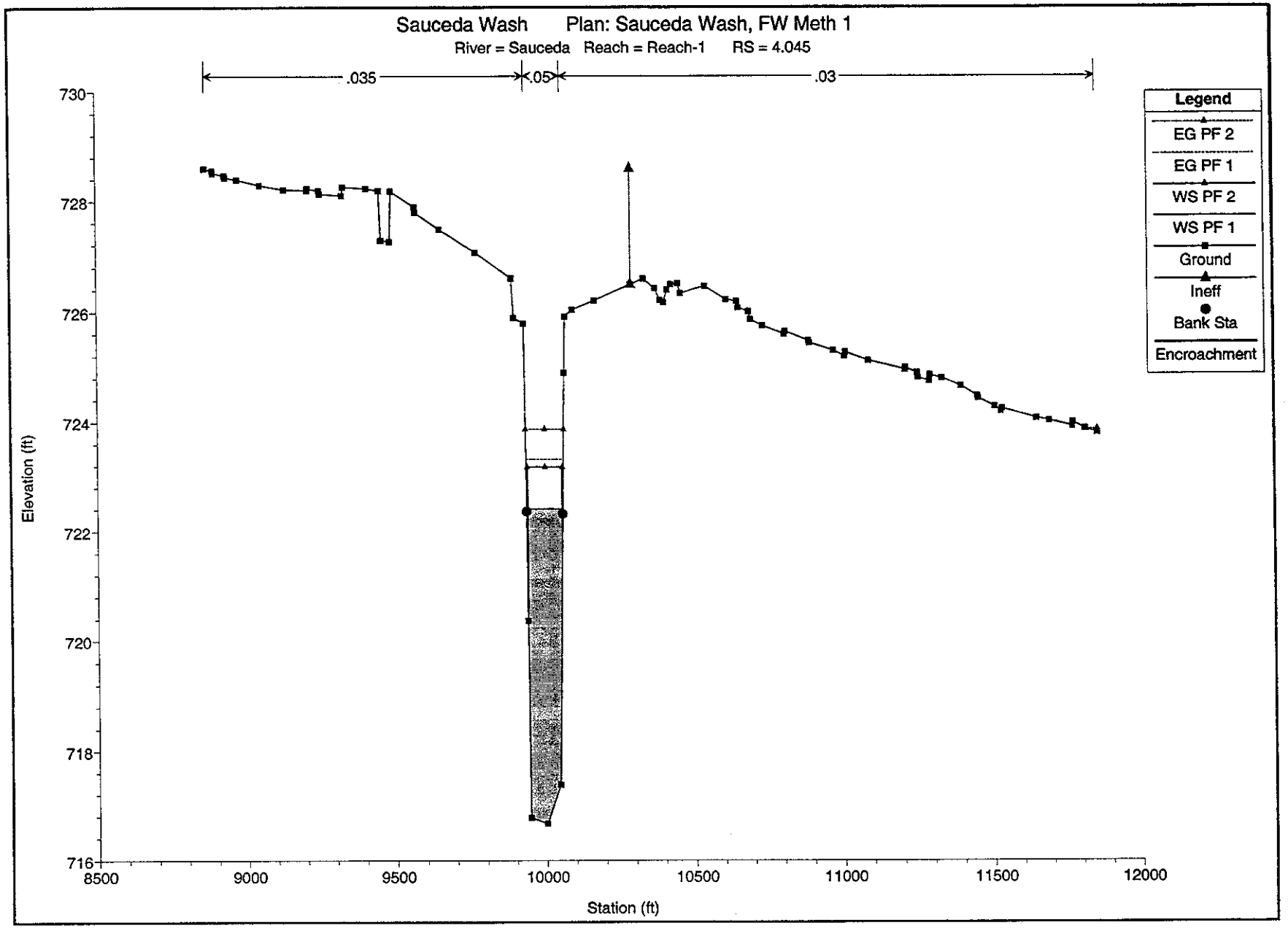

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.077 I-8, East Bound Lane
.035
.05
.03
Legend
EG PF 1
EG PF 2
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Elevation (ft)
730
728
726
724
722
720
718
716
714
8500
9000
9500
10000
10500
Station (ft)

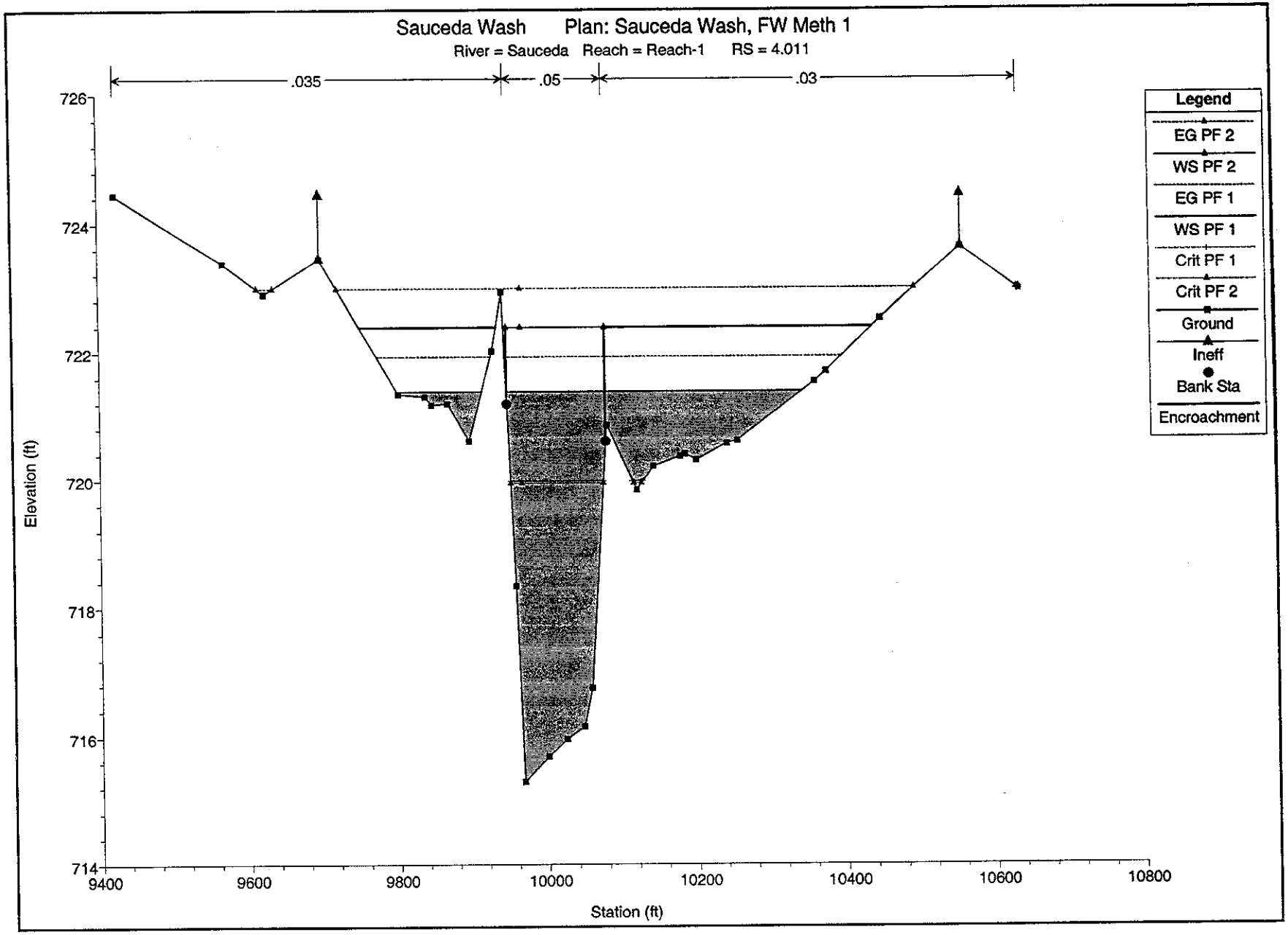

Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.077 I-8, East Bound Lane
.03
.05
.03
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Elevation (ft)
728
726
724
722
720
718
716
9850
9900
9950
10000
10050
10100
Station (ft)


Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.062
.03
.05
.03
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
726
724
722
720
718
716
9850
9900
9950
10000
10050
10100
Station (ft)


Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.055 I-8 West Bound Lanes
.03
.05
0
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Elevation (ft)
728
726
724
722
720
718
716
9850
9900
9950
10000
10050
10100
Station (ft)


Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.055 I-8 West Bound Lanes
.035
.05
.03
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
718
716
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)


Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.045
.035
.05
.03
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
730
728
726
724
722
720
718
716
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)


Sauceda Wash Plan: Sauceda Wash, FW Meth 1
River = Sauceda Reach = Reach-1 RS = 4.011
.035
.05
.03
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
726
724
722
720
718
716
714
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

Appendix E.3

EXPANSION AND CONTRACTION COEFFICIENTS

Appendix E.3.: EXPANSION AND CONTRACTION COEFFICIENTS

Expansion and contraction coefficients were selected from the U.S. Army Corps of Engineer's HEC-2 Water Surface Profiles "User's Manual." The majority of all the washes use coefficients for gradual transitions. However, several washes encounter culverts or bridges requiring higher values. The following table summarizes the coefficients used in this project.

Description of Transition	Contraction Coefficient	Expansion Coefficient
Gradual Transitions	0.1	0.3
Bridge Cross Sections	0.3	0.5
Abrupt Transitions (including most culverts)	0.6	0.8

Appendix E.4

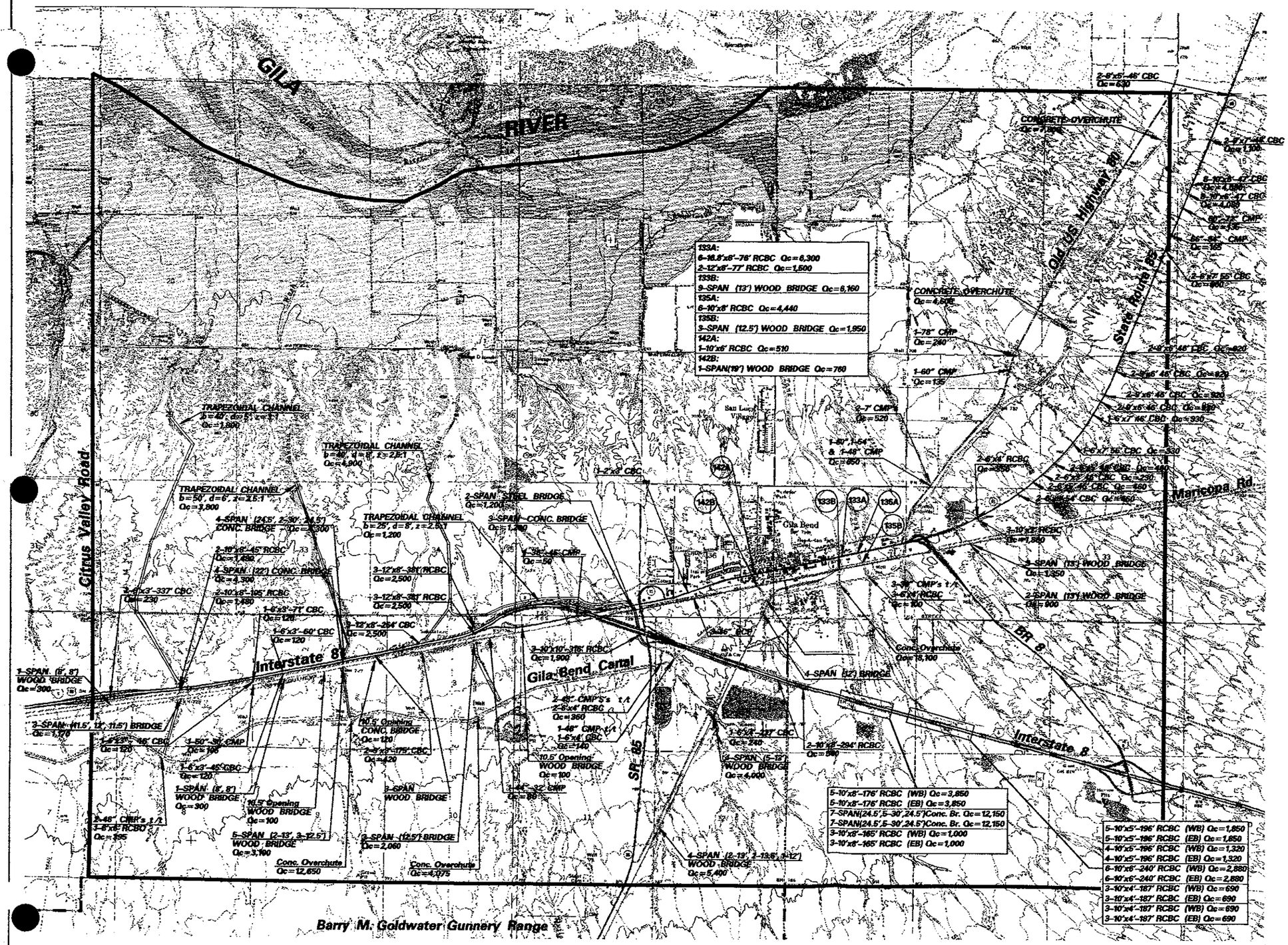
ANALYSIS OF STRUCTURES

Appendix E.4.: ANALYSIS OF STRUCTURES

All of the structures affecting the floodplain delineation are modeled within the HEC-RAS computer models of each wash. No additional hydraulic modeling of the structures was performed. As-built drawings of the ADOT structures as well as photographs and drawings of field surveyed structures are included in this section as reference material.

The Southern Pacific Railroad structures are referenced by milepost numbers painted on each structure. ADOT structures are referenced in the As-built drawings by stationing referenced to the construction plans for I-8. The Gila Bend Canal structures are referenced by the wash which crosses the canal at that structure.

A reference map on the next page displays all the location and sizes of all existing structures in and around the project area.



GILA BEND
Area Drainage Master Plan

EXISTING DRAINAGE FACILITIES

LEGEND & ABBREVIATIONS

———	PLANNING STUDY AREA BOUNDARY
RCBC	REINFORCED CONCRETE BOX CULVERT
Qc	APPROXIMATE CONVEYANCE CAPACITY IN cfs
CMP	CORRUGATED METAL PIPE
WB	WEST BOUND
EB	EAST BOUND
t/t	TRANSITION TO

N

0 1000 2000 4000 8000

SCALE: 1" = 4,000'

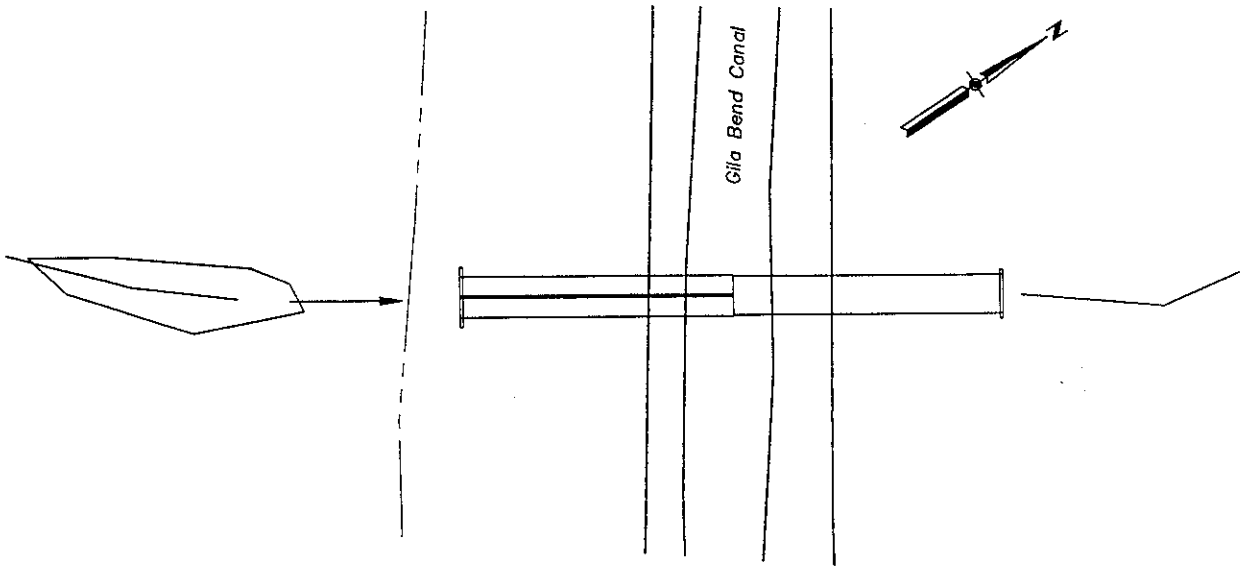
eec
Engineering and Environmental Consultants, Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012-2905
TEL:(602)248-7702 FAX:(602)248-7851

Canal Structures

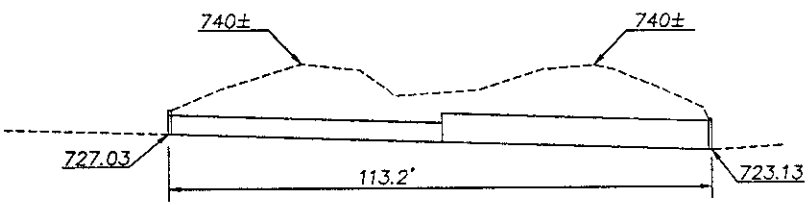
Gila Bend Canal Structure
Unnamed Wash No 1

GILA BEND CANAL STRUCTURE
UNNAMED WASH NO. 1
(2) 48" CMP'S TRANSITION TO (1) 8'Wx6'H RCBC

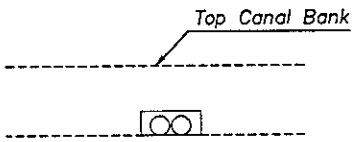
Information obtained from field measurements by EEC. (March 2000)



PLAN
1"=40'



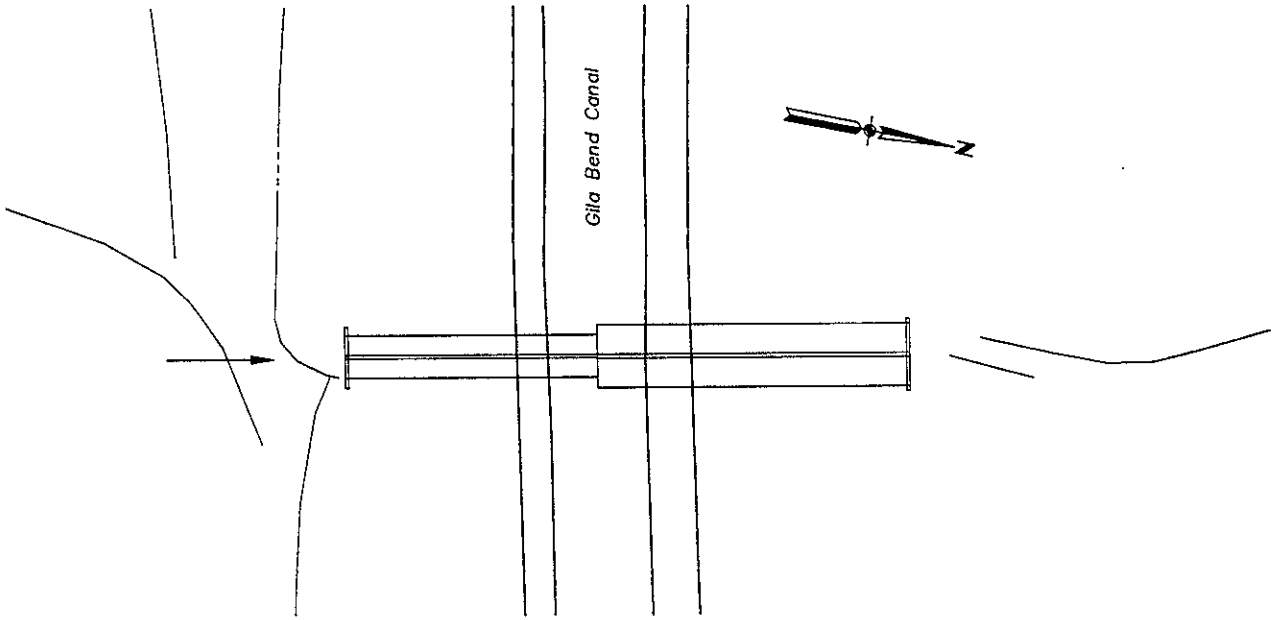
PROFILE
1"=40'



ELEVATION
1"=40'

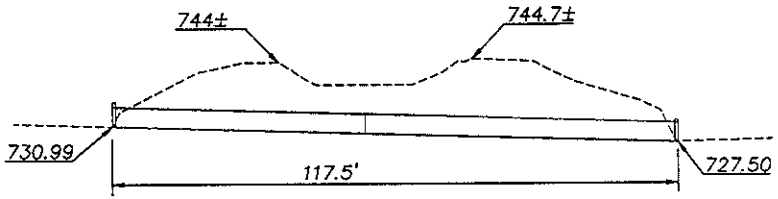
Gila Bend Canal Structure
Unnamed Wash No 2

GILA BEND CANAL STRUCTURE
UNNAMED WASH NO. 2
(2) 48" CMP'S TRANSITION TO (2) 6'Wx4'H RCBC'S

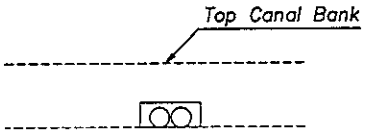


PLAN
1"=40'

Information obtained from field measurements by EEC. (March 2000)



PROFILE
1"=40'

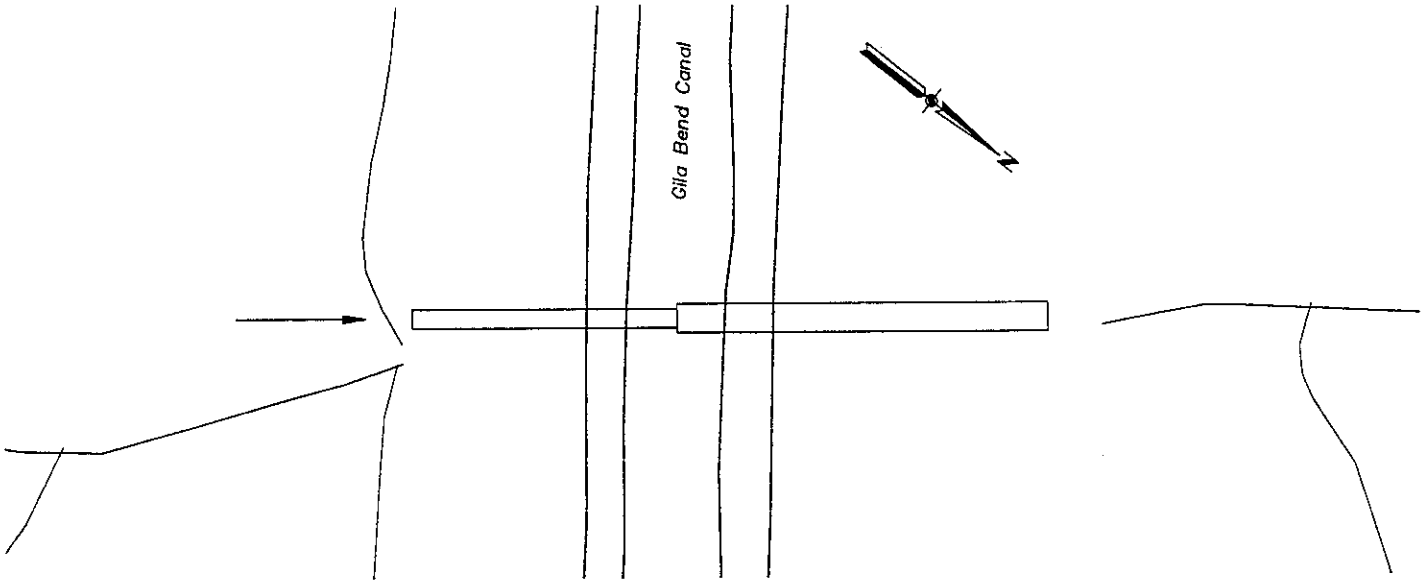


ELEVATION
1"=40'

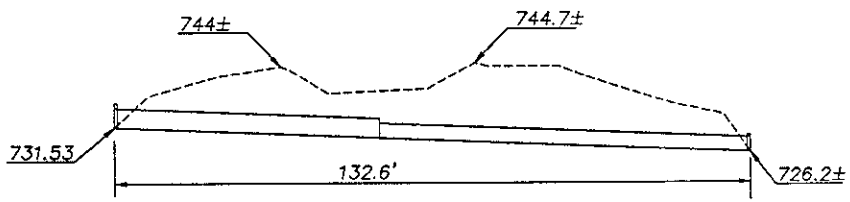
Gila Bend Canal Structure
Unnamed Wash No 3

GILA BEND CANAL STRUCTURE
UNNAMED WASH NO. 3
(1) 48" CMP TRANSITION TO (1) 6'Wx3'H RCBC

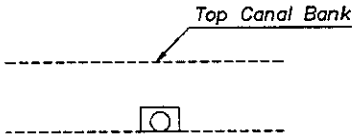
Information obtained from field measurements by EEC. (March 2000)



PLAN
1"=40'

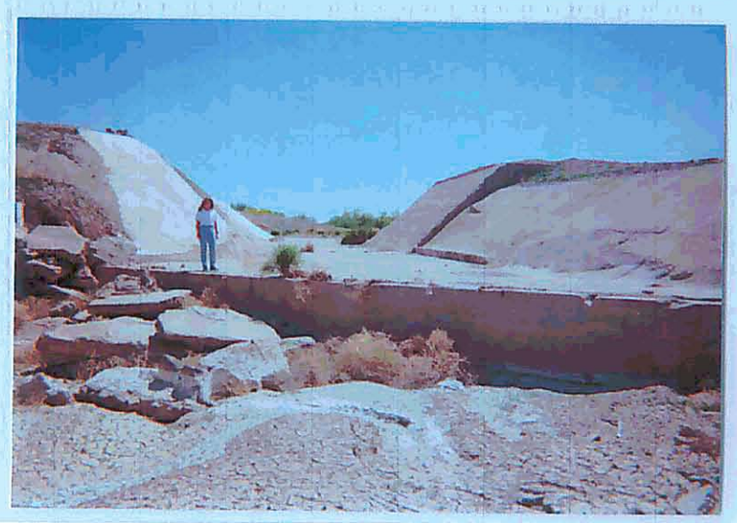


PROFILE
1"=40'



ELEVATION
1"=40'

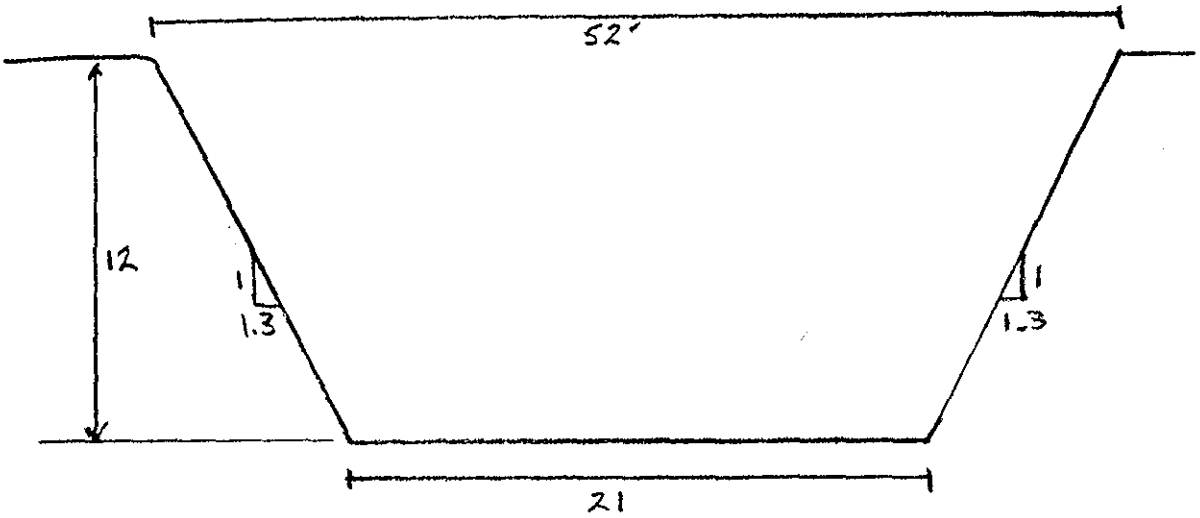
Gila Bend Canal Spillway/Siphon
Sauceda Wash



Project Title: Gila Bend ADMP Project No. 99541 Date 4-14-00

Subject: Saucedo Wash Prepared By: LAV Checked By: _____ Page: _____

Gila Bend Canal Spillway & Siphon



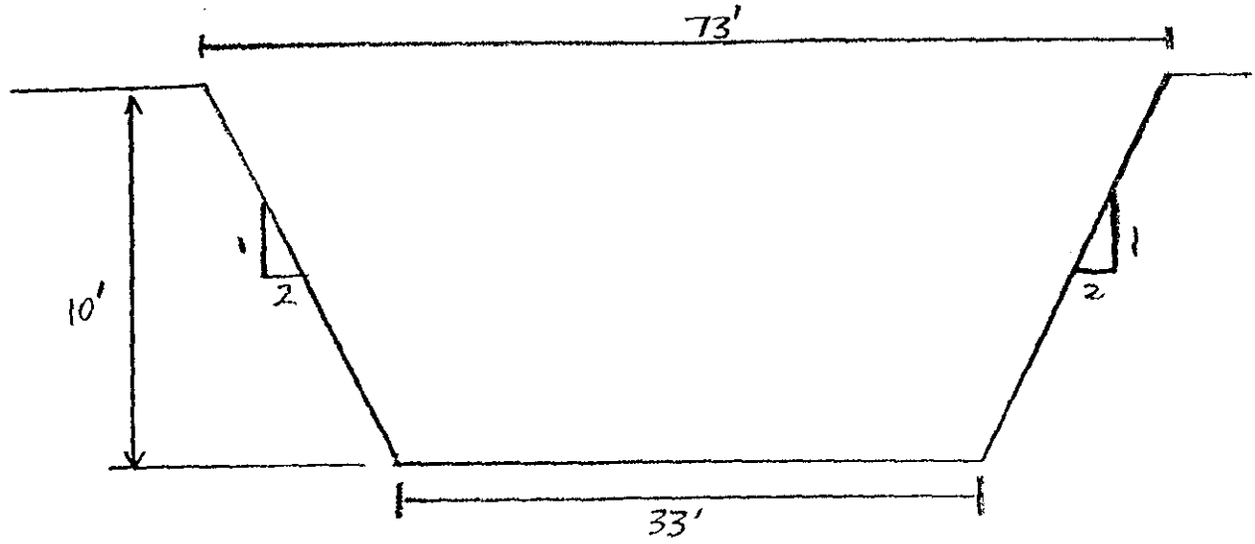
Length of Spillway = 200' (Approx)

Gila Bend Canal Spillway/Siphon
Quilotosa Wash

Project Title Gila Bend ADMP Project No. 99541 Date 4-14-00

Subject Quilotosa Wash Prepared By LAV Checked By _____ Page _____

Gila Bend Canal Spillway & Siphon



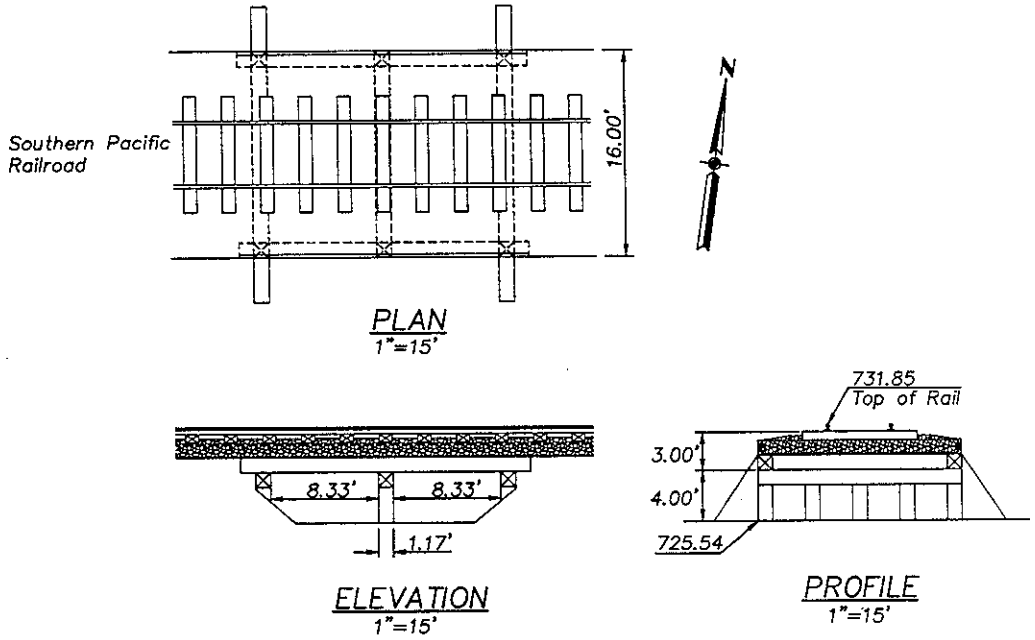
Length of spillway = 150' (Approx)

Railroad Structures

SPRR Structure
Mile Marker 850.64

SOUTHERN PACIFIC RAILROAD STRUCTURE AT MP 850.64

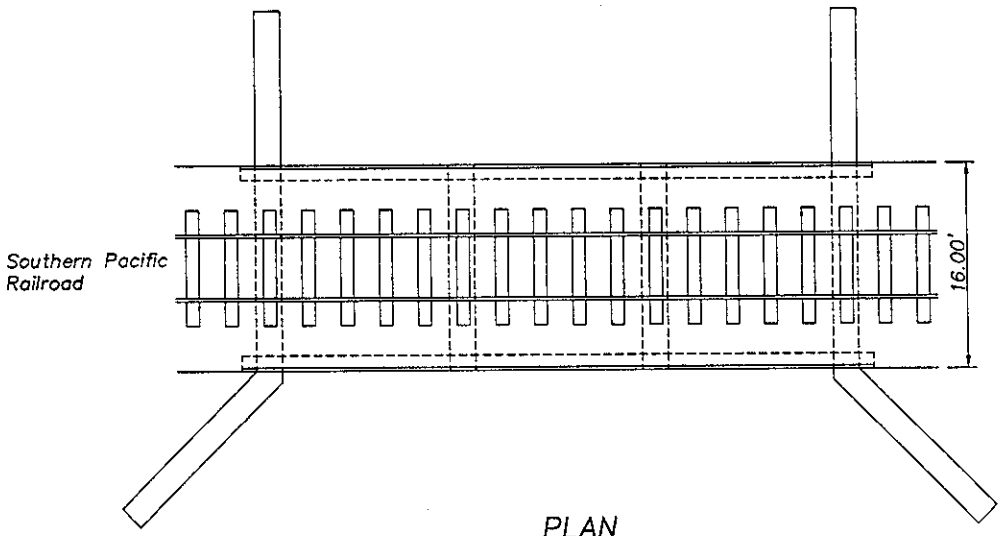
Information obtained from field measurements by EEC. (March 2000)



SPRR Structure
Mile Marker 851.13

SOUTHERN PACIFIC RAILROAD STRUCTURE AT MP 851.13+ UNNAMED WASH NO. 1

Information obtained from field measurements by EEC. (March 2000)



PLAN
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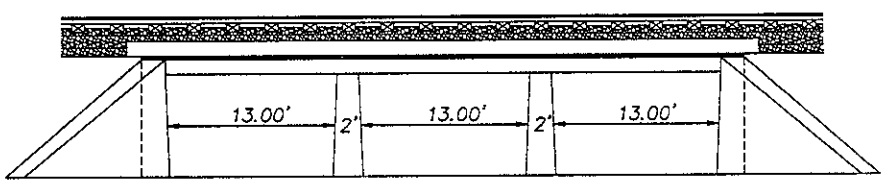

ELEVATION
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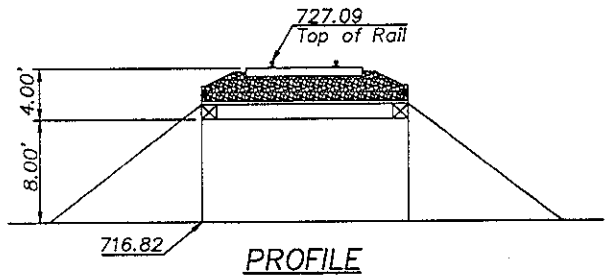
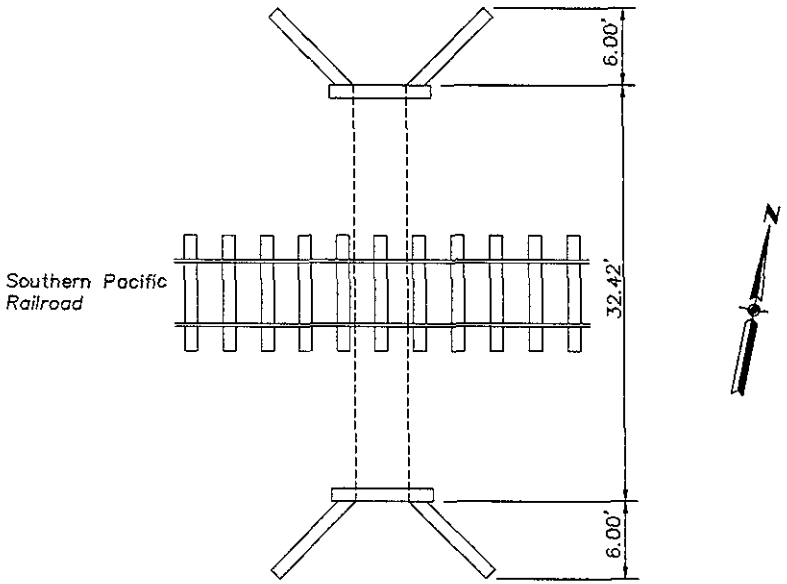


PROFILE
1"=15'

SPRR Structure
Mile Marker 851.61

SOUTHERN PACIFIC RAILROAD STRUCTURE AT MP 851.61

Information obtained from field measurements by EEC. (March 2000)



PLAN
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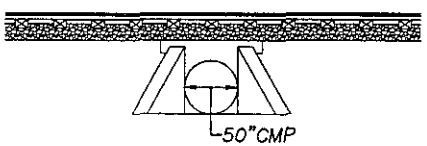
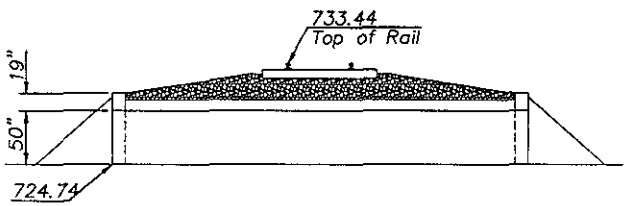


ELEVATION
1"=15'

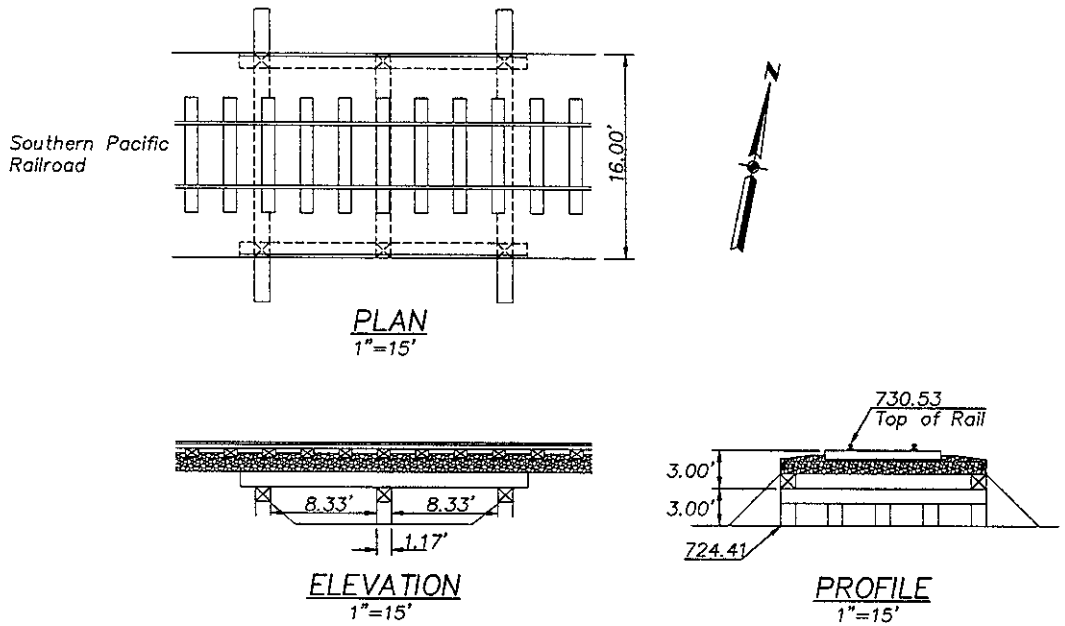


PROFILE
1"=15'

SPRR Structure
Mile Marker 851.91

SOUTHERN PACIFIC RAILROAD STRUCTURE AT MP 851.91

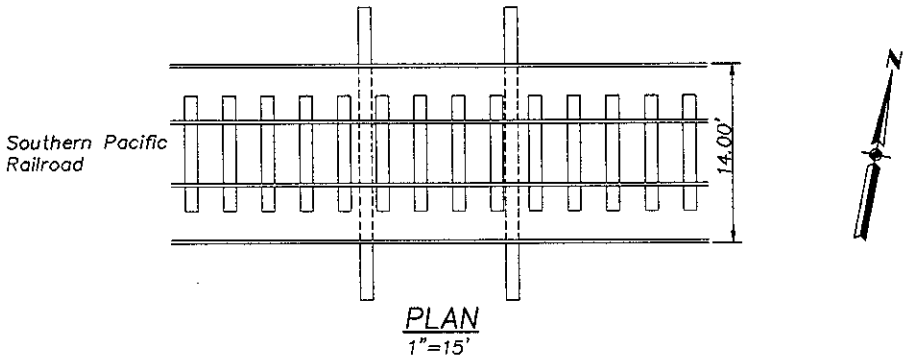
Information obtained from field measurements by EEC. (March 2000)

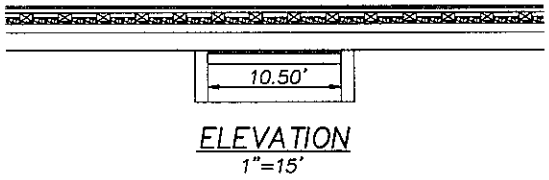


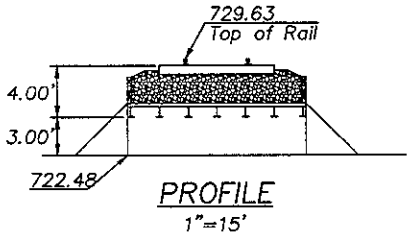
SPRR Structure
Mile Marker 852.22

SOUTHERN PACIFIC RAILROAD STRUCTURE AT MP 852.22

Information obtained from field measurements by EEC. (March 2000)



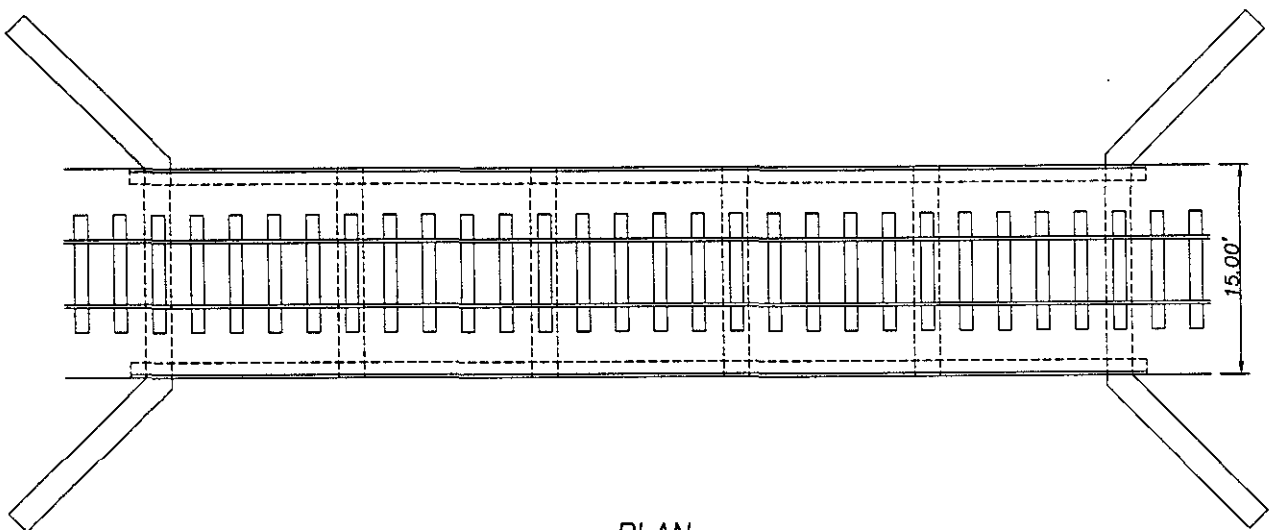




SPRR Structure
Mile Marker 852.38

SOUTHERN PACIFIC RAILROAD STRUCTURE AT MP 852.38 SAUCEDA WASH

Information obtained from field measurements by EEC. (March 2000)



PLAN
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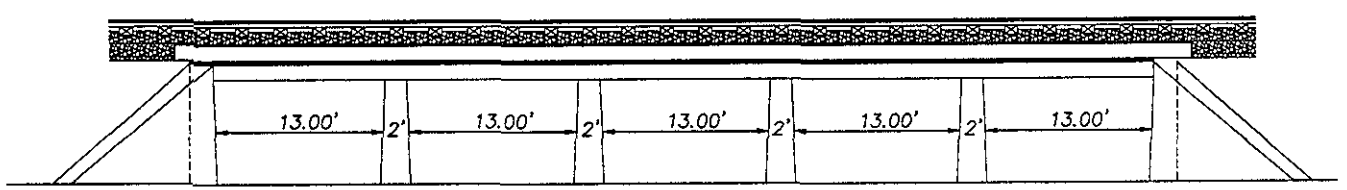

ELEVATION
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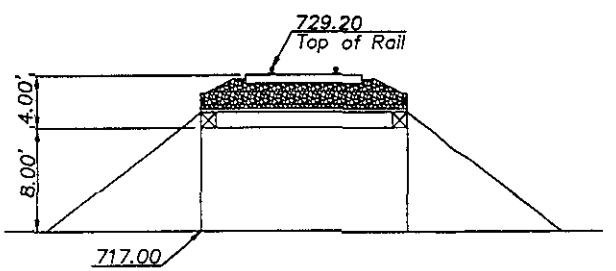
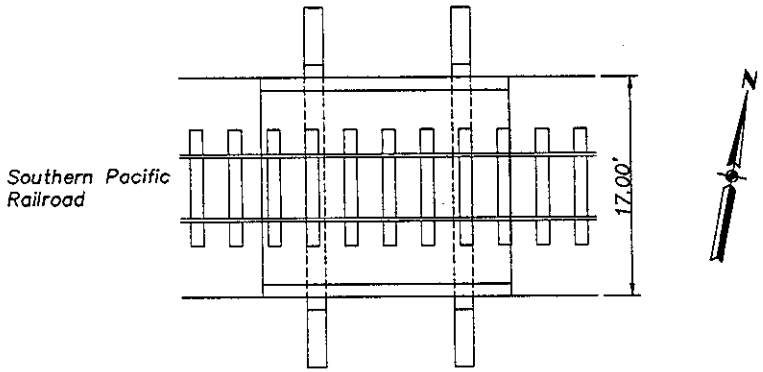


PROFILE
1"=15'

SPRR Structure
Mile Marker 852.63

SOUTHERN PACIFIC RAILROAD STRUCTURE AT MP 852.63

Information obtained from field measurements by EEC. (March 2000)



PLAN
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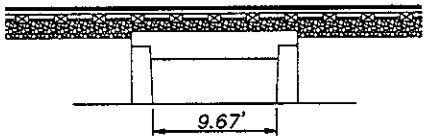

ELEVATION
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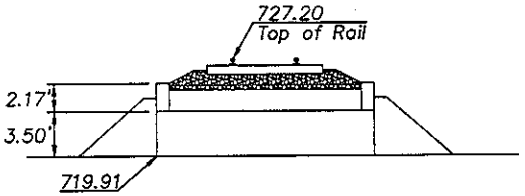
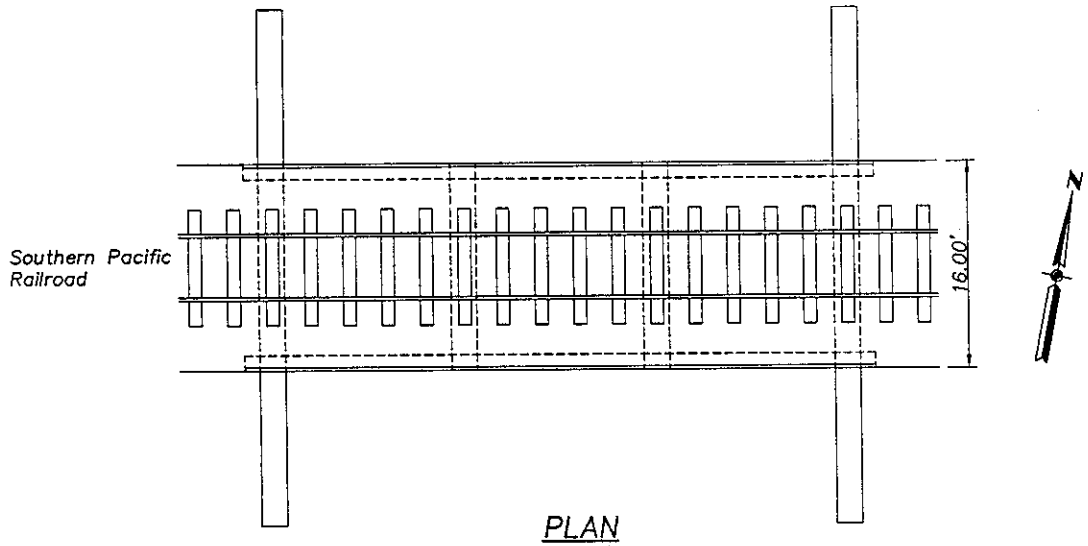


PROFILE
1"=15'

SPRR Structure
Mile Marker 853.01

SOUTHERN PACIFIC RAILROAD STRUCTURE AT MP 853.01

Information obtained from field measurements by EEC. (March 2000)



PLAN
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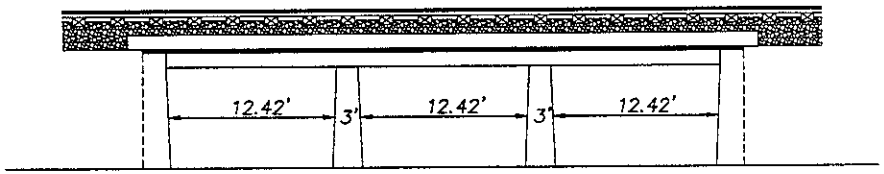

ELEVATION
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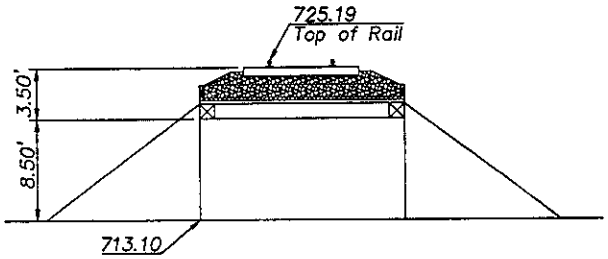
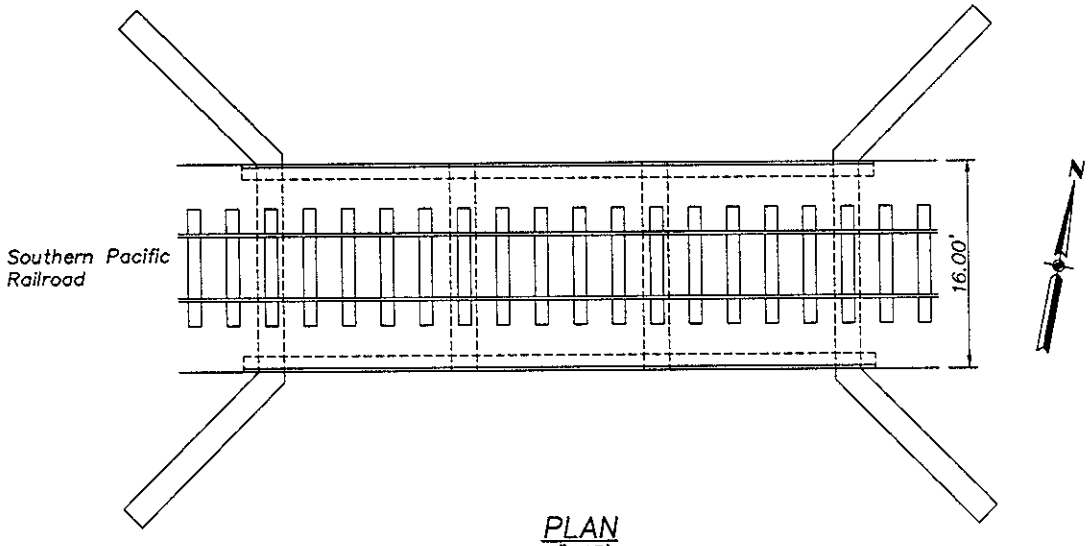


PROFILE
1"=15'

SPRR Structure
Mile Marker 853.39

SOUTHERN PACIFIC RAILROAD STRUCTURE AT MP 853.39 QUILOTOSA WASH

Information obtained from field measurements by EEC. (March 2000)



PLAN
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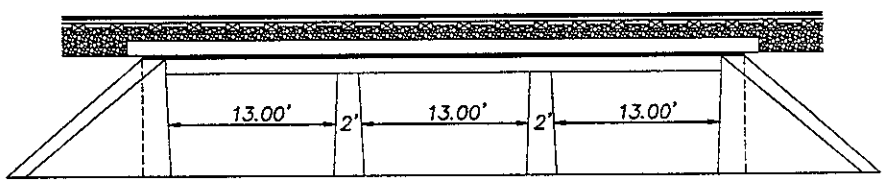
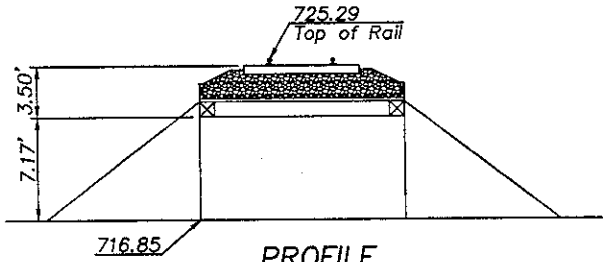


ELEVATION
1"=15'

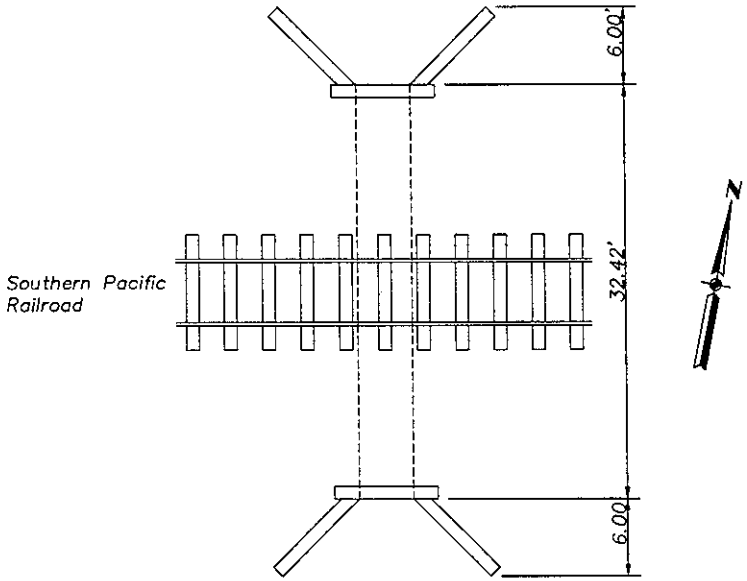


PROFILE
1"=15'

SPRR Structure
Mile Marker 853.51

SOUTHERN PACIFIC RAILROAD STRUCTURE AT MP 853.51

Information obtained from field measurements by EEC. (March 2000)



PLAN
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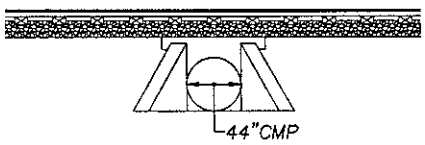

ELEVATION
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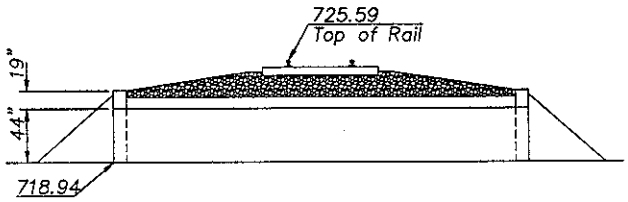
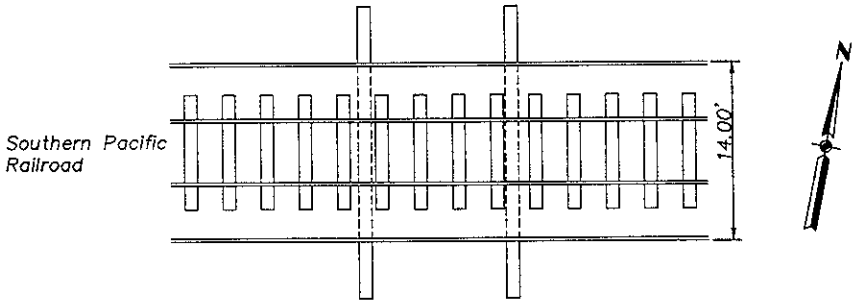


PROFILE
1"=15'

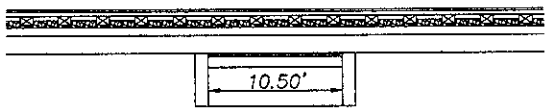
SPRR Structure
Mile Marker 853.76

SOUTHERN PACIFIC RAILROAD STRUCTURE AT MP 853.76

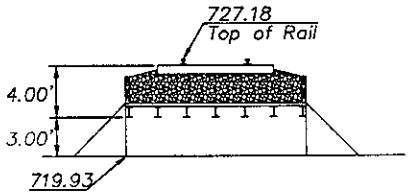
Information obtained from field measurements by EEC. (March 2000)



PLAN
1"=15'



ELEVATION
1"=15'

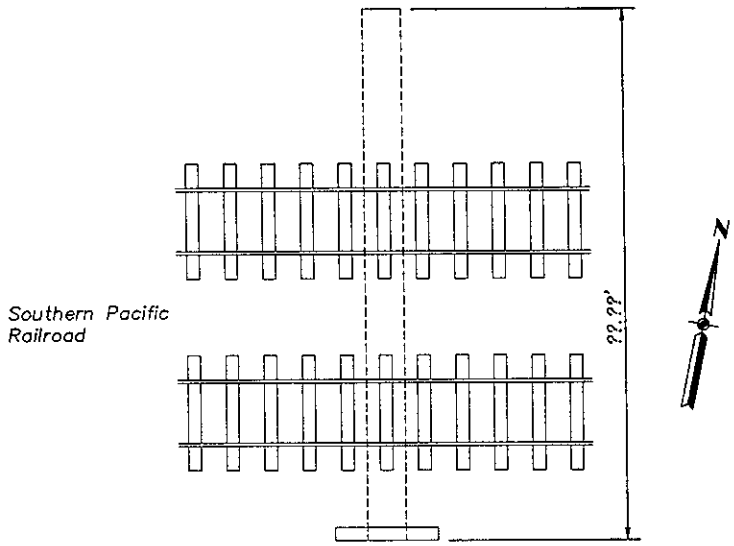


PROFILE
1"=15'

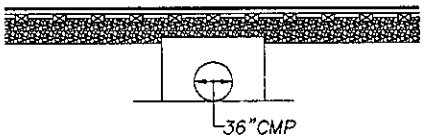
SPRR Structure
Mile Marker 854.16

SOUTHERN PACIFIC RAILROAD STRUCTURE AT MP 854.16

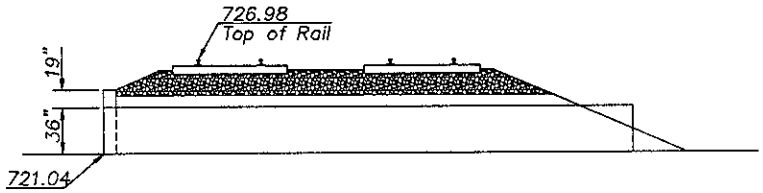
Information obtained from field measurements by EEC. (March 2000)



PLAN
1"=15'

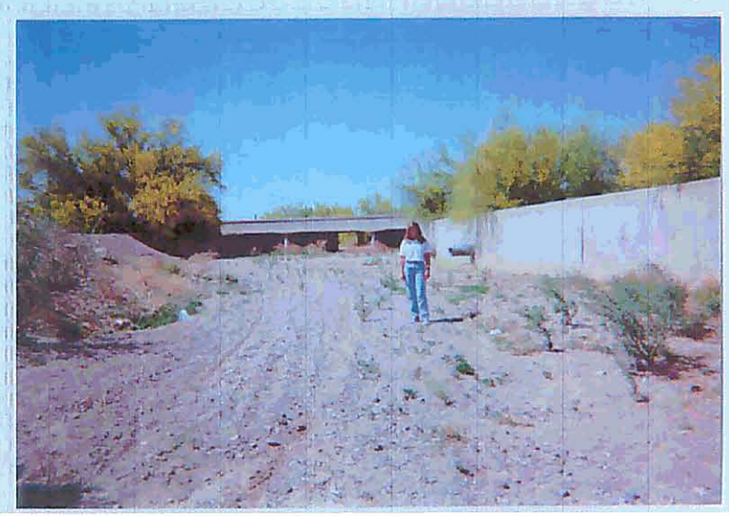


ELEVATION
1"=15'



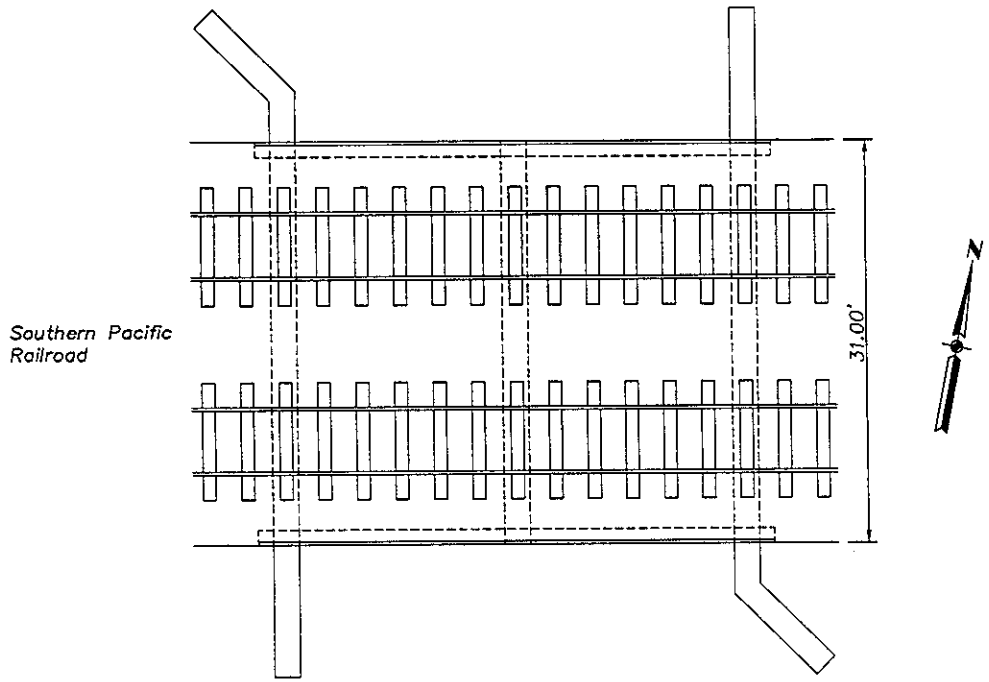
PROFILE
1"=15'

SPRR Structure
Mile Marker 854.60

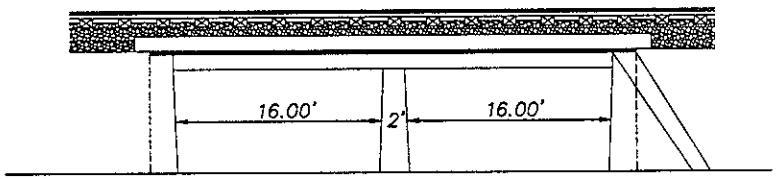


SOUTHERN PACIFIC RAILROAD
STRUCTURE AT MP 854.60
UNNAMED WASH NO. 2

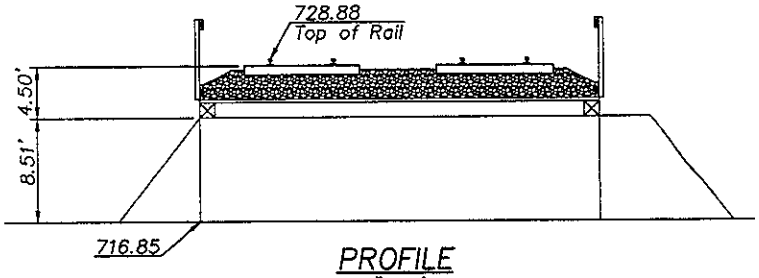
Information obtained from field measurements by EEC. (March 2000)



PLAN
1"=15'



ELEVATION
1"=15'

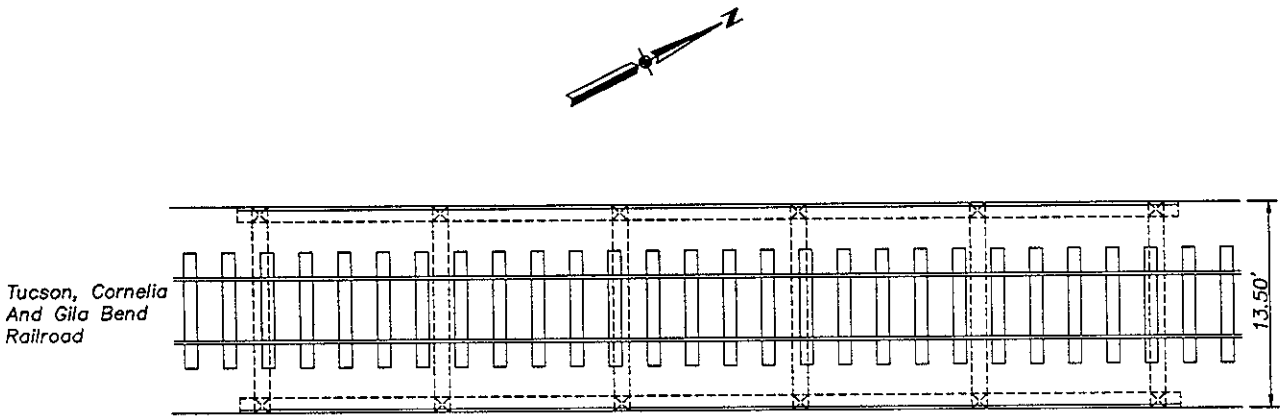


PROFILE
1"=15'

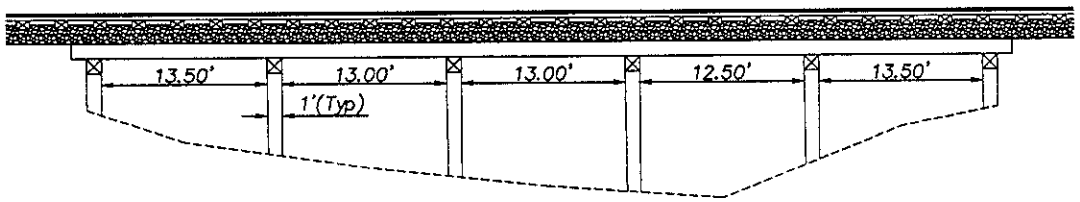
TCBRR Structure
Unnamed Wash No 2

TUCSON, CORNELIA AND GILA BEND R.R. STRUCTURE UNNAMED WASH NO. 2

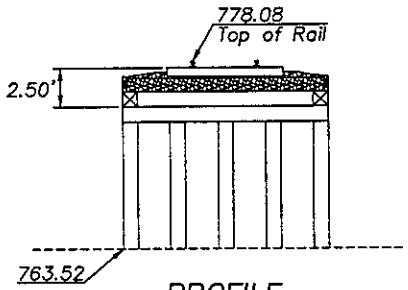
Information obtained from field measurements by EEC. (March 2000)



PLAN
1"=15'



ELEVATION
1"=15'

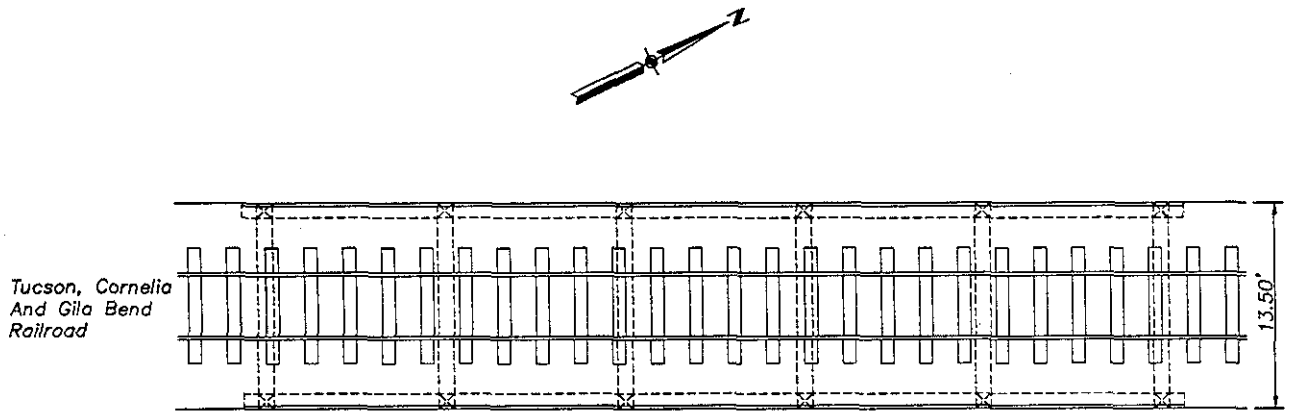


PROFILE
1"=15'

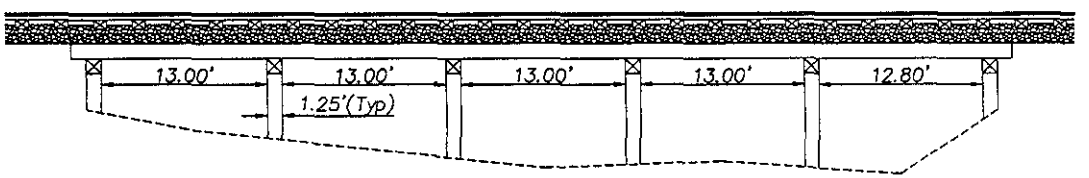
TCBRR Structure
Unnamed Wash No 3

TUCSON, CORNELIA AND GILA BEND R.R. STRUCTURE UNNAMED WASH NO. 3

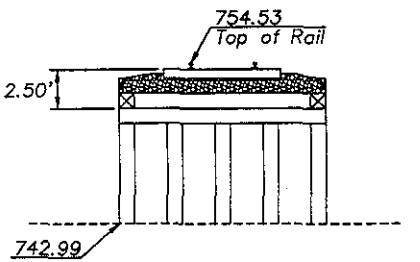
Information obtained from field measurements by EEC. (March 2000)



PLAN
1"=15'



ELEVATION
1"=15'



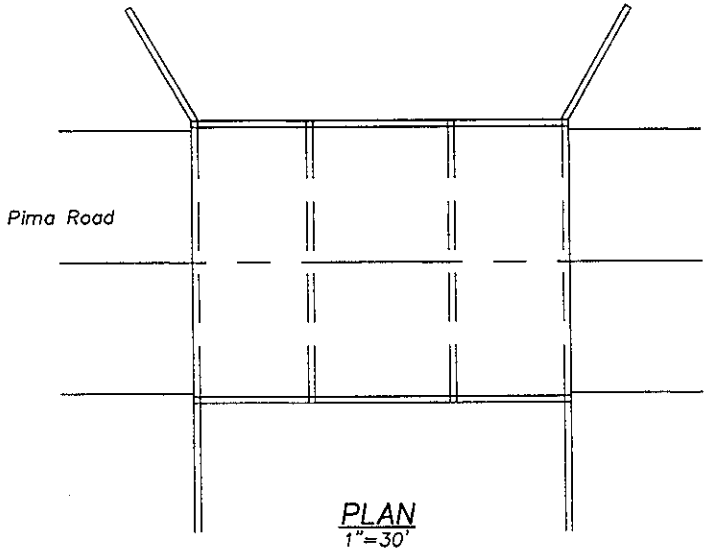
PROFILE
1"=15'

I-8 Highway Structures

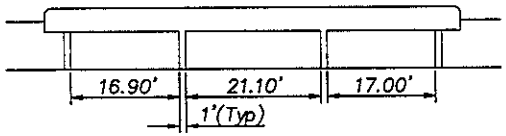
Pima Road Structure
Unnamed Wash No 2

PIMA ROAD STRUCTURE
UNNAMED WASH NO. 2

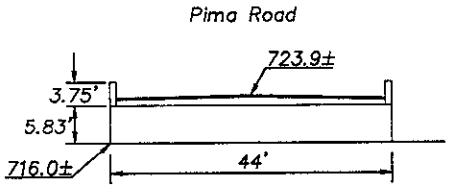
Information obtained from field measurements by EEC. (March 2000)



PLAN
1"=30'



ELEVATION
1"=30'



PROFILE
1"=30'

ADOT Structure
Sta. 4855+ at Unnamed Wash No. 1

Looking Upstream from ADOT Structure

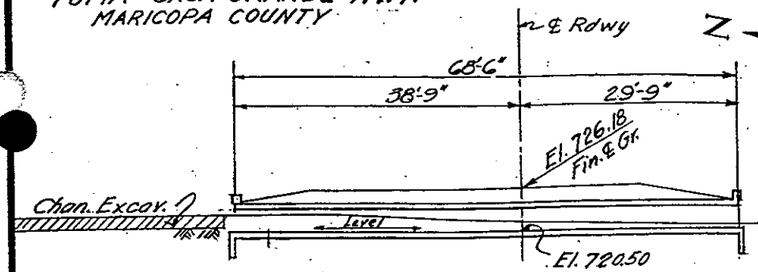
Looking at Inlet Structure

Looking at Outlet Structure

Looking Downstream from Outlet Structure

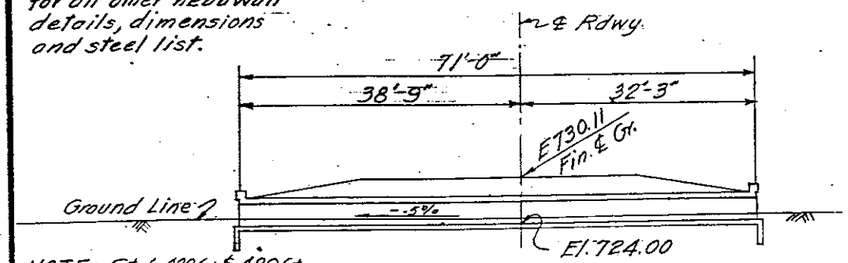
YUMA - CASA GRANDE HWY.
MARICOPA COUNTY

FED. ROAD DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT ~~9-28-60~~ JRP
7	ARIZONA	I-8-2.(18)	37		



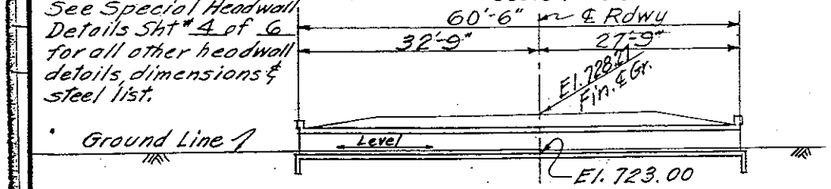
NOTE - Sta. 4806+
See Std. CI-6-2 for all other barrel details, dimensions, bend diagrams & steel list.
See Special Headwall Details Sht # 4 of 6 for all other headwall details, dimensions and steel list.

STA. 4806+
SECTION ON ℄ BOX
New 2-6×3×68'-6" Box Culvert
Special Headwalls
Scale 1" = 10'-0"

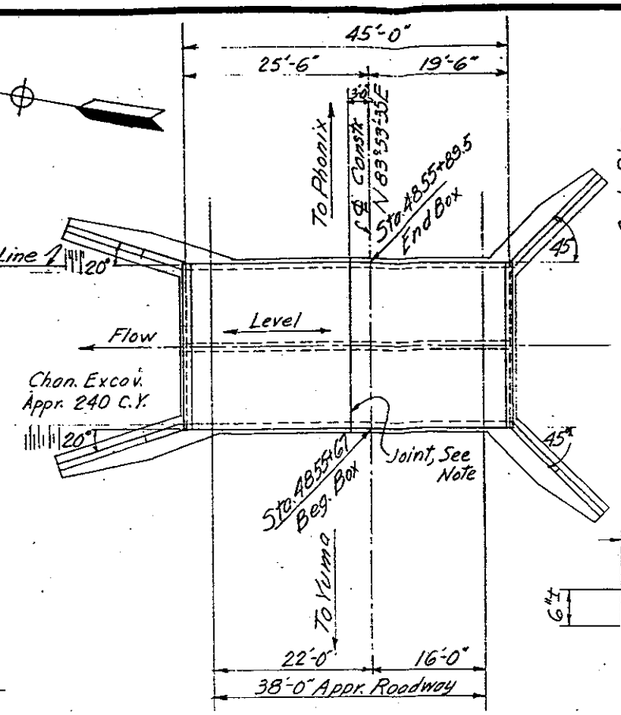


NOTE - Sta's. 4886+ & 4896+
See Std. CI-6-1 for all other barrel details, dimensions, bend diagrams & steel list.
See Special Headwall Details Sht # 4 of 6 for all other headwall details, dimensions & steel list.

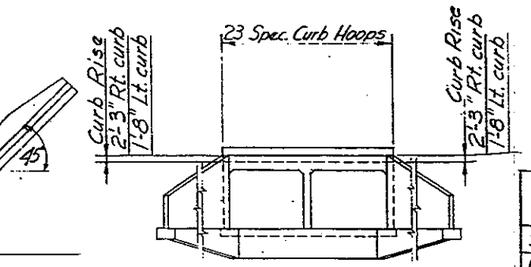
STA. 4886+
SECTION ON ℄ BOX
New 6×3×71'-0" Box Culvert
Special Headwalls
Scale 1" = 10'-0"



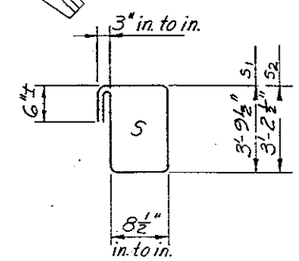
STA. 4896+
SECTION ON ℄ BOX
New 6×3×60'-6" Box Culvert
Special Headwalls
Scale 1" = 10'-0"

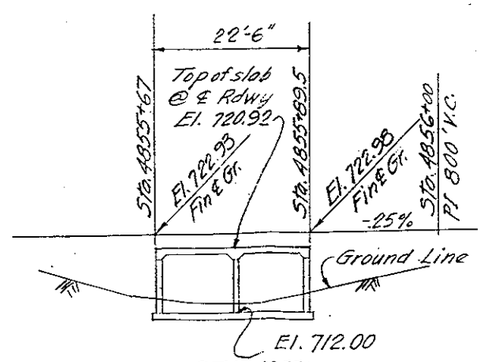


STA. 4855+
LOCATION PLAN
New 2-10×8×45'-0" Box Culv.
25'-0" Std. RG-1 Road Guard Lt. and Rt.
Special Headwalls
Scale 1" = 10'-0"



STA. 4855+
END ELEVATION
No Scale

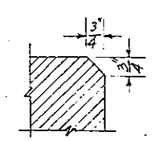




STA. 4855+
SECTION ON ℄ RDWY
Scale 1" = 10'-0"

NOTE - Sta. 4855+
See Std's CI-10-2 for all other barrel details, dimensions, bend diagrams and steel list.
See Std. RG-1 and Special Headwall Details Sht. # 5 of 6 for all other headwall details, dimensions and steel list.

REDUCED SIZE DO NOT SCALE



Chamfer all exposed corners thus unless otherwise noted. This note applicable to all sheets pertaining to this structure.

APPROXIMATE QUANTITIES

STRUCTURE	Std. No.	Sheet No.	Struct. Excav. C.Y.	Class A Conc. C.Y.	Reinf. Steel Lbs.	Spec. RG-1 Rd. Guard Lin. Ft.
Sta. 4806+						
New 2-6×3×68'-6" Box Culvert Special Headwalls	CI-6-2 CI-6-S	43 44 39	~~180~~ 152	82	~~9360~~ 9356	
Sta. 4855+						
New 2-10×8×45'-0" Box Culvert Std. Road Guard Special Headwalls	CI-10-2 CI-10-S RG-1	45 46 49 40	~~270~~ 263	150	~~15,440~~ 15,177	50
Sta. 4886+						
New 6×3×71'-0" Box Culvert Special Headwall	CI-6-1 CI-6-S	42 43 39	~~120~~ 68	51	~~5170~~ 5156	
Sta. 4896+						
New 6×3×60'-6" Box Culvert Special Headwalls	CI-6-1 CI-6-S	42 43 39	~~59~~ ~~90~~	45	~~4475~~ 4490	

GENERAL NOTES ~
Construction - Standard Specs. Arizona Highway Dept. Edition of 1948.
Design - A.A.S.H.O. Specs. 1957, revised to date.
Stresses : Class A Conc : f_c = 1,000 psi ; n = 12
Reinf. Steel : f_s = 20,000 psi
Reinforcing steel shall be intermediate grade and shall conform to A.S.T.M. Specs. A-15 and A-305.

JOINT NOTE ~
All structures shall have contraction or cold joints in top slabs and walls (optional in floor slab) spaced not more than 40 feet apart or as shown. The joint may be made with ¼" plywood bulkhead which shall be left in place. Reinforcing steel shall project through the joint. Plywood for bulkhead shall be treated, either hot dipped 4 hours in approved treating solution or standard pressure treated.

4855+ Unnamed Wash #1 MAIN

ALL CONCRETE CLASS A

		DATE	ARIZONA HIGHWAY DEPARTMENT BRIDGE DIVISION
LAYOUT			
DESIGN			
ARCHITECTURE			
DRAWN	H.W. & G.L.B.	9/58	STA'S. 4806+, 4855+, 4886+ 4896+
TRACED			
CHECKED	H.W.	10/58	LOCATION & SPECIAL DETAILS
SHEET NO. 2 OF 6			BRIDGE NUMBER / DRAWING NUMBER / BRIDGE ENGINEER

I-8-2(18) I-002-2(18) Old

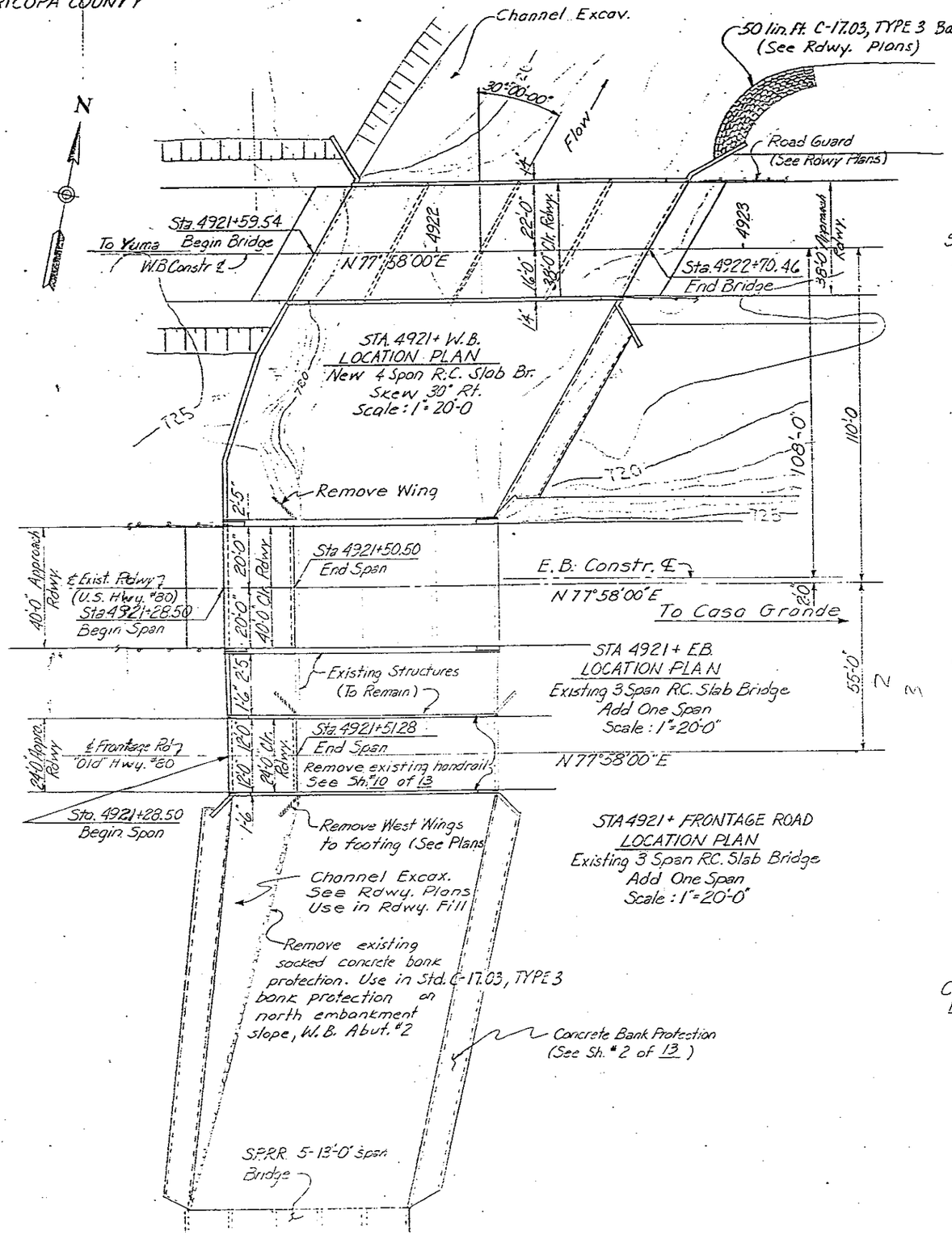
ADOT Structure
Bridges at Sauceda Wash

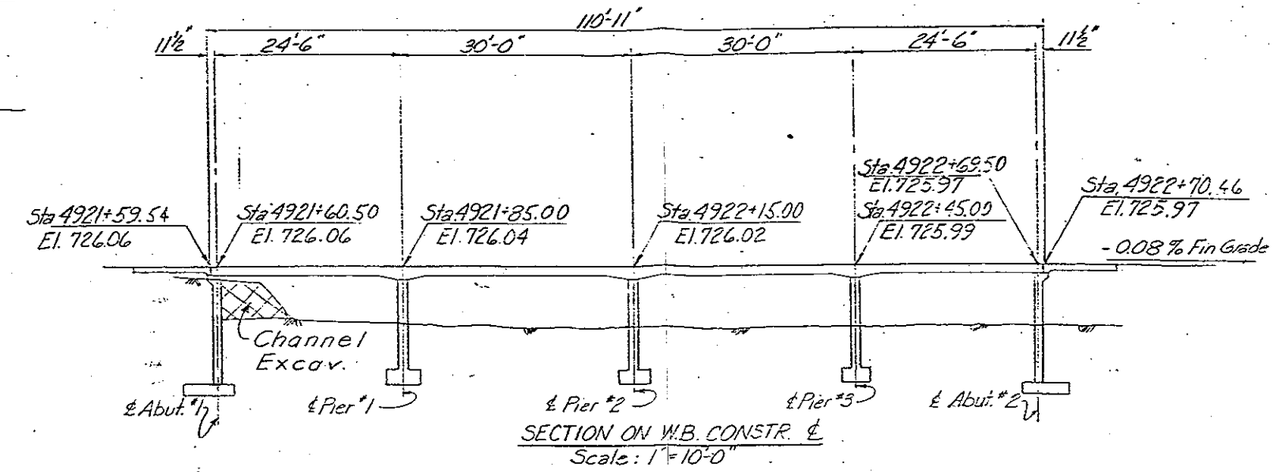
Sauceda Wash Looking Upstream

Sauceda Wash Looking Downstream at Bridges

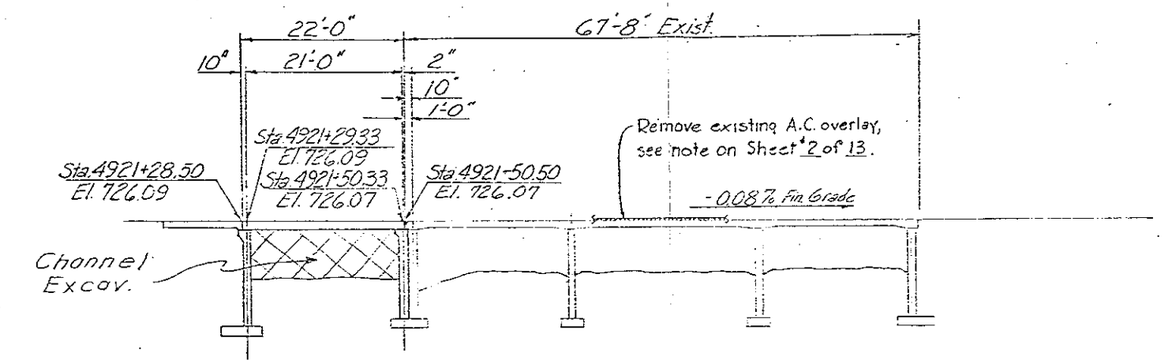
YUMA - CASA GRANDE HWY.
MARICOPA COUNTY

FED. ROAD DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
7	ARIZONA	I-IG-8-2 (40)	36	90	8-13-73

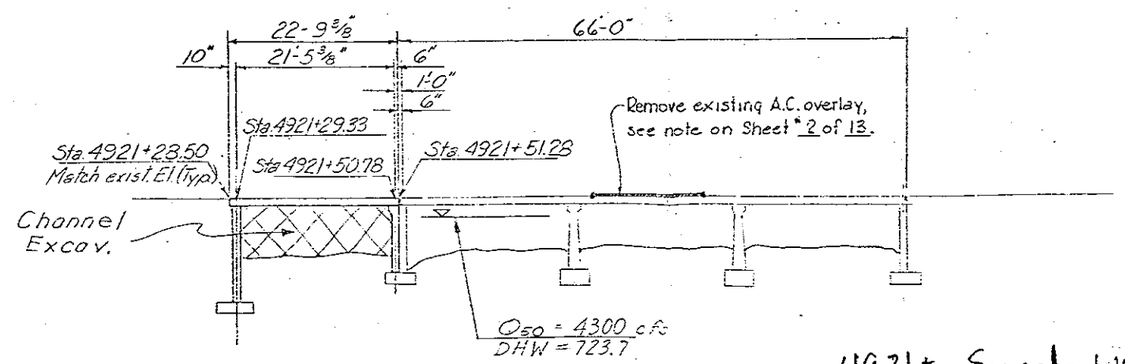




SECTION ON W.B. CONSTR. ℄
Scale: 1" = 10'-0"



SECTION ON E.B. ℄
Scale: 1" = 10'



SECTION ON FRONTAGE RD ℄
Scale: 1" = 10'

4921+ Sauceda WASH (MAIN)

		DATE
LAYOUT		
DESIGN		
ARCHITECTURE		
DRAWN	H.G.R.	4-14
TRACED		
CHECKED	J.E.M.	11-64

ARIZONA HIGHWAY DEPARTMENT
BRIDGE DIVISION

STA. 4921+
SAUCEDA WASH BRIDGES
LOCATION DETAILS

SHEET NO. 1 OF 13 | BRIDGE NUMBER | DRAWING NUMBER | BRIDGE ENGIN.

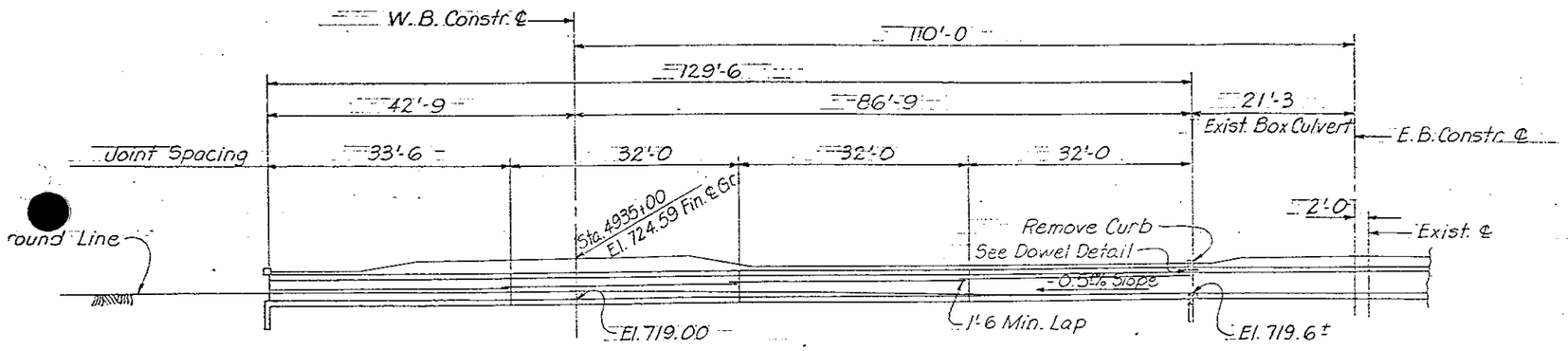
I-IG-8-2 (40)

ADOT Structure
Sta. 4935+

Looking Upstream from Structure

Looking at Inlet Structure

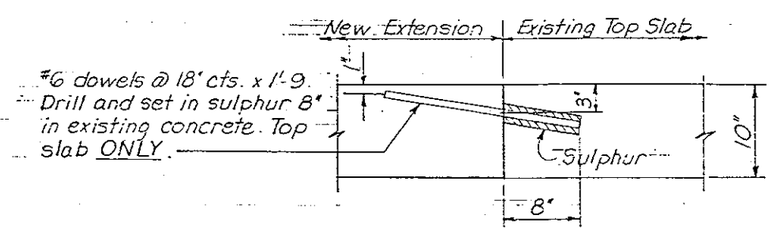
FED. ROAD DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
7	ARIZONA	I-IG-8-2 (40)	86	90	Ø-13-72



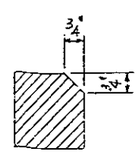
STA. 4935+
SECTION ON ℄ CULVERT

Existing 2-9'x3'x46'-6 Box Culvert
Extend 129'-6 Lt.
Scale: 1" = 10'-0

NOTE:
For Median Catch Basin Inlet Detail, See Sta. 4954+ "CULVERT OPENING DETAIL" Sheet 4 of 5.



DOWEL DETAIL
Scale: 1½" = 1'-0



Chamfer all exposed corners thus unless otherwise noted. This note applicable to all culvert sheets pertaining to this project.

NOTE:
Remove existing headwalls as required for new construction.
Use projecting steel for bond in new concrete.
See Std. CI-9-2 for all other barrel details, dimensions & bend diagrams.
See Std. CW-1 for all other headwall details, dimensions, bend diagrams & steel lists.
See Structure Summary Sheet for Approximate Quantities & General Notes.

4935+

ALL CONCRETE CLASS "A".

1 of 2 between Sauceda & Quilotosa

		DATE
LAYOUT		
DESIGN		
ARCHITECTURE		
DRAWN	A.P.J.	3-70
TRACED		
CHECKED	M.R.C.	5-31-70

ARIZONA HIGHWAY DEPARTMENT
BRIDGE DIVISION

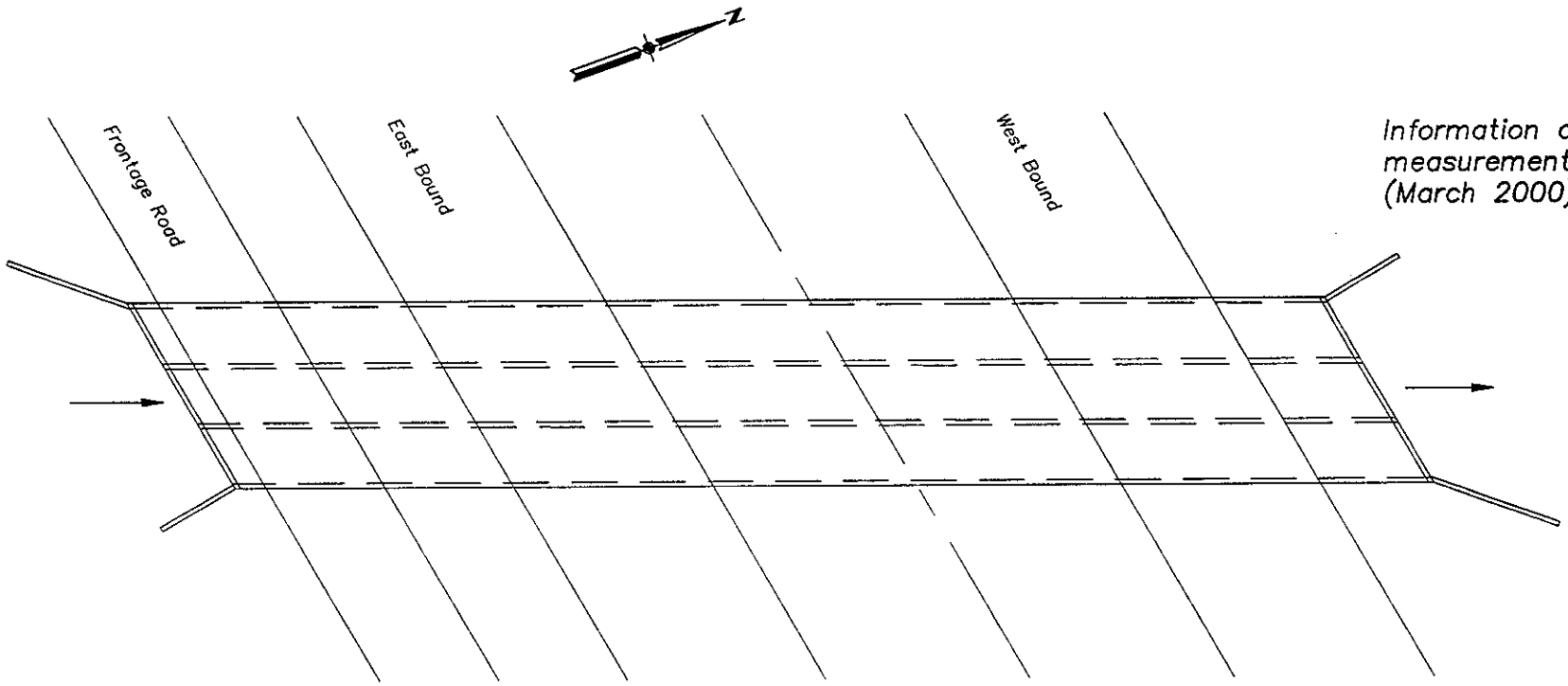
STA. 4935+
LOCATION & SPECIAL DETAILS

ADOT Structure
Sta. 4954+87

Looking Upstream from ADOT Structure

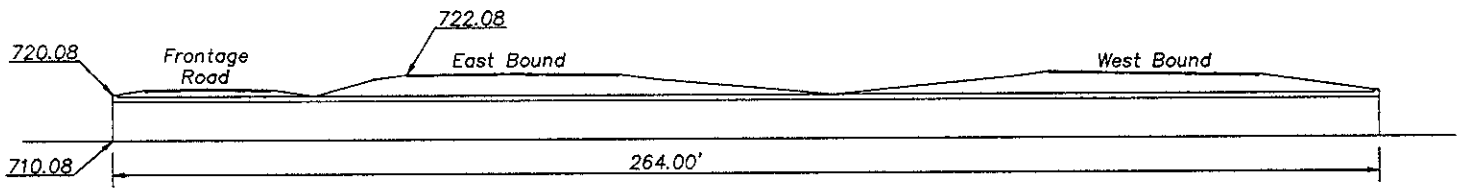
Looking at Inlet Structure

INTERSTATE 8 STRUCTURE
W.B. STA 4954+87.00 TO 4955+33.19
THREE BARREL 12'x8' BOX CULVERT

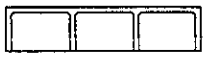


Information obtained from field measurements by EEC. (March 2000)

PLAN
1"=40'



PROFILE
1"=40'



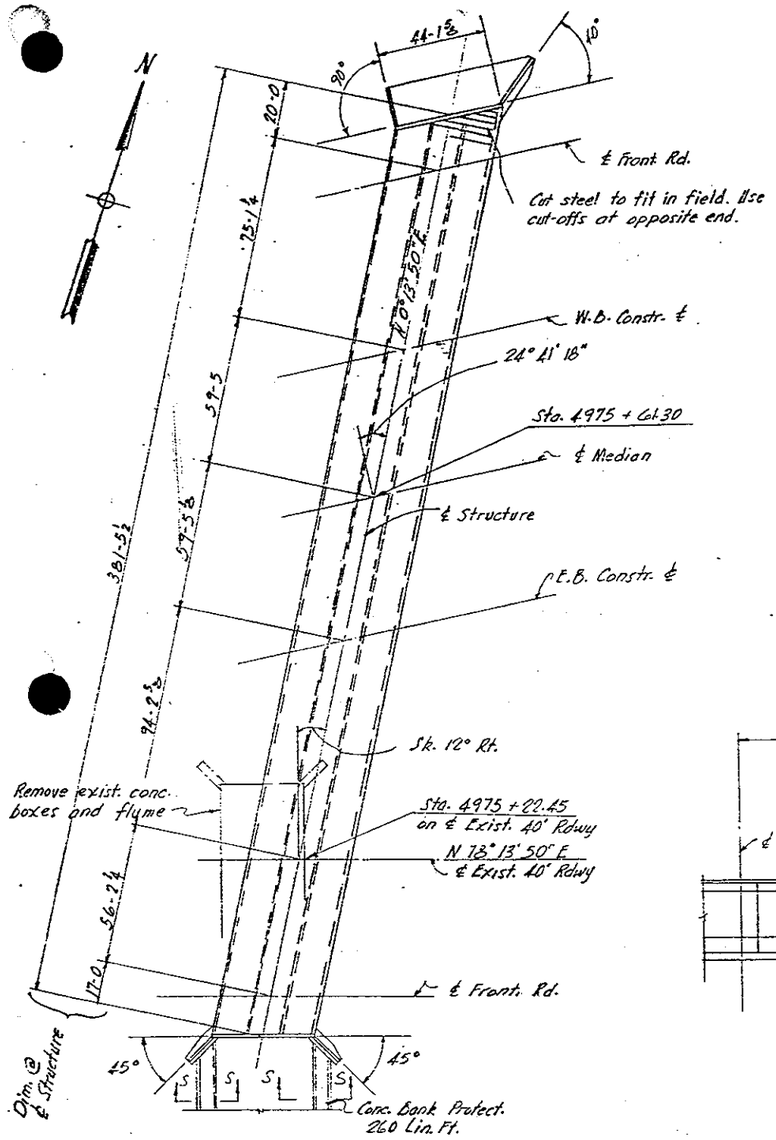
ELEVATION
1"=40'

ADOT Structure
Quilotosa Wash

Looking Upstream from Structure

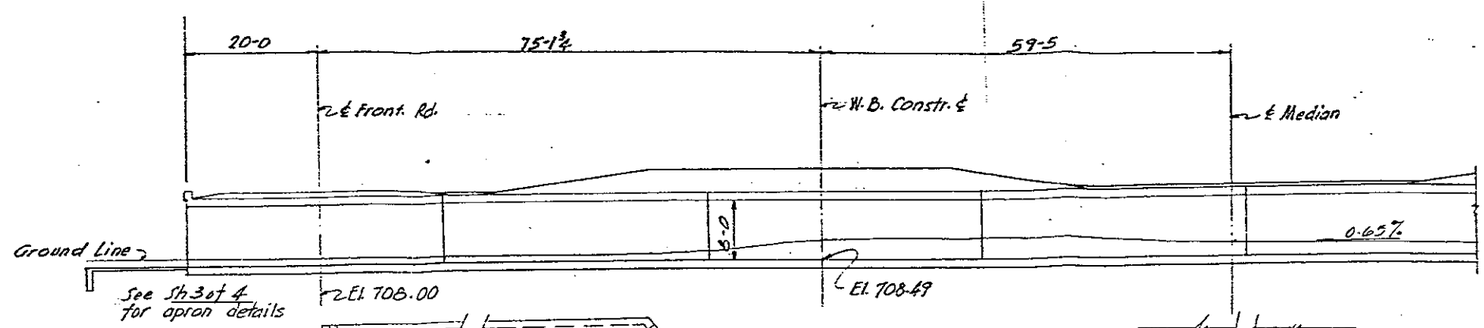
Looking at Inlet Structure

FED. HIGHW. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
7	ARIZONA	I-16-8-2(40)	87	90	

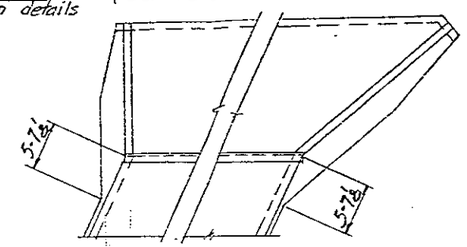


Sta. 4975+
PLAN
New 3-12'x6'x381-5½ C.B.C.
w/Outlet Apron

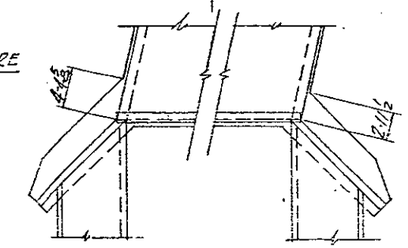
Note – N. Front. Rd & S. Front. Rd. curbs to be built parallel to edge of rdwy.



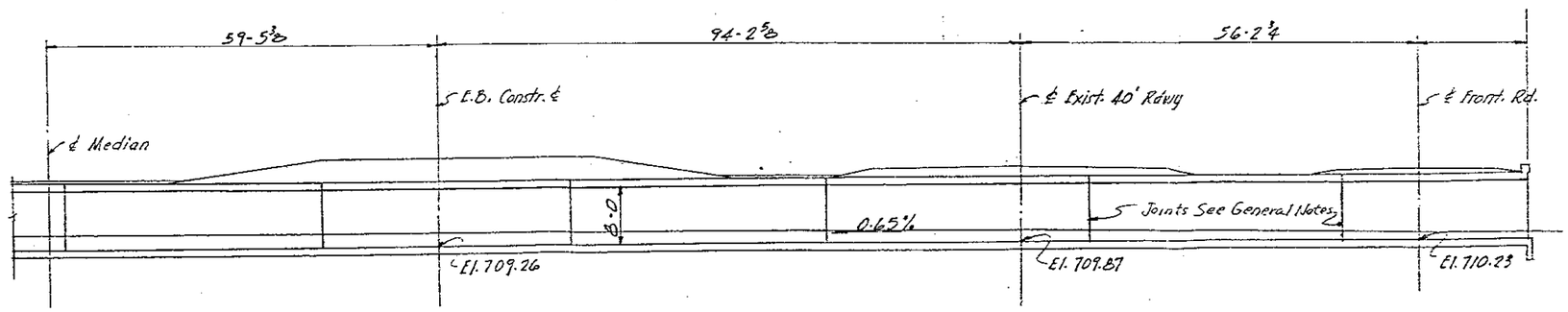
SECTION THRU ℄ STRUCTURE



OUTLET HDWL

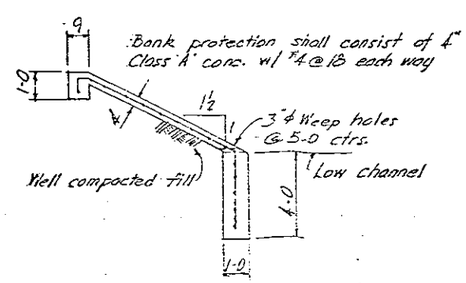


INLET HDWL



SECTION THRU ℄ STRUCTURE

Note – For all other bbl. details see Std C1-12-3
" " " inlet hdwl details see Std CW-2
" " " outlet " " " Std CW-4



SECTION S-S

For General Notes see Summary Sheet.

STA 4975+ Quilotosa Wash MAIN

		DATE
LAYOUT		
DESIGN		
ARCHITECTURE		
DRAWN	KD	4-65
TRACED		
CHECKED	WJ	4-71

ARIZONA HIGHWAY DEPARTMENT
BRIDGE DIVISION

Sta. 4975+
LOCATION & SPECIAL DETAILS

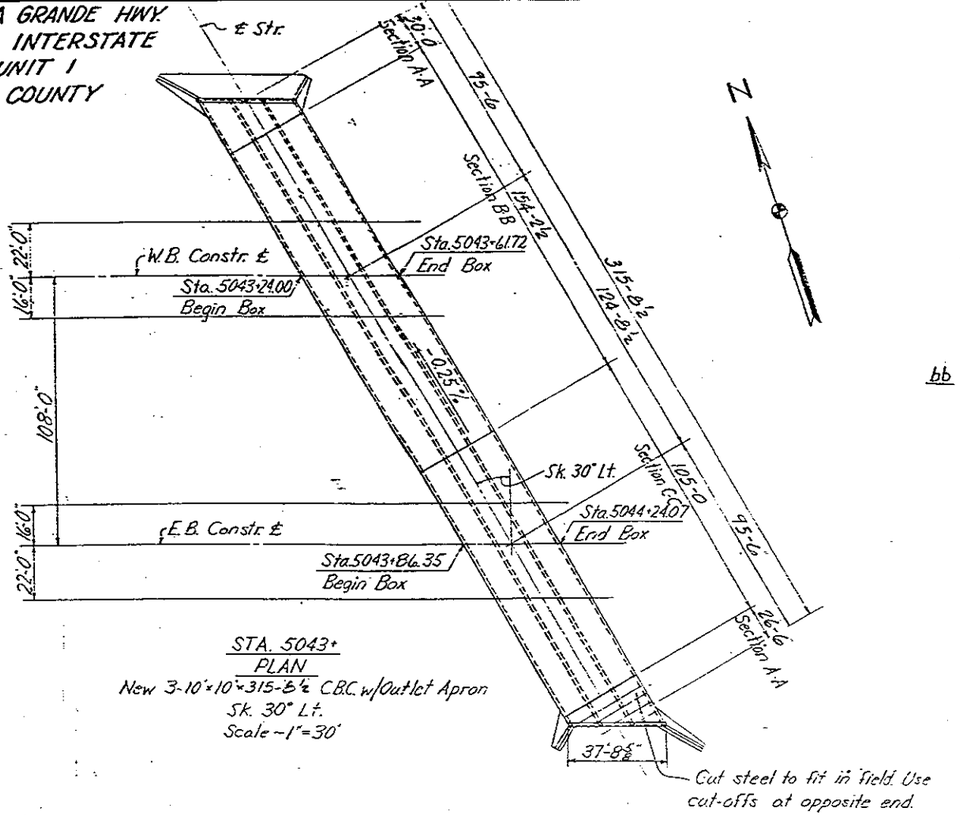
SHEET NO. 2 OF 5

BRIDGE NUMBER | DRAWING NUMBER | BRIDGE ENGINEER

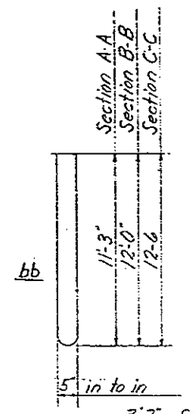
ADOT Structure
I-8 (Sta. 5043+00)

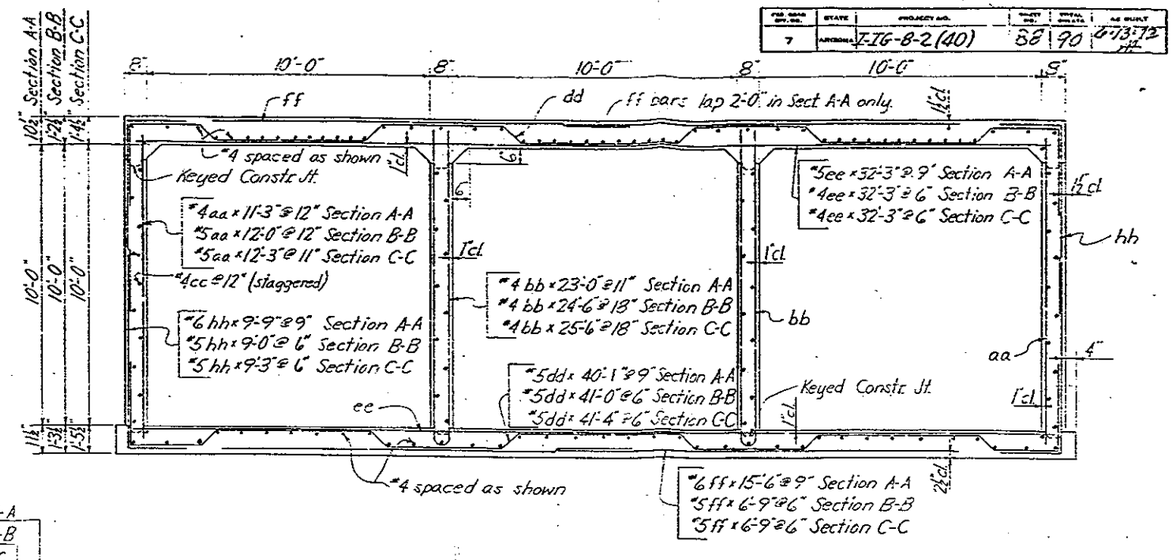
MA-CASA GRANDE HWY.
A BEND INTERSTATE
EEWAY UNIT 1
RICOPA COUNTY

FED. AID PROJ. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
7	ARIZONA	I-16-B-2(40)	88	90	6-13-72

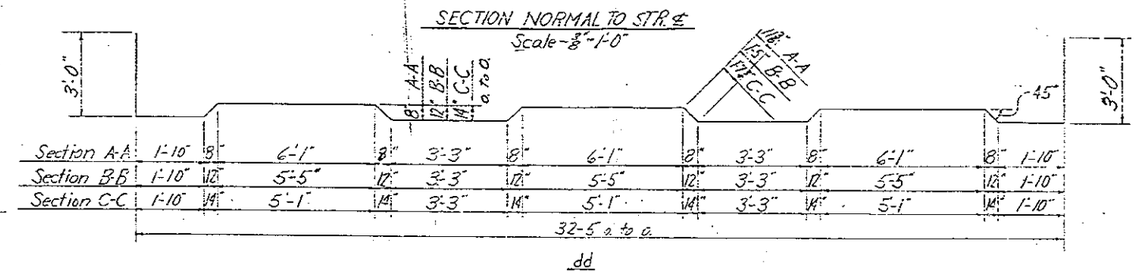


STA. 5043+
PLAN
New 3-10'×10'×315'-8½" CBC. w/Outlet Apron
Sk. 30° Lt.
Scale ~ 1" = 30'



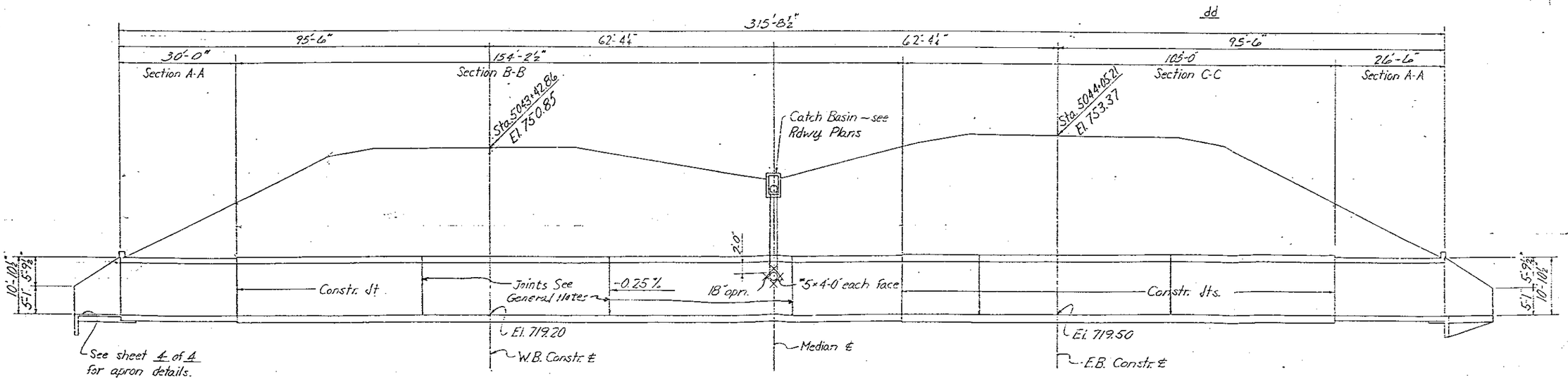


3'-3"	Sect. A-A
2'-3"	Sect. B-B
2'-3"	Sect. C-C



Section A-A	1'-10"	8"	6'-1"	8"	3'-3"	8"	6'-1"	8"	3'-3"	8"	6'-1"	8"	1'-10"
Section B-B	1'-10"	12"	5'-5"	12"	3'-3"	12"	5'-5"	12"	3'-3"	12"	5'-5"	12"	1'-10"
Section C-C	1'-10"	14"	5'-1"	14"	3'-3"	14"	5'-1"	14"	3'-3"	14"	5'-1"	14"	1'-10"

32'-5 a to a.



SECTION THRU ℄ STRUCTURE
Not to Scale

For General Notes see Summary Sheet

STA 5043+ Unnamed WASH #2

NOTE
For all other hdwl. details, dimensions, bend diagrams & steel lists, see Std. C1-10-1a 30° sk.

		DATE
LAYOUT		
DESIGN		
ARCHITECTURE		
DRAWN	Bar	8-64
TRACED		
CHECKED	JRM	11-64

SHEET NO. 3 OF 5

ARIZONA HIGHWAY DEPARTMENT
BRIDGE DIVISION

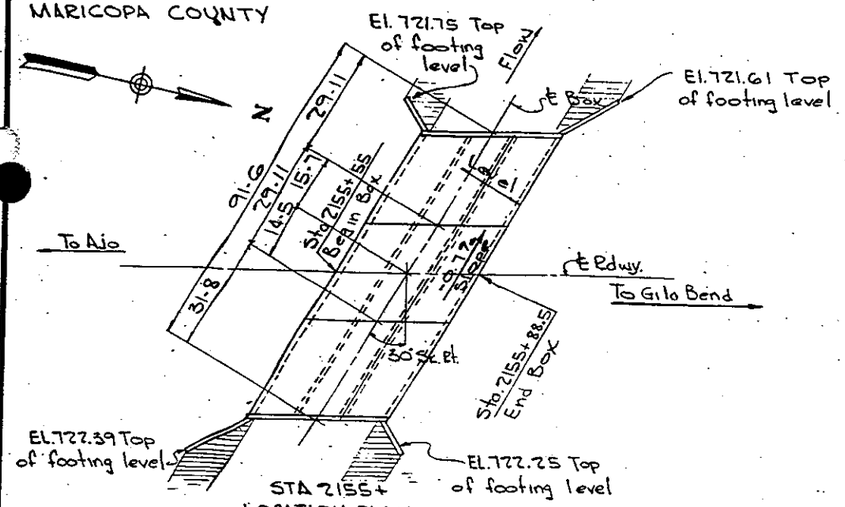
STA. 5043+
LOCATION & SPECIAL DETAILS

BRIDGE NUMBER | DRAWING NUMBER | BRIDGE ENGINEER

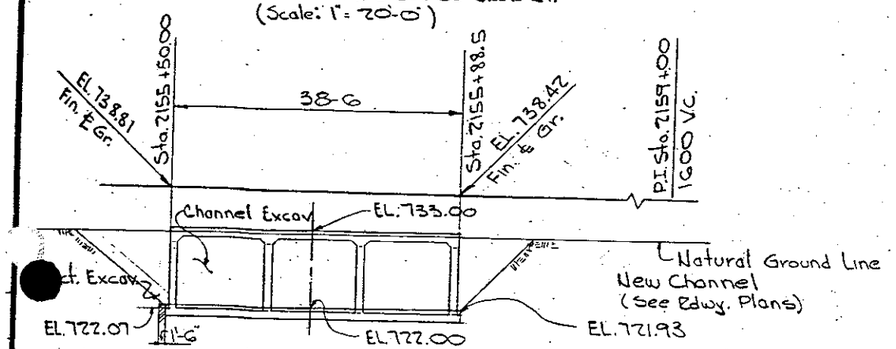
ADOT Structure
SR-85 at Unnamed Wash No 2

MARICOPA COUNTY

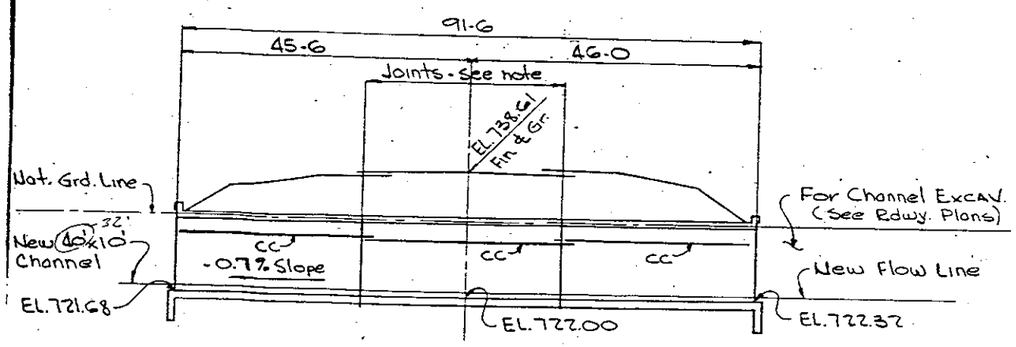
FED. AID PROJ. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
7	ARIZONA	S-222(22)	45	46	~~6-15-63~~ JRP



STA 2155+
LOCATION PLAN
New 3-10x10x91-6 Box 30° Skew Rt.
(Scale: 1" = 20'-0")

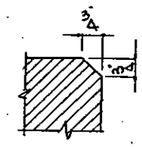


SECTION ON ℄ RDWY.
(Scale: 1"-10'-0")

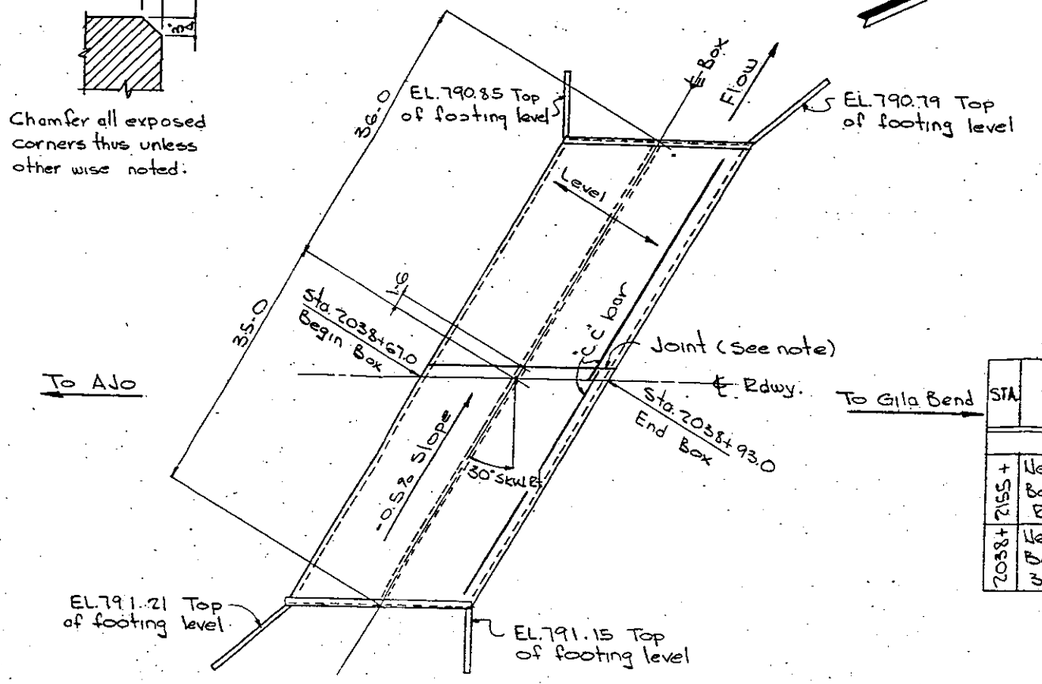


SECTION ON ℄ CULVERT
(Scale: 1"=10'-0")

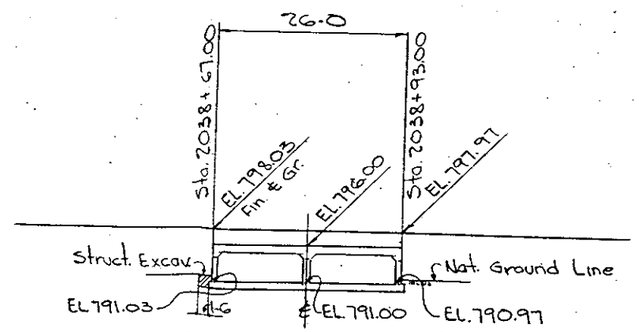
NOTE-Sta. 2155+
See Std. C1-10-3 30° Skew for all other barrel, curb & cut-off wall details, dimensions, bend diagrams & steel list.
See Std. C1-10-20 30° Skew for all other wing details, dimensions, bend diagrams & steel list.



Chamfer all exposed corners thus unless other wise noted.



Sta. 2038+
LOCATION PLAN
New 2-10'x4'x7'-0 Box 30° Skew Rt.
(Scale: 1"=10'-0")



SECTION ON ℄ RDWY.
(Scale: 1"=10'-0)

NOTE:- STA. 2038+
See Std. C1-10-2-30° Skew for other barrel details, dimensions & bend diagrams.
See Std. CW-3 for all other headwall details, dimensions, bend diagrams & steel list

STEEL LIST
(Sta. 2155+)

Mark	No	Size	Lgth	Bend
Standard Barrel				
aa	184	#6	12-9	A.
bb	184	#6	24-0	B2
cc	462	#4	31-6	Str.
dd	128	#7	46-0	D2
ee	126	#7	38-3	Str.
ff	252	#7	7-0	Str.

STEEL LIST
(Sta. 2038+)

Mark	No	Size	Lgth	Bend
Standard Barrel				
aa	184	#5	6-6	A
bb	72	#5	12-0	B
cc	172	#4	36-3	STR.
dd	100	#7	33-0	D
ee	102	#7	25-9	Str.
ff	102	#7	7-0	Str.

APPROXIMATE QUANTITIES

STA.	Structure	Std No.	Sheet No.	Struct. Excav. C.Y.	Spec. Comp. C.Y.	Class A Conc. C.Y.	Reinf. Steel Lbs.
2155+	New 3-10x10x91'-6" Box Culv. 30° Skew Rt.	Spec. C1-10-3-30° C1-10-2a-30°	45	361.8 ~~370~~	✓ 560	✓ 39.624	48,696 ~~[illegible]~~
2038+	New 2-10'x4'x71'-0 Box Culv. 30° Skew Rt.	Spec. C1-10-2-30° CW1-3	45	241.1 ~~[illegible]~~	✓ 160	✓ 173.59	20,811 ~~[illegible]~~

REDUCED SIZE
DO NOT SCALE

STA 2155+
UNNAMED WASH No 2
SR-85

GENERAL NOTES

Construction - Std Specs. Ariz. Hwy. Dept. Edition of 1960
Reinforcing Steel shall be intermediate grade ASTM A15 & A305
All dimensions for reinforcing steel shall be from the surface of concrete to center of bars except when noted otherwise

JOINT NOTE:

All structures shall have Contraction or Cold Joints in the top slab and walls (Optional in floor slab) spaced not more than 40 feet apart or as shown. The joint may be made with ¼" plywood bulkhead which shall be left in place. Reinforcing steel shall project through the joint.

ALL CONCRETE CLASS "A"

		DATE
LAYOUT		
DESIGN		
ARCHITECTURE		
DRAWN	J.R.B.	5-61
TRACED		
CHECKED	N.A.B.	6-61
SHEET NO.	1 - 2	

ARIZONA HIGHWAY DEPARTMENT
BRIDGE DIVISION

STA. 2155+ & STA. 2038+
LOCATION & SPECIAL DETAILS

Registered Professional Engineer (Civil & Structural) CERTIFICATE EXPIRES MARTIN TONEY OCT. 31, 19__ ARIZONA, U.S.A.

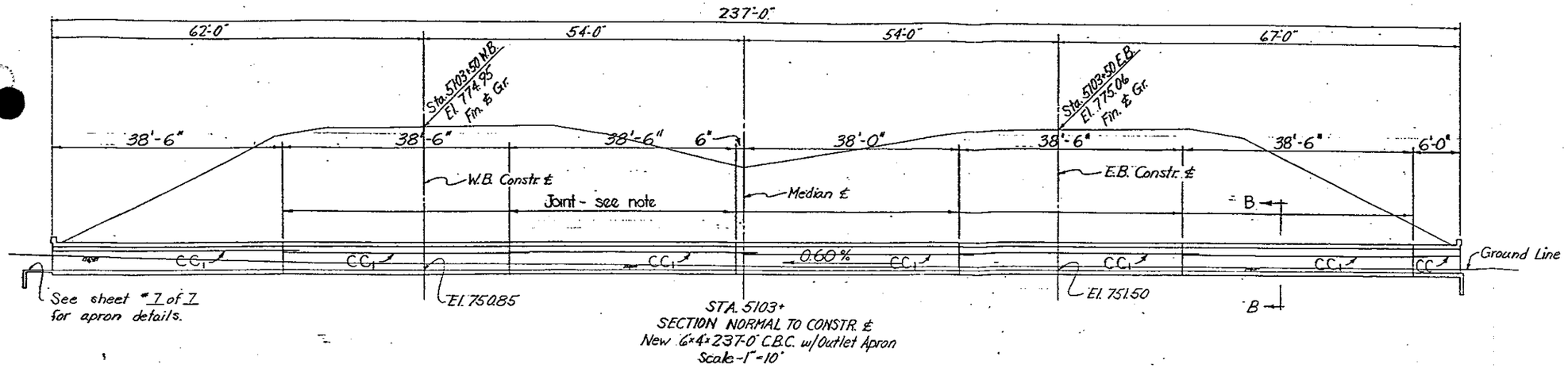
ADOT Structure
Sta. 5103+

Looking Upstream from Structure

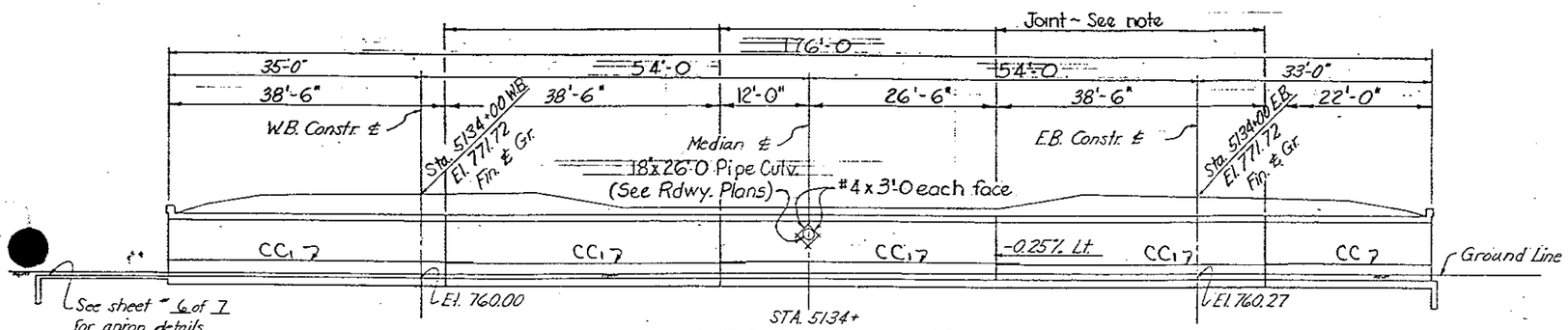
Looking at Inlet Structure

YUMA-CASA GRANDE HWY
MARICOPA COUNTY

FED. ROAD DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
7	ARIZONA	I-IG-8-2(44)	70	76	11-69 R.A.



STA. 5103+
SECTION NORMAL TO CONSTR. ℄
New 6×4×237'-0" C.B.C. w/Outlet Apron
Scale-1"=10'

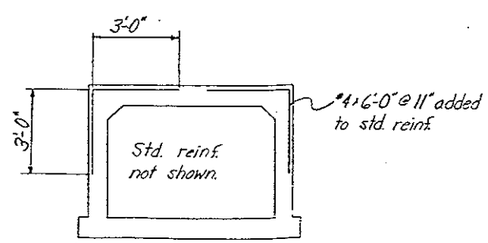


STA. 5134+
SECTION NORMAL TO CONSTR. ℄
New 4-10'x8'x176'-0" C.B.C. w/Outlet Apron

Scale-1"=10'

NOTE:
For joint note and details, see structure summary sheet.
—Tie bars shall have a min. lap of 1'-6".

NOTE—Sta. 5103+
For all other details, dimensions, bend diagrams & steel lists see Std. CI-6-1.
—Sta. 5134+
For all other bbl. details, dimensions, bend diagrams & steel lists see Std. CI-10-4. For all other hdwl. details, dimensions, bend diagrams & steel lists see Std. CW-2.
See roadway plans for special installation of guard rail over culvert.



SECTION B-B
Scale-3/8"=1'-0"

STA 5103+ Scott Ave Wash - West

STA 5134+ Sand Tank Wash - West

		DATE
LAYOUT		
DESIGN		
ARCHITECTURE	A. P. J.	1-66
DRAWN	Soll	9-66
TRACED		1-66
CHECKED		12-66

ARIZONA HIGHWAY DEPARTMENT
BRIDGE DIVISION

STAS. 5103+ & 5134+
LOCATION & SPECIAL DETAILS

SHEET NO. 1 OF 7 | BRIDGE NUMBER | DRAWING NUMBER | BRIDGE ENGINEER

ADOT Structure
Scott Avenue Wash

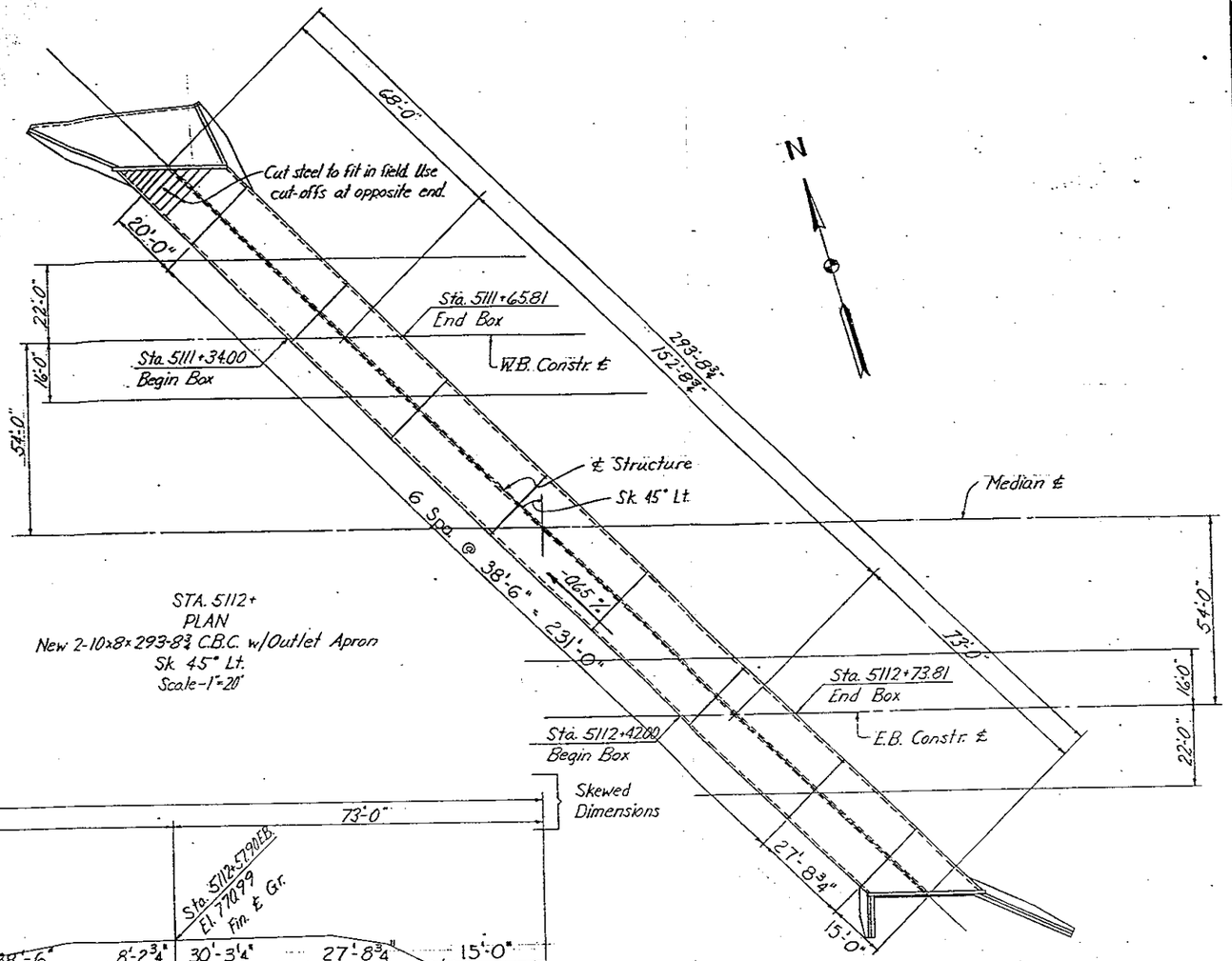
Looking Upstream from Structure

Looking at Inlet Structure

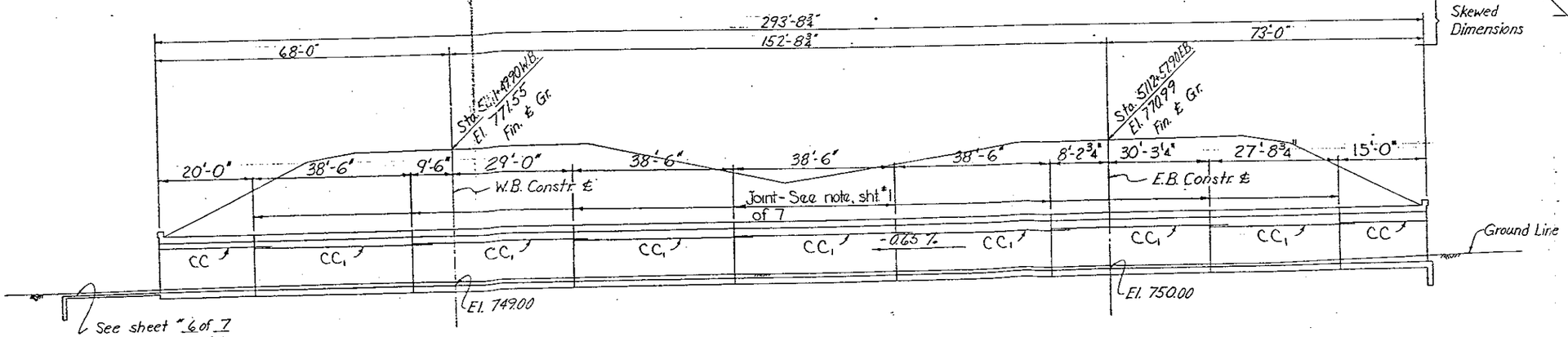
YUMA – CASA GRANDE HWY.
MARICOPA COUNTY

FED. ROAD DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
7	ARIZONA	I-IG-8-2(44)	71	76	11-69 A.A.

NOTE – Sta. 5112+
For all other bbl. details, dimensions, bend diagrams & steel lists see Std. CI-10-2.
For all other inlet hdwl. details, dimensions, bend diagrams & steel lists see Std. CW-7.
For all other outlet hdwl. details, dimensions, bend diagrams & steel lists see Std. CW-8.



STA. 5112+
PLAN
New 2-10x8x293-8¾ C.B.C. w/Outlet Apron
Sk. 45° Lt.
Scale-1"=20'



SECTION NORMAL TO ℄ RDWY.
Scale-1"=10'

STA 5112+ Scott AVE WASH (MAIN)

		DATE
LAYOUT		
DESIGN		
ARCHITECTURE	R.A.	1-68
DRAWN	B.W.	9-68
TRACED	C.J.	1-68
CHECKED	W.B.P.	12-68

SHEET NO. 2 OF 7

ARIZONA HIGHWAY DEPARTMENT
BRIDGE DIVISION

STA. 5112+
LOCATION & SPECIAL DETAILS

BRIDGE NUMBER | DRAWING NUMBER

Registered Professional Engineer (Civil) & Certificate Land Surveyor — MARTIN TUCKER — Dec. 31, 19 — Arizona, U.S.A. — BRIDGE ENGINEER

ADOT Structure
Sta. 5134+, Sand Tank Wash - West

Looking Upstream from Structure

Looking at Inlet Structure

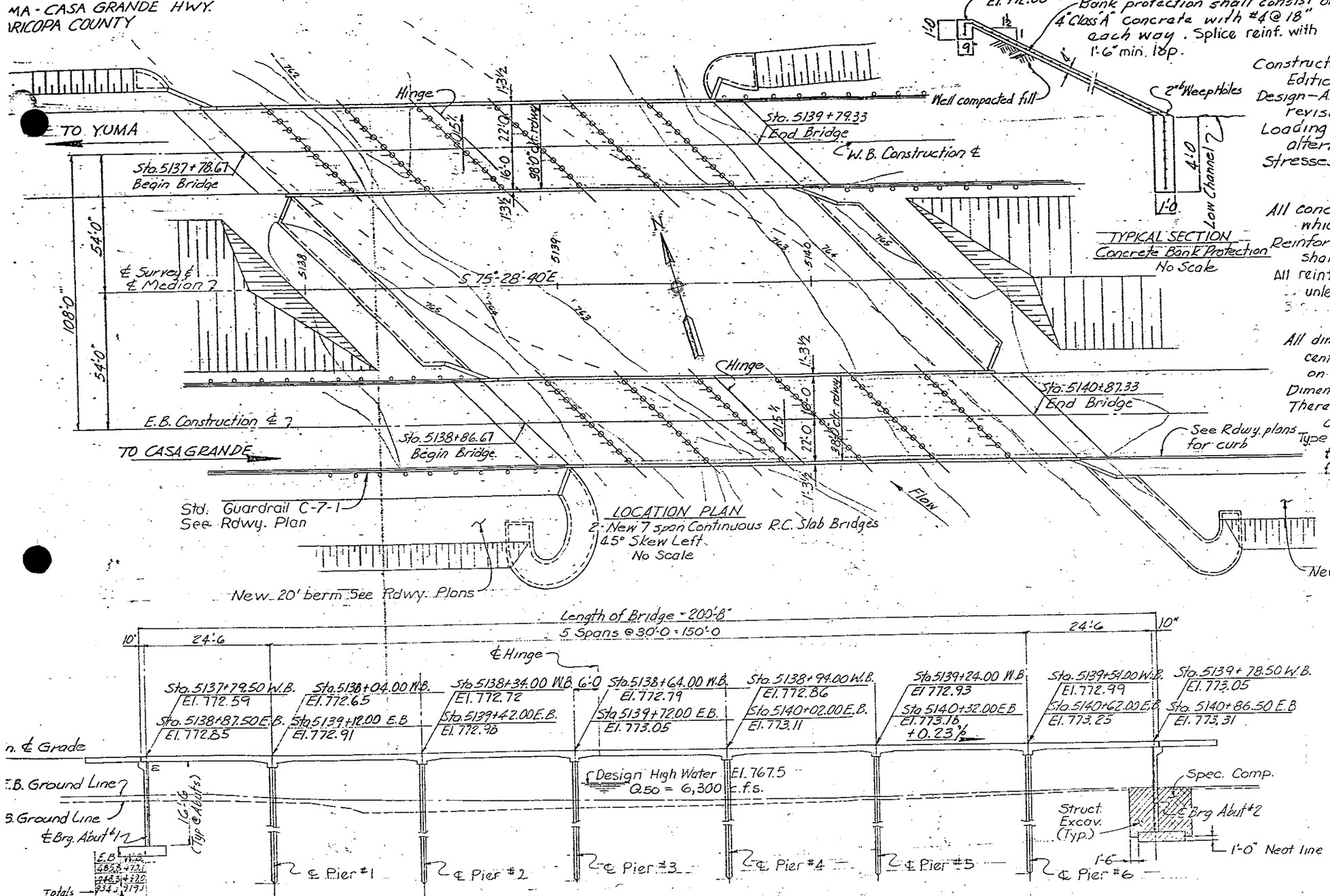
ADOT Structure
Sand Tank Wash

Looking Upstream from Structure

Looking at Bridge Structures

MA - CASA GRANDE HWY.
RICOPA COUNTY

		I-16-B-2(44)	47	76	11-69



TYPICAL SECTION
Concrete Bank Protection
No Scale

LOCATION PLAN
2-New 7 span Continuous R.C. Slab Bridges
45° Skew Left.
No Scale

GENERAL NOTES

Construction – Standard Spec's Arizona Highway Dept Edition of 1960, revised to date
Design – A.A.S.H.O. Std Spec's for Highway Bridges 1965, revised to date.
Loading Class – HS 20-44 and/or Interstate alternate loading.
Stresses – Class "A" Concrete - fc = 1000 p.s.i.; n = 12
Class "D" Concrete - fc = 1200 p.s.i.; n = 10
Reinforcing steel fs = 20,000 p.s.i.
All concrete shall be Class "A" except deck slab which shall be Class "D".
Reinforcing Steel shall be intermediate grade and shall conform to ASTM Spec's A15 and A305.
All reinforcing steel shall have 2" clear cover unless noted otherwise.

All dimensions for reinforcing steel shall be to center of bars except when noted otherwise on plans.
Dimensions shall not be scaled from the plans.
There shall be a minimum of 12" special compaction under approach slabs.
Type A Joint Filler is chemically or bituminous treated preformed expansion joint filler for concrete AASHO M153 Type III

TYP. SECTION THRU CONSTR. ℄
Scale: 1" = 10'-0

PILE NOTES

All piles shall be 14" ϕ C.I.P. Concrete piles as per Std. CP-6 or as detailed on Sheet 4 of 11.
Minimum bearing shall be 32 tons.
Estimated tip elevation shall be to Elev. 743.0'
Estimated length 30'.
Any pile which is driven to a bearing of 1¾ times the bearing given on the plans and which reaches a tip elev. within 3 feet of the estimated tip elevation shall be considered acceptable.

APPROXIMATE QUANTITIES

ITEM	STRUCT. EXCAV. C.Y.	SPEC. COMP. C.Y.	CONCRETE C.Y. Class "A"	CONCRETE C.Y. Class "D"	REINF. STEEL LBS.	Metal Hdrl. H-2-1 Lin. Ft.	14" ϕ C.I.P. Conc. Piles No.	14" ϕ C.I.P. Conc. Piles Lin. Ft.
ABUT #1	450	330	132.81		12,410			
ABUT #2	450	330	132.81		12,410			
PIERS (6)							60	1800
DECK			16.57	401.12	109,480	357.67		
APPRO. SLABS			34.29		3,585			
	1553.2							
TOTAL 1-BR	3000	660	316.43	401.12	137,885	357.67	60	1800
TOTAL 2-BR	3000	1320	632.86	802.24	275,770	715.34	120	3600

462 Total Lin. Ft. Concrete Bank Protection (Measured @ toe)

STA- 5138+
SAND TANK WASH - MAIN

		DATE
LAYOUT		
DESIGN	HGK	4-64
ARCHITECTURE		
DRAWN	RGH	4-64
TRACED		
CHECKED	DPK	6-64
RECOMMENDED		
SHEET NO. 7 OF 11		

ARIZONA HIGHWAY DEPARTMENT
BRIDGE DIVISION
EB & WB STA. 5138+
SAND TANKS WASH BRIDGES
LOCATION PLAN
BRIDGE NUMBER
DRAWING NUMBER
BRIDGE ENGINEER

I-IG 8-2(44)
SHEET NO. 7 OF 10
BRIDGE NUMBER
DRAWING NUMBER
BRIDGE ENGINEER

ADOT Structure
Sta 5145+, Sand Tank Wash - East

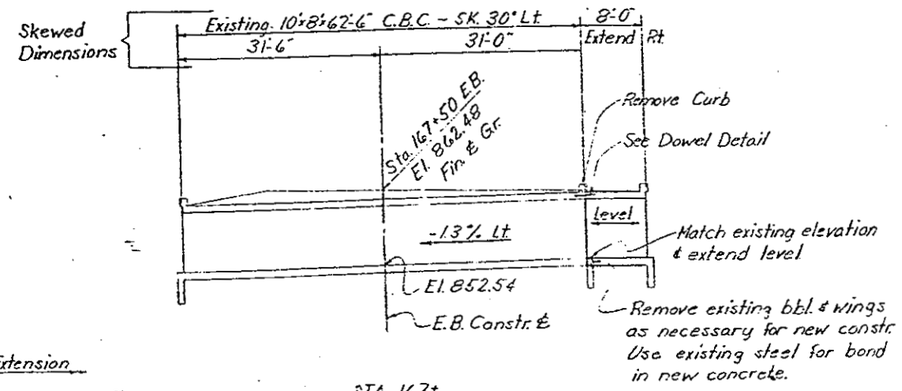
Looking Upstream from Structure

Looking at Inlet Structure

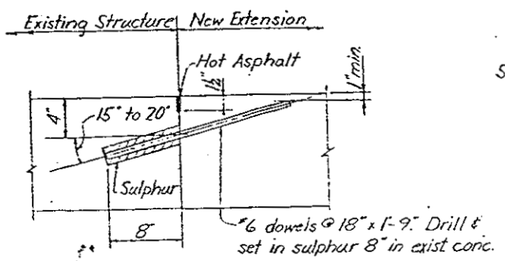
YUMA-CASA GRANDE HWY
MARICOPA COUNTY

FED. ROAD DIV. NO.	STATE	PROJECT NO	SHEET NO.	TOTAL SHEETS	FN. SUFFIX
7	ARIZONA	I-IG-8-2(44)	74A	76	11-0 & 4-4

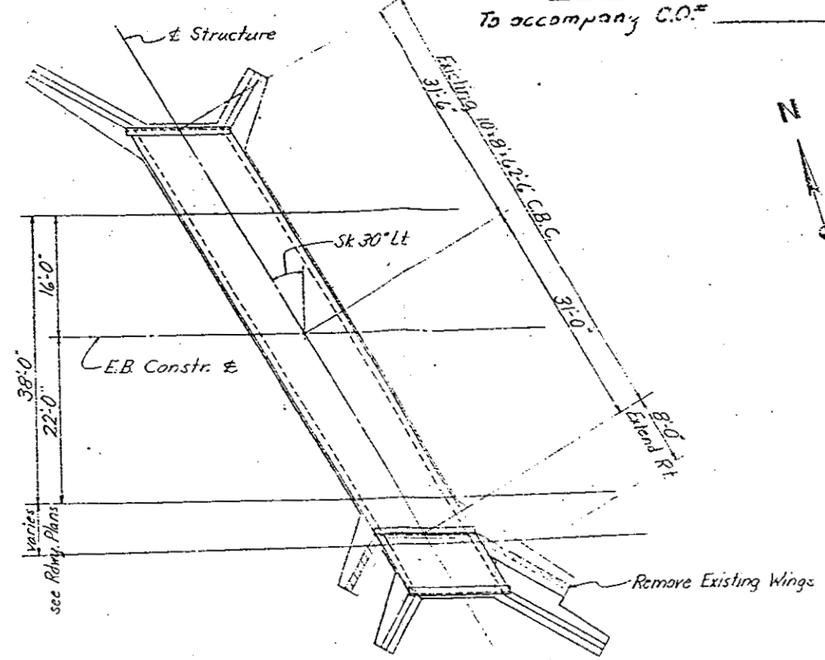
To accompany C.O.# _____



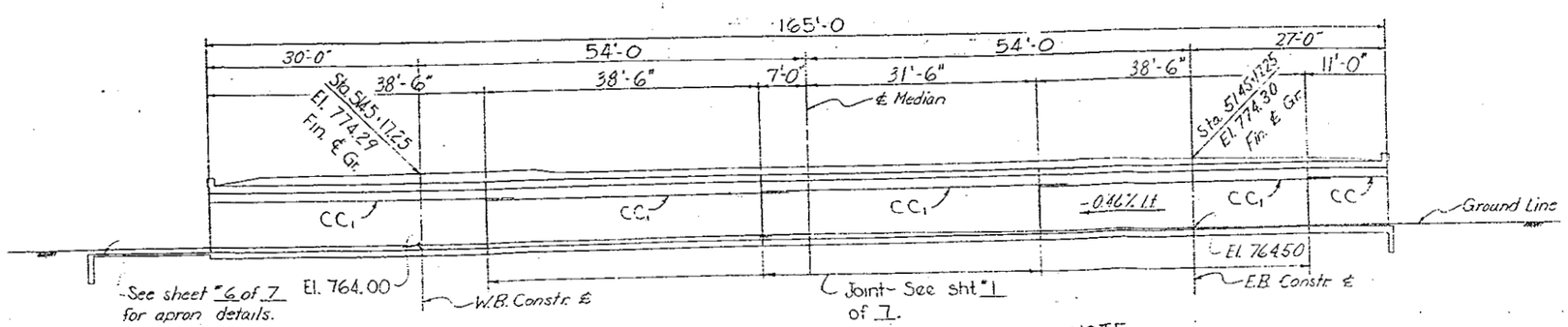
STA. 167+
SECTION NORMAL TO CONSTR. ℄
Scale - 1" = 10'



DOWEL DETAIL
Scale - 1/2" = 1'-0"



STA. 167+
PLAN
Existing 10'x8'x62'-6" C.B.C. - Skew 30° Lt.
Extend 8'-0" Rt
Scale - 1" = 10'



STA. 5145+
- SECTION ON ℄ STRUCTURE
New 10'x8'x165'-0 w/Outlet Apron
3 Scale - 1" = 10'

NOTE
See roadway plans for special installation of guard rail over culvert.

NOTE - Sta. 5145+
For all other bhl details, dimensions, bend diagrams & steel lists see Std CI-10 3 For all other hdwl. details, dimensions, bend diagrams & steel lists see Std CW-2.
- Sta. 167+
For all other details, dimensions, bend diagrams & steel lists see Std. CI-10-1-30° Sk.

C.O.
S

STA 5145+ SAND TANK WASH - EAST

ARIZONA HIGHWAY DEPARTMENT
BRIDGE DIVISION

5A

ADOT Structure
Sta. 5163+, Bender Wash West #2

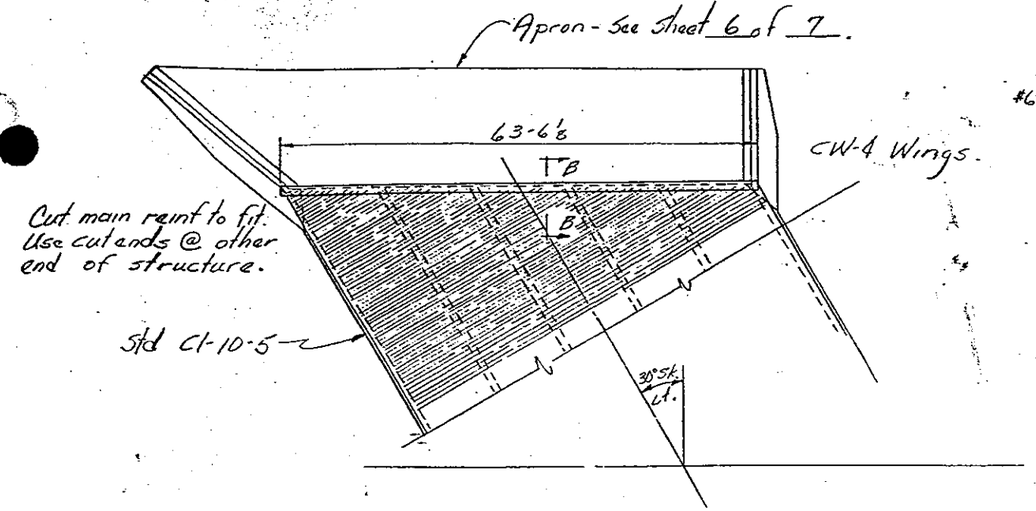
Looking Upstream from Structure

Looking at Inlet Structure

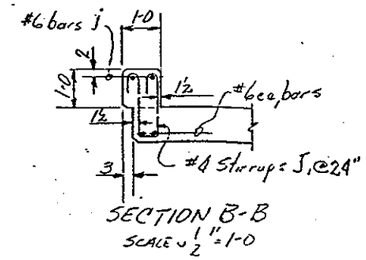
YUMA-CASA GRANDE HWY.
MARICOPA COUNTY

FED. ROAD DIST. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	ID NO.
7	ARIZONA	I-10-6-2(8)	7A	76	11-534A

To accompany C.O. # 1

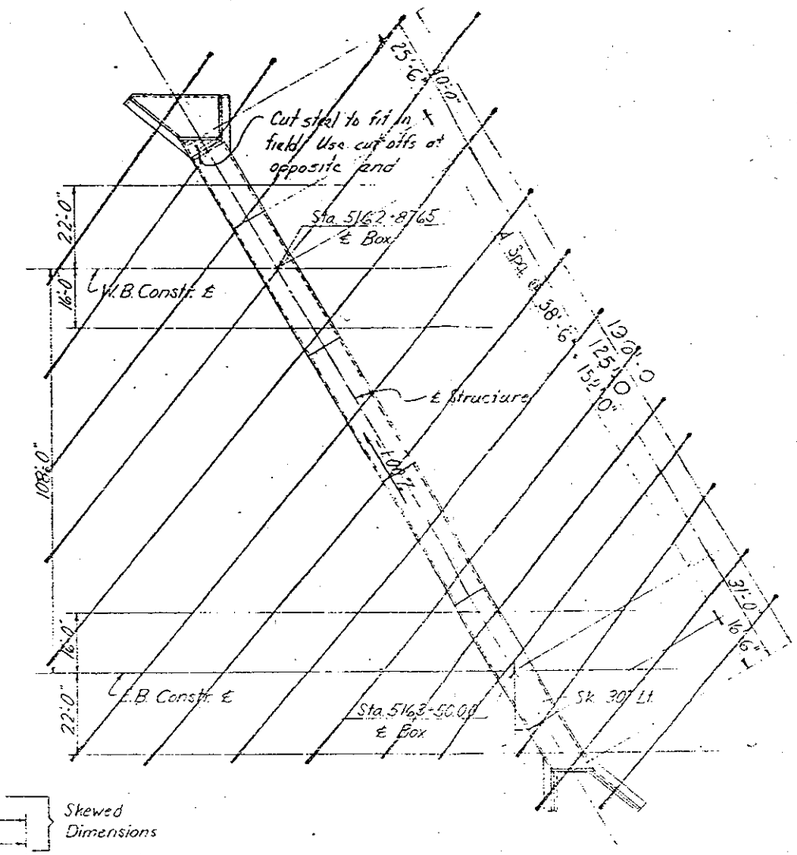


STA 6151+
PART PLAN
SCALE - 1" = 10'-0

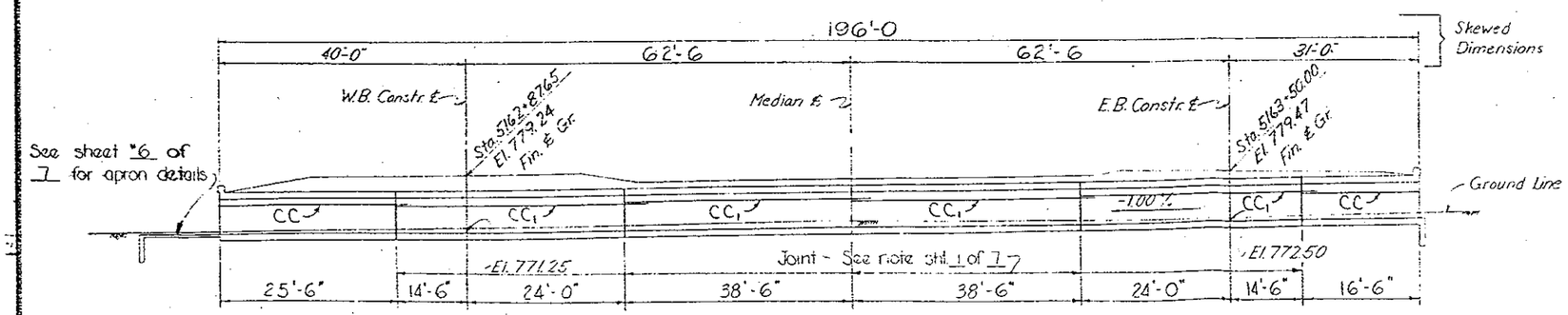


SECTION B-B
SCALE - 1½" = 1'-0

NOTE - Sta. 5163+
For all other bbl. details, dimensions, bend diagrams, & steel lists see ~~Std. CI-8-1~~ Std. CI-10-4 30° Sk.
For all other hdwl. details, dimensions, bend diagrams, & steel lists see Std. CW-3.



~~Sta. 5163~~
~~Skew~~
~~New 5'x5'x 126'-0 w/Outlet Apron~~
~~Skew 50° Lt.~~
~~Scale 1"=10'~~



STA. 5163+
SECTION NORMAL TO CONSTR. ℄
Scale - 1" = 10'
New 4-10'x5'x 196'-0 w/Outlet apron.
Skew 50° Lt.

4-10'x5'

STA 5163+ Bender Wash (west)

LAYOUT / DESIGN / ARCHITECTURAL / DRAWN / TRACED / CHECKED	ARIZONA HIGHWAY DEPARTMENT BRIDGE DIVISION STA 5163+ & 6151+	BRIDGE ENGINEER

ADOT Structure
Bender Wash

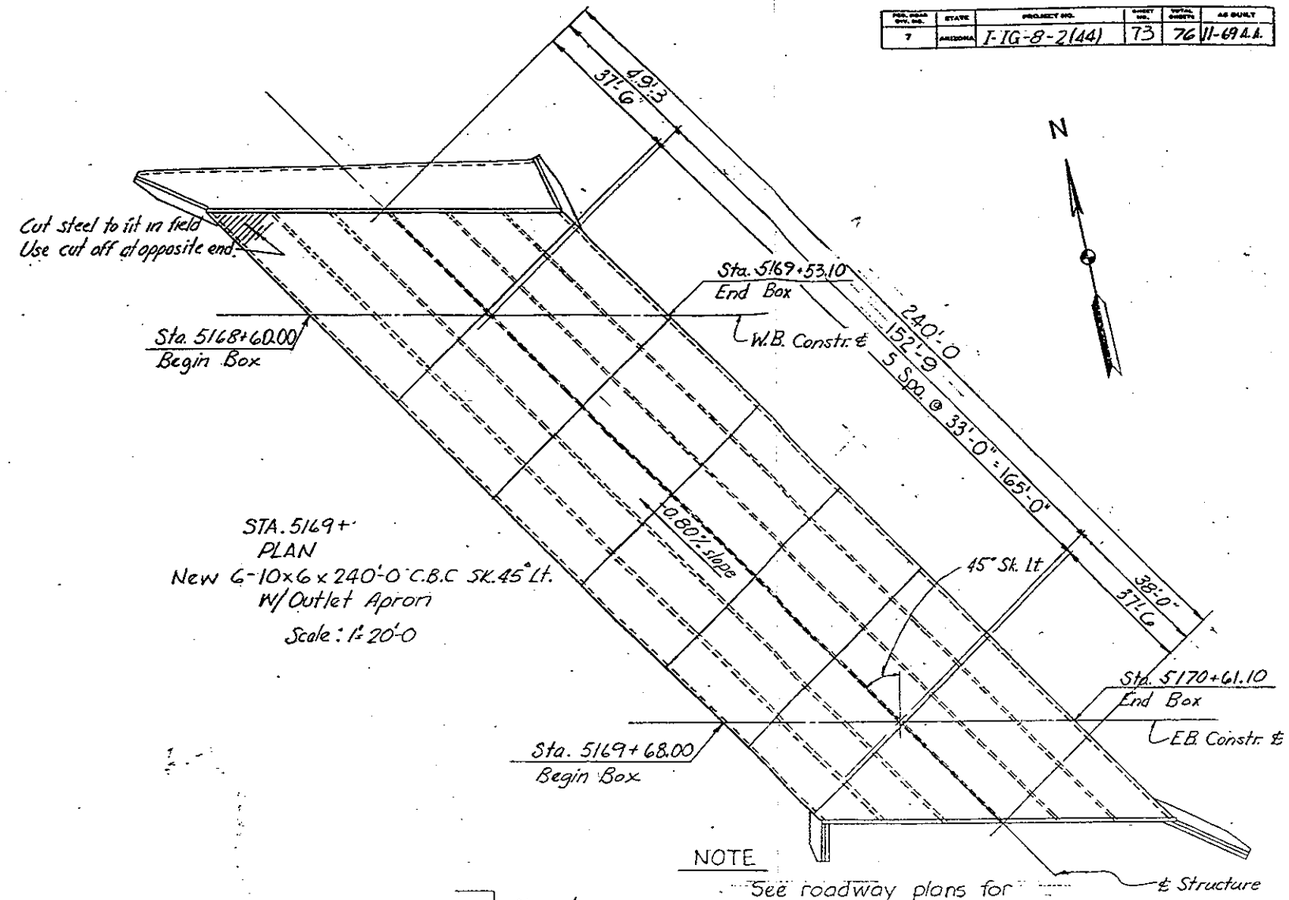
Looking Upstream from Structure

Looking at Inlet Structure

YUMA-CASA GRANDE HWY.
MARICOPA COUNTY

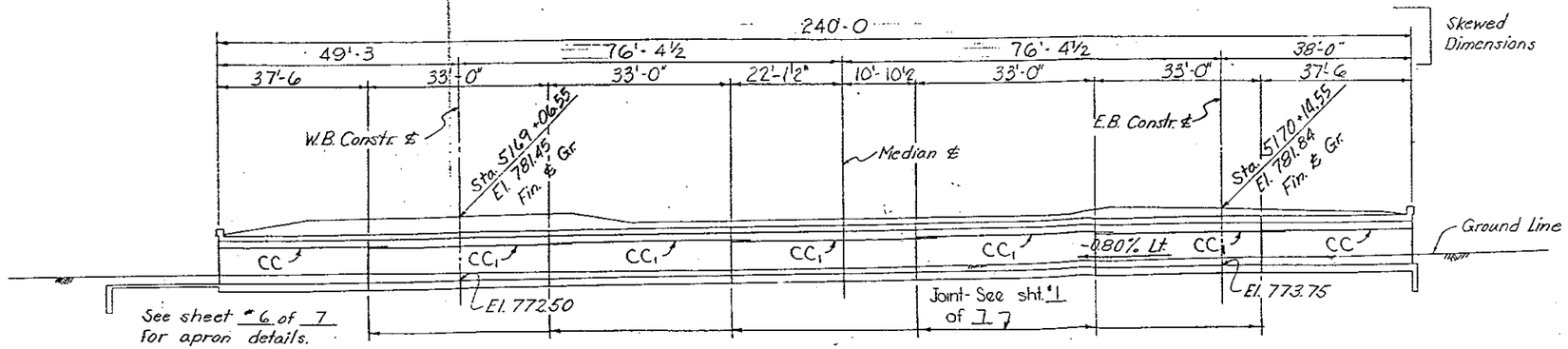
FED. ROAD STATE ROUTE	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
7	ARIZONA	I-IG-8-2(44)	73	76	11-69 A.A.

NOTE- Sta. 5169+
For all other bbl. details, dimensions, bend diagrams & steel lists see Std. C1-10-6. For all other hdwl. details, dimensions, bend diagrams & steel lists see Stds. CW-7 & CW-8.



STA. 5169+
PLAN
New 6-10x6x240'-0" C.B.C Sk. 45° Lt.
W/ Outlet Apron
Scale: 1"=20'-0

NOTE
See roadway plans for special installation of guard rail over culvert.



SECTION NORMAL TO CONSTR. ℄
Scale- 1"=10'

STA 5169+ Bender Wash (MAIN)

		DATE
LAYOUT		
DESIGN		
ARCHITECTURE	A.P.J.	
DRAWN	BOH	12-64
TRACED	C.L.S.	
CHECKED		12-64

SHEET NO. 4 OF 7

ARIZONA HIGHWAY DEPARTMENT
BRIDGE DIVISION

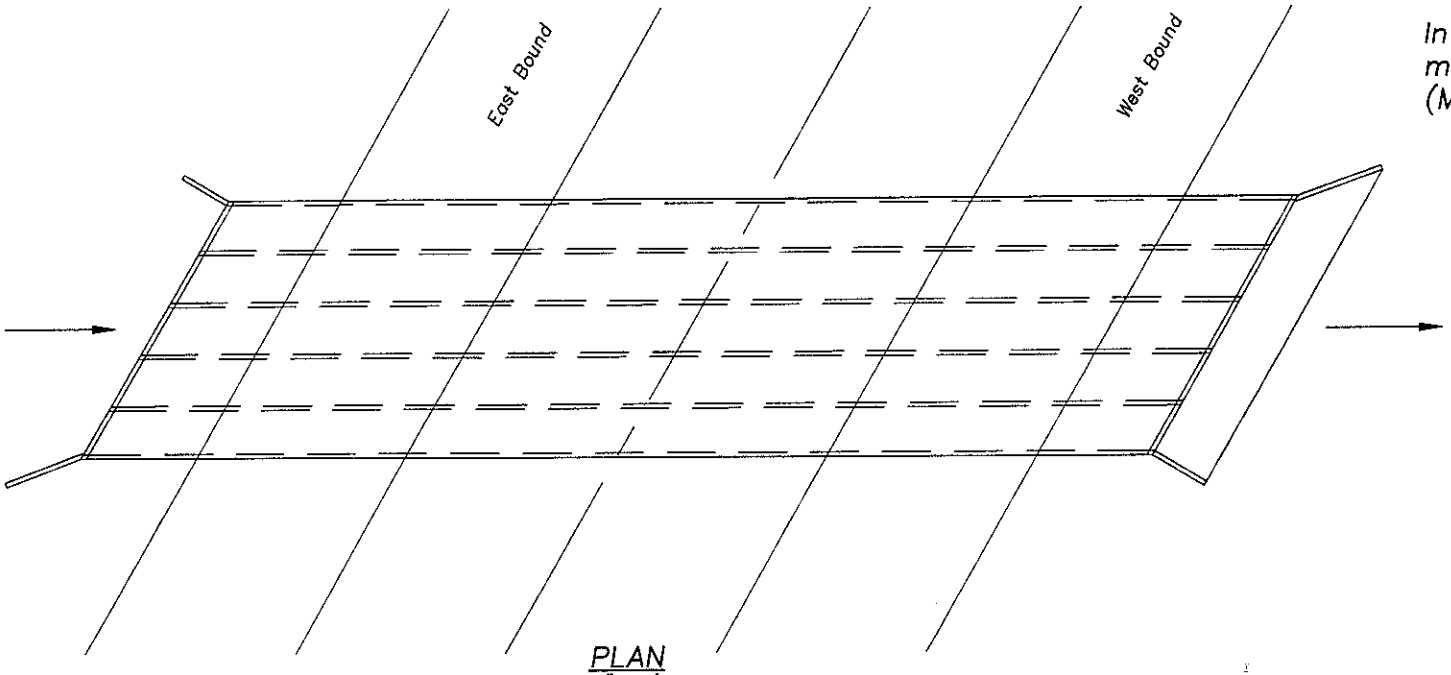
STA. 5169+
LOCATION & SPECIAL DETAILS

BRIDGE NUMBER | DRAWING NUMBER

BRIDGE ENGINEER

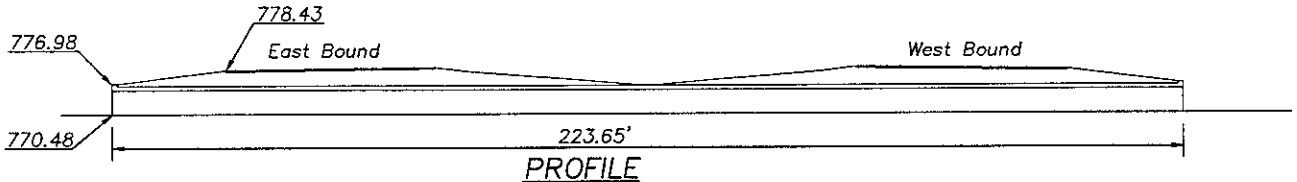
ADOT Highway Structure
I-8 (Sta 5161+15)

INTERSTATE 8 STRUCTURE
MED. STA 5161+15 TO 5161+78.5
FIVE BARREL 10'x5' BOX CULVERT

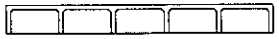


PLAN
1"=40'

Information obtained from field measurements by EEC. (March 2000)



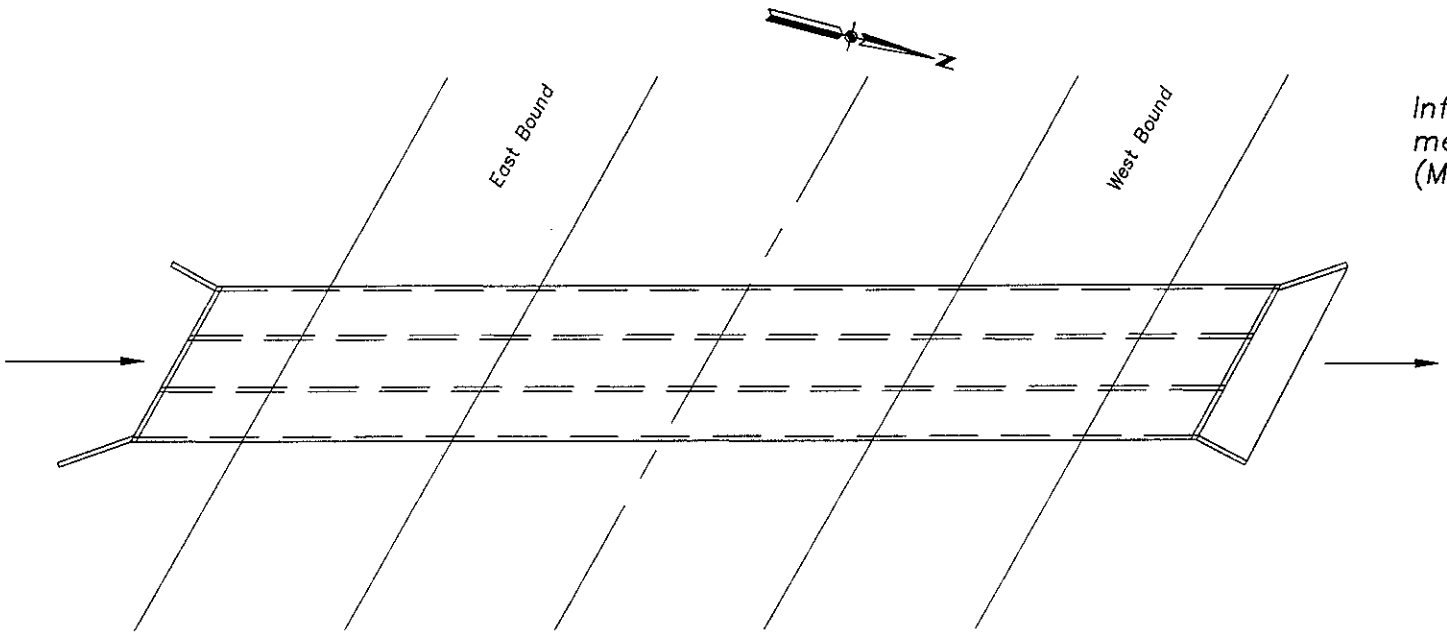
PROFILE
1"=40'



ELEVATION
1"=40'

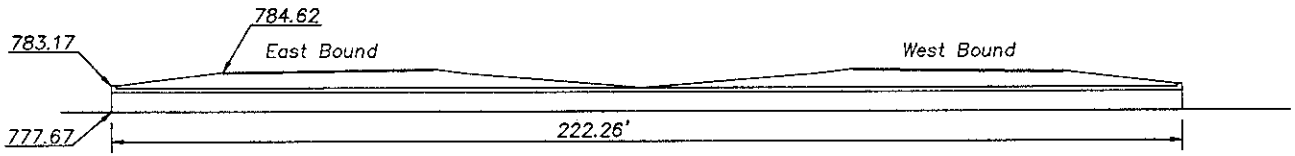
ADOT Highway Structure
I-8 (Sta. 5176+70)

INTERSTATE 8 STRUCTURE
MED. STA 5176+70.00 TO 5177+08.50
THREE BARREL 10'x4' BOX CULVERT

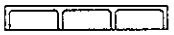


Information obtained from field measurements by EEC. (March 2000)

PLAN
1"=40'

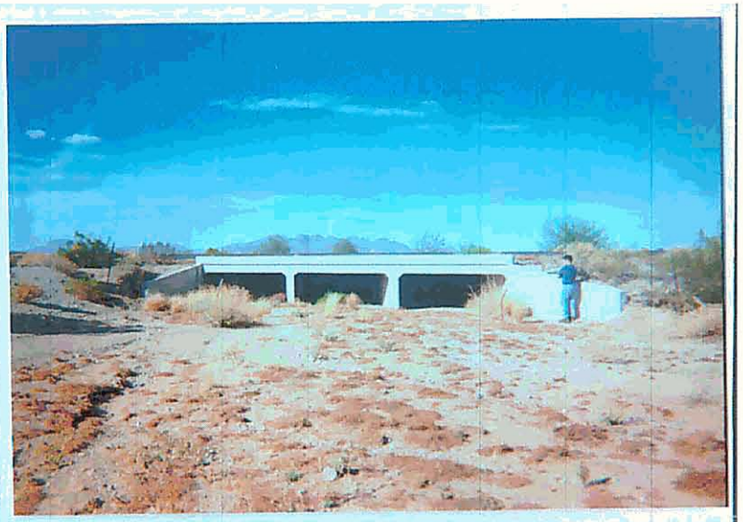


PROFILE
1"=40'



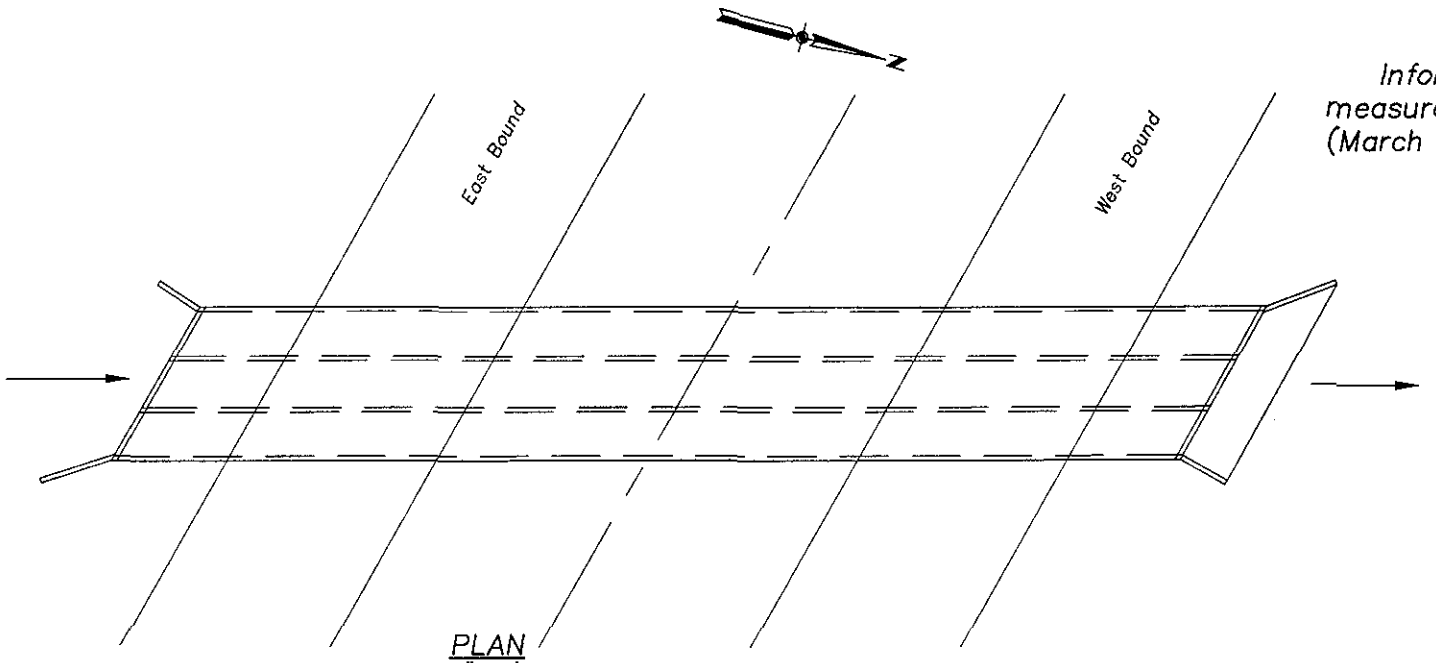
ELEVATION
1"=40'

ADOT Highway Structure
I-8 (Sta. 5181+10.00)

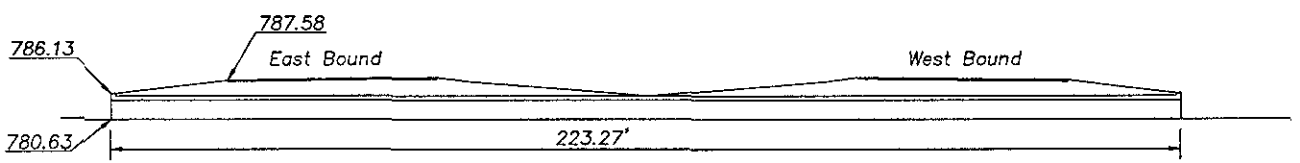


INTERSTATE 8 STRUCTURE
MED. STA 5181+10.00 TO 5181+48.50
THREE BARREL 10'x4' BOX CULVERT

Information obtained from field measurements by EEC. (March 2000)



PLAN
1"=40'



PROFILE
1"=40'

ELEVATION
1"=40'

Appendix E.5
HYDRAULIC CALCULATIONS

HYDRAULIC ANALYSIS
BENDER WASH MAIN CHANNEL

PREMIER
ENGINEERING CORPORATION

BENDER WASH
Split Flow Computation Worksheet 8/30/00 11:30

Xsection ID	Weir Elev.	Culvert Invert Elevation	CWSE	Weir Depth ft	Weir Avg Depth ft	Depth at Culvert ft		Weir Length ft	Eff. Weir Length ft	Weir Discharge cfs	Culvert Discharge cfs	Total Flow cfs
1.904	776.9	772	777.15	0.25		5.15					768	3581
					0.125		0.3521127	135	47.53521127	16		
1.93	777.6	772.5	777.14	-0.46		4.64					457	4054
					0		1	80	80	0		
1.968	778.5	N/A	778.42	-0.08		N/A						4054
					0		1	85	85	0		
2.013 ~~2.024~~	779.4	775.4	778.74	-0.66		3.34					1007	5060
					0		1	180	180	0		
2.089	780.5	N/A	780.06	-0.44		N/A						5060
					0.125		0.3623188	840	304.3478261	98		
2.184 ~~4~~	784.5	N/A	784.75	0.25		N/A						5159
					0.335		1	360	360	185		
2.27 ~~64~~	786.91	N/A	787.33	0.42		N/A						5344
					0.21		0.2427746	730	177.2254335	186		
2.32 ~~69~~	791.2	N/A	789.89	-1.31		N/A						5530
3.291	824.32	N/A	820.6	-3.72		N/A						3970
					0		1	450	450	0		
3.398	825.82	N/A	825.46	-0.34		N/A						3970
					0		1	480	480	0		
3.48	830.1	N/A	830.03	-0.07		N/A						3970
					0		1	420	420	0		
3.577	833.32	N/A	832.98	-0.34		N/A						3970
					0		1	780	780	0		
3.661	839.2	N/A	836.72	-2.48		N/A						3970

Total Weir Flow to Sand Tank Wash	485
Flow to Sand Tank Wash @ I-8	2813
Total Diversion to Sand Tank Wash	3298

Bender Wash Flow Split Rating Curve

Inflow, cfs	Diversion to Sand Tank Wash, cfs
0	0
2100	887
3000	1536
4000	2380
5000	3278
5530	3298
6000	4171

PREMIER
ENGINEERING CORPORATION

BENDER WASH
Side Weir Split Flow Computation Worksheet 8/30/00 9:03

Xsection ID	Weir Elev.	Culvert Invert Elevation	CWSE	Weir Depth ft	Weir Avg Depth ft	Depth at Culvert ft	Weir Length ft	Eff. Weir Length ft	Weir Discharge cfs	Culvert Discharge cfs	Total Flow cfs
1.904	776.9	772	774.57	-2.33		2.57				183.57143	1070
					0		135	135	0		
1.93	777.6	772.5	776.02	-1.58		3.52				233.42175	1304
					0		80	80	0		
1.968	778.5	N/A	777.08	-1.42		N/A					1304
					0		85	85	0		
2.~~024~~013	779.4	775.4	777.64	-1.76		2.24				796.15385	2100
					0		180	180	0		
2.089	780.5	N/A	779.78	-0.72		N/A					2100
					0		840	840	0		
2.18~~64~~4	784.5	N/A	784	-0.5		N/A					2100
					0		360	360	0		
2.27~~84~~4	786.91	N/A	786.85	-0.06		N/A					2100
					0		730	730	0		
2.32~~69~~9	791.2	N/A	788.82	-2.38		N/A					2100

Total Weir Flow to Sand Tank Wash	0
Flow to Sand Tank Wash @ I-8	887
Total Diversion to Sand Tank Wash	887

PREMIER
ENGINEERING CORPORATION

BENDER WASH
Side Weir Split Flow Computation Worksheet 8/30/00 9:03

Xsection ID	Weir Elev.	Culvert Invert Elevation	CWSE	Weir Depth ft	Weir Avg Depth ft	Depth at Culvert ft	Weir Length ft	Eff. Weir Length ft	Weir Discharge cfs	Culvert Discharge cfs	Total Flow cfs
1.904	776.9	772	775.03	-1.87		3.03				216.42857	1725
					0		135	135	0		
1.93	777.6	772.5	776.77	-0.83		4.27				369.04762	2094
					0		80	80	0		
1.968	778.5	N/A	777.7	-0.8		N/A					2094
					0		85	85	0		
2.0~~24~~13	779.4	775.4	778.07	-1.33		2.67				878.84615	2972
					0		180	180	0		
2.089	780.5	N/A	779.86	-0.64		N/A					2972
					0		840	840	0		
2.18~~64~~	784.5	N/A	784.33	-0.17		N/A					2972
					0.045		360	124.6153846	9		
2.27~~54~~	786.91	N/A	787	0.09		N/A					2982
					0.045		730	31.58653846	18		
2.32~~69~~9	791.2	N/A	789.21	-1.99		N/A					3000

Total Weir Flow to Sand Tank Wash	28
Flow to Sand Tank Wash @ I-8	1508
Total Diversion to Sand Tank Wash	1536

PREMIER
ENGINEERING CORPORATION

BENDER WASH
Side Weir Split Flow Computation Worksheet 8/30/00 9:04

Xsection ID	Weir Elev.	Culvert Invert Elevation	CWSE	Weir Depth ft	Weir Avg Depth ft	Depth at Culvert ft	Weir Length ft	Eff. Weir Length ft	Weir Discharge cfs	Culvert Discharge cfs	Total Flow cfs
1.904	776.9	772	775.25	-1.65		3.25				232.14286	2490
					0		135	135	0		
1.93	777.6	772.5	777.1	-0.5		4.6				447.61905	2938
					0		80	80	0		
1.968	778.5	N/A	778.05	-0.45		N/A					2938
					0		85	85	0		
2.0~~24~~13	779.4	775.4	778.39	-1.01		2.99				940.38462	3878
					0		180	180	0		
2.089	780.5	N/A	779.93	-0.57		N/A					3878
					0.02		840	55.08196721	6		
2.18~~84~~	784.5	N/A	784.54	0.04		N/A					3885
					0.13		360	360	45		
2.27~~84~~	786.91	N/A	787.13	0.22		N/A					3929
					0.11		730	85.42553191	71		
2.32~~89~~	791.2	N/A	789.54	-1.66		N/A					4000

Total Weir Flow to Sand Tank Wash	122
Flow to Sand Tank Wash @ I-8	2258
Total Diversion to Sand Tank Wash	2380

PREMIER
ENGINEERING CORPORATION

BENDER WASH
Side Weir Split Flow Computation Worksheet

8/30/00 9:04

Xsection ID	Weir Elev.	Culvert Invert Elevation	CWSE	Weir Depth ft	Weir Avg Depth ft	Depth at Culvert ft	Weir Length ft	Eff. Weir Length ft	Weir Discharge cfs	Culvert Discharge cfs	Total Flow cfs
1.904	776.9	772	775.43	-1.47		3.43				245	3202
					0		135	135	0		
1.93	777.6	772.5	777.28	-0.32		4.78				490.47619	3692
					0		80	80	0		
1.968	778.5	N/A	778.3	-0.2		N/A					3692
					0		85	85	0		
2.024\3	779.4	775.4	778.63	-0.77		3.23				986.53846	4679
					0		180	180	0		
2.069	780.5	N/A	780	-0.5		N/A					4679
					0.095		840	231.3043478	65		
2.18~~64~~	784.5	N/A	784.69	0.19		N/A					4744
					0.26		360	360	126		
2.27~~54~~	786.91	N/A	787.24	0.33		N/A					4870
					0.165		730	137.6571429	130		
2.32~~69~~	791.2	N/A	789.78	-1.42		N/A					5000

Total Weir Flow to Sand Tank Wash	321
Flow to Sand Tank Wash @ I-8	2957
Total Diversion to Sand Tank Wash	3278

PREMIER
ENGINEERING CORPORATION

BENDER WASH
Side Weir Split Flow Computation Worksheet 8/30/00 9:04

Xsection ID	Weir Elev.	Culvert Invert Elevation	CWSE	Weir Depth ft	Weir Avg Depth ft	Depth at Culvert ft	Weir Length ft	Eff. Weir Length ft	Weir Discharge cfs	Culvert Discharge cfs	Total Flow cfs
1.904	776.9	772	775.57	-1.33		3.57				269.44444	3852
					0		135	135	0		
1.93	777.6	772.5	777.44	-0.16		4.94				537.03704	4389
					0.005		80	4.705882353	0		
1.968	778.5	N/A	778.51	0.01		N/A					4389
					0.005		85	1.465517241	0		
2.024~~1~~3	779.4	775.4	778.83	-0.57		3.43				1022.0339	5411
					0		180	180	0		
2.089	780.5	N/A	780.11	-0.39		N/A					5411
					0.155		840	372	136		
2.18~~0~~4	784.5	N/A	784.81	0.31		N/A					5547
					0.39		360	360	232		
2.27~~5~~4	786.91	N/A	787.38	0.47		N/A					5780
					0.235		730	201.8235294	220		
2.32~~6~~9	791.2	N/A	789.97	-1.23		N/A					6000

Total Weir Flow to Sand Tank Wash	589
Flow to Sand Tank Wash @ I-8	3583
Total Diversion to Sand Tank Wash	4171

FLOW DISTRIBUTION PRINTOUT FOR ESTIMATE OF FLOWS TO BENDER WASH CULVERTS D + E (2 EASTERNMOST CULVERTS) UNDER I-8

Plan: Bender Main River: Bender Wash Reach:Main Channel Riv Sta: 2.326 Profile: PF 1

Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	% Conv.	Hydr D. (ft)	Velocity (ft/s)
0.00	[illegible]	2387.61	652.83	660.02	43.18	0.99	3.66
LB 1857.57	RB 1918.57	1373.46	261.37	62.48	24.84	4.28	5.25
1918.57	1980.07	632.33	142.74	61.52	11.43	2.32	4.43
1980.07	2041.56	325.74	95.89	61.54	5.89	1.56	3.40
2041.56	2103.06	232.00	78.20	61.50	4.20	1.27	2.97
2103.06	2164.55	293.82	90.40	61.99	5.31	1.47	3.25
2164.55	2226.05	168.79	64.67	61.63	3.05	1.05	2.61
2226.05	2287.55	111.57	50.42	61.56	2.02	0.82	2.21
2287.55	2349.04	4.68	4.95	21.69	0.08	0.23	0.94

FLOW RIGHT OF STA. 2200 = 188 CFS.

Plan: Bender Main River: Bender Wash Reach:Main Channel Riv Sta: 2.275 Profile: PF 1

Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	% Conv.	Hydr D. (ft)	Velocity (ft/s)
84.78	1689.35	3765.58	968.25	1035.55	70.46	0.94	3.89
LB 1689.35	RB 1790.21	899.02	207.13	101.80	16.82	2.05	4.34
1790.21	1859.47	115.12	44.41	69.05	2.15	0.64	2.59
1859.47	1928.74	317.65	81.75	69.27	5.94	1.18	3.89
1928.74	1998.01	129.63	47.78	69.39	2.43	0.69	2.71
1998.01	2067.27	83.85	31.86	48.42	1.57	0.67	2.63
2067.27	2136.54	3.75	4.90	47.47	0.07	0.10	0.77
2136.54	2205.80	29.40	18.05	56.38	0.55	0.32	1.63

FLOW RIGHT OF STA. 2074 = 33 CFS.

Plan: Bender Main River: Bender Wash Reach:Main Channel Riv Sta: 2.186 Profile: PF 1

Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	% Conv.	Hydr D. (ft)	Velocity (ft/s)
38.64	167.4.64	4113.11	1574.42	1597.26	79.73	0.99	2.61
LB 167.4.64	RB 1713.08	542.88	133.56	39.83	10.52	3.47	4.06
1713.08	1783.69	221.38	83.18	70.62	4.29	1.18	2.66
1783.69	1854.31	228.31	84.81	70.79	4.43	1.20	2.69
1854.31	1924.92	33.77	25.36	60.86	0.65	0.42	1.33
1924.92	1995.54	12.56	14.87	70.61	0.24	0.21	0.84
1995.54	2066.15	1.44	3.58	51.73	0.03	0.07	0.40
2066.15	2136.76						
2136.76	2207.38	5.54	6.43	29.65	0.11	0.22	0.86

FLOW RIGHT OF STA 1888 = 37 CFS.

FLOW DISTRIBUTION FOR ESTIMATE OF BENDER WASH BREAKOUT FLOW AT CROSS SECTION 3.480

Plan: Bender Main River: Bender Wash Reach:Main Channel Riv Sta: 3.480 Profile: PF 1

Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	% Conv.	Hyd. D. (ft)	Velocity (fps)
0.00	741.58	2010.29	739.29	529.42	50.64	1.40	2.72
LEW 741.58	FIR 876.42	874.79	320.29	134.86	22.03	2.38	2.73
876.42	940.20	339.50	121.83	63.78	8.55	1.91	2.79
940.20	1003.99	371.63	128.62	63.78	9.36	2.02	2.89
1003.99	1067.77	255.68	102.77	63.79	6.44	1.61	2.49
1067.77	1131.56	86.97	53.81	63.79	2.19	0.84	1.62
1131.56	1195.34	22.38	23.83	63.78	0.56	0.37	0.94
1195.34	1259.12	7.80	12.66	63.78	0.20	0.20	0.62
1259.12	1322.91	0.97	3.46	56.72	0.02	0.06	0.28

FLOW RIGHT OF STA. 1140 = 28 CFS.

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION

August 31, 2000
BENDER WASH BREAKOUT AT XS 3.480
TO BENDER NORTH TRIBUTARY
Q100 = 18 CFS +/-

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second)	18.0
Channel Bottom Slope (feet per foot)	0.0067
Manning`s Roughness Coefficient (n-value)	0.0400
Channel Side Slope - Left Side (horizontal/vertical)	32.50
Channel Side Slope - Right Side (horizontal/vertical)	60.00
Channel Bottom Width (feet)	0.0

==========

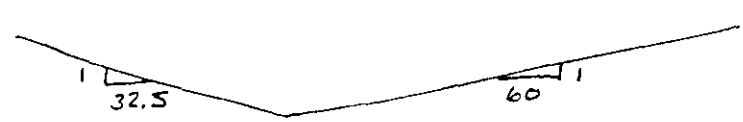
PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet)	0.55
Flow Velocity (feet per second)	1.29
Froude Number (Flow is Sub-Critical)	0.434
Velocity Head (feet)	0.03
Energy Head (feet)	0.58
Cross-Sectional Area of Flow (square feet)	13.96
Top Width of Flow (feet)	50.82

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TYPICAL SECTION OF BREAKOUT FLOW PATH:



C82 Summary Data

Flow	Bender Wash (C82 at I-8) Flow Depth (feet)					
	A	B	C	D	E	Weir
0.00	0.00	0.00	0.00	0.00	0.00	5.70
250.00	3.50	3.77	0.26	2.39	1.91	6.25
500.00	4.40	4.82	0.95	3.63	3.81	6.50
750.00	5.10	5.63	2.00	4.67	4.85	6.69
1000.00	5.80	6.44	3.30	5.71	6.40	6.83
1500.00	7.30	8.06	6.25			7.09
2000.00			9.00			7.33

Source: Flood Control District of Maricopa County, *Gila Bend Area Floodplain Delineation Study, Technical Data Notebook, Hydrology, Book 1 of 2.* Prepared by Burgess & Niple, Inc., March, 1992.

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
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: Bender Wash
Project File : bender.prj
Run Date and Time: 6/21/01 9:40:31 AM

Project in English units

Project Description:
Study name: Gila Bend Area Drainage Master Plan

Study contractors: EEC,
Inc. and Premier Engineering Corporation

Source of hydrology: Gila Bend
Area Floodplain Delineation Study (FCD 90-67) by Burgess & Niple for FCDMC,
March 1991

Source of survey: Gila Bend Area Floodplain Delineation Study
(FCD 90-67); new topographic mapping and survey by Cooper Aerial Mapping, Inc.,
1999.

FCD Contract Number: 99-18

Datum: NGVD 1929

PLAN DATA

Plan Title: Bender Wash Main Channel FW Meth 1
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Bender Wash\bender.p10

Geometry Title: Bender Wash Main Channel
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Bender Wash\bender.g04

Flow Title : Bender Wash Main Channel FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Bender Wash\bender.f10

Plan Summary Information:

Number of:	Cross Sections =	22	Mulitple Openings =	0
	Culverts =	0	Inline Weirs =	0
	Bridges =	0		

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 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 = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 2	1	9932.37	10449.28
3.588	PF 2	1	9925	10330
3.495	PF 2	1	9800	10282.86
3.409	PF 2	1	9642.77	10247.58
3.299	PF 2	1	8995.36	10163.39
3.224	PF 2	1	8961.95	10057.41
3.122	PF 2	1	9244.96	10149.85
3.024	PF 2	1	9423.25	10196.12
2.924	PF 2	1	9282.77	10125.27
2.837	PF 2	1	9135.87	10111.55
2.724	PF 2	1	9234.49	10068.24
2.644	PF 2	1	9586.01	10064.85
2.553	PF 2	1	9623.58	10048.58
2.445	PF 2	1	9851.43	10420.63
2.329	PF 2	1	9280.23	10508.23
2.274	PF 2	1	8322.77	10429.99
2.184	PF 2	1	8275.93	10404.91
2.089	PF 2	1	8392.69	10023.52
2.013	PF 2	1	8510.75	10055.68
1.968	PF 2	1	8537.27	9910.66
1.930	PF 2	1	8610.33	9638.46
1.904	PF 2	1	8680.24	9591.84

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 3	4	.5	
3.588	PF 3	4	.6	
3.495	PF 3	4	1.3	
3.409	PF 3	4	1.3	
3.299	PF 3	4	1.8	
3.224	PF 3	4	.6	
3.122	PF 3	4	1.2	
3.024	PF 3	4	.8	
2.924	PF 3	4	.8	
2.837	PF 3	4	.7	
2.724	PF 3	4	1.3	
2.644	PF 3	4	.5	
2.553	PF 3	4	1.8	
2.445	PF 3	4	.5	
2.329	PF 3	4	1.1	
2.274	PF 3	4	.8	
2.184	PF 3	4	1.1	
2.089	PF 3	4	.8	
2.013	PF 3	4	.9	
1.968	PF 3	4	.7	
1.930	PF 3	4	.7	
1.904	PF 3	4	.7	

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 4	4	.5	
3.588	PF 4	4	.6	
3.495	PF 4	4	1.3	
3.409	PF 4	4	1.3	
3.299	PF 4	4	1.8	
3.224	PF 4	4	.6	
3.122	PF 4	4	1.2	
3.024	PF 4	4	.8	
2.924	PF 4	4	.8	
2.837	PF 4	4	.7	
2.724	PF 4	4	1.3	
2.644	PF 4	4	.5	
2.553	PF 4	4	1.8	
2.445	PF 4	4	.5	
2.329	PF 4	4	1.1	
2.274	PF 4	4	.8	
2.184	PF 4	4	1.1	
2.089	PF 4	4	.8	

2.013	PF 4	4	.9	
1.968	PF 4	4	.7	
1.930	PF 4	4	.7	
1.904	PF 4	4	.7	

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 5	4	.5	
3.588	PF 5	4	.6	
3.495	PF 5	4	1.3	
3.409	PF 5	4	1.3	
3.299	PF 5	4	1.8	
3.224	PF 5	4	.6	
3.122	PF 5	4	1.2	
3.024	PF 5	4	.8	
2.924	PF 5	4	.8	
2.837	PF 5	4	.7	
2.724	PF 5	4	1.3	
2.644	PF 5	4	.5	
2.553	PF 5	4	1.8	
2.445	PF 5	4	.5	
2.329	PF 5	4	1.1	
2.274	PF 5	4	.8	
2.184	PF 5	4	1.1	
2.089	PF 5	4	.8	
2.013	PF 5	4	.9	
1.968	PF 5	4	.7	
1.930	PF 5	4	.7	
1.904	PF 5	4	.7	

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 6	4	.5	
3.588	PF 6	4	.6	
3.495	PF 6	4	1.3	
3.409	PF 6	4	1.3	
3.299	PF 6	4	1.8	
3.224	PF 6	4	.6	
3.122	PF 6	4	1.2	
3.024	PF 6	4	.8	
2.924	PF 6	4	.8	
2.837	PF 6	4	.7	
2.724	PF 6	4	1.3	
2.644	PF 6	4	.5	
2.553	PF 6	4	1.8	
2.445	PF 6	4	.5	
2.329	PF 6	4	1.1	
2.274	PF 6	4	.8	
2.184	PF 6	4	1.1	
2.089	PF 6	4	.8	
2.013	PF 6	4	.9	
1.968	PF 6	4	.7	
1.930	PF 6	4	.7	
1.904	PF 6	4	.7	

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 7	4	.5	
3.588	PF 7	4	.6	
3.495	PF 7	4	1.3	
3.409	PF 7	4	1.3	
3.299	PF 7	4	1.8	
3.224	PF 7	4	.6	
3.122	PF 7	4	1.2	
3.024	PF 7	4	.8	
2.924	PF 7	4	.8	
2.837	PF 7	4	.7	
2.724	PF 7	4	1.3	
2.644	PF 7	4	.5	
2.553	PF 7	4	1.8	
2.445	PF 7	4	.5	
2.329	PF 7	4	1.1	
2.274	PF 7	4	.8	
2.184	PF 7	4	1.1	
2.089	PF 7	4	.8	
2.013	PF 7	4	.9	

1.968	PF 7	4	.7	
1.930	PF 7	4	.7	
1.904	PF 7	4	.7	

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 8	4	.5	
3.588	PF 8	4	.6	
3.495	PF 8	4	1.3	
3.409	PF 8	4	1.3	
3.299	PF 8	4	1.8	
3.224	PF 8	4	.6	
3.122	PF 8	4	1.2	
3.024	PF 8	4	.8	
2.924	PF 8	4	.8	
2.837	PF 8	4	.7	
2.724	PF 8	4	1.3	
2.644	PF 8	4	.5	
2.553	PF 8	4	1.8	
2.445	PF 8	4	.5	
2.329	PF 8	4	1.1	
2.274	PF 8	4	.8	
2.184	PF 8	4	1.1	
2.089	PF 8	4	.8	
2.013	PF 8	4	.9	
1.968	PF 8	4	.7	
1.930	PF 8	4	.7	
1.904	PF 8	4	.7	

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 9	4	.5	
3.588	PF 9	4	.6	
3.495	PF 9	4	1.3	
3.409	PF 9	4	1.3	
3.299	PF 9	4	1.8	
3.224	PF 9	4	.6	
3.122	PF 9	4	1.2	
3.024	PF 9	4	.8	
2.924	PF 9	4	.8	
2.837	PF 9	4	.7	
2.724	PF 9	4	1.3	
2.644	PF 9	4	.5	
2.553	PF 9	4	1.8	
2.445	PF 9	4	.5	
2.329	PF 9	4	1.1	
2.274	PF 9	4	.8	
2.184	PF 9	4	1.1	
2.089	PF 9	4	.8	
2.013	PF 9	4	.9	
1.968	PF 9	4	.7	
1.930	PF 9	4	.7	
1.904	PF 9	4	.7	

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 10	4	.5	
3.588	PF 10	4	.6	
3.495	PF 10	4	1.3	
3.409	PF 10	4	1.3	
3.299	PF 10	4	1.8	
3.224	PF 10	4	.6	
3.122	PF 10	4	1.2	
3.024	PF 10	4	.8	
2.924	PF 10	4	.8	
2.837	PF 10	4	.7	
2.724	PF 10	4	1.3	
2.644	PF 10	4	.5	
2.553	PF 10	4	1.8	
2.445	PF 10	4	.5	
2.329	PF 10	4	1.1	
2.274	PF 10	4	.8	
2.184	PF 10	4	1.1	
2.089	PF 10	4	.8	
2.013	PF 10	4	.9	
1.968	PF 10	4	.7	

1.930	PF 10	4	.7	
1.904	PF 10	4	.7	

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 11	4	.5	
3.588	PF 11	4	.6	
3.495	PF 11	4	1.3	
3.409	PF 11	4	1.3	
3.299	PF 11	4	1.8	
3.224	PF 11	4	.6	
3.122	PF 11	4	1.2	
3.024	PF 11	4	.8	
2.924	PF 11	4	.8	
2.837	PF 11	4	.7	
2.724	PF 11	4	1.3	
2.644	PF 11	4	.5	
2.553	PF 11	4	1.8	
2.445	PF 11	4	.5	
2.329	PF 11	4	1.1	
2.274	PF 11	4	.8	
2.184	PF 11	4	1.1	
2.089	PF 11	4	.8	
2.013	PF 11	4	.9	
1.968	PF 11	4	.7	
1.930	PF 11	4	.7	
1.904	PF 11	4	.7	

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 12	4	.5	
3.588	PF 12	4	.6	
3.495	PF 12	4	1.3	
3.409	PF 12	4	1.3	
3.299	PF 12	4	1.8	
3.224	PF 12	4	.6	
3.122	PF 12	4	1.2	
3.024	PF 12	4	.8	
2.924	PF 12	4	.8	
2.837	PF 12	4	.7	
2.724	PF 12	4	1.3	
2.644	PF 12	4	.5	
2.553	PF 12	4	1.8	
2.445	PF 12	4	.5	
2.329	PF 12	4	1.1	
2.274	PF 12	4	.8	
2.184	PF 12	4	1.1	
2.089	PF 12	4	.8	
2.013	PF 12	4	.9	
1.968	PF 12	4	.7	
1.930	PF 12	4	.7	
1.904	PF 12	4	.7	

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	value2
3.671	PF 13	4	.5	
3.588	PF 13	4	.6	
3.495	PF 13	4	1.3	
3.409	PF 13	4	1.3	
3.299	PF 13	4	1.8	
3.224	PF 13	4	.6	
3.122	PF 13	4	1.2	
3.024	PF 13	4	.8	
2.924	PF 13	4	.8	
2.837	PF 13	4	.7	
2.724	PF 13	4	1.3	
2.644	PF 13	4	.5	
2.553	PF 13	4	1.8	
2.445	PF 13	4	.5	
2.329	PF 13	4	1.1	
2.274	PF 13	4	.8	
2.184	PF 13	4	1.1	
2.089	PF 13	4	.8	
2.013	PF 13	4	.9	
1.968	PF 13	4	.7	
1.930	PF 13	4	.7	

1.904	PF 13	4	.7	

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 14	4	.5	
3.588	PF 14	4	.6	
3.495	PF 14	4	1.3	
3.409	PF 14	4	1.3	
3.299	PF 14	4	1.8	
3.224	PF 14	4	.6	
3.122	PF 14	4	1.2	
3.024	PF 14	4	.8	
2.924	PF 14	4	.8	
2.837	PF 14	4	.7	
2.724	PF 14	4	1.3	
2.644	PF 14	4	.5	
2.553	PF 14	4	1.8	
2.445	PF 14	4	.5	
2.329	PF 14	4	1.1	
2.274	PF 14	4	.8	
2.184	PF 14	4	1.1	
2.089	PF 14	4	.8	
2.013	PF 14	4	.9	
1.968	PF 14	4	.7	
1.930	PF 14	4	.7	
1.904	PF 14	4	.7	

River = Bender Wash Reach = Main Channel

RS	Profile	Method	Value1	Value2
3.671	PF 15	4	.5	
3.588	PF 15	4	.6	
3.495	PF 15	4	1.3	
3.409	PF 15	4	1.3	
3.299	PF 15	4	1.8	
3.224	PF 15	4	.6	
3.122	PF 15	4	1.2	
3.024	PF 15	4	.8	
2.924	PF 15	4	.8	
2.837	PF 15	4	.7	
2.724	PF 15	4	1.3	
2.644	PF 15	4	.5	
2.553	PF 15	4	1.8	
2.445	PF 15	4	.5	
2.329	PF 15	4	1.1	
2.274	PF 15	4	.8	
2.184	PF 15	4	1.1	
2.089	PF 15	4	.8	
2.013	PF 15	4	.9	
1.968	PF 15	4	.7	
1.930	PF 15	4	.7	
1.904	PF 15	4	.7	

FLOW DATA

Flow Title: Bender Wash Main Channel FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Bender Wash\bender.f10

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
Bender Wash	Main Channel	3.671	3970	3970
Bender Wash	Main Channel	3.588	3970	3970
Bender Wash	Main Channel	3.495	3970	3970
Bender Wash	Main Channel	3.409	3970	3970
Bender Wash	Main Channel	3.299	3969	3969
Bender Wash	Main Channel	2.329	5530	5530
Bender Wash	Main Channel	2.274	5350	5350
Bender Wash	Main Channel	2.184	5182	5182
Bender Wash	Main Channel	2.089	5101	5101
Bender Wash	Main Channel	2.013	5101	5101
Bender Wash	Main Channel	1.968	4116	4116
Bender Wash	Main Channel	1.930	4116	4116
Bender Wash	Main Channel	1.904	3612	3612

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Bender Wash	Main Channel	PF 1		Normal S = .000722
Bender Wash	Main Channel	PF 2		Known WS = 778

GEOMETRY DATA

Geometry Title: Bender Wash Main Channel
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Bender Wash\bender.g04

CROSS SECTION RIVER: Bender Wash
REACH: Main Channel RS: 3.671

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9668.56	837.3	9695.22	837.23	9757.27	836.91	9843.93	836.45	9896.39	836
9932.37	835.7	9953.54	835.43	9991.66	834.61	10019.3	833.98	10050.94	833.54
10063.14	833.3	10070.3	833.43	10085.06	833.46	10106.22	833.61	10128.32	833.89
10171.03	834.1	10257.99	834.39	10302.87	834.59	10363.24	834.94	10384.6	835.05
10449.28	835.7	10470.03	835.77	10496.25	835.85	10544.59	835.93	10602.31	835.87
10619.52	835.9	10747.66	836.6	10793.59	836.77	10854.45	836.84	10897.16	837.01
10946.62	837.4	11028.04	838.36	11068.01	838.72	11137.91	839.07	11176.16	839.17
11221.41	839.2	11264.52	839.12						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9668.56	.045	9932.37	.06	10449.28	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9932.37	10449.28	420	437.12	550	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	836.76	Element			
Vel Head (ft)	0.15	Wt. n-Val.	0.045	0.060	0.040
W.S. Elev (ft)	836.61	Reach Len. (ft)	420.00	437.12	550.00
Crit W.S. (ft)	835.68	Flow Area (sq ft)	49.60	1110.77	172.65
E.G. Slope (ft/ft)	0.006022	Area (sq ft)	49.60	1110.77	172.65
Q Total (cfs)	3970.00	Flow (cfs)	71.32	3554.55	344.14
Top Width (ft)	935.23	Top Width (ft)	118.03	516.91	300.29
Vel Total (ft/s)	2.98	Avg. Vel. (ft/s)	1.44	3.20	1.99
Max Chl Dpth (ft)	3.31	Hydr. Depth (ft)	0.42	2.15	0.57
Conv. Total (cfs)	51159.4	Conv. (cfs)	919.0	45805.6	4434.7
Length Wtd. (ft)	480.67	Wetted Per. (ft)	118.03	516.94	300.29
Min Ch El (ft)	833.30	Shear (lb/sq ft)	0.16	0.81	0.22
Alpha	1.08	Stream Power (lb/ft s)	0.23	2.59	0.43
Frctn Loss (ft)	3.38	Cum Volume (acre-ft)	282.38	76.71	73.79
C & E Loss (ft)	0.01	Cum SA (acres)	215.32	42.58	51.27

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 #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	837.22	Element			
Vel Head (ft)	0.13	Wt. n-Val.		0.060	
W.S. Elev (ft)	837.09	Reach Len. (ft)	420.00	437.12	550.00
Crit W.S. (ft)		Flow Area (sq ft)		1359.88	
E.G. Slope (ft/ft)	0.003854	Area (sq ft)		1359.88	
Q Total (cfs)	3970.00	Flow (cfs)		3970.00	
Top Width (ft)	516.91	Top Width (ft)		516.91	
Vel Total (ft/s)	2.92	Avg. Vel. (ft/s)		2.92	
Max Chl Dpth (ft)	3.79	Hydr. Depth (ft)		2.63	
Conv. Total (cfs)	63948.8	Conv. (cfs)		63948.8	
Length Wtd. (ft)	448.06	Wetted Per. (ft)		519.72	
Min Ch El (ft)	833.30	Shear (lb/sq ft)		0.63	

Alpha	1.00	Stream Power (lb/ft s)		1.84	
Frctn Loss (ft)	2.91	Cum Volume (acre-ft)	154.85	91.65	20.86
C & E Loss (ft)	0.03	Cum SA (acres)	121.08	42.58	19.03

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: Bender Wash
REACH: Main Channel RS: 3.588

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9638.59	833.95	9705.91	833.82	9773.22	833.58	9832.33	833.23	9882.36	832.8
9948.53	832.16	9975.17	83210033.12		83210080.88		831.95	10109.8	831.9
10125.36	831.79	10142.13	831.79	10161.2	831.19	10170.64	830.83	10173.33	830.8
10194.91	831.71	10204.53	83210235.72		832.46	10270.53	832.48	10298.12	832.3
10340.54	831.92	10391.71	831.37	10422.91	831.14	10437.62	831.08	10489.18	831.2
10534.71	831.3	10578.9	831.33	10610.09	831.61	10680.34	832.51	10707.84	832.9
10734.89	833.14	10766.08	833.29	10801.69	833.32				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9638.59	.045	10109.8	.06	10204.53	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
10109.8	10204.53	460	491.3	480	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	833.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.045	0.060	0.040
W.S. Elev (ft)	833.15	Reach Len. (ft)	460.00	491.30	480.00
Crit W.S. (ft)	832.75	Flow Area (sq ft)	237.24	154.28	697.75
E.G. Slope (ft/ft)	0.008298	Area (sq ft)	237.24	154.28	697.75
Q Total (cfs)	3970.00	Flow (cfs)	658.30	481.67	2830.03
Top Width (ft)	894.23	Top Width (ft)	267.77	94.73	531.73
Vel Total (ft/s)	3.64	Avg. Vel. (ft/s)	2.77	3.12	4.06
Max Chl Dpth (ft)	2.35	Hydr. Depth (ft)	0.89	1.63	1.31
Conv. Total (cfs)	43581.2	Conv. (cfs)	7226.5	5287.6	31067.1
Length Wtd. (ft)	475.59	Wetted Per. (ft)	267.77	94.77	531.75
Min Ch El (ft)	830.80	Shear (lb/sq ft)	0.46	0.84	0.68
Alpha	1.07	Stream Power (lb/ft s)	1.27	2.63	2.76
Frctn Loss (ft)	3.36	Cum Volume (acre-ft)	281.00	70.36	68.30
C & E Loss (ft)	0.02	Cum SA (acres)	213.46	39.51	46.01

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 #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	834.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.	0.045	0.060	0.040
W.S. Elev (ft)	833.82	Reach Len. (ft)	460.00	491.30	480.00
Crit W.S. (ft)		Flow Area (sq ft)	330.72	217.87	188.77
E.G. Slope (ft/ft)	0.013216	Area (sq ft)	330.72	217.87	188.77
Q Total (cfs)	3970.00	Flow (cfs)	1841.08	1080.45	1048.48
Top Width (ft)	405.00	Top Width (ft)	184.80	94.73	125.47
Vel Total (ft/s)	5.38	Avg. Vel. (ft/s)	5.57	4.96	5.55
Max Chl Dpth (ft)	3.02	Hydr. Depth (ft)	1.79	2.30	1.50
Conv. Total (cfs)	34533.0	Conv. (cfs)	16014.6	9398.2	9120.2
Length Wtd. (ft)	471.78	Wetted Per. (ft)	186.23	94.77	127.28
Min Ch El (ft)	830.80	Shear (lb/sq ft)	1.47	1.90	1.22
Alpha	1.01	Stream Power (lb/ft s)	8.16	9.41	6.80
Frctn Loss (ft)	3.61	Cum Volume (acre-ft)	153.26	83.74	19.66
C & E Loss (ft)	0.07	Cum SA (acres)	120.18	39.51	18.24

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: Bender Wash
REACH: Main Channel RS: 3.495

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9504.89	830.47	9552.4	830.41	9576.29	830.33	9602.86	830.2	9671.84	829.47
9725.23	829.05	9767.4	828.89	9851.14	828.9	9886.85	828.8	9934.62	828.47
9977.05	828	10008.53	827.6	410054.07	828	10071.48	828.1	10102.96	828.01
10122.44	828.04	10148.02	828.03	10174.78	827.85	10201.72	827.61	0237.91	827.14
10243.93	827.35	10260.39	827.75	10282.86	828.04	10305.34	828.21	0334.91	828.1
10350.29	828	10382.21	827.98	10417.71	828.15	10468.1	828.71	0507.61	829.24
10534.69	829.51	0575.03	829.71	0701.18	829.99	10754.83	830.1		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9504.89	.04	510148.02	.06	10282.86	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
10148.02	10282.86	490	453.04	440	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	829.98	Element			
Vel Head (ft)	0.15	Wt. n-Val.	0.045	0.060	0.040
W.S. Elev (ft)	829.84	Reach Len. (ft)	490.00	453.04	440.00
Crit W.S. (ft)	829.19	Flow Area (sq ft)	637.66	293.95	369.84
E.G. Slope (ft/ft)	0.006098	Area (sq ft)	637.66	293.95	369.84
Q Total (cfs)	3970.00	Flow (cfs)	1905.89	955.67	1108.44
Top Width (ft)	997.94	Top Width (ft)	510.94	134.84	352.15
Vel Total (ft/s)	3.05	Avg. Vel. (ft/s)	2.99	3.25	3.00
Max Chl Dpth (ft)	2.70	Hydr. Depth (ft)	1.25	2.18	1.05
Conv. Total (cfs)	50839.5	Conv. (cfs)	24406.7	12238.2	14194.6
Length Wtd. (ft)	467.15	Wetted Per. (ft)	510.96	134.86	352.16
Min Ch El (ft)	827.14	Shear (lb/sq ft)	0.48	0.83	0.40
Alpha	1.00	Stream Power (lb/ft s)	1.42	2.70	1.20
Frctn Loss (ft)	3.96	Cum Volume (acre-ft)	276.38	67.83	62.42
C & E Loss (ft)	0.00	Cum SA (acres)	209.35	38.21	41.14

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 #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	830.59	Element			
Vel Head (ft)	0.21	Wt. n-Val.	0.045	0.060	
W.S. Elev (ft)	830.38	Reach Len. (ft)	490.00	453.04	440.00
Crit W.S. (ft)	829.39	Flow Area (sq ft)	722.81	367.50	
E.G. Slope (ft/ft)	0.004973	Area (sq ft)	722.81	367.50	
Q Total (cfs)	3970.00	Flow (cfs)	2732.08	1237.92	
Top Width (ft)	482.86	Top Width (ft)	348.02	134.84	
Vel Total (ft/s)	3.64	Avg. Vel. (ft/s)	3.78	3.37	
Max Chl Dpth (ft)	3.24	Hydr. Depth (ft)	2.08	2.73	
Conv. Total (cfs)	56295.3	Conv. (cfs)	38741.4	17553.9	
Length Wtd. (ft)	467.83	Wetted Per. (ft)	349.52	137.20	
Min Ch El (ft)	827.14	Shear (lb/sq ft)	0.64	0.83	
Alpha	1.01	Stream Power (lb/ft s)	2.43	2.80	
Frctn Loss (ft)	3.91	Cum Volume (acre-ft)	147.70	80.44	18.62
C & E Loss (ft)	0.02	Cum SA (acres)	117.37	38.21	17.55

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: Bender Wash
REACH: Main Channel RS: 3.409

INPUT

Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8923.57	827	8952.99	826.74	8974.02	826.48	9011.69	825.79	9056.39	824.91
9086.71	824.4	9108.3	824.24	9145.78	824.28	9242.57	824.87	9309.71	824.96
9369.26	825.1	9458.66	825.69	9503.35	825.89	9578.26	825.93	9659.79	826.2
9712.53	826.2	9755.33	826.03	9779.67	825.87	9822.19	825.33	9860.93	824.79
9889.05	824.5	9913.95	824.33	9955.91	824.22	10022.77	824.22	10062.06	824.34
10126.9	824.4	10211.01	824.37	10247.58	824.53	10369.35	825.38	10413.26	825.65
10464.35	825.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8923.57	.045	9889.05	.061	10247.58	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9889.05	10247.58	510	581.38	540	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	826.02	Element			
Vel Head (ft)	0.18	Wt. n-Val.	0.045	0.060	0.040
W.S. Elev (ft)	825.83	Reach Len. (ft)	510.00	581.38	540.00
Crit W.S. (ft)	825.48	Flow Area (sq ft)	495.96	537.39	126.76
E.G. Slope (ft/ft)	0.012579	Area (sq ft)	495.96	537.39	126.76
Q Total (cfs)	3970.00	Flow (cfs)	1645.80	1954.91	369.29
Top Width (ft)	1163.65	Top Width (ft)	588.35	358.53	216.77
Vel Total (ft/s)	3.42	Avg. Vel. (ft/s)	3.32	3.64	2.91
Max Chl Dpth (ft)	1.61	Hydr. Depth (ft)	0.84	1.50	0.58
Conv. Total (cfs)	35397.1	Conv. (cfs)	14674.2	17430.3	3292.6
Length Wtd. (ft)	537.62	Wetted Per. (ft)	588.37	358.53	216.81
Min Ch El (ft)	824.22	Shear (lb/sq ft)	0.66	1.18	0.46
Alpha	1.01	Stream Power (lb/ft s)	2.20	4.28	1.34
Frctn Loss (ft)	4.73	Cum Volume (acre-ft)	270.00	63.51	59.91
C & E Loss (ft)	0.02	Cum SA (acres)	203.17	35.65	38.27

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 OUTPUT Profile #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	826.66	Element			
Vel Head (ft)	0.36	Wt. n-Val.	0.045	0.060	
W.S. Elev (ft)	826.29	Reach Len. (ft)	510.00	581.38	540.00
Crit W.S. (ft)	825.84	Flow Area (sq ft)	146.60	701.84	
E.G. Slope (ft/ft)	0.016904	Area (sq ft)	146.60	701.84	
Q Total (cfs)	3970.00	Flow (cfs)	445.20	3524.80	
Top Width (ft)	604.81	Top Width (ft)	246.28	358.53	
Vel Total (ft/s)	4.68	Avg. Vel. (ft/s)	3.04	5.02	
Max Chl Dpth (ft)	2.07	Hydr. Depth (ft)	0.60	1.96	
Conv. Total (cfs)	30534.4	Conv. (cfs)	3424.2	27110.3	
Length Wtd. (ft)	550.23	Wetted Per. (ft)	246.44	360.29	
Min Ch El (ft)	824.22	Shear (lb/sq ft)	0.63	2.06	
Alpha	1.07	Stream Power (lb/ft s)	1.91	10.32	
Frctn Loss (ft)	5.29	Cum Volume (acre-ft)	142.81	74.87	18.62
C & E Loss (ft)	0.07	Cum SA (acres)	114.03	35.65	17.55

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: Bender Wash
REACH: Main Channel RS: 3.299

INPUT
Description:
Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7185.41	821.6	7294.62	821.51	7337.05	821.42	7379.47	821.16	7485.54	820.14
7534.4	819.9	7591.61	819.69	7676.46	819.37	7761.31	818.95	7832.69	818.51
7888.59	818	7952.23	817.41	7994.66	817.15	8015.87	817.12	8045.75	817.2

8088.36	817.5	8143.15	818.14	8216.2	819.11	8270.44	819.71	8291.65	819.9
8344.04	820.1	8397.72	820.12	8429.26	819.96	8450.93	819.96	8461.36	819.78
8471.87	819.4	8525	816.95	8535.42	816.45	8546.21	816.13	8557.1	816
8577.66	815.9	8607.94	815.95	8618.47	816	8631.34	816.21	8655.66	816.3
8674.27	816.5	8699.68	816.62	8717.2	816.75	8738.66	816.78	8781.59	816.7
8824.52	816.4	8867.45	816	8878.77	815.85	8910.38	815.93	8915.96	816.01
8931.84	816.6	8953.53	818.47	8974.77	819.98	8990.33	820.49	9004.3	820.6
9027.52	820.4	9039.17	820.28	9064.7	820.13	9105.84	820.02	9139.07	819.95
9176.26	819.9	9189.42	819.99	9213.45	819.96	9232.35	819.75	9275.28	819.57
9339.67	819.6	9378.73	819.59	9425.81	819.64	9473.98	819.81	9515.01	819.83
9582.84	819.7	9621.67	819.69	9675.01	819.81	9706.53	820	9728.34	820.2
9771.31	820.7	9814.5	821.09	9857.69	821.25	9888.34	821.23	9922.47	820.98
9945.69	820.7	9965.65	820.44	9987.25	820	9995.01	819.79	10008.84	819.56
10018.25	819.71	10030.43	819.21	10048.34	818.41	10054.54	818.14	10073.62	818.72
10090.82	818.71	10101.67	819.05	10116.81	819.71	10127.11	820	10163.39	820.48
10181.59	820.61	10224.78	821.1	10315	822.46	10354.34	822.98	10397.53	823.39
10462.31	823.81	10528.34	824	10635.09	824.24	10695.59	824.32		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7185.41	.045	9965.65	.06	10163.39	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9965.65	10163.39	460	398.2	420	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	821.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.045	0.060	0.040
W.S. Elev (ft)	821.14	Reach Len. (ft)	460.00	398.20	420.00
Crit W.S. (ft)	820.60	Flow Area (sq ft)	1010.15	334.27	23.33
E.G. Slope (ft/ft)	0.006505	Area (sq ft)	5523.12	334.27	23.33
Q Total (cfs)	3969.00	Flow (cfs)	2986.08	947.20	35.72
Top Width (ft)	2771.75	Top Width (ft)	2510.14	197.74	63.87
Vel Total (ft/s)	2.90	Avg. Vel. (ft/s)	2.96	2.83	1.53
Max Chl Dpth (ft)	5.29	Hydr. Depth (ft)	1.13	1.69	0.37
Conv. Total (cfs)	49210.7	Conv. (cfs)	37023.7	11744.1	442.9
Length Wtd. (ft)	447.67	Wetted Per. (ft)	896.61	197.82	63.88
Min Ch El (ft)	818.14	Shear (lb/sq ft)	0.46	0.69	0.15
Alpha	1.01	Stream Power (lb/ft s)	1.35	1.94	0.23
Frctn Loss (ft)	3.78	Cum Volume (acre-ft)	234.77	57.69	58.98
C & E Loss (ft)	0.01	Cum SA (acres)	185.03	31.94	36.53

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 #PF 2

E.G. Elev (ft)	821.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.045	0.060	
W.S. Elev (ft)	821.17	Reach Len. (ft)	460.00	398.20	420.00
Crit W.S. (ft)	820.59	Flow Area (sq ft)	1037.48	340.25	
E.G. Slope (ft/ft)	0.006192	Area (sq ft)	1037.48	340.25	
Q Total (cfs)	3969.00	Flow (cfs)	3019.34	949.66	
Top Width (ft)	1106.64	Top Width (ft)	908.90	197.74	
Vel Total (ft/s)	2.88	Avg. Vel. (ft/s)	2.91	2.79	
Max Chl Dpth (ft)	3.03	Hydr. Depth (ft)	1.14	1.72	
Conv. Total (cfs)	50440.2	Conv. (cfs)	38371.4	12068.8	
Length Wtd. (ft)	447.31	Wetted Per. (ft)	909.56	198.51	
Min Ch El (ft)	818.14	Shear (lb/sq ft)	0.44	0.66	
Alpha	1.00	Stream Power (lb/ft s)	1.28	1.85	
Frctn Loss (ft)	3.73	Cum Volume (acre-ft)	135.88	67.92	18.62
C & E Loss (ft)	0.01	Cum SA (acres)	107.27	31.94	17.55

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 RIVER: Bender Wash
REACH: Main Channel RS: 3.224

INPUT
Description:
Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7453.41	818.7	7501.71	818.44	7544.19	818.08	7613.78	817.4	7658.51	817.07
7756.59	816.6	7820.32	816.5	7885.73	816.34	7905.28	816.23	7926.89	816.21
7947.76	816	7971.62	815.57	8016.35	814.47	8032.72	814.12	8053.96	813.8
8075.2	813.7	8096.44	813.85	8117.68	814.21	8160.16	815.23	8168.85	815.48
8181.4	815.7	8195.28	815.81	8223.88	815.76	8266.36	815.72	8308.84	815.82
8330.63	816	8374.2	816.27	8478.76	816.6	8563.72	816.66	8627.44	816.55
8712.4	816.3	8776.77	816	8794.74	815.98	8842.91	816.13	8880.59	816.16
8935.56	816.1	8963.47	816	9072.01	815.88	9119.62	815.91	9205.78	816.05
9257.04	816	9336.57	815.95	9401.28	816	9429.14	816.07	9487.56	816.1
9538.41	816.4	9574.84	816.62	9638.56	817.17	9684.12	817.42	9746.41	817.5
9793.4	817.3	9854.26	816.96	9902.68	816.51	9942.64	816.1	9962.12	815.85
9975.53	815.8	9983.69	815.73	9995.53	815.45	10011.95	815.31	10026.83	816.03
10048.43	816.7	10057.41	816.94	10069.97	817.29	10115.57	818.68	10134.74	819.17
10157.23	819.68	10178	820	10209.15	820.23	10286.17	820.59	10337.52	820.68
10373.58	820.63	10434.08	820.4						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7453.41	.045	9854.26	.06	10057.41	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9854.26	10057.41	290	535.06	480	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888			F

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	817.48	Element			
Vel Head (ft)	0.21	Wt. n-Val.	0.045	0.060	0.040
W.S. Elev (ft)	817.27	Reach Len. (ft)	290.00	535.06	480.00
Crit W.S. (ft)	816.93	Flow Area (sq ft)	882.59	219.61	1.91
E.G. Slope (ft/ft)	0.011433	Area (sq ft)	2439.79	219.61	1.91
Q Total (cfs)	3969.00	Flow (cfs)	3354.28	612.46	2.26
Top Width (ft)	2295.77	Top Width (ft)	2080.79	203.15	11.82
Vel Total (ft/s)	3.59	Avg. Vel. (ft/s)	3.80	2.79	1.18
Max Chl Dpth (ft)	3.57	Hydr. Depth (ft)	1.06	1.08	0.16
Conv. Total (cfs)	37119.9	Conv. (cfs)	31370.8	5728.0	21.1
Length Wtd. (ft)	342.41	Wetted Per. (ft)	829.68	203.19	11.83
Min Ch El (ft)	815.31	Shear (lb/sq ft)	0.76	0.77	0.12
Alpha	1.04	Stream Power (lb/ft s)	2.89	2.15	0.14
Frctn Loss (ft)	3.11	Cum Volume (acre-ft)	192.72	55.16	58.86
C & E Loss (ft)	0.01	Cum SA (acres)	160.79	30.10	36.17

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 #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	817.55	Element			
Vel Head (ft)	0.22	Wt. n-Val.	0.045	0.060	
W.S. Elev (ft)	817.33	Reach Len. (ft)	290.00	535.06	480.00
Crit W.S. (ft)	817.00	Flow Area (sq ft)	834.91	231.60	
E.G. Slope (ft/ft)	0.011865	Area (sq ft)	834.91	231.60	
Q Total (cfs)	3969.00	Flow (cfs)	3288.13	680.88	
Top Width (ft)	976.36	Top Width (ft)	773.21	203.15	
Vel Total (ft/s)	3.72	Avg. Vel. (ft/s)	3.94	2.94	
Max Chl Dpth (ft)	2.02	Hydr. Depth (ft)	1.08	1.14	
Conv. Total (cfs)	36437.5	Conv. (cfs)	30186.7	6250.8	
Length Wtd. (ft)	343.06	Wetted Per. (ft)	774.53	203.57	
Min Ch El (ft)	815.31	Shear (lb/sq ft)	0.80	0.84	
Alpha	1.03	Stream Power (lb/ft s)	3.14	2.48	
Frctn Loss (ft)	3.20	Cum Volume (acre-ft)	125.99	65.31	18.62
C & E Loss (ft)	0.01	Cum SA (acres)	98.38	30.10	17.55

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 RIVER: Bender Wash
REACH: Main Channel RS: 3.122

INPUT
Description:
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8033.81	816.2	8089.55	815.94	8118.55	815.67	8160.62	815.11	8231.22	813.99
8280.47	813.4	8322.9	813	8344.12	812.87	8386.54	812.73	8413.03	812.62
8471.4	812.1	8513.83	811.9	8556.26	811.84	8619.9	812.01	8665.44	812.45
8768.4	813.7	8833.71	814.39	8875.78	814.72	8917.85	814.89	8959.91	814.89
9001.98	814.8	9065.39	814.61	9192.68	813.82	9235.1	813.6	9277.53	813.44
9301.07	813.4	9343.87	813.13	9386.66	812.73	9447.24	812.14	9489.67	811.91
9557.84	811.8	9595.3	811.82	9630.14	812	9648.36	812.23	9707.87	813.33
9746.74	813.9	9789.9	814.26	9824.48	814.36	9863.35	814.21	9894.11	813.84
9915.42	813.4	9941.09	812.75	9958.05	812.24	9979.96	811.51	10000.67	811.81
10043.29	812.31	10072.99	812.64	10149.85	813.91	10163.07	814.16	10206.88	814.96
10240.87	815.51	10274.86	815.89	10326.74	816.13	10376.82	816.25	10424.2	816.34
10551.87	817	10592.89	817.2	10615.7	817.25	10659.42	817.13	10725.96	816.65
10758.91	816.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8033.81	.045	9894.11	.061	10149.85	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9894.11	10149.85	460	519.61	430	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888			F

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	814.36	Element			
Vel Head (ft)	0.16	Wt. n-Val.	0.045	0.060	0.040
W.S. Elev (ft)	814.19	Reach Len. (ft)	460.00	519.61	430.00
Crit W.S. (ft)	813.53	Flow Area (sq ft)	854.70	386.42	2.14
E.G. Slope (ft/ft)	0.007376	Area (sq ft)	1708.55	386.42	2.14
Q Total (cfs)	3969.00	Flow (cfs)	2885.03	1082.11	1.86
Top Width (ft)	1546.95	Top Width (ft)	1276.10	255.74	15.12
Vel Total (ft/s)	3.19	Avg. Vel. (ft/s)	3.38	2.80	0.87
Max Chl Dpth (ft)	2.69	Hydr. Depth (ft)	1.26	1.51	0.14
Conv. Total (cfs)	46213.6	Conv. (cfs)	33592.2	12599.7	21.6
Length Wtd. (ft)	477.24	Wetted Per. (ft)	679.24	255.79	15.12
Min Ch El (ft)	811.50	Shear (lb/sq ft)	0.58	0.70	0.07
Alpha	1.02	Stream Power (lb/ft s)	1.96	1.95	0.06
Frctn Loss (ft)	2.65	Cum Volume (acre-ft)	178.91	51.44	58.83
C & E Loss (ft)	0.01	Cum SA (acres)	149.62	27.29	36.02

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 #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	814.34	Element			
Vel Head (ft)	0.19	Wt. n-Val.	0.045	0.060	
W.S. Elev (ft)	814.15	Reach Len. (ft)	460.00	519.61	430.00
Crit W.S. (ft)	813.54	Flow Area (sq ft)	790.56	374.48	
E.G. Slope (ft/ft)	0.007544	Area (sq ft)	790.56	374.48	
Q Total (cfs)	3969.00	Flow (cfs)	2931.04	1037.97	
Top Width (ft)	812.83	Top Width (ft)	557.09	255.74	
Vel Total (ft/s)	3.41	Avg. Vel. (ft/s)	3.71	2.77	
Max Chl Dpth (ft)	2.65	Hydr. Depth (ft)	1.42	1.46	
Conv. Total (cfs)	45695.0	Conv. (cfs)	33745.0	11950.1	
Length Wtd. (ft)	477.01	Wetted Per. (ft)	557.70	256.03	
Min Ch El (ft)	811.50	Shear (lb/sq ft)	0.67	0.69	
Alpha	1.05	Stream Power (lb/ft s)	2.48	1.91	
Frctn Loss (ft)	2.54	Cum Volume (acre-ft)	120.58	61.58	18.62
C & E Loss (ft)	0.01	Cum SA (acres)	93.96	27.29	17.55

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 RIVER: Bender Wash
REACH: Main Channel RS: 3.024

INPUT
Description:
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8308.52	813	8358.11	812.69	8422.63	812.15	8515.18	811.42	8549.64	811.15
8592.2	810.7	8634.77	810.02	8700.29	808.63	8719.89	808.29	8746.56	807.95
8762.45	807.8	8792.84	807.72	8815.38	807.87	8826.3	808	8839.12	808.29
8911.42	810.7	8933.58	811.25	8953.99	811.65	8977.95	812	9012.39	812.17
9070.5	812.1	9091.19	812	9102.96	811.87	9163.06	811.81	9188.08	811.73
9230.65	811.7	9273.21	811.45	9394.44	810.32	9422.18	810.06	9464.74	809.56
9533.27	808.7	9571.15	808.34	9592.43	808.28	9613.71	808.37	9642.79	808.75
9682.2	809.6	9698.84	809.96	9741.4	810.83	9756.68	811.07	9784.13	811.49
9811.75	811.8	9848.37	811.91	9891.19	811.93	9913.8	811.97	9934.01	811.84
9951.46	811.9	9955.42	811.74	9960.65	811.24	9976.84	808.96	9989.12	808.54
9998.25	807.9	10019.66	807.97	10026.78	808.05	10064.43	808.96	10080.93	809.52
10126.36	810.4	10168.85	810.94	10196.12	811.19	10241.09	811.56	10275.08	811.8
10305.53	812.1	10345.8	812.21	10360.06	812.23	10445.04	812.82	10530.02	813.32
10572.51	813.6	10636.25	814.23	10678.74	814.49	10721.23	814.51	0763.72	814.22
10788.83	81410806.21		813.89	10827.82	813.84				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8308.52	.045	9960.65	.06	10196.12	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9960.65	10196.12	540	515.69	480	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888			F

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	811.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.045	0.060	0.040
W.S. Elev (ft)	811.57	Reach Len. (ft)	540.00	515.69	480.00
Crit W.S. (ft)	810.40	Flow Area (sq ft)	898.73	471.23	8.79
E.G. Slope (ft/ft)	0.004326	Area (sq ft)	1798.09	471.23	8.79
Q Total (cfs)	3969.00	Flow (cfs)	2743.69	1218.23	7.08
Top Width (ft)	1277.64	Top Width (ft)	995.76	235.47	46.41
Vel Total (ft/s)	2.88	Avg. Vel. (ft/s)	3.05	2.59	0.81
Max Chl Dpth (ft)	3.85	Hydr. Depth (ft)	1.66	2.00	0.19
Conv. Total (cfs)	60341.0	Conv. (cfs)	41712.6	18520.9	107.6
Length Wtd. (ft)	532.08	Wetted Per. (ft)	542.04	235.69	46.41
Min Ch El (ft)	807.90	Shear (lb/sq ft)	0.45	0.54	0.05
Alpha	1.03	Stream Power (lb/ft s)	1.37	1.40	0.04
Frctn Loss (ft)	3.11	Cum Volume (acre-ft)	160.40	46.32	58.78
C & E Loss (ft)	0.00	Cum SA (acres)	137.62	24.36	35.71

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 #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	811.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.045	0.060	
W.S. Elev (ft)	811.64	Reach Len. (ft)	540.00	515.69	480.00
Crit W.S. (ft)	810.36	Flow Area (sq ft)	799.37	486.83	
E.G. Slope (ft/ft)	0.003951	Area (sq ft)	799.37	486.83	
Q Total (cfs)	3969.00	Flow (cfs)	2741.34	1227.66	
Top Width (ft)	613.55	Top Width (ft)	378.08	235.47	
Vel Total (ft/s)	3.09	Avg. Vel. (ft/s)	3.43	2.52	
Max Chl Dpth (ft)	3.74	Hydr. Depth (ft)	2.11	2.07	
Conv. Total (cfs)	63139.9	Conv. (cfs)	43610.0	19529.9	
Length Wtd. (ft)	532.68	Wetted Per. (ft)	379.73	236.14	
Min Ch El (ft)	807.90	Shear (lb/sq ft)	0.52	0.51	
Alpha	1.06	Stream Power (lb/ft s)	1.78	1.28	
Frctn Loss (ft)	2.95	Cum Volume (acre-ft)	112.18	56.45	18.62
C & E Loss (ft)	0.01	Cum SA (acres)	89.02	24.36	17.55

Warning: Divided flow computed for this cross-section.
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: Bender Wash
REACH: Main Channel RS: 2.924

INPUT
Description:
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8180.97	809.3	8229.8	809.07	8309.18	808.58	8331.88	808.47	8353.51	808.29
8375.68	808	8420.01	806.92	8433.95	806.78	8467.98	806.91	8536.03	807.41
8574.95	807.6	8623.56	807.43	8681.22	807.06	8723.64	806.9	8766.07	806.82
8792.17	806.7	8834.33	806.25	8876.48	805.7	8893.35	805.5	8914.57	805.37
8935.78	805.5	8956.99	805.88	8978.21	806.34	9002.94	807.01	9020.64	807.32
9038.56	807.6	9063.06	807.54	9087.24	807.56	9105.49	807.47	9129.4	807.5
9147.92	807.5	9160.8	807.53	9214.52	807.62	9257.32	807.53	9300.12	807.21
9360.06	806.6	9402.49	806.31	9444.91	806.17	9487.34	806.26	9514.12	806.44
9556.93	806.9	9642.53	808.08	9685.33	808.53	9720.7	808.68	9763.12	808.58
9805.55	808.2	9823.54	808.03	9880.44	807.52	9921.63	807.32	9954.1	807.13
9975.33	806.9	10004.02	806.32	10017.77	805.97	10032.39	806.21	10060.22	807.39
10097.27	807.8	10125.27	807.99	10179.35		10195.94	807.87	10210.93	807.67
10233.43	807.6	10268.05		10297.47	808.54	10319.1	809.08	10376.22	810.8
10412.28	811.7	10427.27		10449.74	812.28	10492.16	812.49	10535.43	812.55
10557.9	812.5	10600.33	812.34	10621.78	812.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8180.97	.045	9823.54	.06	10125.27	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9823.54	10125.27	550	471.5	490	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888			F

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	808.59	Element			
Vel Head (ft)	0.17	Wt. n-Val.	0.045	0.060	0.040
W.S. Elev (ft)	808.42	Reach Len. (ft)	550.00	471.50	490.00
Crit W.S. (ft)	808.01	Flow Area (sq ft)	819.83	354.95	85.15
E.G. Slope (ft/ft)	0.008328	Area (sq ft)	1901.10	354.95	85.15
Q Total (cfs)	3969.00	Flow (cfs)	2890.03	893.86	185.11
Top Width (ft)	1847.94	Top Width (ft)	1380.41	301.73	165.81
Vel Total (ft/s)	3.15	Avg. Vel. (ft/s)	3.53	2.52	2.17
Max Chl Dpth (ft)	3.05	Hydr. Depth (ft)	1.21	1.18	0.51
Conv. Total (cfs)	43491.7	Conv. (cfs)	31668.5	9794.8	2028.4
Length Wtd. (ft)	537.06	Wetted Per. (ft)	677.29	301.77	165.82
Min Ch El (ft)	805.97	Shear (lb/sq ft)	0.63	0.61	0.27
Alpha	1.08	Stream Power (lb/ft s)	2.22	1.54	0.58
Frctn Loss (ft)	3.25	Cum Volume (acre-ft)	137.47	41.43	58.26
C & E Loss (ft)	0.01	Cum SA (acres)	122.89	21.18	34.54

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 #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	808.84	Element			
Vel Head (ft)	0.21	Wt. n-Val.	0.045	0.060	
W.S. Elev (ft)	808.63	Reach Len. (ft)	550.00	471.50	490.00
Crit W.S. (ft)	808.11	Flow Area (sq ft)	698.41	416.16	
E.G. Slope (ft/ft)	0.008301	Area (sq ft)	698.41	416.16	
Q Total (cfs)	3969.00	Flow (cfs)	2807.27	1161.73	
Top Width (ft)	806.56	Top Width (ft)	504.83	301.73	
Vel Total (ft/s)	3.56	Avg. Vel. (ft/s)	4.02	2.79	
Max Chl Dpth (ft)	2.66	Hydr. Depth (ft)	1.38	1.38	
Conv. Total (cfs)	43564.1	Conv. (cfs)	30812.9	12751.2	
Length Wtd. (ft)	531.62	Wetted Per. (ft)	506.14	302.41	

Min Ch El (ft)	805.97	Shear (lb/sq ft)	0.72	0.71	
Alpha	1.08	Stream Power (lb/ft s)	2.87	1.99	
Frctn Loss (ft)	2.69	Cum Volume (acre-ft)	102.90	51.10	18.62
C & E Loss (ft)	0.03	Cum SA (acres)	83.55	21.18	17.55

Warning: Divided flow computed for this cross-section.
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: Bender Wash
REACH: Main Channel RS: 2.837

INPUT
Description:
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7912.44	805.31	7971.85	805.18	8008.43	804.8	8064.77	804.41	8129.41	804.07
8173.3	803.96	8228.02	804.05	8282.75	804.2	8324.42	804.21	8392.2	804.02
8432.76	804.1	8497.76	804.71	8531.08	804.8	8566.95	804.72	8584.43	804.51
8606.1	804	8611.1	803.83	8627.77	803.5	8649.43	802.76	8674.56	802.13
8692.77	802.6	8714.44	803.02	8736.1	803.6	8746.3	803.78	8782.17	803.96
8853.91	804.08	8909.45	804.14	8931.11	804	8974.45	803.36	9017.79	802.61
9061.12	802.09	9082.79	801.97	9105	802	9140.87	802.24	9191.13	802.93
9234.46	803.42	9284.35	803.77	9322.53	803.9	9364.47	803.91	9391.96	804.05
9407.81	804.18	9431.5	804.44	9493.16	805.1	9535.59	805.49	9557.71	805.66
9578.02	805.69	9599.65	805.67	9620.45	805.6	9641.73	805.4	9705.31	804.68
9747.74	804.31	9770.5	804.22	9790.16	804.2	9813.43	804.34	9832.59	804.48
9875.02	804.94	9899.28	805.13	9917.45	805.1	9938.67	804.77	9959.88	803.96
9981.1	802.53	9985.13	802.84	10002.31	803.7	10028.05	804.15	10044.74	804.57
10070.98	804.81	10087.17	804.91	10111.55	805.1	10217.77	806.03	10260.92	806.3
10331.74	806.52	10429.05	806.65	10521.69	807	10578.71	807.11		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7912.44	.045	9917.45	.06	10111.55	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9917.45	10111.55	630	596.64	580	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888			F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	805.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.045	0.060	0.040
W.S. Elev (ft)	805.18	Reach Len. (ft)	630.00	596.64	580.00
Crit W.S. (ft)	804.41	Flow Area (sq ft)	1207.27	174.43	0.35
E.G. Slope (ft/ft)	0.004607	Area (sq ft)	2224.86	174.43	0.35
Q Total (cfs)	3969.00	Flow (cfs)	3695.94	272.96	0.10
Top Width (ft)	1988.97	Top Width (ft)	1785.90	194.10	8.98
Vel Total (ft/s)	2.87	Avg. Vel. (ft/s)	3.06	1.56	0.29
Max Chl Dpth (ft)	3.21	Hydr. Depth (ft)	1.40	0.90	0.04
Conv. Total (cfs)	58474.8	Conv. (cfs)	54451.9	4021.4	1.5
Length Wtd. (ft)	621.26	Wetted Per. (ft)	862.61	194.21	8.98
Min Ch El (ft)	802.53	Shear (lb/sq ft)	0.40	0.26	0.01
Alpha	1.08	Stream Power (lb/ft s)	1.23	0.40	0.00
Frctn Loss (ft)	4.33	Cum Volume (acre-ft)	111.42	38.57	57.78
C & E Loss (ft)	0.00	Cum SA (acres)	102.90	18.49	33.56

Warning: Divided flow computed for this cross-section.
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 #PF 2

E.G. Elev (ft)	806.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.045	0.060	
W.S. Elev (ft)	806.01	Reach Len. (ft)	630.00	596.64	580.00
Crit W.S. (ft)	805.06	Flow Area (sq ft)	1248.19	335.82	

E.G. Slope (ft/ft)	0.003399	Area (sq ft)	1248.19	335.82	
Q Total (cfs)	3969.00	Flow (cfs)	3272.59	696.42	
Top Width (ft)	975.68	Top Width (ft)	781.58	194.10	
Vel Total (ft/s)	2.51	Avg. Vel. (ft/s)	2.62	2.07	
Max Chl Dpth (ft)	3.80	Hydr. Depth (ft)	1.60	1.73	
Conv. Total (cfs)	68072.9	Conv. (cfs)	56128.6	11944.3	
Length Wtd. (ft)	621.47	Wetted Per. (ft)	785.41	195.12	
Min Ch El (ft)	802.53	Shear (lb/sq ft)	0.34	0.37	
Alpha	1.02	Stream Power (lb/ft s)	0.88	0.76	
Frctn Loss (ft)	4.31	Cum Volume (acre-ft)	90.61	47.03	18.62
C & E Loss (ft)	0.03	Cum SA (acres)	75.43	18.49	17.55

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: Bender Wash
REACH: Main Channel RS: 2.724

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8624.91	802.9	8660.65	802.24	8682.32	801.9	8725.68	801.52	8769.03	801.42
8813.88	801.3	8849.7	800.79	8864.98	800.41	8877.41	799.96	8885.53	799.37
8920.77	797.3	8942.44	797.49	8964.12	798.02	8993	798.99	9007.47	799.43
9027.87	800	9061.06	800.15	9075.35	800.19	9125.74	800.44	9167.58	800.38
9259.82	800.1	9287.43	799.97	9328.99	799.76	9352.11	799.7	9398.17	799.83
9432.26	800.1	9467.34	800.25	9513.8	800.63	9541.87	800.83	9607.42	801.26
9647.5	801.4	9687.57	801.5	9728.84	801.39	9774.09	801.11	9834.47	800.67
9909.84	800.3	9940.73	800.04	9961.98	799.58	9968.09	799.58	10000.34	798.81
10004.49	798.6	10025.74	799.59	10048.23	799.89	10068.24	799.96	10090.83	799.96
10139.09	799.8	10202.48	799.84	10240.45	799.91	10348.81	800.34	10397.72	800.64
10433.55	801	10458.56	801.44	10541.29	802.95	10568.3	803.31	10607.42	803.65
10627.47	803.7	10670.56	803.76	10692.11	803.77				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8624.91	.045	9940.73	.061	10068.24	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9940.73	10068.24	470	424.76	400	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	801.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.045	0.060	0.040
W.S. Elev (ft)	800.82	Reach Len. (ft)	470.00	424.76	400.00
Crit W.S. (ft)	800.53	Flow Area (sq ft)	742.07	168.51	256.31
E.G. Slope (ft/ft)	0.011731	Area (sq ft)	742.07	168.51	256.31
Q Total (cfs)	3969.00	Flow (cfs)	2582.06	544.20	842.74
Top Width (ft)	1292.63	Top Width (ft)	818.17	127.51	346.95
Vel Total (ft/s)	3.40	Avg. Vel. (ft/s)	3.48	3.23	3.29
Max Chl Dpth (ft)	3.52	Hydr. Depth (ft)	0.91	1.32	0.74
Conv. Total (cfs)	36644.4	Conv. (cfs)	23839.3	5024.4	7780.8
Length Wtd. (ft)	455.19	Wetted Per. (ft)	818.31	127.55	346.95
Min Ch El (ft)	798.60	Shear (lb/sq ft)	0.66	0.97	0.54
Alpha	1.00	Stream Power (lb/ft s)	2.31	3.12	1.78
Frctn Loss (ft)	3.06	Cum Volume (acre-ft)	89.97	36.22	56.07
C & E Loss (ft)	0.01	Cum SA (acres)	84.07	16.29	31.19

Warning: Divided flow computed for this cross-section.
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 #PF 2

E.G. Elev (ft)	801.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.	0.045	0.060	
W.S. Elev (ft)	801.40	Reach Len. (ft)	470.00	424.76	400.00
Crit W.S. (ft)		Flow Area (sq ft)	572.73	242.92	

E.G. Slope (ft/ft)	0.021142	Area (sq ft)	572.73	242.92	
Q Total (cfs)	3969.00	Flow (cfs)	2635.07	1333.94	
Top Width (ft)	755.56	Top Width (ft)	628.05	127.51	
Vel Total (ft/s)	4.87	Avg. Vel. (ft/s)	4.60	5.49	
Max Chl Dpth (ft)	2.80	Hydr. Depth (ft)	0.91	1.91	
Conv. Total (cfs)	27296.7	Conv. (cfs)	18122.6	9174.1	
Length Wtd. (ft)	457.44	Wetted Per. (ft)	629.28	128.99	
Min Ch El (ft)	798.60	Shear (lb/sq ft)	1.20	2.49	
Alpha	1.02	Stream Power (lb/ft s)	5.53	13.65	
Frctn Loss (ft)	3.03	Cum Volume (acre-ft)	77.44	43.07	18.62
C & E Loss (ft)	0.04	Cum SA (acres)	65.23	16.29	17.55

Warning: Divided flow computed for this cross-section.
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: Bender Wash
REACH: Main Channel RS: 2.644

INPUT
Description:
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8819	800.3	8867.4	800.16	8901.09	799.97	8968.47	799.3	9053.18	798.52
9075.48	798.2	9103.23	797.72	9142.37	796.75	9164.66	796.09	9186.96	795.67
9204.31	794.9	9209.25	794.74	9231.55	794.96	9253.85	795.62	9284.85	796.22
9305.38	796.6	9320.73	796.89	9372.76	797.48	9416.69	797.83	9454.51	797.93
9482.61	797.9	9508.01	797.69	9548.06	797.25	9613.21	796.39	9654.89	796
9678.36	796	9732.22	795.99	9787.38	796.03	9831.08	796.21	9884.76	796.54
9919.81	796.6	9940.32	796.53	9962.17	796.33	9984.02	796	10005.87	795.54
10032.25	796.1	10064.85	796.58	10109.06	797.27	10158.5	797.42	10180.21	797.45
10204.43	797.42	10223.64	797.51	10253.59	797.56	10275.71	797.64	10311.35	797.94
10397.35	799.03	10453.92	799.71	10489.56	800.03				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8819	.035	9919.81	.055	10064.85	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9919.81	10064.85	510	479.57	520	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	797.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	797.77	Reach Len. (ft)	510.00	479.57	520.00
Crit W.S. (ft)		Flow Area (sq ft)	971.44	230.85	91.71
E.G. Slope (ft/ft)	0.004340	Area (sq ft)	971.44	230.85	91.71
Q Total (cfs)	3969.00	Flow (cfs)	3286.01	560.09	122.90
Top Width (ft)	1101.72	Top Width (ft)	730.36	145.04	226.33
Vel Total (ft/s)	3.07	Avg. Vel. (ft/s)	3.38	2.43	1.34
Max Chl Dpth (ft)	3.03	Hydr. Depth (ft)	1.33	1.59	0.41
Conv. Total (cfs)	60244.4	Conv. (cfs)	49877.5	8501.4	1865.5
Length Wtd. (ft)	502.26	Wetted Per. (ft)	730.44	145.06	226.33
Min Ch El (ft)	795.54	Shear (lb/sq ft)	0.36	0.43	0.11
Alpha	1.10	Stream Power (lb/ft s)	1.22	1.05	0.15
Frctn Loss (ft)	2.13	Cum Volume (acre-ft)	80.72	34.27	54.48
C & E Loss (ft)	0.00	Cum SA (acres)	75.72	14.96	28.56

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 #PF 2

E.G. Elev (ft)	798.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.035	0.055	
W.S. Elev (ft)	798.46	Reach Len. (ft)	510.00	479.57	520.00
Crit W.S. (ft)		Flow Area (sq ft)	753.31	331.51	
E.G. Slope (ft/ft)	0.003193	Area (sq ft)	753.31	331.51	
Q Total (cfs)	3969.00	Flow (cfs)	3098.47	870.53	
Top Width (ft)	478.84	Top Width (ft)	333.80	145.04	

Vel Total (ft/s)	3.66	Avg. Vel. (ft/s)	4.11	2.63	
Max Chl Dpth (ft)	2.92	Hydr. Depth (ft)	2.26	2.29	
Conv. Total (cfs)	70242.6	Conv. (cfs)	54836.1	15406.5	
Length Wtd. (ft)	495.37	Wetted Per. (ft)	335.52	146.94	
Min Ch El (ft)	795.54	Shear (lb/sq ft)	0.45	0.45	
Alpha	1.10	Stream Power (lb/ft s)	1.84	1.18	
Frctn Loss (ft)	1.91	Cum Volume (acre-ft)	70.29	40.27	18.62
C & E Loss (ft)	0.00	Cum SA (acres)	60.04	14.96	17.55

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: Bender Wash
REACH: Main Channel RS: 2.553

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9097.36	796.5	9140.41	796.21	9195.63	795.7	9260.64	795.4	9300.95	795.23
9346.82	795.3	9369.76	795.19	9390.68	794.78	9423.19	793.49	9438.56	792.82
9461.5	792.2	9488.2	792.27	9507.37	792.38	9530.3	792.66	9539.27	792.82
9584.16	793.7	9612.68	794.23	9642.9	794.64	9690.47	795.06	9717.43	795.15
9744.38	795.1	9771.34	794.98	9796.98	794.72	9866.45	793.4	9905.8	792.83
9939.53	792.7	9948.9	792.7	9963.58	792.58	9970.38	792.69	9976.81	792.96
9991.71	793.4	10015.5	794.33	10034.35	794.91	10055.68	795.98	10077	796.09
10092.88	796.11	10119.65	795.99	10183.62	796.43	10226.28	796.61	10268.93	796.63

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9097.36	.035	9771.34	.055	10034.35	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9771.34	10034.35	490	569.33	510	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	795.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	795.65	Reach Len. (ft)	490.00	569.33	510.00
Crit W.S. (ft)		Flow Area (sq ft)	746.57	536.19	5.49
E.G. Slope (ft/ft)	0.004151	Area (sq ft)	746.57	536.19	5.49
Q Total (cfs)	3969.00	Flow (cfs)	2461.84	1500.35	6.80
Top Width (ft)	841.69	Top Width (ft)	563.95	263.01	14.73
Vel Total (ft/s)	3.08	Avg. Vel. (ft/s)	3.30	2.80	1.24
Max Chl Dpth (ft)	3.45	Hydr. Depth (ft)	1.32	2.04	0.37
Conv. Total (cfs)	61602.5	Conv. (cfs)	38210.1	23286.9	105.6
Length Wtd. (ft)	526.82	Wetted Per. (ft)	564.03	263.07	14.75
Min Ch El (ft)	792.58	Shear (lb/sq ft)	0.34	0.53	0.10
Alpha	1.02	Stream Power (lb/ft s)	1.13	1.48	0.12
Frctn Loss (ft)	2.47	Cum Volume (acre-ft)	70.66	30.05	53.90
C & E Loss (ft)	0.01	Cum SA (acres)	68.14	12.71	27.12

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 #PF 2

E.G. Elev (ft)	796.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	796.55	Reach Len. (ft)	490.00	569.33	510.00
Crit W.S. (ft)		Flow Area (sq ft)	238.79	774.75	18.39
E.G. Slope (ft/ft)	0.004747	Area (sq ft)	238.79	774.75	18.39
Q Total (cfs)	3969.00	Flow (cfs)	952.52	2962.98	53.50
Top Width (ft)	425.00	Top Width (ft)	147.76	263.01	14.23
Vel Total (ft/s)	3.85	Avg. Vel. (ft/s)	3.99	3.82	2.91
Max Chl Dpth (ft)	3.97	Hydr. Depth (ft)	1.62	2.95	1.29
Conv. Total (cfs)	57606.6	Conv. (cfs)	13825.0	43005.0	776.5
Length Wtd. (ft)	551.44	Wetted Per. (ft)	149.94	263.07	15.18
Min Ch El (ft)	792.58	Shear (lb/sq ft)	0.47	0.87	0.36
Alpha	1.00	Stream Power (lb/ft s)	1.88	3.34	1.04
Frctn Loss (ft)	2.93	Cum Volume (acre-ft)	64.48	34.18	18.51
C & E Loss (ft)	0.01	Cum SA (acres)	57.22	12.71	17.46

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: Bender Wash
REACH: Main Channel RS: 2.445

INPUT
Description:
Station Elevation Data num= 67

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8809.75	793.6	8868.41	793.8	8911.54	793.82	8993.82	793.71	9058.81	793.72
9155.66	793.8	9191.56	793.82	9263.37	793.62	9371.09	793.08	9427.04	792.76
9478.81	792.6	9514.72	792.61	9586.53	792.82	9622.43	792.79	9658.34	792.54
9694.25	792	9708.63	791.61	9730.51	790.95	9760.86	790.22	9765.45	790.09
9774.8	790.6	9797.12	792	9828.79	792.82	9860.46	792.63	9896.03	791.91
9923.8	791.2	9955.47	790.39	9989.62	789.86	10011.43	789.78	10018.81	789.87
10057.48	790.8	10085.69	791.41	10101.86	791.72	10125.8	792.04	10166.68	792.42
10209.9	792.7	10232.97	792.71	10274.72	792.62	10317.93	792.39	10361.15	792.13
10425.97	791.9	10447.75	791.91	10469.18	792	10520.16	792.41	10554.49	792.76
10571.74	792.8	10600.57	792.51	10608.98	792.32	10648.46	792.24	10677.63	791.84
10689.03	791.8	10709.12	789.41	10730.03	787.09	10749.78	786.74	10773.29	786.51
10799.18	786	10859.32	785.64	10874.54	785.39	10895.33	785.28	10946.55	785.15
11021.84	786.5	11025.12	786.69	11053.07	790.35	11073.59	792.99	11092.2	793.05
11103.08	793	11113.55	792.83						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8809.75	.035	9860.46	.055	10166.68	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9860.46	10166.68	535	614.31	700	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888			F

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	793.32	Element			
Vel Head (ft)	0.13	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	793.19	Reach Len. (ft)	535.00	614.31	700.00
Crit W.S. (ft)	792.67	Flow Area (sq ft)	427.52	623.72	338.05
E.G. Slope (ft/ft)	0.005325	Area (sq ft)	427.52	623.72	2938.70
Q Total (cfs)	3969.00	Flow (cfs)	1174.69	1975.54	818.77
Top Width (ft)	1764.81	Top Width (ft)	511.72	306.22	946.87
Vel Total (ft/s)	2.86	Avg. Vel. (ft/s)	2.75	3.17	2.42
Max Chl Dpth (ft)	8.04	Hydr. Depth (ft)	0.84	2.04	0.84
Conv. Total (cfs)	54392.5	Conv. (cfs)	16098.3	27073.5	11220.8
Length Wtd. (ft)	606.41	Wetted Per. (ft)	511.83	306.28	400.24
Min Ch El (ft)	789.78	Shear (lb/sq ft)	0.28	0.68	0.28
Alpha	1.03	Stream Power (lb/ft s)	0.76	2.14	0.68
Frctn Loss (ft)	3.18	Cum Volume (acre-ft)	64.06	22.47	36.66
C & E Loss (ft)	0.01	Cum SA (acres)	62.09	8.99	21.49

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 OUTPUT Profile #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	793.85	Element			
Vel Head (ft)	0.21	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	793.64	Reach Len. (ft)	535.00	614.31	700.00
Crit W.S. (ft)	792.93	Flow Area (sq ft)	8.85	759.94	313.27
E.G. Slope (ft/ft)	0.005986	Area (sq ft)	8.85	759.94	313.27
Q Total (cfs)	3969.00	Flow (cfs)	26.81	2911.24	1030.94
Top Width (ft)	569.20	Top Width (ft)	9.03	306.22	253.95
Vel Total (ft/s)	3.67	Avg. Vel. (ft/s)	3.03	3.83	3.29
Max Chl Dpth (ft)	3.86	Hydr. Depth (ft)	0.98	2.48	1.23
Conv. Total (cfs)	51300.7	Conv. (cfs)	346.6	37628.8	13325.3
Length Wtd. (ft)	622.44	Wetted Per. (ft)	9.98	306.28	255.67
Min Ch El (ft)	789.78	Shear (lb/sq ft)	0.33	0.93	0.46
Alpha	1.01	Stream Power (lb/ft s)	1.00	3.55	1.51
Frctn Loss (ft)	3.58	Cum Volume (acre-ft)	63.09	24.15	16.57
C & E Loss (ft)	0.01	Cum SA (acres)	56.34	8.99	15.8[illegible]

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: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION RIVER: Bender Wash
REACH: Main Channel RS: 2.329

INPUT
Description:
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8199.87	791.2	8247.27	791.22	8291.33	791.2	8373.14	791	8447.25	790.93
8480.76	790.9	8523.8	790.9	8566.85	791.11	8655.15	791.79	8707.12	791.93
8724.86	791.9	8761.6	791.65	8811.07	791.06	8846.66	790.43	8889.71	789.56
8915.02	789.1	8932.76	788.88	8954.28	788.71	8997.33	788.68	9018.97	788.79
9070.95	789.2	9147.99	789.93	9212.57	790.41	9255.61	790.64	9298.66	790.77
9330.82	790.7	9363.23	790.44	9449.33	789.65	9469.39	789.5263	9496.36	789.36
9507.67	789.3467	9538.72	789.31	9578.47	789.4	9621.52	789.71	9643.18	789.89
9665.76	790.19	9698.3	790.24	9720.23	790.4	9778.2	790.32	9803.73	790.51
9865.9	790.92	9869.83	790.85	9885.2	790.2	9893.75	789.56	9920.78	788.45
9942.46	787.81	9947.68	787.56	9956.38	787.4	9957.8	787.2	9968.63	786.63
9982.39	787.47	9991.25	787.44	10001.63	784.91	10007.65	788.13	10025.38	786.86
10037.4	788.01	10057.44	787.49	10061.92	786.11	10070.23	783.41	10090.23	786.15
10095.65	787.03	10104.32	784.8	10111.2	786.41	10118.44	787.69	10166.08	787.6
10177.28	787.08	10196.29	788.52	10216.83	788.51	10247.76	788.42	10284.02	788.69
10302.92	788.92	10315.82	786.39	10321.04	786.91	10336.11	789.47	10356.38	789.13
10372.21	788.72	10381.11	789.51	10389.11	789.41	10398.75	788.17	10421.36	788.93
10435.14	788.12	10443.72	788.53	10465.38	789.71	10473.64	789.68	10482.81	789.47
10502.48	789.69	10531.89	790.58	10587.39	791.11	10625.11	791.46	10651.38	791.65
10672.3	791.67	10711.41	791.63	10733.4	791.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8199.87	.035	10057.44	.055	10118.44	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
10057.44	10118.44	440	288.13	310	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	790.13	Element			
Vel Head (ft)	0.25	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	789.89	Reach Len. (ft)	440.00	288.13	310.00
Crit W.S. (ft)	789.41	Flow Area (sq ft)	649.42	261.06	525.25
E.G. Slope (ft/ft)	0.005184	Area (sq ft)	649.42	261.06	525.25
Q Total (cfs)	5530.00	Flow (cfs)	2503.02	1317.35	1709.63
Top Width (ft)	1108.12	Top Width (ft)	656.63	61.00	390.49
Vel Total (ft/s)	3.85	Avg. Vel. (ft/s)	3.85	5.05	3.25
Max Chl Dpth (ft)	6.49	Hydr. Depth (ft)	0.99	4.28	1.35
Conv. Total (cfs)	76806.2	Conv. (cfs)	34764.5	18296.7	23745.0
Length Wtd. (ft)	381.48	Wetted Per. (ft)	657.98	62.48	391.26
Min Ch El (ft)	783.40	Shear (lb/sq ft)	0.32	1.35	0.43
Alpha	1.08	Stream Power (lb/ft s)	1.23	6.82	1.41
Frctn Loss (ft)	2.58	Cum Volume (acre-ft)	57.45	16.23	8.83
C & E Loss (ft)	0.00	Cum SA (acres)	54.92	6.41	10.75

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.

CROSS SECTION OUTPUT Profile #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	790.26	Element			
Vel Head (ft)	0.31	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	789.95	Reach Len. (ft)	440.00	288.13	310.00
Crit W.S. (ft)	789.41	Flow Area (sq ft)	473.32	265.26	552.08
E.G. Slope (ft/ft)	0.005579	Area (sq ft)	473.32	265.26	552.08
Q Total (cfs)	5530.00	Flow (cfs)	2197.39	1403.47	1929.14

Top Width (ft)	851.57	Top Width (ft)	400.78	61.00	389.79
Vel Total (ft/s)	4.28	Avg. Vel. (ft/s)	4.64	5.29	3.49
Max Chl Dpth (ft)	6.55	Hydr. Depth (ft)	1.18	4.35	1.42
Conv. Total (cfs)	74036.5	Conv. (cfs)	29419.0	18789.9	25827.7
Length Wtd. (ft)	377.59	Wetted Per. (ft)	402.12	62.48	390.64
Min Ch El (ft)	783.40	Shear (lb/sq ft)	0.41	1.48	0.49
Alpha	1.09	Stream Power (lb/ft s)	1.90	7.82	1.72
Frctn Loss (ft)	2.69	Cum Volume (acre-ft)	60.13	16.92	9.62
C & E Loss (ft)	0.02	Cum SA (acres)	53.82	6.41	10.72

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.

CROSS SECTION RIVER: Bender Wash
REACH: Main Channel RS: 2.274

INPUT
Description:
Station Elevation Data num= 100

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8322.77	786.91	8369.41	786.77	8392.73	786.59	8416.05	786.3	8462.69	785.67
8501.28	785.12	8533.3	784.95	8579.29	785.09	8602.61	785.3	8629.36	785.58
8672.56	786.25	8725.42	787.09	8742.52	787.28	8756.01	787.1	8773.41	787.05
8822.11	786.46	8830.88	786.41	8839.31	786.1	8848.4	786.3	8868.01	785.64
8875.37	785.3	8883.01	785.31	8890.09	785.82	8899.33	784.2	8903.3	785.32
8907.16	785.86	8921.2	786.04	8934.2	786.31	8972.8	787.3	8986.92	787.27
8999.21	787.11	9073.36	786.51	9079.82	786.63	9124.16	787.7	9152.29	786.87
9165.77	786.3	9177.08	786.45	9183.94	786.87	9193.26	787.2	9225.39	787.53
9258.23	787.83	9313.51	787.99	9326.39	788.01	9393.56	788.2	9428	788.41
9464.94	788.53	9479.46	788.71	9489.1	788.49	9498.68	788.4	9508.25	788.24
9525.67	788.04	9546.79	787.92	9597.6	787.1	9612.22	786.8	9632.09	786.33
9644.99	786.6	9720.99	787.11	9795.69	787.8	9815.62	788.1	9873.86	788.21
9890.63	788.11	9898.22	787.83	9927.34	786.71	9946.87	785.9	9961.8	785.06
9972.99	786.03	9988.01	785.63	9994.97	784.71	10007.99	782.41	10010.11	782.67
10025.99	786.7695	10028.2	787.34	10046.71	786.91	10066.29	786.52	10084.65	786.4
10122.26	786.24	10131.67	786.05	10159.22	786.04	10217.04	787.15	10221.18	786.4
10227.18	786.24	10237.42	787.26	10257.51	787.33	10278.95	787.52	10288.67	784.6
10300.11	787.05	10314.17	787.41	10349.28	787.27	10386.95	787	10426.07	787
10428.91	786.97	10438.3	788.72	10448.74	788.92	10457.66	787.48	10495.14	787.8
10543.55	788.13	10586.18	788.63	10613.91	788.86	10677.22	789.3	10720.85	789.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8322.77	.035	9927.34	.055	10025.99	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9927.34	10025.99	430	474.46	474	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	787.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	787.31	Reach Len. (ft)	430.00	474.46	474.00
Crit W.S. (ft)	787.04	Flow Area (sq ft)	944.60	204.25	221.22
E.G. Slope (ft/ft)	0.009335	Area (sq ft)	944.60	204.25	221.22
Q Total (cfs)	5350.00	Flow (cfs)	3845.70	860.94	643.36
Top Width (ft)	1472.42	Top Width (ft)	1026.15	98.65	347.62
Vel Total (ft/s)	3.90	Avg. Vel. (ft/s)	4.07	4.22	2.91
Max Chl Dpth (ft)	4.91	Hydr. Depth (ft)	0.92	2.07	0.64
Conv. Total (cfs)	55372.1	Conv. (cfs)	39802.7	8910.7	6658.7
Length Wtd. (ft)	440.48	Wetted Per. (ft)	1027.06	99.54	348.53
Min Ch El (ft)	782.40	Shear (lb/sq ft)	0.54	1.20	0.37
Alpha	1.04	Stream Power (lb/ft s)	2.18	5.04	1.08
Frctn Loss (ft)	2.68	Cum Volume (acre-ft)	49.40	14.69	6.17
C & E Loss (ft)	0.04	Cum SA (acres)	46.42	5.88	8.12

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 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 #PF 2

E.G. Elev (ft)	787.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	787.31	Reach Len. (ft)	430.00	474.46	474.00
Crit W.S. (ft)	787.04	Flow Area (sq ft)	937.66	203.58	218.83
E.G. Slope (ft/ft)	0.009520	Area (sq ft)	937.66	203.58	218.83
Q Total (cfs)	5350.00	Flow (cfs)	3841.34	864.70	643.96
Top Width (ft)	1464.92	Top Width (ft)	1023.65	98.65	342.62
Vel Total (ft/s)	3.93	Avg. Vel. (ft/s)	4.10	4.25	2.94
Max Chl Dpth (ft)	4.91	Hydr. Depth (ft)	0.92	2.06	0.64
Conv. Total (cfs)	54831.4	Conv. (cfs)	39369.3	8862.1	6599.9
Length Wtd. (ft)	440.48	Wetted Per. (ft)	1024.55	99.54	343.64
Min Ch El (ft)	782.40	Shear (lb/sq ft)	0.54	1.22	0.38
Alpha	1.03	Stream Power (lb/ft s)	2.23	5.16	1.11
Frctn Loss (ft)	2.66	Cum Volume (acre-ft)	53.00	15.37	6.88
C & E Loss (ft)	0.04	Cum SA (acres)	46.63	5.88	8.11

Warning: Divided flow computed for this cross-section.
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: Bender Wash
REACH: Main Channel RS: 2.184

INPUT
Description:
Station Elevation Data num= 88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8275.93	784.46	8341.44	784.26	8358.15	784.13	8419.3	783.92	8456.95	783.5
8464.11	783.51	8522.37	782.84	8591.6	783.22	8641.04	784.55	8687.01	783.9
8750.12	783.71	8769.23	783.58	8798.8	783.93	8823.99	784.02	8866.77	784.1
8898.58	783.99	8930.86	784.12	8958.99	783.71	8984.08	783.03	8995.34	782.8
9007.04	783.56	9009.3	783.12	9015.3	782.79	9022.68	782.78	9030.93	781.2
9040.08	782.39	9056.06	783.15	9061.67	781.61	9068.88	783.07	9089.01	783.3
9105.01	783.32	9119.97	783.16	9159.4	784.8	9194.06	783.23	9232.34	782.5
9256.68	783.42	9273.24	784.03	9305.4	785.27	9351.44	784.28	9419.34	784
9435.87	783.95	9492.68	783.27	9502.36	782.74	9509.64	783.8	9528.57	783.9
9550.02	784.15	9583.54	783.96	9608.07	783.64	9637.07	782.94	9653.5	783.5
9673.61	783.98	9699.31	784.09	9727.16	784.29	9759.04	784.55	9764.39	784.7
9805.95	784.48	9839.76	784.11	9859.07	783.98	9877.47	783.38	9911.93	784
9921.98	780.25	9940.36	780.32	9950.37	784.16	9959.32	784.01	9998.26	783.2
10025.52	783.47	10044.16	783.72	10054.5	784.01	10066.51	784.17	10077.22	782.5
10101.52	784.19	10124.37	785	10131.15	784.38	10168.41	784.4	10231.7	784.7
10250.99	784.63	10290.28	784.77	10330.16	784.82	10376.17	784.8	10384.48	784.3
10400.7	784.65	10416.8	784.92	10475.38	786.12	10487.55	786.39	10495.66	788.2
10497.99	788.21	10503.87	787.81	10507.87	788.38				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8275.93	.035	9911.93	.055	9950.37	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9911.93	9950.37	600	501.92	501.92	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	784.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	784.72	Reach Len. (ft)	600.00	501.92	501.92
Crit W.S. (ft)	784.32	Flow Area (sq ft)	1532.96	132.56	209.16
E.G. Slope (ft/ft)	0.004235	Area (sq ft)	1532.96	132.56	209.16
Q Total (cfs)	5182.00	Flow (cfs)	4191.60	519.52	470.88
Top Width (ft)	1975.06	Top Width (ft)	1592.90	38.44	343.72
Vel Total (ft/s)	2.76	Avg. Vel. (ft/s)	2.73	3.92	2.25
Max Chl Dpth (ft)	4.47	Hydr. Depth (ft)	0.96	3.45	0.61
Conv. Total (cfs)	79632.2	Conv. (cfs)	64412.6	7983.5	7236.1
Length Wtd. (ft)	588.19	Wetted Per. (ft)	1594.15	39.83	343.97
Min Ch El (ft)	780.25	Shear (lb/sq ft)	0.25	0.88	0.16
Alpha	1.05	Stream Power (lb/ft s)	0.70	3.45	0.36
Frctn Loss (ft)	4.32	Cum Volume (acre-ft)	37.17	12.86	3.83
C & E Loss (ft)	0.03	Cum SA (acres)	33.49	5.13	4.36

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 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 #PF 2

E.G. Elev (ft)	784.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	784.73	Reach Len. (ft)	600.00	501.92	501.92
Crit W.S. (ft)	784.31	Flow Area (sq ft)	1547.65	132.91	212.34
E.G. Slope (ft/ft)	0.004116	Area (sq ft)	1547.65	132.91	212.34
Q Total (cfs)	5182.00	Flow (cfs)	4195.47	514.50	472.04
Top Width (ft)	1979.08	Top Width (ft)	1593.99	38.44	346.65
Vel Total (ft/s)	2.74	Avg. Vel. (ft/s)	2.71	3.87	2.22
Max Chl Dpth (ft)	4.48	Hydr. Depth (ft)	0.97	3.46	0.61
Conv. Total (cfs)	80768.1	Conv. (cfs)	65391.8	8019.1	7357.3
Length Wtd. (ft)	588.25	Wetted Per. (ft)	1595.26	39.83	346.91
Min Ch El (ft)	780.25	Shear (lb/sq ft)	0.25	0.86	0.16
Alpha	1.05	Stream Power (lb/ft s)	0.68	3.32	0.35
Frctn Loss (ft)	4.32	Cum Volume (acre-ft)	40.73	13.54	4.53
C & E Loss (ft)	0.03	Cum SA (acres)	33.71	5.13	4.36

Warning: Divided flow computed for this cross-section.
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: Bender Wash
REACH: Main Channel RS: 2.089

INPUT
Description:
Station Elevation Data num= 82

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8337.2	780.2	8398.26	780.04	8472.06	780.17	8482.74	780.16	8547.91	780.2
8581.45	779.9	8612.81	779.76	8638.16	779.5	8649.35	779.52	8699.6	779.72
8725.43	779.6	8740.32	779.69	8772.6	779	8788.1	778.63	8798.16	778.7
8809.61	778.2	8833.54	777.46	8847.22	778.12	8863.09	777.82	8913.92	777.7
8926.72	778.3	8938.33	778.62	8958.47	779.14	8964.87	779.12	8986.64	779.22
9013.32	779.6	9049	779.55	9078.83	779.91	9128.9	781.09	9167.87	780.99
9186.1	780.9	9220.56	780.7	9240.06	780.16	9244.28	779.84	9268.39	778.2
9277.7	777.1	9282.52	778.36	9319.2	778.68	9351.3	778.66	9370.66	779.4
9388.48	780	9403.7	780.05	9438.09	780.4	9444.9	780.18	9463.92	779.21
9481.64	778.7	9507.95	778.55	9539.97	778.63	9563.35	778.92	9573.63	778.83
9583.53	779	9596.47	779.56	9618.92	780.67	9665.47	779.73	9677.6	779.95
9689.1	779.9	9720.17	780.61	9723.38	780.93	9731.95	781.13	9738.3	781.09
9754.85	780.3	9768.57	779.5	9770.84	779.33	9781.8	779.6	9807.11	780.35
9815.09	782.5	9819.55	782.24	9823.99	782.47	9837.23	780.67	9867.02	780.84
9872.21	780.7	9928.3	781.14	9946.6	779.9	9962.99	779.64	9970.68	779.65
9977.82	779.3	9983.28	778.93	10015.52	778.12	10023.27	779.93	10028.41	781.17
10072.88	781.78	10081.21	783.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8337.2	.035	9946.6	.055	10023.2	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9946.6	10023.2	210	343.99	343.99	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	780.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	780.05	Reach Len. (ft)	210.00	343.99	343.99
Crit W.S. (ft)	780.04	Flow Area (sq ft)	894.35	74.27	0.03
E.G. Slope (ft/ft)	0.015956	Area (sq ft)	894.35	74.27	0.03
Q Total (cfs)	5101.00	Flow (cfs)	4853.20	247.78	0.02
Top Width (ft)	1020.38	Top Width (ft)	943.28	76.60	0.50
Vel Total (ft/s)	5.27	Avg. Vel. (ft/s)	5.43	3.34	0.70
Max Chl Dpth (ft)	2.95	Hydr. Depth (ft)	0.95	0.97	0.0(

Conv. Total (cfs)	40382.7	Conv. (cfs)	38421.0	1961.6	0.2
Length Wtd. (ft)	219.74	Wetted Per. (ft)	943.79	76.85	0.51
Min Ch El (ft)	778.12	Shear (lb/sq ft)	0.94	0.96	0.06
Alpha	1.03	Stream Power (lb/ft s)	5.12	3.21	0.04
Frctn Loss (ft)	1.64	Cum Volume (acre-ft)	20.45	11.66	2.62
C & E Loss (ft)	0.09	Cum SA (acres)	16.02	4.47	2.38

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is les: 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 cros: section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	780.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.47	Wt. n-Val.	0.035	0.055	0.040
W.S. Elev (ft)	780.03	Reach Len. (ft)	210.00	343.99	343.99
Crit W.S. (ft)	780.03	Flow Area (sq ft)	872.46	72.46	0.02
E.G. Slope (ft/ft)	0.016936	Area (sq ft)	872.46	72.46	0.02
Q Total (cfs)	5101.00	Flow (cfs)	4855.99	245.00	0.01
Top Width (ft)	991.46	Top Width (ft)	914.54	76.60	0.32
Vel Total (ft/s)	5.40	Avg. Vel. (ft/s)	5.57	3.38	0.67
Max Chl Dpth (ft)	2.93	Hydr. Depth (ft)	0.95	0.95	0.06
Conv. Total (cfs)	39197.0	Conv. (cfs)	37314.4	1882.6	0.1
Length Wtd. (ft)	219.68	Wetted Per. (ft)	915.04	76.85	0.35
Min Ch El (ft)	778.12	Shear (lb/sq ft)	1.01	1.00	0.05
Alpha	1.03	Stream Power (lb/ft s)	5.61	3.37	0.04
Frctn Loss (ft)	1.53	Cum Volume (acre-ft)	24.07	12.35	3.31
C & E Loss (ft)	0.10	Cum SA (acres)	16.43	4.47	2.36

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is les: 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 cros: section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal tc 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: Bender Wash
REACH: Main Channel RS: 2.013

INPUT
Description:
Station Elevation Data num= 91

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8392.66	780.5	8432.66	779.4	8512.66	778.6	8548.73	778.2	8562.77	778.36
8607.37	778.37	8621.96	778.45	8650.35	777.3	8668.85	777.64	8686.91	777.83
8706.26	777.8	8725.81	777.98	8761.49	778.5	8763.32	778.63	8780.86	778.31
8797.51	778.05	8817.83	777.88	8820.42	778	8836.39	777.61	8882.36	776.68
8890.17	776.68	8891.23	776.87	8909	776.7	8918.65	776.91	8935.81	777.44
8942.83	777.47	8963.43	777.96	8994.5	776.9	9014.29	776.43	9054.37	776.34
9067.61	776.75	9078.29	776.66	9091.28	776.5	9127.41	776.48	9164.96	776.59
9181.25	776.71	9209.06	777.86	9221.09	777.7	9232.68	778	9243.48	778.08
9264.15	778.51	9270.7	778.49	9297.24	778.9	9324.96	779.79	9355.97	780.48
9365.59	780.69	9423.15	780	9427.14	779.9	9436.89	779.08	9444.67	778.34
9447.69	778.49	9467.4	778.19	9474.53	778.3	9483.29	777.56	9493.04	777.44
9515.12	776.61	9519.52	775.58	9527.55	776.8	9536.97	776.64	9555.47	776.79
9567.09	776.75	9591.32	776.59	9612.36	777	9623.37	777.46	9680.7	777.21
9695.22	777.13	9752.02	777.41	9774.92	777.5	9834.51	777.6	9916.81	778.27
9923.35	778.62	9928.93	778.63	9942.61	781.3	9949.91	781.61	9953.57	783.28
9959.74	781.41	9966.64	780.03	9970.66	778.5175	9972.66	777.765	9978.68	775.5
10005.81	776.44	10016.59	776.43	10030.32	776.43	10044.52	777.08	10047.06	777.1
10050.89	777.94	10054.12	778.3	10068.41	780.53	10076.34	781.82	10087.06	782.8
10109.86	783.02								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8392.66	.035	9970.66	.055	10054.12	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9970.66	10054.12	240	295.7	295.7	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888			F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	778.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.035	0.055	
W.S. Elev (ft)	778.62	Reach Len. (ft)	240.00	295.70	295.70
Crit W.S. (ft)	778.04	Flow Area (sq ft)	1437.10	163.51	
E.G. Slope (ft/ft)	0.004303	Area (sq ft)	1437.10	174.56	0.33
Q Total (cfs)	5101.00	Flow (cfs)	4607.50	493.50	
Top Width (ft)	1334.92	Top Width (ft)	1249.42	83.46	2.04
Vel Total (ft/s)	3.19	Avg. Vel. (ft/s)	3.21	3.02	
Max Chl Dpth (ft)	3.12	Hydr. Depth (ft)	1.15	2.24	
Conv. Total (cfs)	77759.6	Conv. (cfs)	70236.6	7523.0	
Length Wtd. (ft)	255.12	Wetted Per. (ft)	1249.91	73.58	
Min Ch El (ft)	775.50	Shear (lb/sq ft)	0.31	0.60	
Alpha	1.00	Stream Power (lb/ft s)	0.99	1.80	
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	14.83	10.68	2.62
C & E Loss (ft)	0.03	Cum SA (acres)	10.74	3.84	2.37

Warning: Divided flow computed for this cross-section.
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 #PF 2

E.G. Elev (ft)	778.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.035	0.055	
W.S. Elev (ft)	778.70	Reach Len. (ft)	240.00	295.70	295.70
Crit W.S. (ft)	778.04	Flow Area (sq ft)	1544.13	169.72	
E.G. Slope (ft/ft)	0.003774	Area (sq ft)	1544.13	181.66	0.44
Q Total (cfs)	5101.00	Flow (cfs)	4609.21	491.79	
Top Width (ft)	1347.79	Top Width (ft)	1262.77	83.46	1.56
Vel Total (ft/s)	2.98	Avg. Vel. (ft/s)	2.98	2.90	
Max Chl Dpth (ft)	3.20	Hydr. Depth (ft)	1.22	2.32	
Conv. Total (cfs)	83029.6	Conv. (cfs)	75024.8	8004.9	
Length Wtd. (ft)	255.44	Wetted Per. (ft)	1263.38	73.58	
Min Ch El (ft)	775.50	Shear (lb/sq ft)	0.29	0.54	
Alpha	1.00	Stream Power (lb/ft s)	0.86	1.57	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	18.24	11.35	3.30
C & E Loss (ft)	0.03	Cum SA (acres)	11.19	3.84	2.36

Warning: Divided flow computed for this cross-section.
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: Bender Wash
REACH: Main Channel RS: 1.968

INPUT
Description:
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8522.81	778.5	8602.81	777.5	8629.07	776.91	8635.8	777.05	8656.7	777.67
8684.41	777.78	8710.07	777.7	8715.2	777.54	8733.93	777.28	8753.1	776.61
8797.13	777.52	8828.38	778.1	8840.38	778.35	8857.76	777.84	8892.6	777.24
8915.59	777.18	8937.9	777	9013.36	776.01	9033.21	776.01	9039.22	775.84
9053.09	775.75	9065.82	775.8	9102.49	775.58	9163.32	775.71	9169.09	775.4
9176.35	775.37	9241.02	775.4	9257.74	775.24	9263.44	775.4	9269.79	775.38
9299.17	775.76	9325.1	777.1	9335.64	777.36	9353.52	777.17	9362.49	777.15
9388.78	776.81	9400.29	776.5	9419.01	776.47	9429.79	776.2	9440.96	776.12
9448.48	775.93	9474.44	774.4	9483	774	9486.94	774.87	9492.04	775.62
9503.94	775.36	9518.59	775.5	9531.54	775.53	9538.06	773.55	9545.2	775.28
9547.01	775.3	9571.16	775.5	9592.63	775.5	9645.34	775.3	9669.46	775.21
9706.5	775.19	9714.25	777.3	9722.57	776.41	9737.39	776.19	9750.29	776.26
9775.39	776.82	9775.81	777	9803.04	777.49	9806.36	777.51	9829.3	777.92
9841.85	778.04	9857.63	777.9	9867.13	777.88	9874.96	778.02	9882.33	777.97
9921.59	778.44	9932.47	778.6	9939.97	779.12	9950.75	779.41	9967.4	780.17

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8522.81	.035	9335.64	.035	9714.25	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9335.64	9714.25	180	422.4	422.4	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	778.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.035	0.035	
W.S. Elev (ft)	778.32	Reach Len. (ft)	180.00	422.40	422.40
Crit W.S. (ft)	776.65	Flow Area (sq ft)	1297.43	989.56	
E.G. Slope (ft/ft)	0.000637	Area (sq ft)	1297.43	989.56	184.42
Q Total (cfs)	4116.00	Flow (cfs)	2107.88	2008.12	
Top Width (ft)	1371.70	Top Width (ft)	795.84	378.61	197.25
Vel Total (ft/s)	1.80	Avg. Vel. (ft/s)	1.62	2.03	
Max Chl Dpth (ft)	4.77	Hydr. Depth (ft)	1.63	2.61	
Conv. Total (cfs)	163100.0	Conv. (cfs)	83526.4	79573.6	
Length Wtd. (ft)	285.87	Wetted Per. (ft)	795.97	379.62	
Min Ch El (ft)	773.55	Shear (lb/sq ft)	0.06	0.10	
Alpha	1.04	Stream Power (lb/ft s)	0.11	0.21	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	7.30	6.73	2.00
C & E Loss (ft)	0.05	Cum SA (acres)	5.10	2.27	1.69

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 fo additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is les than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	778.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.035	0.035	
W.S. Elev (ft)	778.43	Reach Len. (ft)	180.00	422.40	422.40
Crit W.S. (ft)	776.65	Flow Area (sq ft)	1383.39	1030.35	
E.G. Slope (ft/ft)	0.000587	Area (sq ft)	1383.39	1030.35	205.58
Q Total (cfs)	4116.00	Flow (cfs)	2053.13	2062.88	
Top Width (ft)	1373.39	Top Width (ft)	798.37	378.61	196.41
Vel Total (ft/s)	1.71	Avg. Vel. (ft/s)	1.48	2.00	
Max Chl Dpth (ft)	4.88	Hydr. Depth (ft)	1.73	2.72	
Conv. Total (cfs)	169826.9	Conv. (cfs)	84712.3	85114.6	
Length Wtd. (ft)	276.77	Wetted Per. (ft)	798.61	379.62	
Min Ch El (ft)	773.55	Shear (lb/sq ft)	0.06	0.10	
Alpha	1.07	Stream Power (lb/ft s)	0.09	0.20	
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	10.18	7.24	2.61
C & E Loss (ft)	0.02	Cum SA (acres)	5.51	2.27	1.68

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is les than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Bender Wash
REACH: Main Channel RS: 1.930

INPUT
Description:
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8592.29	777.6	8622.11	777.14	8644.19	776.71	8647.2	776.79	8665	776.28
8669.06	776.1	8703.76	777.32	8735.74	777.48	8740.73	776.94	8751.08	776.43
8777.66	775.5	8830.79	776.96	8849.11	776.9	8865.72	776.62	8879.49	776.6
8890.84	776.5	8897.5	776.32	8937.72	776.75	8980.22	776.11	9013.17	776.96
9016.36	777.2	9069.98	776.24	9079.32	776.14	9100.63	776.26	9120.37	776.18
9126.35	776.8	9144.96	776.93	9162.94	777.17	9183.32	777.33	9184.5	777.46
9199.57	777.7	9224.05	777.81	9238.2	777.73	9250.19	777.28	9282.34	776.19
9296.07	775.5	9310.92	774.92	9338.24	773.69	9346.68	771.92	9350.26	771.32
9358.3	774.4	9363.58	774.08	9372.87	773.8	9434.55	774.38	9456.27	774.91
9469.13	775.6	9474.66	775.64	9487.2	776.9	9489.91	776.68	9490.31	774.89
9491.74	774.1	9496.79	773.33	9511.83	773.07	9518.04	772.97	9539.03	772.86
9539.97	772.7	9548.39	773.5	9549.77	775.22	9550.03	776.52	9561.77	775.83
9577.88	775.6	9590.2	775.41	9608.88	775.73	9620.5	775.72	9624.23	775.9

9644.7 777.9 9655.24 779.02 9671.94 779.3 9718.26 780.21

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8592.29	.035	9496.79	.035	9548.39	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9496.79	9548.39	135	138.58	138.58	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888			F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
9358.36	9498.96	781.09

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	777.90	Element			
Vel Head (ft)	0.58	Wt. n-Val.	0.035	0.035	
W.S. Elev (ft)	777.32	Reach Len. (ft)	135.00	138.58	138.58
Crit W.S. (ft)	777.32	Flow Area (sq ft)	645.94	187.24	
E.G. Slope (ft/ft)	0.006382	Area (sq ft)	645.94	212.32	132.45
Q Total (cfs)	4116.00	Flow (cfs)	2528.80	1587.20	
Top Width (ft)	787.68	Top Width (ft)	648.14	49.43	90.11
Vel Total (ft/s)	4.94	Avg. Vel. (ft/s)	3.91	8.48	
Max Chl Dpth (ft)	6.00	Hydr. Depth (ft)	1.00	4.32	
Conv. Total (cfs)	51521.8	Conv. (cfs)	31654.1	19867.7	
Length Wtd. (ft)	136.15	Wetted Per. (ft)	652.13	47.39	
Min Ch El (ft)	772.70	Shear (lb/sq ft)	0.39	1.57	
Alpha	1.52	Stream Power (lb/ft s)	1.55	13.35	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	3.28	0.90	0.46
C & E Loss (ft)	0.15	Cum SA (acres)	2.12	0.19	0.30

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 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: 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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	778.16	Element			
Vel Head (ft)	0.23	Wt. n-Val.	0.035	0.035	
W.S. Elev (ft)	777.93	Reach Len. (ft)	135.00	138.58	138.58
Crit W.S. (ft)	777.32	Flow Area (sq ft)	1077.46	213.73	
E.G. Slope (ft/ft)	0.002481	Area (sq ft)	1077.46	242.53	187.51
Q Total (cfs)	4116.00	Flow (cfs)	2892.67	1223.33	
Top Width (ft)	887.53	Top Width (ft)	748.03	49.43	90.07
Vel Total (ft/s)	3.19	Avg. Vel. (ft/s)	2.68	5.72	
Max Chl Dpth (ft)	6.61	Hydr. Depth (ft)	1.44	4.93	
Conv. Total (cfs)	82630.8	Conv. (cfs)	58071.8	24559.0	
Length Wtd. (ft)	135.89	Wetted Per. (ft)	753.27	48.00	
Min Ch El (ft)	772.70	Shear (lb/sq ft)	0.22	0.69	
Alpha	1.46	Stream Power (lb/ft s)	0.59	3.95	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	5.09	1.07	0.70
C & E Loss (ft)	0.06	Cum SA (acres)	2.31	0.19	0.30

Warning: Divided flow computed for this cross-section.
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: Bender Wash
REACH: Main Channel RS: 1.904

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8680.24	776.9	8708.45	776.6	8731.26	776.17	8775.7	775.29	8799.92	774.77

8823.24	774.7	8831.65	774.89	8850.32	774.64	8866.36	774.48	8882.36	774.16
8895.54	774.5	8935.61	775.31	8955.22	774.45	8966.75	774.26	8980.74	774.2
8989.78	774	9009.35	774.01	9022.25	774.29	9046.26	774.57	9081.66	775.73
9126.59	774.4	9138.23	774.08	9152.27	773.84	9164.21	773.89	9191.35	774.09
9208.57	774.3	9222.06	774.93	9235.39	774.41	9241.6	774.75	9259.7	775.5
9261.23	775.7	9267.61	775.45	9291.29	775.15	9317.25	775.15	9332.9	774.83
9346.72	774.8	9353.1	775.02	9372.02	775.33	9377.73	776.18	9390.98	777.51
9404.26	777.4	9406.92	777.33	9411.48	776.77	9415.23	776.18	9424.57	775.55
9424.85	773.5	9425.56	772	9493.26	772	9495.23	772.1	9496.31	773.73
9496.62	775.2	9498.7	774.93	9524.5	775.09	9534.82	775.06	9556.03	775.2
9573.67	775.6	9591	776.92	9610.55	778.73	9617.78	778.9	9667.79	779.69

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8680.24	.035	9424.85	.035	9496.31	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9424.85	9496.31		0	0	0 .1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	777.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.035	0.035	
W.S. Elev (ft)	777.00	Reach Len. (ft)			
Crit W.S. (ft)	775.72	Flow Area (sq ft)	1472.33	272.93	
E.G. Slope (ft/ft)	0.000722	Area (sq ft)	1472.33	355.57	156.62
Q Total (cfs)	3612.00	Flow (cfs)	2713.23	898.77	
Top Width (ft)	887.87	Top Width (ft)	720.87	71.46	95.54
Vel Total (ft/s)	2.07	Avg. Vel. (ft/s)	1.84	3.29	
Max Chl Dpth (ft)	5.00	Hydr. Depth (ft)	2.04	4.99	
Conv. Total (cfs)	134409.3	Conv. (cfs)	100964.4	33444.9	
Length Wtd. (ft)		Wetted Per. (ft)	723.14	55.66	
Min Ch El (ft)	772.00	Shear (lb/sq ft)	0.09	0.22	
Alpha	1.23	Stream Power (lb/ft s)	0.17	0.73	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	778.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.035	0.035	
W.S. Elev (ft)	778.00	Reach Len. (ft)			
Crit W.S. (ft)	775.67	Flow Area (sq ft)	2209.28	327.73	
E.G. Slope (ft/ft)	0.000229	Area (sq ft)	2209.28	427.14	252.30
Q Total (cfs)	3612.00	Flow (cfs)	2924.81	687.19	
Top Width (ft)	911.60	Top Width (ft)	744.61	71.46	95.53
Vel Total (ft/s)	1.42	Avg. Vel. (ft/s)	1.32	2.10	
Max Chl Dpth (ft)	6.00	Hydr. Depth (ft)	2.97	5.99	
Conv. Total (cfs)	238464.7	Conv. (cfs)	193096.2	45368.6	
Length Wtd. (ft)		Wetted Per. (ft)	747.93	55.66	
Min Ch El (ft)	772.00	Shear (lb/sq ft)	0.04	0.08	
Alpha	1.11	Stream Power (lb/ft s)	0.06	0.18	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Bender Wash

Reach	River Sta.	n1	n2	n3
Main Channel	3.671	.045	.06	.04
Main Channel	3.588	.045	.06	.04
Main Channel	3.495	.045	.06	.04
Main Channel	3.409	.045	.06	.04
Main Channel	3.299	.045	.06	.04
Main Channel	3.224	.045	.06	.04

Main Channel	3.122	.045	.06	.04
Main Channel	3.024	.045	.06	.04
Main Channel	2.924	.045	.06	.04
Main Channel	2.837	.045	.06	.04
Main Channel	2.724	.045	.06	.04
Main Channel	2.644	.035	.055	.04
Main Channel	2.553	.035	.055	.04
Main Channel	2.445	.035	.055	.04
Main Channel	2.329	.035	.055	.04
Main Channel	2.274	.035	.055	.04
Main Channel	2.184	.035	.055	.04
Main Channel	2.089	.035	.055	.04
Main Channel	2.013	.035	.055	.04
Main Channel	1.968	.035	.035	.035
Main Channel	1.930	.035	.035	.035
Main Channel	1.904	.035	.035	.035

SUMMARY OF REACH LENGTHS

River: Bender Wash

Reach	River Sta.	Left	Channel	Right
Main Channel	3.671	420	437.12	550
Main Channel	3.588	460	491.3	480
Main Channel	3.495	490	453.04	440
Main Channel	3.409	510	581.38	540
Main Channel	3.299	460	398.2	420
Main Channel	3.224	290	535.06	480
Main Channel	3.122	460	519.61	430
Main Channel	3.024	540	515.69	480
Main Channel	2.924	550	471.5	490
Main Channel	2.837	630	596.64	580
Main Channel	2.724	470	424.76	400
Main Channel	2.644	510	479.57	520
Main Channel	2.553	490	569.33	510
Main Channel	2.445	535	614.31	700
Main Channel	2.329	440	288.13	310
Main Channel	2.274	430	474.46	474
Main Channel	2.184	600	501.92	501.92
Main Channel	2.089	210	343.99	343.99
Main Channel	2.013	240	295.7	295.7
Main Channel	1.968	180	422.4	422.4
Main Channel	1.930	135	138.58	138.58
Main Channel	1.904	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Bender Wash

Reach	River Sta.	Contr.	Expan.
Main Channel	3.671	.1	.3
Main Channel	3.588	.1	.3
Main Channel	3.495	.1	.3
Main Channel	3.409	.1	.3
Main Channel	3.299	.1	.3
Main Channel	3.224	.1	.3
Main Channel	3.122	.1	.3
Main Channel	3.024	.1	.3
Main Channel	2.924	.1	.3
Main Channel	2.837	.1	.3
Main Channel	2.724	.1	.3
Main Channel	2.644	.1	.3
Main Channel	2.553	.1	.3
Main Channel	2.445	.1	.3
Main Channel	2.329	.1	.3
Main Channel	2.274	.1	.3
Main Channel	2.184	.1	.3
Main Channel	2.089	.1	.3

Main Channel	2.013	.1	.3
Main Channel	1.968	.1	.3
Main Channel	1.930	.1	.3
Main Channel	1.904	.1	.3

HEC-RAS Plan: Bend M FW1 River: Bender Wash Reach: Main Channel

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Main Channel	3.671	PF 1	3970.00	833.30	836.60		836.75	0.006053	3.21	1330.51	934.00	0.39
Main Channel	3.671	PF 2	3970.00	833.30	837.09		837.22	0.003866	2.92	1358.65	516.91	0.32
Main Channel	3.588	PF 1	3970.00	830.80	833.15	832.75	833.37	0.008302	3.12	1089.12	894.17	0.43
Main Channel	3.588	PF 2	3970.00	830.80	833.82	833.43	834.27	0.013245	4.96	736.89	405.00	0.58
Main Channel	3.495	PF 1	3970.00	827.14	829.84		829.98	0.006087	3.25	1302.36	998.42	0.39
Main Channel	3.495	PF 2	3970.00	827.14	830.38		830.59	0.004965	3.37	1090.87	482.86	0.36
Main Channel	3.409	PF 1	3970.00	824.22	825.83	825.48	826.02	0.012628	3.64	1160.17	1170.85	0.52
Main Channel	3.409	PF 2	3970.00	824.22	826.29	825.84	826.66	0.016995	5.03	846.93	604.81	0.63
Main Channel	3.299	PF 1	3969.00	818.14	821.14	820.59	821.27	0.006499	2.83	1368.17	2771.96	0.38
Main Channel	3.299	PF 2	3969.00	818.14	821.17	820.59	821.30	0.006184	2.79	1378.34	1106.87	0.37
Main Channel	3.224	PF 1	3969.00	815.31	817.27	816.93	817.48	0.011487	2.79	1102.33	2294.86	0.47
Main Channel	3.224	PF 2	3969.00	815.31	817.33	817.00	817.55	0.011926	2.94	1064.61	975.54	0.49
Main Channel	3.122	PF 1	3969.00	811.50	814.20	813.55	814.36	0.007346	2.80	1245.01	1546.01	0.40
Main Channel	3.122	PF 2	3969.00	811.50	814.15	813.55	814.34	0.007493	2.77	1167.78	813.51	0.40
Main Channel	3.024	PF 1	3969.00	807.90	811.57	810.41	811.70	0.004306	2.58	1381.41	1279.55	0.32
Main Channel	3.024	PF 2	3969.00	807.90	811.64	810.37	811.79	0.003948	2.52	1286.58	613.61	0.31
Main Channel	2.924	PF 1	3969.00	805.97	808.42	807.97	808.59	0.008440	2.53	1254.28	1846.06	0.41
Main Channel	2.924	PF 2	3969.00	805.97	808.62	808.13	808.83	0.008386	2.80	1109.66	802.53	0.42
Main Channel	2.837	PF 1	3969.00	802.53	805.18	804.41	805.32	0.004562	1.56	1387.26	1992.22	0.29
Main Channel	2.837	PF 2	3969.00	802.53	806.01	805.05	806.11	0.003402	2.07	1583.59	975.68	0.28
Main Channel	2.724	PF 1	3969.00	798.60	800.81	800.53	800.99	0.011847	3.24	1162.94	1291.27	0.50
Main Channel	2.724	PF 2	3969.00	798.60	801.40		801.77	0.021303	5.51	812.98	753.22	0.70
Main Channel	2.644	PF 1	3969.00	795.54	797.77		797.93	0.004323	2.42	1296.09	1102.52	0.34
Main Channel	2.644	PF 2	3969.00	795.54	798.47		798.69	0.003189	2.62	1085.23	478.84	0.31
Main Channel	2.553	PF 1	3969.00	792.58	795.64		795.79	0.004186	2.81	1284.50	840.64	0.35
Main Channel	2.553	PF 2	3969.00	792.58	796.55		796.78	0.004762	3.83	1030.97	425.00	0.39
Main Channel	2.445	PF 1	3969.00	789.78	793.20	792.74	793.33	0.005239	3.15	1396.74	1755.56	0.39
Main Channel	2.445	PF 2	3969.00	789.78	793.64	792.93	793.85	0.005905	3.81	1086.57	569.20	0.43
Main Channel	2.329	PF 1	5530.00	783.40	789.88	789.41	790.13	0.005268	5.08	1426.41	1104.49	0.43
Main Channel	2.329	PF 2	5530.00	783.40	789.95	789.41	790.26	0.005661	5.32	1283.54	849.92	0.45
Main Channel	2.274	PF 1	5350.00	782.40	787.30	787.04	787.55	0.009121	4.15	1348.17	1455.86	0.51
Main Channel	2.274	PF 2	5350.00	782.40	787.29	787.04	787.55	0.009373	4.19	1333.38	1439.84	0.52
Main Channel	2.184	PF 1	5182.00	780.25	784.72	784.31	784.85	0.004239	3.92	1874.08	1974.91	0.37
Main Channel	2.184	PF 2	5182.00	780.25	784.73	784.31	784.86	0.004121	3.87	1892.17	1978.91	0.37
Main Channel	2.089	PF 1	5101.00	778.12	780.06	780.02	780.50	0.015893	3.33	970.09	1022.37	0.60
Main Channel	2.089	PF 2	5101.00	778.12	780.03	780.03	780.50	0.016936	3.38	944.95	991.46	0.61
Main Channel	2.013	PF 1	5101.00	775.50	778.62	778.06	778.78	0.004299	3.02	1601.18	1335.04	0.36
Main Channel	2.013	PF 2	5101.00	775.50	778.71	778.06	778.84	0.003759	2.89	1716.05	1347.93	0.33
Main Channel	1.968	PF 1	4116.00	773.55	778.32	776.65	778.37	0.000637	2.03	2286.56	1371.61	0.22
Main Channel	1.968	PF 2	4116.00	773.55	778.43	776.66	778.48	0.000584	2.00	2417.91	1373.39	0.21
Main Channel	1.930	PF 1	4116.00	772.70	777.32	777.32	777.90	0.006392	8.48	832.54	787.28	0.72
Main Channel	1.930	PF 2	4116.00	772.70	777.95	777.34	778.17	0.002425	5.67	1301.14	887.53	0.45
Main Channel	1.904	PF 1	3612.00	772.00	777.00	775.70	777.08	0.000722	3.29	1745.26	887.87	0.26
Main Channel	1.904	PF 2	3612.00	772.00	778.00	775.70	778.04	0.000229	2.10	2537.01	911.60	0.15

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
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: Bender Wash
Project File : bender.prj
Run Date and Time: 6/21/01 7:53:45 AM

Project in English units

Project Description:
Study name: Gila Bend Area Drainage Master Plan

Study contractors: EEC,
Inc. and Premier Engineering Corporation

Source of hydrology: Gila Bend
Area Floodplain Delineation Study (FCD 90-67) by Burgess & Niple for FCDMC,
March 1991

Source of survey: Gila Bend Area Floodplain Delineation Study
(FCD 90-67); new topographic mapping and survey by Cooper Aerial Mapping, Inc.,
99.

FCD Contract Number: 99-18

Datum: NGVD 1929

PLAN DATA

Plan Title: Bender Wash North Trib FW Meth 1
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Bender Wash\bender.p12

Geometry Title: Bender Wash North Tributary
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Bender Wash\bender.g03

Flow Title : Bender Wash North Trib FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Bender Wash\bender.f12

Plan Summary Information:
Number of: Cross Sections = 23 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 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 = RIVER-1 Reach = Reach-1

	Profile	Method	Value1	Value2
1.818	PF 2	1	9833.310	281.45
1.727	PF 2	1	9945.110	409.28
1.622	PF 2	1	9749.310	214.12
1.530	PF 2	1	9935.161	0090.23
1.495	PF 2	1	9968.091	0059.14
1.450	PF 2	1	9843.161	0097.93
1.358	PF 2	1	9794.361	0127.67
1.317	PF 2	1	9917.74	10127.7
1.267	PF 2	1	9769.131	0365.45
1.176	PF 2	1	9857.111	0218.39
1.090	PF 2	1	9931.21	0074.49
1.000	PF 2	1	9737.591	0082.59
0.987	PF 2	1	9706.161	0107.97
0.925	PF 2	1	9704.281	0290.66
0.910	PF 2	1	9918.391	0368.41
0.829	PF 2	1	9920.931	0146.64
0.734	PF 2	1	9954.531	0062.35
0.637	PF 2	1	9784.11	0054.38
0.576	PF 2	1	9844.631	0042.63
0.562	PF 2	1	99221	0270.56
0.481	PF 2	1	9837.391	0259.68
0.416	PF 2	1	9917.321	0240.42
0.323	PF 2	1	9083.681	0190.79

FLOW DATA

Flow Title: Bender Wash North Trib FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Bender Wash\bender.f12

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
RIVER-1	Reach-1	1.818	1670	1670
RIVER-1	Reach-1	0.323	5530	5530

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF 1		Known WS = 789.88
RIVER-1	Reach-1	PF 2		Known WS = 790.09

GEOMETRY DATA

Geometry Title: Bender Wash North Tributary
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Bender Wash\bender.g03

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.818

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9718.72	840.3	9738.59	840.36	9757.15	840.37	9770.16	840.17	9795.86	838.88
9801.73	838.7	9804.7	838.33	9813.77	837.57	9828.48	836.22	9833.3	835.99
9852.26	834.7	9864.88	834.19	9876.03	833.92	9896.45	833.7	9928.02	833.96
9947.36	834.3	9959.59	834.43	9971.13	834.69	9999	835.141	0046.31	835.93
10072.2	836.11	0082.84	836.221	0098.08	836.18	10204.7	836.311	0253.38	836.42
10279.27	836.41	0305.15	836.211	0326.57	836	10357.04	835.49	10387.5	835.14
10417.97	835.31	0486.34	836.41	0512.22	836.711	0539.84	836.831	0563.99	836.69
10600.77	836.91	0631.24	837.121	0642.17	837.16				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9718.72	.045	9833.3	.061	0046.31	.04

```
Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
        9833.310046.31               480  477.29     430              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 1.727

INPUT
Description:
Station Elevation Data     num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9822.14   836.4 9837.05  836.63 9850.08  836.49 9871.72  835.79 9893.36  832.09
 9909.08   830.6    9915  829.76 9936.64  828.42  9945.1  828.15 9958.28  828.06
 9999.21   827.910025.79  827.8610097.69  828.1510121.66  828.0710193.56  827.61
10266.16     82710297.57   826.810328.98  826.7710337.38  826.7910364.39   827.1
10385.31   827.410391.81  827.6510409.28     82810423.23  828.6110433.25  828.73
10457.22   830.310481.19  831.9710505.15  832.8210529.12  833.0910553.09  833.17
10592.03   833.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9822.14    .045  9945.1     .0610409.28     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
        9945.110409.28               525  558.11     400              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 1.622

INPUT
Description:
Station Elevation Data     num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9509.54   832.3 9529.28  832.24 9550.65     832 9558.68  831.78 9572.02  831.61
  9596.8   830.5 9614.75  829.57 9637.65  827.95 9657.49  827.68 9673.05  827.74
 9678.86   827.7 9700.22  826.66 9711.18  825.91 9721.59  825.43  9749.3  823.88
 9764.33   823.5 9787.43  822.79 9807.06  822.65  9832.1  822.36  9849.8  822.35
 9880.71   822.2 9935.27  822.17 9978.06  822.4610001.57  822.6610042.31  822.74
10063.79   822.710085.26  822.8810106.74  822.9710149.69  822.6510171.17  822.48
[illegible]92.64   822.810214.12  824.0810225.13  825.9310243.21  827.8110257.07  828.17
[illegible]280.3   829.210300.02  829.6110342.98  830.1310364.45   830.210391.59  830.19
10429.15   830.110450.36  830.1510493.31  830.4410514.78  830.7210557.73  831.43
10582.16     83210596.36  832.12

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9509.54    .045  9749.3     .0610214.12     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
        9749.310214.12               400  484.13     510              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 1.530

INPUT
Description:
Station Elevation Data     num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9509.83   832.4 9541.81     832 9564.66  831.29 9572.07  831.12  9591.4  830.53
 9618.15   829.9 9644.89   829.4 9662.84  829.12 9671.63  829.06 9725.12  828.35
 9783.87   827.7 9814.13  827.64 9844.39  827.54 9858.83  827.33 9885.57  826.61
 9904.91   825.7 9912.32  825.49 9935.16  823.99 9939.06  823.81  9965.8  821.42
 9995.68   819.9  9999.3  819.9410017.07  820.1310027.09  820.1510040.86  821.03
10058.66     82210090.23  824.06 10112.2   824.510121.79  824.4410135.98  824.46
10159.76   824.610184.93  825.0710207.32  825.46 10216.5  825.7210248.06  826.09
10279.63   826.310326.22  826.2710374.33  826.06 10405.9  825.9810437.47  826.05
10469.03   826.310540.25  827.2410587.81   827.810626.87  828.0910641.71  828.11

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9509.83    .045 9935.16     .0610090.23     .04

[illegible]nk Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
      9935.1610090.23               200  187.35     170              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 1.495
```

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9723.14	824.7	9741.13	824.54	9764.2	824.42	9797.09	824.55	9862.85	825.16
9877.3	825.1	9895.74	825.21	9900	825.08	9909.5	825.1	9928.62	824.88
45.39	824.3	9961.5	823.9	9968.09	823.55	9990.78	820.36	9999.55	820.32
12.85	820.51	0029.76	821.28	10034.53	821.73	10041.81	822.19	10056.2	823.31
10059.14	823.432	10065.6	823.71	10077.87	824.13	10101.44	824.47	10142.89	824.3
10173.12	824.05	10208.96	824	10243.76	824.09				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9723.14	.045	9968.09	.06	10059.14	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9968.09	10059.14	260	236.33	160	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.450

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9555	822.8	9604.32	822.26	9649.48	822.06	9709.53	822.1	9739.8	822.06
9752.03	822	9762.89	821.82	9773.28	821.75	9794.53	821.39	9803.03	821.05
9815.78	820.7	9837.03	819.58	9843.16	818.85	9858.28	817.47	9875.28	816.03
9883.3	815.7	9900.78	814.36	9923.43	813.61	9943.28	813.44	9965.6	813.47
9985.78	813.7	10000.7	814.13	10031.48	814.99	10034.69	815.17	10055.2	815.92
10066.31	816.81	0078.92	817.49	10097.93	819.23	10102.64	820.16	10116.76	819.28
10126.35	819	10129.55	818.51	10150.07	820.19	10161.17	822.81	10173.79	823.32
10192.79	824.21	0197.51	824.26	10224.42	824.08	10256.04	823.71	0268.67	823.71
10287.66	823.61	0319.28	823.83	10339.82	824.1	10348	824.16		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9555	.045	9843.16	.06	10097.93	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9843.16	10097.93	300	483.46	550	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.358

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9730.08	822.36	9747.15	822.34	9754.77	822.18	9772.93	821.5	9794.36	819.89
9797.12	819.42	9815.79	816.97	9829.8	816.08	9858.64	815.3	9897.05	815.23
9922.92	815.33	9979.86	815.11	10001.86	815.11	0017.11	815.11	0051.67	815.32
10073.18	816.06	10090.82	817.11	0094.68	817.59	10116.19	819.31	0127.67	820
10164.52	821.42	10203.4	822.24	10238.23	822.72	10275.09	823	10352.77	823.41
10395.79	823.76	10418.3	824.01						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9730.08	.045	9794.36	.06	10127.67	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9794.36	10127.67	150	219.57	265	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.317

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9746.64	820.5	9795.52	820.35	9804.23	820.22	9844.41	820.02	9868.85	819.94
9893.3	819.3	9897.49	819.35	9917.74	819.08	9928.58	818.55	9959.67	817.89
9992.22	817	9999.37	816.78	10021.16	816	10051.29	815.31	10072.63	815.78
081.42	816.11	0100.16	817.21	0111.56	818.63	10127.7	819.23	10141.69	819.36
10155.23	819.61	0171.82	819.67	10182.76	819.81	0201.96	819.83	10210.3	819.9
10237.83	820	10265.37	820	10322.49	820.31	0412.89	820.94	10473.16	821.24
10506.78	821.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9746.64	.045	9917.74	.06	10127.7	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9917.74	10127.7	200	262.1	260	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.267

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9474.13	820.5	9518.29	820.21	9548.73	820.11	9613.27	819.97	9650.02	819.76
9731.37	819.1	9769.13	818.7722	9797.02	818.53	9883.56	817.73	9999.37	816.75
10013.71	816.66	10035.25	816.71	10095.29	817.37	10129.76	817.64	10158.77	817.79
10216.8	817.93	10275.4	818.11	10305.42	818.23	10335.43	818.49	10365.45	818.84
10425.49	819.65	10455.51	820	10485.52	820.16	10516.95	820.16		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9474.13	.045	9769.13	.06	10365.45	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9769.13	10365.45	430	481.8	505	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.176

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9562.39	817.1	9734.16	816.32	9764.9	816.14	9826.93	815.99	9857.11	815.82
9887.85	815.3	9949.33	814.61	9985.19	814.1	10010.8	813.66	10024.75	813.71
10041.54	813.5	10072.28	813.81	10103.88	814.16	10164.49	815.05	10218.39	815.883
10225.96	816	10256.7	816.41	10287.44	816.59	10318.18	816.65	10348.91	816.61
10369.8	816.54								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9562.39	.045	9857.11	.06	10218.39	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9857.11	10218.39	460	453.49	440	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.090

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9451.49	814.8	9462.62	814.88	9486.78	814.45	9530.05	813.82	9550.86	813.24
9575.01	812.2	9584.15	811.78	9617.44	809.41	9625.25	809.43	9642.45	809.73
9650.72	810.1	9664.93	811.23	9684.01	812	9694.48	812.18	9709.89	812.6
9717.3	812.7	9732.37	812.74	9747.96	812.85	9810.62	812.78	9825.02	812.84
9858.43	812.8	9891.84	812.53	9901.05	812.35	9925.25	811.74	9931.2	811.54
9961.34	809.9	9991.48	807.71	10021.63	808.07	10025.48	808.28	10051.77	810.12
10074.49	811.53	10081.91	812	10092.3	812.24	10112.06	812.87	10142.2	813.2
10192.53	813.37	10262.77	813.41	10326.17	813.54	10373.24	813.49		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9451.49	.045	9931.2	.06	10074.49	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9931.2	10074.49	470	477.16	450	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.000

INPUT
Description:
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9279.62	812.3	9299.01	812.18	9317.86	812	9340.23	811.58	9366.09	810.92

9407.31	809.8	9433.16	809.12	9452.04	808.71	9474.4	808.3	9496.76	808
9519.12	808.2	9533.78	808.11	9541.48	807.94	9566.98	807.97	9597.3	805.89
9627.33	802.8	9649.65	804.35	9657.35	804.95	9678.56	805.62	9687.37	806.38
9707.46	807.8	9717.39	808.39	9736.37	808.58	9765.28	809.27	9777.44	809.43
9794.19	809.1	9807.46	809.08	9823.09	809.1	9852	808.68	9867.51	808.09
[illegible]880.91	806.1	9897.53	804.89	9909.81	806.76	9927.55	807.89	9938.72	806.85
[illegible]57.57	806.5	9967.63	805.81	9972.62	805.005	9987.59	802.59	9999.7	802.79
10017.71	803.61	10023.98	804	10047.88	805.04	10078.5	804.96	10105.76	804.39
10108.22	804.23	10133.02	804	10160.29	803.28	10168.56	803.35	10187.55	803.92
10198.73	804.87	10214.81	807	10228.9	808.09	10242.07	808.75	10259.07	809.4
10289.24	809.85	10319.41	810	10325.28	809.67	10365.53	810.04	10440.09	810.16
10479.8	810.14								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9279.62	.045	9972.62	.06	10047.88	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9972.62	10047.88	65	68	75	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 0.987

INPUT
Description:
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9466.01	808.8	9487.5	808.54	9492.86	808.4	9517.53	807.94	9521.66	807.59
9547.56	804.4	9577.59	803.05	9579.26	802.94	9608.07	801.87	9636.87	801.66
9637.64	801.7	9665.67	800.26	9667.67	800.12	9694.47	799.95	9727.72	800.34
9752.08	801	9757.75	801.47	9780.88	800.85	9787.78	800.37	9817.8	800.2
9838.48	800.6	9847.83	800.7	9867.28	801.39	9877.86	801.99	9896.09	801.56
9907.88	800.8	9924.89	801.78	9937.91	802.27	9953.69	802.34	9967.94	801.97
9997.97	802	10011.29	802.11	10027.99	802.53	10058.02	802.74	10097.7	802.78
10118.07	802.6	10126.5	802.69	10148.1	802.68	10155.3	802.94	10178.13	803.92
10184.11	804.31	10208.16	807.43	10212.91	807.81	10238.18	808.82	10241.71	808.91
10270.51	809.21	10298.24	809.08	10324.26	807.92	10399.33	808.41	10420.63	808.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
[illegible]466.01	.045	9953.69	.06	10027.99	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9953.69	10027.99	200	325.25	220	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 0.925

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9658.06	809.3	9677.81	809.21	9707.39	808.95	9736.97	808.56	9764.27	808
9794.27	806.3	9824.28	803.9	9854.28	800.02	9855.29	800.14	9884.28	802
9914.46	803.3	9944.29	804.02	9974.29	804.42	10004.3	804.41	10034.3	804.1
10064.3	803.91	10094.31	803.44	10121.52	802.29	10154.31	801.79	10244.32	801.02
10274.32	800.71	10304.33	800.11	10328.58	799.04	10334.33	798.89	10358.16	798.77
10364.33	798.81	10394.34	800.04	10417.33	802.12	10424.34	803.01	10446.91	803.97
10454.34	804.21	10476.49	804.56	10514.35	804.99	10605.15	805.9		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9658.06	.045	9824.28	.06	9944.29	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9824.28	9944.29	70	77.06	75	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 0.910

INPUT
Description:
[illegible]ation Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
[illegible]9693.66	808.9	9725.02	808.99	9754.6	808.98	9784.18	808.71	9813.76	808
9828.38	807	9843.34	806.9	9858.39	805.7	9872.92	805.29	9888.39	803.62
9902.51	802.2	9918.39	801.92	9932.09	800.63	9948.4	800.66	9961.67	800.05
9978.4	801.4	10008.4	801.5	10020.83	801.21	10038.41	799.81	10068.41	799.6[illegible]

```
10079.99   799.710098.41  799.7710109.57  800.0610128.41  800.3510139.15  800.72
10168.73   801.610188.42  801.9710198.31  802.2310218.42  802.5510227.89  802.78
10248.43   803.110257.47  803.2810278.43  803.6110287.05   803.810316.63  804.26
10346.22   804.310368.44   804.3 10375.8  804.2510398.44  804.2710405.38   804.2
10428.44   804.210434.96  804.1410464.54  804.1110494.12  804.2610518.45  804.51
10555.69     80510619.49  805.5710635.12  805.9710640.75     806

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9693.66    .045 9918.39     .0610168.73     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9918.3910168.73               430  426.24     400             .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.829

INPUT
Description:
Station Elevation Data     num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9607.54   805.9 9661.71  805.36 9703.27  804.85 9758.92   804.3  9805.1  804.06
 9823.72     804 9856.12     804 9864.35  804.09 9888.52     804 9920.93  803.15
 9933.38   802.3  9979.4  799.76 9985.73  799.37 9999.37  799.5910017.54  799.58
10026.56   799.710055.99  800.68 10080.3  801.5910111.68  802.5110146.64  803.26
10194.67   803.810205.81  803.8410237.19  804.1910268.57  804.3410314.74  804.44
10338.75   804.410359.26  804.39

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9607.54    .045 9920.93     .0610146.64     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9920.9310146.64               480  510.52     500             .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.734

INPUT
Description:
Station Elevation Data     num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9719.42     804 9742.26  803.89 9772.58  803.48 9804.76  802.46 9833.23  801.29
 9857.62   800.5 9863.56  800.22 9884.04     800 9910.47  799.94 9924.21  800.06
  9936.9   799.9 9954.53  799.83 9963.33  799.48 9984.85  798.28 9998.76  797.98
10014.53   797.610038.44  799.0810047.25  799.2910062.35  799.8810078.71  800.15
10110.24   800.3 10134.1  800.1310158.01  800.0210181.92  799.9810253.67  799.98
10330.36     80010355.16  799.9510404.81  800.38 10445.7  801.2710483.58  801.45
10485.88     80210521.44  801.9410560.12     802

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9719.42    .045 9954.53     .0610062.35     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.5310062.35               510  508.41     470             .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.637

INPUT
Description:
Station Elevation Data     num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9615.37     799 9659.15   798.5 9720.43  797.27 9729.62  797.12  9784.1  795.77
  9800.1   795.5  9823.6  795.12 9847.77  794.92 9894.07  794.69 9917.57  794.49
 9964.55   794.3 9975.11   794.4 9988.04   794.3 9999.12  793.9610007.73  793.73
10015.54     79410054.38  795.99 10077.8     79610119.94  796.4210147.86  796.79
10181.42   797.410195.74  797.6210270.97  798.5910323.29  798.71

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9615.37    .045  9784.1     .0610054.38     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9784.110054.38               330   322.8     380             .1       .3

CROSS SECTION           RIVER: RIVER-1
```

REACH: Reach-1 RS: 0.576

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9584.72	796	9651.75	795.49	9721.99	795.26	9757.63	795.04	9779.14	794.82
9844.63	793.8	9897.6	792.98	9932.72	792.41	9975.62	791.92	10003.69	792.06
10019.92	792.5	10035.86	793.55	10042.63	793.67	10057.8	794.32	10075.62	795.01
10086.21	795.5	10097.54	795.87	10113.61	794.76	10166.55	795.55	10200.09	796.1
10204.03	796.1	10226.56	796.1	10249.76	796.31	10259.61	796.6	10262.46	796.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9584.72	.045	9844.63	.06	10042.63	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9844.63	10042.63	100	70.37	80	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 0.562

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9658.13	794.69	9686.39	794.61	9731.48	794.28	9793.69	793.8	9874.06	793.38
9914.24	793.04	9934.36	792.8	9956.93	792.46	9976.85	792	9998.1	791.3
10000.69	791.36	10022.39	791.26	10032.54	791.35	10058.03	791.41	10070.14	791.24
10088.69	790.43	10101.98	790.13	10111.11	790.03	10136.98	789.91	10159.91	789.66
10178.84	789.58	10182.76	789.52	10205.57	789.41	10219.95	789.11	10226.59	789.24
10270.56	790.68	10277.93	789.59	10283.2	789.56	10286.92	789.11	10315.85	788.64
10318.81	788.5	10361.64	788.07	10384.19	787.91	10406.2	788.51	10430.15	788.2
10444.51	788.08	10465.79	788.23	10488.77	789.44	10508.97	790.8	10517.1	791.65
10548.52	795.37	10608.71	795.96	10617.16	796				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9658.13	.045	10088.69	.06	10270.56	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
10088.69	10270.56	250	429.9	315	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 0.481

INPUT
Description:
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7998.68	793.6	8057.34	793.8	8100.47	793.82	8182.75	793.71	8247.74	793.72
8344.59	793.8	8380.49	793.82	8452.3	793.62	8560.02	793.08	8615.97	792.76
8667.74	792.6	8703.65	792.61	8775.46	792.82	8811.36	792.79	8847.27	792.54
8883.18	792	8897.56	791.61	8919.44	790.95	8949.79	790.22	8954.38	790.09
8963.73	790.6	8986.05	792	9017.72	792.82	9049.39	792.63	9084.96	791.91
9112.73	791.2	9144.4	790.39	9178.55	789.86	9200.36	789.78	9207.74	789.87
9246.41	790.8	9274.62	791.41	9290.79	791.72	9314.73	792.04	9355.61	792.42
9398.83	792.7	9421.9	792.7	9463.65	792.62	9506.86	792.39	9550.08	792.13
9614.9	791.9	9636.68	791.91	9658.11	792	9709.09	792.41	9743.42	792.76
9760.67	792.8	9789.5	792.51	9797.91	792.32	9837.39	792.24	9866.56	791.84
9877.96	791.8	9898.05	789.41	9918.96	787.09	9938.71	786.74	9962.22	786.51
9988.11	786	10048.25	785.64	10063.47	785.39	10084.26	785.28	10135.48	785.15
10210.77	786.5	10214.05	786.69	10242	790.35	10259.68	792.62	10261.52	792.99
10281.13	793.05	10292.01	793	10302.48	792.83				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7998.68	.045	9837.39	.06	10259.68	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9837.39	10259.68	110	341.49	160	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
8			F

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 0.416

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9691.86	792.1	9739.51	792.24	9790.89	792	9866.79	791.51	9909.22	791.37
[illegible]17.32	791.4	9923.2	790.88	9953.94	790.65	9963.74	789.91	9985.71	789.66
[illegible]3.01	789.7	9998.94	789.59	10000.42	789.54	10007.58	790.97	10015.13	792.22
10036.66	792	10049.51	792.09	10092.05	791.41	10116.26	791.41	10170.81	791.04
10177.83	791.11	10189.03	790.57	10206.54	791.25	10223.95	791.15	10262.91	791.54
10298.15	792	10320.54	792.44	10331.75	792.85	10343.73	792.88	10355.39	793.01
10401.04	793.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9691.86	.045	9917.32	.06	10007.58	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9917.32	10007.58	600	492.51	340	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 0.323

INPUT
Description:
Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7882.43	791.2	7929.83	791.22	7973.89	791.2	8055.7	791	8129.81	790.93
8163.32	790.9	8206.36	790.9	8249.41	791.11	8337.71	791.79	8389.68	791.93
8407.42	791.9	8444.16	791.65	8493.63	791.06	8529.22	790.43	8572.27	789.56
8597.58	789.1	8615.32	788.88	8636.84	788.71	8679.89	788.68	8701.53	788.79
8753.51	789.2	8830.55	789.93	8895.13	790.41	8938.17	790.64	8981.22	790.77
9013.38	790.7	9045.79	790.44	9131.89	789.65	9151.95	789.5263	9178.92	789.36
9190.16	789.3467	9221.28	789.31	9261.03	789.4	9304.08	789.71	9325.74	789.89
9348.32	790.19	9380.86	790.24	9402.79	790.4	9460.76	790.32	9486.29	790.51
9548.46	790.92	9552.39	790.85	9567.76	790.2	9576.31	789.56	9603.34	788.45
9625.02	787.81	9630.24	787.56	9638.94	787.4	9640.36	787.2	9651.19	786.63
9664.95	787.47	9673.81	787.44	9684.19	784.9	9690.21	788.13	9701.22	787.3414
9707.94	786.86	9719.96	788.01	9740	787.49	9744.48	786.1	9752.79	783.4
9772.79	786.15	9778.21	787.03	9786.88	784.8	9793.76	786.4	9801	787.69
[illegible]8.64	787.6	9859.84	787.08	9878.85	788.52	9899.39	788.5	9930.32	788.42
[illegible]6.58	788.69	9985.48	788.92	9998.38	786.39	10003.6	786.91	10018.67	789.47
10038.94	789.13	10054.77	788.72	10063.67	789.51	10071.67	789.41	10081.31	788.17
10103.92	788.93	10117.7	788.12	10126.28	788.53	10147.94	789.7	10156.2	789.68
10165.37	789.47	10185.04	789.69	10214.45	790.58	10269.95	791.11	10307.67	791.46
10333.94	791.65	10354.86	791.67	10393.97	791.63	10415.96	791.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7882.43	.045	9740	.06	9801	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9985.48	10018.67	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	1.818	.045	.06	.04
Reach-1	1.727	.045	.06	.04
Reach-1	1.622	.045	.06	.04
Reach-1	1.530	.045	.06	.04
Reach-1	1.495	.045	.06	.04
Reach-1	1.450	.045	.06	.04
Reach-1	1.358	.045	.06	.04
Reach-1	1.317	.045	.06	.04
Reach-1	1.267	.045	.06	.04
Reach-1	1.176	.045	.06	.04
Reach-1	1.090	.045	.06	.04
[illegible]ach-1	1.000	.045	.06	.04
[illegible]ch-1	0.987	.045	.06	.04
[illegible]each-1	0.925	.045	.06	.04
Reach-1	0.910	.045	.06	.04
Reach-1	0.829	.045	.06	.04
Reach-1	0.734	.045	.06	.04

Reach-1	0.637	.045	.06	.04
Reach-1	0.576	.045	.06	.04
Reach-1	0.562	.045	.06	.04
Reach-1	0.481	.045	.06	.04
Reach-1	0.416	.045	.06	.04
Reach-1	0.323	.045	.06	.04

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	1.818	480	477.29	430
Reach-1	1.727	525	558.11	400
Reach-1	1.622	400	484.13	510
Reach-1	1.530	200	187.35	170
Reach-1	1.495	260	236.33	160
Reach-1	1.450	300	483.46	550
Reach-1	1.358	150	219.57	265
Reach-1	1.317	200	262.1	260
Reach-1	1.267	430	481.8	505
Reach-1	1.176	460	453.49	440
Reach-1	1.090	470	477.16	450
Reach-1	1.000	65	68	75
Reach-1	0.987	200	325.25	220
Reach-1	0.925	70	77.06	75
Reach-1	0.910	430	426.24	400
Reach-1	0.829	480	510.52	500
Reach-1	0.734	510	508.41	470
Reach-1	0.637	330	322.8	380
Reach-1	0.576	100	70.37	80
Reach-1	0.562	250	429.9	315
Reach-1	0.481	110	341.49	160
Reach-1	0.416	600	492.51	340
Reach-1	0.323	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	1.818	.1	.3
Reach-1	1.727	.1	.3
Reach-1	1.622	.1	.3
Reach-1	1.530	.1	.3
Reach-1	1.495	.1	.3
Reach-1	1.450	.1	.3
Reach-1	1.358	.1	.3
Reach-1	1.317	.1	.3
Reach-1	1.267	.1	.3
Reach-1	1.176	.1	.3
Reach-1	1.090	.1	.3
Reach-1	1.000	.1	.3
Reach-1	0.987	.1	.3
Reach-1	0.925	.1	.3
Reach-1	0.910	.1	.3
Reach-1	0.829	.1	.3
Reach-1	0.734	.1	.3
Reach-1	0.637	.1	.3
Reach-1	0.576	.1	.3
Reach-1	0.562	.1	.3
Reach-1	0.481	.1	.3
Reach-1	0.416	.1	.3
Reach-1	0.323	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl

			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	1.818		1670.00	833.70	836.47	835.84	836.61	0.01	3.27	594.95	666.55	0
Reach-1	1.818		1670.00	833.70	836.65	835.85	836.83	0.01	3.51	[illegible].96	448.15	0
Reach-1	1.727		1670.00	826.77	828.31	828.31	828.69	0.06	4.92	340.10	476.26	1
Reach-1	1.727		1670.00	826.77	828.31	828.31	828.69	0.06	4.95	337.44	464.18	1
Reach-1	1.622		1670.00	822.17	825.97		825.99	0.00	1.06	1594.27	515.27	0
Reach-1	1.622		1670.00	822.17	826.09		826.11	0.00	1.04	1599.28	464.82	0
Reach-1	1.530		1670.00	819.90	825.58		825.66	0.00	2.41	753.78	302.47	0
Reach-1	1.530		1670.00	819.90	825.68		825.78	0.00	2.60	642.71	155.07	0
Reach-1	1.495		1670.00	820.32	823.73	823.73	824.80	0.04	8.29	202.48	101.88	1
Reach-1	1.495		1670.00	820.32	823.72	823.72	824.80	0.04	8.36	199.73	91.05	1
Reach-1	1.450		1670.00	813.44	820.37		820.40	0.00	1.25	1375.00	328.86	0
Reach-1	1.450		1670.00	813.44	820.41		820.43	0.00	1.27	1319.81	254.77	0
Reach-1	1.358		1670.00	815.10	820.22		820.25	0.00	1.19	1408.74	343.59	0
Reach-1	1.358		1670.00	815.10	820.26		820.28	0.00	1.18	1418.29	333.31	0
Reach-1	1.317		1670.00	815.31	819.97	818.03	820.08	0.00	2.64	[illegible].73	371.25	0
Reach-1	1.317		1670.00	815.31	820.00	818.03	820.11	0.00	2.71	617.08	209.96	0
Reach-1	1.267		1670.00	816.66	819.15		819.21	0.00	1.97	856.40	662.76	0
Reach-1	1.267		1670.00	816.66	819.13		819.20	0.00	2.00	836.29	596.32	0
Reach-1	1.176		1670.00	813.50	815.97	815.35	816.14	0.01	3.33	503.30	393.09	0
Reach-1	1.176		1670.00	813.50	816.02	815.35	816.18	0.01	3.22	519.11	361.28	0
Reach-1	1.090		1670.00	807.71	811.69	810.71	811.91	0.01	3.76	453.14	241.43	0
Reach-1	1.090		1670.00	807.71	812.32		812.57	0.01	3.98	419.83	143.29	0
Reach-1	1.000		1670.00	802.59	805.08	805.08	805.58	0.03	5.28	295.77	288.61	1
Reach-1	1.000		1670.00	802.59	806.07	806.07	806.91	0.03	7.59	233.58	142.78	1
Reach-1	0.987		1670.00	801.97	804.55		804.56	0.00	0.63	1773.81	639.66	0
Reach-1	0.987		1670.00	801.97	804.89		804.91	0.00	0.84	1339.02	401.81	0
Reach-1	0.925		1670.00	800.02	804.49		804.51	0.00	0.71	1548.99	655.63	0
Reach-1	0.925		1670.00	800.02	804.76		804.80	0.00	1.31	1022.43	477.13	0
Reach-1	0.910		1670.00	799.66	804.45		804.48	0.00	1.45	[illegible]297.26	632.30	0
Reach-1	0.910		1670.00	799.66	804.73		804.75	0.00	1.34	1322.27	450.02	0

Reach-1	0.829		1670.00	799.37	803.90		804.01	0.00	2.64	651.77	319.26	0
Reach-1	0.829		1670.00	799.37	804.32		804.40	0.00	2.33	715.31	225.71	0
Reach-1	0.734		1670.00	797.60	800.51	800.51	800.84	0.02	5.29	[illegible].82	553.58	1
Reach-1	0.734		1670.00	797.60	800.64	800.64	801.62	0.04	7.93	210.48	107.82	1
Reach-1	0.637		1670.00	793.73	797.07		797.15	0.00	2.37	743.03	431.59	0
Reach-1	0.637		1670.00	793.73	797.19	795.79	797.29	0.00	2.51	665.31	270.28	0
Reach-1	0.576		1670.00	791.92	794.00	794.00	794.64	0.05	6.42	261.80	218.49	1
Reach-1	0.576		1670.00	791.92	793.98	793.98	794.64	0.05	6.54	255.39	198.00	1
Reach-1	0.562		1670.00	789.10	792.93		792.95	0.00	0.65	1824.26	604.46	0
Reach-1	0.562		1670.00	789.10	793.10		793.16	0.00	2.15	835.46	348.56	0
Reach-1	0.481		1670.00	785.15	792.90	786.82	792.90	0.00	0.69	2444.14	1673.84	0
Reach-1	0.481		1670.00	785.15	793.06	786.82	793.07	0.00	0.67	2476.71	422.29	0
Reach-1	0.416		1670.00	789.54	792.77	791.98	792.84	0.00	2.28	823.60	637.71	0
Reach-1	0.416		1670.00	789.54	792.86		792.99	0.00	2.92	565.93	323.10	0
Reach-1	0.323		5530.00	786.39	789.88	789.31	790.12	0.01	4.90	1429.84	1105.84	1
Reach-1	0.323		5530.00	786.39	790.09	789.31	790.34	0.01	4.75	1408.18	878.42	1

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach-1	1.818	836.61	836.47	0.14	7.90	0.02	2.61	1283.24	384.14	666.55
Reach-1	1.818	836.83	836.65	0.18	8.12	0.02		1507.94	162.06	448.15
Reach-1	1.727	828.69	828.31	0.38	0.71	0.11	0.60	1666.52	2.88	476.26
Reach-1	1.727	828.69	828.31	0.38	0.67	0.11		1670.00	464.18	
Reach-1	1.622	825.99	825.97	0.02	0.32	0.01	25.46	1637.33	7.21	515.27
Reach-1	1.622	826.11	826.09	0.02	0.32	0.01		1670.00	464.82	
Reach-1	1.530	825.66	825.58	0.08	0.77	0.10	20.04	1511.43	138.53	302.47
Reach-1	1.530	825.78	825.68	0.10	0.88	0.10		1670.00	155.07	
Reach-1	1.495	824.80	823.73	1.07	0.23	0.31	0.42	1667.34	2.24	101.88
Reach-1	1.495	824.80	823.72	1.09	0.24	0.32		1670.00	91.05	
Reach-1	1.450	820.40	820.37	0.02	0.15	0.00	5.27	1634.13	30.60	328.86
Reach-1	1.450	820.43	820.41	0.02	0.15	0.00		1670.00	254.77	

Reach-1	1.358	820.25	820.22	0.02	0.16	0.01	0.14	1669.76	0.10	343.59
Reach-1	1.358	820.28	820.26	0.02	0.16	0.01		1670.00	333.31	
Reach-1	1.317	820.08	819.97	0.11	0.86	0.01	27.49	1618.23	27	371.25
Reach-1	1.317	820.11	820.00	0.11	0.90	0.02		1670.00	209.96	
Reach-1	1.267	819.21	819.15	0.06	3.05	0.01	5.51	1662.13	2.36	662.76
Reach-1	1.267	819.20	819.13	0.06	3.01	0.01		1670.00	596.32	
Reach-1	1.176	816.14	815.97	0.17	4.23	0.00	1.23	1668.66	0.11	393.09
Reach-1	1.176	816.18	816.02	0.16	3.60	0.01		1670.00	361.28	
Reach-1	1.090	811.91	811.69	0.21	6.29	0.03	430.53	1239.35	0.12	241.43
Reach-1	1.090	812.57	812.32	0.25	5.60	0.06		1670.00	143.29	
Reach-1	1.000	805.58	805.08	0.50	0.05	0.15	382.37	547.50	740.13	288.61
Reach-1	1.000	806.91	806.07	0.84	0.07	0.24	69.29	1352.00	248.71	142.78
Reach-1	0.987	804.56	804.55	0.01	0.05	0.00	1360.88	115.13	193.99	639.66
Reach-1	0.987	804.91	804.89	0.03	0.11	0.00	1315.00	172.94	182.06	401.81
Reach-1	0.925	804.51	804.49	0.02	0.03	0.00	0.56	185.10	1484.34	655.63
Reach-1	0.925	804.80	804.76	0.04	0.05	0.01	2.54	383.29	1284.17	477.13
Reach-1	0.910	804.48	804.45	0.03	0.46	0.01	69.17	1411.52	189.31	632.30
Reach-1	0.910	804.75	804.73	0.03	0.34	0.01		1396.30	273.70	450.02
Reach-1	0.829	804.01	803.90	0.11	3.15	0.02	10.11	1642.94	16.95	319.26
Reach-1	0.829	804.40	804.32	0.08	2.69	0.09		1670.00	225.71	
Reach-1	0.734	800.84	800.51	0.33	3.12	0.07	144.97	1038.98	486.05	553.58
Reach-1	0.734	801.62	800.64	0.98	3.95	0.26		1670.00	107.82	
Reach-1	0.637	797.15	797.07	0.08	2.46	0.06	45.92	1501.83	122.25	431.59
Reach-1	0.637	797.29	797.19	0.10	2.59	0.06		1670.00	270.28	
Reach-1	0.576	794.64	794.00	0.64	0.04	0.19	1.96	1664.98	3.06	218.49
Reach-1	0.576	794.64	793.98	0.66	0.33	0.18		1670.00	198.00	
Reach-1	0.562	792.95	792.93	0.02	0.04	0.00	92.98	371.34	1205.68	604.46
Reach-1	0.562	793.16	793.10	0.06	0.08	0.02	371.51	1298.49	348.56	
Reach-1	0.481	792.90	792.90	0.01	0.06	0.01	5.89	1664.08	0.03	1673.84
Reach-1	0.481	793.07	793.06	0.01	0.06	0.01		1670.00	.29	
Reach-1	0.416	792.84	792.77	0.07	2.70	0.02	322.91	514.00	833.09	637.71
Reach-1	0.416	792.99	792.86	0.14	2.64	0.01		679.6		

990.31 323.10

Reach-1 0.323 790.12 789.88 0.24 4831.77 348.43
349.80 1105.84
Reach-1 0.323 790.34 790.09 0.25 4688.04 370.88
[illegible].08 878.42

Profile Output Table - Encroachment 1

Reach	River Sta	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Wdth Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	1.818	836.47		836.61	666.55	2.61	1283.24	384.14	9833.30	10046.31		
Reach-1	1.818	836.65	0.18	836.83	448.15		1507.94	162.06	9833.30	9833.30	10046.31	10281.45
Reach-1	1.727	828.31		828.69	476.26	0.60	1666.52	2.88	9945.10	10409.28		
Reach-1	1.727	828.31	0.00	828.69	464.18		1670.00	9945.10	9945.10	10409.28	10409.28	
Reach-1	1.622	825.97		825.99	515.27	25.46	1637.33	7.21	9749.30	10214.12		
Reach-1	1.622	826.09	0.12	826.11	464.82		1670.00	9749.30	9749.30	10214.12	10214.12	
Reach-1	1.530	825.58		825.66	302.47	20.04	1511.43	138.53	9935.16	10090.23		
Reach-1	1.530	825.68	0.09	825.78	155.07		1670.00	9935.16	9935.16	10090.23	10090.23	
Reach-1	1.495	823.73		824.80	101.88	0.42	1667.34	2.24	9968.09	10059.14		
Reach-1	1.495	823.72	-0.01	824.80	91.05		1670.00	9968.09	9968.09	10059.14	10059.14	
Reach-1	1.450	820.37		820.40	328.86	5.27	1634.13	30.60	9843.16	10097.93		
Reach-1	1.450	820.41	0.03	820.43	254.77		1670.00	9843.16	9843.16	10097.93	10097.93	
Reach-1	1.358	820.22		820.25	343.59	0.14	1669.76	0.10	9794.36	10127.67		
Reach-1	1.358	820.26	0.03	820.28	333.31		1670.00	9794.36	9794.36	10127.67	10127.67	
Reach-1	1.317	819.97		820.08	371.25	27.49	1618.23	24.27	9917.74	10127.70		
Reach-1	1.317	820.00	0.02	820.11	209.96		1670.00	9917.74	9917.74	10127.70	10127.70	
Reach-1	1.267	819.15		819.21	662.76	5.51	1662.13	2.36	9769.13	10365.45		
Reach-1	1.267	819.13	-0.01	819.20	596.32		1670.00	9769.13	9769.13	10365.45	10365.45	
Reach-1	1.176	815.97		816.14	393.09	1.23	1668.66	0.11	9857.11	10218.39		
Reach-1	1.176	816.02	0.05	816.18	361.28		1670.00	9857.11	9857.11	10218.39	10218.39	
Reach-1	1.090	811.69		811.91	241.43	430.53	1239.35	0.12	9931.20	10074.49		
Reach-1	1.090	812.32	0.63	812.57	143.29		1670.00	9931.20	9931.20	10074.49	10074.49	
Reach-1	1.000	805.08		805.58	288.61	382.37	547.50	740.13	9972.62	10047.88		
Reach-1	1.000	806.07	0.99	806.91	142.78	69.29	1352.00	[illegible].71	9737.59	9972.62	10047.88	10082.59
Reach-1	0.987	804.55		804.56	639.66	1360.88	115.13	193.99	9953.69	10027.99		
Reach-1	0.987	804.89	0.34	804.91	401.81	1315.00	172.9[illegible]					

182.06 9706.16 9953.69 10027.99 10107.97

Reach-1 0.925 804.49 804.51 655.63 0.56 185.10
1484.34 9824.28 9944.29
Reach-1 0.925 804.76 0.26 804.80 477.13 2.54 383.29
[illegible]4.17 9704.28 9824.28 9944.29 10290.66

Reach-1 0.910 804.45 804.48 632.30 69.17 1411.52
189.31 9918.39 10168.73
Reach-1 0.910 804.73 0.27 804.75 450.02 1396.30
273.70 9918.39 9918.39 10168.73 10368.41

Reach-1 0.829 803.90 804.01 319.26 10.11 1642.94
16.95 9920.93 10146.64
Reach-1 0.829 804.32 0.41 804.40 225.71 1670.00
9920.93 9920.93 10146.64 10146.64

Reach-1 0.734 800.51 800.84 553.58 144.97 1038.98
486.05 9954.53 10062.35
Reach-1 0.734 800.64 0.13 801.62 107.82 1670.00
9954.53 9954.53 10062.35 10062.35

Reach-1 0.637 797.07 797.15 431.59 45.92 1501.83
122.25 9784.10 10054.38
Reach-1 0.637 797.19 0.12 797.29 270.28 1670.00
9784.10 9784.10 10054.38 10054.38

Reach-1 0.576 794.00 794.64 218.49 1.96 1664.98
3.06 9844.63 10042.63
Reach-1 0.576 793.98 -0.02 794.64 198.00 1670.00
9844.63 9844.63 10042.63 10042.63

Reach-1 0.562 792.93 792.95 604.46 92.98 371.34
1205.68 10088.69 10270.56
Reach-1 0.562 793.10 0.17 793.16 348.56 371.51 1298.49
9922.00 10088.69 10270.56 10270.56

Reach-1 0.481 792.90 792.90 517.60 5.89 1664.08
0.03 9837.39 10259.68
[illegible]each-1 0.481 793.06 0.17 793.07 422.29 1670.00
[illegible]7.39 9837.39 10259.68 10259.68

Reach-1 0.416 792.77 792.84 637.71 322.91 514.00
833.09 9917.32 10007.58
Reach-1 0.416 792.86 0.09 792.99 323.10 679.69
990.31 9917.32 9917.32 10007.58 10240.42

Reach-1 0.323 789.88 790.12 1105.84 4831.77 348.43
349.80 9985.48 10018.67
Reach-1 0.323 790.09 0.21 790.34 878.42 4688.04 370.88
471.08 9083.68 9985.48 10018.67 10190.79

PREMIER
ENGINEERING CORPORATION

SAND TANK WASH
Split Flow Computation Worksheet

769.46

8/30/00 11:32

Xsection ID	Weir Elev.	CWSE	Depth ft	Avg Depth ft	Weir Length ft	Eff. Weir Length ft	Weir Discharge cfs	Weir Q to West @ I-8 cfs	Inflow from Bender, cfs	Total Flow cfs
4.911	769.05	769.46	0.41					3834		15437
				0.205	475	153.3465	117			
4.996	771.15	770.29	-0.86							15554
				0	400	400	0			
5.095	773.54	771.71	-1.83						16	15554
				0	375	375	0			
5.19	775.25	774.66	-0.59							15538
				0.44	600	359.1837	464			
5.282	777.7	778.58	0.88						98	16002
				0.44	650	515.3153	503			
5.37	780.97	780.74	-0.23							16407
				0.35	400	301.0753	219			
5.464	782.4	783.1	0.7						185	16626
				0.35	460	357.7778	252			
5.562	784.8	784.6	-0.2						186	16694
				0	600	600	0			
5.659	788	785.07	-2.93							16508
				0	495	495	0			
5.753	790.1	788.95	-1.15							16508
				0.57	500	248.9083	570			
5.844	792	793.14	1.14							17078
				0.91	400	400	920			
5.942	794.58	795.26	0.68							17998
				1.095	550	550	1670			
6.045	796.9	798.41	1.51							19668
				0.96	500	500	1246			
6.134	800.4	800.81	0.41							20914
				1.745	550	550	3360			
6.24	801.23	804.31	3.08							24274

Total Weir Flow to Scott Avenue Wash	9322
Flow to Scott Avenue Wash @ I-8	3834
Total Diversion to Scott Avenue Wash	13156

Sand Tank Wash Flow Split Rating Curve

Inflow, cfs	Outflow to Scott Ave. Wash, cfs
0	0
1100	0
3550	89
8750	1988
18450	8362
24274	13156
25400	14118

PREMIER
ENGINEERING CORPORATION

SAND TANK WASH #N/A
Split Flow Computation Worksheet 8/30/00 11:32

Xsection ID	Weir Elev.	CWSE	Depth ft	Avg Depth ft	Weir Length ft	Eff. Weir Length ft	Weir Discharge cfs	Weir Q to West @ I-8 cfs	Inflow from Bender, cfs	Total Flow cfs
4.911	769.05	764.49	-4.56					0		1585
				0	475	475	0			
4.996	771.15	766.91	-4.24							1585
				0	400	400	0			
5.095	773.54	767.96	-5.58						16	1585
				0	375	375	0			
5.19	775.25	772.2	-3.05							1570
				0	600	600	0			
5.282	777.7	775.64	-2.06						98	1570
				0	650	650	0			
5.37	780.97	777.74	-3.23							1471
				0	400	400	0			
5.464	782.4	780.57	-1.83						185	1471
				0	460	460	0			
5.562	784.8	781.35	-3.45						186	1286
				0	600	600	0			
5.659	788	781.4	-6.6							1100
				0	495	495	0			
5.753	790.1	785.07	-5.03							1100
				0	500	500	0			
5.844	792	789.62	-2.38							1100
				0	400	400	0			
5.942	794.58	792.46	-2.12							1100
				0	550	550	0			
6.045	796.9	795.42	-1.48							1100
				0	500	500	0			
6.134	800.4	797.2	-3.2							1100
				0	550	550	0			
6.24	801.23	800.2	-1.03							1100

Total Weir Flow to Scott Avenue Wash	**0**
Flow to Scott Avenue Wash @ I-8	**0**
Total Diversion to Scott Avenue Wash	**0**
Total Diversion to Scott Avenue Wash	**0**

PREMIER
ENGINEERING CORPORATION

SAND TANK WASH #N/A
Split Flow Computation Worksheet 8/30/00 11:32

Xsection ID	Weir Elev.	CWSE	Depth ft	Avg Depth ft	Weir Length ft	Eff. Weir Length ft	Weir Discharge cfs	Weir Q to West @ I-8 cfs	Inflow from Bender, cfs	Total Flow cfs
4.911	769.05	766.17	-2.88					51		3946
				0	475	475	0			
4.996	771.15	768.27	-2.88							3946
				0	400	400	0			
5.095	773.54	769.27	-4.27						16	3946
				0	375	375	0			
5.19	775.25	772.96	-2.29							3931
				0	600	600	0			
5.282	777.7	776.8	-0.9						98	3931
				0	650	650	0			
5.37	780.97	778.81	-2.16							3832
				0	400	400	0			
5.464	782.4	781.39	-1.01						185	3832
				0	460	460	0			
5.562	784.8	782.32	-2.48						186	3647
				0	600	600	0			
5.659	788	782.45	-5.55							3461
				0	495	495	0			
5.753	790.1	786.15	-3.95							3461
				0	500	500	0			
5.844	792	790.54	-1.46							3461
				0	400	400	0			
5.942	794.58	793.22	-1.36							3461
				0	550	550	0			
6.045	796.9	796.56	-0.34							3461
				0	500	500	0			
6.134	800.4	798.51	-1.89							3461
				0.155	550	77.5	89			
6.24	801.23	801.54	0.31							3550

Total Weir Flow to Scott Avenue Wash	89
Flow to Scott Avenue Wash @ I-8	51
Total Diversion to Scott Avenue Wash	140
Total Diversion to Scott Avenue Wash	89

PREMIER
ENGINEERING CORPORATION

SAND TANK WASH
Split Flow Computation Worksheet

#N/A

8/30/00 11:32

Xsection ID	Weir Elev.	CWSE	Depth ft	Avg Depth ft	Weir Length ft	Eff. Weir Length ft	Weir Discharge cfs	Weir Q to West @ I-8 cfs	Inflow from Bender, cfs	Total Flow cfs
4.911	769.05	767.77	-1.28					839		8086
				0	475	475	0			
4.996	771.15	769.27	-1.88							8086
				0	400	400	0			
5.095	773.54	770.45	-3.09						16	8086
				0	375	375	0			
5.19	775.25	773.76	-1.49							8071
				0	600	600	0			
5.282	777.7	777.68	-0.02						98	8071
				0	650	650	0			
5.37	780.97	779.74	-1.23							7972
				0	400	400	0			
5.464	782.4	782.21	-0.19						185	7972
				0	460	460	0			
5.562	784.8	783.35	-1.45						186	7787
				0	600	600	0			
5.659	788	783.6	-4.4							7601
				0	495	495	0			
5.753	790.1	787.3	-2.8							7601
				0	500	500	0			
5.844	792	791.66	-0.34							7601
				0	400	400	0			
5.942	794.58	794.04	-0.54							7601
				0.21	550	240.625	140			
6.045	796.9	797.32	0.42							7741
				0.21	500	154.4118	128			
6.134	800.4	799.46	-0.94							7869
				0.715	550	331.8565	881			
6.24	801.23	802.66	1.43							8750

Total Weir Flow to Scott Avenue Wash	**1149**
Flow to Scott Avenue Wash @ I-8	**839**
Total Diversion to Scott Avenue Wash	**1988**

PREMIER
ENGINEERING CORPORATION

SAND TANK WASH
Split Flow Computation Worksheet

#N/A

8/30/00 11:32

Xsection ID	Weir Elev.	CWSE	Depth ft	Avg Depth ft	Weir Length ft	Eff. Weir Length ft	Weir Discharge cfs	Weir Q to West @ I-8 cfs	Inflow from Bender, cfs	Total Flow cfs
4.911	769.05	769.09	0.04					2761		13334
				0.02	475	16.37931	4			
4.996	771.15	770.03	-1.12							13338
				0	400	400	0			
5.095	773.54	771.4	-2.14						16	13338
				0	375	375	0			
5.19	775.25	774.41	-0.84							13322
				0.34	600	268.4211	315			
5.282	777.7	778.38	0.68						98	13637
				0.34	650	394.6429	341			
5.37	780.97	780.53	-0.44							13880
				0.24	400	208.6957	125			
5.464	782.4	782.88	0.48						185	14005
				0.24	460	225.3061	143			
5.562	784.8	784.3	-0.5						186	13963
				0	600	600	0			
5.659	788	784.72	-3.28							13777
				0	495	495	0			
5.753	790.1	788.53	-1.57							13777
				0.38	500	163.0901	310			
5.844	792	792.76	0.76							14087
				0.55	400	400	432			
5.942	794.58	794.92	0.34							14520
				0.76	550	550	966			
6.045	796.9	798.08	1.18							15485
				0.64	500	500	678			
6.134	800.4	800.5	0.1							16164
				1.35	550	550	2286			
6.24	801.23	803.83	2.6							18450

Total Weir Flow to Scott Avenue Wash	**5601**
Flow to Scott Avenue Wash @ I-8	**2761**
Total Diversion to Scott Avenue Wash	**8362**

PREMIER
ENGINEERING CORPORATION

SAND TANK WASH
Split Flow Computation Worksheet 8/30/00 11:32

Xsection ID	Weir Elev.	CWSE	Depth ft	Avg Depth ft	Weir Length ft	Eff. Weir Length ft	Weir Discharge cfs	Weir Q to West @ I-8 cfs	Inflow from Bender, cfs	Total Flow cfs
4.911	769.05	769.53	0.48					4037		15804
				0.24	475	176.7442	148			
4.996	771.15	770.34	-0.81							15952
				0	400	400	0			
5.095	773.54	771.76	-1.78						16	15952
				0	375	375	0			
5.19	775.25	774.71	-0.54							15936
				0.46	600	378.0822	496			
5.282	777.7	778.62	0.92						98	16432
				0.46	650	538.7387	537			
5.37	780.97	780.78	-0.19							16871
				0.37	400	318.2796	239			
5.464	782.4	783.14	0.74						185	17110
				0.37	460	382.4719	274			
5.562	784.8	784.65	-0.15						186	17199
				0	600	600	0			
5.659	788	785.13	-2.87							17013
				0	495	495	0			
5.753	790.1	789.01	-1.09							17013
				0.605	500	263.0435	624			
5.844	792	793.21	1.21							17637
				0.98	400	400	1028			
5.942	794.58	795.33	0.75							18665
				1.16	550	550	1821			
6.045	796.9	798.47	1.57							20486
				1.02	500	500	1365			
6.134	800.4	800.87	0.47							21851
				1.81	550	550	3549			
6.24	801.23	804.38	3.15							25400

Total Weir Flow to Scott Avenue Wash	10081
Flow to Scott Avenue Wash @ I-8	4037
Total Diversion to Scott Avenue Wash	14118

C132 Flow Split

Stage	Discharge (cfs)					
	Weir West	Sand Tank Wash (C132 at I-8)				Total Flow
		West (A)	Middle (B)	East (C)	Total	
760.4	0	0	0	0	0	0
761	0	50	0	0	50	50
762	0	100	0	0	100	100
763	0	400	25	0	425	425
764	0	800	300	0	1100	1100
765	0	1250	850	0	2100	2100
766	0	1700	1700	150	3550	3550
767	300	2250	2900	400	5550	5850
768	1000	2800	4250	700	7750	8750
769	2500	3400	5900	1050	10350	12850
770	5400	3850	7800	1400	13050	18450
770.8	8700	4200	9470	1630	15300	24000
771	9600	4300	9800	1700	15800	25400
772	15000	4700	11800	2100	18600	33600

Source: Flood Control District of Maricopa County, *Gila Bend Area Floodplain Delineation Study, Technical Data Notebook, Hydrology, Book 1 of 2.* Prepared by Burgess & Niple, Inc., March, 1992.

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
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: Sand Tank Wash
Project File : sandtank.prj
Run Date and Time: 6/21/01 9:10:21 AM

Project in English units

Project Description:
Study name: Gila Bend Area Drainage Master Plan

Study contractors: EEC,
Inc. and Premier Engineering Corporation

Source of hydrology: Gila Bend
Area Floodplain Delineation Study (FCD 90-67) by Burgess & Niple for FCDMC,
March 1991

Source of survey: Gila Bend Area Floodplain Delineation Study
(FCD 90-67);
topographic mapping and survey by Cooper Aerial Mapping,
Inc., 1999.

FCD Contract Number: 99-18

Datum: NGVD 1929

PLAN DATA

Plan Title: Sand Tank Wash Main Branch
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Sand Tank Wash\sandtank.p01

Geometry Title: *Sand Tank Wash Main Branch*
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Sand Tank Wash\sandtank.g01

Flow Title : Sand Tank Wash Main Branch
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Sand Tank Wash\sandtank.f01

Plan Summary Information:
Number of: Cross Sections = 15 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 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 = Sand Tank Wash Reach = Main Branch

	Profile	Method	Value1	Value2
6.257	PF 2	1	9620.82	12162.13
6.151	PF 2	1	9588.02	11704.35
6.062	PF 2	1	9560.59	11287.52
5.959	PF 2	1	9354.18	10784.34
5.862	PF 2	1	9448.05	10631.12
5.770	PF 2	1	9715.35	10341.07
5.676	PF 2	1	9131.5	10295.11
5.580	PF 2	1	8697.44	10351.99
5.482	PF 2	1	8816.32	10643.34
5.387	PF 2	1	8874.84	10829.68
5.299	PF 2	1	8668.21	10802.88
5.207	PF 2	1	8919.48	10380.19
5.112	PF 2	1	9172.26	10241.24
5.013	PF 2	1	9160.97	10443.07
4.917	PF 2	1	8895.75	10762.8

FLOW DATA

Flow Title: Sand Tank Wash Main Branch
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Sand Tank Wash\sandtank.f01

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
Sand Tank Wash	Main Branch	6.257	24265	24265
Sand Tank Wash	Main Branch	6.151	21020	21020
Sand Tank Wash	Main Branch	6.062	19813	19813
Sand Tank Wash	Main Branch	5.959	18177	18177
Sand Tank Wash	Main Branch	5.862	17257	17257
Sand Tank Wash	Main Branch	5.770	16679	16679
Sand Tank Wash	Main Branch	5.676	16679	16679
Sand Tank Wash	Main Branch	5.580	16859	16859
Sand Tank Wash	Main Branch	5.482	16765	16765
Sand Tank Wash	Main Branch	5.387	16536	16536
Sand Tank Wash	Main Branch	5.299	16139	16139
Sand Tank Wash	Main Branch	5.207	15699	15699
Sand Tank Wash	Main Branch	5.112	15703	15703
Sand Tank Wash	Main Branch	5.013	15703	15703
Sand Tank Wash	Main Branch	4.917	15573	15573

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Sand Tank Wash	Main Branch	PF 1		Known WS = 769.49

GEOMETRY DATA

Geometry Title: Sand Tank Wash Main Branch
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Sand Tank Wash\sandtank.g01

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 6.257

INPUT
Description:
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9620.82	801.23	9648	801.22	9675.17	801.1	9702.34	800.74	9729.51	800.36
9756.69	800.08	9785.56	800.02	9815.75	800.3	9838.2	800.6	9845.93	800.76
9865.37	800.98	9876.12	801.15	9906.3	801.1	9919.72	800.63	9936.48	799.98
9946.89	799.19	9966.67	797.2	9974.06	797.1	10001.23	797.5	10040.1	798.83
10057.23	799.47	10109.76	800.52	10136.89	800.8	10191.15	801.18	10272.54	801.57
10328.94	801.89	10389.32	802.36	10449.7	802.9	10489.59	803.2	10543.85	803.42
10652.37	803.75	10781.79	804.25	10806.92	804.3	10856.92	804.3	10894.08	804.17
10934.66	803.94	10975.24	803.6	10994.73	803.41	11037.2	803.1	11079.67	802.89

11137.54	802.5611185.85	801.9711228.33	801.411292.03	800.811340.42	800.35
11381	800.3611421.57	800.8311440.69	801.1611462.15	801.411483.16	801.48
11504.4	801.1711525.63	800.36 11543.3	799.9311550.79	799.411568.11	797.65
11583.88	797.2811589.78	797.7111594.87	798.0211610.58	799.911631.81	801.04
11653.04	801.49 11676.3	801.7911695.51	801.8911717.02	801.911760.81	801.71
[illegible]80.44	801.6 11822.9	801.5211865.37	801.6211907.83	801.9 11950.3	802.37
[illegible]2.76	803.59 12077.7	803.92 12124.2	80412183.86	804.412226.33	804.48

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9620.82	.04	9919.72	.0510109.76		.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9919.7210109.76		560	559.68	530	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 6.151

INPUT
Description:
Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9588.02	800.4	9611.81	800.37	9641.98	800.2	9693.53	799.76	9702.32	799.71
9720.78	799.8	9732.5	800	9792.84	800.39	9823.02	800.37	9853.19	800
9884.24	799	9913.53	797.63	9943.71	796.01	9965.98	795.15	9973.88	794.56
9993.22	79410004.07		794.3510019.95		795.4110034.36		795.9910053.49		796.51
10064.66	79710073.07		797.1510099.64		797.4210155.54		798.1810185.84		798.77
10216.13	799.410246.43		80010276.72		800.1710312.13		800.21 10367.6		800.09
10397.9	80010458.49		799.5110488.78		799.3810524.63		799.410579.67		799.62
10640.26	800	10684	800.3610710.56		800.4910737.12		800.5310763.68		800.48
10799.17	800.310836.37		799.9810855.72		799.7610877.27		799.4310898.18		799.05
10940.64	798.111004.32		796.511025.55		795.9911046.78		795.2111053.16		795.51
11068.01	795.911081.44		796.9211098.03		797.6911110.51		798.6611131.76		799.47
11153	799.711188.16		799.811233.23		799.6611259.24		799.4811282.45		799.45
11344.23	799.811413.49		799.9211577.96		799.9311662.95		800.03	11705	800.8
11800	801.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
[illegible]8.02	.04	9853.19	.0510246.43		.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9853.1910246.43		500	469.92	150	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 6.062

INPUT
Description:
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9560.59	796.9	9628.49	796.43	9658.51	796.19	9718.53	795.57	9748.55	795.4
9778.56	795.5	9808.58	795.84	9868.61	796.87	9898.62	796.93	9928.63	795.98
9934.2	795.5	9963.31	793.5	9988.66	791.4	10000	791.8410019.08		792.57
10049.73	79410080.39		795.0310111.05		795.7210145.39		796.1910172.36		796.4
10233.67	796.610264.33		796.6310325.64		796.3310344.11		796.3410388.41		796.48
10420.11	796.710451.81		796.7910483.51		796.7610515.21		796.610560.45		796.26
10607.71	795.710631.35		795.3510642.01		795.0610654.98		794.8710692.97		793.81
10705.41	793.610725.88		793.9910737.11		794.310749.51		794.9910768.81		795.65
10800.51	795.9	10820.4	795.8310844.03		795.79	10878.6	795.8710914.92		796.18
10950	796	11230	798	11450	799.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9560.59	.04	9928.63	.0510111.05		.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9928.6310111.05		530	543.84	540	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 5.959

[illegible]UT
[illegible]cription:
[illegible]tion Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9354.18	794.58	9395.91	794.2	9452.18	793.64	9536.58	792.6	9565.32	792.27
9594.75	792	9624.82	791.8	9654.89	791.8	9715.03	792.08	9761.66	792.22

9789.79	792.41	9817.93	792.7	9865.39	793.49	9895.46	793.72	9925.53	793.34
9955.6	791.97	9985.67	789.2	10000	789.82	10015.89	790.46	10046.25	792
10076.61	792.93	10106.97	793.51	10145.27	793.81	10171.55	793.91	10198.05	793.89
10228.41	793.76	10258.77	793.51	10289.13	793.09	10329.21	792.52	10355.48	792.21
10381.76	792	10434.31	792	10449.99	791.91	10486.86	791.89	10513.14	791.71
[illegible]26.07	791.76	10545.69	791.91	10608.53	792.64	10737.6	794.61	10780.66	795.21
[illegible]24.9	795.71	10847.03	795.91	10874.17	796.03	10935.52	796.51	10985.61	796.72
11079.01	796.95	11147.29	797.21	11181.43	797.26				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9354.18	.04	9925.53	.05	10106.97	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9925.53	10106.97	445	512.16	580	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 5.862

INPUT
Description:
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9448.05	792	9542.48	791.3	9589.41	790.94	9646.1	790.58	9667.05	790.35
9698.19	789.6	9729.33	788.95	9760.47	788.62	9784.27	788.78	9791.61	788.78
9808.63	789.1	9832.99	789.35	9857.35	789.56	9885.04	789.62	9916.18	789.27
9930.42	788.9	9947.32	788.69	9954.78	788.44	9979.14	787.95	10003.47	786.57
10009.64	786.4	10027.65	787.27	10040.9	787.99	10072.17	789.03	10103.43	789.54
10134.69	789.6	10178.62	789.42	10302.44	788.41	10322.26	788.26	10353.52	788.2
10357.23	788.4	10365.34	788.74	10387.53	789.22	10421.9	790.33	10431.47	790.39
10456.28	791	10475.55	791.16	10490.65	791.46	10525.03	792	10541.68	792.2
10563.73	792.1	10571.46	792	10585.77	792.11	10593.78	792.3	10607.81	792.5
10632.91	793.2	10696.9	793.87	10740.08	794.18	10784.16	794.37	10834.41	794.38

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9448.05	.04	9916.18	.05	10072.17	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9916.18	10072.17	495	485.76	450	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 5.770

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9588.58	790.1	9613.5	790.1	9638.43	790.04	9665.78	789.84	9696.62	789.39
9713.2	789	9738.12	788.54	9763.05	788.23	9789.11	788	9819.94	787.36
9862.74	786.2	9913.25	784.69	9943.26	784	9962.44	783.85	9974.1	783.65
9987.36	783.6	10000	783.61	10014.02	783.65	10042.46	783.88	10064.9	784
10070.9	784.1	10075	787.3	10100	787.4	10125	787.3	10185	784.7
10200	784.62	10215	784.71	10285.91	788	10321.47	788.68	10364.8	789.3
10389.22	789.56	10430.87	789.83	10458.09	790.14	10504.78	790.82	10526.97	791
10540.99	791.11	10565.88	791.11	10595.84	790.96	10607.06	790.79	10634.53	790.6
10664.71	790.49	10699.15	790.63	10717.18	790.74	10768.02	790.83	10810.29	790.8
10849.33	790.89	10871.39	790.98	10959.45	791.65	11003.5	791.93	11025.52	791.9
11047.54	792.03								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9588.58	.035	9819.94	.055	10075	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9819.94	10075	495	496.32	360	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 5.676

INPUT
Description:
[illegible]tion Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
[illegible]000.12	788	9029.2	787.73	9059.22	787.24	9090.27	786.62	9121.31	785.67
9152.36	783.9	9175.49	781.12	9183.4	780.66	9200.01	781.24	9214.45	780
9245.49	779.2	9262.39	778.75	9322.6	777.71	9378.98	776.76	9400.72	776.52
9431.76	776.4	9445.18	776.25	9462.81	776.32	9469.7	776.04	9494.22	775.94

9518.73	774.8	9524.9	774.72	9543.25	774.9	9555.94	774.82	9567.77	775.19
9586.99	775.4	9592.28	775.56	9618.03	776.01	9649.08	776.34	9665.84	776.55
9690.35	777	9714.87	777.59	9742.22	778.45	9763.9	779.18	9773.26	779.56
9788.42	780	9804.31	780.55	9812.94	780.62	9845.36	782.14	9861.97	782.6
9866.4	782.8	9886.49	783.52	9897.44	784	9918.3	784.42	9928.2	784.62
[illegible]8.38	784	9988.55	781.91	10022.49	782.98	10048.91	784	10079.08	784.22
[illegible]9.26	784	10127.99	784.07	10139.43	783.94	10155.22	783.85	10169.61	783.57
10182.44	782.9	10197	782.55	10199.85	782.48	10208.58	782.87	10230.69	783.99
10261.54	784.71	10308.15	785.24	10333.04	785.59	10384.93	786.45	10446.62	787.56
10482.39	788	10508.31	788.04	10581.96	787.91	10606.85	787.92	10631.92	788
10662.54	788.31	10731.31	789.02	10760.87	789.25	10793.2	789.37	10829.13	789.15
10868.18	788.71	10925.05	788.05	10953.55	787.95	10976.4	787.95	11038.91	788.1
11081.59	788.11	11124.28	787.96	11145.62	787.69	11188.3	787.44	11230.98	787.36
11273.67	787.41	11322.47	787.66	11360.92	788	11404.63	788.55	11444.39	788.97
11465.74	789	11487.08	788.91	11529.76	788.35	11553.18	787.98	11615.12	787.64
11644.42	787.71	11692.38	787.91	11745.44	788.25	11807.19	788.85	11871.22	789.4
11913.9	789.71	11956.58	789.81	11974.25	789.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9000.12	.035	9958.38	.055	10048.91	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9958.38	10048.91	520	506.88	580	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 5.580

INPUT
Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8671.11	784.8	8690.86	784.69	8742.32	784.12	8781.79	783.93	8874.81	783.95
8903.03	783.9	8933.33	783.79	8980.8	783.5	9054.57	782.98	9115.19	782.74
9166.28	782.6	9192.78	782.25	9206.11	781.99	9219.27	780.93	9236.42	780.34
9245.77	780.1	9272.27	779.78	9298.77	779.35	9327.35	779.07	9357.66	778.95
9387.97	779	9418.27	779.09	9457.75	779.41	9484.25	779.69	9510.74	780
9539.51	780.1	9569.82	780.07	9630.44	779.89	9669.73	779.69	9696.23	779.63
9722.72	779.7	9751.67	780	9781.98	780.55	9802.22	780.95	9828.71	781.26
[illegible]42.6	781.4	9872.91	781.18	9881.71	780.97	9903.22	780.62	9961.2	779.4
[illegible]63.83	779.31	10000.01	779.15	10013.63	779.05	10024.7	779.08	10055.31	780.1
10067.87	781.41	10085.92	783.91	10089.95	784.01	10116.54	784.98	10140.83	785.03
10147.15	785.09	10177.77	784.81	10191.72	784.66	10208.38	784.41	10217.16	784.36
10238.99	784.04	10269.61	783.91	10293.48	784.11	10300.22	784.09	10318.92	784.35
10337.76	784.54	10385.72	784.81	10410.64	784.99	10428.17	785.05		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8671.11	.035	9842.6	.055	10067.87	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9842.6	10067.87	485	517.44	400	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 5.482

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8816.32	782.4	8886.9	781.75	8961.88	781.23	9069.88	780.54	9142.39	780
9193.96	779.6	9222.36	779.45	9252.86	779.44	9271.32	779.51	9297.11	779.69
9313.85	779.9	9374.84	780	9435.84	780.2	9477.61	780.44	9557.82	781.05
9649.31	781.8	9683.9	781.99	9710.3	781.98	9801.79	781.63	9838.62	781.53
9873.27	781.3	9893.28	781.19	9923.78	780.75	9954.27	780	9967.55	779.55
9993.34	778.31	10015.27	777.47	10045.77	779.98	10076.27	781.27	10106.78	781.8
10122.17	782	10137.28	782.03	10205.9	782.81	10320.3	783.84	10335.64	783.93
10353.43	783.91	10372.83	783.71	10394.51	783.28	10425.02	782.45	10437.87	782.05
10460.82	781.41	10481.24	780.95	10502.92	780.68	10524.6	780.81	10546.28	781.07
10568.21	781.61	10589.65	781.85	10611.33	782.31	10639.8	783.04	10654.69	783.37
10677.56	784	10711.4	784.37	10732.55	784.38				

[illegible]ning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8816.32	.035	9893.28	.055	10076.27	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9893.28	10076.27	440	501.6	460	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 5.387

INPUT
Description:
Station Elevation Data num= 67

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8813.52	780.97	8844.95	780.96	8867.47	780.82	8887.65	780.6	8912.36	780
8929.35	779.5	8937.07	778.97	8986.49	776.22	8991.23	776	9022.16	775.35
9060.62	775.94	9090.47	776.45	9134.75	777.26	9184.18	778	9300.61	779.39
9335.99	779.76	9362.48	779.92	9381.86	779.77	9393.42	779.9	9431.28	780.05
9517.17	779.82	9554.83	779.8	9628.97	779.91	9678.39	779.8	9704.28	779.73
9733.74	779.53	9764.68	779.42	9801.94	779.61	9851.36	779.9	9876.07	780.29
9888.43	780.57	9900.78	780.36	9919.37	779.95	9950.3	776.1	9981.24	775.22
10000	775.4	110024.25	775.7	110043.18	776	10074.17	776.8	10122.75	778.31
10147.37	778.98	10172	779.55	10198.1	779.99	10229.24	780.1	10266.96	779.9
10311.98	779.53	10428.42	778.22	10469.55	777.96	10494.87	777.9	10528.1	778.14
10576.45	778.68	10596.74	778.89	10626.6	778.98	10643.18	780	10664.17	781.21
10672.24	781.3	10699.65	780.63	10715.6	780.86	10729.04	780.6	10737.12	779.95
10741.65	779.34	10793.25	780.55	10817.22	780.24	10836.17	781	10864.81	781.93
10894.59	782.42	10902.37	782.55						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8813.52	.035	9919.37	.055	10172	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9919.37	10172	585	464.64	380	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 5.299

INPUT
Description:
Station Elevation Data num= 137

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8668.21	777.7	8673.3	777.8	8687.32	777.66	8732.54	777.4	8787.81	777.69
8798.86	777.8	8804.58	777.73	8824.86	777.31	8877.23	777.15	8913.81	776.86
8924.33	774.4	8933.99	775.37	8939.05	774.07	8946.92	772.51	8967.75	772.38
8977.9	771.7	8985.7	771.97	8993.16	773.33	9007.89	774.81	9022.61	775.1
9058.38	775.9	9062.81	775.73	9070.32	774.19	9077.44	775.5	9087.33	775.05
9096.7	773.8	9104.75	775.52	9138.45	775.43	9164.73	775.18	9175.27	775.84
9197.94	776	9205.83	775.98	9215.11	776.31	9233.7	776.76	9264.85	775.6
9283.02	775.9	9314	776.38	9328.44	776.55	9344.57	776.86	9362.56	776.8
9396.41	776.6	9415.26	775.99	9425.28	775.95	9428.38	776.05	9434.85	775.89
9448.36	775.9	9465.03	776.08	9480.02	775.5	9486.07	775.83	9498.21	776.72
9510.33	776.9	9522.43	776.91	9529.09	777.16	9547.82	777.46	9549.8	777.39
9591.05	777.8	9616.96	778.24	9623.35	777.81	9637.9	777.15	9652.09	776.72
9660.71	776.1	9689.5	776.87	9693.48	776.61	9719.54	776.37	9744.17	777.51
9760.48	777.4	9767.6	777.28	9774.72	777.44	9836.44	777.45	9838.23	777.84
9847.36	777.2	9854.93	776.2	9888.23	775.62	9899.8	774.82	9909.21	774.73
9914.53	773.9	9925.5	774.9	9944.68	774.77	9971.59	774.49	9987.37	772.71
10025.74	773.2	10030.68	774.71	10033.32	775.25	10037.65	776.6	10044.92	777.05
10056.12	778.1	10097.81	777.13	10117.4	777.14	10125.47	777.26	10134.88	777.19
10162.13	777.3	10183.23	777.38	10209.98	777.39	10218.72	776.96	10222.5	777.83
10259.99	778.1	10305.71	778.71	10320.58	778.87	10353	779.43	10371.68	778.49
10374.18	778.1	10381.35	777.91	10395.12	777.89	10407.12	777.44	10425.51	777.38
10436.83	777	10449.2	776.5	10468.25	776.71	10499.97	776.57	10511.75	776.43
10541.64	776.7	10548.99	777.06	10557.42	777.14	10586.71	776.76	10604.76	776.75
10624.06	778	10633.46	778.47	10644.41	778.24	10657.59	778.61	10680.22	778.78
10696.95	779.1	10730.36	778.84	10750.89	778.61	10764.36	778.64	10799.27	778.41
10804.09	778.6	10828.79	778.68	10843.9	778.85	10859.1	779.13	10911.91	779.97
10973.23	780.4	10985.58	780.32	11009.71	780.39	11074.68	780.02	11160.84	780.87
11177.58	780.9	11202.06	780.62						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8668.21	.035	9847.36	.04	10044.92	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9847.36	10044.92	560	485.76	500	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 5.207

INPUT
Description:

Station Elevation Data num= 124

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8916.19	775.25	8921.11	774.37	8970.18	773.93	8976.6	773.8	8996.35	774.29
9020.96	769.38	9039.17	769.7	9049.91	769.01	9066.8	769.9	9082.56	772.6
9094.98	771.13	9104.18	772.33	9119.58	772.37	9140.77	772.5	9153.11	772.6
[illegible]0.88	772.95	9201.52	773.35	9213.54	773.55	9225.14	773.6	9227.3	773.71
[illegible]43.8	772.34	9256.98	772.11	9267.94	770.91	9285.06	772.9	9305.7	773.16
9356.09	774.45	9367.1	774.74	9407.07	774.61	9429.5	773.5	9441.48	773.4
9461.23	772.23	9463.95	771.99	9500.17	772.76	9506.37	772.9	9518.98	772.8
9550.9	773.17	9559.97	773.2	9590.25	772.89	9601.41	771.9	9615.1	773.27
9623.54	773.34	9638.91	773.35	9656.79	774.04	9701.97	774.8	9727.25	775.11
9733.25	774.96	9747.9	775.08	9769.88	774.77	9784.21	774.3	9795.79	773.13
9797.62	773.11	9811.25	774.32	9815.38	774.2	9821.26	774.3	9845.51	774.21
9854.17	774.32	9872.74	775.64	9890.69	775.32	9895.75	775.5	9907.83	775.78
9946.59	774.54	9958.93	772.34	9964.94	771.48	9976.63	772.4	9987.12	770.9
10000	771.3	10008.66	772.22	10012.2	772.48	10035.15	7	7110047.44	770.44
10047.86	771.08	10062.54	771.31	10080.61	771.46	10096.43	772.2	10110.6	771.5
10114.35	771.5	10136.97	770.81	10150.52	773.48	10158.94	772.8	10169.72	774.08
10182.11	775.41	10195.89	775.23	10206.94	774.96	10211.97	7	7510220.38	775.17
10234.9	775.05	10254.89	774.71	10264.77	774.64	10275.89	774.7	10281.16	774.53
10289.44	774.76	10309.29	774.42	10329.74	773.24	10338.37	773.5	10351.47	774.33
10359.76	774.38	10369.43	774.59	10374.83	774.57	10388.3	774.8	10398.13	775.19
10413.33	775.2	10428.48	775.5	10444.82	775.37	10470.79	775.7	10491.02	776.61
10520.9	7	7710529.88	777.13	10574.06	776.74	10600.03	776.6	10646.78	777.16
10656.26	777.4	10676.72	777.33	10704.48	778.32	10735.22	777.8	10744.13	777.91
10775.7	778.49	10792.06	778.58	10812.71	778.46	10829.65	778.5	10889.56	778.63
10928.58	778.8	10966.4	778.78	11001.91	779.27	11036.34	779		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8916.19	.035	9946.59	.041	10169.72	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9946.59	10169.72	410	501.6	470	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 5.112

INPUT
[illegible]ription:
[illegible]ation Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9087.48	773.54	9099.5	772.16	9149.28	772.7	9157.96	772.61	9162.92	772.22
9212.15	769.2	9218.82	768.84	9225.86	767.7	9230.42	766.92	9234.11	767.16
9249.48	767.77	9274.84	767.67	9275.59	767.5	9296.62	768.64	9301.33	768.11
9312.97	768.1	9318.8	768.19	9327.69	768.1	9361.85	768.3	9382.52	767.83
9396.26	767.3	9410.12	766.61	9419.11	766.8	9435.94	766.74	9458.71	766.19
9466.33	765.63	9522.02	765.1	9547.86	765.1	9603.11	765.06	9653.2	766.42
9663.7	766.46	9703.17	767.04	9746.45	767.6	9758.84	767.54	9760.97	767.26
9785.6	767.87	9806.9	768.11	9833.81	768.1	9850.46	767.85	9855.81	767.84
9861.35	768.88	9878.25	771.82	9910.97	771.5	9915.31	771.88	9923.36	770.43
9929.24	769.87	9945.8	769.38	9950.78	767.9	9964.92	768.42	9981.59	767.6
9986.51	767.53	10000	767.61	10011.55	767.7	10027.98	769.86	10032.68	770.37
10038.03	770.33	10066.45	770.58	10095.31	770.9	10133.75	770.58	10153.53	770.6
10162.35	769.22	10166.83	768.4	10210.62	768.4	10216.78	770.36	10222.46	770.96
10232.57	770.97	10243.71	771.84	10248.89	7	7210262.91	771.85	10293.87	772.39
10301.79	772.48	10341.27	772.7	10351.79	772.7	10368	772.38	10377.22	772.33
10409.44	773.41	10418.77	773.63	10442.58	773.5	10456.82	773.57	10473.9	773.42
10476.52	773.2	10480.46	774.23	10489.21	774.3	10501.25	774.29	10515.05	773.66
10526.93	773.41	10565.19	772.07	10591.18	772.6	10611.61	773.11	10615.71	773.36
10632.65	773.62	10649.09	773.78	10654.5	774.1	10665.1	774.29	10668.25	774.21
10674.88	774.46	10689.06	774.71	10721.95	775.1	10732.68	775.29	10739.4	775.23
10781	775.32								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9087.48	.035	9923.36	.041	10032.68	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9923.36	10032.68	440	522.72	460	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
[illegible]CH: Main Branch RS: 5.013

INPUT
Description:
Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

9053.24	771.14	9073.4	771.15	9082.62	770.9	9120.93	770.41	9154.02	770.4
9177.25	769.99	9182.17	769.86	9192.74	770.6	9209.19	770.57	9240.56	766.27
9262.88	763.95	9266.04	764.23	9274.5	765.7	9280.16	765.75	9310.28	765.55
9313.32	765.59	9321.88	763.14	9324.99	763.5	9349.82	766.12	9362.67	765.01
9369.3	765.34	9375.25	765.39	9382.03	766.2	9391.68	765.43	9400.4	766.02
[illegible]413.6	766.24	9428.63	766.77	9452.53	767.3	9458.83	767.52	9481.94	767.99
[illegible]0.87	768.11	9513.21	767.81	9552.2	767.8	9576.43	767.94	9606.75	768.5
9612.72	768.47	9624.4	768.78	9649.55	768.4	9693.57	768.83	9718.05	768.69
9733.92	768.51	9779.14	768.65	9790.3	768.5	9800.97	768.19	9862.87	768.31
9867.91	768.57	9890.69	769.01	9930.19	769.8	9954.44	769.75	9969.77	765.14
9970.97	764.85	10000.01	764.48	10022.02	764.61	0030.74	764.42	10043.08	764.78
10068.16	765.06	10076.99	766.18	10093.3	767.51	0099.05	768.13	10123.59	769.76
10151.19	769.98	10153.96	769.91	10170.66	770.81	0184.33	770.99	10206.38	769.59
10217.3	770	10259.74	770.02	10264.17	769.91	0277.21	770.62	10288.84	771.03
10318.82	771.95	10333.1	772.24	10337.78	771.81	0376.39	769.84	10380.3	769.69
10408.24	769.51	0444.08	770.31	0474.18	770.61	0492.85	770.58	10499.66	770.79
10516.41	771.12	10542.17	771.26	10558.87	770.51	0573.33	770.45	10589.41	770.58
10613.37	771.37	10630.42	771.56	10645.06	771.51	0671.59	773.08	10699.65	773.26
10708.25	773.56	10728.87	773.71	10743.94	773.91	0779.36	773.91	10796.04	774.15

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9053.24	.035	9954.44	.04	10123.59	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9954.44	10123.59	460	506.88	440	.1	.3

CROSS SECTION RIVER: Sand Tank Wash
REACH: Main Branch RS: 4.917

INPUT
Description:
Station Elevation Data num= 132

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8895.75	769.05	8928.67	768.8	8945.59	768.83	8955.33	768.76	8981.58	769
8993.69	768.97	9001.94	768.55	9009.08	768.13	9016.8	768.66	9032.32	768.4
9043.53	767.18	9050.88	767.99	9062.98	767.47	9070.87	767.92	9080.83	767.4
9096.35	768.19	9103.18	767.96	9113.61	768.17	9119.93	768.46	9151.29	768.7
9162.96	767.66	9172.26	768.69	9207.33	768.45	9261.88	768.79	9282.02	768.9
[illegible]94.42	768.8	9322.77	768.04	9333.18	770.4	9346.27	770.58	9353.44	767.5
[illegible]65.48	767.12	9371.79	765.18	9376.5	764.94	9386.07	762.69	9415.6	765.4
9422.77	763.81	9436.31	761.04	9444.18	763.76	9456.85	764.96	9464.5	765.9
9467.55	765.95	9487.64	763.97	9490.3	763.66	9503.25	764.57	9517.38	765.2
9541.93	766.19	9546.3	766.18	9556.61	765.78	9565.99	765.13	9575.74	765.2
9603.41	765.8	9644.27	765.75	9667.27	766.06	9688.68	766.71	9697.51	766.6
9721.12	766.77	9741.66	766.71	9766.28	766.84	9799.65	766.7	9814.6	766.8
9833.7	766.03	9840.99	765.61	9854.81	766.18	9861.62	766.59	9881.91	766.6
9912.98	766.86	9924.32	766.69	9926.25	766.1	9930.31	766.5	9938.42	765.1
9940.75	764.51	9944.87	765.17	9954.26	766.2	9964.03	765.36	9971.11	766.4
9972.97	765.76	9981.8	761.62	10005.24	761.81	0016.38	761.98	10047.98	762.4
10067.42	762.53	10077.64	765.17	10081.01	765.73	0095.97	768.64	10110.35	768.5
10114.57	768.49	10134.18	767.09	10156.41	766.99	0170.27	767.29	10179.9	767.2
10207	766.14	10226.61	766.16	10239.29	766.37	0245.39	766.61	10264.97	767.1
10273.07	767.25	10283.51	767.92	10323.65	767.05	0351.34	766.91	10369.47	767.8
10405.47	766.45	10413.64	766.03	10424.84	766.57	0453.47	767.06	10457.44	767.4
10492.3	768.08	10495.78	768.09	10505.77	768.41	0511.39	768.32	10538.45	768.3
10548.74	768.13	10570.64	768	10586.7	767.82	0605.27	768.18	10646.24	768.5
10663.3	768.25	10683.74	768.27	10728.19	768.49	0749.62	768.89	10767.41	769.7
10770.43	769.78	10789.4	770.42	10812.79	770.66	0834.79	770.68	10851.5	770.7
10867.73	770.34	10876.19	770.36	10891.95	771.06	0905.26	771.07	10931.59	771.4
10973.23	771.94	10993.6	772.01						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8895.75	.035	9972.97	.04	10081.01	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9972.97	10081.01	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

[illegible]er:Sand Tank Wash

Reach	River Sta.	n1	n2	n3
Main Branch	6.257	.04	.05	.04

Main Branch	6.151	.04	.05	.04
Main Branch	6.062	.04	.05	.04
Main Branch	5.959	.04	.05	.04
Main Branch	5.862	.04	.05	.04
Main Branch	5.770	.035	.055	.04
Main Branch	5.676	.035	.055	.04
Main Branch	5.580	.035	.055	.04
Main Branch	5.482	.035	.055	.04
Main Branch	5.387	.035	.055	.04
Main Branch	5.299	.035	.04	.035
Main Branch	5.207	.035	.04	.035
Main Branch	5.112	.035	.04	.035
Main Branch	5.013	.035	.04	.035
Main Branch	4.917	.035	.04	.035

SUMMARY OF REACH LENGTHS

River: Sand Tank Wash

Reach	River Sta.	Left	Channel	Right
Main Branch	6.257	560	559.68	530
Main Branch	6.151	500	469.92	150
Main Branch	6.062	530	543.84	540
Main Branch	5.959	445	512.16	580
Main Branch	5.862	495	485.76	450
Main Branch	5.770	495	496.32	360
Main Branch	5.676	520	506.88	580
Main Branch	5.580	485	517.44	400
Main Branch	5.482	440	501.6	460
Main Branch	5.387	585	464.64	380
Main Branch	5.299	560	485.76	500
Main Branch	5.207	410	501.6	470
Main Branch	5.112	440	522.72	460
Main Branch	5.013	460	506.88	440
Main Branch	4.917	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Sand Tank Wash

Reach	River Sta.	Contr.	Expan.
Main Branch	6.257	.1	.3
Main Branch	6.151	.1	.3
Main Branch	6.062	.1	.3
Main Branch	5.959	.1	.3
Main Branch	5.862	.1	.3
Main Branch	5.770	.1	.3
Main Branch	5.676	.1	.3
Main Branch	5.580	.1	.3
Main Branch	5.482	.1	.3
Main Branch	5.387	.1	.3
Main Branch	5.299	.1	.3
Main Branch	5.207	.1	.3
Main Branch	5.112	.1	.3
Main Branch	5.013	.1	.3
Main Branch	4.917	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Main Branch	6.257	24265.00	797.10	804.26		804.53	0.00	5.14	6128.58	2458.80	0
Main Branch	6.257	24265.00	797.10	804.26		804.53	0.00	5.15	6122.58	2456.32	0

Main Branch	6.151	21020.00	794.00	800.78	800.78	801.48	0.01	7.92	3400.85	2116.07	1
Main Branch	6.151	21020.00	794.00	800.79	800.74	801.48	0.01	7.90	3407.18	2116.23	1
Main Branch	6.062	19813.00	791.40	798.40	797.68	798.78	0.01	6.09	[illegible].41	1728.27	0
Main Branch	6.062	19813.00	791.40	798.40	797.68	798.78	0.01	6.10	4092.08	1726.93	1
Main Branch	5.959	18177.00	789.20	795.25		795.67	0.01	5.45	3528.14	1430.23	1
Main Branch	5.959	18177.00	789.20	795.25		795.67	0.01	5.45	3531.89	1430.16	1
Main Branch	5.862	17257.00	786.40	793.15		793.45	0.00	4.87	3918.16	1183.03	0
Main Branch	5.862	17257.00	786.40	793.13		793.44	0.00	4.90	3897.09	1182.39	0
Main Branch	5.770	16679.00	783.60	788.96	788.96	790.40	0.02	10.03	1761.32	625.79	1
Main Branch	5.770	16679.00	783.60	789.01	789.01	790.40	0.02	9.84	1792.63	625.72	1
Main Branch	5.676	16679.00	781.91	785.09		785.24	0.00	0.96	5748.51	1163.81	0
Main Branch	5.676	16679.00	781.91	785.09		785.23	0.00	0.96	5748.36	1163.61	0
Main Branch	5.580	16859.00	779.05	784.62		784.82	0.00	3.05	4760.15	1568.04	0
Main Branch	5.580	16859.00	779.05	784.62		784.82	0.00	3.05	4759.96	1567.01	0
Main Branch	5.482	16765.00	777.47	783.12		783.50	0.00	4.34	3545.76	1667.98	0
Main Branch	5.482	16765.00	777.47	783.13		783.50	0.00	4.34	3545.96	1667.71	0
Main Branch	5.387	16536.00	775.22	780.75		781.06	0.01	4.84	3681.21	1902.76	0
Main Branch	5.387	16536.00	775.22	780.74		781.06	0.01	4.85	3678.88	1901.89	0
Main Branch	5.299	16139.00	772.71	778.55	777.74	778.84	0.00	5.29	3940.29	1936.51	0
Main Branch	5.299	16139.00	772.71	778.55	777.74	778.84	0.00	5.29	3939.11	1936.29	0
Main Branch	5.207	15699.00	770.44	774.66	774.66	775.61	0.01	8.76	2052.26	1165.85	1
Main Branch	5.207	15699.00	770.44	774.66	774.66	775.61	0.01	8.76	2054.04	1167.31	1
Main Branch	5.112	15703.00	767.53	771.65		771.93	0.00	3.06	3816.23	1046.27	0
Main Branch	5.112	15703.00	767.53	771.65		771.93	0.00	3.06	3814.83	1046.06	0
Main Branch	5.013	15703.00	764.42	770.28		770.81	0.00	6.66	2772.21	1127.32	1
Main Branch	5.013	15703.00	764.42	770.28		770.81	0.00	6.64	2779.85	1128.02	1
Main Branch	4.917	15573.00	761.62	769.49	767.96	769.68	0.00	4.79	4790.27	1847.41	0
Main Branch	4.917	15573.00	761.62	769.49	767.96	769.68	0.00	4.79	4790.27	1847.41	0

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)

Main Branch	6.257	804.53	804.26	0.27	3.01	0.04	5175.49	5271.02	13818.49 2458.80
Main Branch	6.257	804.53	804.26	0.27	3.01	0.04	5175.19	5272.72	13817.09 2456.32
Main Branch	6.151	801.48	800.78	0.69	2.60	0.09	554.35	10576.78	.87 2116.07
Main Branch	6.151	801.48	800.79	0.69	2.60	0.09	557.15	10563.63	9899.22 2116.23
Main Branch	6.062	798.78	798.40	0.38	3.11	0.00	3801.96	5133.57	10877.47 1728.27
Main Branch	6.062	798.78	798.40	0.38	3.11	0.00	3799.40	5137.44	10876.16 1726.93
Main Branch	5.959	795.67	795.25	0.41	2.18	0.03	7176.81	3546.74	7453.45 1430.23
Main Branch	5.959	795.67	795.25	0.41	2.20	0.03	7177.01	3544.73	7455.27 1430.16
Main Branch	5.862	793.45	793.15	0.30	2.94	0.11	5882.89	3912.04	7462.07 1183.03
Main Branch	5.862	793.44	793.13	0.31	2.93	0.11	5874.50	3922.92	7459.57 1182.39
Main Branch	5.770	790.40	788.96	1.44	0.64	0.39	409.18	10870.66	5399.15 625.79
Main Branch	5.770	790.40	789.01	1.39	0.64	0.37	442.09	10786.61	5450.30 625.72
Main Branch	5.676	785.24	785.09	0.14	0.41	0.01	16246.97	188.07	243.97 1163.81
Main Branch	5.676	785.23	785.09	0.14	0.41	0.01	16246.91	188.05	244.04 1163.61
Main Branch	5.580	784.82	784.62	0.20	1.31	0.02	13594.51	3142.56	121.94 1568.04
Main Branch	5.580	784.82	784.62	0.20	1.31	0.02	13594.87	3142.09	122.04 1567.01
Main Branch	5.482	783.50	783.12	0.37	2.41	0.02	12573.79	2723.85	1467.36 1667.98
Main Branch	5.482	783.50	783.13	0.37	2.41	0.02	12573.12	2723.62	1468.26 1667.71
Main Branch	5.387	781.06	780.75	0.32	2.21	0.01	8480.44	4549.41	3506.16 1902.76
Main Branch	5.387	781.06	780.74	0.32	2.21	0.01	8480.38	4550.70	3504.93 1901.89
Main Branch	5.299	778.84	778.55	0.29	3.16	0.07	10275.60	4073.09	1790.31 1936.51
Main Branch	5.299	778.84	778.55	0.29	3.16	0.07	10275.36	4073.86	1789.78 1936.29
Main Branch	5.207	775.61	774.66	0.95	1.45	0.20	9965.50	5585.01	148.50 1165.85
Main Branch	5.207	775.61	774.66	0.95	1.45	0.20	9965.82	5584.22	148.97 1167.31
Main Branch	5.112	771.93	771.65	0.28	1.10	0.02	13951.09	1048.08	703.83 1046.27
Main Branch	5.112	771.93	771.65	0.28	1.10	0.02	13951.89	1047.89	703.22 1046.06
Main Branch	5.013	770.81	770.28	0.53	1.02	0.10	10673.97	4915.46	113.57 1127.32
Main Branch	5.013	770.81	770.28	0.53	1.02	0.10	10677.85	4909.01	116.14 1128.02
Main Branch	4.917	769.68	769.49	0.19			9003.12	3624.89	2944.99 1847.41
Main Branch	4.917	769.68	769.49	0.19			9003.12	3624.89	.99 1847.41

Profile Output Table - Encroachment 1

Reach	River Sta	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Wdth Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
[illegible]ain Branch	6.257	804.26		804.53	2458.80	5175.49	5271.02	[illegible]8.49		9919.72	10109.76	
Main Branch	6.257	804.26	0.00	804.53	2456.32	5175.19	5272.72	13817.09	9620.82	9919.72	10109.76	12162.13
Main Branch	6.151	800.78		801.48	2116.07	554.35	10576.78	9888.87		9853.19	10246.43	
Main Branch	6.151	800.79	0.00	801.48	2116.23	557.15	10563.63	9899.22	9588.02	9853.19	10246.43	11704.35
Main Branch	6.062	798.40		798.78	1728.27	3801.96	5133.57	10877.47		9928.63	10111.05	
Main Branch	6.062	798.40	0.00	798.78	1726.93	3799.40	5137.44	10876.16	9560.59	9928.63	10111.05	11287.52
Main Branch	5.959	795.25		795.67	1430.23	7176.81	3546.74	7453.45		9925.53	10106.97	
Main Branch	5.959	795.25	0.00	795.67	1430.16	7177.01	3544.73	7455.27	9354.18	9925.53	10106.97	10784.34
Main Branch	5.862	793.15		793.45	1183.03	5882.89	3912.04	7462.07		9916.18	10072.17	
Main Branch	5.862	793.13	-0.02	793.44	1182.39	5874.50	3922.92	7459.57	9448.05	9916.18	10072.17	10631.12
Main Branch	5.770	788.96		790.40	625.79	409.18	10870.66	5399.15		9819.94	10075.00	
Main Branch	5.770	789.01	0.05	790.40	625.72	442.09	10786.61	5450.30	9715.35	9819.94	10075.00	10341.07
Main Branch	5.676	785.09		785.24	1163.81	16246.97	188.07	243.97		9958.38	10048.91	
Main Branch	5.676	785.09	0.00	785.23	1163.61	16246.91	188.05	244.04	9131.50	9958.38	10048.91	10295.11
[illegible]ain Branch	5.580	784.62		784.82	1568.04	13594.51	3142.56	121.94		9842.60	10067.87	
Main Branch	5.580	784.62	0.00	784.82	1567.01	13594.87	3142.09	122.04	8697.44	9842.60	10067.87	10351.99
Main Branch	5.482	783.12		783.50	1667.98	12573.79	2723.85	1467.36		9893.28	10076.27	
Main Branch	5.482	783.13	0.00	783.50	1667.71	12573.12	2723.62	1468.26	8816.32	9893.28	10076.27	10643.34
Main Branch	5.387	780.75		781.06	1902.76	8480.44	4549.41	3506.16		9919.37	10172.00	
Main Branch	5.387	780.74	0.00	781.06	1901.89	8480.38	4550.70	3504.93	8874.84	9919.37	10172.00	10829.68
Main Branch	5.299	778.55		778.84	1936.51	10275.60	4073.09	1790.31		9847.36	10044.92	
Main Branch	5.299	778.55	0.00	778.84	1936.29	10275.36	4073.86	1789.78	8668.21	9847.36	10044.92	10802.88
Main Branch	5.207	774.66		775.61	1165.85	9965.50	5585.01	148.50		9946.59	10169.72	
Main Branch	5.207	774.66	0.00	775.61	1167.31	9965.82	5584.22	148.97	8919.48	9946.59	10169.72	10380.19
Main Branch	5.112	771.65		771.93	1046.27	13951.09	1048.08	703.83		9923.36	10032.68	
Main Branch	5.112	771.65	0.00	771.93	1046.06	13951.89	1047.89	703.22	9172.26	9923.36	10032.68	10241.24
Main Branch	5.013	770.28		770.81	1127.32	10673.97	4915.46	113.57		9954.44	10123.59	
[illegible]ain Branch	5.013	770.28	0.01	770.81	1128.02	10677.85	4909.01	[illegible].14	9160.97	9954.44	10123.59	10443.07
Main Branch	4.917	769.49		769.68	1847.41	9003.12	3624.89	2944.99		9972.97	10081.01	
Main Branch	4.917	769.49	0.00	769.68	1847.41	9003.12	3624.8[illegible]					

2944.99 8895.75 9972.97 10081.01 10762.80

PREMIER
ENGINEERING CORPORATION

SAND TANK WASH
Split Flow Summary

Xsection ID	Weir Discharge cfs	Weir Q to West @ I-8 cfs	Inflow from Bender, cfs	Total Flow cfs
4.917		3921		15573
	130			
5.013				15703
	0			
5.112			4	15703
	0			
5.207				15699
	441			
5.299			81	16139
	477			
5.387				16536
	229			
5.482			169	16765
	263			
5.58			180	16859
	0			
5.676				16679
	0			
5.77				16679
	578			
5.862				17257
	920			
5.959				18177
	1636			
6.062				19813
	1208			
6.151				21020
	3245			
6.257				24265

Total Weir Flow to Scott Avenue Wash	**9126**
Flow to Scott Avenue Wash @ I-8	**3921**
Total Diversion to Scott Avenue Wash	**13047**

C150 Flow Split

Stage	Discharge (cfs)				
	Weir West	Scott Avenue Wash			Total Flow
		Culvert	Road	Total	
751.6	0	0	0	0	0
752.0	0	100	0	100	100
753.0	0	200	0	200	200
754.0	0	300	0	300	300
755.0	0	500	0	500	500
756.0	0	650	500	1150	1150
757.0	0	900	950	1850	1850
758.0	0	1100	1450	2550	2550
758.5	0	1200	1650	2850	2850
759.0	1600	1300	1900	3200	4800
759.5	4000	1350	2100	3450	7450
760.0	8000	1400	2400	3800	11800
760.5	14500	1475	2650	4125	18625
761.0	22000	1550	2950	4500	26500

Source: Flood Control District of Maricopa County, *Gila Bend Area Floodplain Delineation Study, Technical Data Notebook, Hydrology, Book 1 of 2.* Prepared by Burgess & Niple, Inc., March, 1992.

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
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: Scott Avenue Wash
Project File : scottave.prj
Run Date and Time: 6/21/01 9:14:54 AM

Project in English units

Project Description:
Study name: Gila Bend Area Drainage Master Plan

Study contractors: EEC,
Inc. and Premier Engineering Corporation

Source of hydrology: Gila Bend
Area Floodplain Delineation Study (FCD 90-67) by Burgess & Niple for FCDMC,
March 1991

Source of survey: Gila Bend Area Floodplain Delineation Study
(FCD 90-67);
topographic mapping and survey by Cooper Aerial Mapping,
., 1999.

FCD Contract Number: 99-18

Datum: NGVD 1929

PLAN DATA

Plan Title: Scott Avenue Wash
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Scott Avenue Wash\scottave.p02

Geometry Title: Scott Avenue Wash
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Scott Avenue Wash\scottave.g01

Flow Title : Scott Avenue Wash
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Scott Avenue Wash\scottave.f01

Plan Summary Information:
Number of: Cross Sections = 19 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

putation 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 = Scott Ave. Wash Reach = Main Channel

	Profile	Method	Value1	Value2
6.986	PF 2	1	9820.3	710093.21
6.895	PF 2	1	9859.1	510449.32
6.792	PF 2	1	9875.0	210046.43
6.700	PF 2	1	9526.6	810301.89
6.605	PF 2	1	9070.8	310601.74
6.505	PF 2	1	9348.2	10829.7
6.398	PF 2	1	9454.1	910287.22
6.306	PF 2	1	9602.9	110448.21
6.202	PF 2	1	9897.8	810950.81
6.104	PF 2	1	9349.5	910873.01
6.012	PF 2	1	9239.8	310745.28
5.909	PF 2	1	8943.4	210558.76
5.819	PF 2	1	9127.7	210563.96
5.724	PF 2	1	9062.7	910626.22
5.625	PF 2	1	8879	10963.7
5.521	PF 2	1	8545.5	810931.65
5.427	PF 2	1	8791.3	710658.55
5.338	PF 2	1	9054.22	10243.2
5.258	PF 2	1	9430.8	610319.65

FLOW DATA

Flow Title: Scott Avenue Wash
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Scott Avenue Wash\scottave.f01

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
Scott Ave. Wash	Main Channel	6.986	3245	3245
Scott Ave. Wash	Main Channel	6.700	4453	4453
Scott Ave. Wash	Main Channel	6.605	7009	7009
Scott Ave. Wash	Main Channel	6.505	7587	7587
Scott Ave. Wash	Main Channel	6.202	7850	7850
Scott Ave. Wash	Main Channel	6.104	8079	8079
Scott Ave. Wash	Main Channel	5.909	8556	8556
Scott Ave. Wash	Main Channel	5.819	8997	8997
Scott Ave. Wash	Main Channel	5.521	13168	13168
Scott Ave. Wash	Main Channel	5.258	1408	1408

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Scott Ave. Wash	Main Channel	PF 1		Known WS = 760.1
Scott Ave. Wash	Main Channel	PF 2		Known WS = 760.1

GEOMETRY DATA

Geometry Title: Scott Avenue Wash
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Scott Avenue Wash\scottave.g01

CROSS SECTION RIVER: Scott Ave. Wash
REACH: Main Channel RS: 6.986

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9409.22	802.2	9537.03	801.98	9604.33	801.2	9631.74	800.94	9651.88	800.81
9675.66	800.7	9726.46	800.52	9746.98	800.33	9770.76	800.2	9794.54	800
9821.17	799.6	9852.74	798.81	9884.32	797.84	9889.64	797.61	9896.55	797.4
9915.89	796.84	9937.19	796.2	9960.97	795.82	9979.03	795.45	10000	795.58
10010.21	795.65	10040.61	796	10061.56	797.43	10071.02	798.25	10087.67	799.35
10101.42	800	10131.83	800.7						

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9509.22    .045 9896.55    .05510061.56     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9896.5510061.56               440  480.17     450              .1       .3

CROSS SECTION           RIVER: Scott Ave. Wash
REACH: Main Channel        RS: 6.895

INPUT
Description:
Station Elevation Data     num=       27
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9759.15   799.9 9783.66  799.89 9837.91  798.92 9872.27  798.23 9890.74  797.93
 9916.57   797.3  9924.8  797.12 9938.73  796.56 9963.07  795.82 9983.03  794.13
 9992.91   793.310000.01  793.3510024.49  793.68 10055.4  794.3310104.78  795.52
10117.24   795.810129.53  795.8210148.16  796.0710179.08  796.1610240.91  795.97
10278.02     79610302.86  796.2410333.67  796.64 10395.5   797.610488.26  799.14
10525.51   799.7 10553.6  800.04

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9759.15    .045 9963.07    .05510117.24     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9963.0710117.24               520  539.45     425              .1       .3

CROSS SECTION           RIVER: Scott Ave. Wash
REACH: Main Channel        RS: 6.792

INPUT
Description:
Station Elevation Data     num=       45
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9179.26   796.6 9304.37  796.66 9368.42  796.56 9425.32  796.42 9455.56   796.4
 9485.79   796.5 9546.27  796.88 9583.27  797.08 9606.74  797.14 9636.98  797.07
 9690.69   796.8  9744.4   796.7 9798.11  796.49 9878.87  795.99 9909.11   794.5
 9939.35   792.9 9959.25  792.01  9986.1  791.17   10000  790.710013.75  791.92
10018.17  792.9110029.87  794.710042.23  795.810059.91  796.710070.72  797.14
10099.21  797.3710150.05    79710184.67  796.8610213.16  796.910241.64  797.06
10270.23  797.2910360.36  798.210420.45  798.7310480.54  799.1110510.58  799.22
10540.63  799.2410570.67  799.110611.97  798.6510660.81  798.0910690.85  797.92
 10720.9  798.0310754.41  798.610782.89  799.3710811.38     800 10815.2  800.03

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9179.26    .045 9939.35    .05510018.17     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9939.3510018.17               485   488.5     490              .1       .3

CROSS SECTION           RIVER: Scott Ave. Wash
REACH: Main Channel        RS: 6.700

INPUT
Description:
Station Elevation Data     num=       38
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9443.74   795.67  9461.1  795.76 9474.48  795.77 9504.67   795.3 9566.86  793.96
 9595.23   793.39 9625.42  792.95 9655.61  792.71  9685.8   792.6 9715.99  792.76
 9746.17   793.16 9783.99  793.81 9811.13  794.18 9838.27   794.2 9866.93  793.74
 9892.55   792.99 9927.31  791.73 9946.83  790.72 9957.49   790.3 9973.97  788.82
 9987.68   787.9610017.87  788.0310028.25  789.3410037.44  790.2610048.06   790.9
10055.39   791.1310078.25  792.1410120.65  792.5710168.82  793.15   10199   793.4
10245.37   793.9910299.65  794.7910353.93  795.6610389.44  796.0810410.32   796.3
10440.51   796.4210489.64  796.5410571.83  796.44

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9443.74    .045 9957.49    .05510037.44     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9957.4910037.44               330  504.66     530              .1       .3

CROSS SECTION           RIVER: Scott Ave. Wash
REACH: Main Channel        RS: 6.605
```

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8971.19	792.9	9036.19	792.82	9088.36	792.63	9161.53	792.2	9212.8	792
9236.88	791.8	9311.95	791.82	9365.24	791.99	9396	792.1	9437.3	792.48
9519.06	793.5	9549.82	793.87	9582.95	794.12	9614.17	794.12	9647.99	793.85
9681.8	793.4	9720.65	792.6	9749.44	792	9765.14	791.84	9787.39	791.57
9817.07	791.5	9860.34	791.8	9876.36	791.77	9898.61	791.33	9918.52	790.24
9925.34	789.6	9943.1	788.3	9965.34	787.6	9987.59	786.66	10009.83	786.43
10019.97	786.5	10055.36	787.29	10076.57	788.01	10087.6	788.58	10098.81	789.47
10121.42	790.9	10143.3	792	10155.23	792.25	10165.55	792.56	10193.03	792.83
10232.28	793.1	10256.68	793.28	10290.5	793.25	10324.31	793.02	10365.75	792.52
10391.95	792.2	10425.76	791.91	10476.97	791.98	10510.41	792.14	10575.41	792.59
10628.66	792.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8971.19	.045	9876.36	.055	10143.3	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9876.36	10143.3	540	524.45	525	.1	.3

CROSS SECTION RIVER: Scott Ave. Wash
REACH: Main Channel RS: 6.505

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9093.62	790.7	9135.31	790.72	9188.42	790.52	9249.38	790.09	9316.08	789.48
9419.38	788.5	9471.03	788.07	9554.23	787.79	9615.2	787.72	9651.8	787.82
9677.62	788	9706.65	788.54	9737.14	789.19	9780.92	790.16	9806.74	790.49
9832.57	790.7	9840.39	790.67	9861.59	790.55	9896.18	790.15	9921.64	789.56
9930.78	789.4	9943.62	788.92	9965.99	787.87	9987.57	785.77	10000	784.47
10034.55	784.6	10075.47	784.93	10146.78	785.82	10185.36	786.41	10251.29	787.55
10295.24	788	10345.86	788.22	10405.12	788.44	10427.1	788.46	10471.05	788.44
10536.98	788.2	10568.62	788.04	10588	787.98	10657.18	788.06	10691.77	788.19
10760.95	788.2	10822.67	788.11	10829.7	788.11				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9093.62	.045	9965.99	.055	10295.24	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9965.99	10295.24	535	565	515	.1	.3

CROSS SECTION RIVER: Scott Ave. Wash
REACH: Main Channel RS: 6.398

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9229.78	788.2	9277.11	788.09	9380.83	788.03	9406.76	787.87	9432.69	787.41
9458.62	786.8	9514.77	785.13	9545.22	784.34	9562.35	784.12	9575.68	784.1
9588.28	784	9606.13	783.98	9614.21	783.86	9636.58	783.93	9640.14	783.87
9667.03	783.9	9692	782.16	9697.49	781.92	9717.93	783.24	9727.94	783.65
9743.86	783.7	9758.39	784.11	9769.8	784.32	9795.73	785.05	9821.66	785.7
9849.75	786.1	9867.52	786.17	9881.81	786.01	9894.69	785.77	9917.84	784.89
9938.81	784	9956.18	783	9960.87	782.68	9984.78	781.39	10004.99	779.97
10019.1	780.01	10027.05	780.41	10041.36	781.42	10053.42	782.53	10057.53	783.03
10071.17	783.99	10093.23	784.96	10115.3	785.51	10137.36	785.88	10164.87	786.07
10203.54	786.2	10226.62	786.24	10247.66	786.41	10269.72	786.64	10313.85	787.27
10357.97	787.93	10411.89	788.09	10446.21	788.21	10473.65	788.22	10490.68	788.18

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9229.78	.035	9960.87	.06	10053.42	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9960.87	10053.42	410	488.87	530	.1	.3

Effective Flow num= 1

Sta L	Sta R	Elev	Permanent
888			F

CROSS SECTION RIVER: Scott Ave. Wash

REACH: Main Channel RS: 6.306

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
96.29	788.3	9436.05	788.49	9469.07	788.53	9506.75	788.29	9526.18	788
535.13	787.8	9578.49	786.09	9601.18	785.18	9616.64	784.68	9639.26	784.26
9661.87	784.1	9684.49	784.07	9700.26	784.15	9707.1	784.06	9733.29	784.05
9752.33	783.8	9766.32	783.77	9799.34	782.94	9832.37	781.58	9842.79	781.21
9865.43	780	9898.42	780	9910.64	780.12	9933.25	780.22	9954.69	779.81
9966.63	779.1	9988.66	778.62	9998.28	778.95	10007.21	779.62	10019.5	780.67
10032.58	781.3	10040.73	782.03	10048.38	782.46	10061.95	783.48	10076.39	784
10089.55	784.1	10104.4	784.44	10146.84	784.63	10231.74	784.71	10274.18	784.61
10316.63	784.5	10339.22	784.45	10383.03	784.61	10426.83	784.87	10448.21	784.95

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9396.29	.035	9933.25	.06	10019.5	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9933.25	10019.5	480	549.41	465	.1	.3

CROSS SECTION RIVER: Scott Ave. Wash
REACH: Main Channel RS: 6.202

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9415.35	785.4	9446.97	785.22	9489.07	784.77	9544.92	784.12	9567.78	784
9581.27	783.7	9612.62	783.66	9622.45	783.7	9650.84	784	9673.89	784.13
9714.18	784.4	9776.31	784.52	9817.82	784.45	9843.16	784.13	9853.46	784.24
9864.88	783.9	9882.66	784.06	9889.11	783.87	9908.3	782.21	9924.75	781.36
9938.22	780.8	9960.4	779.48	9965.58	779	9995.15	776.57	10016.87	776.63
10038.58	776.99	10067.33	777.9	10082	778.38	10098.31	778.98	10125.43	779.72
10147.14	780.15	10190.57	781.38	10215.98	782	10233.99	782.42	10255.71	782.73
10281.2	782.81	10299.13	782.69	10327.08	782.2	10364.27	781.41	10388.13	780.95
10407.7	780.64	10429.41	780.41	10451.12	780.4	10472.83	780.45	10495.07	780.64
66.35	781.48	10604.84	781.85	10646.54	782.1	10689.96	782.31	10744.58	782.41
80.22	782.37	10841.95	782.41	10863.66	782.4	10922.8	782.57	10950.81	782.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9415.35	.035	9965.58	.06	10098.31	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9965.58	10098.31	560	513.68	360	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

CROSS SECTION RIVER: Scott Ave. Wash
REACH: Main Channel RS: 6.104

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9213.5	782.4	9258.36	781.98	9302.88	781.46	9369.67	780.6	9432.25	780
9491.03	779.8	9526.84	779.75	9570.02	779.85	9592.57	779.95	9632.88	780
9659.9	779.8	9703.59	779.71	9739.02	779.49	9759.09	779.4	9789.62	779.61
9820.15	779.7	9877.94	779.02	9903.63	778.91	9911.73	779	9929.32	778.9
9942.26	779	9955	778.88	9972.79	778.38	9980.69	777.49	10003.32	774.16
10033.85	774.9	10109.11	777.25	10134.8	777.96	10160.49	778.58	10186.49	779.17
10217.02	779.7	10237.54	779.87	10247.55	780	10278.08	780.11	10299.17	780.09
10341.01	780	10411.51	779.96	10436.89	780	10476.82	780.16	10523.56	780.25
10570.31	780.2	10596.7	780.11	10640.42	780.08	10692.59	780.11	10733.91	780.21
10788.47	780.4	10827.4	780.65	10852.39	780.71	10900.96	781.06		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9213.5	.035	9972.79	.06	10160.49	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9972.79	10160.49	525	485.05	430	.1	.3

CROSS SECTION RIVER: Scott Ave. Wash

REACH: Main Channel RS: 6.012

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
84.46	780.7	9042.51	780.43	9123.61	780.19	9158.8	779.99	9202.74	779.61
9294.3	778.6	9323.65	778.38	9351.63	778.17	9389.78	778	9416.78	777.99
9454.53	778.2	9523.2	778.77	9549.5	778.97	9579.65	779.14	9610.3	779.17
9647	779.1	9677.72	778.83	9708.43	778.48	9739.15	778.1	9792.12	777.58
9831.29	777.3	9852.14	777.13	9862	777.02	9882.14	776.91	9892.72	776.75
9912.15	776.6	9942.16	775.98	9954.15	774.9	9972.17	773.47	9984.86	772.8
10002.18	771.6	10032.18	773.68	10062.19	775.99	10077	776.3	10092.2	776.49
10111.89	776.3	10132.07	776	10156.91	775.87	10186.85	776.08	10202.13	776.48
10218.84	776.8	10272.18	778.25	10295.53	778.63	10318.89	778.72	10342.24	778.5
10365.59	777.9	10378.76	777.45	10388.94	776.92	10412.29	776	10435.65	775.63
10459	775.7	10506.69	776.32	10529.06	776.77	10575.76	777.5	10622.46	778.12
10676.08	778.6	10715.87	778.83	10745.28	778.91				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8934.46	.035	9942.16	.06	10062.19	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9942.16	10062.19	360	544.37	410	.1	.3

CROSS SECTION RIVER: Scott Ave. Wash
REACH: Main Channel RS: 5.909

INPUT
Description:
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8770.7	779.2	8829.3	778.75	8894.19	778	8959.08	777.22	9023.97	776.63
9106.58	776	9121.3	775.93	9147.52	775.95	9166.09	776.08	9218.63	776.65
9251.08	776.9	9283.52	777.14	9322.99	777.17	9348.41	777.09	9445.74	776.49
9510.63	776.2	9575.52	776.12	9616.76	776.22	9640.41	776.36	9672.85	776.51
9685.71	776.5	9716.91	776.57	9754.65	776.44	9778.61	775.98	9800.84	775.64
9808.59	775.2	9839.9	773.84	9860.89	773.01	9871.22	772.72	9890.92	772
20.94	771.2	9965.17	770.25	9980.99	770	9996.49	771	10011.02	770.91
28.12	773.3	10041.06	775.87	10059.79	776.61	10071.1	777.13	10101.14	777.36
10144.44	777.4	10206.8	777.28	10244.38	777.14	10287.94	777.08	10316.67	777.12
10331.49	776.9	10339.97	776.67	10358.28	776.57	10414.51	777.2	10432.62	777.13
10501.21	777.4	10520.74	777.39	10524.05	777.48	10558.76	777.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8770.7	.035	9800.84	.06	10041.06	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9800.84	10041.06	270	478.37	445	.1	.3

CROSS SECTION RIVER: Scott Ave. Wash
REACH: Main Channel RS: 5.819

INPUT
Description:
Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8862.65	777.2	8910.76	776.98	8976.17	776.49	9020.43	776.25	9047.06	776.13
9069.58	776	9139.69	774.92	9172.4	774.55	9205.11	774.48	9237.81	774.7
9273.06	775.1	9303.22	775.32	9310	774.97	9320.79	774.91	9335.93	775.46
9385.31	775.6	9423.73	775.54	9443.86	775.39	9472.37	774.98	9486.77	775.16
9526.7	774.8	9560.5	774.7	9607.28	774.8	9642.26	774.75	9664.62	775.19
9683.57	775.3	9722.88	774.96	9735.74	774.66	9757.93	774.38	9768.76	774.59
9777.23	774.6	9801.5	774.27	9809.34	773.78	9818.5	773.84	9824.59	772.57
9835.41	772.2	9840.59	772.25	9843.19	771.36	9850.85	772.32	9864.9	773.8
9889.21	773.9	9902.47	773.86	9929.46	770.24	9951.58	768.55	9954.96	768.35
9964.22	769.5	9981.82	769.51	10000.26	766.92	10013.14	768.17	10027.2	769.21
10052.23	769.8	10055.64	769.91	10078.78	773.97	10101.09	773.31	10115.19	772.95
10125.74	773	10140.47	770.53	10153.51	771.86	10166.26	771.64	10180.47	771.56
10185.99	770.7	10191.46	770.09	10209.99	771.26	10215.96	771.94	10235.44	773.1
263.25	773.8	10274.15	774.43	10286.2	774.74	10296.65	775.08	10316.18	775.17
40.91	774.6	10369.43	775.01	10385.57	774.61	10403.87	774.7	10463.29	774.47
472.63	774.5	10480.68	773.87	10490.13	774.57	10511.23	774.61	10522.82	775.01
10530.46	774.8	10578.88	775.24	10594.78	775.35	10598.76	775.21	10610.28	775.5
10644.06	775.9	10656.72	775.79	10705.17	775.74	10719.14	775.96	10723.82	775.86
10769.1	775.6	10786.94	775.43	10809.95	775.33	10827.15	775.59	10834.67	775.77

10856.66 775.610860.92 775.47

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8862.65	.05	9902.47	.0510078.78		.045

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

9902.4	710078.78	420	499.58	450	.1	.3

CROSS SECTION RIVER: Scott Ave. Wash
REACH: Main Channel RS: 5.724

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8781.98	775	8794.45	775.15	8815.85	775.4	8832.66	775.39	8848.36	775.12
8861.81	775	8885.19	774.96	8917.27	774.56	8951.78	774.18	8969.05	773.89
9007.68	773.5	9063.58	772.72	9084.93	772.52	9134.26	772.21	9143.18	772.23
9220.62	772.2	9252.58	772.34	9280.65	772.67	9309.41	772.91	9328.3	772.96
9333.7	772.9	9382.45	772.72	9388.34	772.55	9411.83	772.57	9420.23	772.61
9454.87	772.6	9472.2	772.73	9510.77	772.83	9556.06	772.78	9576.03	772.86
9592.6	773	9595.34	772.26	9602.37	772.46	9608.98	773.78	9614.28	773.4
9639.91	772.8	9682.19	772.75	9709.57	772.9	9719.93	772.71	9737.62	772.75
9803.84	772	9813.72	772.01	9829.69	771.67	9836.7	771.22	9856.12	770.5
9871.18	770.4	9884.59	769.05	9900.56	770.03	9909.35	770.4	9918.44	769.76
9929.46	768.3	9939.97	767.07	9949.78	766.82	9963.56	766.69	9965.89	766.2
9973.14	765.5	9977.76	766.36	9986.68	766.36	9997.28	763.7710006.21		765.85
10017.14	768.210022.94		768.72	10032.6	769.8310035.02		769.9310045.79		769.91
10057.25	770.710067.98		771.1610123.24		770.8710150.72		768.5410162.89		769.76
10191.28	769.8	10225.3	769.9410227.83		770.0410242.26		768.3610248.96		768.2
10252.62	767.310260.89		768.610275.47		769.1710280.05		769.2610299.13		769.96
10308.26	770.210314.11		770.1910321.22		769.4910331.93		769.4510340.15		770.01
10349.91	770.210363.79		771.1510381.59		771.910401.72		771.8710421.35		771.76
10432.68	771.810477.22		772.2510488.61		771.7810498.79		772.3410503.28		772.45
10545.78	772.510561.71		772.4610572.72		772.5410628.75		772.7410646.22		772.85
10731.47	772.8	10802.6	772.96						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8781.98	.05	9918.44	.0510045.79		.045

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

9918.4	410045.79	540	525.09	500	.1	.3

CROSS SECTION RIVER: Scott Ave. Wash
REACH: Main Channel RS: 5.625

INPUT
Description:
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8686.03	772.1	8698.11	771.93	8823.49	771.32	8829.06	771.35	8834.86	771.17
8878.89	770.4	8892.7	770.28	8916.94	769.89	8929.42	769.92	8939.97	769.57
8951.81	769.9	8995.45	769.57	9042.52	769.82	9084.29	769.46	9134.59	768.92
9162.22	768.8	9205.43	768.76	9244.06	768.66	9267.75	768.78	9325.9	769.45
9377.91	770	9418.96	770.11	9484.9	770.51	9492.48	770.48	9497.06	769.49
9505.55	769.5	9512.32	770.72	9564.55	770.01	9577.86	770.06	9623.79	770.11
9653.26	769.9	9696.78	769.94	9718.42	770.02	9735.1	769.95	9780.41	769.91
9816.94	769.9	9836.77	769.82	9854.69	769.8	9860.59	769.64	9892.23	769.25
9903.27	769.2	9914.08	768.81	9957.94	764.97	9967.57	764.43	9974.5	763.28
9989.84	763.410000.83		761.1310012.11		763.64	10034.3	764.2210062.72		765.12
10065.21	765.510075.29		766.1710096.52		766.7710111.08		766.8910127.32		766.98
10141	767.810150.07		768.1410158.64		768.2410163.36		768.810184.93		768.99
10224.73	768.510267.96		768.5810311.18		768.6610342.09		768.9510360.32		769.08
10387.39	769.1	10409.4	769.310468.72		769.4	10484.5	769.4410556.83		769.57
10563.44	768.910597.45		770.2210622.48		770.2210626.33		770.1310653.76		770.05
10681.36	77010712.72		769.7210750.14		770.0710790.87		770.2210810.48		770.21
10849.65	770.410876.64		770.4310926.12		770.4	10963.7	770.3		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8686.03	.05	9914.08	.0510163.36		.045

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

9914.0	810163.36	530	546.31	530	.1	.3

CROSS SECTION RIVER: Scott Ave. Wash

REACH: Main Channel RS: 5.521

INPUT
Description:
Station Elevation Data num= 109

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8545.58	767.1	8553.29	767.24	8558.21	768.02	8562.02	769.2	8568.27	768.13
8609.74	767.3	8646.55	766.54	8669.96	766.4	8729.3	765.87	8744.73	765.09
8766.63	765.8	8806.27	765.82	8852.8	765.83	8894.38	765.66	8931.81	765.33
8939.32	764.2	8948.12	765.53	8958.65	765.48	8960.87	765.24	8963.73	764.42
8969.41	765.4	9001.15	765.52	9006.36	764.04	9015.4	765.78	9045.46	765.67
9058.86	765.7	9125.69	766.42	9164.22	766.33	9205.55	766.39	9241.52	766.82
9252.85	767.1	9257.56	766.42	9267.2	766.13	9272.71	767.37	9281.49	766.62
9290.21	766.5	9324.57	766.49	9365.27	766.79	9400.17	766.82	9445.12	767.01
9509.44	766.7	9522.29	767.99	9536.57	767.99	9565.73	768.37	9581.23	768.22
9594.4	767.4	9612.99	767.54	9654.02	767.5	9660.27	767.8	9703.13	767.32
9756.15	766.6	9765.75	766.27	9772.98	766.21	9783.49	766.5	9796.99	766.37
9803.9	766.1	9844.41	766.4	9858.27	766.38	9879.2	766.09	9931.7	763.76
9956.56	761.8	9978.42	761.44	9985.37	761.4	9999.45	757.76	10008.73	759.57
10011.54	759.8	10014.71	760.71	10018.51	761.33	10022.71	761.34	10028.68	761.92
10045.25	764.3	10049.01	764.74	10059.38	764.92	10087.15	765.8	10091.13	766.33
10109.94	766.2	10125.58	766.16	10151.64	765.87	10207.55	764.46	10212.55	763.72
10216.5	764.1	10228.01	764.57	10233.34	764.59	10252.31	764.9	10275.6	765.37
10315.33	765.9	10361.54	766.17	10377.71	766.22	10400.18	766.15	10479.11	766.15
10551.06	766.4	10558.93	765.33	10568.7	766.38	10590.4	766.44	10633.15	766.07
10656.27	765.6	10664.89	766.14	10687.02	766.18	10725.66	766.5	10746.02	766.48
10754.53	766.3	10763.69	766.35	10778.2	766.66	10784.9	766.17	10793.83	766.81
10821.73	766.4	10824.65	766.54	10869.04	766.8	10931.65	766.78		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8545.58	.05	9879.2	.05	10087.15	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9879.2	10087.15	370	497.06	485	.1	.3

CROSS SECTION RIVER: Scott Ave. Wash
REACH: Main Channel RS: 5.427

INPUT
Description:
Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8791.37	763.8	8792.97	763.17	8805.21	762.89	8816.36	762.48	8821.81	764.89
8822.82	764.6	8830.34	763.87	8879.29	763.05	8902.11	762.73	8918.95	763.27
8931.09	763.2	8964.58	763.11	8973.48	762.08	8982.27	763.22	8986.61	762.87
9011.42	762.9	9033.58	763.06	9037.48	762.45	9050.46	763.15	9052.34	763.14
9090.61	764	9113.85	764.72	9122.2	764.62	9142.55	764	9209.65	764.35
9232.35	764.6	9246.51	764.91	9259.24	764.06	9267.84	764.03	9273.79	765.41
9291.02	764.5	9301.79	764.61	9367.02	764.78	9378.32	764.7	9403.16	764.84
9462.91	764.8	9521.6	765.01	9555.05	765.02	9578.46	764.99	9634.51	765.2
9649.62	765.7	9683.5	765.84	9687.7	765.93	9705.04	765.17	9745.98	764.75
9753.79	764.6	9762.74	764.24	9771.96	764.13	9785.35	763.66	9799.46	763.62
9804.53	763.3	9810.2	763.32	9814.06	763.89	9849.99	763.44	9853.85	763.44
9858.24	763.2	9868.36	763.03	9893.89	763.03	9936.49	762.66	9940.7	762.27
9973	758.7	9982.49	758.3	9992.2	758.33	10002.59	755.62	10011.13	758.66
10014.82	758.6	10022.64	757.28	10026.77	757.82	10043.13	758.83	10066.54	761.09
10072.2	761.3	10118.81	761.55	10128.94	761.03	10143.71	761.75	10151.54	762.04
10161.44	762.6	10166.65	762.63	10208.1	763.45	10230.72	763.73	10240.72	763.57
10274.64	762.8	10314.62	761.83	10323.06	761.49	10331.27	759.95	10339.32	760.54
10344.46	760.1	10351.9	760.38	10359.62	760.23	10367.54	760.81	10388.82	761.54
10417.59	762.6	10422.46	762.46	10439.16	762.68	10451.25	762.76	10463.63	762.7
10518.73	762.9	10534.22	762.85	10556.12	762.96	10573.09	763.16	10618.21	763.82
10635.3	763.6	10644.29	763.59	10658.55	763.75				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8791.37	.05	9940.7	.05	10072.2	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9940.7	10072.2	640	471.34	410	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
	F		

CROSS SECTION RIVER: Scott Ave. Wash
REACH: Main Channel RS: 5.338

INPUT
Description:
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9054.22	758.7	9060.28	759.32	9080.83	759.73	9100.27	759.42	9124.86	759.37
79.33	760.3	9191.56	760.56	9225.85	760.65	9250.26	760.75	9258.96	760.74
01.24	761.1	9333.01	761.86	9362.54	761.81	9373.24	761.82	9377.21	761.61
9418.54	761.3	9436.42	760.97	9447.54	760.82	9480.12	761.05	9497.84	761.29
9552.21	761.2	9576.11	761.26	9628.01	761.02	9642.39	761	9648.69	760.64
9653.46	760.7	9657.69	761.08	9671.76	760.82	9688.88	760.33	9711.78	757.65
9721.2	756.3	9735.66	757.97	9757.13	758.82	9776.79	759.38	9793.91	759.57
9815.75	759.7	9858.31	759.92	9882.27	758.16	9893.26	757.73	9896.29	757.82
9901.22	757.4	9947.16	757.24	9954.42	756.92	9964.99	756.9	9971.45	756.35
9991.49	756.8	10003.79	753.7	10014.14	756.65	10024.79	757.47	10045.87	757.6
10055.43	757.1	10071.85	757.17	10075.96	757.4	10103.73	758.08	10109.3	758.48
10121.94	759.6	10129.05	760.31	10138.69	760.66	10150.67	761.27	10166.91	760.58
10178.04	760.2	10179.85	760.32	10216.59	760.74	10235.53	760.55	10243.2	760.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9054.22	.05	9947.16	.05	10024.79	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9947.16	10024.79	360	422.4	90	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

CROSS SECTION RIVER: Scott Ave. Wash
REACH: Main Channel RS: 5.258

INPUT
Description:
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9430.86	759.1	9496.78	758.67	9531.87	758.13	9551.83	757.63	9567.16	758.22
9578.84	758.3	9634.7	758.63	9649.99	758.61	9662.2	758.88	9726.79	758.94
9761.99	759.2	9768.2	759.13	9790.7	759.32	9805.14	759.31	9834.85	758.95
9841.12	758.8	9871.52	757.96	9884.09	758.54	9904	758.49	9955.66	757.68
62.09	756.3	9966.51	755.1	9972.26	755.02	9978.14	755.11	9983.21	754.2
91.31	751.5	10000.84	752.99	10007.21	754.21	10023.8	754.43	10049.27	754.6
10069.03	754.3	10077.13	754.54	10093.05	755.55	10115.68	755.62	10121.74	755.59
10143.62	756.4	10178.66	756.99	10184.68	757.42	10194.02	757.45	10198.86	757.22
10221.75	757.6	10245.4	758.12	10256.21	758.56	10265.29	758.75	10277.95	759.4
10284.52	759.5	10300.46	759.67	10306.7	759.87	10326.41	760.22	10347.09	760.41
10360.83	760.4	10426.8	760.78	10429.56	760.72	10452.2	760.81	10477.82	761.08
10499.95	76	10507.42	760.85	10520.73	760.81	10545.14	760.61	10564.99	760.93
10578.95	760.9	10596.74	761.14	10609.79	761.15	10621.65	761.46	10640	761.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9430.86	.05	9983.21	.05	10007.21	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9983.21	10007.21	0	0	0	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

SUMMARY OF MANNING'S N VALUES

River:Scott Ave. Wash

Reach	River Sta.	n1	n2	n3
Main Channel	6.986	.045	.055	.04
Main Channel	6.895	.045	.055	.04
Main Channel	6.792	.045	.055	.04
Main Channel	6.700	.045	.055	.04
in Channel	6.605	.045	.055	.04
in Channel	6.505	.045	.055	.04
Main Channel	6.398	.035	.06	.04
Main Channel	6.306	.035	.06	.04
Main Channel	6.202	.035	.06	.04
Main Channel	6.104	.035	.06	.04

Main Channel	6.012	.035	.06	.04
Main Channel	5.909	.035	.06	.04
Main Channel	5.819	.05	.05	.045
Main Channel	5.724	.05	.05	.045
Main Channel	5.625	.05	.05	.045
Main Channel	5.521	.05	.05	.045
Main Channel	5.427	.05	.05	.045
Main Channel	5.338	.05	.05	.045
Main Channel	5.258	.05	.05	.045

SUMMARY OF REACH LENGTHS

River: Scott Ave. Wash

Reach	River Sta.	Left	Channel	Right
Main Channel	6.986	440	480.17	450
Main Channel	6.895	520	539.45	425
Main Channel	6.792	485	488.5	490
Main Channel	6.700	330	504.66	530
Main Channel	6.605	540	524.45	525
Main Channel	6.505	535	565	515
Main Channel	6.398	410	488.87	530
Main Channel	6.306	480	549.41	465
Main Channel	6.202	560	513.68	360
Main Channel	6.104	525	485.05	430
Main Channel	6.012	360	544.37	410
Main Channel	5.909	270	478.37	445
Main Channel	5.819	420	499.58	450
Main Channel	5.724	540	525.09	500
Main Channel	5.625	530	546.31	530
Main Channel	5.521	370	497.06	485
Main Channel	5.427	640	471.34	410
Main Channel	5.338	360	422.4	90
Main Channel	5.258	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Scott Ave. Wash

Reach	River Sta.	Contr.	Expan.
Main Channel	6.986	.1	.3
Main Channel	6.895	.1	.3
Main Channel	6.792	.1	.3
Main Channel	6.700	.1	.3
Main Channel	6.605	.1	.3
Main Channel	6.505	.1	.3
Main Channel	6.398	.1	.3
Main Channel	6.306	.1	.3
Main Channel	6.202	.1	.3
Main Channel	6.104	.1	.3
Main Channel	6.012	.1	.3
Main Channel	5.909	.1	.3
Main Channel	5.819	.1	.3
Main Channel	5.724	.1	.3
Main Channel	5.625	.1	.3
Main Channel	5.521	.1	.3
Main Channel	5.427	.1	.3
Main Channel	5.338	.1	.3
Main Channel	5.258	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Main Channel	6.986	3245.00	795.45	799.61		799.99	0.01	5.11	683.28	272.88	0

Main Channel	6.986		3245.00	795.45	799.61		799.99	0.01	5.11	
683.26	272.84	0								
Main Channel	6.895		3245.00	793.30	798.50		798.59	0.00	2.67	
1379.84	590.81	0								
Main Channel	6.895		3245.00	793.30	798.50		798.59	0.00	2.68	
1378.18	590.17	0								
Main Channel	6.792		3245.00	790.70	796.01		796.84	0.01	7.77	
469.79	171.43	1								
Main Channel	6.792		3245.00	790.70	796.02		796.84	0.01	7.76	
470.38	171.41	1								
Main Channel	6.700		4453.00	787.96	794.83		794.97	0.00	3.95	
1660.76	775.19	0								
Main Channel	6.700		4453.00	787.96	794.82		794.97	0.00	3.95	
1660.20	775.11	0								
Main Channel	6.605		7009.00	786.43	792.69	791.29	793.13	0.01	5.69	
1533.79	1091.44	1								
Main Channel	6.605		7009.00	786.43	792.69	791.29	793.13	0.01	5.68	
1536.99	1093.91	1								
Main Channel	6.505		7587.00	784.47	789.18		789.46	0.01	4.77	
1963.82	1282.46	0								
Main Channel	6.505		7587.00	784.47	789.18		789.46	0.01	4.78	
1959.43	1281.44	0								
Main Channel	6.398		7587.00	779.97	786.90	786.15	787.15	0.00	4.28	
1987.41	833.87	0								
Main Channel	6.398		7587.00	779.97	786.91	786.15	787.15	0.00	4.27	
1990.76	833.03	0								
Main Channel	6.306		7587.00	778.62	785.16		785.55	0.00	5.31	
1664.73	846.48	0								
Main Channel	6.306		7587.00	778.62	785.15		785.54	0.00	5.33	
1658.21	845.30	0								
Main Channel	6.202		7850.00	776.57	783.11	782.02	783.37	0.00	4.92	
2094.57	1052.94	0								
Main Channel	6.202		7850.00	776.57	783.11	782.02	783.37	0.00	4.92	
2094.77	1052.93	0								
Main Channel	6.104		8079.00	774.16	780.86		781.14	0.01	5.02	
2119.39	1523.24	0								
Main Channel	6.104		8079.00	774.16	780.86		781.14	0.01	5.02	
2118.83	1523.16	0								
Main Channel	6.012		8079.00	771.60	779.20		779.36	0.00	3.91	
2710.15	1505.49	0								
Main Channel	6.012		8079.00	771.60	779.20		779.36	0.00	3.91	
2710.15	1505.45	0								
Main Channel	5.909		8556.00	770.00	777.41		777.73	0.00	5.07	
2155.27	1581.13	0								
Main Channel	5.909		8556.00	770.00	777.41		777.73	0.00	5.07	
2155.07	1581.07	0								
Main Channel	5.819		8997.00	766.92	775.10		775.58	0.01	6.36	
1914.44	1191.61	0								
Main Channel	5.819		8997.00	766.92	775.11		775.58	0.01	6.36	
1915.54	1192.36	0								
Main Channel	5.724		8997.00	763.77	772.74		773.16	0.01	6.54	
2104.35	1236.76	0								
Main Channel	5.724		8997.00	763.77	772.73		773.15	0.01	6.55	
2098.56	1228.06	0								
Main Channel	5.625		8997.00	761.13	770.40		770.74	0.00	5.43	
2573.63	1953.02	0								
Main Channel	5.625		8997.00	761.13	770.40		770.74	0.00	5.43	
2572.79	1952.62	0								
Main Channel	5.521		13168.00	757.76	767.43		767.80	0.01	6.46	
3345.96	2165.03	1								
Main Channel	5.521		13168.00	757.76	767.43		767.80	0.01	6.46	
3345.96	2165.03	1								

Main Channel	5.427	13168.00	755.62	765.05	764.28	765.40	0.00	6.23	3309.26	1735.81	0
Main Channel	5.427	13168.00	755.62	765.05	764.28	765.40	0.00	6.23	3309.36	1735.84	0
Main Channel	5.338	13168.00	753.70	762.48	760.99	762.96	0.01	7.54	[illegible].49	1188.98	1
Main Channel	5.338	13168.00	753.70	762.48	760.99	762.96	0.01	7.54	2614.21	1188.98	1
Main Channel	5.258	1408.00	751.50	760.10	757.55	761.11	0.01	8.05	174.99	888.79	1
Main Channel	5.258	1408.00	751.50	760.10	757.55	761.11	0.01	8.05	174.99	888.79	1

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Channel	6.986	799.99	799.61	0.38	1.31	0.09	216.15	2935.28	93.56	272.88
Main Channel	6.986	799.99	799.61	0.38	1.32	0.09	216.18	2935.24	93.58	272.84
Main Channel	6.895	798.59	798.50	0.09	1.67	0.07	174.59	1676.63	1393.78	590.81
Main Channel	6.895	798.59	798.50	0.09	1.67	0.07	174.47	1677.18	1393.35	590.17
Main Channel	6.792	796.84	796.01	0.83	1.66	0.20	428.05	2649.12	167.83	171.43
Main Channel	6.792	796.84	796.02	0.82	1.66	0.20	428.98	2647.74	168.28	171.41
Main Channel	6.700	794.97	794.83	0.15	1.82	0.03	1399.80	1940.89	[illegible]2.31	775.19
Main Channel	6.700	794.97	794.82	0.15	1.81	0.03	1399.46	1941.38	1112.17	775.11
Main Channel	6.605	793.13	792.69	0.44	3.62	0.05	742.25	6046.03	220.72	1091.44
Main Channel	6.605	793.13	792.69	0.44	3.63	0.05	745.32	6041.56	222.13	1093.91
Main Channel	6.505	789.46	789.18	0.27	2.29	0.01	1062.47	4957.80	1566.73	1282.46
Main Channel	6.505	789.46	789.18	0.28	2.29	0.01	1061.06	4963.66	1562.28	1281.44
Main Channel	6.398	787.15	786.90	0.24	1.59	0.01	4676.66	2304.27	606.07	833.87
Main Channel	6.398	787.15	786.91	0.24	1.59	0.01	4676.99	2300.62	609.39	833.03
Main Channel	6.306	785.55	785.16	0.38	2.13	0.04	4145.03	2617.39	824.58	846.48
Main Channel	6.306	785.54	785.15	0.39	2.14	0.04	4149.36	2622.08	815.57	845.30
Main Channel	6.202	783.37	783.11	0.26	2.23	0.00	606.64	3662.76	3580.60	1052.94
Main Channel	6.202	783.37	783.11	0.26	2.23	0.00	606.70	3662.44	3580.86	1052.93
Main Channel	6.104	781.14	780.86	0.28	1.74	0.04	2592.75	4217.20	1269.05	1523.24
Main Channel	6.104	781.14	780.86	0.28	1.74	0.04	2592.38	4218.08	1268.54	1523.16
Main Channel	6.012	779.36	779.20	0.16	1.61	0.02	1534.08	2588.74	3956.18	1505.49
Main Channel	6.012	779.36	779.20	0.16	1.61	0.02	1534.13	2588.73	3956.15	1505.45

Main Channel 5.909 777.73 777.41 0.32 2.13 0.02 2076.20 6329.55
150.25 1581.13
Main Channel 5.909 777.73 777.41 0.32 2.13 0.02 2075.94 6329.90
150.16 1581.07

Main Channel 5.819 775.58 775.10 0.48 2.41 0.02 648.40 5934.99
[illegible].61 1191.61
Main Channel 5.819 775.58 775.11 0.48 2.41 0.02 649.12 5934.58
2413.30 1192.36

Main Channel 5.724 773.16 772.74 0.42 2.39 0.02 828.31 4553.16
3615.54 1236.76
Main Channel 5.724 773.15 772.73 0.42 2.40 0.02 825.34 4556.61
3615.05 1228.06

Main Channel 5.625 770.74 770.40 0.34 2.94 0.00 1210.92 6460.19
1325.89 1953.02
Main Channel 5.625 770.74 770.40 0.34 2.94 0.00 1210.34 6461.25
1325.41 1952.62

Main Channel 5.521 767.80 767.43 0.37 2.40 0.01 3514.16 5833.64
3820.20 2165.03
Main Channel 5.521 767.80 767.43 0.37 2.40 0.01 3514.16 5833.64
3820.20 2165.03

Main Channel 5.427 765.40 765.05 0.35 2.43 0.01 2310.84 4902.37
5954.80 1735.81
Main Channel 5.427 765.40 765.05 0.35 2.43 0.01 2310.92 4902.27
5954.82 1735.84

Main Channel 5.338 762.96 762.48 0.48 1.80 0.05 5857.48 3594.29
3716.23 1188.98
Main Channel 5.338 762.96 762.48 0.48 1.80 0.05 5857.18 3594.58
3716.24 1188.98

Main Channel 5.258 761.11 760.10 1.01 1408.00
888.79
Main Channel 5.258 761.11 760.10 1.01 1408.00
888.79

Profile Output Table - Encroachment 1

Reach	River Sta	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Wdth Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Main Channel	6.986	799.61		799.99	272.88	216.15	2935.28	93.56	9896.55	10061.56		
Main Channel	6.986	799.61	0.00	799.99	272.84	216.18	2935.24	93.58	9820.37	9896.55	10061.56	10093.21
Main Channel	6.895	798.50		798.59	590.81	174.59	1676.63	1393.78	9963.07	10117.24		
Main Channel	6.895	798.50	0.00	798.59	590.17	174.47	1677.18	1393.35	9859.15	9963.07	10117.24	10449.32
Main Channel	6.792	796.01		796.84	171.43	428.05	2649.12	167.83	9939.35	10018.17		
Main Channel	6.792	796.02	0.00	796.84	171.41	428.98	2647.74	168.28	9875.02	9939.35	10018.17	10046.43
Main Channel	6.700	794.83		794.97	775.19	1399.80	1940.89	1112.31	9957.49	10037.44		
Main Channel	6.700	794.82	0.00	794.97	775.11	1399.46	1941.38	1112.17	9526.68	9957.49	10037.44	10301.89
Main Channel	6.605	792.69		793.13	1091.44	742.25	6046.03	220.72	9876.36	10143.30		
Main Channel	6.605	792.69	0.00	793.13	1093.91	745.32	6041.56	222.13	9070.83	9876.36	10143.30	10601.74
Main Channel	6.505	789.18		789.46	1282.46	1062.47	4957.80	1566.73	9965.99	10295.24		
Main Channel	6.505	789.18	0.00	789.46	1281.44	1061.06	4963.66	1562.28	9348.20	9965.99	10295.24	10829.70

Main Channel 6.398 786.90 787.15 833.87 4676.66 2304.27
606.07 9960.87 10053.42
Main Channel 6.398 786.91 0.00 787.15 833.03 4676.99 2300.62
609.39 9454.19 9960.87 10053.42 10287.22

Main Channel 6.306 785.16 785.55 846.48 4145.03 2617.39
.58 9933.25 10019.50
Main Channel 6.306 785.15 -0.01 785.54 845.30 4149.36 2622.08
815.57 9602.91 9933.25 10019.50 10448.21

Main Channel 6.202 783.11 783.37 1052.94 606.64 3662.76
3580.60 9965.58 10098.31
Main Channel 6.202 783.11 0.00 783.37 1052.93 606.70 3662.44
3580.86 9897.88 9965.58 10098.31 10950.81

Main Channel 6.104 780.86 781.14 1523.24 2592.75 4217.20
1269.05 9972.79 10160.49
Main Channel 6.104 780.86 0.00 781.14 1523.16 2592.38 4218.08
1268.54 9349.59 9972.79 10160.49 10873.01

Main Channel 6.012 779.20 779.36 1505.49 1534.08 2588.74
3956.18 9942.16 10062.19
Main Channel 6.012 779.20 0.00 779.36 1505.45 1534.13 2588.73
3956.15 9239.83 9942.16 10062.19 10745.28

Main Channel 5.909 777.41 777.73 1581.13 2076.20 6329.55
150.25 9800.84 10041.06
Main Channel 5.909 777.41 0.00 777.73 1581.07 2075.94 6329.90
150.16 8943.42 9800.84 10041.06 10558.76

Main Channel 5.819 775.10 775.58 1191.61 648.40 5934.99
2413.61 9902.47 10078.78
Main Channel 5.819 775.11 0.00 775.58 1192.36 649.12 5934.58
2413.30 9127.72 9902.47 10078.78 10563.96

Main Channel 5.724 772.74 773.16 1236.76 828.31 4553.16
3615.54 9918.44 10045.79
Main Channel 5.724 772.73 0.00 773.15 1228.06 825.34 4556.61
3615.05 9062.79 9918.44 10045.79 10626.22

Main Channel 5.625 770.40 770.74 1953.02 1210.92 6460.19
1325.89 9914.08 10163.36
Main Channel 5.625 770.40 0.00 770.74 1952.62 1210.34 6461.25
1325.41 8879.00 9914.08 10163.36 10963.70

Main Channel 5.521 767.43 767.80 2165.03 3514.16 5833.64
3820.20 9879.20 10087.15
Main Channel 5.521 767.43 0.00 767.80 2165.03 3514.16 5833.64
3820.20 8545.58 9879.20 10087.15 10931.65

Main Channel 5.427 765.05 765.40 1705.64 2310.84 4902.37
5954.80 9940.70 10072.20
Main Channel 5.427 765.05 0.00 765.40 1705.67 2310.92 4902.27
5954.82 8791.37 9940.70 10072.20 10658.55

Main Channel 5.338 762.48 762.96 903.01 5857.48 3594.29
3716.23 9947.16 10024.79
Main Channel 5.338 762.48 0.00 762.96 903.01 5857.18 3594.58
3716.24 9054.22 9947.16 10024.79 10243.20

Main Channel 5.258 760.10 761.11 24.00 1408.00
9983.21 10007.21
Main Channel 5.258 760.10 0.00 761.11 24.00 1408.00
9430.86 9983.21 10007.21 10319.65

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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X     X  XXXXXX    XXXX        XXXX        XX      XXXX
X     X  X        X    X      X   X      X  X    X
X     X  X        X           X   X     X    X   X
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: I-8 Wash East
Project File : I8WEast.prj
Run Date and Time: 6/21/01 9:00:11 AM

Project in English units

Project Description:
Study name: Gila Bend Area Drainage Master Plan

Study contractors: EEC,
Inc. and Premier Engineering Corporation

Source of hydrology: Gila Bend
Area Floodplain Delineation Study (FCD 90-67) by Burgess & Niple for FCDMC,
March 1991

Source of survey: Gila Bend Area Floodplain Delineation Study
(FCD 90-67);
topographic mapping and survey by Cooper Aerial Mapping,
., 1999.

FCD Contract Number: 99-18

Datum: NGVD 1929

PLAN DATA

Plan Title: I-8 Wash East
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\I-8 East\I8WEast.p01

Geometry Title: I-8 Wash East
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\I-8 East\I8WEast.g01

Flow Title : I-8 Wash East
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\I-8 East\I8WEast.f01

Plan Summary Information:
Number of: Cross Sections = 7 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

utation 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

r = I-8 Wash East Reach = Main

	Profile	Method	Value1	Value2
.695	PF 2	1	9985.011	1192.61
.490	PF 2	1	9503.391	0313.95
.395	PF 2	1	9470.081	0377.46
.299	PF 2	1	9392.31	0440.55
.198	PF 2	1	9467.21	1169.08
.118	PF 2	1	9668.461	0477.61
0	PF 2	1	9740	10500

FLOW DATA

Flow Title: I-8 Wash East
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\I-8 East\I8WEast.f01

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
I-8 Wash East	Main	.695	9290	9290
I-8 Wash East	Main	0	8988	8988

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
I-8 Wash East	Main	PF 1		Known WS = 754.74
I-8 Wash East	Main	PF 2		Known WS = 755.72

GEOMETRY DATA

metry Title: I-8 Wash East
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\I-8 East\I8WEast.g01

CROSS SECTION RIVER: I-8 Wash East
REACH: Main RS: .695

INPUT
Description:
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9580.65	768	9597.13	767.47	9612.02	766.61	9614.8	766.82	9623.54	766.48
9637.24	766.2	9662.6	765.86	9681.33	765.76	9703.33	765.48	9721.88	765.31
9760.76	764.8	9772.42	764.7	9786.14	764.74	9799.3	764.59	9823.69	764.01
9839.95	763.7	9868.38	763.07	9900.52	762.58	9902.09	762.53	9914.55	762.92
9925.91	762	9932.48	762.12	9951.94	761.99	9960.39	762.53	9978.99	762.38
9985.01	761.4224	9985.15	761.4	9992.68	762.28	9994.58	761.78	10004.11	761.99
10009.63	760.41	0018.92	761.61	0037.52	761.47	10047.15	760.84	10054.07	762.63
10069.49	761.86	10137.86	762.51	0143.38	762.51	10175.78	763.11	10180.86	763.24
10222.45	762.18	10243.44	762	10274.67	761.99	10294.67	762.06	10308.12	761.87
10320.76	761.12	10324.5	760.81	0343.61	760.64	10347.23	761.42	10374.43	760.57
10376.92	760.58	10438.4	761.21	0453.46	761.11	10476.24	761.11	10530.01	760.4
10565.57	760.85	10606.55	760.71	0629.15	760.68	10683.09	760.46	10740.06	760.16
10759.63	760.09	10819.9	760	10836.17	759.93	10854	759.71	10907.16	759.39
10912.71	759.41	0923.02	759.21	0959.57	758.94	10976.03	758.85	10999.67	758.64
11012.13	758.63	11034.28	757.81	1047.84	758.48	11057.51	758.62	11064.1	758.38
11115.63	758.65	11132.35	758.81	1150.34	758.64	11175.68	758.74	11183.03	759.31
11189.3	760.58	11192.61	761.42	2411231.04	771.21	1233.22	771.85	11243.51	773.32
11248.44	773.26								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9580.65	.049	9985.01	.049	11192.61	.049

k Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9985.011 1192.61 290 1082.4 1010 .1 .3

CROSS SECTION RIVER: I-8 Wash East
REACH: Main RS: .490

INPUT
Description:
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63.35	766.6	9270.24	766.85	9273.79	764.67	9299.4	765.06	9305.63	766.81
4.84	765.5	9331.48	765.51	9338.24	764.54	9352.97	763.61	9361.92	763.37
9378.33	762.2	9390.49	761.68	9402.25	760.82	9424.7	758.56	9437.62	757.45
9458.1	756.7	9465.35	756.61	9499.27	755.72	9503.42	755.5879	9509.32	755.4
9528.62	754.96	9539.86	755	9576.11	753.88	9595.73	753.91	9617.03	753.74
9631.74	753.87	9657.82	752.7	9664.2	752.49	9669.73	751.93	9673.37	751.75
9678.39	751.79	9694.55	750.5	9709.49	750.05	9718.09	749.61	9724.11	749.13
9738.3	748.53	9745.95	748.3	9765.13	748.09	9778.53	746.91	9786.2	746
9802.63	745.73	9817.13	745.3	9838.06	745.13	9849.22	744.99	9873.74	745.25
9890.87	745.65	9932	743.2	9963.9	742.75	9967.99	743.43	9971.2	743.27
9973.41	741.87	9981.01	741.8	10004.42	741.68	10011.53	743.38	10022.77	743.57
10045.76	743.5	10055.12	744.6	10082.52	746.76	10089.99	747.35	10091.26	747.21
10112.2	746.2	10125.3	747.8	10131.08	748.33	10136.77	747.06	10151.15	746.65
10156.35	746.91	10166.61	746.91	10178.12	747.45	10185.37	747.39	10189.52	746.86
10195.48	746.47	10209.29	748.6	10224.79	750.19	10258.27	752.06	10268.96	753.5
10289.21	755.98	10298.81	756.6	10301.08	756.46	10307.11	755.32	10312.65	755.45
10313.94	755.58	10318.26	756.05	10332.55	757	10342.58	757.14	10350.25	757.19
10353.57	757.38	10361.15	757.46	10381.59	757.1	10395.63	756.72	10401.6	756.78
10414.16	757.17	10469.26	757.45						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9263.35	.055	9503.42	.05	10313.94	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9503.42	10313.94	720	501.6	310	.1	.3

CROSS SECTION RIVER: I-8 Wash East
REACH: Main RS: .395

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6.98	766.4	9275.51	766.37	9286.12	766.25	9302.1	766.47	9327.66	766.73
2.34	766.7	9405.46	765.93	9417.29	766.14	9433.02	765.17	9470.08	755.4409
9472.56	754.79	9485.43	753.6	9499.69	752.37	9508.22	752.13	9514.6	751.21
9524.89	750.52	9568.02	748.8	9650.28	747.35	9662.34	747.81	9668.58	747.44
9682.22	747.43	9689.18	747.6	9692.11	747.39	9695.85	747.69	9709.26	747.35
9717.14	748.22	9722.93	748.5	9736.65	750.84	9742.06	751.65	9783.04	751.89
9800.22	752.14	9809.26	752.6	9832.28	753.09	9858.37	752.32	9884.43	752.4
9889.69	752.19	9892.88	751.6	9897.3	751.91	9906.57	751.18	9912.23	751.01
9919.68	751.18	9927.89	750.9	9936.42	750.41	9953.51	748.89	9956.7	748.82
9965.07	748.3	9973.94	748.1	10004.46	747.77	10056.14	747.54	10072.73	747.41
10091.48	747.22	10103.37	747.1	10122.95	747.12	10143.15	747.01	10176.5	746.41
10216.55	746.41	10229.67	746.4	10245.39	748.49	10262.2	752.78	10294.29	753.26
10302.89	753.33	10320.87	752.9	10338.85	752.63	10348.99	753.25	10369.69	754.13
10377.26	755.4	10377.46	755.44	10710398.43	759.7	10428.23	759.96	10447.46	759.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9256.98	.055	9470.08	.05	10377.46	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9470.08	10377.46	510	506.88	480	.1	.3

CROSS SECTION RIVER: I-8 Wash East
REACH: Main RS: .299

INPUT
Description:
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9235	764.1	9250.78	763.79	9275.76	763.45	9291.43	763.13	9313.4	762.55
9333.14	761.1	9341.19	761.08	9351.47	761.48	9364.69	761.88	9383.77	757.33
9392.37	755.2254	9414.29	749.8	9428.01	749.61	9462.55	748.97	9474.9	749.05
9511.78	749.09	9522.45	748.9	9534.34	749.31	9554.77	749.26	9568.96	750.9
87.15	750.49	9606.93	751.4	9629.4	753.1	9652.5	751.81	9665.82	752.07
7.44	755.38	9723.23	755.6	9734.77	755.14	9746.32	754.88	9753.22	754.61
9772.9	754.44	9784.94	754.4	9793.41	754.53	9816.85	753.91	9821.88	754.14
9830.37	754.07	9840.67	753.6	9849.47	753.31	9865.83	753.81	9886.6	752.84
9896.31	753.22	9899.87	753.6	9910.73	753.35	9951.86	749.05	9971	747.42
9972.94	747.67	9992.21	747.6	10024.96	747.29	10044.2	746.66	10119.81	746.12

```
 10136.2  745.6310155.87   745.210194.63  745.7710243.93  746.5610256.35  746.98
10261.99  747.3410266.72   748.3 10279.6  752.1610281.35  752.4210285.91  752.44
10293.22  751.1610295.79   751.110301.71  752.3710304.86  752.5510329.51  752.87
10344.55  752.1610352.75   752.410373.69  752.7810402.85   752.510424.34  752.96
10440.55755.225810466.55  758.8610474.44   759.810487.05   759.610501.92  759.58
[illegible]4.42  759.34

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9235    .055  9392.3     .0510440.55    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
        9392.310440.55               380  533.28     750              .1       .3

CROSS SECTION           RIVER: I-8 Wash East
REACH: Main                RS: .198

INPUT
Description:
Station Elevation Data     num=     129
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9227.74   763.2 9284.37  761.82 9335.14   760.1 9349.49  759.189362.359  758.96
 9366.51   758.5 9380.78   758.5 9389.04  758.11  9398.7   756.99406.149  756.54
9415.979   755.9 9423.28  756.29 9431.04  757.09 9435.31  757.82 9458.41  757.26
9463.229   755.9 9467.21755.0792 9472.59  753.97 9482.29  755.56 9492.09  756.65
    9499  757.23 9511.53   757.1 9514.88  756.949520.109  755.77 9551.51  748.56
9578.899  748.89 9583.51   748.9 9588.54   749.2  9594.6  749.57 9605.99  750.25
 9636.54  751.439644.899  751.29652.439  750.93 9686.39  750.14 9700.43  750.14
 9735.54   749.6 9738.88   749.6 9763.83  750.46 9768.45  751.01 9773.03  751.28
  9777.8  751.97 9799.37  752.39805.229  752.489814.399  751.999828.189  752.55
 9866.81  753.31 9901.85     754 9912.53  754.27 9925.76   754.7 9964.88  754.54
10009.85  754.4210031.44  754.210049.04  754.5610053.47  754.5810067.74  754.11
10087.67  754.4310099.93  754.910115.32  755.03 10126.6   754.710139.46  754.07
10156.49  753.7710162.24  753.310171.38  752.7510177.36  752.6510180.53  752.94
10182.35  752.6810195.09    75310203.48  753.0410220.03  753.3310237.48  752.27
 10261.5  751.8710275.96  751.110298.06  750.0610316.17   749.410332.89  749.28
10339.65  749.12 10356.2    74910363.34  749.0110378.36  748.6110385.52  748.76
10398.21  748.46 10436.9   748.4 10450.8  748.3210475.66  747.4910478.93  747.45
   10547  748.0210557.43  747.710564.12  747.7410574.09  747.3210590.13  747.35
[illegible]5.16  747.4810633.37  746.810638.65  746.5910654.41  746.7210686.62  746.71
[illegible]1.57  746.6110706.94  746.610713.56  746.3510736.82  746.57 10763.7  746.81
 10787.8   746.810799.51  747.410805.54  747.45 10809.1  747.2510831.43  748.27
10840.84  748.6410850.53  748.410857.55  749.4210868.99  750.2310890.44  751.37
10901.56  750.3510915.75  750.910932.78  750.9610945.94   750.910958.88  751.02
10963.94  750.85 10985.5  750.611009.17  750.4211033.66  750.1511070.06  750.11
11087.35  749.9211097.79  749.7 11105.6  749.3111124.84  749.1311133.05   749.1
11153.01   752.411161.71  753.511166.03  753.8511169.08  753.77

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9227.74    .055 9467.21     .0511169.08    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
        9467.2111169.08              480   422.4     650              .1       .3

CROSS SECTION           RIVER: I-8 Wash East
REACH: Main                RS: .118

INPUT
Description:
Station Elevation Data     num=      38
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9655.28  755.49 9666.46   755.3 9668.46754.9253 9680.87   752.6 9715.06  745.71
 9728.46  745.49 9756.11  744.95 9776.25  744.82 9886.77   745.4 9897.51  745.47
 9914.36  747.12 9921.56  747.64 9954.25  747.22 9974.69   747.2   10000  747.55
10047.49  748.62 10059.7  748.57 10077.8  749.2110105.01   750.410141.27  749.86
10153.68  749.9510163.28  750.5210180.15  751.2210195.77     75210225.53  752.03
10240.69  752.43 10247.9  752.2710279.83  751.8110284.25   751.7   10299  751.66
10339.19  750.7810398.68  749.7810422.76   749.710435.83   749.510452.58  750.32
10477.61754.9255 10487.2  756.6910491.72  757.49

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
[illegible]5.28    .055 9668.46     .0510477.61    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
        9668.4610477.61              870   623.04     380              .1       .3
```

CROSS SECTION RIVER: I-8 Wash East
REACH: Main RS: 0

INPUT
Description: Section .694 from Evans Wash
Station Elevation Data num= 104

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9011.2	758.7	9056.3	758.45	9107.12	757.96	9123.05	758.12	9132.65	757.99
9170.47	757.6	9176.91	757.09	9189.77	757.17	9198.68	757.02	9239.31	756.61
9267.72	755.9	9293.42	755.62	9299.24	755.46	9326.06	755	9334.61	754.61
9356.76	753.5	9384.26	752.99	9405.22	752.43	9423.45	752.16	9453.66	751.15
9470.68	751.4	9479.94	751.22	9498.8	751.7	9518.22	751.62	9536.69	752.46
9540.27	752.4	9559.53	753.77	9580.37	755.03	9602.58	754.99	9607.16	755.09
9622.65	755.2	9625.65	754.95	9645.91	754.88	9653.62	754.78	9658.42	754.57
9674.48	753.4	9678.63	753.22	9691.35	753.3	9707.31	753.58	9730.77	753.51
9741.35	753.3	9745.1	753.65	9753.61	753.3	9760.45	752.73	9766.05	752.62
9777.59	752.1	9791.28	750.12	9795.03	749.85	9808.76	748.24	9831.47	748.85
9838.83	748.9	9882.63	744.86	9893.52	745.39	9905.86	745.48	9932.11	745.54
9958.77	745.1	9972.46	744.62	9986.74	743.94	10000	743.04	10008.67	743.43
10015.81	743.91	10029.21	744.69	10032.91	744.51	10052.81	744.83	10082.13	745.68
10109.5	746.71	10114.98	747.14	10134.92	747.93	10141.12	749.01	10151.26	750.03
10163.53	751.51	10169.76	751.57	10176.78	752.01	10209.5	752.06	10227.37	752.04
10240.92	751.81	10263.26	751.64	10284.54	751.56	10323.27	750.64	10350.16	750.14
10383.15	750.61	10394.31	750.71	10421.22	751.81	10449.47	751.52	10468.18	750.4
10474.95	750.11	10506.19	750.71	10559.75	751.17	10565.03	751.33	10605.19	752.06
10621.29	751.2	10632.1	751.54	10645.09	753.18	10697.65	754.52	10702.24	754.74
10720.89	755.41	10746.08	756.16	10765.85	757.01	10776.5	757.11	10789.3	757.11
10800.19	757.31	10815.64	756.93	10829.36	757.01	10846.73	756.48		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9011.2	.044	9932.11	.059	10082.13	.039

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9932.11	10082.13	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:I-8 Wash East

Reach	River Sta.	n1	n2	n3
Main	.695	.049	.049	.049
Main	.490	.055	.05	.055
Main	.395	.055	.05	.055
Main	.299	.055	.05	.055
Main	.198	.055	.05	.055
Main	.118	.055	.05	.055
Main	0	.044	.059	.039

SUMMARY OF REACH LENGTHS

River: I-8 Wash East

Reach	River Sta.	Left	Channel	Right
Main	.695	290	1082.4	1010
Main	.490	720	501.6	310
Main	.395	510	506.88	480
Main	.299	380	533.28	750
Main	.198	480	422.4	650
Main	.118	870	623.04	380
Main	0	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: I-8 Wash East

Reach	River Sta.	Contr.	Expan.

Main	.695	.1	.3
Main	.490	.1	.3
Main	.395	.1	.3
Main	.299	.1	.3
Main	.198	.1	.3
[illegible]n	.118	.1	.3
[illegible]n	0	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Main	.695	9290.00	757.80	761.42	761.42	762.19	0.03	7.02	1323.97	899.94	1
Main	.695	9290.00	757.80	761.42	761.42	762.19	0.03	7.02	1323.97	899.94	1
Main	.490	9290.00	741.68	755.60		755.64	0.00	1.62	5739.63	791.41	0
Main	.490	9290.00	741.68	756.29		756.33	0.00	1.48	6291.88	802.64	0
Main	.395	9290.00	746.40	755.45		755.50	0.00	1.80	5167.56	907.48	0
Main	.395	9290.00	746.40	756.18		756.22	0.00	1.59	5827.10	907.38	0
Main	.299	9290.00	745.20	755.24		755.29	0.00	1.87	4958.29	1002.61	0
Main	.299	9290.00	745.20	756.04		756.08	0.00	1.60	5789.70	1048.25	0
Main	.198	9290.00	746.35	755.09		755.11	0.00	1.22	7605.54	1658.25	0
Main	.198	9290.00	746.35	755.95		755.97	0.00	1.03	[illegible].66	1668.44	0
Main	.118	9290.00	744.82	754.92		754.98	0.00	1.90	4900.69	809.15	0
Main	.118	9290.00	744.82	755.86		755.90	0.00	1.64	5654.57	809.15	0
Main	0.001	8988.00	743.04	754.74	748.59	754.78	0.00	1.96	5653.60	1291.52	0
Main	0.001	8988.00	743.04	755.72	748.59	755.77	0.00	1.80	5218.94	760.00	0

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
		(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Main	.695	762.19	761.42	0.76	0.78	0.22		9290.00	899.94	
Main	.695	762.19	761.42	0.76	0.60	0.22		9290.00	899.94	
Main	.490	755.64	755.60	0.04	0.14	0.00	0.00	9290.00	0.00	791.41
Main	.490	756.33	756.29	0.03	0.10	0.00	0.00	9290.00	0.00	802.64
Main	.395	755.50	755.45	0.05	0.21	0.00	0.00	9290.00	0.00	907.48
Main	.395	756.22	756.18	0.04	0.14	0.00		9290.00	[illegible].38	
Main	.299	755.29	755.24	0.05	0.17	0.01	0.00	9290.00	0.00	1002.61
Main	.299	756.08	756.04	0.04	0.10	0.01		9290.00	1048.25	

Main	.198		755.11	755.09	0.02	0.12	0.00	0.00	9290.00	1658.25
Main	.198		755.97	755.95	0.02	0.07	0.00	0.00	9290.00	1668.44
Main	.118		754.98	754.92	0.06	0.19	0.00		9290.00	809.15
Main	.118		755.90	755.86	0.04	0.13	0.00		9290.00	809.15
Main	0		754.78	754.74	0.04			2568.60	2973.59	3445.82 1291.52
Main	0		755.77	755.72	0.05			2498.37	2994.00	3495.63 760.00

Profile Output Table - Encroachment 1

Reach	River Sta	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Wdth Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Main	.695	761.42		762.19	899.94		9290.00	9985.01	11192.61			
Main	.695	761.42	0.00	762.19	899.94		9290.00	9985.01	9985.01	11192.61	11192.61	
Main	.490	755.60		755.64	791.41	0.00	9290.00	0.00	9503.42	10313.94		
Main	.490	756.29	0.69	756.33	802.64	0.00	9290.00	0.00	9503.39	9503.42	10313.94	10313.95
Main	.395	755.45		755.50	907.48	0.00	9290.00	0.00	9470.08	10377.46		
Main	.395	756.18	0.73	756.22	907.38		9290.00	9470.08	9470.08	10377.46	10377.46	
Main	.299	755.24		755.29	1002.61	0.00	9290.00	0	9392.30	10440.55		
Main	.299	756.04	0.80	756.08	1048.25		9290.00	9392.30	9392.30	10440.55	10440.55	
Main	.198	755.09		755.11	1658.25	0.00	9290.00	9467.21	11169.08			
Main	.198	755.95	0.87	755.97	1668.44	0.00	9290.00	9467.20	9467.21	11169.08	11169.08	
Main	.118	754.92		754.98	809.15		9290.00	9668.46	10477.61			
Main	.118	755.86	0.93	755.90	809.15		9290.00	9668.46	9668.46	10477.61	10477.61	
Main	0	754.74		754.78	1291.52	2568.60	2973.59	3445.82	9932.11	10082.13		
Main	0	755.72	0.98	755.77	760.00	2498.37	2994.00	3495.63	9740.00	9932.11	10082.13	10500.00

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
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: Cemetery Wash
Project File : Cemetery.prj
Run Date and Time: 5/10/02 11:06:54 AM

Project in English units

Project Description:
Study name: Gila Bend Area Drainage Master Plan

Cemetery Wash (proposed) -
Unnamed Wash No. 4

Study contractors: Engineering and Environmental
Consultants, Inc. and Premier Engineering Corporation

Source of hydrology:
Gila Bend Area Floodplain Delineation Study (FCD 90-67) by Burgess & Niple for
FCDMC, March 1991

Source of survey: Gila Bend Area Floodplain Delineation
Study (FCD 90-67);
new topographic mapping and survey by Cooper Aerial
Mapping, Inc., 1999.

FCD Contract Number: 99-18

Datum: NGVD 1929

PLAN DATA

Plan Title: Unnamed Wash # 4 (Cemetery) FW Method 1
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Cemetery Wash\Cemetery.p03

Geometry Title: Unnamed Wash # 4
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Cemetery Wash\Cemetery.g01

Flow Title : Unnamed Wash # 4 FW Method 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Cemetery Wash\Cemetery.f02

Plan Summary Information:

Number of:	Cross Sections	= 17	Mulitple Openings	=	0
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculaton tolerance	=	0.01
Maximum number of interations	=	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 = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 2	1	9940	10070
1.429	PF 2	1	9920	10080
1.335	PF 2	1	9950	10050
1.244	PF 2	1	9910	10090
1.151	PF 2	1	9950	10050
1.052	PF 2	1	9932	10080
.959	PF 2	1	9970	10070
.861	PF 2	1	9915	10040
.754	PF 2	1	9990	10025
0.682	PF 2	1	9970	10030
.592	PF 2	1	9975	10030
0.497	PF 2	1	9980	10015
0.395	PF 2	1	9980	10010
0.292	PF 2	1	9975	10050
0.202	PF 2	1	9900	10100
0.106	PF 2	1	9800	10120
.001	PF 2	1	9740	10500

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 2	1	9940	10070
1.429	PF 2	1	9920	10080
1.335	PF 2	1	9950	10050
1.244	PF 2	1	9910	10090
1.151	PF 2	1	9950	10050
1.052	PF 2	1	9932	10080
.959	PF 2	1	9970	10070
.861	PF 2	1	9915	10040
.754	PF 2	1	9990	10025
0.682	PF 2	1	9970	10030
.592	PF 2	1	9975	10030
0.497	PF 2	1	9980	10015
0.395	PF 2	1	9980	10010
0.292	PF 2	1	9977.64	10043.9
0.202	PF 2	1	9900	10100
0.106	PF 2	1	9800	10120
.001	PF 2	1	9740	10500

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 3	4	.2	
1.429	PF 3	4	.2	
1.335	PF 3	4	.2	
1.244	PF 3	4	.2	
1.151	PF 3	4	.2	
1.052	PF 3	4	.2	
.959	PF 3	4	.2	
.861	PF 3	4	.2	
.754	PF 3	4	.2	
0.682	PF 3	4	.2	
.592	PF 3	4	.2	
0.497	PF 3	4	.2	
0.395	PF 3	4	.2	
0.292	PF 3	4	.2	
0.202	PF 3	4	.2	
0.106	PF 3	4	.2	
.001	PF 3	4	.2	

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 3	0	0	0
1.429	PF 3	0	0	0
1.335	PF 3	0	0	0
1.244	PF 3	0	0	0

1.151	PF 3	0	0	0
1.052	PF 3	0	0	0
.959	PF 3	0	0	0
.861	PF 3	0	0	0
.754	PF 3	0	0	0
0.682	PF 3	0	0	0
.592	PF 3	0	0	0
0.497	PF 3	0	0	0
0.395	PF 3	0	0	0
0.292	PF 3	0	0	0
0.202	PF 3	0	0	0
0.106	PF 3	0	0	0
.001	PF 3	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 4	4	.3	
1.429	PF 4	4	.3	
1.335	PF 4	4	.3	
1.244	PF 4	4	.3	
1.151	PF 4	4	.3	
1.052	PF 4	4	.3	
.959	PF 4	4	.3	
.861	PF 4	4	.3	
.754	PF 4	4	.3	
0.682	PF 4	4	.3	
.592	PF 4	4	.3	
0.497	PF 4	4	.3	
0.395	PF 4	4	.3	
0.292	PF 4	4	.3	
0.202	PF 4	4	.3	
0.106	PF 4	4	.3	
.001	PF 4	4	.3	

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 4	0	0	0
1.429	PF 4	0	0	0
1.335	PF 4	0	0	0
1.244	PF 4	0	0	0
1.151	PF 4	0	0	0
1.052	PF 4	0	0	0
.959	PF 4	0	0	0
.861	PF 4	0	0	0
.754	PF 4	0	0	0
0.682	PF 4	0	0	0
.592	PF 4	0	0	0
0.497	PF 4	0	0	0
0.395	PF 4	0	0	0
0.292	PF 4	0	0	0
0.202	PF 4	0	0	0
0.106	PF 4	0	0	0
.001	PF 4	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 5	4	.4	
1.429	PF 5	4	.4	
1.335	PF 5	4	.4	
1.244	PF 5	4	.4	
1.151	PF 5	4	.4	
1.052	PF 5	4	.4	
.959	PF 5	4	.4	
.861	PF 5	4	.4	
.754	PF 5	4	.4	
0.682	PF 5	4	.4	
.592	PF 5	4	.4	
0.497	PF 5	4	.4	
0.395	PF 5	4	.4	
0.292	PF 5	4	.4	
0.202	PF 5	4	.4	
0.106	PF 5	4	.4	
.001	PF 5	4	.4	

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2

1.530	PF 5	0	0	0
1.429	PF 5	0	0	0
1.335	PF 5	0	0	0
1.244	PF 5	0	0	0
1.151	PF 5	0	0	0
1.052	PF 5	0	0	0
.959	PF 5	0	0	0
.861	PF 5	0	0	0
.754	PF 5	0	0	0
0.682	PF 5	0	0	0
.592	PF 5	0	0	0
0.497	PF 5	0	0	0
0.395	PF 5	0	0	0
0.292	PF 5	0	0	0
0.202	PF 5	0	0	0
0.106	PF 5	0	0	0
.001	PF 5	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 6	4	.5	
1.429	PF 6	4	.5	
1.335	PF 6	4	.5	
1.244	PF 6	4	.5	
1.151	PF 6	4	.5	
1.052	PF 6	4	.5	
.959	PF 6	4	.5	
.861	PF 6	4	.5	
.754	PF 6	4	.5	
0.682	PF 6	4	.5	
.592	PF 6	4	.5	
0.497	PF 6	4	.5	
0.395	PF 6	4	.5	
0.292	PF 6	4	.5	
0.202	PF 6	4	.5	
0.106	PF 6	4	.5	
.001	PF 6	4	.5	

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 6	0	0	0
1.429	PF 6	0	0	0
1.335	PF 6	0	0	0
1.244	PF 6	0	0	0
1.151	PF 6	0	0	0
1.052	PF 6	0	0	0
.959	PF 6	0	0	0
.861	PF 6	0	0	0
.754	PF 6	0	0	0
0.682	PF 6	0	0	0
.592	PF 6	0	0	0
0.497	PF 6	0	0	0
0.395	PF 6	0	0	0
0.292	PF 6	0	0	0
0.202	PF 6	0	0	0
0.106	PF 6	0	0	0
.001	PF 6	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 7	4	.6	
1.429	PF 7	4	.6	
1.335	PF 7	4	.6	
1.244	PF 7	4	.6	
1.151	PF 7	4	.6	
1.052	PF 7	4	.6	
.959	PF 7	4	.6	
.861	PF 7	4	.6	
.754	PF 7	4	.6	
0.682	PF 7	4	.6	
.592	PF 7	4	.6	
0.497	PF 7	4	.6	
0.395	PF 7	4	.6	
0.292	PF 7	4	.6	
0.202	PF 7	4	.6	
0.106	PF 7	4	.6	

.001	PF 7	4	.6

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 7	0	0	0
1.429	PF 7	0	0	0
1.335	PF 7	0	0	0
1.244	PF 7	0	0	0
1.151	PF 7	0	0	0
1.052	PF 7	0	0	0
.959	PF 7	0	0	0
.861	PF 7	0	0	0
.754	PF 7	0	0	0
0.682	PF 7	0	0	0
.592	PF 7	0	0	0
0.497	PF 7	0	0	0
0.395	PF 7	0	0	0
0.292	PF 7	0	0	0
0.202	PF 7	0	0	0
0.106	PF 7	0	0	0
.001	PF 7	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 8	4	.7	
1.429	PF 8	4	.7	
1.335	PF 8	4	.7	
1.244	PF 8	4	.7	
1.151	PF 8	4	.7	
1.052	PF 8	4	.7	
.959	PF 8	4	.7	
.861	PF 8	4	.7	
.754	PF 8	4	.7	
0.682	PF 8	4	.7	
.592	PF 8	4	.7	
0.497	PF 8	4	.7	
0.395	PF 8	4	.7	
0.292	PF 8	4	.7	
0.202	PF 8	4	.7	
0.106	PF 8	4	.7	
.001	PF 8	4	.7	

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 8	0	0	0
1.429	PF 8	0	0	0
1.335	PF 8	0	0	0
1.244	PF 8	0	0	0
1.151	PF 8	0	0	0
1.052	PF 8	0	0	0
.959	PF 8	0	0	0
.861	PF 8	0	0	0
.754	PF 8	0	0	0
0.682	PF 8	0	0	0
.592	PF 8	0	0	0
0.497	PF 8	0	0	0
0.395	PF 8	0	0	0
0.292	PF 8	0	0	0
0.202	PF 8	0	0	0
0.106	PF 8	0	0	0
.001	PF 8	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 9	4	.8	
1.429	PF 9	4	.8	
1.335	PF 9	4	.8	
1.244	PF 9	4	.8	
1.151	PF 9	4	.8	
1.052	PF 9	4	.8	
.959	PF 9	4	.8	
.861	PF 9	4	.8	
.754	PF 9	4	.8	
0.682	PF 9	4	.8	
.592	PF 9	4	.8	
0.497	PF 9	4	.8	

0.395	PF 9	4	.8	
0.292	PF 9	4	.8	
0.202	PF 9	4	.8	
0.106	PF 9	4	.8	
.001	PF 9	4	.8	

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 9	0	0	0
1.429	PF 9	0	0	0
1.335	PF 9	0	0	0
1.244	PF 9	0	0	0
1.151	PF 9	0	0	0
1.052	PF 9	0	0	0
.959	PF 9	0	0	0
.861	PF 9	0	0	0
.754	PF 9	0	0	0
0.682	PF 9	0	0	0
.592	PF 9	0	0	0
0.497	PF 9	0	0	0
0.395	PF 9	0	0	0
0.292	PF 9	0	0	0
0.202	PF 9	0	0	0
0.106	PF 9	0	0	0
.001	PF 9	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 10	4	.9	
1.429	PF 10	4	.9	
1.335	PF 10	4	.9	
1.244	PF 10	4	.9	
1.151	PF 10	4	.9	
1.052	PF 10	4	.9	
.959	PF 10	4	.9	
.861	PF 10	4	.9	
.754	PF 10	4	.9	
0.682	PF 10	4	.9	
.592	PF 10	4	.9	
0.497	PF 10	4	.9	
0.395	PF 10	4	.9	
0.292	PF 10	4	.9	
0.202	PF 10	4	.9	
0.106	PF 10	4	.9	
.001	PF 10	4	.9	

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 10	0	0	0
1.429	PF 10	0	0	0
1.335	PF 10	0	0	0
1.244	PF 10	0	0	0
1.151	PF 10	0	0	0
1.052	PF 10	0	0	0
.959	PF 10	0	0	0
.861	PF 10	0	0	0
.754	PF 10	0	0	0
0.682	PF 10	0	0	0
.592	PF 10	0	0	0
0.497	PF 10	0	0	0
0.395	PF 10	0	0	0
0.292	PF 10	0	0	0
0.202	PF 10	0	0	0
0.106	PF 10	0	0	0
.001	PF 10	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 11	4	1	
1.429	PF 11	4	1	
1.335	PF 11	4	1	
1.244	PF 11	4	1	
1.151	PF 11	4	1	
1.052	PF 11	4	1	
.959	PF 11	4	1	
.861	PF 11	4	1	

.754	PF 11	4	1	
0.682	PF 11	4	1	
.592	PF 11	4	1	
0.497	PF 11	4	1	
0.395	PF 11	4	1	
0.292	PF 11	4	1	
0.202	PF 11	4	1	
0.106	PF 11	4	1	
.001	PF 11	4	1	

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 11	0	0	0
1.429	PF 11	0	0	0
1.335	PF 11	0	0	0
1.244	PF 11	0	0	0
1.151	PF 11	0	0	0
1.052	PF 11	0	0	0
.959	PF 11	0	0	0
.861	PF 11	0	0	0
.754	PF 11	0	0	0
0.682	PF 11	0	0	0
.592	PF 11	0	0	0
0.497	PF 11	0	0	0
0.395	PF 11	0	0	0
0.292	PF 11	0	0	0
0.202	PF 11	0	0	0
0.106	PF 11	0	0	0
.001	PF 11	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 12	4	1.1	
1.429	PF 12	4	1.1	
1.335	PF 12	4	1.1	
1.244	PF 12	4	1.1	
1.151	PF 12	4	1.1	
1.052	PF 12	4	1.1	
.959	PF 12	4	1.1	
.861	PF 12	4	1.1	
.754	PF 12	4	1.1	
0.682	PF 12	4	1.1	
.592	PF 12	4	1.1	
0.497	PF 12	4	1.1	
0.395	PF 12	4	1.1	
0.292	PF 12	4	1.1	
0.202	PF 12	4	1.1	
0.106	PF 12	4	1.1	
.001	PF 12	4	1.1	

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 12	0	0	0
1.429	PF 12	0	0	0
1.335	PF 12	0	0	0
1.244	PF 12	0	0	0
1.151	PF 12	0	0	0
1.052	PF 12	0	0	0
.959	PF 12	0	0	0
.861	PF 12	0	0	0
.754	PF 12	0	0	0
0.682	PF 12	0	0	0
.592	PF 12	0	0	0
0.497	PF 12	0	0	0
0.395	PF 12	0	0	0
0.292	PF 12	0	0	0
0.202	PF 12	0	0	0
0.106	PF 12	0	0	0
.001	PF 12	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 13	4	1.2	
1.429	PF 13	4	1.2	
1.335	PF 13	4	1.2	
1.244	PF 13	4	1.2	

1.151	PF 13	4	1.2
1.052	PF 13	4	1.2
.959	PF 13	4	1.2
.861	PF 13	4	1.2
.754	PF 13	4	1.2
0.682	PF 13	4	1.2
.592	PF 13	4	1.2
0.497	PF 13	4	1.2
0.395	PF 13	4	1.2
0.292	PF 13	4	1.2
0.202	PF 13	4	1.2
0.106	PF 13	4	1.2
.001	PF 13	4	1.2

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 13	0	0	0
1.429	PF 13	0	0	0
1.335	PF 13	0	0	0
1.244	PF 13	0	0	0
1.151	PF 13	0	0	0
1.052	PF 13	0	0	0
.959	PF 13	0	0	0
.861	PF 13	0	0	0
.754	PF 13	0	0	0
0.682	PF 13	0	0	0
.592	PF 13	0	0	0
0.497	PF 13	0	0	0
0.395	PF 13	0	0	0
0.292	PF 13	0	0	0
0.202	PF 13	0	0	0
0.106	PF 13	0	0	0
.001	PF 13	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 14	4	1.3	
1.429	PF 14	4	1.3	
1.335	PF 14	4	1.3	
1.244	PF 14	4	1.3	
1.151	PF 14	4	1.3	
1.052	PF 14	4	1.3	
.959	PF 14	4	1.3	
.861	PF 14	4	1.3	
.754	PF 14	4	1.3	
0.682	PF 14	4	1.3	
.592	PF 14	4	1.3	
0.497	PF 14	4	1.3	
0.395	PF 14	4	1.3	
0.292	PF 14	4	1.3	
0.202	PF 14	4	1.3	
0.106	PF 14	4	1.3	
.001	PF 14	4	1.3	

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 14	0	0	0
1.429	PF 14	0	0	0
1.335	PF 14	0	0	0
1.244	PF 14	0	0	0
1.151	PF 14	0	0	0
1.052	PF 14	0	0	0
.959	PF 14	0	0	0
.861	PF 14	0	0	0
.754	PF 14	0	0	0
0.682	PF 14	0	0	0
.592	PF 14	0	0	0
0.497	PF 14	0	0	0
0.395	PF 14	0	0	0
0.292	PF 14	0	0	0
0.202	PF 14	0	0	0
0.106	PF 14	0	0	0
.001	PF 14	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2

1.530	PF 15	4	1.4
1.429	PF 15	4	1.4
1.335	PF 15	4	1.4
1.244	PF 15	4	1.4
1.151	PF 15	4	1.4
1.052	PF 15	4	1.4
.959	PF 15	4	1.4
.861	PF 15	4	1.4
.754	PF 15	4	1.4
0.682	PF 15	4	1.4
.592	PF 15	4	1.4
0.497	PF 15	4	1.4
0.395	PF 15	4	1.4
0.292	PF 15	4	1.4
0.202	PF 15	4	1.4
0.106	PF 15	4	1.4
.001	PF 15	4	1.4

River = Cemetery Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.530	PF 15	0	0	0
1.429	PF 15	0	0	0
1.335	PF 15	0	0	0
1.244	PF 15	0	0	0
1.151	PF 15	0	0	0
1.052	PF 15	0	0	0
.959	PF 15	0	0	0
.861	PF 15	0	0	0
.754	PF 15	0	0	0
0.682	PF 15	0	0	0
.592	PF 15	0	0	0
0.497	PF 15	0	0	0
0.395	PF 15	0	0	0
0.292	PF 15	0	0	0
0.202	PF 15	0	0	0
0.106	PF 15	0	0	0
.001	PF 15	0	0	0

FLOW DATA

Flow Title: Unnamed Wash # 4 FW Method 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Cemetery Wash\Cemetery.f02

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
Cemetery Wash	Reach-1	1.530	790	790
Cemetery Wash	Reach-1	.001	8988	8988

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Cemetery Wash	Reach-1	PF 1	Normal S = .0047	Known WS = 754.76
Cemetery Wash	Reach-1	PF 2	Normal S = .0047	Known WS = 755.66

GEOMETRY DATA

Geometry Title: Unnamed Wash # 4
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Cemetery Wash\Cemetery.g01

CROSS SECTION RIVER: Cemetery Wash
REACH: Reach-1 RS: 1.530

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8994.08	793	9217.28	794.02	9251.71	793.98	9292.96	794.21	9490.39	794.84

```
 9582.73   793.6 9636.59  792.75    9654792.3365 9668.17     792 9873.04     792
 9948.98  791.89   10000  791.6810068.25  791.8810132.69  791.9310214.17     792
10238.82  792.3110440.91   795.110461.87  794.94

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8994.08     .04    9654     .0510214.17    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.9810068.25           529.45  529.45  529.45              .1       .3

CROSS SECTION          RIVER: Cemetery Wash
REACH: Reach-1            RS: 1.429

INPUT
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9091.67   790.6 9113.52  790.57  9345.5  791.03  9371.8  791.18 9431.62  790.99
 9450.23   790.9 9474.37  790.93 9603.66  791.26 9620.37  791.38 9653.03  791.51
 9673.79   791.5 9703.21  791.17 9737.72  790.88 9839.84  789.67 9927.74  788.98
 9941.94   788.8 9965.91     78810031.88     78810079.81   788.710314.49     792
 10482.6     792

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9091.67     .04 9941.94     .0510079.81    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.9410079.81           497.16  497.16  497.16              .1       .3

CROSS SECTION          RIVER: Cemetery Wash
REACH: Reach-1            RS: 1.335

INPUT
Description:
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9756.4  788.44 9816.87     788    9840787.6199 9881.37  786.94   10000  786.82
10113.89   786.810116.89  787.8110195.24     78810213.28  789.06 10372.3  791.24
10593.91   791.210599.73  791.05

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9756.4     .04    9840     .0510116.89    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          984010116.89           480.17  480.17  480.17              .1       .3

CROSS SECTION          RIVER: Cemetery Wash
REACH: Reach-1            RS: 1.244

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9128.54  784.85 9135.01  784.74 9330.91  785.23 9338.09  785.25 9413.86  785.34
    9578  784.82 9688.13  784.75 9705.11     784   10000     78410251.57  784.45
   10275  785.3310319.95     78810469.36     78810546.04   788.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9128.54     .04    9578     .05   10275    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9578   10275           492.07  492.07  492.07              .1       .3

CROSS SECTION          RIVER: Cemetery Wash
REACH: Reach-1            RS: 1.151

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9464.1  783.07 9526.23  783.19 9544.22  783.21    9679780.8649 9717.21   780.2
 9723.39     780 9753.85     780 9788.27  781.09 9790.17   781.1 9835.43     78(
```

```
   10000     78010123.16     780   10159780.7889 10228.1  782.31 10278.8     784
10548.58     78410561.32  784.2510591.01  784.3410816.41  785.98

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9464.1     .04 9790.17     .05   10159    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9790.17   10159           522.08  522.08  522.08             .1       .3

CROSS SECTION           RIVER: Cemetery Wash
REACH: Reach-1             RS: 1.052

INPUT
Description:
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9649.43     780 9706.18     780    9904     780 9917.73     780 9927.22  778.03
    9928777.8842    9930777.5104  9933.3776.8936 9938.08     776   10000     776
10038.77     776 10050.2  776.34 10072.5776.961610107.96  777.9510180.82     780
10308.32     780

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9649.43     .04  9933.3     .05 10072.5    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9933.3 10072.5           495.09  495.09  495.09             .1       .3

CROSS SECTION           RIVER: Cemetery Wash
REACH: Reach-1             RS: .959

INPUT
Description:
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9727.97   777.8 9793.27  777.01 9871.83     776    9904775.2255 9974.01  773.54
   10000  773.0510034.67   773.210052.89  773.3210061.47  773.66   10103775.1094
10128.52     77610399.86     776

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9727.97    .035 9974.01    .05510061.47     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9974.0110061.47           516.87  516.87  516.87             .1       .3

CROSS SECTION           RIVER: Cemetery Wash
REACH: Reach-1             RS: .861

INPUT
Description:
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9878.97  773.77 9896.47  772.67 9920.14  771.04 9958.53   770.8   10000  771.16
   10040771.442510118.94     772   10131772.520910151.35   773.410205.75     776
10217.86     77610245.14  776.42

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9878.97    .035 9920.14    .055   10040     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9920.14   10040           565.33  565.33  565.33             .1       .3

CROSS SECTION           RIVER: Cemetery Wash
REACH: Reach-1             RS: .754

INPUT
Description:
Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9950.12  770.28 9990.04  768.06   10000  763.4510009.14   765.610013.32  766.56
10048.36  767.0110067.06  768.4110083.15  770.4810089.57   770.910101.47  771.31
10113.54   771.5
```

```
Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9950.12    .035 9990.04    .05510013.32     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9990.0410013.32           376.99  376.99  376.99             .1       .3

CROSS SECTION           RIVER: Cemetery Wash
REACH: Reach-1             RS: 0.682

INPUT
Description:
Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9820.96  768.82 9830.69  768.82 9861.72     766    9875765.1199 9886.92  764.33
 9947.43  764.23 9990.41   764.4   10000  761.9110004.93   762.910013.77  764.61
10022.67  764.7610052.97  764.9910057.57  765.0810073.03   766.110087.04  766.86
10101.57  768.0110107.77  768.7910131.85  770.3510136.78   770.710165.65  771.61
10197.37   772.5

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9820.96    .035 9990.41    .05510013.77     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9990.4110013.77           479.13  479.13  479.13             .1       .3

CROSS SECTION           RIVER: Cemetery Wash
REACH: Reach-1             RS: .592

INPUT
Description:
Station Elevation Data     num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9864.24   766.4 9878.19  766.02 9882.76   766.2 9901.97  766.13 9931.82  765.33
 9952.07   763.8    9954763.5733 9966.03  762.16  9985.7  760.79 9995.16  758.94
   10000  757.8510009.07   759.510018.53  761.3110024.73  761.1710031.14  760.49
10033.19  760.45 10048.8   761.210056.57  761.1910066.75  762.37   10078763.4355
10092.83  764.8410130.24  767.18

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9864.24    .035  9985.7    .05510018.53     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9985.710018.53           496.88  496.88  496.88             .1       .3

CROSS SECTION           RIVER: Cemetery Wash
REACH: Reach-1             RS: 0.497

INPUT
Description:
Station Elevation Data     num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9830.24   764.1  9875.4  764.75 9885.65  764.32 9887.52  764.36 9900.85  761.83
 9912.93   761.8 9921.79     762 9927.54  762.66    9930762.3068 9933.67  761.78
 9983.17  759.69 9991.71   758.8   10000  756.93 10011.1759.393610024.06  762.27
10027.68  762.6110054.91  763.0210059.61   762.810065.45  763.13

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9830.24    .035 9983.17    .055 10011.1     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.17 10011.1           539.03  539.03  539.03             .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Cemetery Wash
REACH: Reach-1             RS: 0.395

INPUT
Description:
Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
 9949.91   760.3 9959.22  759.88  9969.5757.8489 9977.34   756.3 9980.25755.9276
   10000   753.4   10009755.6586   10017757.666310028.61  760.5810030.11  760.89
10049.55  759.8810068.66   761.810079.12  762.16

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9949.91    .035 9980.25    .055   10009     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.25   10009            544.67  544.67  544.67              .1       .3

CROSS SECTION           RIVER: Cemetery Wash
REACH: Reach-1             RS: 0.292

INPUT
Description:
Station Elevation Data     num=      31
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9793.41  759.53 9800.23  759.78 9819.72  759.57 9846.97   759.5 9886.13  760.93
 9905.94  761.29 9926.27  760.84 9936.79  760.32 9953.03     759 9965.52  757.14
 9968.32  756.92    9978 755.545 9991.27  753.66   10000 751.1510013.83   753.2
10019.82  753.4110026.56  753.8310048.36  756.0510054.96  756.3710058.26   755.8
10069.32  753.0710081.39  752.81 10088.2  752.3710091.56   752.510095.94     753
10110.34  755.3910118.08  756.3410149.63  756.7710168.85  757.4910181.45   757.9
10197.17   758.1

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9793.41    .035    9978    .05510048.36     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          997810048.36            477.12  477.12  477.12              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Cemetery Wash
REACH: Reach-1             RS: 0.202

INPUT
Description:
Station Elevation Data     num=      40
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9650.34  759.09 9675.51  757.92 9690.19  758.89 9701.59  759.77 9723.19   759.5
 9757.78  758.87  9763.7  758.69 9797.68  758.23 9837.99  756.76 9840.77   756.4
 9860.65  754.25 9862.46  754.31 9875.56  754.02 9896.85  752.99 9905.69   752.7
 9911.83  752.49 9920.13  752.66 9931.41  751.55 9940.01  751.74 9948.32   751.5
 9952.01  751.02 9973.93   751.1 9986.03  751.21 9995.34   749.4   10000   748.7
10011.44  751.4310028.67   750.610032.55   750.710039.64  751.1810062.09   751.3
10080.07  751.3310091.85   751.6 10096.5  751.5610104.44  751.7110111.07   752.1
10115.26  752.7710119.28  753.1210146.65  755.9710151.85  756.4410156.44     756

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9650.34    .035 9986.03    .05510011.44     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.0310011.44            505.28  505.28  505.28              .1       .3

CROSS SECTION           RIVER: Cemetery Wash
REACH: Reach-1             RS: 0.106

INPUT
Description:
Station Elevation Data     num=      38
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9657.55   756.3 9675.57  755.74 9685.18  755.16 9712.23  753.97 9722.89     754
 9733.81   754.2 9757.65  753.52 9802.95     753 9829.86  753.13 9874.84  752.49
 9893.18   752.3 9912.69  752.21 9938.36  751.99 9943.93   751.6 9964.35  751.04
 9972.08   750.4 9988.35  748.13 9993.91  746.19   10000 745.5510006.89  747.13
10011.81   748.410034.75  747.7110043.96  747.6110081.02  750.1110095.42  751.36
10112.53   750.9 10129.5  749.8410134.77  750.32   10137  750.1110150.03   751.7
10162.83   751.410170.69  752.0310183.73  753.8710187.78  754.2210204.04  755.98
   10217   756.8 10225.8  756.9310247.13  756.77

Manning's n Values         num=       3
```

Sta	n Val	Sta	n Val	Sta	n Val
9657.55	.035	9988.35	.05	510011.81	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9988.35	10011.81	550	554.4	550	.1	.3

CROSS SECTION RIVER: Cemetery Wash
REACH: Reach-1 RS: .001

INPUT
Description: Same X-sect as 0.694 on Evans Wash
Same x-sect as 0.694 in
Unnamed Wash No. 3
Station Elevation Data num= 104

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9011.2	758.7	9056.3	758.45	9107.12	757.96	9123.05	758.12	9132.65	757.99
9170.47	757.6	9176.91	757.09	9189.77	757.17	9198.68	757.02	9239.31	756.61
9267.72	755.9	9293.42	755.62	9299.24	755.46	9326.06	755	9334.61	754.61
9356.76	753.5	9384.26	752.99	9405.22	752.43	9423.45	752.16	9453.66	751.15
9470.68	751.4	9479.94	751.22	9498.8	751.7	9518.22	751.62	9536.69	752.46
9540.27	752.4	9559.53	753.77	9580.37	755.03	9602.58	754.99	9607.16	755.09
9622.65	755.2	9625.65	754.95	9645.91	754.88	9653.62	754.78	9658.42	754.57
9674.48	753.4	9678.63	753.22	9691.35	753.3	9707.31	753.58	9730.77	753.51
9741.35	753.3	9745.1	753.65	9753.61	753.3	9760.45	752.73	9766.05	752.62
9777.59	752.1	9791.28	750.12	9795.03	749.85	9808.76	748.24	9831.47	748.85
9838.83	748.9	9882.63	744.86	9893.52	745.39	9905.86	745.48	9932.11	745.54
9958.77	745.1	9972.46	744.62	9986.74	743.94	10000	743.04	10008.67	743.43
10015.81	743.9	10029.21	744.69	10032.91	744.51	10052.81	744.83	10082.13	745.68
10109.5	746.7	10114.98	747.14	10134.92	747.93	10141.12	749.01	10151.26	750.03
10163.53	751.5	10169.76	751.57	10176.78	752.01	10209.5	752.06	10227.37	752.04
10240.92	751.8	10263.26	751.64	10284.54	751.56	10323.27	750.64	10350.16	750.14
10383.15	750.6	10394.31	750.7	10421.22	751.81	10449.47	751.52	10468.18	750.4
10474.95	750.1	10506.19	750.71	10559.75	751.17	10565.03	751.33	10605.19	752.06
10621.29	751.2	10632.1	751.54	10645.09	753.18	10697.65	754.52	10702.24	754.74
10720.89	755.4	10746.08	756.16	10765.85	757.01	10776.5	757.11	10789.3	757.11
10800.19	757.3	10815.64	756.93	10829.36	757.01	10846.73	756.48		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9011.2	.045	9932.11	.06	10082.13	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9932.11	10082.13	0	0	0	.3	.5

SUMMARY OF MANNING'S N VALUES

River:Cemetery Wash

Reach	River Sta.	n1	n2	n3
Reach-1	1.530	.04	.05	.045
Reach-1	1.429	.04	.05	.045
Reach-1	1.335	.04	.05	.045
Reach-1	1.244	.04	.05	.045
Reach-1	1.151	.04	.05	.045
Reach-1	1.052	.04	.05	.045
Reach-1	.959	.035	.055	.04
Reach-1	.861	.035	.055	.04
Reach-1	.754	.035	.055	.04
Reach-1	0.682	.035	.055	.04
Reach-1	.592	.035	.055	.04
Reach-1	0.497	.035	.055	.04
Reach-1	0.395	.035	.055	.04
Reach-1	0.292	.035	.055	.04
Reach-1	0.202	.035	.055	.04
Reach-1	0.106	.035	.055	.04
Reach-1	.001	.045	.06	.04

SUMMARY OF REACH LENGTHS

River: Cemetery Wash

Reach	River Sta.	Left	Channel	Right
Reach-1	1.530	529.45	529.45	529.45
Reach-1	1.429	497.16	497.16	497.16
Reach-1	1.335	480.17	480.17	480.17
Reach-1	1.244	492.07	492.07	492.07
Reach-1	1.151	522.08	522.08	522.08
Reach-1	1.052	495.09	495.09	495.09
Reach-1	.959	516.87	516.87	516.87
Reach-1	.861	565.33	565.33	565.33
Reach-1	.754	376.99	376.99	376.99
Reach-1	0.682	479.13	479.13	479.13
Reach-1	.592	496.88	496.88	496.88
Reach-1	0.497	539.03	539.03	539.03
Reach-1	0.395	544.67	544.67	544.67
Reach-1	0.292	477.12	477.12	477.12
Reach-1	0.202	505.28	505.28	505.28
Reach-1	0.106	550	554.4	550
Reach-1	.001	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Cemetery Wash

Reach	River Sta.	Contr.	Expan.
Reach-1	1.530	.1	.3
Reach-1	1.429	.1	.3
Reach-1	1.335	.1	.3
Reach-1	1.244	.1	.3
Reach-1	1.151	.1	.3
Reach-1	1.052	.1	.3
Reach-1	.959	.1	.3
Reach-1	.861	.1	.3
Reach-1	.754	.1	.3
Reach-1	0.682	.1	.3
Reach-1	.592	.1	.3
Reach-1	0.497	.1	.3
Reach-1	0.395	.1	.3
Reach-1	0.292	.1	.3
Reach-1	0.202	.1	.3
Reach-1	0.106	.1	.3
Reach-1	.001	.3	.5

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	1.530	790.00	791.68	792.58	792.34	792.65	0.01	2.45	373.21	614.11	0
Reach-1	1.530	790.00	791.68	792.83	792.83	793.36	0.04	5.89	135.65	130.00	1
Reach-1	1.429	790.00	788.00	789.99		790.06	0.00	2.41	385.04	358.49	0
Reach-1	1.429	790.00	788.00	790.58		790.65	0.00	2.18	365.37	160.00	0
Reach-1	1.335	790.00	786.80	788.11	787.54	788.19	0.00	2.33	354.61	395.34	0
Reach-1	1.335	790.00	786.81	788.67		788.95	0.01	4.30	183.62	100.00	1
Reach-1	1.244	790.00	784.00	784.73	784.50	784.81	0.01	2.26	349.41	570.44	1
Reach-1	1.244	790.00	784.00	785.63		785.75	0.00	2.75	286.96	180.00	0

Reach-1	1.151		790.00	780.00	780.98	780.55	781.04	0.01	2.04	389.73	484.35	0
Reach-1	1.151		790.00	780.00	781.64	781.24	782.00	0.01	4.81	164.29	100.00	1
Reach-1	1.052		790.00	776.00	777.81		777.97	0.01	3.29	248.23	174.47	0
Reach-1	1.052		790.00	776.00	777.99		778.13	0.00	2.99	267.17	148.00	0
Reach-1	.959		790.00	773.05	775.34		775.46	0.00	2.88	292.23	210.63	0
Reach-1	.959		790.00	773.05	775.61		775.79	0.01	3.41	230.88	100.00	0
Reach-1	.861		790.00	770.80	772.60	772.11	772.73	0.01	2.97	274.82	235.34	0
Reach-1	.861		790.00	770.80	773.19		773.33	0.00	2.96	264.88	125.00	0
Reach-1	.754		790.00	763.45	768.92	768.05	769.21	0.01	4.59	188.99	96.54	0
Reach-1	.754		790.00	763.45	769.79	768.30	770.28	0.01	5.66	140.81	35.00	0
Reach-1	0.682		790.00	761.91	765.17	765.17	765.60	0.02	5.73	155.56	184.73	1
Reach-1	0.682		790.00	761.91	766.07		766.72	0.01	6.50	123.06	60.00	1
Reach-1	.592		790.00	757.85	763.63		763.73	0.00	2.69	316.92	126.50	0
Reach-1	.592		790.00	757.85	764.57		764.73	0.00	3.29	243.70	55.00	0
Reach-1	0.497		790.00	756.93	761.81		762.21	0.01	5.50	161.76	94.48	1
Reach-1	0.497		790.00	756.93	762.64		763.16	0.01	5.89	138.47	35.00	1
Reach-1	0.395		790.00	753.40	759.58	757.48	759.80	0.00	4.03	210.27	63.85	0
Reach-1	0.395		790.00	753.40	759.98	757.45	760.37	0.00	5.07	159.17	30.00	0
Reach-1	0.292		790.00	751.15	755.16	755.16	756.07	0.04	7.64	103.41	107.00	1
Reach-1	0.292		790.00	751.15	755.51		756.13	0.02	6.32	124.94	64.77	1
Reach-1	0.202		790.00	748.70	754.93		754.95	0.00	0.91	851.38	282.34	0
Reach-1	0.202		790.00	748.70	755.80		755.82	0.00	0.75	906.75	200.00	0
Reach-1	0.106		790.00	745.55	754.91		754.92	0.00	0.55	1689.14	503.40	0
Reach-1	0.106		790.00	745.55	755.79		755.80	0.00	0.50	1613.99	320.00	0
Reach-1	.001		8988.00	743.04	754.76	748.59	754.80	0.00	1.96	5679.47	1293.31	0
Reach-1	.001		8988.00	743.04	755.66	748.59	755.71	0.00	1.82	5173.34	760.00	0

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach-1	1.530	792.65	792.58	0.07	2.58	0.00	342.98	231.99	215.03	614.11
Reach-1	1.530	793.36	792.83	0.53	2.42	0.14	43.07	740.0		

6.90	130.00									
Reach-1	1.429	790.06	789.99	0.08	1.87	0.00	114.02	596.32	79.66	358.49
Reach-1	1.429	790.65	790.58	0.07	1.67	0.02	73.29	716.56	0.15	160.00
Reach-1	1.335	788.19	788.11	0.08	3.38	0.00	6.95	770.29	12.77	395.34
Reach-1	1.335	788.95	788.67	0.29	3.15	0.05		790.00	100.00	
Reach-1	1.244	784.81	784.73	0.08	3.76	0.00		790.00	570.44	
Reach-1	1.244	785.75	785.63	0.12	3.73	0.02		790.00	180.00	
Reach-1	1.151	781.04	780.98	0.06	3.06	0.01	133.47	656.12	0.41	484.35
Reach-1	1.151	782.00	781.64	0.36	3.80	0.07		790.00	100.00	
Reach-1	1.052	777.97	777.81	0.16	2.50	0.01	3.83	767.36	18.81	174.47
Reach-1	1.052	778.13	777.99	0.14	2.33	0.00	2.20	774.24	13.56	148.00
Reach-1	.959	775.46	775.34	0.12	2.73	0.00	173.56	529.26	87.18	210.63
Reach-1	.959	775.79	775.61	0.18	2.45	0.01	29.91	706.80	53.29	100.00
Reach-1	.861	772.73	772.60	0.13	3.51	0.02	52.41	544.48	193.11	235.34
Reach-1	.861	773.33	773.19	0.14	3.01	0.04	37.11	752.89	125.00	
Reach-1	.754	769.21	768.92	0.28	3.58	0.01	12.22	384.01	393.77	96.54
Reach-1	.754	770.28	769.79	0.49	3.53	0.02	0.03	587.56	202.41	35.00
Reach-1	0.682	765.60	765.17	0.43	0.89	0.00	496.52	260.59	32.89	184.73
Reach-1	0.682	766.72	766.07	0.66	1.85	0.15	244.26	432.22	113.52	60.00
Reach-1	.592	763.73	763.63	0.10	1.49	0.03	116.64	367.10	306.26	126.50
Reach-1	.592	764.73	764.57	0.16	1.54	0.04	123.33	549.95	116.71	55.00
Reach-1	0.497	762.21	761.81	0.40	2.36	0.05	216.21	523.93	49.86	94.48
Reach-1	0.497	763.16	762.64	0.51	2.75	0.04	43.40	697.18	49.41	35.00
Reach-1	0.395	759.80	759.58	0.23	3.67	0.07	124.89	574.67	90.45	63.85
Reach-1	0.395	760.37	759.98	0.39	4.22	0.02	1.01	780.52	8.47	30.00
Reach-1	0.292	756.07	755.16	0.91	0.23	0.27		790.00	107.00	
Reach-1	0.292	756.13	755.51	0.62	0.13	0.18		790.00	64.77	
Reach-1	0.202	754.95	754.93	0.01	0.03	0.00	300.66	115.05	374.29	282.34
Reach-1	0.202	755.82	755.80	0.01	0.02	0.00	327.08	111.66	351.26	200.00
Reach-1	0.106	754.92	754.91	0.00	0.11	0.00	243.30	106.29	440.41	503.40
Reach-1	0.106	755.80	755.79	0.00	0.08	0.00	305.80	106.25	377.95	320.00

Reach-1 .001 754.80 754.76 0.04 2569.04 2978.77
3440.20 1293.31
Reach-1 .001 755.71 755.66 0.05 2498.04 3024.57
3465.39 760.00

Profile Output Table - Encroachment 1

Reach	River Sta	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Wdth Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	1.530	792.58		792.65	614.11	342.98	231.99	215.03		9948.98	10068.25	
Reach-1	1.530	792.83	0.26	793.36	130.00	43.07	740.03	6.90	9940.00	9948.98	10068.25	10070.00
Reach-1	1.429	789.99		790.06	358.49	114.02	596.32	79.66		9941.94	10079.81	
Reach-1	1.429	790.58	0.59	790.65	160.00	73.29	716.56	0.15	9920.00	9941.94	10079.81	10080.00
Reach-1	1.335	788.11		788.19	395.34	6.95	770.29	12.77		9840.00	10116.89	
Reach-1	1.335	788.67	0.56	788.95	100.00		790.00	9950.00	9840.00	10116.89	10050.00	
Reach-1	1.244	784.73		784.81	570.44		790.00	9578.00	10275.00			
Reach-1	1.244	785.63	0.90	785.75	180.00		790.00	9910.00	9578.00	10275.00	10090.00	
Reach-1	1.151	780.98		781.04	484.35	133.47	656.12	0.41		9790.17	10159.00	
Reach-1	1.151	781.64	0.67	782.00	100.00		790.00	9950.00	9790.17	10159.00	10050.00	
Reach-1	1.052	777.81		777.97	174.47	3.83	767.36	18.81		9933.30	10072.50	
Reach-1	1.052	777.99	0.19	778.13	148.00	2.20	774.24	13.56	9932.00	9933.30	10072.50	10080.00
Reach-1	.959	775.34		775.46	210.63	173.56	529.26	87.18		9974.01	10061.47	
Reach-1	.959	775.61	0.27	775.79	100.00	29.91	706.80	53.29	9970.00	9974.01	10061.47	10070.00
Reach-1	.861	772.60		772.73	235.34	52.41	544.48	193.11		9920.14	10040.00	
Reach-1	.861	773.19	0.59	773.33	125.00	37.11	752.89	9915.00	9920.14	10040.00	10040.00	
Reach-1	.754	768.92		769.21	96.54	12.22	384.01	393.77		9990.04	10013.32	
Reach-1	.754	769.79	0.87	770.28	35.00	0.03	587.56	202.41	9990.00	9990.04	10013.32	10025.00
Reach-1	0.682	765.17		765.60	184.73	496.52	260.59	32.89		9990.41	10013.77	
Reach-1	0.682	766.07	0.90	766.72	60.00	244.26	432.22	113.52	9970.00	9990.41	10013.77	10030.00
Reach-1	.592	763.63		763.73	126.50	116.64	367.10	306.26		9985.70	10018.53	
Reach-1	.592	764.57	0.94	764.73	55.00	123.33	549.95	116.71	9975.00	9985.70	10018.53	10030.00
Reach-1	0.497	761.81		762.21	88.56	216.21	523.93	49.86		9983.17	10011.10	
Reach-1	0.497	762.64	0.83	763.16	35.00	43.40	697.18	49.41	9980.00	9983.17	10011.10	10015.00
Reach-1	0.395	759.58		759.80	63.85	124.89	574.67	90.45		9980.25	10009.00	

```
  Reach-1       0.395              759.98           0.40     760.37        30.00       1.01     780.52
8.47    9980.00    9980.25   10009.00   10010.00

  Reach-1       0.292              755.16                    756.07        58.90                790.00
9978.00   10048.36
  Reach-1       0.292              755.51           0.35     756.13        64.77                790.00
9977.64    9978.00   10048.36   10043.90

  Reach-1       0.202              754.93                    754.95       282.34     300.66     115.05
374.29                9986.03   10011.44
  Reach-1       0.202              755.80           0.87     755.82       200.00     327.08     111.66
351.26    9900.00    9986.03   10011.44   10100.00

  Reach-1       0.106              754.91                    754.92       503.40     243.30     106.29
440.41                9988.35   10011.81
  Reach-1       0.106              755.79           0.88     755.80       320.00     305.80     106.25
377.95    9800.00    9988.35   10011.81   10120.00

  Reach-1       .001               754.76                    754.80      1293.31    2569.04    2978.77
3440.20                9932.11   10082.13
  Reach-1       .001               755.66           0.90     755.71       760.00    2498.04    3024.57
3465.39    9740.00    9932.11   10082.13   10500.00
```

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
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: Unnamed Wash # 3 (Evans Wash)
Project File : Evans.prj
Run Date and Time: 5/13/02 10:02:38 AM

Project in English units

Project Description:
Study name: Gila Bend Area Drainage Master Plan

Study contractors:
Engineering and Environmental Consultants, Inc. and Premier Engineering Corporation

Source of hydrology: Gila Bend Area Floodplain Delineation Study (FCD 90-67) by Burgess & Niple for FCDMC, March 1991

Source of survey:
Gila Bend Area Floodplain Delineation Study (FCD 90-67); new topographic mapping and survey by Cooper Aerial Mapping, Inc., 1999.

FCD Contract
Number: 99-18

Datum: NGVD 1929

PLAN DATA

Plan Title: Unnamed Wash # 3 FW Meth 1
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Evans Wash\Evans.p02

Geometry Title: Unnamed Wash # 3
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Evans Wash\Evans.g01

Flow Title : Unnamed # 3 FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Evans Wash\Evans.f02

Plan Summary Information:

Number of:	Cross Sections =	23	Mulitple Openings =	0
	Culverts =	0	Inline Weirs =	0
	Bridges =	1		

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 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 = False
Left Offset = 0
Right Offset = 0

River = Evans Wash Reach = Reach-1

RS	Profile	Method	Value1	Value2
2.111	PF 2	1	9955	10021
1.998	PF 2	1	9970	10015
1.903	PF 2	1	9983	10020
1.812	PF 2	1	9970	10015
1.728	PF 2	1	9985	10030
1.654	PF 2	1	9965	10021
1.558	PF 2	1	9970	10035
1.460	PF 2	1	9940	10017
1.375	PF 2	1	9975	10020
1.280	PF 2	1	9975	10025
1.185	PF 2	1	9980	10020
1.092	PF 2	1	9960	10023
1.001	PF 2	1	9920	10010
0.901	PF 2	1	9930	10070
0.795	PF 2	1	9750	10120
0.694	PF 2	1	9740	10500
0.686	PF 2	1	9740	10500
0.664	PF 2	1	9900	10270
0.599	PF 2	1	9860	10110
0.508	PF 2	1	9900	10100
0.418	PF 2	1	9825	10155
0.324	PF 2	1	9700	10275
0.228	PF 2	1	9700	10275
0.154	PF 2	1	9280	10190

FLOW DATA

Flow Title: Unnamed # 3 FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Evans Wash\Evans.f02

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
Evans Wash	Reach-1	2.111	1110	1110
Evans Wash	Reach-1	0.694	8988	8988
Evans Wash	Reach-1	0.664	7248	8988
Evans Wash	Reach-1	0.154	8872	8872

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Evans Wash	Reach-1	PF 1	Normal S = .0057	Known WS = 745.89
Evans Wash	Reach-1	PF 2	Normal S = .0057	Known WS = 746.71

GEOMETRY DATA

Geometry Title: Unnamed Wash # 3
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Evans Wash\Evans.g01

CROSS SECTION RIVER: Evans Wash
REACH: Reach-1 RS: 2.111

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9560.78	791.61	9647.32	791.9	9664.42	791.72	9678.76	791.46	9774.63	790.06
9821.47	790.23	9834.74	790.4	9872.09	789.82	9923.09	787.38	9928.4	787.19

```
 9934.23  785.98 9949.61   783.4 9954.77  784.98 9962.58  787.03 9981.52  786.44
 9984.04  786.13   10000   782.910001.32  783.4910006.62  783.23   10021 787.247
10024.34  788.1810045.82  788.1810053.95   787.810086.29  789.4710099.17  789.55
10140.86  790.0710149.25  790.42

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9560.78    .035 9981.52    .055   10021     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.52   10021            597.46  597.46  597.46              .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 1.998

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9784.9   787.7 9799.11  787.44 9821.76  787.31 9838.25  786.89 9860.93  786.49
 9885.47   786.2 9918.54  786.43  9930.4  786.06 9950.95  785.53 9972.95  785.02
 9975.19   784.9 9979.53  783.91 9994.56  779.79   10000  779.56 10004.2  780.97
10012.64     78310027.04  783.4410039.34  783.8910051.63  785.74   10064786.0596
10079.11  786.45 10084.1   786.110105.98  785.7610127.09  787.1310179.03  787.13
10232.85  787.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9784.9    .035 9975.19    .05510012.64     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.1910012.64            502.95  502.95  502.95              .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 1.903

INPUT
Description:
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9895.42  784.59 9927.81   785.9 9928.76  785.86 9953.96   784.7 9977.55   783.8
    9981782.5321    9985 781.062 9994.42   777.6   10000  776.1110003.61  777.23
10017.04   780.310037.91   781.7   10052782.483110065.62  783.2410083.61  783.17
10087.06  783.6110103.64   781.310116.09  782.7510137.72  782.62 10159.1   781.4
10166.74  780.6410177.57   783.710181.35  784.4810192.68  784.5910220.08  785.25
 10292.3  785.0610327.58   784.910392.22  784.53

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9895.42    .035    9985    .05510017.04     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          998510017.04            478.15  478.15  478.15              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 1.812

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9655.81  782.33 9672.21  782.41 9719.19  782.18 9743.84  780.46 9753.26   781.5
 9790.04  781.45 9799.96  781.48 9837.31  781.46 9840.72   781.4    9859777.9753
 9877.55   774.5 9884.31  776.67 9893.09  777.05 9906.13  779.42 9918.08  777.55
 9923.22   776.9 9926.98  777.53 9943.96  779.54 9955.45  778.02 9965.23  777.14
 9987.34   774.9   10000   773.3   10013777.5236   10015778.173410026.84  782.02
10027.87  781.9810043.71  779.7510057.24     77910085.74  779.7210107.36  779.95
10124.26  779.9410137.18  780.4710144.03   780.610216.12  782.1510312.31  782.34

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9655.81    .035 9955.45    .055   10013     .04
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9955.45   10013            442.57  442.57  442.57              .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 1.728

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9833.9  780.57 9882.15  782.36 9885.31  782.65 9920.08   782.5 9958.73  782.14
 9973.72  775.98    9978 774.785 9986.65  772.37   10000  769.94 10011.9   770.5
10016.87  770.3110027.72  772.9810042.14  774.7810052.28  774.4210075.08     774
   10080774.951510085.68  776.0510101.37   778.610135.74  779.2910195.65  780.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9833.9    .035 9986.65    .05510027.72     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.6510027.72            395.6   395.6   395.6              .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 1.654

INPUT
Description:
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9928.83  776.89 9934.28  776.79  9940.9  776.59 9957.18  773.62    9965772.0546
 9968.77   771.3  9975.2770.5546   10000  767.6810013.88  770.85   10021772.1655
10024.65  772.8410046.13  777.1910062.87   777.110122.01  777.4710135.23  777.48
10187.65  777.67

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9928.83    .035  9975.2    .05510013.88     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9975.210013.88            504.97  504.97  504.97              .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 1.558

INPUT
Description:
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9783.42   778.9 9812.19  777.82 9826.64  777.69 9848.89   776.3 9850.02  776.09
 9868.89   773.6 9892.85  770.73 9899.29  769.87 9926.85  769.35 9931.56  769.56
 9935.54   769.4 9954.71  768.99 9979.04  768.62 9987.41   768.6  9994.1  766.26
   10000   764.710007.63   765.810022.74  767.7610060.61  766.5810065.36  766.34
10073.82   767.4   10091769.826710119.13   773.810157.56  774.9310164.57  774.23
10167.13  774.2210175.73   775.710241.92  775.54

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9783.42    .035 9987.41    .05510022.74     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9987.4110022.74            518.83  518.83  518.83              .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 1.460

INPUT
Description:
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9837.46   772.6 9846.87  772.37 9863.07  772.48  9885.7  772.33 9895.38   768.6
    9900766.3719 9903.26   764.8 9914.01  764.89 9935.94  765.15 9955.46  765.26
 9987.99  765.24   10000   761.9   10017766.194210038.52  771.6310065.33  771.76
10085.45  772.15
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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9837.46    .035 9987.99    .055   10017     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9987.99   10017            444.51  444.51  444.51              .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 1.375

INPUT
Description:
Station Elevation Data     num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9932.38  767.13 9937.54  767.58 9949.74   765.6    9957763.7642 9962.79   762.3
 9971.68  761.95 9989.19  760.05   10000  758.3210014.38     76110021.46   762.9
10042.22  759.21   10056763.844510074.63  770.1110085.18  770.8510095.06   771.2
   10123  771.4710126.29  770.1710136.44  770.1110147.86  771.6410229.15   771.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9932.38    .035 9971.68    .05510021.46     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.6810021.46            504.29  504.29  504.29              .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 1.280

INPUT
Description:
Station Elevation Data     num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9899.66  765.63 9904.04  766.44 9920.33   766.1 9933.55  764.05 9950.84  762.46
 9961.12  761.61 9964.76  760.73    9981758.5166 9990.66   757.2   10000   755.3
 10021.4757.963310029.65  758.9910038.75     761   10041761.571710050.95   764.1
10059.33   764.110077.06  764.7710094.74  765.5410101.29   765.710116.87  765.62
10121.43   765.510154.17  765.7310157.87  765.07

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9899.66    .035    9981    .055 10021.4     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9981 10021.4            499.86  499.86  499.86              .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 1.185

INPUT
Description:
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9943.07  762.51 9948.41  762.43 9955.28  761.97    9971759.1895    9980757.5976
   10000  754.0610009.98     75510022.72  755.9510038.31  758.9910044.28  759.71
10052.12  758.0410058.42   757.910065.77  755.5310085.74  761.56

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9943.07    .035    9980    .05510022.72     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          998010022.72            491.64  491.64  491.64              .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 1.092

INPUT
Description:
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9880.89  762.45 9890.03  762.69 9918.94  760.96 9937.42   759.9    9952757.4658
 9966.77     755   10000  750.8410014.44  753.6810025.31  757.4810031.18  759.34
10038.32   759.710050.37  760.67
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9880.89    .035 9966.77    .05510014.44     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.7710014.44            481.86  481.86  481.86              .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 1.001

INPUT
Description:
Station Elevation Data     num=       42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9418.94   761.7 9428.15  761.82 9443.39  761.49 9516.51  761.09    9541  760.82
 9553.43   760.6 9586.66  760.61 9590.27  760.85 9600.18  760.96 9624.75  761.37
 9661.38   761.8 9678.41  761.97 9685.37  761.79 9695.65  761.22 9714.85  759.95
 9724.42   760.4 9743.41  761.07 9756.16  760.78 9781.83  759.86 9803.84  759.15
  9808.9   758.9 9817.12   758.8 9836.21  756.87 9855.38  755.05  9861.6  754.34
 9869.46   753.7    9876   752.8 9882.09  754.28 9889.35  754.85 9892.59  754.22
 9901.92   753.2 9941.07   752.8 9950.56  753.04 9979.53  753.59 9997.87   750.4
   10000   750.110010.62   754.310028.84  760.3610039.62  760.52 10060.7  760.63
10084.84   760.110114.02  759.81

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9418.94    .035 9979.53    .05510010.62     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.5310010.62            526.19  526.19  526.19              .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 0.901

INPUT
Description:
Station Elevation Data     num=       24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9846.23   758.9 9849.41  758.95 9880.46  758.78 9902.53   758.4 9916.14  758.81
 9929.42  755.57 9940.08  752.66 9949.17  751.53 9963.34   750.2 9967.73  749.62
 9969.95  749.86  9989.8  749.19   10000  748.1210006.26  748.810017.83  750.38
10040.02  750.4910062.28  750.41 10090.4  750.4710104.67  756.310106.71     757
10115.98  756.9210129.62  756.6610139.33  757.7610165.25  757.8

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9846.23    .035 9963.34    .05510017.83     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9963.3410017.83            558.58  558.58  558.58              .1       .3
Ineffective Flow      num=        1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 0.795

INPUT
Description:
Station Elevation Data     num=       48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9591.7   757.1  9606.7     752    9609   750.8  9613.4   751.4    9641  752.25
    9650  752.01  9661.7     751 9668.65  751.23  9673.2  751.73 9688.06   751.7
 9695.07  751.45 9710.37   750.6 9725.54  750.88 9732.73  750.87 9751.53  750.54
 9765.71  749.84 9770.58   749.6 9782.39  747.99 9794.31     748 9813.71  747.81
 9823.06  748.09 9829.17   750.3 9837.15  751.57 9847.72  751.73 9855.84   752.2
 9869.45  753.57 9876.78   754.2 9893.42  754.45 9904.31  754.41 9917.64   753.1
 9933.61   750.5 9938.52   750.7 9950.63  750.33 9966.73  749.06 9977.05  748.67
 9985.74  747.15   10000   745.210010.78  747.4110012.93  747.97 10017.3  748.22
10042.64  748.7210047.93     75110054.91  752.5610061.91  752.9310073.59  754.16
10086.46  754.7810094.09   754.910129.56  755.67

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
  9591.7    .035 9977.05    .055 10017.3     .04
```

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9977.05	10017.3	535.37	535.37	535.37	.1	.3

CROSS SECTION RIVER: Evans Wash
REACH: Reach-1 RS: 0.694

INPUT
Description:
Station Elevation Data num= 113

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9011.2	758.7	9056.3	758.45	9107.12	757.96	9123.05	758.12	9132.65	757.99
9170.47	757.6	9176.91	757.09	9189.77	757.17	9198.68	757.02	9239.31	756.61
9267.72	755.9	9293.42	755.62	9299.24	755.46	9326.06	755	9334.61	754.61
9356.76	753.5	9384.26	752.99	9405.22	752.43	9423.45	752.16	9453.66	751.15
9470.68	751.4	9479.94	751.22	9498.8	751.7	9518.22	751.62	9536.69	752.46
9540.27	752.4	9559.53	753.77	9580.37	755.03	9602.58	754.99	9607.16	755.09
9622.65	755.2	9625.65	754.95	9645.91	754.88	9653.62	754.78	9658.42	754.57
9674.48	753.4	9678.63	753.22	9691.35	753.3	9707.31	753.58	9730.77	753.51
9741.35	753.3	9745.1	753.65	9753.61	753.3	9760.45	752.73	9766.05	752.62
9777.59	752.1	9791.28	750.12	9795.03	749.85	9808.76	748.24	9831.47	748.85
9838.83	748.9	9882.63	744.86	9893.52	745.39	9905.86	745.48	9932.11	745.54
9958.77	745.1	9972.46	744.62	9986.74	743.94	10000	743.04	10008.67	743.43
10015.81	743.9	10029.21	744.69	10032.91	744.51	10052.81	744.83	10082.13	745.68
10109.5	746.7	10114.98	747.14	10134.92	747.93	10141.12	749.01	10151.26	750.03
10163.53	751.5	10169.76	751.57	10176.78	752.01	10209.5	752.06	10227.37	752.04
10240.92	751.8	10263.26	751.64	10284.54	751.56	10323.27	750.64	10350.16	750.14
10383.15	750.6	10394.31	750.7	10421.22	751.81	10449.47	751.52	10468.18	750.4
10474.95	750.1	10506.19	750.71	10559.75	751.17	10565.03	751.33	10605.19	752.06
10621.29	751.2	10632.1	751.54	10645.09	753.18	10697.65	754.52	10702.24	754.74
10720.89	755.4	10746.08	756.16	10765.85	757.01	10776.5	757.11	10789.3	757.11
10800.19	757.3	10860	756	10930	754	11050	753.75	11220	754
11320	754	11350	752	11420	750	11600	750	11640	752
11710	754	11860	754.5	12100	760				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9011.2	.045	9932.11	.06	10082.13	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9932.11	10082.13	161.91	161.91	161.91	.3	.5

BRIDGE RIVER: Evans Wash
REACH: Reach-1 RS: 0.686

INPUT
Description:
Distance from Upstream XS = 40
Deck/Roadway Width = 13.5
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 12

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
8973	758.62		9473	756.22		9965.1	754.64	752.03
10000	754.53	752.03	10034.9	754.46	752.03	10340	753.9	
10600	753.8		11100	753.4		11340	753	
11490	753.5		11740	754.1		12030	754.6	

Upstream Bridge Cross Section Data
Station Elevation Data num= 113

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9011.2	758.7	9056.3	758.45	9107.12	757.96	9123.05	758.12	9132.65	757.99
9170.47	757.6	9176.91	757.09	9189.77	757.17	9198.68	757.02	9239.31	756.61
9267.72	755.9	9293.42	755.62	9299.24	755.46	9326.06	755	9334.61	754.61
9356.76	753.5	9384.26	752.99	9405.22	752.43	9423.45	752.16	9453.66	751.15
9470.68	751.4	9479.94	751.22	9498.8	751.7	9518.22	751.62	9536.69	752.46
9540.27	752.4	9559.53	753.77	9580.37	755.03	9602.58	754.99	9607.16	755.09
9622.65	755.2	9625.65	754.95	9645.91	754.88	9653.62	754.78	9658.42	754.57
9674.48	753.4	9678.63	753.22	9691.35	753.3	9707.31	753.58	9730.77	753.51
9741.35	753.3	9745.1	753.65	9753.61	753.3	9760.45	752.73	9766.05	752.62
9777.59	752.1	9791.28	750.12	9795.03	749.85	9808.76	748.24	9831.47	748.85
9838.83	748.9	9882.63	744.86	9893.52	745.39	9905.86	745.48	9932.11	745.54
9958.77	745.1	9972.46	744.62	9986.74	743.94	10000	743.04	10008.67	743.43
10015.81	743.9	10029.21	744.69	10032.91	744.51	10052.81	744.83	10082.13	745.68
10109.5	746.7	10114.98	747.14	10134.92	747.93	10141.12	749.01	10151.26	750.03
10163.53	751.5	10169.76	751.57	10176.78	752.01	10209.5	752.06	10227.37	752.04
10240.92	751.8	10263.26	751.64	10284.54	751.56	10323.27	750.64	10350.16	750.14

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10383.15   750.610394.31   750.710421.22  751.8110449.47  751.5210468.18   750.4
10474.95   750.110506.19  750.7110559.75  751.1710565.03  751.3310605.19  752.06
10621.29   751.2 10632.1  751.5410645.09  753.1810697.65  754.5210702.24  754.74
10720.89   755.410746.08  756.1610765.85  757.01 10776.5  757.11 10789.3  757.11
10800.19   757.3   10860     756   10930     754   11050  753.75   11220     754
   11320     754   11350     752   11420     750   11600     750   11640     752
   11710     754   11860   754.5   12100     760

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9011.2    .045 9932.11     .0610082.13     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9932.1110082.13              .3       .5

Downstream  Deck/Roadway Coordinates
    num=      12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8973  758.62            9473  756.22          9965.1  754.64  752.03
   10000  754.53  752.03 10034.9  754.46  752.03   10340   753.9
   10600   753.8           11100   753.4           11340     753
   11490   753.5           11740   754.1           12030   754.6

Downstream Bridge Cross Section Data
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9752.76  752.23  9770.7  752.77 9781.28  752.52 9792.83   752.1 9797.27  752.11
 9808.71  752.56 9822.59  752.77 9827.38  752.76 9843.98   752.3  9853.6   752.2
 9867.75   751.8 9883.34  751.23 9893.42  750.21 9908.67   750.8 9912.18  750.67
 9937.76  749.46 9947.19   748.2 9964.14  745.58 9977.29   743.8 9992.33  742.71
   10000  742.5910009.42  742.8710040.16  744.2810082.75  744.310100.06  750.08
10121.33  751.1510132.33  751.0210136.54  750.7710144.15  750.110154.91  748.57
10164.11  747.8110177.86  746.9410182.27  746.56 10211.5  747.210224.94  747.37
10230.53     74810240.95  748.6210253.48  748.6410277.83  750.910284.87  751.09
10300.45  750.9510308.79  750.7110316.75  750.7210325.97    75110342.44  750.75
10343.49  750.9410349.62  751.0210355.82  751.3110361.01  751.310378.65  751.43
10391.86  748.8910397.13  748.2810418.54  748.5710432.28  748.710434.32  749.03
 10451.4  749.5710464.99  749.6410477.42   750.610507.83  752.4 10527.1  753.71
10539.94   754.310572.84  755.3610608.11  756.4510641.79  757.710655.71  758.36

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9752.76    .045 9908.67     .0610121.33     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9908.6710121.33              .1       .3

Upstream Embankment side slope              =       2 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  4

Pier Data
Pier Station     Upstream=9978.625    Downstream=9978.625
Upstream     num=       2
    Width   Elev    Width   Elev
        1  742.99       1  752.03
Downstream     num=       2
    Width   Elev    Width   Elev
        1  742.99       1  752.03

Pier Data
Pier Station     Upstream=9992.875    Downstream=9992.875
Upstream     num=       2
    Width   Elev    Width   Elev
        1  742.99       1  752.03
Downstream     num=       2
    Width   Elev    Width   Elev
        1  742.99       1  752.03

Pier Data
```

```
Pier Station      Upstream=10007.13    Downstream=10007.13
Upstream      num=        2
    Width   Elev    Width   Elev
       1  742.99       1  752.03
Downstream      num=        2
    Width   Elev    Width   Elev
       1  742.99       1  752.03

Pier Data
Pier Station      Upstream=10021.38    Downstream=10021.38
Upstream      num=        2
    Width   Elev    Width   Elev
       1  742.99       1  752.03
Downstream      num=        2
    Width   Elev    Width   Elev
       1  742.99       1  752.03

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
       Yarnell                 KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 0.664

INPUT
Description:
Station Elevation Data     num=       65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9752.76  752.23  9770.7  752.77 9781.28  752.52 9792.83   752.1 9797.27  752.11
 9808.71  752.56 9822.59  752.77 9827.38  752.76 9843.98   752.3  9853.6   752.2
 9867.75   751.8 9883.34  751.23 9893.42  750.21 9908.67   750.8 9912.18  750.67
 9937.76  749.46 9947.19   748.2 9964.14  745.58 9977.29   743.8 9992.33  742.71
   10000  742.5910009.42  742.8710040.16  744.2810082.75  744.310100.06  750.08
10121.33  751.1510132.33  751.0210136.54  750.7710144.15  750.110154.91  748.57
10164.11  747.8110177.86  746.9410182.27  746.56 10211.5  747.210224.94  747.37
10230.53     74810240.95  748.6210253.48  748.6410277.83  750.910284.87  751.09
10300.45  750.9510308.79  750.7110316.75  750.7210325.97    75110342.44  750.75
10343.49  750.9410349.62  751.0210355.82  751.3110361.01  751.310378.65  751.43
10391.86  748.8910397.13  748.2810418.54  748.5710432.28  748.710434.32  749.03
 10451.4  749.5710464.99  749.6410477.42   750.610507.83  752.4 10527.1  753.71
10539.94   754.310572.84  755.3610608.11  756.4510641.79  757.710655.71  758.36

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9752.76    .045 9908.67     .0610121.33     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9908.6710121.33           341.64  341.64  341.64             .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 0.599

INPUT
Description:
Station Elevation Data     num=       51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9536.05  752.53     9557   751.9  9602.1   751.8 9649.22  751.97 9659.54   751.9
 9676.13   751.8 9708.53  751.58 9713.37  751.81 9745.78  751.05 9755.58   750.1
 9779.21  749.46 9789.27  749.01 9800.69  749.11 9808.88  749.19 9825.14   748.8
```

```
 9839.34  747.75 9858.96  745.43 9864.24  745.62 9882.36  745.79 9889.39   745.5
 9904.64  743.85 9913.78  744.44  9922.8  744.07 9933.19  744.08 9936.31   744.4
 9949.01  743.79 9961.58   743.3 9992.41  741.11   10000  740.5310003.14   740.9
   10024744.196410040.16  746.7510053.64  746.3910068.88  745.7110075.86  744.86
10081.11     74510092.44  745.2810120.91  749.84 10124.5  750.3410141.88  751.38
10157.91   751.1 10160.1  751.1110199.17     75010240.84     748   10251     746
10255.33  745.6510259.75   746.110267.89  748.0510310.11     75010461.46  751.94
10519.65  754.01

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9536.05    .045 9936.31     .06   10024     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9936.31   10024            477.8   477.8   477.8              .1       .3

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 0.508

INPUT
Description:
Station Elevation Data     num=      57
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9785.7  748.27 9795.92   748.2 9806.17  747.98 9815.11  747.37 9840.78   746.4
 9861.22  746.13 9879.11   745.7 9895.54  745.08 9924.18   741.5 9934.62  741.79
 9944.74  741.34 9953.41   741.4 9976.72  742.15   10000     73910009.26  739.43
10031.44  740.14   10048742.335110053.77   743.110056.01  743.2910079.46  743.04
10085.81   743.610113.82  746.6710126.18   747.610147.18  747.6910165.67  747.84
10189.41  747.6710192.36  747.5710197.95   746.810214.43  746.3310221.04  746.55
10231.43  746.4810239.26  746.78 10244.6   746.610252.57  746.6710261.19  746.48
10279.47  747.4610321.31   747.6 10339.1   747.610361.28  748.2110388.95  748.09
 10413.5  747.7110421.38  747.7810447.15   747.510459.41  747.56   10476  748.37
10481.16  748.39 10526.5  749.2910545.64   749.610568.39  750.5910585.79  751.54
10595.01  751.9710608.22  752.8510640.69   754.710654.51  755.1710685.68  756.55
10711.66  757.4710723.63  757.07

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9785.7    .045 9976.72     .06   10048     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.72   10048            478.17  478.17  478.17              .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Evans Wash
REACH: Reach-1             RS: 0.418

INPUT
Description:
Station Elevation Data     num=      80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9097.69   747.2 9145.55  746.76 9202.91  746.19 9219.71  745.81 9233.01  745.69
 9245.75   745.4 9250.71  744.96 9254.66  744.84 9266.68  742.89 9270.24  742.46
 9287.48   745.9 9327.62  745.79 9342.39  745.69 9397.06  745.59 9448.55  745.52
 9521.34     745 9539.23   745.5 9550.78  745.52 9564.37  745.44 9604.22  745.06
 9626.98     745 9647.21  744.79 9679.95  744.63 9691.16  743.63 9696.98  742.93
 9712.81   743.4 9722.17  743.36 9741.33  742.78 9766.77  742.32 9786.12  742.25
 9814.15   742.3 9845.89  741.84 9858.47  741.18 9882.22   739.8 9905.45  741.94
 9918.62   743.1 9922.32  743.05 9938.16   742.1 9962.32  740.42 9991.43  739.22
 9994.46     739   10000  738.5710031.12  740.0210042.59  740.2310090.03  740.72
 10108.7     74110118.86  741.6110133.81  743.0910150.78  744.5710164.38  745.47
10169.84   745.510196.66  745.2210220.48   745.510235.09  745.5310245.18  745.32
 10280.1   744.210286.77  743.8210294.14  743.1610298.58  743.5710304.11  743.77
10323.87   743.910337.27  744.1710387.88  745.3410421.45  746.4710429.04  746.49
10474.07   745.810488.25  745.6210504.89  745.11 10528.3  745.8210562.59   746.3
10577.09   746.510581.84  746.6510657.75  748.2210666.91  748.4710693.77  749.83
10707.62   749.910743.21  751.3910756.63  752.13 10761.1  752.6410797.71  753.32

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9097.69    .045 9962.32     .0610042.59     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9962.3210042.59            494.75  494.75  494.75              .1       .3
```

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888		F	
888		F	

CROSS SECTION RIVER: Evans Wash
REACH: Reach-1 RS: 0.324

INPUT
Description:
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9354.13	743.6	9382.7	742.62	9393.25	741.89	9414.97	740.97	9423.55	739.44
9433.32	739	9437.13	738.99	9453.45	741.51	9463.14	743.17	9499.17	743.34
9504.66	743.7	9513.88	743.4	9604.73	741.05	9614.89	739.75	9626.7	740.27
9635.73	740.5	9653.73	742.25	9666.24	743.16	9677.92	743.28	9695.92	743.06
9721.33	742.9	9760.92	741.98	9773.75	741.4	9809.68	740.77	9823.78	740.56
9838.65	740	9842.32	739.97	9874.6	739.27	9883.31	738.81	9899.34	737.78
9901.72	737.8	9927.77	738.12	9937.91	738.52	9971.09	738.82	9973.95	738.81
9994.78	737.1	10000	736.75	10015.12	739.15	10030.75	738.63	10042.59	738.71
10073.81	738.71	10084.55	739.24	10100.43	740.31	10109.35	740.27	10121.85	739.31
10144.33	739.31	10162.56	739.75	10203.49	740.51	10213.26	740.46	10229.54	739.72
10244.48	739.31	10257.98	738.89	10263.65	738.61	10284.84	739.68	10292.84	739.92
10313.25	740.21	10317.46	740.61	10336.71	741.28	10343.96	741.04	10351.41	741.22
10352.71	741.41	10375.27	741.83	10381.31	741.53	10413.77	742.21	10419.94	742.47
10429.62	742.51	10436.82	742.74	10511.15	744.28	10526.38	744.91	10571.25	746.9
10583.35	747.51	10593.24	747.93	10621.11	750.17	10637.84	751.08	10655.29	751.68
10668.2	752								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9354.13	.045	9973.95	.06	10015.12	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9973.95	10015.12	506.35	506.35	506.35	.1	.3

CROSS SECTION RIVER: Evans Wash
REACH: Reach-1 RS: 0.228

INPUT
Description:
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9595.02	741.8	9618.85	741.26	9636.27	740.29	9706.96	739.48	9722.15	739.51
9728.77	739.7	9764.74	740.37	9769.46	740.23	9807.1	739.77	9813.81	739.73
9844.22	739.4	9877.1	737.47	9883.75	737.14	9909.54	738.73	9922.35	739.09
9930.39	739.2	9935.18	738.97	9941.31	738.51	9961	736.82	59974.28	735.69
9983.73	735.22	9992.66	735.2	10000	734.52	10004.32	735.13	10008.64	735.91
10017.63	737.03	10097.1	737.11	10101.59	737.15	10113.72	736.62	10129.29	737.46
10174.55	737.21	10197.53	736.91	10219.12	737.28	10231.46	737.35	10245.84	737.09
10261.84	736.96	10321.83	737.9	10333	737.99	10338.95	738.16	10354.27	738.4
10381.93	739.49	10402.32	740.5	10434.6	740.95	10452.84	741.42	10460.22	741.25
10485.79	740.42	10491.59	741.41	10495.73	741.75	10510.03	741.66	10516.72	741.37
10524.22	742.41	10527.28	742.61	10544.75	743.33	10562.78	744.36	10572.48	745.19
10581.23	746.11	10587.39	746.91	10619.65	750.64	10622.51	750.88	10629.19	750.07
10634.38	751.55	10636.73	751.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9595.02	.045	9961	.06	10017.63	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9961	10017.63	392.99	392.99	392.99	.1	.3

CROSS SECTION RIVER: Evans Wash
REACH: Reach-1 RS: 0.154

INPUT
Description: Same x-section as 1.865 on Hacker
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9095.24	743.87	9111.79	739.53	9116.23	738.71	9120.32	738.75	9133.88	738
9136.34	738.17	9150.11	738.09	9165.05	737.53	9196.72	737.26	9200.46	737.1
9227.66	737.25	9240.02	737.24	9255.27	737.35	9278.74	737.41	9289.4	736.8
9308.95	736.19	9335.37	735.91	9360.76	735.51	9364.21	735.56	9402.5	736.5
9417.25	735.06	9433.12	733.14	9450.48	733.38	9472.26	731.01	9481.12	731

9498.69	733.6	9508.85	733.65	9515.3	734.04	9547.05	734.41	9584.12	735.2
9596.61	735.61	9628.78	737.78	9635.56	737.93	9662.63	737.76	9699.04	738.4
9701.26	738.38	9710.84	739.44	9716.7	738.45	9747.27	737.74	9754.44	738.3
9758.27	738.35	9762.03	737.99	9768.27	737.68	9787.2	737.43	9802.47	737.6
9807.01	737.53	9826.08	736.63	9846.3	735.79	9859.87	737.09	9871.4	737.7
9877.68	737.81	9884.52	737.07	9896.61	736.72	9902.15	736.7	9913.32	736.7
9916.83	736.97	9927.69	737.05	9938.3	736.83	9948.98	736.38	9957.84	736.1
9963.84	735.65	9968.42	735.54	9978.1	734.9	10000	731.5	10018.03	736.2
10021.7	736.22	10062.72	736.47	10080.75	736.19	10139.14	734.7	10161.89	734.4
10180.35	734.26	10196.66	735.82	10213.55	735.98	10221.69	735.46	10240.52	735.5
10249.9	735.68	10258.46	735.63	10260.59	735.81	10267.62	735.81	10274.28	736.2
10311.93	742.56	10320.08	744.14	10322.15	744.35	10343.46	741.51	10356.05	742.3
10365.63	741.99	10370.91	741.47	10390.43	741.6	10400.68	742.94	10408.25	743.8
10426.79	745.07	10438.41	746.24	10462.36	748.08				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9095.24	.045	9402.5	.06	9628.78	.045	9957.84	.06	10196.66	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9963.84	10021.7	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Evans Wash

Reach	River Sta.	n1	n2	n3	n4	n5
Reach-1	2.111	.035	.055	.04		
Reach-1	1.998	.035	.055	.04		
Reach-1	1.903	.035	.055	.04		
Reach-1	1.812	.035	.055	.04		
Reach-1	1.728	.035	.055	.04		
Reach-1	1.654	.035	.055	.04		
Reach-1	1.558	.035	.055	.04		
Reach-1	1.460	.035	.055	.04		
Reach-1	1.375	.035	.055	.04		
Reach-1	1.280	.035	.055	.04		
Reach-1	1.185	.035	.055	.04		
Reach-1	1.092	.035	.055	.04		
Reach-1	1.001	.035	.055	.04		
Reach-1	0.901	.035	.055	.04		
Reach-1	0.795	.035	.055	.04		
Reach-1	0.694	.045	.06	.04		
Reach-1	0.686	Bridge				
Reach-1	0.664	.045	.06	.04		
Reach-1	0.599	.045	.06	.04		
Reach-1	0.508	.045	.06	.04		
Reach-1	0.418	.045	.06	.04		
Reach-1	0.324	.045	.06	.04		
Reach-1	0.228	.045	.06	.04		
Reach-1	0.154	.045	.06	.045	.06	.05

SUMMARY OF REACH LENGTHS

River: Evans Wash

Reach	River Sta.	Left	Channel	Right
Reach-1	2.111	597.46	597.46	597.46
Reach-1	1.998	502.95	502.95	502.95
Reach-1	1.903	478.15	478.15	478.15
Reach-1	1.812	442.57	442.57	442.57
Reach-1	1.728	395.6	395.6	395.6
Reach-1	1.654	504.97	504.97	504.97
Reach-1	1.558	518.83	518.83	518.83
Reach-1	1.460	444.51	444.51	444.51
Reach-1	1.375	504.29	504.29	504.29
Reach-1	1.280	499.86	499.86	499.86
Reach-1	1.185	491.64	491.64	491.64
Reach-1	1.092	481.86	481.86	481.86

Reach-1	1.001	526.19	526.19	526.19
Reach-1	0.901	558.58	558.58	558.58
Reach-1	0.795	535.37	535.37	535.37
Reach-1	0.694	161.91	161.91	161.91
Reach-1	0.686	Bridge		
Reach-1	0.664	341.64	341.64	341.64
Reach-1	0.599	477.8	477.8	477.8
Reach-1	0.508	478.17	478.17	478.17
Reach-1	0.418	494.75	494.75	494.75
Reach-1	0.324	506.35	506.35	506.35
Reach-1	0.228	392.99	392.99	392.99
Reach-1	0.154	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Evans Wash

Reach	River Sta.	Contr.	Expan.
Reach-1	2.111	.1	.3
Reach-1	1.998	.1	.3
Reach-1	1.903	.1	.3
Reach-1	1.812	.1	.3
Reach-1	1.728	.1	.3
Reach-1	1.654	.1	.3
Reach-1	1.558	.1	.3
Reach-1	1.460	.1	.3
Reach-1	1.375	.1	.3
Reach-1	1.280	.1	.3
Reach-1	1.185	.1	.3
Reach-1	1.092	.1	.3
Reach-1	1.001	.1	.3
Reach-1	0.901	.1	.3
Reach-1	0.795	.1	.3
Reach-1	0.694	.3	.5
Reach-1	0.686	Bridge	
Reach-1	0.664	.1	.3
Reach-1	0.599	.1	.3
Reach-1	0.508	.1	.3
Reach-1	0.418	.1	.3
Reach-1	0.324	.1	.3
Reach-1	0.228	.1	.3
Reach-1	0.154	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	2.111	1110.00	782.90	788.38		788.58	0.00	3.59	312.96	162.90	0
Reach-1	2.111	1110.00	782.90	789.38		789.66	0.00	4.18	260.38	66.00	0
Reach-1	1.998	1110.00	779.56	785.93		786.24	0.00	4.82	261.78	137.79	0
Reach-1	1.998	1110.00	779.56	786.67		787.15	0.01	5.62	204.06	45.00	0
Reach-1	1.903	1110.00	776.11	783.34	781.88	783.73	0.01	5.48	241.57	193.35	0
Reach-1	1.903	1110.00	776.11	783.41	781.70	784.06	0.01	6.54	174.62	37.00	1
Reach-1	1.812	1110.00	773.30	778.27		779.16	0.02	7.56	147.48	123.83	1
Reach-1	1.812	1110.00	773.30	778.89		779.63	0.01	6.90	161.97	45.00	1
Reach-1	1.728	1110.00	769.94	775.67		775.92	0.00	4.3			

291.85	108.90	0									
Reach-1	1.728		1110.00	769.94	775.71		776.17	0.01	5.46		
207.86	45.00	0									
Reach-1	1.654		1110.00	767.68	772.54		773.40	0.02	7.65		
152.14	60.43	1									
Reach-1	1.654		1110.00	767.68	773.49		773.96	0.01	5.56		
204.79	56.00	0									
Reach-1	1.558		1110.00	764.70	769.75		769.95	0.00	3.52		
326.71	184.70	0									
Reach-1	1.558		1110.00	764.70	770.55		770.96	0.01	5.23		
217.80	65.00	0									
Reach-1	1.460		1110.00	761.90	766.58	766.22	767.03	0.01	5.29		
205.24	118.93	1									
Reach-1	1.460		1110.00	761.90	767.54		767.96	0.01	4.69		
217.82	77.00	0									
Reach-1	1.375		1110.00	758.32	763.65		763.92	0.00	4.11		
263.94	97.94	0									
Reach-1	1.375		1110.00	758.32	764.40		764.93	0.01	5.83		
190.33	45.00	0									
Reach-1	1.280		1110.00	755.30	761.46		761.76	0.00	4.61		
256.19	78.83	0									
Reach-1	1.280		1110.00	755.30	762.42		762.70	0.00	4.36		
261.70	50.00	0									
Reach-1	1.185		1110.00	754.06	759.41		759.69	0.00	4.53		
269.35	105.06	0									
Reach-1	1.185		1110.00	754.06	759.84		760.45	0.01	6.23		
178.14	40.00	1									
Reach-1	1.092		1110.00	750.84	757.05		757.41	0.00	4.92		
235.12	69.57	0									
Reach-1	1.092		1110.00	750.84	757.37		757.67	0.00	4.53		
252.52	63.00	0									
Reach-1	1.001		1110.00	750.10	755.12		755.32	0.00	3.50		
308.32	158.46	0									
Reach-1	1.001		1110.00	750.10	755.94		756.18	0.00	3.28		
291.91	90.00	0									
Reach-1	0.901		1110.00	748.12	754.87		754.91	0.00	1.42		
740.33	169.20	0									
Reach-1	0.901		1110.00	748.12	755.81		755.84	0.00	1.39		
756.61	140.00	0									
Reach-1	0.795		1110.00	745.20	754.86		754.86	0.00	0.60		
1984.85	492.92	0									
Reach-1	0.795		1110.00	745.20	755.79		755.80	0.00	0.63		
1806.65	370.00	0									
Reach-1	0.694		8988.00	743.04	754.76	748.59	754.78	0.00	1.63		
7536.96	2260.54	0									
Reach-1	0.694		8988.00	743.04	755.66	748.59	755.71	0.00	1.82		
5174.68	760.00	0									
Reach-1	0.686		Bridge								
Reach-1	0.664		7248.00	742.59	750.99		751.30	0.00	4.63		
1629.53	535.34	0									
Reach-1	0.664		8988.00	742.59	751.89		752.30	0.00	5.01		
1766.00	370.00	0									
Reach-1	0.599		7248.00	740.53	749.63		749.99	0.00	5.40		
1555.16	441.88	0									
Reach-1	0.599		8988.00	740.53	750.42		750.97	0.00	5.92		
1500.79	250.00	0									
Reach-1	0.508		7248.00	739.00	747.39		747.93	0.01	6.58		
1246.99	392.99	0									
Reach-1	0.508		8988.00	739.00	748.09		748.89	0.01	6.89		
1256.59	200.00	0									

Reach-1	0.418	7248.00	738.57	745.94		746.24	0.00	4.15	1664.44	1264.40	0
Reach-1	0.418	8988.00	738.57	746.94		747.28	0.00	4.25	1945.61	330.00	0
Reach-1	0.324	7248.00	736.75	745.94		745.97	0.00	1.22	5913.86	1195.68	0
Reach-1	0.324	8988.00	736.75	746.80		746.88	0.00	1.88	4078.41	575.00	0
Reach-1	0.228	7248.00	734.52	745.90		745.92	0.00	0.98	6830.82	984.20	0
Reach-1	0.228	8988.00	734.52	746.71		746.77	0.00	1.51	5075.54	575.00	0
Reach-1	0.154	8872.00	731.50	745.89	736.90	745.90	0.00	0.74	12038.78	1339.69	0
Reach-1	0.154	8872.00	731.50	746.71	736.99	746.72	0.00	0.88	9849.47	910.00	0

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach-1	2.111	788.58	788.38	0.21	2.32	0.01	576.04	522.12	11.84	162.90
Reach-1	2.111	789.66	789.38	0.28	2.50	0.02	336.07	773.93	66.00	
Reach-1	1.998	786.24	785.93	0.31	2.50	0.01	36.73	768.00	305.27	137.79
Reach-1	1.998	787.15	786.67	0.47	3.07	0.02	31.14	1049.34	29.52	45.00
Reach-1	1.903	783.73	783.34	0.39	4.53	0.05	22.32	873.78	213.90	193.35
Reach-1	1.903	784.06	783.41	0.65	4.42	0.01	14.77	1058.27	36.96	37.00
Reach-1	1.812	779.16	778.27	0.89	3.05	0.19	0.37	1107.21	2.42	123.83
Reach-1	1.812	779.63	778.89	0.74	3.37	0.08		1102.94	7.06	45.00
Reach-1	1.728	775.92	775.67	0.25	2.46	0.06	64.53	842.91	202.56	108.90
Reach-1	1.728	776.17	775.71	0.45	2.22	0.00	16.87	1074.89	18.24	45.00
Reach-1	1.654	773.40	772.54	0.86	3.25	0.20	82.03	995.83	32.14	60.43
Reach-1	1.654	773.96	773.49	0.46	2.98	0.02	122.62	929.95	57.43	56.00
Reach-1	1.558	769.95	769.75	0.20	2.89	0.03	88.95	422.46	598.59	184.70
Reach-1	1.558	770.96	770.55	0.41	3.00	0.00	152.41	775.32	182.27	65.00
Reach-1	1.460	767.03	766.58	0.46	3.05	0.05	691.48	418.17	0.36	118.93
Reach-1	1.460	767.96	767.54	0.41	3.01	0.01	607.20	502.80	77.00	
Reach-1	1.375	763.92	763.65	0.28	2.16	0.00	56.48	672.94	380.58	97.94
Reach-1	1.375	764.93	764.40	0.53	2.16	0.07		1110.00	45.00	
Reach-1	1.280	761.76	761.46	0.30	2.07	0.01	110.68	860.74	138.58	78.83
Reach-1	1.280	762.70	762.42	0.28	2.23	0.03	79.98	983.61		

46.35 50.00

Reach-1 1.185 759.69 759.41 0.28 2.28 0.01 24.60 772.11
313.29 105.06
Reach-1 1.185 760.45 759.84 0.60 2.68 0.09 1110.00
40.00

Reach-1 1.092 757.41 757.05 0.36 2.04 0.05 37.13 1016.09
56.77 69.57
Reach-1 1.092 757.67 757.37 0.31 1.47 0.02 41.29 1003.40
65.31 63.00

Reach-1 1.001 755.32 755.12 0.20 0.36 0.05 763.12 345.65
1.23 158.46
Reach-1 1.001 756.18 755.94 0.23 0.28 0.06 706.32 403.68
90.00

Reach-1 0.901 754.91 754.87 0.04 0.04 0.01 130.20 430.52
549.28 169.20
Reach-1 0.901 755.84 755.81 0.03 0.04 0.01 177.37 491.86
440.77 140.00

Reach-1 0.795 754.86 754.86 0.00 0.08 0.00 806.72 191.36
111.91 492.92
Reach-1 0.795 755.80 755.79 0.01 0.08 0.00 736.44 226.43
147.13 370.00

Reach-1 0.694 754.78 754.76 0.02 2138.37 2481.58
4368.05 2260.54
Reach-1 0.694 755.71 755.66 0.05 2497.99 3024.10
3465.91 760.00

Reach-1 0.686 Bridge

Reach-1 0.664 751.30 750.99 0.31 1.31 0.00 13.18 4834.20
2400.62 535.34
Reach-1 0.664 752.30 751.89 0.41 1.31 0.02 23.83 6177.56
2786.62 370.00

Reach-1 0.599 749.99 749.63 0.36 2.04 0.02 1889.84 3340.01
2018.15 441.88
Reach-1 0.599 750.97 750.42 0.56 2.05 0.02 2571.05 4072.15
2344.80 250.00

Reach-1 0.508 747.93 747.39 0.54 1.62 0.07 2651.04 3321.44
1275.52 392.99
Reach-1 0.508 748.89 748.09 0.80 1.46 0.14 3470.62 3822.50
1694.88 200.00

Reach-1 0.418 746.24 745.94 0.30 0.19 0.08 2785.05 2123.99
2338.96 1264.40
Reach-1 0.418 747.28 746.94 0.34 0.32 0.08 3357.19 2516.72
3114.09 330.00

Reach-1 0.324 745.97 745.94 0.02 0.05 0.00 3302.22 408.40
3537.38 1195.68
Reach-1 0.324 746.88 746.80 0.08 0.11 0.01 3652.11 696.02
4639.88 575.00

Reach-1 0.228 745.92 745.90 0.02 0.02 0.00 2224.02 569.35
4454.63 984.20
Reach-1 0.228 746.77 746.71 0.05 0.03 0.01 3055.70 947.96
4984.35 575.00

Reach-1 0.154 745.90 745.89 0.01 6333.50 501.94
2036.56 1339.69
Reach-1 0.154 746.72 746.71 0.01 6750.84 637.87
1483.29 910.00

Profile Output Table - Encroachment 1

Reach River Sta W.S. Elev Prof Delta WS E.G. Elev Top Wdth Act Q Left Q Channel Q
Right Enc Sta L Ch Sta L Ch Sta R Enc Sta R
(ft) (ft) (ft) (ft) (cfs) (cfs)
(cfs) (ft) (ft) (ft) (ft)

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  Reach-1       2.111              788.38                    788.58        162.90      576.04      522.12
11.84                9981.52   10021.00
  Reach-1       2.111              789.38          1.00      789.66         66.00      336.07      773.93
9955.00    9981.52   10021.00   10021.00

  Reach-1       1.998              785.93                    786.24        137.79       36.73      768.00
305.27               9975.19   10012.64
  Reach-1       1.998              786.67          0.74      787.15         45.00       31.14     1049.34
29.52    9970.00    9975.19   10012.64   10015.00

  Reach-1       1.903              783.34                    783.73        106.10       22.32      873.78
213.90               9985.00   10017.04
  Reach-1       1.903              783.41          0.08      784.06         37.00       14.77     1058.27
36.96    9983.00    9985.00   10017.04   10020.00

  Reach-1       1.812              778.27                    779.16         61.73        0.37     1107.21
2.42                9955.45   10013.00
  Reach-1       1.812              778.89          0.62      779.63         45.00                 1102.94
7.06    9970.00    9955.45   10013.00   10015.00

  Reach-1       1.728              775.67                    775.92        108.90       64.53      842.91
202.56               9986.65   10027.72
  Reach-1       1.728              775.71          0.04      776.17         45.00       16.87     1074.89
18.24    9985.00    9986.65   10027.72   10030.00

  Reach-1       1.654              772.54                    773.40         60.43       82.03      995.83
32.14               9975.20   10013.88
  Reach-1       1.654              773.49          0.96      773.96         56.00      122.62      929.95
57.43    9965.00    9975.20   10013.88   10021.00

  Reach-1       1.558              769.75                    769.95        184.70       88.95      422.46
598.59               9987.41   10022.74
  Reach-1       1.558              770.55          0.80      770.96         65.00      152.41      775.32
182.27    9970.00    9987.41   10022.74   10035.00

  Reach-1       1.460              766.58                    767.03        118.93      691.48      418.17
0.36                9987.99   10017.00
  Reach-1       1.460              767.54          0.97      767.96         77.00      607.20      502.80
9940.00    9987.99   10017.00   10017.00

  Reach-1       1.375              763.65                    763.92         97.94       56.48      672.94
380.58               9971.68   10021.46
  Reach-1       1.375              764.40          0.76      764.93         45.00                 1110.00
9975.00    9971.68   10021.46   10020.00

  Reach-1       1.280              761.46                    761.76         78.83      110.68      860.74
138.58               9981.00   10021.40
  Reach-1       1.280              762.42          0.96      762.70         50.00       79.98      983.68
46.35    9975.00    9981.00   10021.40   10025.00

  Reach-1       1.185              759.41                    759.69        105.06       24.60      772.11
313.29               9980.00   10022.72
  Reach-1       1.185              759.84          0.43      760.45         40.00                 1110.00
9980.00    9980.00   10022.72   10020.00

  Reach-1       1.092              757.05                    757.41         69.57       37.13     1016.09
56.77               9966.77   10014.44
  Reach-1       1.092              757.37          0.32      757.67         63.00       41.29     1003.40
65.31    9960.00    9966.77   10014.44   10023.00

  Reach-1       1.001              755.12                    755.32        158.46      763.12      345.65
1.23                9979.53   10010.62
  Reach-1       1.001              755.94          0.82      756.18         90.00      706.32      403.68
9920.00    9979.53   10010.62   10010.00

  Reach-1       0.901              754.87                    754.91        169.20      130.20      430.52
549.28               9963.34   10017.83
  Reach-1       0.901              755.81          0.93      755.84        140.00      177.37      491.86
440.77    9930.00    9963.34   10017.83   10070.00

  Reach-1       0.795              754.86                    754.86        492.92      806.72      191.36
111.91               9977.05   10017.30
  Reach-1       0.795              755.79          0.94      755.80        370.00      736.44      226.43
147.13    9750.00    9977.05   10017.30   10120.00
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Reach-1	0.694		754.76			754.78	2260.54	2138.37	2481.58
4368.05		9932.11	10082.13						
Reach-1	0.694		755.66		0.91	755.71	760.00	2497.99	3024.10
3465.91	9740.00	9932.11	10082.13	10500.00					
Reach-1	0.686	BR U	754.76			754.78	1741.24	0.00	1591.91
7403.55		9932.11	10082.13						
Reach-1	0.686	BR U	755.66		0.91	755.71	760.00	598.11	2694.61
5690.60	9740.00	9932.11	10082.13	10500.00					
Reach-1	0.686	BR D	754.76			754.78	625.03		3646.06
5349.40		9908.67	10121.33						
Reach-1	0.686	BR D	755.21		0.46	755.71	713.50	383.42	3530.42
5069.49	9740.00	9908.67	10121.33	10500.00					
Reach-1	0.664		750.99			751.30	535.34	13.18	4834.20
2400.62		9908.67	10121.33						
Reach-1	0.664		751.89		0.90	752.30	370.00	23.83	6177.56
2786.62	9900.00	9908.67	10121.33	10270.00					
Reach-1	0.599		749.63			749.99	441.88	1889.84	3340.01
2018.15		9936.31	10024.00						
Reach-1	0.599		750.42		0.79	750.97	250.00	2571.05	4072.15
2344.80	9860.00	9936.31	10024.00	10110.00					
Reach-1	0.508		747.39			747.93	308.53	2651.04	3321.44
1275.52		9976.72	10048.00						
Reach-1	0.508		748.09		0.70	748.89	200.00	3470.62	3822.50
1694.88	9900.00	9976.72	10048.00	10100.00					
Reach-1	0.418		745.94			746.24	350.85	2785.05	2123.99
2338.96		9962.32	10042.59						
Reach-1	0.418		746.94		1.00	747.28	330.00	3357.19	2516.72
3114.09	9825.00	9962.32	10042.59	10155.00					
Reach-1	0.324		745.94			745.97	1195.68	3302.22	408.40
3537.38		9973.95	10015.12						
Reach-1	0.324		746.80		0.86	746.88	575.00	3652.11	696.02
4639.88	9700.00	9973.95	10015.12	10275.00					
Reach-1	0.228		745.90			745.92	984.20	2224.02	569.35
4454.63		9961.00	10017.63						
Reach-1	0.228		746.71		0.82	746.77	575.00	3055.70	947.96
4984.35	9700.00	9961.00	10017.63	10275.00					
Reach-1	0.154		745.89			745.90	1339.69	6333.50	501.94
2036.56		9963.84	10021.70						
Reach-1	0.154		746.71		0.82	746.72	910.00	6750.84	637.87
1483.29	9280.00	9963.84	10021.70	10190.00					

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U.S. Army Corp of Engineers
Hydrologic Engineering Center
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(916) 756-1104

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X      X  X    X
X     X  X        X            X   X    X    X   X
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: Hacker Wash
Project File : Hacker.prj
Run Date and Time: 5/15/02 4:22:29 PM

Project in English units

Project Description:
Study name: Gila Bend Area Drainage Master Plan

Study contractors:
Engineering and Environmental Consultants, Inc. and Premier Engineering Corporation

Source of hydrology: Gila Bend Area Floodplain Delineation Study (FCD 90-67) by Burgess & Niple for FCDMC, March 1991

Source of survey:
Gila Bend Area Floodplain Delineation Study (FCD 90-67);
new topographic
mapping and survey by Cooper Aerial Mapping, Inc., 1999.

FCD Contract
Number: 99-18

Datum: NGVD 1929

PLAN DATA

Plan Title: HackerWash, FW 1
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Hacker Wash\Hacker.p02

Geometry Title: Hacker Wash, FW 1
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Hacker Wash \Hacker.g03

Flow Title : Hacker Wash
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Hacker Wash \Hacker.f01

Plan Summary Information:

Number of:	Cross Sections =	32	Mulitple Openings =	1
	Culverts =	2	Inline Weirs =	0
	Bridges =	3		

Computational Information
Water surface calculation tolerance = 0.01

```
    Critical depth calculaton tolerance =  0.01
    Maximum number of interations       =  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 = RIVER-1          Reach = Reach-1
RS      Profile           Method  Value1  Value2
3.655   PF 2                   1    9983   10015
3.555   PF 2                   1    9955   10015
3.464   PF 2                   1    9965   10025
3.361   PF 2                   1    9975   10025
3.258   PF 2                   1    9960   10035
3.248   PF 2                   1    9791   10546
3.163   PF 2                   1    9960   10020
3.066   PF 2                   1    9960   10025
2.972   PF 2                   1    9970   10030
2.882   PF 2                   1    9982   10050
2.791   PF 2                   1    9920   10050
2.686   PF 2                   1 9940.6310040.08
2.599   PF 2                   1    9966   10034
2.508   PF 2                   1 9928.0610070.64
2.416   PF 2                   1 9970.42   10035
2.298   PF 2                   1    9950   10050
2.204   PF 2                   1    9920   10050
2.030   PF 2                   1    9620   10230
1.952   PF 2                   1    9760   10388
1.865   PF 2                   1 9845.8710741.78
1.855   PF 2                   1    9850   10735
1.829   PF 2                   1 9853.26   10730
1.734   PF 2                   1    972010167.77
1.650   PF 2                   1    980010222.17
1.635   PF 2                   1    980010222.17
1.612   PF 2                   1    9850   10275
1.539   PF 2                   1    9745   10200
1.530   PF 2                   1    9321   10250
1.528   PF 2                   1    9950   10050
1.452   PF 2                   1    9960   10040
1.351   PF 2                   1    9930   10070
1.336   PF 2                   1    9920   10080
1.333   PF 2                   1    9920   10080
1.320   PF 2                   1    9920   10080
1.306   PF 2                   1    9920   10080
1.298   PF 2                   1    9750   10060
1.283   PF 2                   1    9700   10050
1.210   PF 2                   1 9408.42 10030.9

River = RIVER-1          Reach = Reach-1
RS      Profile           Method  Value1  Value2
3.655   PF 3                   0       0       0
3.555   PF 3                   0       0       0
3.464   PF 3                   0       0       0
3.361   PF 3                   0       0       0
3.258   PF 3                   0       0       0
3.248   PF 3                   0       0       0
3.163   PF 3                   0       0       0
3.066   PF 3                   0       0       0
2.972   PF 3                   0       0       0
2.882   PF 3                   0       0       0
2.791   PF 3                   0       0       0
2.686   PF 3                   0       0       0
```

2.599	PF 3	0	0	0
2.508	PF 3	0	0	0
2.416	PF 3	0	0	0
2.298	PF 3	0	0	0
2.204	PF 3	0	0	0
2.030	PF 3	0	0	0
1.952	PF 3	0	0	0
1.865	PF 3	0	0	0
1.855	PF 3	0	0	0
1.829	PF 3	0	0	0
1.734	PF 3	0	0	0
1.650	PF 3	0	0	0
1.635	PF 3	4	.6	
1.612	PF 3	0	0	0
1.539	PF 3	0	0	0
1.530	PF 3	0	0	0
1.528	PF 3	4	.6	
1.452	PF 3	0	0	0
1.351	PF 3	0	0	0
1.336	PF 3	0	0	0
1.333	PF 3	0	0	0
1.320	PF 3	0	0	0
1.306	PF 3	0	0	0
1.298	PF 3	0	0	0
1.283	PF 3	0	0	0
1.210	PF 3	4	.6	

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
3.655	PF 4	0	0	0
3.555	PF 4	0	0	0
3.464	PF 4	0	0	0
3.361	PF 4	0	0	0
3.258	PF 4	0	0	0
3.248	PF 4	0	0	0
3.163	PF 4	0	0	0
3.066	PF 4	0	0	0
2.972	PF 4	0	0	0
2.882	PF 4	0	0	0
2.791	PF 4	0	0	0
2.686	PF 4	0	0	0
2.599	PF 4	0	0	0
2.508	PF 4	0	0	0
2.416	PF 4	0	0	0
2.298	PF 4	0	0	0
2.204	PF 4	0	0	0
2.030	PF 4	0	0	0
1.952	PF 4	0	0	0
1.865	PF 4	0	0	0
1.855	PF 4	0	0	0
1.829	PF 4	0	0	0
1.734	PF 4	0	0	0
1.650	PF 4	0	0	0
1.635	PF 4	4	.7	
1.612	PF 4	0	0	0
1.539	PF 4	0	0	0
1.530	PF 4	0	0	0
1.528	PF 4	4	.7	
1.452	PF 4	0	0	0
1.351	PF 4	0	0	0
1.336	PF 4	0	0	0
1.333	PF 4	0	0	0
1.320	PF 4	0	0	0
1.306	PF 4	0	0	0
1.298	PF 4	0	0	0
1.283	PF 4	0	0	0
1.210	PF 4	4	.7	

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
3.655	PF 5	0	0	0

3.555	PF 5	0	0	0
3.464	PF 5	0	0	0
3.361	PF 5	0	0	0
3.258	PF 5	0	0	0
3.248	PF 5	0	0	0
3.163	PF 5	0	0	0
3.066	PF 5	0	0	0
2.972	PF 5	0	0	0
2.882	PF 5	0	0	0
2.791	PF 5	0	0	0
2.686	PF 5	0	0	0
2.599	PF 5	0	0	0
2.508	PF 5	0	0	0
2.416	PF 5	0	0	0
2.298	PF 5	0	0	0
2.204	PF 5	0	0	0
2.030	PF 5	0	0	0
1.952	PF 5	0	0	0
1.865	PF 5	0	0	0
1.855	PF 5	0	0	0
1.829	PF 5	0	0	0
1.734	PF 5	0	0	0
1.650	PF 5	0	0	0
1.635	PF 5	4	.8	
1.612	PF 5	0	0	0
1.539	PF 5	0	0	0
1.530	PF 5	0	0	0
1.528	PF 5	4	.8	
1.452	PF 5	0	0	0
1.351	PF 5	0	0	0
1.336	PF 5	0	0	0
1.333	PF 5	0	0	0
1.320	PF 5	0	0	0
1.306	PF 5	0	0	0
1.298	PF 5	0	0	0
1.283	PF 5	0	0	0
1.210	PF 5	4	.8	

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
3.655	PF 6	0	0	0
3.555	PF 6	0	0	0
3.464	PF 6	0	0	0
3.361	PF 6	0	0	0
3.258	PF 6	0	0	0
3.248	PF 6	0	0	0
3.163	PF 6	0	0	0
3.066	PF 6	0	0	0
2.972	PF 6	0	0	0
2.882	PF 6	0	0	0
2.791	PF 6	0	0	0
2.686	PF 6	0	0	0
2.599	PF 6	0	0	0
2.508	PF 6	0	0	0
2.416	PF 6	0	0	0
2.298	PF 6	0	0	0
2.204	PF 6	0	0	0
2.030	PF 6	0	0	0
1.952	PF 6	0	0	0
1.865	PF 6	0	0	0
1.855	PF 6	0	0	0
1.829	PF 6	0	0	0
1.734	PF 6	0	0	0
1.650	PF 6	0	0	0
1.635	PF 6	4	.9	
1.612	PF 6	0	0	0
1.539	PF 6	0	0	0
1.530	PF 6	0	0	0
1.528	PF 6	4	.9	
1.452	PF 6	0	0	0
1.351	PF 6	0	0	0

1.336	PF 6	0	0	0
1.333	PF 6	0	0	0
1.320	PF 6	0	0	0
1.306	PF 6	0	0	0
1.298	PF 6	0	0	0
1.283	PF 6	0	0	0
1.210	PF 6	4	.9	

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
3.655	PF 7	0	0	0
3.555	PF 7	0	0	0
3.464	PF 7	0	0	0
3.361	PF 7	0	0	0
3.258	PF 7	0	0	0
3.248	PF 7	0	0	0
3.163	PF 7	0	0	0
3.066	PF 7	0	0	0
2.972	PF 7	0	0	0
2.882	PF 7	0	0	0
2.791	PF 7	0	0	0
2.686	PF 7	0	0	0
2.599	PF 7	0	0	0
2.508	PF 7	0	0	0
2.416	PF 7	0	0	0
2.298	PF 7	0	0	0
2.204	PF 7	0	0	0
2.030	PF 7	0	0	0
1.952	PF 7	0	0	0
1.865	PF 7	0	0	0
1.855	PF 7	0	0	0
1.829	PF 7	0	0	0
1.734	PF 7	0	0	0
1.650	PF 7	0	0	0
1.635	PF 7	4	1	
1.612	PF 7	0	0	0
1.539	PF 7	0	0	0
1.530	PF 7	0	0	0
1.528	PF 7	4	1	
1.452	PF 7	0	0	0
1.351	PF 7	0	0	0
1.336	PF 7	0	0	0
1.333	PF 7	0	0	0
1.320	PF 7	0	0	0
1.306	PF 7	0	0	0
1.298	PF 7	0	0	0
1.283	PF 7	0	0	0
1.210	PF 7	4	1	

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
3.655	PF 8	0	0	0
3.555	PF 8	0	0	0
3.464	PF 8	0	0	0
3.361	PF 8	0	0	0
3.258	PF 8	0	0	0
3.248	PF 8	0	0	0
3.163	PF 8	0	0	0
3.066	PF 8	0	0	0
2.972	PF 8	0	0	0
2.882	PF 8	0	0	0
2.791	PF 8	0	0	0
2.686	PF 8	0	0	0
2.599	PF 8	0	0	0
2.508	PF 8	0	0	0
2.416	PF 8	0	0	0
2.298	PF 8	0	0	0
2.204	PF 8	0	0	0
2.030	PF 8	0	0	0
1.952	PF 8	0	0	0
1.865	PF 8	0	0	0

1.855	PF 8	0	0	0
1.829	PF 8	0	0	0
1.734	PF 8	0	0	0
1.650	PF 8	0	0	0
1.635	PF 8	4	1.1	
1.612	PF 8	0	0	0
1.539	PF 8	0	0	0
1.530	PF 8	0	0	0
1.528	PF 8	4	1.1	
1.452	PF 8	0	0	0
1.351	PF 8	0	0	0
1.336	PF 8	0	0	0
1.333	PF 8	0	0	0
1.320	PF 8	0	0	0
1.306	PF 8	0	0	0
1.298	PF 8	0	0	0
1.283	PF 8	0	0	0
1.210	PF 8	4	1.1	

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
3.655	PF 9	0	0	0
3.555	PF 9	0	0	0
3.464	PF 9	0	0	0
3.361	PF 9	0	0	0
3.258	PF 9	0	0	0
3.248	PF 9	0	0	0
3.163	PF 9	0	0	0
3.066	PF 9	0	0	0
2.972	PF 9	0	0	0
2.882	PF 9	0	0	0
2.791	PF 9	0	0	0
2.686	PF 9	0	0	0
2.599	PF 9	0	0	0
2.508	PF 9	0	0	0
2.416	PF 9	0	0	0
2.298	PF 9	0	0	0
2.204	PF 9	0	0	0
2.030	PF 9	0	0	0
1.952	PF 9	0	0	0
1.865	PF 9	0	0	0
1.855	PF 9	0	0	0
1.829	PF 9	0	0	0
1.734	PF 9	0	0	0
1.650	PF 9	0	0	0
1.635	PF 9	4	1.2	
1.612	PF 9	0	0	0
1.539	PF 9	0	0	0
1.530	PF 9	0	0	0
1.528	PF 9	4	1.2	
1.452	PF 9	0	0	0
1.351	PF 9	0	0	0
1.336	PF 9	0	0	0
1.333	PF 9	0	0	0
1.320	PF 9	0	0	0
1.306	PF 9	0	0	0
1.298	PF 9	0	0	0
1.283	PF 9	0	0	0
1.210	PF 9	4	1.2	

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
3.655	PF 10	0	0	0
3.555	PF 10	0	0	0
3.464	PF 10	0	0	0
3.361	PF 10	0	0	0
3.258	PF 10	0	0	0
3.248	PF 10	0	0	0
3.163	PF 10	0	0	0
3.066	PF 10	0	0	0
2.972	PF 10	0	0	0

2.882	PF 10	0	0	0
2.791	PF 10	0	0	0
2.686	PF 10	0	0	0
2.599	PF 10	0	0	0
2.508	PF 10	0	0	0
2.416	PF 10	0	0	0
2.298	PF 10	0	0	0
2.204	PF 10	0	0	0
2.030	PF 10	0	0	0
1.952	PF 10	0	0	0
1.865	PF 10	0	0	0
1.855	PF 10	0	0	0
1.829	PF 10	0	0	0
1.734	PF 10	0	0	0
1.650	PF 10	0	0	0
1.635	PF 10	4	1.3	
1.612	PF 10	0	0	0
1.539	PF 10	0	0	0
1.530	PF 10	0	0	0
1.528	PF 10	4	1.3	
1.452	PF 10	0	0	0
1.351	PF 10	0	0	0
1.336	PF 10	0	0	0
1.333	PF 10	0	0	0
1.320	PF 10	0	0	0
1.306	PF 10	0	0	0
1.298	PF 10	0	0	0
1.283	PF 10	0	0	0
1.210	PF 10	4	1.3	

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
3.655	PF 11	0	0	0
3.555	PF 11	0	0	0
3.464	PF 11	0	0	0
3.361	PF 11	0	0	0
3.258	PF 11	0	0	0
3.248	PF 11	0	0	0
3.163	PF 11	0	0	0
3.066	PF 11	0	0	0
2.972	PF 11	0	0	0
2.882	PF 11	0	0	0
2.791	PF 11	0	0	0
2.686	PF 11	0	0	0
2.599	PF 11	0	0	0
2.508	PF 11	0	0	0
2.416	PF 11	0	0	0
2.298	PF 11	0	0	0
2.204	PF 11	0	0	0
2.030	PF 11	0	0	0
1.952	PF 11	0	0	0
1.865	PF 11	0	0	0
1.855	PF 11	0	0	0
1.829	PF 11	0	0	0
1.734	PF 11	0	0	0
1.650	PF 11	0	0	0
1.635	PF 11	4	1.4	
1.612	PF 11	0	0	0
1.539	PF 11	0	0	0
1.530	PF 11	0	0	0
1.528	PF 11	4	1.4	
1.452	PF 11	0	0	0
1.351	PF 11	0	0	0
1.336	PF 11	0	0	0
1.333	PF 11	0	0	0
1.320	PF 11	0	0	0
1.306	PF 11	0	0	0
1.298	PF 11	0	0	0
1.283	PF 11	0	0	0
1.210	PF 11	4	1.4	

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
3.655	PF 12	0	0	0
3.555	PF 12	0	0	0
3.464	PF 12	0	0	0
3.361	PF 12	0	0	0
3.258	PF 12	0	0	0
3.248	PF 12	0	0	0
3.163	PF 12	0	0	0
3.066	PF 12	0	0	0
2.972	PF 12	0	0	0
2.882	PF 12	0	0	0
2.791	PF 12	0	0	0
2.686	PF 12	0	0	0
2.599	PF 12	0	0	0
2.508	PF 12	0	0	0
2.416	PF 12	0	0	0
2.298	PF 12	0	0	0
2.204	PF 12	0	0	0
2.030	PF 12	0	0	0
1.952	PF 12	0	0	0
1.865	PF 12	0	0	0
1.855	PF 12	0	0	0
1.829	PF 12	0	0	0
1.734	PF 12	0	0	0
1.650	PF 12	0	0	0
1.635	PF 12	4	1.5	
1.612	PF 12	0	0	0
1.539	PF 12	0	0	0
1.530	PF 12	0	0	0
1.528	PF 12	4	1.5	
1.452	PF 12	0	0	0
1.351	PF 12	0	0	0
1.336	PF 12	0	0	0
1.333	PF 12	0	0	0
1.320	PF 12	0	0	0
1.306	PF 12	0	0	0
1.298	PF 12	0	0	0
1.283	PF 12	0	0	0
1.210	PF 12	4	1.5	

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
3.655	PF 13	0	0	0
3.555	PF 13	0	0	0
3.464	PF 13	0	0	0
3.361	PF 13	0	0	0
3.258	PF 13	0	0	0
3.248	PF 13	0	0	0
3.163	PF 13	0	0	0
3.066	PF 13	0	0	0
2.972	PF 13	0	0	0
2.882	PF 13	0	0	0
2.791	PF 13	0	0	0
2.686	PF 13	0	0	0
2.599	PF 13	0	0	0
2.508	PF 13	0	0	0
2.416	PF 13	0	0	0
2.298	PF 13	0	0	0
2.204	PF 13	0	0	0
2.030	PF 13	0	0	0
1.952	PF 13	0	0	0
1.865	PF 13	0	0	0
1.855	PF 13	0	0	0
1.829	PF 13	0	0	0
1.734	PF 13	0	0	0
1.650	PF 13	0	0	0
1.635	PF 13	4	1.6	
1.612	PF 13	0	0	0
1.539	PF 13	0	0	0
1.530	PF 13	0	0	0

1.528	PF 13	4	1.6	
1.452	PF 13	0	0	0
1.351	PF 13	0	0	0
1.336	PF 13	0	0	0
1.333	PF 13	0	0	0
1.320	PF 13	0	0	0
1.306	PF 13	0	0	0
1.298	PF 13	0	0	0
1.283	PF 13	0	0	0
1.210	PF 13	4	1.6	

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
3.655	PF 14	0	0	0
3.555	PF 14	0	0	0
3.464	PF 14	0	0	0
3.361	PF 14	0	0	0
3.258	PF 14	0	0	0
3.248	PF 14	0	0	0
3.163	PF 14	0	0	0
3.066	PF 14	0	0	0
2.972	PF 14	0	0	0
2.882	PF 14	0	0	0
2.791	PF 14	0	0	0
2.686	PF 14	0	0	0
2.599	PF 14	0	0	0
2.508	PF 14	0	0	0
2.416	PF 14	0	0	0
2.298	PF 14	0	0	0
2.204	PF 14	0	0	0
2.030	PF 14	0	0	0
1.952	PF 14	0	0	0
1.865	PF 14	0	0	0
1.855	PF 14	0	0	0
1.829	PF 14	0	0	0
1.734	PF 14	0	0	0
1.650	PF 14	0	0	0
1.635	PF 14	4	1.7	
1.612	PF 14	0	0	0
1.539	PF 14	0	0	0
1.530	PF 14	0	0	0
1.528	PF 14	4	1.7	
1.452	PF 14	0	0	0
1.351	PF 14	0	0	0
1.336	PF 14	0	0	0
1.333	PF 14	0	0	0
1.320	PF 14	0	0	0
1.306	PF 14	0	0	0
1.298	PF 14	0	0	0
1.283	PF 14	0	0	0
1.210	PF 14	4	1.7	

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
3.655	PF 15	0	0	0
3.555	PF 15	0	0	0
3.464	PF 15	0	0	0
3.361	PF 15	0	0	0
3.258	PF 15	0	0	0
3.248	PF 15	0	0	0
3.163	PF 15	0	0	0
3.066	PF 15	0	0	0
2.972	PF 15	0	0	0
2.882	PF 15	0	0	0
2.791	PF 15	0	0	0
2.686	PF 15	0	0	0
2.599	PF 15	0	0	0
2.508	PF 15	0	0	0
2.416	PF 15	0	0	0
2.298	PF 15	0	0	0
2.204	PF 15	0	0	0

2.030	PF 15	0	0	0
1.952	PF 15	0	0	0
1.865	PF 15	0	0	0
1.855	PF 15	0	0	0
1.829	PF 15	0	0	0
1.734	PF 15	0	0	0
1.650	PF 15	0	0	0
1.635	PF 15	4	1.8	
1.612	PF 15	0	0	0
1.539	PF 15	0	0	0
1.530	PF 15	0	0	0
1.528	PF 15	4	1.8	
1.452	PF 15	0	0	0
1.351	PF 15	0	0	0
1.336	PF 15	0	0	0
1.333	PF 15	0	0	0
1.320	PF 15	0	0	0
1.306	PF 15	0	0	0
1.298	PF 15	0	0	0
1.283	PF 15	0	0	0
1.210	PF 15	4	1.8	

FLOW DATA

Flow Title: Hacker Wash
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Hacker Wash\Hacker.f01

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
RIVER-1	Reach-1	3.655	1350	1350
RIVER-1	Reach-1	1.865	8870	8870
RIVER-1	Reach-1	1.829	8960	8960
RIVER-1	Reach-1	1.530	3250	3250
RIVER-1	Reach-1	1.210	8700	8700

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF 1	Normal S = .0056	Known WS = 0
RIVER-1	Reach-1	PF 2	Normal S = .0056	Known WS = 724.41

GEOMETRY DATA

Geometry Title: Hacker Wash, FW 1
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Hacker Wash\Hacker.g03

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 3.655

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9869.23	787.85	9898.43	787.53	9916.05	787.69	9936.07	787.6	9950.49	787.02
9965.91	786.64	9979	783.1264	9982.19	782.27	9987.57	80.4634	10000	776.21
10013.81	780.11	10052.45	780.8210	056.76	780.87	10088	783.037	710092.79	783.37
10109.79	784.45	10160.85	786.210	184.16	786.2110	215.91	785.85	10260.53	785.81

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

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 9869.23    .035  9987.5     .0610013.81    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9987.510013.81              500     528     500             .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 3.555

INPUT
Description:
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9816.83  783.78 9871.46   781.3 9884.45  781.23    9905778.9499 9920.32  777.25
 9921.91   777.3  9938.8  777.72 9949.06  776.76 9957.66  776.76 9981.18  774.52
 9994.28   773.3   10000   772.510001.51  773.3210011.23  777.0510024.81  777.63
10031.85   778.110041.37  778.8910065.84  781.25

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9816.83    .035 9957.66     .0610011.23    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.6610011.23              500  480.48     500             .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 3.464

INPUT
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9862.02  781.44 9881.56  780.93 9901.65  780.76 9925.89  780.24    9941776.3748
 9944.42   775.5 9948.08  773.95 9960.67  773.45    9970772.7941 9982.15  771.94
   10000  769.9710010.24   771.2  10021773.0385   10040 776.28510055.07  778.86
10060.04  779.1610087.63  780.5210101.56  780.7810104.92   781.110179.75  781.99
10204.72  782.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9862.02    .035    9970     .06   10021    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10021              550  543.84     550             .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 3.361

INPUT
Description:
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9860.93   777.2 9888.51  776.09 9911.44   775.1 9917.93  774.04 9937.99  772.59
 9945.19  773.28 9971.11  771.26 9985.41   770.9 9989.18  770.03   10000     767
10013.55  770.6810028.13  771.2310046.59     77210058.16  771.43 10073.2  772.13
   10079772.907810093.63  774.8710100.73  776.1410105.72   776.110134.84  777.64
10143.59  777.9610148.59  777.9210185.66  777.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9860.93    .035 9985.41     .0610013.55    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.4110013.55              540  543.84     540             .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 3.258

INPUT
Description:
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
 9915.12  778.54 9927.86   778.7 9947.92  773.67 9954.14  772.02    9956771.3019
    9961 769.372 9966.99  767.06  9990.1  765.02 9996.25     764   10000  763.52
10025.92  768.4510030.33  768.4210055.63  769.41   10096771.705510111.73   772.6
10142.38  772.7110146.31  772.4610169.83  769.7410184.97  772.8110188.08   773.9
10208.03  773.3310226.57  773.2910228.45  773.3910251.05  775.2210263.78   775.1
10364.66   774.710369.57  774.6210374.44  774.87 10456.1  774.4110505.23     775

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9915.12    .035    9961     .0610030.33    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          996110030.33              500  501.26     500              .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888       F

BRIDGE                   RIVER: RIVER-1
REACH: Reach-1              RS: 3.248

INPUT
Description:
Distance from Upstream XS =      50
Deck/Roadway Width        =    13.5
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=        9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8933  782.74            9431  780.25            9965  778.21  775.58
    9997  778.08  775.58   10000  778.07  775.58 10034.5  777.95  775.58
   10435  775.36           10936  773.43           11434  770.79

Upstream Bridge Cross Section Data
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9915.12  778.54 9927.86   778.7 9947.92  773.67 9954.14  772.02    9956771.3019
    9961 769.372 9966.99  767.06  9990.1  765.02 9996.25     764   10000  763.52
10025.92  768.4510030.33  768.4210055.63  769.41   10096771.705510111.73   772.6
10142.38  772.7110146.31  772.4610169.83  769.7410184.97  772.8110188.08   773.9
10208.03  773.3310226.57  773.2910228.45  773.3910251.05  775.2210263.78   775.1
10364.66   774.710369.57  774.6210374.44  774.87 10456.1  774.4110505.23     775

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9915.12    .035    9961     .0610030.33    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
          996110030.33              .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888       F

Downstream  Deck/Roadway Coordinates
    num=        9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8933  782.74            9431  780.25            9965  778.21  775.58
    9997  778.08  775.58   10000  778.07  775.58 10034.5  777.95  775.58
   10435  775.36           10936  773.43           11434  770.79

Downstream Bridge Cross Section Data
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9789.81  771.97 9825.56   771.6 9843.98  771.32 9870.64  770.72 9874.41  770.71
 9907.81  770.19 9919.15   768.6    9926 767.121 9930.59  766.13 9950.11  764.84
 9963.49  765.05   10000  761.89 10008.7   763.310016.88  764.3510020.45  763.99
10030.33  764.4910054.47  765.97   10058767.021310062.63   768.410071.27  770.01
10090.72  770.4210118.24  771.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9789.81    .035 9963.49     .0610016.88    .045
```

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
       9963.4910016.88             .3       .5

Upstream Embankment side slope              =       2 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  4

Pier Data
Pier Station     Upstream=    9979    Downstream=    9979
Upstream     num=       2
    Width   Elev    Width   Elev
       1  763.52       1  775.58
Downstream     num=       2
    Width   Elev    Width   Elev
       1  763.52       1  775.58

Pier Data
Pier Station     Upstream=    9993    Downstream=    9993
Upstream     num=       2
    Width   Elev    Width   Elev
       1  763.52       1  775.58
Downstream     num=       2
    Width   Elev    Width   Elev
       1  763.52       1  775.58

Pier Data
Pier Station     Upstream=   10007    Downstream=   10007
Upstream     num=       2
    Width   Elev    Width   Elev
       1  763.52       1  775.58
Downstream     num=       2
    Width   Elev    Width   Elev
       1  763.52       1  775.58

Pier Data
Pier Station     Upstream= 10020.5    Downstream= 10020.5
Upstream     num=       2
    Width   Elev    Width   Elev
       1  763.52       1  775.58
Downstream     num=       2
    Width   Elev    Width   Elev
       1  763.52       1  775.58

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
       Yarnell                 KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line
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CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 3.163

INPUT
Description:
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9789.81  771.97 9825.56   771.6 9843.98  771.32 9870.64  770.72 9874.41  770.71
 9907.81  770.19 9919.15   768.6    9926 767.121 9930.59  766.13 9950.11  764.84
 9963.49  765.05   10000  761.89 10008.7   763.310016.88  764.3510020.45  763.99
10030.33  764.4910054.47  765.97   10058767.021310062.63   768.410071.27  770.01
10090.72  770.4210118.24  771.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9789.81    .035 9963.49     .0610016.88    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9963.4910016.88              500  512.16     500             .3       .5

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 3.066

INPUT
Description:
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9639.92  769.72 9664.47  769.08 9765.91   767.5  9825.1  767.28  9854.9  767.49
 9885.48  767.65 9898.58  767.64  9905.1   767.8 9916.11   767.8 9936.59  764.38
 9943.21  762.86 9965.73  762.97 9999.24   758.6   10000  758.5310006.13  759.82
10018.23  762.1610078.15  764.4310162.43   767.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9639.92    .035 9965.73     .0610018.23    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9965.7310018.23              500  496.32     500             .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 2.972

INPUT
Description:
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9846.1   765.8 9875.43  764.81 9911.41  763.77 9948.86  763.42 9950.75  763.38
    9961761.4565 9974.09     759 9982.31  757.94   10000  756.06 10000.7  756.18
 10030.2  757.3210031.89   757.510080.21  760.86   10090761.3257 10110.9  762.32
10137.07  762.28 10190.5  764.31 10200.4   764.810215.89  765.3310236.57  765.65
10253.01  765.6210256.48  765.4810279.29   765.7 10293.4  765.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9846.1    .045    9961     .07   10090     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9961   10090              480   475.2     480             .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 2.882

INPUT
Description:
Station Elevation Data    num=      91
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9239.08   762.6 9286.86  762.39 9290.89  762.79 9293.09  763.82 9326.37  763.19
 9336.28   763.1 9340.59  764.17 9351.86  765.99 9353.22  766.11 9370.16  766.09
 9394.43   766.2 9404.03  764.32 9409.35   763.7 9481.77  763.35 9525.91  763.05
 9563.34   763.2 9728.07  763.89 9752.39  763.89 9781.37  763.73 9834.68  763.56
 9837.53   763.5 9864.66  763.27  9908.7  761.95  9919.6  761.76 9940.67  761.15
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 9966.56   760.9  9980.5  758.65    9982758.1159 9997.21   752.7   10000  751.91
10010.44  754.7210019.11   756.9 10049.4  757.8810055.65  757.5110062.76  756.84
10074.71  756.9710091.16   757.9   10093758.243910102.45  760.0110117.82  762.61
10125.46  762.7410163.39  762.8610251.43   764.210338.66  764.4510413.28  764.84
10438.97  766.3610454.97  766.3110464.54   766.410497.89  765.7610522.53  764.96
10560.88   764.610624.77  765.47 10637.6   765.7   10651  765.8810671.45  766.39
10673.93  766.3810718.08  767.19 10794.2   765.310828.23  767.2410845.84  767.14
10857.37  766.4910872.87  767.1510883.23   767.3 10891.4     76710899.54  766.45
10906.55  766.7110908.05  766.9710918.95   765.410926.92  764.6410939.95  764.52
10946.75  764.81 10972.8  763.5910976.01   763.711014.46  766.3211025.03  768.14
11035.82  768.3611046.27  768.08 11062.5     765 11076.2  763.29   11089   763.5
11103.04  763.4811114.62  763.6711136.02   764.711150.18  764.7911303.21  765.64
11315.67  765.69 11324.9  765.6311337.01   765.911364.85  765.7811538.11  764.68
11651.91   765.5
```

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9239.08	.045	9982	.07	10049.4	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9982	10049.4	480	480.48	480	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 2.791

INPUT
Description:
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9331.38	762.8	9340.36	764	9366.35	763.91	9380.63	763.92	9386.69	762.72
9394.38	761.6	9443.47	761	9476.29	760.62	9500.78	760.64	9683.65	761.05
9690.35	760.5	9692.17	760.62	9702.12	760.13	9708.76	760.07	9724.05	759.74
9740.4	759.6	9744.07	759.23	9753.81	758.93	9779.86	758.42	9815.33	757.5
9816.73	757.4	9844.95	757.22	9851.53	757.57	9866.6	757.31	9870	756.6979
9884.6	754.07	9890.82	754	9904.96	754.02	9928.98	754.72	9945.29	753.87
9951.57	753.29	9984.61	753.3	10000	749.6210003.41		750.2910024.53		753.97
10028.17	754.88	10028.9	754.610035.31		754.6410042.29		754.910052.43		754.44
10076.26	754.8510077.58		754.9	10085	756.267210097.39		758.5510101.13		759.15
10115.52	759.810118.65		759.6610136.57		760.510157.21		761.5310164.68		761.8
10195.24	761.2110243.09		761.310310.01		762.610364.58		763.0610435.22		763.66
10451.74	763.6510472.43		763.5410506.64		763.510512.49		763.4610540.74		761.26
10570.26	763.6810645.97		763.45						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9331.38	.045	9928.98	.07	10042.29	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9928.9	10042.29	500	554.4	500	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 2.686

INPUT
Description:
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9483.86	761	9496.62	759.03	9510.72	758.89	9548.95	758.92	9651.88	758.44
9680.88	758.6	9702.65	758.28	9725.44	758.09	9734.64	757.74	9762.08	756.52
9785.87	757.3	9798.21	758.07	9851.75	757.89	9889.7	757.51	9899.71	756.94
9940.63	754.5	9957.94	753.3	9976.51	752.43	9993.73	748.78	10000	747.53
10006.33	748.810013.46		750.2510021.35		752.1410040.08		754.210063.92		755.97
10100.18	758.510108.15		757.8910135.19		756.4410150.57		755.7910176.39		752.4
10189.18	754.810193.65		756.3610202.17		756.5210227.71		757.510264.97		758.87
10275.88	758.610335.55		757.4110349.28		756.7710360.15		756.410381.48		753.77
10391.63	752.910400.15		75210400.72		752.610415.88		754.5110444.47		758.18
10449.93	758.310490.56		759.110506.33		758.8810513.19		758.910564.27		760.81
10614.23	760.510639.98		761.110707.73		76110725.98		760.8510768.51		760.8
10789.98	760.910858.64		760.2910913.77		759.9810943.42		760.3811012.69		760.74
11019.7	760.911035.58		76111051.73		761.2511073.73		761.6711099.25		761.65
11128.42	761.211162.86		761.811183.13		761.3411201.59		760.5711215.71		761.05

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11241.87   761.211250.26  760.2111255.73  759.77

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9483.86    .045 9940.63     .0710040.08     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9940.6310040.08               450  459.36     450              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888       F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 2.599

INPUT
Description:
Station Elevation Data     num=       20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9909.28  754.82 9917.53  754.66  9939.6  753.98 9944.81   753.8 9952.49  753.01
 9963.12752.0248  9977.2  750.72   10000  746.3910003.66  746.4310023.69   749.7
10034.76  752.3710038.93  752.7710048.73  752.0510052.06  752.12   10058752.7538
10079.05     755 10093.9  756.0110104.54  756.38 10122.8  756.4110132.52   755.3

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9909.28    .045 9963.12     .0710034.76     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9963.1210034.76               490  480.48     490              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 2.508

INPUT
Description:
Station Elevation Data     num=       81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9471.36   753.5 9493.83  754.18  9500.3  753.32 9506.33  752.75 9515.88     754
 9521.78   753.5 9539.39  753.56 9549.68  755.63 9593.01  755.74 9605.58  753.75
 9627.16     754 9660.52  754.48 9677.05  754.12 9684.59  754.04 9698.37  753.77
 9706.84   752.1 9718.37  753.69 9732.63  753.72 9758.91  753.93 9793.98   753.9
 9806.31   753.5 9830.24  753.59 9875.75  752.87  9885.7  752.35 9888.29  752.35
 9919.79   750.6 9928.06  750.68 9929.66  751.09 9939.19  750.41  9939.8  750.24
    9958   746.8 9961.25  746.14 9974.62  747.91 9977.14  747.81 9991.95  746.29
   10000   745.210015.26  748.6710044.13  748.3510059.39  750.0110070.64  750.61
10079.11     75010085.14  751.3210099.84   753.110115.75  754.11 10137.7  753.93
10206.33   753.910212.54  753.9810260.19  753.8910289.27  753.9510296.75  754.02
10341.94   753.2 10363.3  753.5810374.96  753.6910397.51   754.110424.83   754.2
10434.83   754.510449.51  754.7110460.61  754.6110518.68  754.6810536.44  754.92
 10564.3   754.110590.86   754.410605.19  754.3410666.63  754.3610708.79  754.18
10743.29   754.610777.21  754.6710801.84  754.8110817.55   754.210836.96  754.33
 10876.6   754.310886.02  753.6510896.61   754.610902.24  753.9110914.31  754.54
10932.35   754.610972.66  754.5511001.59  754.6711045.44  754.69 11097.5  755.79
11117.36     756

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9471.36    .045 9928.06     .0710070.64     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9928.0610070.64               480  485.76     480              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 2.416

INPUT
Description:
Station Elevation Data     num=       60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9748.24   752.4 9751.32  752.36 9768.92  749.05 9775.46  749.73 9783.86  750.45
```

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 9795.82   750.3 9810.72  751.22 9864.31  750.43 9917.39  749.79 9927.95   749.5
 9933.67   749.6 9959.21  748.47 9970.42  748.19 9974.73  747.37   10000  741.64
10007.86   743.6 10017.9  745.7410038.12  746.2810060.08  746.2910072.13  745.58
10085.02   745.210102.17  747.04   10109747.892410114.99  748.6410122.77  749.98
10131.63  748.6610211.03   746.510217.96  745.94 10230.2  745.3110249.32  744.77
10287.39  744.47 10296.4   744.310309.45  744.3810318.05  744.3310332.09  744.59
10363.67  745.5910380.25   745.910388.51  745.7310393.42   744.710394.98  745.11
10407.04  747.02 10411.2   747.110417.77  746.8910442.05  747.4810458.52  748.38
10476.28  749.1610486.43   749.910499.87  750.4910504.31  747.5610508.33  749.06
10511.67  748.9110519.38   750.510569.89  751.6910583.48   751.510604.27  751.87
10614.51  752.1310648.67   752.410689.53   752.510764.56  752.6110781.87  752.71

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9748.24    .045 9970.42     .06 10017.9     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.42 10017.9              630  623.04     630             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888       F

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 2.298

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9825.86  748.44 9830.96  747.77 9844.51     748 9853.51  749.76 9895.04   749.3
 9908.08  747.19 9920.78     747 9925.18  746.77 9934.89  746.59 9947.23   746.1
 9957.91  745.81 9967.56  744.12 9971.05   743.5 9983.66  740.79 9992.24   740.9
   10000  740.7810002.91  740.5710008.49  740.7610011.33  741.16 10024.2   741.7
10050.86  745.2410068.41  745.2710082.57  746.0410112.03  747.2110152.18   747.9
10210.33  743.4710213.73  743.2510255.45  739.3410279.32   737.310313.37   734.6
10321.17  734.9410338.45  734.9310368.58  735.3610396.14  739.14 10405.1   740.7
10409.74  741.1310430.33  744.8910446.13  747.0110468.65  747.3710490.75   747.1
10531.71  740.2610546.72  738.15 10563.6  736.0310584.52  736.1610615.61   736.3
10629.94  736.4810654.45   738.110661.16  738.6910680.31  740.1810707.48   740.6
10723.55  740.8110788.76  741.7110793.16  741.8210810.58  748.4310816.87   748.8
10820.91  748.7510856.31  748.9110863.72  748.9710906.09  748.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9825.86    .045 9957.91     .0610050.86     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.9110050.86              490  496.32     490             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888       F
888       F

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 2.204

INPUT
Description: conveyance through borrow pit
Station Elevation Data    num=      54
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9824.64  746.77 9833.19  746.85  9851.2   746.9 9866.03  746.62 9887.68   743.5
 9907.76  743.42 9927.87  743.29 9958.41   740.9 9966.59  740.16 9971.56  740.03
  9977.1  739.32 9989.59  740.16   10000     74010019.16  739.4610034.81  741.64
10042.78  743.6310056.63  744.6610060.67  745.610066.25  745.7910077.88  745.49
10082.21  746.6510089.23  744.2810104.18  742.810168.91  737.1110193.19  735.02
 10200.3  734.8110216.26  733.6710233.79  732.310249.53  732.3410255.99  732.34
10263.86  732.7910267.25  733.0210311.06  733.910341.77   739.210364.83  742.74
 10413.6  743.8810443.82  734.01 10449.1  732.3 10549.6  732.3410576.53  734.62
10597.81  736.6110636.98  737.0410657.88  738.510685.77  738.7210721.11  739.11
10723.42  739.6810734.45   743.210739.36  743.610742.68  742.9410746.38  743.98
10752.39  745.9910790.07   745.310795.94  745.310842.28  745.54
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Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9824.64    .045 9907.76     .0610042.78     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9907.7610042.78              500  918.72     600              .1       .3
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 2.030

INPUT
Description:
Station Elevation Data     num=       74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8903.01     744 8922.96  743.95 8966.43   743.6  8988.6  743.61 8994.98  744.05
 8999.06   743.4 9073.39  742.67 9132.27  742.19  9140.2  742.18 9152.24  742.39
  9219.7   742.4 9223.83  742.46 9299.05  742.43 9361.35  742.69 9364.04  742.65
 9401.53   742.9 9424.78  743.06 9449.49  742.95  9524.7  742.77 9539.08  742.86
  9572.2   743.2 9575.39  743.32 9579.25  742.79 9626.17  742.06 9629.66  742.14
 9634.48   742.8 9649.25  744.19 9656.15  744.73 9697.99  745.08 9710.57  742.76
 9724.02     741 9761.81   739.8 9798.35  743.83 9799.69  743.94 9833.41  739.46
 9838.03   739.7 9868.94  738.06  9878.1  738.08 9882.13  738.21 9895.39  737.92
 9898.07   738.3 9906.58  737.71 9915.08   738.5  9936.9   738.2 9963.86  738.14
  9966.6     738 9991.41   738.110000.67  737.8710026.38  738.02 10034.6  737.93
10046.73     73810077.82  737.9210094.59  738.7110096.83  738.7210117.68  739.31
10122.26  739.310126.06  738.9810129.24  739.4510145.54  739.5310168.69  738.75
10183.79  739.310199.36  739.5610213.86  740.1710235.62  740.9210254.57  739.97
10264.73  740.910275.93  740.9710294.71   740.810315.71  740.9910330.82  741.25
10354.08  741.310429.71  742.2110434.25   742.310496.53  742.54

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 8903.01    .045 9838.03     .0610117.68     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9838.0310117.68              410  411.84     410              .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 1.952

INPUT
Description:
Station Elevation Data     num=       60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9388.45     742 9392.44   742.2 9410.44     742 9465.43  741.47 9500.17  741.36
 9513.51   742.6 9517.39   741.6 9532.66  741.55 9539.25  742.02 9543.63  741.62
 9558.03   741.3 9574.92  740.93 9609.04  741.34 9625.56  743.91 9646.53  744.06
 9670.31   744.3 9680.51  742.86 9687.27  742.02 9722.16  741.55 9728.31  741.77
 9755.86   742.5 9763.56  741.99 9770.74  741.19 9780.26  740.81 9785.99  740.44
 9797.67   740.1 9823.62  738.93 9851.72  739.54 9856.26  740.59 9861.64  739.24
 9884.47   738.4 9888.98  739.19 9918.23  738.14    9937  737.82 9951.02  737.22
 9954.85   737.4 9967.83  736.68 9972.98  736.11 9981.33  735.87 9994.55  734.63
   10000   734.210021.41  736.1710040.55  736.49 10055.4  736.4610110.29  738.51
 10123.4   738.210144.06  737.2810163.59  737.21 10173.8  738.6710175.25  738.77
10185.48   738.610193.86  738.8610207.88  738.8810217.81  739.4810250.44  739.72
10293.01     74010323.61  740.2810329.58  740.5110347.57  741.62 10388.5  741.81

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9388.45    .045 9954.85     .0610040.55     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.8510040.55              460  459.36     460              .1       .3
```

Ineffective Flow num= 1
Sta L Sta R Elev Permanent
888 F

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.865

INPUT
Description:
Station Elevation Data num= 105

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9620.19	743.55	9654.14	743.8	9662.12	743.87	9678.67	739.53	9683.11	738.71
9687.2	738.75	9700.76	738	9703.22	738.17	9716.99	738.09	9731.93	737.53
9763.6	737.26	9767.34	737.1	9794.54	737.25	9806.9	737.24	9822.15	737.35
9845.62	737.41	9856.28	736.8	9875.83	736.19	9902.25	735.91	9927.64	735.51
9931.09	735.56	9969.38	736.5	9984.13	735.06	10000	7311	0017.36	733.38
10039.14	733.38	10048	733.3	10065.57	733.6	10075.73	733.65	10082.18	734.04
10113.93	734.41	10151	735.2	10163.49	735.61	10195.66	737.78	10202.44	737.93
10229.51	737.76	10265.92	738.4	10268.14	738.38	10277.72	739.44	10283.58	738.45
10314.15	737.74	10321.32	738.3	10325.15	738.35	10328.91	737.99	10335.15	737.68
10354.08	737.43	10369.35	737.6	10373.89	737.53	10392.96	736.63	10413.18	735.79
10426.75	737.09	10438.28	737.7	10444.56	737.81	10451.4	737.07	10463.49	736.72
10469.03	736.7	10480.2	736.7	10483.71	736.97	10494.57	737.05	10505.18	736.83
10515.86	736.38	10524.72	736.1	10530.72	735.65	10535.3	735.54	10544.98	734.9
10565.88	731.5	10584.91	736.2	10588.58	736.22	10629.6	736.47	10647.63	736.19
10706.02	734.7	10728.77	734.4	10747.23	734.26	10763.54	735.82	10780.43	735.98
10788.57	735.46	10807.4	735.5	10816.78	735.68	10825.34	735.63	10827.47	735.81
10834.5	735.81	10841.16	736.2	10878.81	742.56	10886.96	744.14	10889.03	744.35
10910.34	741.51	10922.93	742.3	10932.51	741.99	10937.79	741.47	10957.31	741.6
10967.56	742.94	10975.13	743.8	10993.67	745.07	11005.29	746.24	11029.24	748.08
11042.68	748.13	11053.11	748	11072.83	747.45	11076.54	747.25	11088.46	747.76
11098.67	747.45	11103.23	747	11117.21	747.82	11121.23	748.35	11130.39	748.16

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9620.19	.045	9969.38	.06	10195.66	.04	10494.57	.06	10841.16	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9969.38	10195.66	200	190.08	200	.6	.8

Ineffective Flow num= 1
Sta L Sta R Elev Permanent
888 F

CULVERT RIVER: RIVER-1
REACH: Reach-1 RS: 1.855

INPUT
Description:
Distance from Upstream XS = 55
Deck/Roadway Width = 80
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 17

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
8392	745.54		8651	744.63		8907	744.13	
9159	743.69		9409	743.49		9568	743.28	
9591	744.43		9603	744.86		9762	744.32	
9965	744.05		10000	744		10160	743.67	
10359	744.03		10557	743.78		10758	744.37	
10960	744.63		11170	745.21				

Upstream Bridge Cross Section Data
Station Elevation Data num= 105

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9620.19	743.55	9654.14	743.8	9662.12	743.87	9678.67	739.53	9683.11	738.71
9687.2	738.75	9700.76	738	9703.22	738.17	9716.99	738.09	9731.93	737.53
9763.6	737.26	9767.34	737.1	9794.54	737.25	9806.9	737.24	9822.15	737.35
9845.62	737.41	9856.28	736.8	9875.83	736.19	9902.25	735.91	9927.64	735.51
9931.09	735.56	9969.38	736.5	9984.13	735.06	10000	7311	0017.36	733.38
10039.14	733.38	10048	733.3	10065.57	733.6	10075.73	733.65	10082.18	734.04
10113.93	734.41	10151	735.2	10163.49	735.61	10195.66	737.78	10202.44	737.93

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10229.51  737.7610265.92   738.410268.14  738.3810277.72  739.4410283.58  738.45
10314.15  737.7410321.32   738.310325.15  738.3510328.91  737.9910335.15  737.68
10354.08  737.4310369.35   737.610373.89  737.5310392.96  736.6310413.18  735.79
10426.75  737.0910438.28   737.710444.56  737.81 10451.4  737.0710463.49  736.72
10469.03   736.7 10480.2   736.710483.71  736.9710494.57  737.0510505.18  736.83
10515.86  736.3810524.72   736.110530.72  735.65 10535.3  735.5410544.98   734.9
10565.88   731.510584.91   736.210588.58  736.22 10629.6  736.4710647.63  736.19
10706.02   734.710728.77   734.410747.23  734.2610763.54  735.8210780.43  735.98
10788.57  735.46 10807.4   735.510816.78  735.6810825.34  735.6310827.47  735.81
 10834.5  735.8110841.16   736.210878.81  742.5610886.96  744.1410889.03  744.35
10910.34  741.5110922.93   742.310932.51  741.9910937.79  741.4710957.31   741.6
10967.56  742.9410975.13   743.810993.67  745.0711005.29  746.2411029.24  748.08
11042.68  748.1311053.11     74811072.83  747.4511076.54  747.2511088.46  747.76
11098.67  747.4511103.23     74711117.21  747.8211121.23  748.3511130.39  748.16

Manning's n Values          num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
 9620.19    .045 9969.38     .0610195.66    .04510494.57     .0610841.16     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9969.3810195.66             .6       .8
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

Downstream  Deck/Roadway Coordinates
    num=      17
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8392  745.54            8651  744.63            8907  744.13
    9159  743.69            9409  743.49            9568  743.28
    9591  744.43            9603  744.86            9762  744.32
    9965  744.05           10000     744           10160  743.67
   10359  744.03           10557  743.78           10758  744.37
   10960  744.63           11170  745.21

Downstream Bridge Cross Section Data
Station Elevation Data    num=     122
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9533.72  741.36 9535.43  741.34 9547.87  742.26 9552.79  742.76 9558.69   743.3
 9589.45   743.8 9602.04  743.93 9629.47  741.42 9643.87  740.31 9647.76  739.46
 9656.29   738.8  9673.9  738.44  9683.9   738.4 9691.29  737.95 9699.32  737.89
  9712.2   737.2 9724.34  737.27 9748.82  736.88 9752.78  736.75 9766.17  736.62
    9775     736 9792.74   735.5 9806.11   734.8  9822.1  734.12 9830.38  733.99
 9852.09     734 9871.74  733.27 9880.09  733.37 9913.39  732.78 9928.61  732.63
 9933.69   732.7 9941.61  733.51 9950.05  734.11 9967.62  734.57 9969.61  733.81
 9976.08   729.2 9988.14  723.74 9993.98  722.87   10000  722.6110008.09  727.28
10019.25     73110021.11  731.93 10024.6  732.9510036.38  732.5610046.08  732.79
10047.98  732.510061.46  732.21   10070  732.2210076.75  731.9510089.99  731.67
 10091.9  731.610099.95  731.6110118.67  730.77 10134.4  729.8810139.86  729.86
10159.93  728.710168.63   728.410200.92  727.7510225.11  727.5310247.38  727.64
10256.51  727.910269.99  727.8510284.99  727.9810310.79   727.210334.27  726.79
10346.73  726.210369.34   726.410374.36  726.9310382.75  727.5410392.75  728.44
10397.36  728.410408.82  729.6210419.68  730.4310431.68  730.8910435.52  731.17
10441.82  730.810473.56  730.3110487.97  729.9810500.59  730.26 10507.4  729.58
10518.71  726.5 10521.5  726.8810540.76  732.1710553.29  734.8410558.89  736.24
10562.59  737.310573.06  737.45 10589.6  736.5710593.49  736.6610604.73  735.97
10607.06  736.310612.16  736.2310616.96  736.3610627.05  736.1610636.51  736.57
 10641.8  736.710652.18   737.310666.72  737.9810673.68  738.4710684.06  738.57
10688.44  738.3 10706.6  739.1910715.94  739.3510729.13  740.7710743.36   741.6
10747.72  741.910764.61  741.1210771.07  741.2810775.52  741.1510793.78  741.68
10806.59  742.210829.17   743.6   10851  744.6310873.63   745.210882.83  744.95
10898.26  744.910924.98  744.6810944.56  744.3310952.71  744.4410964.48  745.12
10976.79  745.210982.76  746.08

Manning's n Values          num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
 9533.72    .045 9967.62     .04510021.11     .0410441.82     .04510562.59     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9967.6210021.11             .6       .8
```

```
Upstream Embankment side slope                =       1 horiz. to 1.0 vertical
Downstream Embankment side slope              =     1.5 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  2

Culvert Name      Shape       Rise     Span
Culvert #1       Circular       4
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                 55   117.5       .024                   .5                1
Number of Barrels =  2
Upstream   Elevation =  730.99
Centerline Stations
    Sta.    Sta.
 9997.7510002.25
Downstream Elevation =  727.5
Centerline Stations
    Sta.    Sta.
 9997.7510002.25

Culvert Name      Shape       Rise     Span
Culvert #2       Circular       4
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                 50   132.6       .024                   .5                1
Upstream   Elevation =  731.53
           Centerline Station =  10565
Downstream Elevation =  726.62
           Centerline Station =  10520

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 1.829

INPUT
Description:
Station Elevation Data    num=     122
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9533.72  741.36 9535.43  741.34 9547.87  742.26 9552.79  742.76 9558.69   743.3
 9589.45   743.8 9602.04  743.93 9629.47  741.42 9643.87  740.31 9647.76  739.46
 9656.29   738.8  9673.9  738.44  9683.9   738.4 9691.29  737.95 9699.32  737.89
  9712.2   737.2 9724.34  737.27 9748.82  736.88 9752.78  736.75 9766.17  736.62
    9775     736 9792.74   735.5 9806.11   734.8  9822.1  734.12 9830.38  733.99
 9852.09     734 9871.74  733.27 9880.09  733.37 9913.39  732.78 9928.61  732.63
 9933.69   732.7 9941.61  733.51 9950.05  734.11 9967.62  734.57 9969.61  733.81
 9976.08   729.2 9988.14  723.74 9993.98  722.87   10000  722.6110008.09  727.28
10019.25     73110021.11  731.93 10024.6  732.9510036.38  732.5610046.08  732.79
10047.98  732.510061.46  732.21   10070  732.2210076.75  731.9510089.99  731.67
 10091.9  731.610099.95  731.6110118.67  730.77 10134.4  729.8810139.86  729.86
10159.93  728.710168.63   728.410200.92  727.7510225.11  727.5310247.38  727.64
10256.51  727.910269.99  727.8510284.99  727.9810310.79   727.210334.27  726.79
10346.73  726.210369.34   726.410374.36  726.9310382.75  727.5410392.75  728.44
10397.36  728.410408.82  729.6210419.68  730.4310431.68  730.8910435.52  731.17
10441.82  730.810473.56  730.3110487.97  729.9810500.59  730.26 10507.4  729.58
10518.71  726.5 10521.5  726.8810540.76  732.1710553.29  734.8410558.89  736.24
10562.59  737.310573.06  737.45 10589.6  736.5710593.49  736.6610604.73  735.97
10607.06  736.310612.16  736.2310616.96  736.3610627.05  736.1610636.51  736.57
 10641.8  736.710652.18   737.310666.72  737.9810673.68  738.4710684.06  738.57
10688.44  738.3 10706.6  739.1910715.94  739.3510729.13  740.7710743.36   741.6
10747.72  741.910764.61  741.1210771.07  741.2810775.52  741.1510793.78  741.68
10806.59  742.210829.17   743.6   10851  744.6310873.63   745.210882.83  744.95
10898.26  744.910924.98  744.6810944.56  744.3310952.71  744.4410964.48  745.12
10976.79  745.210982.76  746.08
```

```
Manning's n Values          num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
 9533.72    .045 9967.62    .04510021.11     .0410441.82    .04510562.59     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.6210021.11              500   501.6     500              .6       .8

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 1.734

INPUT
Description:
Station Elevation Data     num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9282     744    9292     742    9310     740    9322     738    9480     738
    9556     738    9600   738.8 9612.48     738 9618.29     736 9638.21     734
 9641.02     732 9643.38     730 9644.23     728    9647  725.49 9656.57  724.81
  9659.9  724.45 9670.54  725.06 9680.51   724.9 9691.35  724.39 9698.41  726.54
 9702.59  728.05 9711.34  729.87 9730.97   730.4  9747.4  730.56  9764.8  731.04
 9778.55  730.47 9793.14  730.41 9804.18   729.2 9812.71  728.54 9822.98  729.03
 9838.56  727.88 9846.87  727.13 9858.19   726.3 9872.22  725.67 9890.59  724.13
 9896.68  723.78 9910.81  724.02 9914.69   724.2 9935.48  723.45 9940.34  723.12
 9952.56  723.86 9957.76  723.64 9973.06   723.5 9974.09  723.11 9977.96  722.88
  9989.4  723.33   10000     72310011.77   726.4 10024.6  726.6110027.64  726.78
10030.33   727.510057.48  727.7910061.41   731.2 10062.6  732.5310067.35  733.09
10075.52  733.3610095.81  735.1310106.21   732.610111.34  732.2510146.74  732.04
10174.81  732.1310212.91   732.9 10252.5   741.3 10263.4  743.8710282.38  748.53
10286.67   749.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9282     .04 9872.22    .04510011.77     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9872.2210011.77              450  443.52     450              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 1.650

INPUT
Description:
Station Elevation Data     num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9253     744    9260     742    9331     740 9358.72   738.7 9377.52  737.86
 9385.86  737.91 9403.81  737.56 9420.88     737 9437.35   736.8 9467.36  736.26
 9510.12   736.3 9555.15  736.12 9593.56  735.86 9600.46   735.9 9674.72  735.51
 9746.96  734.57 9749.69  734.46 9767.22  734.44 9787.85   734.5 9793.33  734.49
    9824  734.59 9834.25  734.41 9867.44  734.33 9890.22     734 9926.07   733.7
 9939.32  733.49 9959.37  733.07 9970.55   732.7 9976.36   732.3 9984.55  723.11
 9995.34   722.3   10000  722.2510017.91  722.3410025.63   728.910034.97  733.01
10037.96   732.910061.06   732.910070.97  732.76 10083.2   732.810100.13  733.08
10128.78  737.8910138.82  739.3410150.19  739.3210164.85   739.1   10256     740
   10348     742   10425     744

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9253     .04 9970.55    .04510034.97     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.5510034.97              200  200.64     200              .3       .5

CULVERT                 RIVER: RIVER-1
REACH: Reach-1             RS: 1.635

INPUT
Description: need new D/S x-section(s)
Distance from Upstream XS =       75
Deck/Roadway Width        =       91
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
```

```
    num=       10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9162  743.28            9254  743.23            9503  742.15
    9749  740.71            9990  738.81           10000  738.61
   10088   738.5           10240     740           10329     742
   10415     744

Upstream Bridge Cross Section Data
Station Elevation Data    num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9253     744    9260     742    9331     740 9358.72   738.7 9377.52  737.86
 9385.86  737.91 9403.81  737.56 9420.88     737 9437.35   736.8 9467.36  736.26
 9510.12   736.3 9555.15  736.12 9593.56  735.86 9600.46   735.9 9674.72  735.51
 9746.96  734.57 9749.69  734.46 9767.22  734.44 9787.85   734.5 9793.33  734.49
    9824  734.59 9834.25  734.41 9867.44  734.33 9890.22     734 9926.07   733.7
 9939.32  733.49 9959.37  733.07 9970.55   732.7 9976.36   732.3 9984.55  723.11
 9995.34   722.3   10000  722.2510017.91  722.3410025.63   728.910034.97  733.01
10037.96   732.910061.06   732.910070.97  732.76 10083.2   732.810100.13  733.08
10128.78  737.8910138.82  739.3410150.19  739.3210164.85   739.1   10256     740
   10348     742   10425     744

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9253     .04 9970.55    .04510034.97     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9970.5510034.97             .3       .5

Downstream  Deck/Roadway Coordinates
    num=       10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9162  743.28            9254  743.23            9503  742.15
    9749  740.71            9990  738.81           10000  738.61
   10088   738.5           10240     740           10329     742
   10415     744

Downstream Bridge Cross Section Data
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9207     740    9223     738    9348   736.2 9377.15  735.66 9383.53  735.69
 9435.76  735.44 9446.39  735.44 9522.29   734.7 9573.83  734.32 9601.21  734.16
 9668.33   733.7 9733.42  733.53 9769.24   733.6 9786.28  733.41 9805.45  733.29
 9844.76  733.52 9877.93  733.49 9884.76   734.2 9888.29  734.11 9893.46   733.5
 9909.52  733.12 9925.06  733.09 9970.32   732.6 9981.77  725.35 9986.14  721.57
   10000  720.9910015.78  721.2110026.25   729.510030.53   732.310062.76  732.03
10087.81  731.9710106.63  731.7510138.95   731.610155.05  731.6310183.03  731.55
10197.44  731.4610219.07  731.5610229.22   731.7   10337     732   10361     740
 10401.5     750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9207     .04 9970.32    .04510030.53     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9970.3210030.53             .3       .5

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1          Box        10      10
FHWA Chart # 11- Skewed headwall; Chamfered or beveled Inlet
FHWA Scale # 2 - Headwall skewed 30 deg.; inlet edges chamfered 3/4 inch
Solution Criteria = Highest U.S. EG
```

Culvert	Upstrm Dist	Length	n Value	Entrance Loss Coef	Exit Loss Coef
	75	91.5	.012	.4	1

Number of Barrels = 3
Upstream Elevation = 722.37
Centerline Stations

Sta.	Sta.	Sta.
9989	10000	10011

Downstream Elevation = 721.68
Centerline Stations

Sta.	Sta.	Sta.
9989	10000	10011

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.612

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9207	740	9223	738	9348	736.2	9377.15	735.66	9383.53	735.69
9435.76	735.44	9446.39	735.44	9522.29	734.7	9573.83	734.32	9601.21	734.16
9668.33	733.7	9733.42	733.53	9769.24	733.6	9786.28	733.41	9805.45	733.29
9844.76	733.52	9877.93	733.49	9884.76	734.2	9888.29	734.11	9893.46	733.5
9909.52	733.12	9925.06	733.09	9970.32	732.6	9981.77	725.35	9986.14	721.57
10000	720.99	10015.78	721.21	10026.25	729.5	10030.53	732.3	10062.76	732.03
10087.81	731.97	10106.63	731.75	10138.95	731.6	10155.05	731.63	10183.03	731.55
10197.44	731.46	10219.07	731.56	10229.22	731.7	10337	732	10361	740
10401.5	750								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9207	.04	9970.32	.045	10030.53	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9970.32	10030.53	390	385.44	380	.3	.5

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.539

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9240	732	9271.42	731.84	9310.46	731.87	9334.17	731.83	9365.06	731.68
9421.9	730.9	9490.84	730.26	9509.64	730.26	9560.47	730.5	9597.38	730.71
9652.27	730.7	9685.12	730.53	9705	730.69	9771.12	730.84	9794.59	730.93
9847.16	729.7	9870.14	729.24	9900.06	728.86	9904.17	728.65	9925.53	729.83
9929.9	729.8	9933.76	729.3	9940.59	729.13	9969.01	728.97	9971.31	727.87
9994.77	718.7	10008.16	718.41	10015.09	722.6	10030	730.08	10044.58	730.31
10048.9	730.3	10100.77	731.19	10169.63	731.44	10175.7	732	10206.3	734
10283.6	734	10335.7	736	10354	740	10389.3	750		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9240	.04	9969.01	.045	10030	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9969.01	10030	45.22	47.52	45.22	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.530

INPUT
Description:
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9320.22	728	9387.57	728.24	9443.17	727.99	9461.7	727.73	9476.5	727.38
9477.03	727.7	9498.89	727.7	9501.36	727.78	9529.28	727.85	9601.26	728.35
9628.66	728.5	9637.39	728.45	9683.07	728.41	9688.89	728.28	9700.65	728.23
9709.01	727.7	9727.7	727.68	9732.23	728.09	9770.12	728.25	9776.93	728.45
9790.64	728.4	9805.43	728.53	9812.28	728.78	9829.28	728.95	9836.42	728.93

9851.58	729.2	9859.91	729.07	9876.1	729.19	9891.9	729.37	9895.21	729.22
9897.34	729.5	9911.85	729.67	9920.66	729.68	9952.49	729.48	9965.39	728.86
9985.14	720.1	9992.52	719.85	9995.11	719.73	10000	719.73	10012.59	719.73
10019.37	719.8	10029.67	727.02	10032	728.4144	10034.9	730.15	10050.67	730.87
10068.62	731.36	10089.04	731.41	10108.06	731.67	10113.19	731.38	10118.23	731.68
10139.73	731.72	10150.73	731.61	10183.64	731.71	10195.78	731.63	10204.81	731.91
10218.19	733.9	10235.8	734.11	10240.73	734.3	10293	734	10300	736
10305.4	740	10330.8	750						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9320.22	.04	9965.39	.045	10032	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9965.39	10032	400	411.84	400	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

MULTIPLE OPENING RIVER: RIVER-1
REACH: Reach-1 RS: 1.528

INPUT
Description:
Distance from Upstream XS = 15
Deck/Roadway Width = 235
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 12

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
8895	754.03		9097	753.85		9301	753.76	
9509	753.4		9719	753.26		9965	752.9	
10000	752.88		10211	752.83		10222.95	752.7	745
10297.05	752.7	745	10457	752.62		12000	752.3	

Upstream Bridge Cross Section Data
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9320.22	728	9387.57	728.24	9443.17	727.99	9461.7	727.73	9476.5	727.38
9477.03	727.7	9498.89	727.7	9501.36	727.78	9529.28	727.85	9601.26	728.35
9628.66	728.5	9637.39	728.45	9683.07	728.41	9688.89	728.28	9700.65	728.23
9709.01	727.7	9727.7	727.68	9732.23	728.09	9770.12	728.25	9776.93	728.45
9790.64	728.4	9805.43	728.53	9812.28	728.78	9829.28	728.95	9836.42	728.93
9851.58	729.2	9859.91	729.07	9876.1	729.19	9891.9	729.37	9895.21	729.22
9897.34	729.5	9911.85	729.67	9920.66	729.68	9952.49	729.48	9965.39	728.86
9985.14	720.1	9992.52	719.85	9995.11	719.73	10000	719.73	10012.59	719.73
10019.37	719.8	10029.67	727.02	10032	728.4144	10034.9	730.15	10050.67	730.87
10068.62	731.36	10089.04	731.41	10108.06	731.67	10113.19	731.38	10118.23	731.68
10139.73	731.72	10150.73	731.61	10183.64	731.71	10195.78	731.63	10204.81	731.91
10218.19	733.9	10235.8	734.11	10240.73	734.3	10293	734	10300	736
10305.4	740	10330.8	750						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9320.22	.04	9965.39	.045	10032	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
9965.39	10032	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

Downstream Deck/Roadway Coordinates
num= 12

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
8895	754.03		9097	753.85		9301	753.76	
9509	753.4		9719	753.26		9965	752.9	
10000	752.88		10211	752.83		10222.95	752.7	745
10297.05	752.7	745	10457	752.62		12000	752.3	

Downstream Bridge Cross Section Data

```
Station Elevation Data     num=       55
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9400    724.7  9418.56   724.75  9470.55   725.23  9492.18   725.38  9564.18   725.93
 9589.58    726.1  9607.43   726.12  9631.35   726.06  9644.46   726.08  9662.95   725.42
 9674.57    725.7  9685.21   725.58  9697.95   724.29  9713.58    723.6  9734.26    723.8
  9740.2    723.7  9749.53   722.27  9756.22    723.4  9775.46   723.77   9789.5   723.97
 9797.39    724.4  9810.58   724.56  9823.91    725.1  9832.95   725.33  9853.34   726.07
 9856.48    726.2  9874.06   726.53  9884.25   726.49  9896.48   726.78  9927.61   726.39
 9942.77    726.3  9953.08   726.43  9967.02    726.3  9971.51   724.93  9975.97   723.03
 9986.31    718.1  9996.49   718.08 10006.97  717.89 10016.95   720.21 10027.33   727.33
10049.27   727.21 10089.05   727.44 10106.59  727.45 10118.51   727.57 10196.92   727.44
10203.13   727.41 10213.77   727.75 10221.47  727.44 10413.47   728.10 477.57      730
10531.17   732.10 586.47     734.10 632.37    736.10 683.87     738.10 724.47      740

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    9400      .04  9967.02     .045 10027.33      .04

Bank Sta: Left   Right     Coeff Contr.    Expan.
       9967.02 10027.33              .3        .5
Ineffective Flow      num=        2
   Sta L    Sta R     Elev   Permanent
888         F
888         F

Upstream Embankment side slope                =       .5 horiz. to 1.0 vertical
Downstream Embankment side slope              =       .5 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =      .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

Number of Culverts =  1

Culvert Name      Shape      Rise     Span
Culvert #1          Box       10       10
FHWA Chart # 11- Skewed headwall; Chamfered or beveled Inlet
FHWA Scale # 2 - Headwall skewed 30 deg.; inlet edges chamfered 3/4 inch
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                 15  315.75       .012                   .4                1
Number of Barrels =  3
Upstream   Elevation =  719.73
Centerline Stations
    Sta.     Sta.     Sta.
    9989    10000    10011
Downstream Elevation =  718.97
Centerline Stations
    Sta.     Sta.     Sta.
    9989    10000    10011

Multiple Opening Stagnation Limits

                         Upstream                Downstream
```

Opening Type	Sta. Left	Sta. Right	Sta. Left	Sta. Right
Culvert Group	8895	10100	8895	10100
Conveyance	10100	12000	10100	12000

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.452

INPUT
Description: Ineff. flow based on allowable expansion
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9400	724.7	9418.56	724.75	9470.55	725.23	9492.18	725.38	9564.18	725.93
9589.58	726.1	9607.43	726.12	9631.35	726.06	9644.46	726.08	9662.95	725.42
9674.57	725.7	9685.21	725.58	9697.95	724.29	9713.58	723.6	9734.26	723.8
9740.2	723.7	9749.53	722.27	9756.22	723.4	9775.46	723.77	9789.5	723.97
9797.39	724.4	9810.58	724.56	9823.91	725.1	9832.95	725.33	9853.34	726.07
9856.48	726.2	9874.06	726.53	9884.25	726.49	9896.48	726.78	9927.61	726.39
9942.77	726.3	9953.08	726.43	9967.02	726.3	9971.51	724.93	9975.97	723.03
9986.31	718.1	9996.49	718.08	10006.97	717.89	10016.95	720.21	10027.33	727.33
10049.27	727.21	10089.05	727.44	10106.59	727.45	10118.51	727.57	10196.92	727.44
10203.13	727.41	10213.77	727.75	10221.47	727.44	10413.47		728	10477.57
730									
10531.17		732	10586.47			734	10632.37		736
10683.87		738	10724.47			740			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9400	.04	9967.02	.04	10027.33	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9967.02	10027.33	530	533.28	530	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888		F	
888		F	

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.351

INPUT
Description: Ineff. flow based on allowable expansion
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9325	722.1	9345.77	722.42	9380.43	723.13	9396.33	723.39	9415.15	723.57
9431.21	724.4	9442.17	724.84	9460.72	725.31	9464.13	725.24	9484.64	725.58
9502.88	724.7	9522.19	723.79	9545.09	723.21	9552.09	723.1	9589.72	722.21
9608.24	721.9	9631.17	721.07	9658.59	721.67	9665.5	721.43	9676.21	720.81
9689.88	721.3	9704	721.8	9705.71	721.65	9723.27	721.33	9760.84	720.09
9766.51	720	9772.65	720.85	9792.73	720.43	9799.14	719.36	9805.63	718.92
9819.16	720.3	9824.96	720.89	9845.31	720.47	9873.31	719.42	9885.35	720.1
9895.34	720.4	9916.69	720.13	9930.59	720.28	9950.32	720.77	9958.41	722.64
9970.09	725.1	9981.25	720.19	9986.57	719.71	9994.85	716.14	10009.1	716.61
10022.14	721.91	10030.52	725.31	10040.65	723.95	10058.44	722.24	10071.04	721.54
10086.84	721.21	10098.56	721.48	10119.28	721.63	10136.2	721.89	10176.06	722.02
10187.32	721.71	10189.36	721.83	10208	722	10216.8	722	10219.5	720
10228.9	712	10281.1	712	10289.6	720	10293.2	722	10312.9	724
10315.9	726	10418.9	726	10462.5	728	10484.8	730	10503.8	732

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9325	.04	9970.09	.04	10030.52	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9970.09	10030.52	80	79.2	80	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888		F	
888		F	

CROSS SECTION RIVER: RIVER-1

REACH: Reach-1 RS: 1.336

INPUT
Description: Ineff. flow based on allowable expansion
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9000	723.8	9029.5	723.3	9052.46	723.4	9062.29	723.35	9134.29	723.46
9142.91	723.3	9160.94	723.54	9172.92	723.51	9179.84	722.76	9226.37	722.16
9235.95	723.3	9242.48	723.38	9245.34	723.18	9250.22	723.35	9259.34	723.41
9269.02	723.7	9332.4	724.19	9339.59	724.21	9354.82	724.66	9366.88	724.73
9375.88	724.9	9389.55	724.88	9431.5	725.01	9440.16	725.12	9452.73	724.91
9476.09	725.1	9477.13	725.15	9499.42	725.44	9522.19	725.64	9569.56	725.81
9596.2	725.9	9621.57	726.2	9648.95	726.43	9709.81	726.49	9749.3	726.71
9772.41	726.8	9821.27	726.79	9868.91	726.89	9913.01	726.9	9935.28	727.08
9956.3	727.1	9966.64	727.49	9973.82	726.76	9979.56	716.55	9981.26	716.9
9989.04	716.4	10011.96	716.45	10016.97	716.5	10018.4	716.71	10019.12	726.04
10019.73	727.8	10026.13	726.63	10048.54	727.28	10052.29	727.45	10075.65	727.88
10098.19	728	10120.84	728.17	10145.25	728.26	10168.21	728.76	10180.79	728.52
10188.92	725.7	10189.5	728.45	10191.43	728.55	10193.61	725.14	10194.53	722.92
10206.17	722.7	10219.31	711.03	10220.3	710.25	10224.84	709.72	10225.92	709
10270.06	708.9	10277.22	712.18	10291.97	722.88	10292.73	722.93	10298.33	724
10301.73	726	10306.33	728	10414.33	728	10576.63	730		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9000	.04	9973.82	.045	10019.12	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9973.82 10019.12 85 84.48 85 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

BRIDGE RIVER: RIVER-1
REACH: Reach-1 RS: 1.333

INPUT
Description:
Distance from Upstream XS = 10
Deck/Roadway Width = 31
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 7

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
8784	725.85		9284	726.35		9983	728.88	724.38
10000	728.88	724.38	10017	728.88	724.38	10362	730.47	
10650	730.5							

Upstream Bridge Cross Section Data
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9000	723.8	9029.5	723.3	9052.46	723.4	9062.29	723.35	9134.29	723.46
9142.91	723.3	9160.94	723.54	9172.92	723.51	9179.84	722.76	9226.37	722.16
9235.95	723.3	9242.48	723.38	9245.34	723.18	9250.22	723.35	9259.34	723.41
9269.02	723.7	9332.4	724.19	9339.59	724.21	9354.82	724.66	9366.88	724.73
9375.88	724.9	9389.55	724.88	9431.5	725.01	9440.16	725.12	9452.73	724.91
9476.09	725.1	9477.13	725.15	9499.42	725.44	9522.19	725.64	9569.56	725.81
9596.2	725.9	9621.57	726.2	9648.95	726.43	9709.81	726.49	9749.3	726.71
9772.41	726.8	9821.27	726.79	9868.91	726.89	9913.01	726.9	9935.28	727.08
9956.3	727.1	9966.64	727.49	9973.82	726.76	9979.56	716.55	9981.26	716.9
9989.04	716.4	10011.96	716.45	10016.97	716.5	10018.4	716.71	10019.12	726.04
10019.73	727.8	10026.13	726.63	10048.54	727.28	10052.29	727.45	10075.65	727.88
10098.19	728	10120.84	728.17	10145.25	728.26	10168.21	728.76	10180.79	728.52
10188.92	725.7	10189.5	728.45	10191.43	728.55	10193.61	725.14	10194.53	722.92
10206.17	722.7	10219.31	711.03	10220.3	710.25	10224.84	709.72	10225.92	709
10270.06	708.9	10277.22	712.18	10291.97	722.88	10292.73	722.93	10298.33	724
10301.73	726	10306.33	728	10414.33	728	10576.63	730		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
    9000      .04 9973.82    .04510019.12      .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9973.8210019.12              .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
888       F
888       F

Downstream  Deck/Roadway Coordinates
    num=        7
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    8784  725.85             9284  726.35             9983  728.88  724.38
   10000  728.88  724.38   10017  728.88  724.38   10362  730.47
   10650   730.5

Downstream Bridge Cross Section Data
Station Elevation Data    num=       21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9425     720    9777     720    9875     722    9926     723    9961   722.5
    9973   716.8    9990   716.4   10000   716.5   10023  716.55   10027     717
 10027.1     723   10227  723.25   10230     720 10242.2     710 10244.8     708
 10297.8     708 10299.9     710 10309.9     720 10314.4     724 10454.9     726
 10777.5     728

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9425     .04    9961    .045 10027.1     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9961 10027.1              .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
888       F
888       F

Upstream Embankment side slope              =       2 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   10000    Downstream=   10000
Upstream     num=       2
    Width   Elev    Width   Elev
        2  716.85       2  724.38
Downstream     num=       2
    Width   Elev    Width   Elev
        2  716.85       2  724.38

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
       Yarnell                 KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
```

```
        Do not add Weight component to Momentum
        Class B flow critical depth computations use critical depth
            inside the bridge at the upstream end
        Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 1.320

INPUT
Description: Ineff. flow based on allowable expansion
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9425     720    9777     720    9875     722    9926     723    9961   722.5
    9973   716.8    9990   716.4   10000   716.5   10023  716.55   10027     717
 10027.1     723   10227  723.25   10230     720 10242.2     710 10244.8     708
 10297.8     708 10299.9     710 10309.9     720 10314.4     724 10454.9     726
 10777.5     728

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9425     .04    9961    .045 10027.1     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9961 10027.1               75   73.92      75              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 1.306

INPUT
Description: Ineff. flow based on allowable expansion
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9472     720    9582     718    9692     718    9825     718    9913     720
    9920  720.54    9932   720.9    9936     722    9943     724    9956   724.5
  9974.5     724    9983     717    9990   716.9    9995  716.85   10000  716.85
   10022   716.9 10022.1   722.3   10028     722   10168     724 10173.5     722
 10184.7     720 10206.1     710   10257     710 10263.8     720 10270.6     722
 10282.3     724   10288     726 10422.5     726

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9472     .04  9974.5    .045 10022.1     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9974.5 10022.1              120  121.44     120              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

BRIDGE                  RIVER: RIVER-1
REACH: Reach-1             RS: 1.298

INPUT
Description:
Distance from Upstream XS =      28
Deck/Roadway Width        =      44
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8624   720.9            8915   721.2            9166   721.9
    9585   722.6            9881   723.1         9971.55  723.56  721.83
   10000   723.7  721.8310028.55  723.84  721.83   10297   725.1
   10625  726.15

Upstream Bridge Cross Section Data
```

```
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9472     720    9582     718    9692     718    9825     718    9913     720
    9920  720.54    9932   720.9    9936     722    9943     724    9956   724.5
  9974.5     724    9983     717    9990   716.9    9995  716.85   10000  716.85
   10022   716.9 10022.1   722.3   10028     722   10168     724 10173.5     722
 10184.7     720 10206.1     710   10257     710 10263.8     720 10270.6     722
 10282.3     724   10288     726 10422.5     726

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9472     .04  9974.5    .045 10022.1     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        9974.5 10022.1              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

Downstream  Deck/Roadway Coordinates
    num=      10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8624   720.9            8915   721.2            9166   721.9
    9585   722.6            9881   723.1         9971.55  723.56  721.83
   10000   723.7  721.8310028.55  723.84  721.83   10297   725.1
   10625  726.15

Downstream Bridge Cross Section Data
Station Elevation Data    num=      51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9421.23   718.5 9440.51  718.26  9457.5  719.26 9473.52  719.12 9491.75  718.47
 9532.72   718.5 9551.89  719.05 9583.34  719.04 9617.28  719.16 9665.99  720.75
 9680.49   722.4 9686.92  722.91 9730.57   722.7 9741.01  722.14 9743.99  722.12
 9765.31   721.6 9767.83  721.64 9812.76   721.6 9846.83  722.22 9851.37  722.01
 9867.05     722 9889.74  721.69 9907.59   721.8  9918.5  721.98 9924.27  722.33
 9930.72   722.3 9943.07  722.01 9945.07   721.4 9962.88  716.93   10000  716.48
 10011.6   716.210018.26  716.4210030.61  717.0810043.29  721.9310056.99  722.95
10070.26   723.210098.22  723.5210117.45  723.8810151.48  724.0410156.69  724.24
10167.03   724.310193.68  724.6910214.96  724.7810241.77  725.0510246.11  724.93
10264.66   714.910277.85  708.9510282.22  708.6810316.43  707.6410328.74  707.76
10345.75   724.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9421.23     .04 9943.07    .04510056.99     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9943.0710056.99              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream= 9988.95    Downstream= 9988.95
Upstream     num=       2
    Width   Elev    Width   Elev
        1    716        1  721.83
Downstream     num=       2
    Width   Elev    Width   Elev
```

```
       1     716       1  721.83

Pier Data
Pier Station     Upstream=10011.05    Downstream=10011.05
Upstream     num=       2
    Width   Elev    Width   Elev
       1     716       1  721.83
Downstream     num=       2
    Width   Elev    Width   Elev
       1     716       1  721.83

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
       Yarnell                 KVal =     .09
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 1.283

INPUT
Description:
Station Elevation Data    num=      51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9421.23   718.5 9440.51  718.26  9457.5  719.26 9473.52  719.12 9491.75  718.47
 9532.72   718.5 9551.89  719.05 9583.34  719.04 9617.28  719.16 9665.99  720.75
 9680.49   722.4 9686.92  722.91 9730.57   722.7 9741.01  722.14 9743.99  722.12
 9765.31   721.6 9767.83  721.64 9812.76   721.6 9846.83  722.22 9851.37  722.01
 9867.05     722 9889.74  721.69 9907.59   721.8  9918.5  721.98 9924.27  722.33
 9930.72   722.3 9943.07  722.01 9945.07   721.4 9962.88  716.93   10000  716.48
 10011.6   716.210018.26  716.4210030.61  717.0810043.29  721.9310056.99  722.95
10070.26   723.210098.22  723.5210117.45  723.8810151.48  724.0410156.69  724.24
10167.03   724.310193.68  724.6910214.96  724.7810241.77  725.0510246.11  724.93
10264.66   714.910277.85  708.9510282.22  708.6810316.43  707.6410328.74  707.76
10345.75   724.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9421.23     .04 9943.07    .04510056.99     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.0710056.99              280  385.44     420             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 1.210

INPUT
Description:
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  8430.6     750    8450     740  8474.5     730  8499.3     722  8558.2     720
  8577.3     720  8594.1     722  8605.1   722.8  8836.9   722.6  9091.3   722.8
```

9335.8	722.7	9650.2	723.1	9809.5	723.3	9854.7	722	9871.4	720
9970.4	720	9985	715	10015.3	715	10030.9	720	10043.4	724
10160.7	726	10211.2	728						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8430.6	.04	8605.1	.024	9854.7	.04	9970.4	.045	10030.9	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9970.4	10030.9	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3	n4	n5
Reach-1	3.655	.035	.06	.045		
Reach-1	3.555	.035	.06	.045		
Reach-1	3.464	.035	.06	.045		
Reach-1	3.361	.035	.06	.045		
Reach-1	3.258	.035	.06	.045		
Reach-1	3.248	Bridge				
Reach-1	3.163	.035	.06	.045		
Reach-1	3.066	.035	.06	.045		
Reach-1	2.972	.045	.07	.04		
Reach-1	2.882	.045	.07	.04		
Reach-1	2.791	.045	.07	.04		
Reach-1	2.686	.045	.07	.04		
Reach-1	2.599	.045	.07	.04		
Reach-1	2.508	.045	.07	.04		
Reach-1	2.416	.045	.06	.05		
Reach-1	2.298	.045	.06	.05		
Reach-1	2.204	.045	.06	.05		
Reach-1	2.030	.045	.06	.05		
Reach-1	1.952	.045	.06	.05		
Reach-1	1.865	.045	.06	.045	.06	.05
Reach-1	1.855	Culvert				
Reach-1	1.829	.045	.045	.04	.045	.04
Reach-1	1.734	.04	.045	.04		
Reach-1	1.650	.04	.045	.04		
Reach-1	1.635	Culvert				
Reach-1	1.612	.04	.045	.04		
Reach-1	1.539	.04	.045	.04		
Reach-1	1.530	.04	.045	.04		
Reach-1	1.528	Mult Open				
Reach-1	1.452	.04	.045	.04		
Reach-1	1.351	.04	.045	.04		
Reach-1	1.336	.04	.045	.04		
Reach-1	1.333	Bridge				
Reach-1	1.320	.04	.045	.04		
Reach-1	1.306	.04	.045	.04		
Reach-1	1.298	Bridge				
Reach-1	1.283	.04	.045	.04		
Reach-1	1.210	.04	.024	.04	.045	.04

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	3.655	500	528	500
Reach-1	3.555	500	480.48	500
Reach-1	3.464	550	543.84	550
Reach-1	3.361	540	543.84	540

Reach-1	3.258	500	501.26	500
Reach-1	3.248	Bridge		
Reach-1	3.163	500	512.16	500
Reach-1	3.066	500	496.32	500
Reach-1	2.972	480	475.2	480
Reach-1	2.882	480	480.48	480
Reach-1	2.791	500	554.4	500
Reach-1	2.686	450	459.36	450
Reach-1	2.599	490	480.48	490
Reach-1	2.508	480	485.76	480
Reach-1	2.416	630	623.04	630
Reach-1	2.298	490	496.32	490
Reach-1	2.204	500	918.72	600
Reach-1	2.030	410	411.84	410
Reach-1	1.952	460	459.36	460
Reach-1	1.865	200	190.08	200
Reach-1	1.855	Culvert		
Reach-1	1.829	500	501.6	500
Reach-1	1.734	450	443.52	450
Reach-1	1.650	200	200.64	200
Reach-1	1.635	Culvert		
Reach-1	1.612	390	385.44	380
Reach-1	1.539	45.22	47.52	45.22
Reach-1	1.530	400	411.84	400
Reach-1	1.528	Mult Open		
Reach-1	1.452	530	533.28	530
Reach-1	1.351	80	79.2	80
Reach-1	1.336	85	84.48	85
Reach-1	1.333	Bridge		
Reach-1	1.320	75	73.92	75
Reach-1	1.306	120	121.44	120
Reach-1	1.298	Bridge		
Reach-1	1.283	280	385.44	420
Reach-1	1.210	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	3.655	.1	.3
Reach-1	3.555	.1	.3
Reach-1	3.464	.1	.3
Reach-1	3.361	.1	.3
Reach-1	3.258	.3	.5
Reach-1	3.248	Bridge	
Reach-1	3.163	.3	.5
Reach-1	3.066	.1	.3
Reach-1	2.972	.1	.3
Reach-1	2.882	.1	.3
Reach-1	2.791	.1	.3
Reach-1	2.686	.1	.3
Reach-1	2.599	.1	.3
Reach-1	2.508	.1	.3
Reach-1	2.416	.1	.3
Reach-1	2.298	.1	.3
Reach-1	2.204	.1	.3
Reach-1	2.030	.1	.3
Reach-1	1.952	.1	.3
Reach-1	1.865	.6	.8
Reach-1	1.855	Culvert	
Reach-1	1.829	.6	.8
Reach-1	1.734	.1	.3
Reach-1	1.650	.3	.5
Reach-1	1.635	Culvert	
Reach-1	1.612	.3	.5
Reach-1	1.539	.1	.3

Reach-1	1.530		.3	.5
Reach-1	1.528	Mult Open		
Reach-1	1.452		.3	.5
Reach-1	1.351		.1	.3
Reach-1	1.336		.3	.5
Reach-1	1.333	Bridge		
Reach-1	1.320		.3	.5
Reach-1	1.306		.3	.5
Reach-1	1.298	Bridge		
Reach-1	1.283		.3	.5
Reach-1	1.210		.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	3.655	1350.00	776.21	782.81		783.28	0.01	6.19	254.32	104.46	1
Reach-1	3.655	1350.00	776.21	783.75		784.88	0.01	8.65	160.74	32.00	1
Reach-1	3.555	1350.00	772.50	778.54		778.92	0.01	5.27	279.50	128.38	0
Reach-1	3.555	1350.00	772.50	779.10		779.58	0.01	5.58	246.16	60.00	0
Reach-1	3.464	1350.00	769.97	776.19		776.45	0.00	4.08	336.54	97.73	0
Reach-1	3.464	1350.00	769.97	777.09		777.37	0.00	4.26	322.64	60.00	0
Reach-1	3.361	1350.00	767.00	773.09		773.52	0.01	6.01	267.41	144.79	1
Reach-1	3.361	1350.00	767.00	773.47		774.33	0.01	7.60	182.47	50.00	1
Reach-1	3.258	1350.00	763.52	771.84	768.23	771.95	0.00	2.80	531.74	172.28	0
Reach-1	3.258	1350.00	763.52	772.23	768.24	772.37	0.00	3.09	444.70	75.00	0
Reach-1	3.248	Bridge									
Reach-1	3.163	1350.00	761.89	767.23		767.44	0.00	3.78	363.68	133.17	0
Reach-1	3.163	1350.00	761.89	768.02		768.42	0.01	5.10	270.14	60.00	0
Reach-1	3.066	1350.00	758.53	764.31		764.68	0.01	5.18	291.63	138.20	0
Reach-1	3.066	1350.00	758.53	765.20		765.58	0.01	5.05	273.48	65.00	0
Reach-1	2.972	1350.00	756.06	762.22		762.34	0.00	2.78	491.38	151.95	0
Reach-1	2.972	1350.00	756.06	763.00		763.23	0.00	3.90	346.04	60.00	0
Reach-1	2.882	1350.00	751.91	758.30		758.97	0.03	6.61	205.22	111.83	1
Reach-1	2.882	1350.00	751.91	759.24		759.79	0.02	5.99	225.85	68.00	1
Reach-1	2.791	1350.00	749.62	756.98		757.04	0.00	1.90	679.30	220.41	0
Reach-1	2.791	1350.00	749.62	757.45		757.55	0.00	2.50	540.17	130.00	0

Reach-1	2.686		1350.00	747.53	755.70		755.87	0.00	
3.31	421.19	239.79	0						
Reach-1	2.686		1350.00	747.53	755.93		756.09	0.00	
3.24	416.28	99.45	0						
Reach-1	2.599		1350.00	746.39	753.67		753.89	0.00	
3.89	364.62	120.48	0						
Reach-1	2.599		1350.00	746.39	753.68		753.97	0.01	
4.34	311.39	68.00	0						
Reach-1	2.508		1350.00	745.20	750.88		751.07	0.01	
3.53	386.61	164.58	0						
Reach-1	2.508		1350.00	745.20	751.60		751.73	0.00	
2.81	480.03	142.58	0						
Reach-1	2.416		1350.00	741.64	748.48		748.65	0.00	
3.65	406.14	480.68	0						
Reach-1	2.416		1350.00	741.64	748.98		749.39	0.01	
5.28	263.11	64.58	0						
Reach-1	2.298		1350.00	740.57	746.49	743.92	746.66	0.00	
3.38	425.96	739.32	0						
Reach-1	2.298		1350.00	740.57	746.88	743.92	747.04	0.00	
3.22	423.95	100.00	0						
Reach-1	2.204		1350.00	739.32	745.93		745.98	0.00	
1.91	742.96	962.97	0						
Reach-1	2.204		1350.00	739.32	746.36		746.42	0.00	
2.00	683.54	130.00	0						
Reach-1	2.030		1350.00	737.71	745.93		745.93	0.00	
0.31	4662.10	1593.52	0						
Reach-1	2.030		1350.00	737.71	746.36		746.36	0.00	
0.37	3711.36	610.00	0						
Reach-1	1.952		1350.00	734.20	745.92		745.92	0.00	
0.30	4875.94	1000.05	0						
Reach-1	1.952		1350.00	734.20	746.35		746.36	0.00	
0.29	4808.22	628.00	0						
Reach-1	1.865		8870.00	731.00	745.90	737.00	745.91	0.00	
0.74	12110.14	1381.71	0						
Reach-1	1.865		8870.00	731.00	746.32	737.16	746.33	0.00	
0.94	9291.75	895.91	0						
Reach-1	1.855		Culvert						
Reach-1	1.829		8960.00	722.61	741.34		741.36	0.00	
1.01	9768.41	1131.39	0						
Reach-1	1.829		8960.00	722.61	741.56		741.57	0.00	
1.04	8943.18	876.74	0						
Reach-1	1.734		8960.00	722.88	741.32		741.34	0.00	
1.36	8779.02	954.47	0						
Reach-1	1.734		8960.00	722.88	741.50		741.54	0.00	
1.70	5959.77	447.77	0						
Reach-1	1.650		8960.00	722.25	741.26	735.49	741.31	0.00	
2.49	5638.85	1027.35	0						
Reach-1	1.650		8960.00	722.25	741.33	735.40	741.48	0.00	
3.73	3176.94	422.17	0						
Reach-1	1.635		Culvert						
Reach-1	1.612		8960.00	720.99	733.96	733.96	735.01	0.00	
9.80	1427.40	705.13	1						
Reach-1	1.612		8960.00	720.99	734.42	733.90	735.36	0.00	
9.20	1406.18	425.00	1						
Reach-1	1.539		8960.00	718.41	731.84	731.84	732.90	0.01	

10.16	1559.70	843.04	1							
Reach-1	1.539		8960.00	718.41	732.10	732.10	733.37	0.01		
10.61	1232.79	432.19	1							
Reach-1	1.530		3250.00	719.73	731.61	725.71	731.93	0.00		
4.73	774.17	793.35	0							
Reach-1	1.530		3250.00	719.73	732.31	725.71	732.55	0.00		
4.15	967.13	886.47	0							
Reach-1	1.528		Mult Open							
Reach-1	1.452		3250.00	717.89	728.47	724.73	729.08	0.00		
6.44	546.51	1028.53	0							
Reach-1	1.452		3250.00	717.89	729.29	724.74	729.83	0.00		
6.00	568.34	80.00	0							
Reach-1	1.351		3250.00	716.14	728.65	722.22	728.67	0.00		
1.17	2728.30	1144.71	0							
Reach-1	1.351		3250.00	716.14	728.98	723.51	729.13	0.00		
3.29	1083.08	140.00	0							
Reach-1	1.336		3250.00	716.40	728.19	722.40	728.61	0.00		
5.62	780.95	1370.71	0							
Reach-1	1.336		3250.00	716.40	728.54	722.41	729.02	0.00		
5.81	661.12	160.00	0							
Reach-1	1.333		Bridge							
Reach-1	1.320		3250.00	716.40	725.17	721.65	725.25	0.00		
2.74	1594.91	971.88	0							
Reach-1	1.320		3250.00	716.40	725.60	721.25	725.89	0.00		
4.67	811.74	160.00	0							
Reach-1	1.306		3250.00	716.85	725.18	718.51	725.21	0.00		
1.40	2448.66	813.67	0							
Reach-1	1.306		3250.00	716.85	725.23	723.28	725.70	0.00		
6.15	648.35	160.00	0							
Reach-1	1.298		Bridge							
Reach-1	1.283		3250.00	716.20	724.52	719.67	724.58	0.00		
2.17	1718.38	859.67	0							
Reach-1	1.283		3250.00	716.20	725.40	720.56	725.47	0.00		
2.38	1637.56	350.00	0							
Reach-1	1.210		8700.00	715.00	723.41	723.41	723.92	0.00		
7.85	1830.20	1546.65	1							
Reach-1	1.210		8700.00	715.00	724.41	723.84	724.91	0.00		
6.89	1613.55	622.48	0							

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
		(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	3.655	783.28	782.81	0.47	4.33	0.02	33.91	743.61	572.48	104.46
Reach-1	3.655	784.88	783.75	1.13	5.11	0.20	80.65	1253.96	15.39	32.00
Reach-1	3.555	778.92	778.54	0.39	2.44	0.04	226.87	1064.65	58.48	128.38
Reach-1	3.555	779.58	779.10	0.47	2.15	0.06	26.35	1298.33	25.32	60.00
Reach-1	3.464	776.45	776.19	0.26	2.91	0.02	289.24	984.97	75.79	97.73
Reach-1	3.464	777.37	777.09	0.28	2.98	0.06	83.37			

1224.10	42.53	60.00									
Reach-1	3.361		773.52	773.09	0.43	1.47	0.10	251.72			
702.29	396.00	144.79									
Reach-1	3.361		774.33	773.47	0.86	1.74	0.21	195.65			
969.67	184.67	50.00									
Reach-1	3.258		771.95	771.84	0.11			13.11			
1113.73	223.16	172.28									
Reach-1	3.258		772.37	772.23	0.15			3.52			
1311.23	35.25	75.00									
Reach-1	3.248		Bridge								
Reach-1	3.163		767.44	767.23	0.22	2.71	0.04	260.11			
775.02	314.87	133.17									
Reach-1	3.163		768.42	768.02	0.39	2.83	0.01	45.29			
1263.32	41.39	60.00									
Reach-1	3.066		764.68	764.31	0.36	2.26	0.07	156.24			
1006.71	187.06	138.20									
Reach-1	3.066		765.58	765.20	0.38	2.30	0.04	55.81			
1215.70	78.49	65.00									
Reach-1	2.972		762.34	762.22	0.12	3.31	0.06	1.47			
1338.47	10.06	151.95									
Reach-1	2.972		763.23	763.00	0.24	3.41	0.03				
1350.00		60.00									
Reach-1	2.882		758.97	758.30	0.67	1.75	0.18	0.06			
1070.68	279.27	111.83									
Reach-1	2.882		759.79	759.24	0.56	2.10	0.14				
1347.80	2.21	68.00									
Reach-1	2.791		757.04	756.98	0.06	1.15	0.01	316.12			
833.31	200.58	220.41									
Reach-1	2.791		757.55	757.45	0.10	1.45	0.01	62.78			
1232.50	54.72	130.00									
Reach-1	2.686		755.87	755.70	0.17	1.97	0.01	17.91			
1302.82	29.27	239.79									
Reach-1	2.686		756.09	755.93	0.16	2.12	0.01				
1350.00		99.45									
Reach-1	2.599		753.89	753.67	0.22	2.81	0.01	28.92			
1233.17	87.90	120.48									
Reach-1	2.599		753.97	753.68	0.29	2.19	0.05				
1350.00		68.00									
Reach-1	2.508		751.07	750.88	0.19	2.41	0.00	2.61			
1333.60	13.79	164.58									
Reach-1	2.508		751.73	751.60	0.12	2.30	0.03				
1350.00		142.58									
Reach-1	2.416		748.65	748.48	0.18	2.00	0.00	0.88			
683.91	665.20	480.68									
Reach-1	2.416		749.39	748.98	0.41	2.28	0.08				
1116.51	233.49	64.58									
Reach-1	2.298		746.66	746.49	0.17	0.65	0.04	7.03			
1291.88	51.09	739.32									
Reach-1	2.298		747.04	746.88	0.16	0.59	0.03	11.00			
1339.00		100.00									
Reach-1	2.204		745.98	745.93	0.05	0.03	0.02	96.09			
1226.69	27.22	962.97									
Reach-1	2.204		746.42	746.36	0.06	0.03	0.02				
1328.56	21.44	130.00									
Reach-1	2.030		745.93	745.93	0.00	0.00	0.00	171.58			
657.33	521.09	1593.52									

Reach-1	2.030			746.36	746.36	0.00	0.00	0.00	230.55	
827.97	291.49	610.00								
Reach-1	1.952			745.92	745.92	0.00	0.01	0.00	449.06	
256.68	644.25	1000.05								
Reach-1	1.952			746.36	746.35	0.00	0.02	0.00	410.32	
261.76	677.92	628.00								
Reach-1	1.865			745.91	745.90	0.01			2120.22	
1938.83	4810.95	1381.71								
Reach-1	1.865			746.33	746.32	0.01			1353.85	
2526.18	4989.98	895.91								
Reach-1	1.855		Culvert							
Reach-1	1.829			741.36	741.34	0.01	0.02	0.00	1117.35	
770.06	7072.59	1131.39								
Reach-1	1.829			741.57	741.56	0.02	0.02	0.01	680.13	
806.73	7473.14	876.74								
Reach-1	1.734			741.34	741.32	0.02	0.03	0.00	3547.18	
3308.48	2104.35	954.47								
Reach-1	1.734			741.54	741.50	0.04	0.05	0.01	2687.50	
4187.99	2084.51	447.77								
Reach-1	1.650			741.31	741.26	0.05			5364.65	
2503.95	1091.40	1027.35								
Reach-1	1.650			741.48	741.33	0.14			3320.67	
3771.80	1867.54	422.17								
Reach-1	1.635		Culvert							
Reach-1	1.612			735.01	733.96	1.05	2.03	0.00	324.23	
5731.98	2903.80	705.13								
Reach-1	1.612			735.36	734.42	0.94	1.88	0.10	381.47	
5634.51	2944.01	425.00								
Reach-1	1.539			732.90	731.84	1.06	0.15	0.22	3093.38	
5554.38	312.24	843.04								
Reach-1	1.539			733.37	732.10	1.28	0.13	0.31	2496.81	
5970.47	492.72	432.19								
Reach-1	1.530			731.93	731.61	0.33			196.45	
3021.49	32.06	793.35								
Reach-1	1.530			732.55	732.31	0.24			263.03	
2840.60	146.37	886.47								
Reach-1	1.528		Mult Open							
Reach-1	1.452			729.08	728.47	0.61	0.11	0.29	145.48	
3045.01	59.51	1028.53								
Reach-1	1.452			729.83	729.29	0.54	0.50	0.20	56.69	
3132.57	60.74	80.00								
Reach-1	1.351			728.67	728.65	0.02	0.02	0.04	1526.41	
633.88	1089.71	1144.71								
Reach-1	1.351			729.13	728.98	0.14	0.07	0.03	824.02	
1848.27	577.71	140.00								
Reach-1	1.336			728.61	728.19	0.43			389.12	
2787.81	73.07	1370.71								
Reach-1	1.336			729.02	728.54	0.48			148.41	
2977.23	124.36	160.00								
Reach-1	1.333		Bridge							
Reach-1	1.320			725.25	725.17	0.08	0.02	0.03	1262.31	
1460.82	526.87	971.88								
Reach-1	1.320			725.89	725.60	0.29	0.14	0.05	299.44	
2616.80	333.76	160.00								

```
  Reach-1        1.306                725.21      725.18        0.03                                1545.00
510.88    1194.12      813.67
  Reach-1        1.306                725.70      725.23        0.47                                 353.18
2252.23     644.59      160.00

  Reach-1        1.298                Bridge

  Reach-1        1.283                724.58      724.52        0.06         0.52         0.13      811.24
1584.34     854.42      859.67
  Reach-1        1.283                725.47      725.40        0.07         0.43         0.13     1323.63
1926.37                 350.00

  Reach-1        1.210                723.92      723.41        0.51                                5235.59
3403.56      60.85     1546.65
  Reach-1        1.210                724.91      724.41        0.50                                5298.81
3401.20                 622.48
```

Profile Output Table - Encroachment 1

```
  Reach          River Sta        W.S. Elev  Prof Delta WS  E.G. Elev  Top Wdth Act      Q Left  Q
Channel     Q Right  Enc Sta L    Ch Sta L          (ft)  Ch Sta R  Enc Sta R
                                       (ft)                    (ft)          (ft)          (ft)      (cfs)
(cfs)       (cfs)        (ft)        (ft)        (ft)        (ft)

  Reach-1        3.655                782.81                      783.28        104.46      33.91
743.61      572.48                 9987.50   10013.81
  Reach-1        3.655                783.75            0.95      784.88         32.00      80.65
1253.96      15.39     9983.00     9987.50   10013.81   10015.00

  Reach-1        3.555                778.54                      778.92        128.38     226.87
1064.65      58.48                  9957.66   10011.23
  Reach-1        3.555                779.10            0.57      779.58         60.00      26.35
1298.33      25.32     9955.00     9957.66   10011.23   10015.00

  Reach-1        3.464                776.19                      776.45         97.73     289.24
984.97       75.79                  9970.00   10021.00
  Reach-1        3.464                777.09            0.90      777.37         60.00      83.37
1224.10      42.53     9965.00     9970.00   10021.00   10025.00

  Reach-1        3.361                773.09                      773.52        144.79     251.72
702.29      396.00                  9985.41   10013.55
  Reach-1        3.361                773.47            0.38      774.33         50.00     195.65
969.67      184.67     9975.00     9985.41   10013.55   10025.00

  Reach-1        3.258                771.84                      771.95        143.76      13.11
1113.73     223.16                  9961.00   10030.33
  Reach-1        3.258                772.23            0.39      772.37         75.00       3.52
1311.23      35.25     9960.00     9961.00   10030.33   10035.00

  Reach-1        3.248    BR U        771.65                      771.86         67.57
1290.50      59.50                  9961.00   10030.33
  Reach-1        3.248    BR U        772.07            0.42      772.25         67.34
1286.57      63.44     9791.00     9961.00   10030.33   10546.00

  Reach-1        3.248    BR D        769.14                      769.33         68.89       9.08
991.26      349.66                  9963.49   10016.88
  Reach-1        3.248    BR D        769.55            0.42      769.73         68.67       8.29
987.92      353.79     9791.00     9963.49   10016.88   10546.00

  Reach-1        3.163                767.23                      767.44        133.17     260.11
775.02      314.87                  9963.49   10016.88
  Reach-1        3.163                768.02            0.80      768.42         60.00      45.29
1263.32      41.39     9960.00     9963.49   10016.88   10020.00

  Reach-1        3.066                764.31                      764.68        138.20     156.24
1006.71     187.06                  9965.73   10018.23
  Reach-1        3.066                765.20            0.89      765.58         65.00      55.81
1215.70      78.49     9960.00     9965.73   10018.23   10025.00

  Reach-1        2.972                762.22                      762.34        151.95       1.47
```

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1338.47      10.06                9961.00   10090.00
  Reach-1        2.972              763.00            0.77     763.23          60.00
1350.00                9970.00    9961.00   10090.00   10030.00

  Reach-1        2.882              758.30                     758.97         111.83        0.06
1070.68     279.27                9982.00   10049.40
  Reach-1        2.882              759.24            0.93     759.79          68.00
1347.80       2.21    9982.00    9982.00   10049.40   10050.00

  Reach-1        2.791              756.98                     757.04         220.41      316.12
833.31     200.58                9928.98   10042.29
  Reach-1        2.791              757.45            0.48     757.55         130.00       62.78
1232.50      54.72    9920.00    9928.98   10042.29   10050.00

  Reach-1        2.686              755.70                     755.87         139.88       17.91
1302.82      29.27                9940.63   10040.08
  Reach-1        2.686              755.93            0.23     756.09          99.45
1350.00                9940.63    9940.63   10040.08   10040.08

  Reach-1        2.599              753.67                     753.89         120.48       28.92
1233.17      87.90                9963.12   10034.76
  Reach-1        2.599              753.68            0.01     753.97          68.00
1350.00                9966.00    9963.12   10034.76   10034.00

  Reach-1        2.508              750.88                     751.07         164.58        2.61
1333.60      13.79                9928.06   10070.64
  Reach-1        2.508              751.60            0.72     751.73         142.58
1350.00                9928.06    9928.06   10070.64   10070.64

  Reach-1        2.416              748.48                     748.65         154.58        0.88
683.91     665.20                9970.42   10017.90
  Reach-1        2.416              748.98            0.51     749.39          64.58
1116.51     233.49    9970.42    9970.42   10017.90   10035.00

  Reach-1        2.298              746.49                     746.66         156.62        7.03
1291.88      51.09                9957.91   10050.86
  Reach-1        2.298              746.88            0.38     747.04         100.00       11.00
1339.00                9950.00    9957.91   10050.86   10050.00

  Reach-1        2.204              745.93                     745.98         195.41       96.09
1226.69      27.22                9907.76   10042.78
  Reach-1        2.204              746.36            0.43     746.42         130.00
1328.56      21.44    9920.00    9907.76   10042.78   10050.00

  Reach-1        2.030              745.93                     745.93         798.54      171.58
657.33     521.09                9838.03   10117.68
  Reach-1        2.030              746.36            0.43     746.36         532.01      230.55
827.97     291.49    9620.00    9838.03   10117.68   10230.00

  Reach-1        1.952              745.92                     745.92         718.19      449.06
256.68     644.25                9954.85   10040.55
  Reach-1        1.952              746.35            0.43     746.36         628.00      410.32
261.76     677.92    9760.00    9954.85   10040.55   10388.00

  Reach-1        1.865              745.90                     745.91        1381.71     2120.22
1938.83    4810.95                9969.38   10195.66
  Reach-1        1.865              746.32            0.42     746.33         895.91     1353.85
2526.18    4989.98    9845.87    9969.38   10195.66   10741.78

  Reach-1        1.855              Culvert

  Reach-1        1.829              741.34                     741.36        1131.39     1117.35
770.06    7072.59                9967.62   10021.11
  Reach-1        1.829              741.56            0.21     741.57         876.74      680.13
806.73    7473.14    9853.26    9967.62   10021.11   10730.00

  Reach-1        1.734              741.32                     741.34         954.47     3547.18
3308.48    2104.35                9872.22   10011.77
  Reach-1        1.734              741.50            0.18     741.54         447.77     2687.50
4187.99    2084.51    9720.00    9872.22   10011.77   10167.77
```

```
  Reach-1       1.650              741.26                     741.31        1027.35     5364.65
2503.95    1091.40               9970.55   10034.97
  Reach-1       1.650              741.33            0.08     741.48         422.17     3320.67
3771.80    1867.54    9800.00    9970.55   10034.97   10222.17

  Reach-1       1.635             Culvert

  Reach-1       1.612              733.96                     735.01         705.13      324.23
5731.98    2903.80               9970.32   10030.53
  Reach-1       1.612              734.42            0.46     735.36         425.00      381.47
5634.51    2944.01    9850.00    9970.32   10030.53   10275.00

  Reach-1       1.539              731.84                     732.90         843.04     3093.38
5554.38     312.24               9969.01   10030.00
  Reach-1       1.539              732.10            0.26     733.37         432.19     2496.81
5970.47     492.72    9745.00    9969.01   10030.00   10200.00

  Reach-1       1.530              731.61                     731.93         192.91      196.45
3021.49      32.06               9965.39   10032.00
  Reach-1       1.530              732.31            0.70     732.55         286.81      263.03
2840.60     146.37    9321.00    9965.39   10032.00   10250.00

  Reach-1       1.528           Mult Open

  Reach-1       1.452              728.47                     729.08         105.00      145.48
3045.01      59.51               9967.02   10027.33
  Reach-1       1.452              729.29            0.82     729.83          80.00       56.69
3132.57      60.74    9960.00    9967.02   10027.33   10040.00

  Reach-1       1.351              728.65                     728.67         360.00     1526.41
633.88    1089.71                9970.09   10030.52
  Reach-1       1.351              728.98            0.34     729.13         140.00      824.02
1848.27     577.71    9930.00    9970.09   10030.52   10070.00

  Reach-1       1.336              728.19                     728.61         332.93      389.12
2787.81      73.07               9973.82   10019.12
  Reach-1       1.336              728.54            0.35     729.02         160.00      148.41
2977.23     124.36    9920.00    9973.82   10019.12   10080.00

  Reach-1       1.333   BR U       728.19                     728.61
3224.86                           9973.82   10019.12
  Reach-1       1.333   BR U       728.54            0.35     729.02
3227.12                9920.00    9973.82   10019.12   10080.00

  Reach-1       1.333   BR D       728.02                     728.02         448.90      695.32
2400.82     153.62               9961.00   10027.10
  Reach-1       1.333   BR D       728.54            0.51     729.01
3227.12                9920.00    9961.00   10027.10   10080.00

  Reach-1       1.320              725.17                     725.25         450.00     1262.31
1460.82     526.87               9961.00   10027.10
  Reach-1       1.320              725.60            0.42     725.89         160.00      299.44
2616.80     333.76    9920.00    9961.00   10027.10   10080.00

  Reach-1       1.306              725.18                     725.21         465.00     1545.00
510.88    1194.12                9974.50   10022.10
  Reach-1       1.306              725.23            0.05     725.70         160.00      353.18
2252.23     644.59    9920.00    9974.50   10022.10   10080.00

  Reach-1       1.298   BR U       725.18                     725.21         465.00     2076.75
571.65     601.35                9974.50   10022.10
  Reach-1       1.298   BR U       725.23            0.05     725.70         295.00     2406.82
414.20     426.16    9750.00    9974.50   10022.10   10060.00

  Reach-1       1.298   BR D       724.52                     724.86         473.28     2030.27
760.76     458.71                9943.07   10056.99
  Reach-1       1.298   BR D       725.40            0.89     725.47         310.00     2354.89
503.37     388.91    9750.00    9943.07   10056.99   10060.00

  Reach-1       1.283              724.52                     724.58         515.15      811.24
1584.34     854.42               9943.07   10056.99
```

Reach-1	1.283		725.40		0.89	725.47		350.00	1323.63
1926.37		9700.00	9943.07	10056.99	10050.00				
Reach-1	1.210		723.41			723.92		1546.65	5235.59
3403.56	60.85		9970.40	10030.90					
Reach-1	1.210		724.41		1.00	724.91		622.48	5298.81
3401.20		9408.42	9970.40	10030.90	10030.90				

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
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: Unnamed No. 2W (Hacker Diversion)
Project File : HWDiv.prj
Run Date and Time: 6/21/01 8:57:30 AM

Project in English units

Project Description:
Study Name: Gila Bend Area Drainage Master Plan

Study Contractors:
Engineering and Environmental Consultants, Inc. and Premier Engineering Corporation

Source of Hydrology: Gila Bend Area Floodplain Delineation Study (FCD 90-67) by Bburgess & Niple for FCDMC, March 1991

Source of Survey: Gila Bend Area Floodplain Delineation Study (FCD 90-67); new topographic mapping and survey by Cooper Aerial Mapping, Inc. 1999.

FCD
Contract number FCD 99-18
Datum: NGVD 1929

PLAN DATA

Plan Title: Unnamed No. 2W (Hacker Div.) FW Meth 1
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Hacker Wash Diversion\HWDiv.p05

Geometry Title: Unnamed No. 2W (Hacker Div.)
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Hacker Wash Diversion\HWDiv.g01

Flow Title : Unnamed No. 2W (Hacker Div.) FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Hacker Wash Diversion\HWDiv.f02

Plan Summary Information:

Number of:	Cross Sections	= 9	Mulitple Openings	=	0
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculaton tolerance	=	0.01
Maximum number of interations	=	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 = *River-1* *Reach = Reach-1*

	Profile	Method	Value1	Value2
[illegible]5	PF 2	1	9840.03	10040.7
1.522	PF 2	1	9797	10034.8
1.432	PF 2	1	9813.8	10097.9
1.342	PF 2	1	9750	10094.8
1.293	PF 2	1	9670	10170
1.272	PF 2	1	9800	10240
1.255	PF 2	1	9550	10400
1.238	PF 2	1	9600	10480
1.210	PF 2	1	9510	10500

FLOW DATA

Flow Title: Unnamed No. 2W (Hacker Div.) FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Hacker Wash Diversion\HWDiv.f02

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
Hacker Diversion	Reach-1	0.540	5570	5570
Hacker Diversion	Reach-1	0.170	5540	5540
Hacker Diversion	Reach-1	0.000	8700	8700

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Hacker Diversion	Reach-1	PF 1	Normal S = .004	Normal S = .004
Hacker Diversion	Reach-1	PF 2	Normal S = .004	Known WS = 724.45

GEOMETRY DATA

Geometry Title: Unnamed No. 2W (Hacker Div.)
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Hacker Wash Diversion\HWDiv.g01

CROSS SECTION RIVER: Hacker Diversion
REACH: Reach-1 RS: 0.540

INPUT
Description: cross section at diversion C14A
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8725.9	740	8731	738	8797.4	738	9052.3	736	9541.2	734
9748.7	732	9923.5	730	10000	728	10040.7	730	10066.2	740

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8725.9	.035	9923.5	.045	10040.7	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9923.5	10040.7		480	488	488	.1 .3

CROSS SECTION RIVER: Hacker Diversion
REACH: Reach-1 RS: 0.449

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8486.3	736	8667.9	734	9019.1	732	9404.1	732	9797	730
9993.2	728	10000	728	10006.8	728	10034.8	730	10061.7	740

[illegible]ing's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8486.3	.035	9797	.045	10034.8	.035

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

```
        9797 10034.8                470     476     476              .1       .3

CROSS SECTION           RIVER: Hacker Diversion
REACH: Reach-1             RS: 0.364

INPUT
Description:
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8706     736    9030     734  9194.5     732  9384.1     730  9813.8     728
   10000   726.8 10097.9     728 10114.6     730 10139.8     740

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8706    .035  9813.8    .045 10097.9    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9813.8 10097.9               475     475     475              .1       .3

CROSS SECTION           RIVER: Hacker Diversion
REACH: Reach-1             RS: 0.268

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8416     732  8637.4     730  8739.6   728.6  8982.7     730    9056     730
  9288.1     728  9505.3     726    9916  724.25  9974.7     724   10000  723.75
 10090.3     724 10094.8     726 10103.6     730 10124.3     740

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8416    .035    9916    .045 10094.8    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9916 10094.8               800     260     260              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Hacker Diversion
REACH: Reach-1             RS: 0.219

INPUT
Description:
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8573   728.5    8920     724 9103.06   723.7 9187.23     724    9283   724.4
 9384.17     724    9456     720    9498   719.8    9552     720    9601     722
    9726     724    9833   724.5    9954     724    9982     722   10000     721
   10033   720.8   10087     722   10114     724   10210     726   10238     728
   10243     730   10260     740

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8573    .035    9954    .045   10114    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9954   10114               110     110     110              .1       .3

CROSS SECTION           RIVER: Hacker Diversion
REACH: Reach-1             RS: 0.170

INPUT
Description: X-section along R/R at C11B
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8343  728.43    8840  728.22    9344  727.06    9846  726.21   10000  726.11
   10239  725.95   10247     724   10253     724   10261     730   10268     740

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8343    .035   10239    .045   10261    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          10239   10261               90      90      90              .1       .3

CROSS SECTION           RIVER: Hacker Diversion
```

REACH: Reach-1 RS: 0.139

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8700	724	8762.5	722	8790.3	722	8958.2	724	9061	724
9105.5	720	9306.5	720	9383.5	722	9430.1	724.4	9544.7	724
9957.2	720	10000	720.3	10247.4	722	10521.1	720	10877.9	720

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8700	.035	9544.7	.045	10247.4	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9544.7	10247.4	90	90	90	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888		F	
888		F	

CROSS SECTION RIVER: Hacker Diversion
REACH: Reach-1 RS: 0.029

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7949.3	728	8939.1	724	9427	722	9853	720.9	10000	721.05
10144.4	721.2	10394.3	721.9	10669.1	722	10817.1	722.6	11112.8	723.1
11530.4	725.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7949.3	.035	9427	.045	10394.3	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9427	10394.3	150	150	150	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
		F	

CROSS SECTION RIVER: Hacker Diversion
REACH: Reach-1 RS: 0.000

INPUT
Description: Same x-sect. at Hacker Wash
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9330.6	750	9350	740	9374.5	730	9399.3	722	9458.2	720
9477.3	720	9494.1	722	9505.1	722.8	9736.9	722.6	9991.3	722.8
10000	722.8	10235.8	722.7	10550.2	723.1	10709.5	723.3	10754.7	722
10771.4	720	10870.4	720	10885	715	10915.3	715	10930.9	720
10943.4	724	11060.7	726	11111.2	728				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9330.6	.04	9505.1	.024	10754.7	.04	10870.4	.047	10930.9	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9736.9	10235.8	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Hacker Diversion

Reach	River Sta.	n1	n2	n3	n4	n5
Reach-1	0.540	.035	.045	.035		
Reach-1	0.449	.035	.045	.035		
Reach-1	0.364	.035	.045	.035		
Reach-1	0.268	.035	.045	.035		
Reach-1	0.219	.035	.045	.035		
Reach-1	0.170	.035	.045	.035		
Reach-1	0.139	.035	.045	.035		
Reach-1	0.029	.035	.045	.035		

Reach-1	0.000	.04	.024	.04	.047	.04

SUMMARY OF REACH LENGTHS

River: Hacker Diversion

Reach	River Sta.	Left	Channel	Right
Reach-1	0.540	480	488	488
Reach-1	0.449	470	476	476
Reach-1	0.364	475	475	475
Reach-1	0.268	800	260	260
Reach-1	0.219	110	110	110
Reach-1	0.170	90	90	90
Reach-1	0.139	90	90	90
Reach-1	0.029	150	150	150
Reach-1	0.000	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Hacker Diversion

Reach	River Sta.	Contr.	Expan.
Reach-1	0.540	.1	.3
Reach-1	0.449	.1	.3
Reach-1	0.364	.1	.3
Reach-1	0.268	.1	.3
Reach-1	0.219	.1	.3
Reach-1	0.170	.1	.3
Reach-1	0.139	.1	.3
Reach-1	0.029	.1	.3
Reach-1	0.000	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	0.540	5570.00	728.00	733.90		734.22	0.00	5.28	1286.72	498.83	0
Reach-1	0.540	5570.00	728.00	734.90		735.33	0.00	5.15	1059.69	200.67	0
Reach-1	0.449	5570.00	728.00	732.63	731.50	732.82	0.00	4.01	1806.02	1133.73	0
Reach-1	0.449	5570.00	728.00	733.59	731.50	733.98	0.00	5.04	1105.12	237.80	0
Reach-1	0.364	5570.00	726.80	729.54	729.54	730.23	0.02	7.16	869.80	626.81	1
Reach-1	0.364	5570.00	726.80	729.76	729.67	730.83	0.02	8.32	669.18	284.10	1
Reach-1	0.268	5570.00	723.75	728.01		728.12	0.00	2.87	2128.50	812.31	0
Reach-1	0.268	5570.00	723.75	728.97		729.16	0.00	3.20	1617.02	344.80	0
Reach-1	0.219	5570.00	720.80	727.97		727.98	0.00	0.85	6762.68	1624.10	0
Reach-1	0.219	5570.00	720.80	728.77	725.15	728.84	0.00	2.14	2662.83	500.00	0
Reach-1	0.170	5540.00	724.00	727.44	727.44	727.92	0.02	7.86	1022.58	1080.61	1
Reach-1	0.170	5540.00	725.71	727.79	727.79	728.65	0.02	3.01	744.90	440.00	0

Reach-1	0.139		5540.00	720.00	724.11	722.01	724.16	0.00	1.58	3103.55	2087.85	0
Reach-1	0.139		5540.00	720.00	725.08	722.56	725.15	0.00	2.09	2616.49	850.00	0
Reach-1	0.029		5540.00	720.90	724.06	722.41	724.10	0.00	1.69	[illegible].23	2387.27	0
Reach-1	0.029		5540.00	720.90	725.04	722.40	725.09	0.00	1.68	3269.05	880.00	0
Reach-1	0.000		8700.00	722.60	723.45	723.25	723.82	0.00	3.17	1892.55	1546.90	1
Reach-1	0.000		8700.00	722.60	724.45	724.09	724.87	0.00	5.26	1675.93	990.00	1

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach-1	0.540	734.22	733.90	0.33	1.36	0.04	2472.85	3029.33	67.82	498.83
Reach-1	0.540	735.33	734.90	0.43	1.33	0.01	2009.46	3560.54	200.67	
Reach-1	0.449	732.82	732.63	0.19	2.54	0.05	2030.50	3516.36	23.13	1133.73
Reach-1	0.449	733.98	733.59	0.39	3.08	0.07		5570.00	237.80	
Reach-1	0.364	730.23	729.54	0.70	1.41	0.18	1179.21	4345.19	45.61	626.81
Reach-1	0.364	730.83	729.76	1.08	1.41	0.27		5570.00	284.10	
Reach-1	0.268	728.12	728.01	0.11	0.10	0.03	3500.52	2063.37	[illegible]	812.31
Reach-1	0.268	729.16	728.97	0.19	0.29	0.04	2719.65	2850.35	344.80	
Reach-1	0.219	727.98	727.97	0.01	0.02	0.05	4552.20	828.67	189.13	1624.10
Reach-1	0.219	728.84	728.77	0.07	0.11	0.08	2761.43	2365.53	443.04	500.00
Reach-1	0.170	727.92	727.44	0.47	0.17	0.13	5159.94	380.06	1080.61	
Reach-1	0.170	728.65	727.79	0.86	0.18	0.24	5534.10	5.90	440.00	
Reach-1	0.139	724.16	724.11	0.05	0.06	0.00	2514.29	2794.72	230.98	2087.85
Reach-1	0.139	725.15	725.08	0.07	0.05	0.01		5099.66	440.34	850.00
Reach-1	0.029	724.10	724.06	0.04	0.25	0.03		3759.94	1780.06	2387.27
Reach-1	0.029	725.09	725.04	0.04	0.18	0.04		5040.65	499.35	880.00
Reach-1	0.000	723.82	723.45	0.37			1691.37	1151.23	5857.40	1546.90
Reach-1	0.000	724.87	724.45	0.42			2103.85	4527.40	2068.75	990.00

Profile Output Table - Encroachment 1

Reach	River Sta	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Wdth Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	0.540	733.90		734.22	498.83	2472.85	3029.33	67.82	9923.50	10040.70		

Reach-1 0.540 734.90 1.00 735.33 200.67 2009.46 3560.54
9840.03 9923.50 10040.70 10040.70

Reach-1 0.449 732.63 732.82 1133.73 2030.50 3516.36
23.13 9797.00 10034.80
Reach-1 0.449 733.59 0.96 733.98 237.80 5570.00
.00 9797.00 10034.80 10034.80

Reach-1 0.364 729.54 730.23 626.81 1179.21 4345.19
45.61 9813.80 10097.90
Reach-1 0.364 729.76 0.22 730.83 284.10 5570.00
9813.80 9813.80 10097.90 10097.90

Reach-1 0.268 728.01 728.12 812.31 3500.52 2063.37
6.11 9916.00 10094.80
Reach-1 0.268 728.97 0.96 729.16 344.80 2719.65 2850.35
9750.00 9916.00 10094.80 10094.80

Reach-1 0.219 727.97 727.98 1624.10 4552.20 828.67
189.13 9954.00 10114.00
Reach-1 0.219 728.77 0.80 728.84 500.00 2761.43 2365.53
443.04 9670.00 9954.00 10114.00 10170.00

Reach-1 0.170 727.44 727.92 1080.61 5159.94 380.06
10239.00 10261.00
Reach-1 0.170 727.79 0.35 728.65 440.00 5534.10 5.90
9800.00 10239.00 10261.00 10240.00

Reach-1 0.139 724.11 724.16 1251.75 2514.29 2794.72
230.98 9544.70 10247.40
Reach-1 0.139 725.08 0.97 725.15 750.00 5099.66
440.34 9550.00 9544.70 10247.40 10400.00

Reach-1 0.029 724.06 724.10 1712.46 3759.94
1780.06 9427.00 10394.30
Reach-1 0.029 725.04 0.99 725.09 880.00 5040.65
499.35 9600.00 9427.00 10394.30 10480.00

Reach-1 0.000 723.45 723.82 1546.90 1691.37 1151.23
.40 9736.90 10235.80
Reach-1 0.000 724.45 1.00 724.87 990.00 2103.85 4527.40
2068.75 9510.00 9736.90 10235.80 10500.00

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
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: Gila Bend Canal Wash
Project File : GBCwash.prj
Run Date and Time: 6/21/01 8:10:13 AM

Project in English units

Project Description:
Study Name: Gila Bend Area Drainage Master Plan

Study Contractors:
Engineering and Environmental Consultants, Inc. and Premier Engineering Corporation

Source of Hydrology: Gila Bend Area Floodplain Delineation Study (FCD 90-67) by Bburgess & Niple for FCDMC, March 1991

Source of Survey: Gila Bend Area Floodplain Delineation Study (FCD 90-67); new topographic mapping and survey by Cooper Aerial Mapping, Inc. 1999.

FCD
Contract number FCD 99-18
Datum: NGVD 1929

PLAN DATA

Plan Title: Gila Bend Canal Wash, FW Method 1
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Gila Bend Canal Wash\GBCwash.p02

Geometry Title: Gila Bend Canal Wash
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Gila Bend Canal Wash\GBCwash.g01

Flow Title : Gila Bend Canal Wash, FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Gila Bend Canal Wash\GBCwash.f01

Plan Summary Information:
Number of: Cross Sections = 14 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 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 = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.143	PF 2	1	9700	10070
1.052	PF 2	1	9700	10030
0.974	PF 2	1	9700	10055
0.902	PF 2	1	9700	10065
0.835	PF 2	1	9750	10065
0.773	PF 2	1	9750	10070
0.689	PF 2	1	9700	10070
0.620	PF 2	1	9650	10070
0.546	PF 2	1	9650	10070
0.478	PF 2	1	9650	10060
0.375	PF 2	1	9650	10060
0.270	PF 2	1	9625	10060
0.172	PF 2	1	9550	10060
0.069	PF 2	1	9350	10060

FLOW DATA

Flow Title: Gila Bend Canal Wash, FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Gila Bend Canal Wash\GBCwash.f01

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
RIVER-1	Reach-1	1.143	3380	3380
RIVER-1	Reach-1	1.052	3100	3100
RIVER-1	Reach-1	0.974	3090	3090
RIVER-1	Reach-1	0.835	3040	3040
RIVER-1	Reach-1	0.773	2890	2890
RIVER-1	Reach-1	0.689	2600	2600
RIVER-1	Reach-1	0.620	2200	2200
RIVER-1	Reach-1	0.546	1650	1650
RIVER-1	Reach-1	0.478	1570	1570
RIVER-1	Reach-1	0.375	1530	1530
RIVER-1	Reach-1	0.270	1310	1310
RIVER-1	Reach-1	0.172	1080	1080
RIVER-1	Reach-1	0.069	1040	1040

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF 1	Normal S = .001	Known WS = 744.4
RIVER-1	Reach-1	PF 2	Normal S = .001	Known WS = 745.15

GEOMETRY DATA

Geometry Title: Gila Bend Canal Wash
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Gila Bend Canal Wash\GBCwash.g01

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1.143

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8694.23	747	8744.8	746.56	8785.4	746.32	8829.17	746.1	8859.71	745.92
8900.77	745.7	8938.19	745.61	8976.83	745.41	9016.06	745.27	9059.08	745.43
9096.67	745	9130.26	744.94	9201.47	744.91	9243.52	744.9	9306.16	744.76
9350.34	744.7	9404	744.46	9470.51	744.26	9503.56	744.07	9529.95	744.02
9568.11	744	9593.97	743.99	9607.53	744.12	9620.74	744.16	9686.1	744.02
9718.83	744	9781.98	743.97	9818.7	743.75	9847.51	743.65	9886.85	743.7
9912.66	743.7	9922.87	743.83	9967.4	743.72	9989	743.73	10024.21	743.85

```
10043.49   743.910069.71     74410070.79  744.2810098.25  744.1410129.89  743.89

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8694.23    .045 9922.87    .03510070.79    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9922.8710070.79               480  480.48     480              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 1.052

INPUT
Description:
Station Elevation Data     num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8728.48     746 9013.48     744 9028.23  743.88  9103.6  743.53 9178.97  742.98
 9184.78  742.97  9254.7   742.5  9329.7  742.01 9391.16  741.72 9405.07  741.63
    9447  741.58 9472.33   741.4 9480.44  741.11  9491.9   741.2 9516.95  741.01
 9577.79  740.71 9631.18   740.3 9673.07  740.01 9706.54  739.87 9733.97  739.81
 9781.91  739.62 9802.54   739.5 9857.28  739.18  9871.1  739.07 9932.65  738.45
 9966.49  736.99 9974.55   737.3 9987.08  736.9810000.63  736.9310020.41  742.01
10040.91  743.28 10045.3   744.110053.93  739.3910075.86  739.3910083.11  743.18
10085.51  743.9410101.66   743.1

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8728.48    .045 9932.65    .03510020.41    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9932.6510020.41               410  411.84     410              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.974

INPUT
Description:
Station Elevation Data     num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8787.56     746    8804  746.01 8818.93   745.9 8833.01  745.87 8880.38   745.4
 8899.41   745.3 8959.66  745.16 8968.29  745.11  9042.5  744.87 9115.81  744.78
 9126.32   744.7 9191.19  744.19 9244.19  744.28 9266.57  744.19 9293.97  744.18
 9341.95   743.9 9377.79  743.62 9417.33  743.26 9431.12  743.02 9451.33  742.77
 9482.74   742.6  9550.9  742.09 9570.84   741.9  9646.7  741.58 9671.54   741.6
 9684.71   741.7 9711.02  741.31 9770.25  741.15 9797.74   741.1 9857.69  740.78
 9868.54   740.7 9881.08  740.39 9924.25  739.69 9928.87  739.71 9971.84  737.24
 9976.77   736.9 9985.11  737.56 9994.94  736.6810007.57  736.9310015.33  738.73
10033.68  743.110049.76  743.4510054.76  744.5310059.58  741.6310064.06  738.72
10084.64  738.710096.17  744.2810105.74  744.0610113.73  744.05

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8787.56    .045 9924.25    .03510033.68    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9924.2510033.68               380  380.16     380              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.902

INPUT
Description:
Station Elevation Data     num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8565.53     746 8596.09  745.69 8677.91  745.03 8702.22  745.05 8746.56   744.5
 8828.73   744.1 8972.27   743.1 9026.15  742.91 9072.52  742.62 9122.74  742.28
 9133.94   742.3  9172.5  742.16 9235.94  741.64    9305  741.24 9348.44  741.13
 9399.35     741 9423.68  740.95 9498.91  740.34 9507.93  740.23 9572.14  740.17
 9579.66   740.1 9648.82  739.53 9726.19  739.25 9799.85   738.7 9807.89   738.6
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 9875.09   738.1 9932.41  738.03 9950.32  738.07 9981.74  737.09 9990.18  737.45
10003.58   736.510013.97  736.5610015.72  736.8710024.24  739.3710035.31  742.44
10057.76   742.810063.61  744.0910072.04  738.7210094.24  738.7210103.89  743.59
10118.12   743.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8555.53    .045 9950.32    .03510035.31    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9950.3210035.31              355  353.76     355             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.835

INPUT
Description:
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9090.28     746 9170.28     744 9192.34  743.52 9268.14  742.67 9280.57  742.64
 9342.97  742.75 9415.61   743.5 9438.38  742.98 9483.64   742.8 9519.12  742.62
 9529.12  742.49 9559.15   742.3 9583.33  742.19 9609.23  742.06 9645.97     742
 9665.15  741.93 9720.35   741.5 9733.81  741.33 9778.32  741.01 9792.57  740.79
 9857.07  740.55 9875.94   740.5    9936  739.86 9949.64  739.68 9984.89   738.2
 9989.53  737.85 9998.95   737.6 10016.6  737.4410017.51   737.510025.86  739.24
 10036.9  743.2310066.94     74410075.99  738.7210097.63  738.7210101.39  741.25
10107.13  744.2410108.19   744.410122.22  743.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9090.28    .045 9949.64    .035 10036.9    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9949.64 10036.9              330  327.36     330             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
           F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.773

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8744.28     746 9004.28     744 9013.05  743.95 9038.73  743.79 9070.55  743.51
 9114.16  743.25 9155.02   743.1 9189.58  742.85 9239.48  742.49 9265.01  742.37
 9323.95  742.36 9353.75   742.2 9415.87  741.78 9492.88  741.08 9566.72  740.53
 9577.34  740.48 9642.15   740.2 9661.81  740.11 9717.58  739.66 9746.27  739.37
 9793.01  739.02 9830.71   738.8 9868.44  738.72  9915.2   738.4 9943.86  738.17
    9985  738.78  9987.6   737.1 9999.97  738.6310020.48  737.4910042.75  742.87
10067.29  743.5210071.17   743.710078.31  738.7210100.21  738.7210111.31  743.68
10118.35  743.4310124.42   743.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8744.28    .045    9985    .03510042.75    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          998510042.75              445  443.52     445             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.689

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8847.53     746 9147.53     744 9192.82  743.62 9196.91  743.53  9262.7  743.54
 9267.23  743.56 9287.14   743.4 9342.55   743.2 9370.15  742.91 9417.87  742.35
 9453.16  742.01 9493.19   741.6 9568.51  741.18 9619.18  740.98 9643.84  740.92
 9652.52  740.71 9673.47   740.6 9719.16  740.48  9785.2  740.37 9794.48  740.33
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 9871.12  739.66 9948.93   739.1 9984.43  738.99 9989.13  737.6610002.02  737.93
10018.49  737.5210030.71   740.310038.88  742.3110062.96  743.2510068.58  743.65
 10076.9  738.72 10098.6   738.710107.53  743.7510122.29  742.84

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    147.53    .045 9984.43    .03510038.88    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9984.4310038.88              365  364.72     365             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.620

INPUT
Description:
Station Elevation Data    num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8490.24     746 8790.24     744 8881.02  743.68 8903.23  743.54 8956.51  743.41
 8988.48  743.21    9032     743 9062.63  742.51 9097.77  742.32 9107.49  742.56
 9114.36  742.27 9134.59   742.1 9161.33  742.12 9182.98  742.34 9207.51  741.85
 9227.59  741.61 9258.47   741.9 9279.58  741.42 9306.69  741.19 9326.77  741.29
 9339.34  741.18 9344.75     741 9367.49  741.08 9413.06  740.75 9445.07  740.47
 9472.75  740.35 9507.95   740.3 9517.43     740 9536.75   740.1 9560.43  739.95
 9608.44  739.85 9670.51   739.8 9755.77  739.48  9786.9  739.38 9841.02  738.91
 9862.39  738.77 9926.27   738.8 9937.88  738.74 9952.98  738.29 9987.72  736.83
10000.98  737.1510012.06  737.710013.35  738.0610020.93  739.4310034.12  742.14
10062.78  743.0210066.63  743.410073.97  738.72 10096.3  738.7210106.46  743.47
10116.44   742.810121.55  742.410125.32  740.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8490.24    .045 9937.88    .03510034.12    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9937.8810034.12              390  390.72     390             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.546

INPUT
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8847.51     746 9097.51   743.9 9207.57  743.75 9220.65  743.66  9242.1  743.78
 9399.39  742.59 9434.73   742.3 9631.81  741.76 9666.68  741.58 9833.51  740.83
 9924.19  739.79 9996.74   738.6 10010.6   739.110034.17  741.5410049.46  743.19
10061.76  743.2210064.74  743.410073.17   738.310091.59  738.31   10100  743.94
10114.39  743.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8847.51    .045 9833.51    .03510049.46    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9833.5110049.46              360  359.04     360             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.478

INPUT
Description:
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    2.72   744.5    9208  744.52 9294.09  743.78 9332.87  743.52 9360.81  743.08
   83.32     743 9422.48  743.01 9463.13  742.91 9475.71  742.79  9495.5  742.75
 9514.81   742.7 9527.57  742.67 9698.73  742.49 9721.88  742.39 9902.97  741.14
 9919.21   740.9 9933.57  740.64 9994.84  739.5110000.46  739.3210011.85  739.17
10030.19  741.410049.13  743.8410055.46  744.3910063.53  744.4310068.03  741.67
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10069.96   740.810073.61   738.3 10092.8   738.3 10094.8  739.6410100.29  743.99
10113.08   744.8 10136.7  743.58

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9192.72    .045 9919.21    .03510063.53    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9919.2110063.53              545  543.84     545             .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.375

INPUT
Description:
Station Elevation Data     num=      21
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9192.42   744.7 9195.63  744.64  9337.3  743.05 9398.34  742.84  9511.3  742.52
 9601.04   741.9  9617.6  741.92 9735.04  741.08 9803.75  740.82 9927.13  740.49
 9984.07   740.510009.92  739.3810036.17  742.2410047.02  743.4910057.25  743.03
10064.62     74310069.06  740.3210071.89   738.3 10090.5   738.310098.51  743.23
 10109.4   742.9

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9192.42    .045 9984.07    .03510047.02    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9984.0710047.02              555   554.4     555             .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.270

INPUT
Description:
Station Elevation Data     num=      18
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9214.61   744.3 9299.66  743.76 9466.78  743.19 9506.92  742.85 9587.19  742.41
 9687.03     742 9714.18   741.8 9818.47  741.05 9944.29  740.58 9971.58   740.2
   10000   739.910009.04   739.8 10040.2  743.5710056.31  743.1810065.46   738.3
 10083.3   738.310091.25  743.2610101.38  743.42

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9214.61    .045 9944.29    .035 10040.2    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9944.29 10040.2              515  517.44     515             .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 0.172

INPUT
Description:
Station Elevation Data     num=      28
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9200.34   745.2 9252.25  744.86 9298.68  744.36 9352.79  745.11 9372.87  745.33
 9387.86   744.8 9422.22  743.54 9500.03  743.34 9527.15  743.29 9544.49  743.36
 9610.01     743 9688.71  742.53  9725.1  742.53 9811.62  742.57 9857.17  742.25
 9899.28   741.9  9955.9  741.56 9965.34  741.95 9990.58  738.98 9997.46  738.29
10002.78     73910035.98  742.9510052.07  743.1310057.89  740.4510061.91   738.3
10083.24   738.510087.44  740.2110092.57  742.99

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9200.34    .045 9965.34    .03510052.07    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9965.3410052.07              530  534.84     530             .1       .3
```

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 0.069

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8855.79	746	8871.75	745.78	8997.19	742.32	9061.23	740.04	9163.13	739.63
9259.39	737.2	9426.88	735.6	9428.48	735.63	9440.77	735.21	9542.59	735.21
9551.59	735	9561.9	735.21	9663.37	735.21	9706.39	741.62	9712.5	742.59
9716.63	742.6	9813.84	743.11	9908.18	742.4	9942.88	741.86	9953.83	742.2
9984.04	739.4	9992.38	738.61	10027.34	743.61	10041	743.31	10044.38	743.31
10047.84	741.31	10054.19	738.31	10071.46	738.31	10075.78	741.93	10079.8	744.54
10084.23	744	10088.56	743.09						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8855.79	.045	9953.83	.035	10027.34	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9953.83	10027.34	0	0	0	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888		F	
888		F	

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	1.143	.045	.035	.035
Reach-1	1.052	.045	.035	.035
Reach-1	0.974	.045	.035	.035
Reach-1	0.902	.045	.035	.035
Reach-1	0.835	.045	.035	.035
Reach-1	0.773	.045	.035	.035
Reach-1	0.689	.045	.035	.035
Reach-1	0.620	.045	.035	.035
Reach-1	0.546	.045	.035	.035
Reach-1	0.478	.045	.035	.035
Reach-1	0.375	.045	.035	.035
Reach-1	0.270	.045	.035	.035
Reach-1	0.172	.045	.035	.035
Reach-1	0.069	.045	.035	.035

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	1.143	480	480.48	480
Reach-1	1.052	410	411.84	410
Reach-1	0.974	380	380.16	380
Reach-1	0.902	355	353.76	355
Reach-1	0.835	330	327.36	330
Reach-1	0.773	445	443.52	445
Reach-1	0.689	365	364.72	365
Reach-1	0.620	390	390.72	390
Reach-1	0.546	360	359.04	360
Reach-1	0.478	545	543.84	545
Reach-1	0.375	555	554.4	555
Reach-1	0.270	515	517.44	515
Reach-1	0.172	530	534.84	530
Reach-1	0.069	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	1.143	.1	.3
Reach-1	1.052	.1	.3
Reach-1	0.974	.1	.3
Reach-1	0.902	.1	.3
Reach-1	0.835	.1	.3
Reach-1	0.773	.1	.3
Reach-1	0.689	.1	.3
Reach-1	0.620	.1	.3
Reach-1	0.546	.1	.3
Reach-1	0.478	.1	.3
Reach-1	0.375	.1	.3
Reach-1	0.270	.1	.3
Reach-1	0.172	.1	.3
Reach-1	0.069	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	1.143	3380.00	743.72	745.04	745.04	745.41	0.02	6.58	787.54	1045.83	1
Reach-1	1.143	3380.00	743.72	745.61		746.04	0.01	5.90	662.12	370.00	1
Reach-1	1.052	3100.00	736.93	744.94		744.95	0.00	1.39	4085.78	1222.17	0
Reach-1	1.052	3100.00	736.93	745.68		745.72	0.00	1.84	[illegible]3.76	330.00	0
Reach-1	0.974	3090.00	736.68	744.86		744.90	0.00	2.15	2629.32	1062.43	0
Reach-1	0.974	3090.00	736.68	745.60		745.66	0.00	2.16	1888.74	355.00	0
Reach-1	0.902	3090.00	736.50	744.85		744.86	0.00	1.09	5084.21	1399.63	0
Reach-1	0.902	3090.00	736.50	745.57		745.60	0.00	1.58	2484.24	365.00	0
Reach-1	0.835	3040.00	737.44	744.80		744.83	0.00	2.01	2716.92	983.92	0
Reach-1	0.835	3040.00	737.44	745.48		745.55	0.00	2.46	1634.58	315.00	0
Reach-1	0.773	2890.00	737.10	744.77		744.78	0.00	1.22	4066.96	1220.27	0
Reach-1	0.773	2890.00	737.10	745.43		745.46	0.00	1.75	2014.82	320.00	0
Reach-1	0.689	2600.00	737.52	744.73		744.75	0.00	1.54	3156.41	1084.41	0
Reach-1	0.689	2600.00	737.52	745.38		745.41	0.00	1.77	2004.39	370.00	0
Reach-1	0.620	2200.00	736.83	744.71		744.72	0.00	0.83	4784.31	1441.93	0
Reach-1	0.620	2200.00	736.83	745.35		745.37	0.00	1.13	2529.21	420.00	0
Reach-1	0.546	1650.00	738.60	744.68		744.69	0.00	0.93	[illegible]1.29	1110.12	0
[illegible]each-1	0.546	1650.00	738.60	745.33		745.34	0.00	1.01	[illegible]02.58	420.00	0
Reach-1	0.478	1570.00	739.17	744.63		744.65	0.00	1.27	1937.19	938.16	0

Reach-1	0.478	1570.00	739.17	745.29		745.31	0.00	1.29	1547.88	410.00	0
Reach-1	0.375	1530.00	739.38	744.56	741.69	744.57	0.00	1.07	2225.60	906.79	0
Reach-1	0.375	1530.00	739.38	745.24	741.70	745.25	0.00	1.10	[illegible]36.27	410.00	0
Reach-1	0.270	1310.00	739.80	744.49	741.81	744.50	0.00	1.15	1864.11	886.77	0
Reach-1	0.270	1310.00	739.80	745.19	741.81	745.20	0.00	1.02	1658.35	435.00	0
Reach-1	0.172	1080.00	738.29	744.40		744.42	0.00	1.45	1239.60	700.41	0
Reach-1	0.172	1080.00	738.29	745.15		745.16	0.00	1.08	1477.32	510.00	0
Reach-1	0.069	1040.00	738.60	744.40	742.58	744.40	0.00	0.18	5796.04	1165.41	0
Reach-1	0.069	1040.00	738.60	745.15	742.57	745.15	0.00	0.24	4286.51	710.00	0

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach-1	1.143	745.41	745.04	0.37	0.15	0.11	2189.38	1190.62	1045.83	
Reach-1	1.143	746.04	745.61	0.42	0.20	0.12	1818.00	1562.00	370.00	
Reach-1	1.052	744.95	744.94	0.01	0.05	0.00	2206.07	862.96	30.96	1222.17
Reach-1	1.052	745.72	745.68	0.04	0.06	0.00	1810.68	1260.99	[illegible]33	330.00
Reach-1	0.974	744.90	744.86	0.04	0.03	0.01	1550.41	1517.95	21.64	1062.43
Reach-1	0.974	745.66	745.60	0.05	0.05	0.01	1349.84	1701.72	38.44	355.00
Reach-1	0.902	744.86	744.85	0.01	0.03	0.00	2412.51	652.08	25.41	1399.63
Reach-1	0.902	745.60	745.57	0.03	0.05	0.00	1992.27	1042.53	55.20	365.00
Reach-1	0.835	744.83	744.80	0.03	0.04	0.01	1942.38	1073.43	24.19	983.92
Reach-1	0.835	745.55	745.48	0.06	0.06	0.01	1526.14	1459.58	54.29	315.00
Reach-1	0.773	744.78	744.77	0.01	0.04	0.00	2451.55	418.70	19.75	1220.27
Reach-1	0.773	745.46	745.43	0.03	0.06	0.00	2173.74	668.80	47.46	320.00
Reach-1	0.689	744.75	744.73	0.01	0.02	0.00	2051.42	514.57	34.01	1084.41
Reach-1	0.689	745.41	745.38	0.03	0.03	0.00	1886.17	654.73	59.10	370.00
Reach-1	0.620	744.72	744.71	0.00	0.02	0.00	1655.18	520.89	23.93	1441.93
Reach-1	0.620	745.37	745.35	0.01	0.02	0.00	1369.68	782.60	47.72	420.00
Reach-1	0.546	744.69	744.68	0.01	0.03	0.00	702.76	947.24	[illegible]0.12	
[illegible]ach-1	0.546	745.34	745.33	0.01	0.03	0.00	486.14	1163.86	[illegible].00	
Reach-1	0.478	744.65	744.63	0.01	0.07	0.00	871.20	698.80	938.16	

Reach-1	0.478	745.31	745.29	0.02	0.06	0.00	745.50	824.50
410.00								
Reach-1	0.375	744.57	744.56	0.01	0.06	0.00	1277.74	252.26
906.79								
Reach-1	0.375	745.25	745.24	0.01	0.05	0.00	1224.39	305.61
0.00								
Reach-1	0.270	744.50	744.49	0.01	0.08	0.00	886.50	423.50
886.77								
Reach-1	0.270	745.20	745.19	0.01	0.04	0.00	865.50	444.50
435.00								
Reach-1	0.172	744.42	744.40	0.02	0.01	0.01	637.71	442.29
700.41								
Reach-1	0.172	745.16	745.15	0.01	0.01	0.00	680.06	399.94
510.00								
Reach-1	0.069	744.40	744.40	0.00			992.05	47.95
1165.41								
Reach-1	0.069	745.15	745.15	0.00			961.96	78.04
710.00								

Profile Output Table - Encroachment 1

Reach	River Sta	W.S. Elev (ft)	Prof Delta (ft)	WS E.G. Elev (ft)	Top Wdth Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	1.143	745.04		745.41	986.73	2189.38	1190.62					
9922.87	10070.79											
Reach-1	1.143	745.61	0.57	746.04	370.00	1818.00	1562.00					
9700.00	9922.87	10070.79	10070.00									
Reach-1	1.052	744.94		744.95	1161.42	2206.07	862.96					
30.96	9932.65	10020.41										
Reach-1	1.052	745.68	0.74	745.72	330.00	1810.68	1260.99					
33	9700.00	9932.65	10020.41	10030.00								
Reach-1	0.974	744.86		744.90	998.46	1550.41	1517.95					
21.64	9924.25	10033.68										
Reach-1	0.974	745.60	0.75	745.66	349.76	1349.84	1701.72					
38.44	9700.00	9924.25	10033.68	10055.00								
Reach-1	0.902	744.85		744.86	1339.27	2412.51	652.08					
25.41	9950.32	10035.31										
Reach-1	0.902	745.57	0.73	745.60	357.76	1992.27	1042.53					
55.20	9700.00	9950.32	10035.31	10065.00								
Reach-1	0.835	744.80		744.83	928.65	1942.38	1073.43					
24.19	9949.64	10036.90										
Reach-1	0.835	745.48	0.68	745.55	315.00	1526.14	1459.58					
54.29	9750.00	9949.64	10036.90	10065.00								
Reach-1	0.773	744.77		744.78	1163.14	2451.55	418.70					
19.75	9985.00	10042.75										
Reach-1	0.773	745.43	0.66	745.46	317.29	2173.74	668.80					
47.46	9750.00	9985.00	10042.75	10070.00								
Reach-1	0.689	744.73		744.75	1025.08	2051.42	514.57					
34.01	9984.43	10038.88										
Reach-1	0.689	745.38	0.65	745.41	362.96	1886.17	654.73					
59.10	9700.00	9984.43	10038.88	10070.00								
Reach-1	0.620	744.71		744.72	1379.39	1655.18	520.89					
23.93	9937.88	10034.12										
Reach-1	0.620	745.35	0.64	745.37	412.78	1369.68	782.60					
47.72	9650.00	9937.88	10034.12	10070.00								
Reach-1	0.546	744.68		744.69	1045.19	702.76	947.24					
3.51	10049.46											
Reach-1	0.546	745.33	0.64	745.34	399.46	486.14	1163.86					
50.00	9833.51	10049.46	10070.00									
Reach-1	0.478	744.63		744.65	870.81	871.20	698.80					
9919.21	10063.53											

Reach-1	0.478		745.29		0.65	745.31	410.00	745.50	824.50
9650.00	9919.21	10063.53	10060.00						
Reach-1	0.375		744.56			744.57	844.41	1277.74	252.26
9984.07	10047.02								
Reach-1	0.375		745.24		0.67	745.25	397.02	1224.39	305.61
30.00	9984.07	10047.02	10060.00						
Reach-1	0.270		744.49			744.50	825.59	886.50	423.50
9944.29	10040.20								
Reach-1	0.270		745.19		0.70	745.20	415.20	865.50	444.50
9625.00	9944.29	10040.20	10060.00						
Reach-1	0.172		744.40			744.42	659.91	637.71	442.29
9965.34	10052.07								
Reach-1	0.172		745.15		0.75	745.16	502.07	680.06	399.94
9550.00	9965.34	10052.07	10060.00						
Reach-1	0.069		744.40			744.40	1105.56	992.03	47.95
9953.83	10027.34								
Reach-1	0.069		745.15		0.75	745.15	677.34	961.96	78.04
9350.00	9953.83	10027.34	10060.00						

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
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: Quilotosa Wash
Project File : Quilotosa1.prj
Run Date and Time: 10/30/02 1:57:09 PM

Project in English units

Project Description:
Study Name: Gila Bend Area Drainage Master Plan

Study Contractors:
Engineering and Environmental Consultants, Inc. and Premier Engineering Corporation

Source of Hydrology: Gila Bend Area Floodplain Delineation Study (FCD 90-67) by Bburgess & Niple for FCDMC, March 1991

Source of
Survey: Gila Bend Area Floodplain Delineation Study (FCD 90-67); new Topographic mapping and survey by Cooper Aerial Mapping, Inc. 1999.

FCD
Contract number FCD 99-18
Datum: NGVD 1929

PLAN DATA

Plan Title: Quilotosa Wash, FW Meth 1
Plan File : q:\99541A\HEC-RAS\Quilotosa\Quilotosa1.p03

Geometry Title: Quilotosa Wash
Geometry File : q:\99541A\HEC-RAS\Quilotosa\Quilotosa1.g02

Flow Title : Quilotosa Wash, FW Meth 1
Flow File : q:\99541A\HEC-RAS\Quilotosa\Quilotosa1.f01

Plan Summary Information:

Number of:	Cross Sections	= 39	Mulitple Openings	=	2
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculaton tolerance	=	0.01
Maximum number of interations	=	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 = Quilotosa Reach = Reach-1

RS	Profile	Method	Value1	Value2
6.084	PF 2	1	9988.25	11075
5.993	PF 2	1	9983.5	11180
5.907	PF 2	1	9995	11255
5.841	PF 2	1	9992.75	11230
5.749	PF 2	1	9958.5	11175
5.663	PF 2	1	9990.3	11000
5.569	PF 2	1	9984	11100
5.480	PF 2	1	9990	11600

River = Quilotosa Reach = Reach-4

RS	Profile	Method	Value1	Value2
4.414	PF 2	1	9150	10850
4.399	PF 2	1	9150	10850
4.386	PF 2	1	9641.58	10450
4.290	PF 2	1	9550	10400
4.201	PF 2	1	9510	10490
4.109	PF 2	1	9550	10450
4.013	PF 2	1	9625	10325
3.921	PF 2	1	7800	10200
3.895	PF 2	1	7785	10160
3.892	PF 2	1	7760	10120
3.874	PF 2	1	7770	10100
3.870	PF 2	1	7795	10130
3.793	PF 2	1	7820	10160
3.776	PF 2	1	8050	10150

River = Quilotosa (west) Reach = Reach-3

RS	Profile	Method	Value1	Value2
5.379	PF 2	1	9480	10050
5.289	PF 2	1	9225	10050
5.203	PF 2	1	9450	10060
5.114	PF 2	1	9900	10300
5.025	PF 2	1	9960	10460
4.936	PF 2	1	9960	10500
4.846	PF 2	1	9950	10350
4.755	PF 2	1	9950	10500
4.664	PF 2	1	9800	10700
4.567	PF 2	1	9700	10500
4.477	PF 2	1	9400	10550

River = Quilotosa (east Reach = Reach-2

RS	Profile	Method	Value1	Value2
5.372	PF 2	1	9840	10115
5.269	PF 2	1	9820	10090
5.186	PF 2	1	9890	10175
5.099	PF 2	1	9850	10200
4.980	PF 2	1	9840	10130
4.870	PF 2	1	9830	10170
4.770	PF 2	1	9850	10130
4.673	PF 2	1	9460	10150

FLOW DATA

Flow Title: Quilotosa Wash, FW Meth 1
Flow File : q:\99541A\HEC-RAS\Quilotosa\Quilotosa1.f01

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
Quilotosa	Reach-1	6.084	7850	7850
Quilotosa	Reach-4	4.414	9170	9170
Quilotosa	Reach-4	3.921	15200	15200
Quilotosa	(eastReach-2	5.372	3400	3400
Quilotosa	(west)Reach-3	5.379	4450	4450

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Quilotosa	Reach-1	PF 1	Normal S = .0037	
Quilotosa	Reach-1	PF 2	Normal S = .0037	
Quilotosa	Reach-4	PF 1		Known WS = 0
Quilotosa	Reach-4	PF 2		Known WS = 718.21

GEOMETRY DATA

Geometry Title: Quilotosa Wash
Geometry File : q:\99541A\HEC-RAS\Quilotosa\Quilotosa1.g02

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Quilotosa	Reach-1		JCT1
Quilotosa	Reach-4	JCT2	
Quilotosa	(east Reach-2	JCT1	JCT2
Quilotosa	(west) Reach-3	JCT1	JCT2

JUNCTION INFORMATION

Name: JCT1
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Quilotosa	Reach-1	to Quilotosa (west)	Reach-3	533.28	
Quilotosa	Reach-1	to Quilotosa (east	Reach-2	568.1	

Name: JCT2
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Quilotosa (west)	Reach-3	to Quilotosa	Reach-4	332.64	
Quilotosa (east	Reach-2	to Quilotosa	Reach-4	583.11	

CROSS SECTION RIVER: Quilotosa
REACH: Reach-1 RS: 6.084

INPUT
Description:
Station Elevation Data num= 67

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9663.14	789.62	9694.67	788.12	9721.44	788.36	9746.28	788.6	9761.03	788.66
9791.48	787.48	9845.31	787.39	9871.56	786.56	9904.21	785.9	9974.49	784.24
9982.08	782.8427	9987.58	781.83	9993.83	780.61	10014.13	782.83	10023.24	783.83

```
10062.34   783.810173.67  783.6310271.02  783.7110286.63  782.1810304.18  784.28
10381.96   782.810466.33  782.4210528.09  781.6810547.51  781.8510552.64  781.79
10571.43   782.110590.59  782.03 10598.9  781.7810609.38  781.1710620.07  782.01
10632.28     78210683.53  782.0710714.78  782.1410784.88  782.1310956.24  781.55
10993.56   781.311022.98  781.3211058.32  781.23 11077.4  781.14 11099.6  780.56
11161.76   780.711176.49  780.6311212.71   780.311253.07  779.5911273.35  781.16
11307.15     78111323.25  780.8411344.91   780.611361.44  780.6611374.83  780.51
11392.03   780.611417.91  781.6411425.25  781.8511452.66   782.211470.41  782.54
11551.86   783.111577.12  783.19 11619.6  783.4311687.89  783.0711720.33  782.65
11817.67   781.711842.28  781.2711897.13  782.8811929.03  783.3412067.14  784.96
12099.63   785.612110.32  785.65

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9663.14    .035 9982.08     .0510014.13     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.0810014.13               480  480.48     475              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION          RIVER: Quilotosa
REACH: Reach-1            RS: 5.993

INPUT
Description:
Station Elevation Data    num=      69
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9781.17  787.03 9822.32  785.07  9853.9  783.67 9911.09   781.4 9917.52  781.33
 9930.41  781.37 9948.09  781.21  9974.4  780.86 9976.48780.5398 9992.98     778
10007.29  779.6610015.73780.5563 10016.8  780.6710067.26  780.81 10113.8  780.91
10121.23   781.1 10210.1  780.9310216.15  780.8910302.71  780.8110316.68  780.77
 10343.4   780.510478.75  779.9110514.81  780.0110551.12  780.07 10694.1  780.32
 10714.5   780.310812.08  779.31 10835.1  779.0110892.62  778.9210898.58  778.62
10924.58   777.710932.87  777.1410937.37  778.0510942.39   779.310952.62  778.28
10975.73     77811014.26  778.8511030.92  779.0111139.99  780.2311163.63  780.29
11331.62   780.311374.09  780.2911404.34  780.1511521.79  778.73 11661.6  778.34
11667.26   778.311699.63  778.3411765.08   778.911787.53  779.1211866.76  779.38
11888.92   779.511900.74   779.911937.52  780.9311967.06  781.0112021.26  780.51
12056.02   780.412111.16  779.3612154.28  778.7612190.25  778.7712240.35  778.89
12278.68   779.112307.75  779.3912387.74  779.8912436.43  780.2112445.58  780.47
12459.19   780.2 12596.3  780.6312677.18  781.0112703.17  780.99

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9781.17    .035 9976.48     .0510015.73     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.4810015.73               450  454.08     450              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION          RIVER: Quilotosa
REACH: Reach-1            RS: 5.907

INPUT
Description:
Station Elevation Data    num=      75
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9812.59  785.38 9826.61   784.9 9840.56  784.53    9873  784.63 9892.85   783.9
 9906.41  783.08    9936   781.8  9951.6  780.47 9966.52  780.63 9969.55   780.5
  9984.6  779.12 9995.19777.7699 9997.15  777.5210005.39  776.0910017.89777.7546
10025.74   778.810118.67     77910167.23  779.1310255.85  779.2910299.95  778.05
10307.14  778.1210340.37   778.310361.24  778.5410416.88  778.6610453.35  778.49
10459.05  778.59 10481.1   778.210491.91  777.2610513.42  777.1510516.43  777.21
 10572.2  778.1310582.28   778.2   10631  779.22 10655.4  779.4710692.07  779.78
10698.02  778.2110701.69   777.110730.51   776.710749.41  776.4110753.66  776.29
10787.88  774.9410812.43     77510857.27   775.411006.19   777.811084.96  777.82
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11129.32  777.6511177.69   777.6 11208.5  777.1811244.01  776.6211256.23  776.33
11291.81  775.8811334.84   776.111343.49  776.1711383.82  775.5411418.21  775.37
11436.76  776.8211458.06     77711475.86  777.2211637.55  777.8111657.18   777.9
11672.65  778.2411717.69   777.811857.76  776.4211860.48   776.411988.84   776.7
11997.38  775.51   12082   775.812087.97  775.9612117.68  776.9312153.45  777.44
12187.71  777.3612223.09   776.912308.16  777.08 12417.6  777.6412464.27  777.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9812.59    .035 9995.19     .0510017.89     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9995.1910017.89               350  348.48     370              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION          RIVER: Quilotosa
REACH: Reach-1            RS: 5.841

INPUT
Description:
Station Elevation Data    num=      72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9661.12  783.27 9670.55  783.24 9678.63  783.68    9707  784.26 9758.24   785.4
 9813.41  783.44 9839.46  782.66 9860.05  781.89 9884.45  783.11  9920.1   782.3
 9974.18  778.82 9990.79776.1677 9998.04  775.0110004.89776.1656 10017.6  778.31
10082.25  777.0710159.03   776.210348.73  777.1710365.03  777.0910376.59  776.56
10399.42  776.5710441.94     77610460.54  775.93 10488.2  775.8110505.67  774.77
10513.98  774.7310548.25   774.210559.01  775.0910566.33   775.810608.72  775.03
 10664.2  774.25 10673.1   774.210685.38  774.5910695.04  774.4810702.85  774.51
10722.89  774.3810753.09   774.810759.61   774.910801.81  774.4710818.56   774.2
10861.58  774.0510886.64   774.1 10926.3   774.110936.37  773.7710951.66  772.66
10957.05  772.7110993.66   773.311000.89  773.2711021.07  773.7711180.52  774.58
11194.64  774.5811207.95   774.311218.54  774.3611240.91  773.4111302.86  774.03
11348.74  774.3611372.33     77411423.33  774.5911544.87   776.311618.21  775.44
11644.23  775.0511684.75   774.511747.77  773.7911807.18  773.36 11821.7  773.21
11833.42  774.6311867.66   775.1   12043  775.9112061.82  775.5612187.29  775.45
12254.21  776.1312278.94   776.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9661.12    .035 9974.18     .05 10017.6     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9974.18 10017.6               480  485.76     480              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION          RIVER: Quilotosa
REACH: Reach-1            RS: 5.749

INPUT
Description:
Station Elevation Data    num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9760.8  779.27 9816.83   779.6 9824.81  779.75 9867.98  778.53 9893.89  777.35
 9954.75  774.93 9965.69   774.6 9974.74  774.12 9975.52774.073710002.21  772.49
10013.83  772.5310017.02  772.2910042.18   772.910051.02774.062710053.28  774.36
10079.27  774.3510124.34  774.4610144.44  774.4610158.06   774.5 10302.4  774.26
10322.58  774.1410359.42  773.8310396.59  773.74 10467.5   773.610528.41  773.36
10574.91  773.1210691.62  772.9710702.99  772.9210719.92   772.410754.05  772.67
10947.54  772.7311023.69  772.7311187.18  773.5411195.75   773.511332.22  773.21
 11352.2   773.711441.88  773.3111457.12  773.3511463.72   773.211497.43  773.05
11587.37  772.5311608.29  772.7811654.17  773.2211713.25   773.511804.31  773.76
11978.96  773.96 12009.2  774.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9760.8    .035 9975.52     .0510051.02     .03
```

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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.5210051.02              460  454.08     460              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION          RIVER: Quilotosa
REACH: Reach-1            RS: 5.663

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9817.84  774.35 9888.36  773.65 9895.05   773.6 9908.92  772.95  9916.6  772.51
 9982.07  772.73 9987.22771.6862 9996.92  769.7210009.92771.647510014.32   772.3
10048.75  772.5910073.47  772.5510082.54   771.410095.51  769.9410112.93   771.5
10121.31  772.0810155.67  771.6910178.42  771.6510191.33  770.9310199.97   770.6
 10214.8   771.210264.06     77110368.08  770.19 10412.4  769.8610440.18   769.9
10540.09  769.68 10578.7  769.6610596.96  769.1210608.37  769.3510616.54   769.6
10679.31   770.410711.95  770.9310746.03  771.0310915.78  771.3911031.79   770.7
11044.38  770.6911061.19   770.511119.61   770.111182.92  769.6211227.94   769.6
11250.36  769.5411291.28  770.1111316.86  770.4111327.42  770.7111351.27   770.2
11432.34  768.6611453.25  768.8311527.27  769.8211597.72  770.54 11731.1   772.5
11796.99  772.9211922.25  772.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9817.84    .035 9987.22     .0510009.92     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9987.2210009.92              500  496.32     480              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION          RIVER: Quilotosa
REACH: Reach-1            RS: 5.569

INPUT
Description:
Station Elevation Data    num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9888.68   771.2 9928.65   770.1 9980.98  768.89 9982.98768.4929 9989.19  767.26
 9998.98  765.8210013.69   767.810017.28768.472310022.34  769.4210060.49     769
10125.51  768.2110141.53  767.7310154.64   768.910184.86  768.2710206.28   767.7
10214.22  767.6710225.19  767.4510246.88   768.410287.82  766.99   10298  766.59
10304.85  766.76 10334.8  767.28   10343   767.710401.48  767.1710416.66  766.19
10425.68  765.4910450.55  766.5410479.37   767.310492.23  767.61 10512.3  767.79
10541.79  767.7610719.81  768.1610820.68     76810927.31  767.87 11115.5  767.81
11134.83  767.8111139.49  767.7511185.36   767.511316.02  766.6311342.34  766.66
11470.87  767.8211549.85  768.6211663.19     769

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9888.68    .035 9982.98     .0510017.28     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.9810017.28           470.49  469.92  470.49              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION          RIVER: Quilotosa
REACH: Reach-1            RS: 5.480

INPUT
Description:
Station Elevation Data    num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9901.17  766.11 9926.79  766.14 9948.27  766.12 9963.48  766.19 9971.49  766.15
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 9984.02  766.17 9989.75   766.2  9992.1  765.68   10000  764.55 10006.1  763.52
10026.87  765.42 10088.7   765.210208.56  765.2610213.16  765.1510234.79  765.09
10278.52     76510301.15   764.210316.23  764.4110327.14  764.3510336.37  764.04
10351.42  764.8810402.49   765.210430.28  765.0410466.22  765.26 10504.3  765.29
10517.64  765.2510542.27   766.210587.54  765.52   10624  765.1710638.78  765.28
10775.59  765.4510837.24   765.310899.86  765.2811050.48  765.2411069.17  765.13
11263.71   764.511292.29  764.2111389.81  764.3811476.96  764.2511522.53  764.31
11645.74  764.08 11690.2  764.14 11730.7  764.2111796.03  764.44   11828   765.3
11902.21  765.71   11914  766.2411921.45  766.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9901.17    .035  9992.1     .0510026.87     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9992.110026.87              550  533.28     500             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Quilotosa
REACH: Reach-4             RS: 4.414

INPUT
Description: Concrete overshoot, at Gila Bend Canal
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8048  742.22    8257  743.44    8458  742.13    8666  742.12    8868  742.27
    9072  742.59    9277   742.9    9478   742.7    9682  742.81    9851  742.86
    9963  744.59  9964.8743.5251  9983.5  732.46   10000   732.8 10016.5  733.08
   10037   743.5   10144  742.73   10309  742.89   10512  743.09   10723  742.62
   10930  742.29   11141  742.61   11349  742.79   11553  742.71   11757  743.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8048    .024  9964.8    .018   10037    .024

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9964.8   10037               80    79.2      80             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION           RIVER: Quilotosa
REACH: Reach-4             RS: 4.399

INPUT
Description: D/S side of concrete overshoot
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8048  742.22    8257  743.44    8458  742.19    8666  742.12    8868  742.27
    9072  742.59    9277   742.9    9478   742.7    9682  742.81    9851  742.86
    9963  744.59  9964.8743.5251  9983.5  732.46   10000   732.8 10016.5  733.08
   10037   743.5   10144  742.73   10309  742.89   10512  743.09   10723  742.62
   10930  742.29   11141  742.61   11349  742.79   11553  742.71   11757  743.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8048    .024  9964.8    .018   10037    .024

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9964.8   10037              120   68.64     120             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION           RIVER: Quilotosa
REACH: Reach-4             RS: 4.386
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INPUT
Description:
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8378.88	739.7	8399.22	738.33	8412.44	737.3	8432.48	735.93	8475.48	737.29
8516.38	738.5	8522.2	738.69	8558.84	738.59	8595.4	737.92	8623.32	737.65
8651.33	737.5	8707.05	736.96	8748.79	736.59	8784.31	736.26	8822.06	736.2
8844.6	736.3	8924.2	736.68	8969.22	736.83	9002.74	736.86	9033.59	737.05
9111.43	737.9	9158.72	737.58	9201.15	737.39	9271.41	738.48	9291.81	738.53
9383.8	739.2	9418.44	738.86	9432.88	738.57	9455.07	738.58	9483.19	738.33
9511.79	738.3	9559.85	738.33	9654.8	737.92	9670.27	738.1	9714.23	737.61
9739.77	737.5	9773.6	737.17	9809.78	736.62	9856.41	736.17	9874.95	735.9
9910.76	735.2	9919.26	734.63	9925.61	734.51	9955.83	736.15	9977.61	733.89
10000.62	733.2	10013.27	733.15	10016.07	733.5	10054.11	733.24	10058.35	733.09
10095.49	735.4	10104.38	736.02	10133.48	736.04	10199.61	736.22	10322.62	736.28
10330.61	736.3	10339.74	736.83	10341.59	737.38	10378.15	737.31	10402.17	736.91
10420.82	737	10543.94	737.5	10564.63	737.73	10586.36	737.52	10609.94	737.56
10632.7	737.7	10686.56	737.9	10708.46	738.02	10781.21	737.78	10792.47	737.7
10905.43	737.5	10996.98	738.21	11037.35	738.38	11098.19	738.29		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8378.88	.03	9856.41	.04	10104.38	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9856.41	10104.38	516	506.88	450	.3	.5

CROSS SECTION RIVER: Quilotosa
REACH: Reach-4 RS: 4.290

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8361.78	736.1	8364.92	736.14	8459.74	735.42	8520	734.96	8543.31	734.73
8562.8	734.7	8580.24	734.31	8735.54	732.52	8788.53	732.65	8952.99	732.6
8993.22	732.6	9014.27	732.68	9141.41	734.07	9240.02	734.72	9384.3	734.32
9439.45	734.4	9506.29	734.07	9557.5	733.97	9596.5	733.5	9691.49	733.51
9734.13	733.6	9815.6	733	9919.24	734.06	9942.26	735.14	9946.15	734.2973
9968.43	729.47	9978.4	727.2	10000	727.69	10019.65	728.12	10057.25	734.2678
10060.81	734.85	10111	734.22	10138.35	733.8	10182.99	733.79	10284.58	733.63
10336.24	733.82	10438.67	734.53	10520.17	735.3	10575.27	734.29	10781.7	734.36
10795.94	734.26	10823.23	733.71	10965.64	735.1	11012.19	735.35	11192.89	735.98
11230.65	736.16	11240.12	736.03						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8361.78	.03	9946.15	.04	10057.25	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9946.15	10057.25	447	469.92	438	.1	.3

CROSS SECTION RIVER: Quilotosa
REACH: Reach-4 RS: 4.201

INPUT
Description:
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8577.48	732.2	8616.84	733.29	8637.62	732.98	8683.22	732.45	8811.5	730.13
8861.55	730	8955.33	730.56	9038.21	730.84	9157.18	730.86	9264.91	730.83
9304.99	731	9380.1	731.28	9452.81	731.7	9491.62	731.35	9543.86	731.57
9678.71	730.9	9736.96	731.12	9753.55	731.52	9771.83	731.73	9816.35	731.23
9856.08	731	9952.18	732.37	9955.27	732.17	9958.11	731.54	9991.11	724.32
10000	724.59	10034.42	725.7	10041.49	726.71	10075.97	731.16	10108.55	730.88
10139.25	730.7	10162.71	730.3	10296.32	730.94	10367.71	731.59	10391.61	731.6
10450.66	731.75	10460.03	731.7	10541.08	731.41	10592.33	730.76	10671.61	732.11
10698.93	732.6	10714.24	732.4	10814.09	730.75	10828.34	731.01	10872.05	731.05
10974.46	730.98	11017.7	731	11055.05	731.4	11236.76	732.8	11324.69	733.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8577.48	.03	9958.11	.041	0075.97	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9958.111	0075.97	500	485.76	490	.1	.3

CROSS SECTION RIVER: Quilotosa
REACH: Reach-4 RS: 4.109

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8428.48	728.32	8585.59	728.18	8648.22	728.09	8690.81	728.12	8723.18	728.1
8826.98	728.43	8897.04	728.56	8932.82	728.44	9087.7	727.29	9124.69	727.2
9205.95	727.27	9287.02	727.27	9307.45	727.31	9392.24	727.46	9527.19	727.7
9591.72	727.65	9627.17	727.97	9708.21	727.62	9756.35	727.18	9901.55	727.6
9953.58	727.89	9969.53	724.53	9985.59	721.02	10000	721.42	10026.75	722.2
10035.7	723.55	10064.1	728.12	10171.64	726.63	10188.91	726.55	10327.38	729.3
10395.09	728.84	10411.57	728.34	10572.84	726.12	10607.73	726.91	10627.56	727.4
10644.99	727.43	10651.57	727.31	10794.76	726.44	10825.93	726.86	10861.81	727.5
10901.98	728.15	11052.48	729.43	11057.76	729.34	11086.13	729.09	11122.91	729.5
11160.02	730.03	11207.18	730.24	11240.88	730.48	11253.47	730.65	11302.24	731.8
11409.68	732.25	11424.77	732.36	11429.14	732.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8428.48	.03	9953.58	.04	10064.1	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9953.58	10064.1	520	506.88	500	.1	.3

CROSS SECTION RIVER: Quilotosa
REACH: Reach-4 RS: 4.013

INPUT
Description:
Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8253.64	728.1	8263.93	727.31	8403.75	726.53	8455.96	726.11	8478.02	726.05
8673.03	725.3	8767.83	725.18	8890.1	725.2	9033.07	724.8	9135.44	724.44
9142.16	724.5	9156.55	724.44	9198.69	724.34	9324.24	724.54	9378.48	724.72
9507.05	724.5	9541.31	724.47	9639.24	724.34	9736.8	724.18	9760.58	724.15
9872.29	724.4	9917.86	724.49	9931.69	724.37	9946.77	724.44	9974.02	717.33
9976.43	717.2	10000	718.36	10024.28	719.89	10046.22	722.82	10058.84	724.3
10131.51	723.61	10186.59	723.47	10305.94	724.39	10396.98	724.58	10438.76	723.77
10452.99	723.61	10539.73	725.21	10583.47	726.31	10598.74	726.48	10631.04	726.69
10642.06	726.71	10718.63	723.94	10753.45	722.62	10763.51	722.92	10781.13	723.55
10817.74	724.21	10983.07	725.88	11028.42	726.27	11103.62	726.31	11123.16	726.39
11154.97	726.41	11188.03	726.24	11259.75	725.91	11286.26	725.68	11291.86	725.68
11356.11	727.61	11472.94	730.49	11481.67	730.87	11525.77	730.28		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8253.64	.03	9946.77	.041	0058.84	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9946.77	10058.84	600	485.76	425	.1	.3

CROSS SECTION RIVER: Quilotosa
REACH: Reach-4 RS: 3.921

INPUT
Description:
Station Elevation Data num= 189

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6604.66	724.1	6612.31	724.29	6623.06	724.36	6639.15	724.56	6674.07	724.56
6682.97	724.7	6725.59	724.71	6733.78	725.05	6815.12	725.07	6820.3	724.97
6858.85	725.2	6866.96	724.98	6904.17	725.01	6912.08	724.7	6952.63	724.78
6961.97	724.7	7001.17	724.7	7010.58	724.58	7048.35	724.61	7057.4	724.53
7095.67	724.5	7146.52	724.39	7185.73	724.27	7207.33	724.12	7242.77	723.77

7296.19	723.8	7330.76	723.86	7342.54	723.8	7378.62	723.75	7390.58	723.67
7423.77	723.8	7465.25	723.55	7468.45	723.62	7482.79	723.4	7512.93	723.69
7541.98	723.6	7554.97	723.45	7593.81	722.92	7614.89	722.58	7647.75	722.67
7691.52	722.1	7733.45	721.89	7739.52	722.01	7775.99	721.68	7794.8	721.78
7826.12	721.7	7866.7	721.02	7871.44	720.98	7878.05	714	7905.79	713.1
7915.43	713.2	7922.05	714	7929.05	721	7938.42	721.4	7951.04	721.25
7964.84	721.36	8004.96	720.75	8015.72	721.68	8038.53	721.6	8059.66	721.74
8085.86	721.83	8105.84	722.08	8149.58	722.42	8179.26	722.6	8200.75	722.51
8220.5	722.64	8235.99	722.14	8280.96	722.69	8315.55	722.7	8325.27	722.82
8365.12	722.59	8375.17	722.67	8413.67	722.63	8421.74	722.5	8472.99	722.61
8514.41	722.81	8525.79	722.65	8565.31	722.7	8575.55	722.6	8607.4	722.59
8620.45	721.03	8626.93	720.99	8659.15	722.46	8717.85	721.9	8746.55	721.55
8756.94	721.57	8793.7	721.95	8838.54	722.12	8848.43	722.1	8931.97	721.77
8950.83	721.88	8978.01	722.01	9014.29	722.48	9078.66	722.6	9113.41	722.28
9158.37	721.83	9162.83	721.91	9201.32	721.78	9207.56	721.9	9247.33	721.91
9256.23	722.25	9270.56	721.77	9303.16	721.47	9327.16	721.4	9343.91	721.83
9375.14	722.02	9387.36	721.96	9435.16	721.97	9483.44	722	9485.26	721.88
9512.02	721.68	9526.18	721.84	9531.36	721.71	9560.53	721.5	9562.53	721.57
9597.51	721.67	9610.35	721.84	9644.33	721.81	9699.01	722.1	9709.69	722.07
9748.54	722.22	9759.68	722.18	9790.41	722.22	9805.92	722.5	9834.03	722.31
9844.53	721.45	9868.27	721.12	9880.96	721.04	9885.03	721.1	9913.37	720.26
9930.2	720.07	9935.29	719.88	9969.2	714.1	9971.44	714	9977.67	713.94
9980.05	713.9	9999.97	714.25	10009.81	717.07	10018.84	717.61	0020.99	717.6
10062.17	718.61	0065.25	718.74	10099.03	719.23	10146.9	720.2	10150.8	720.19
10242.04	721.49	10285.18	721.86	10328.89	721.31	10376.14	721.6	10417.2	721.86
10429.87	721.67	10462.2	721.57	10492.84	721.55	10499.5	721.71	0541.35	721.81
10579.11	721.82	10588.7	721.74	10636.54	721.65	10663.36	720.81	0666.95	720.82
10683.29	721.89	10722.2	722.38	10767.48	722.55	10822.52	722.51	0862.76	722.64
10872.68	722.78	10910.41	722.74	10917.8	722.65	10953	722.41	0960.97	722.46
11003.57	722.98	11024.42	722.96	11041.67	722.54	11100.28	722.81	1135.15	722.98
11177.76	723.35	11185.75	723.56	11231.97	723.71	1268.95	724.21	1280.48	724.23
11351.71	725.04	11363.98	725.92	11403.01	726.55	11412.05	726.81	1452.01	727.19
11466.53	727.76	11495.13	728.67	11522.28	729.29	11564.84	729.5		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
6604.66	.03	7647.75	.04	8149.58	.03	9805.92	.04	210285.18	.034

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
7794.8	10146.9	170	153.12	170	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

MULTIPLE OPENING RIVER: Quilotosa
REACH: Reach-4 RS: 3.895

INPUT
Description: SPRR
Distance from Upstream XS = 130
Deck/Roadway Width = 16
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 19

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5673	727.68		5953	727.2		6173	726.96	
6673	726.39		7173	725.92		7672	725.49	
7899.37	725.2	721.69	7921	725.19	721.69	7942.63	725.18	721.69
8421	725.13		8921	725.29		9421	725.38	
9978.5	725.3	721.12	10000	725.29	721.12	10021.5	725.28	721.12
10500	725.49		11001	725.94		11501	726.66	
12000	727.26							

Upstream Bridge Cross Section Data
Station Elevation Data num= 189

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6604.66	724.1	6612.31	724.29	6623.06	724.36	6639.15	724.56	6674.07	724.56
6682.97	724.7	6725.59	724.71	6733.78	725.05	6815.12	725.07	6820.3	724.97
6858.85	725.2	6866.96	724.98	6904.17	725.01	6912.08	724.7	6952.63	724.78
6961.97	724.7	7001.17	724.7	7010.58	724.58	7048.35	724.61	7057.4	724.53
7095.67	724.5	7146.52	724.39	7185.73	724.27	7207.33	724.12	7242.77	723.77

7296.19	723.8	7330.76	723.86	7342.54	723.8	7378.62	723.75	7390.58	723.67
7423.77	723.8	7465.25	723.55	7468.45	723.62	7482.79	723.4	7512.93	723.69
7541.98	723.6	7554.97	723.45	7593.81	722.92	7614.89	722.58	7647.75	722.67
7691.52	722.1	7733.45	721.89	7739.52	722.01	7775.99	721.68	7794.8	721.78
7826.12	721.7	7866.7	721.02	7871.44	720.98	7878.05	714	7905.79	713.1
7915.43	713.2	7922.05	714	7929.05	721	7938.42	721.4	7951.04	721.25
7964.84	721.36	8004.96	720.75	8015.72	721.68	8038.53	721.6	8059.66	721.74
8085.86	721.83	8105.84	722.08	8149.58	722.42	8179.26	722.6	8200.75	722.51
8220.5	722.64	8235.99	722.14	8280.96	722.69	8315.55	722.7	8325.27	722.82
8365.12	722.59	8375.17	722.67	8413.67	722.63	8421.74	722.5	8472.99	722.61
8514.41	722.81	8525.79	722.65	8565.31	722.7	8575.55	722.6	8607.4	722.59
8620.45	721.03	8626.93	720.99	8659.15	722.46	8717.85	721.9	8746.55	721.55
8756.94	721.57	8793.7	721.95	8838.54	722.12	8848.43	722.1	8931.97	721.77
8950.83	721.88	8978.01	722.01	9014.29	722.48	9078.66	722.6	9113.41	722.28
9158.37	721.83	9162.83	721.91	9201.32	721.78	9207.56	721.9	9247.33	721.91
9256.23	722.25	9270.56	721.77	9303.16	721.47	9327.16	721.4	9343.91	721.83
9375.14	722.02	9387.36	721.96	9435.16	721.97	9483.44	722	9485.26	721.88
9512.02	721.68	9526.18	721.84	9531.36	721.71	9560.53	721.5	9562.53	721.57
9597.51	721.67	9610.35	721.84	9644.33	721.81	9699.01	722.1	9709.69	722.07
9748.54	722.22	9759.68	722.18	9790.41	722.22	9805.92	722.5	9834.03	722.31
9844.53	721.45	9868.27	721.12	9880.96	721.04	9885.03	721.1	9913.37	720.26
9930.2	720.07	9935.29	719.88	9969.2	714.1	9971.44	714	9977.67	713.94
9980.05	713.9	9999.97	714.25	10009.81	717.07	10018.84	717.6	10020.99	717.6
10062.17	718.61	10065.25	718.74	10099.03	719.23	10146.9	720.2	10150.8	720.19
10242.04	721.49	10285.18	721.86	10328.89	721.31	10376.14	721.6	10417.2	721.86
10429.87	721.67	10462.2	721.57	10492.84	721.55	10499.5	721.7	10541.35	721.81
10579.11	721.82	10588.7	721.74	10636.54	721.65	10663.36	720.8	10666.95	720.82
10683.29	721.89	10722.2	722.38	10767.48	722.55	10822.52	722.5	10862.76	722.64
10872.68	722.78	10910.41	722.74	10917.8	722.65	10953	722.4	10960.97	722.46
11003.57	722.98	11024.42	722.96	11041.67	722.54	11100.28	722.8	11135.15	722.98
11177.76	723.35	11185.75	723.56	11231.97	723.7	11268.95	724.2	11280.48	724.23
11351.71	725.04	11363.98	725.92	11403.01	726.55	11412.05	726.8	11452.01	727.19
11466.53	727.76	11495.13	728.67	11522.28	729.29	11564.84	729.5		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
6604.66	.03	7647.75	.04	8149.58	.03	9805.92	.04	210285.18	.034

Bank Sta: Left Right Coeff Contr. Expan.

7794.8 10146.9 .3 .5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

Downstream Deck/Roadway Coordinates

num= 19

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5673	727.68		5953	727.2		6173	726.96	
6673	726.39		7173	725.92		7672	725.49	
7899.37	725.2	721.69	7921	725.19	721.69	7942.63	725.18	721.69
8421	725.13		8921	725.29		9421	725.38	
9978.5	725.3	721.12	10000	725.29	721.12	10021.5	725.28	721.12
10500	725.49		11001	725.94		11501	726.66	
12000	727.26							

Downstream Bridge Cross Section Data

Station Elevation Data num= 166

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6695.64	724.2	6725.79	725.35	6734.84	725.55	6740.05	725.51	6772.04	725.49
6789.37	725.4	6813.64	725.49	6816.5	725.4	6835.46	724.34	6858.31	723.32
6878.69	723	6898.07	722.73	6928.05	721.7	6954.08	721.04	6963.96	720.85
7001.25	720.9	7005.48	720.57	7049.11	720.91	7079.89	720.97	7123.55	721
7159.46	720.7	7196.78	720.93	7233.2	721.32	7278.17	721.25	7318.68	721.32
7331.13	721.4	7379.48	721.36	7462.96	721.1	7511.58	721	7560.67	721.03
7565.39	721	7613.28	720.88	7649.48	720.76	7697.23	720.69	7702.06	720.66
7754.93	720.6	7799.71	720.38	7836.72	719.32	7869.93	717.62	7893.19	711.63
7913.89	711	7927.4	710.83	7934.43	710.98	7957.07	718.86	8003.68	719.28
8010.17	720	8015.51	720.76	8061.04	720.56	8101.14	720.6	8144.62	720.68
8186.24	720.7	8224.62	720.79	8265.95	720.79	8292.99	720.7	8335.75	720.7
8375.63	720.6	8414.37	720.65	8457.56	720.7	8543.24	720.73	8585.88	720.56
8641.72	720.5	8683.27	720.51	8725.79	720.34	8728.89	720.36	8774.31	720.29

8824	720.4	8843.59	719.81	8859.53	719.89	8866.47	720.51	8910.33	720.43
8970.5	720.4	9050.3	720.51	9091.1	720.62	9129.08	720.66	9176.4	720.43
9204.66	720.1	9220.65	720.11	9333.25	719.7	9377.83	719.7	9422.29	719.81
9517.8	719.8	9537.89	719.81	9561.31	719.79	9608.39	720.06	9654.19	720.09
9691.16	720.3	9735.34	720.33	9749.49	720.39	9796.88	720.39	9807.03	720.27
9847.44	720.4	9849.72	720.37	9875.5	720.1	9883.82	720.45	9905.3	720.89
9925.47	721	9943.5	721.73	9947.05	721.54	9964.62	722.11	9972.35	717.5
9976.67	716	9984.63	714	9998.38	713.95	10005.12	713.91	10020.12	714
10022.39	714.11	10027.44	714.25	10030.62	721.90	10051	0.11	723.08	10048.16	722.76
10083.61	722.51	10091.62	722.61	10129.53	721.81	10134.27	721.81	10168.78	721.04
10219.95	721.15	10262.03	721	10310.33	720.81	10354.01	720.76	10400.58	720.62
10442.5	720.62	10448.61	720.51	10485.16	720.51	10531.03	720.02	10540.52	719.66
10552.97	719.97	10557.76	719.91	10577.48	719.05	10585.89	718.87	10594.32	719.32
10611.57	719.34	10631.15	720	10642.14	720.05	10667.71	720.38	10677.88	720.32
10711.29	720.69	10740.84	721.31	10752.52	721.97	10759.93	721.91	10804.82	722.4
10841.19	723.16	10848.22	723.11	10883.46	723.29	10892.78	722.34	10897.13	722.25
10937.88	722.21	10972.58	721.31	10018.61	720.79	11066.73	720.71	11092.96	720.82
11105.45	721.27	11138.37	721.61	11148.19	721.73	11161.66	721.72	11194.68	722.54
11220.27	722.46	11239.22	722.71	11259.15	722.84	11282.53	723.79	11334.29	725.22
11385.21	725.73	11422.27	727	11469.36	727.74	11475.18	727.75	11512.17	728.36
11514.78	728.37								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
6695.64	.03	7799.71	.04	8010.17	.03	9964.62	.04	210031.11	.034

Bank Sta: Left	Right	Coeff Contr.	Expan.
7799.71	10030.62	.3	.5

Upstream Embankment side slope = 2 horiz. to 1.0 vertical
Downstream Embankment side slope = 2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 4

Pier Data
Pier Station Upstream= 7913.29 Downstream= 7913.29
Upstream num= 2

Width	Elev	Width	Elev
3	713.1	3	721.69

Downstream num= 2

Width	Elev	Width	Elev
3	713.1	3	721.69

Pier Data
Pier Station Upstream= 7928.71 Downstream= 7928.71
Upstream num= 2

Width	Elev	Width	Elev
3	713.1	3	721.69

Downstream num= 2

Width	Elev	Width	Elev
3	713.1	3	721.69

Pier Data
Pier Station Upstream= 9992.5 Downstream= 9992.5
Upstream num= 2

Width	Elev	Width	Elev
2	713.91	2	721.12

Downstream num= 2

Width	Elev	Width	Elev
2	713.91	2	721.12

Pier Data
Pier Station Upstream= 10007.5 Downstream= 10007.5
Upstream num= 2

Width	Elev	Width	Elev
2	713.91	2	721.12

```
Downstream      num=        2
    Width   Elev    Width   Elev
        2  713.91        2  721.12

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =        2
       Yarnell                 KVal =       .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

Multiple Opening Stagnation Limits
```

	Upstream		Downstream	
Opening Type	Sta. Left	Sta. Right	Sta. Left	Sta. Right
Bridge	5673	9000	5673	9000
Bridge	9000	12000	9000	12000

```
CROSS SECTION           RIVER: Quilotosa
REACH: Reach-4             RS: 3.892

INPUT
Description:
Station Elevation Data     num=     166
```

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6695.64	724.2	6725.79	725.35	6734.84	725.55	6740.05	725.51	6772.04	725.49
6789.37	725.4	6813.64	725.49	6816.5	725.4	6835.46	724.34	6858.31	723.32
6878.69	723	6898.07	722.73	6928.05	721.7	6954.08	721.04	6963.96	720.85
7001.25	720.9	7005.48	720.57	7049.11	720.91	7079.89	720.97	7123.55	721
7159.46	720.7	7196.78	720.93	7233.2	721.32	7278.17	721.25	7318.68	721.32
7331.13	721.4	7379.48	721.36	7462.96	721.1	7511.58	721	7560.67	721.03
7565.39	721	7613.28	720.88	7649.48	720.76	7697.23	720.69	7702.06	720.66
7754.93	720.6	7799.71	720.38	7836.72	719.32	7869.93	717.62	7893.19	711.63
7913.89	711	7927.4	710.83	7934.43	710.98	7957.07	718.86	8003.68	719.28
8010.17	720	8015.51	720.76	8061.04	720.56	8101.14	720.6	8144.62	720.68
8186.24	720.7	8224.62	720.79	8265.95	720.79	8292.99	720.7	8335.75	720.7
8375.63	720.6	8414.37	720.65	8457.56	720.7	8543.24	720.73	8585.88	720.56
8641.72	720.5	8683.27	720.51	8725.79	720.34	8728.89	720.36	8774.31	720.29
8824	720.4	8843.59	719.81	8859.53	719.89	8866.47	720.51	8910.33	720.43
8970.5	720.4	9050.3	720.51	9091.1	720.62	9129.08	720.66	9176.4	720.43
9204.66	720.1	9220.65	720.11	9333.25	719.7	9377.83	719.7	9422.29	719.81
9517.8	719.8	9537.89	719.81	9561.31	719.79	9608.39	720.06	9654.19	720.09
9691.16	720.3	9735.34	720.33	9749.49	720.39	9796.88	720.39	9807.03	720.27
9847.44	720.4	9849.72	720.37	9875.5	720.1	9883.82	720.45	9905.3	720.89
9925.47	721	9943.5	721.73	9947.05	721.54	9964.62	722.11	9972.35	717.5
9976.67	716	9984.63	714	9998.38	713.95	10005.12	713.91	10020.12	714
10022.39	714.11	0027.44	714.25	10030.62	721.90	10031.11	723.08	10048.16	722.76
10083.61	722.51	10091.62	722.61	0129.53	721.81	10134.27	721.81	10168.78	721.04
10219.95	721.15	10262.03	721	10310.33	720.81	0354.01	720.76	10400.58	720.62
10442.5	720.62	10448.61	720.5	10485.16	720.51	10531.03	720.02	10540.52	719.66
10552.97	719.97	10557.76	719.9	10577.48	719.05	10585.89	718.87	10594.32	719.32
10611.57	719.34	10631.15	720	10642.14	720.05	10667.71	720.38	10677.88	720.32
10711.29	720.69	10740.84	721.3	10752.52	721.97	10759.93	721.91	10804.82	722.4
10841.19	723.16	10848.22	723.1	10883.46	723.29	10892.78	722.34	10897.13	722.25

10937.88	722.210972.58	721.311018.61	720.7911066.73	720.7111092.96	720.82
11105.45	721.2711138.37	721.611148.19	721.7311161.66	721.7211194.68	722.54
11220.27	722.4611239.22	722.711259.15	722.8411282.53	723.7911334.29	725.22
11385.21	725.7311422.27	72711469.36	727.7411475.18	727.7511512.17	728.36
11514.78	728.37				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
6695.64	.03	7799.71	.04	8010.17	.03	9964.62	.04	210031.11	.034

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
7799.71	10030.62	100	95.04	100	.3	.5

CROSS SECTION RIVER: Quilotosa
REACH: Reach-4 RS: 3.874

INPUT
Description:
Station Elevation Data num= 109

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6663.34	722	6669.6	722.05	6717.12	721.5	6718.17	721.51	6768.53	720.62
6824.72	720.5	6829.28	720.36	6846.32	720.4	7305.73	721.55	7345.33	721.73
7403.52	721.7	7592.79	719.81	7636.36	719.37	7665.18	719.05	7717.38	718.92
7759.72	718.7	7785.65	718.71	7830.66	718.89	7862.16	717.71	7879.64	710.72
7898.03	710.4	7920.75	709.88	7947.3	714.17	7994.58	721	8043.06	720.86
8073.68	720.9	8280.43	720.18	8539.12	720.12	8661.44	720.56	8684.84	720.65
8885.06	720.4	8930.29	720.41	8933.85	720.37	9075.1	720.23	9194.22	720.12
9493.95	720.1	9539.28	720.45	9552.68	720.48	9573.95	720.47	9776.68	720.73
9814.15	720.8	9829.1	720.67	9843.55	720.86	9910.66	720.78	9914.74	720.84
9935.49	720.7	9957.98	720.64	9969.41	720.29	9971.39	717.67	9974.06	713.13
9974.07	715.8	9980.39	717.46	9990.01	711.221	0002.21	711.221	0015.07	711.22
10027.34	711.221	0029.39	720.51	0077.29	721.121	0084.89	720.961	0117.79	720.95
10124.8	720.791	0198.92	720.81	0239.35	720.741	0247.95	720.71	0353.27	720.64
10434.99	720.571	0474.62	719.91	0479.16	719.861	0503.82	718.91	0516.22	716.85
10544.28	720.11	10587.4	720.61	0633.69	720.911	0636.56	720.951	0672.81	720.98
10679.75	721.411	0714.96	721.81	0729.49	721.851	0760.36	721.871	0780.11	722.16
10803.69	721.991	0821.91	721.81	0846.25	721.951	0862.83	721.191	0897.03	721.08
10914.69	720.931	0948.32	721.11	0958.71	721.921	0967.49	722.031	0991.38	721.32
11043.11	721.321	1080.09	721.51	1095.14	721.541	1149.13	722.561	1161.27	723.04
11180.59	722.961	1207.34	722.71	1228.65	723.321	1255.75	723.941	1286.87	724.25
11306.31	724.591	1336.74	725.5	11371	725.021	1423.53	726.61	1440.03	726.95
11468.96	727.691	1482.64	727.71	1494.52	727.231	1511.44	727.98		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
6663.34	.03	7830.66	.04	7994.58	.03	9969.41	.04	210029.39	.034

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
7830.66	10029.39	425	427.68	425	.3	.5

MULTIPLE OPENING RIVER: Quilotosa
REACH: Reach-4 RS: 3.870

INPUT
Description: I-8
Distance from Upstream XS = 20
Deck/Roadway Width = 360
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 32

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5435	726.51		5649	726.12		5869	725.83	
6092	725.45		6314	725.04		6540	724.78	
6758	724.48		6973	724.21		7185	723.8	
7395	723.45		7611	723.03		7833	722.68	
7895	722.61		8051	722.42		8278	722.16	
8508	721.91		8744	721.9		8985	721.69	
9193	721.77		9418	721.62		9651	721.75	
9887	722.16		10000	722.35		10237	722.42	
10449	722.69		10698	722.77		10948	723.04	
11195	723.07		11398	723.12		11611	723.05	

11826	722.92	12044	723.44

Upstream Bridge Cross Section Data
Station Elevation Data num= 109

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6663.34	722	6669.6	722.05	6717.12	721.5	6718.17	721.51	6768.53	720.62
6824.72	720.5	6829.28	720.36	6846.32	720.4	7305.73	721.55	7345.33	721.73
7403.52	721.7	7592.79	719.81	7636.36	719.37	7665.18	719.05	7717.38	718.92
7759.72	718.7	7785.65	718.71	7830.66	718.89	7862.16	717.71	7879.64	710.72
7898.03	710.4	7920.75	709.88	7947.3	714.17	7994.58	721	8043.06	720.86
8073.68	720.9	8280.43	720.18	8539.12	720.12	8661.44	720.56	8684.84	720.65
8885.06	720.4	8930.29	720.41	8933.85	720.37	9075.1	720.23	9194.22	720.12
9493.95	720.1	9539.28	720.45	9552.68	720.48	9573.95	720.47	9776.68	720.73
9814.15	720.8	9829.1	720.67	9843.55	720.86	9910.66	720.78	9914.74	720.84
9935.49	720.7	9957.98	720.64	9969.41	720.29	9971.39	717.67	9974.06	713.13
9974.07	715.8	9980.39	717.46	9990.01	711.22	10002.21	711.22	10015.07	711.22
10027.34	711.22	10029.39	720.5	10077.29	721.12	10084.89	720.96	10117.79	720.95
10124.8	720.79	10198.92	720.8	10239.35	720.74	10247.95	720.7	10353.27	720.64
10434.99	720.57	10474.62	719.9	10479.16	719.86	10503.82	718.9	10516.22	716.85
10544.28	720.11	10587.4	720.6	10633.69	720.91	10636.56	720.95	10672.81	720.98
10679.75	721.41	10714.96	721.8	10729.49	721.85	10760.36	721.87	10780.11	722.16
10803.69	721.99	10821.91	721.8	10846.25	721.95	10862.83	721.19	10897.03	721.08
10914.69	720.93	10948.32	721.1	10958.71	721.92	10967.49	722.03	10991.38	721.32
11043.11	721.32	11080.09	721.5	11095.14	721.54	11149.13	722.56	11161.27	723.04
11180.59	722.96	11207.34	722.7	11228.65	723.32	11255.75	723.94	11286.87	724.25
11306.31	724.59	11336.74	725.5	11371	725.02	11423.53	726.6	11440.03	726.95
11468.96	727.69	11482.64	727.7	11494.52	727.23	11511.44	727.98		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
6663.34	.03	7830.66	.04	7994.58	.03	9969.41	.04	10029.39	.034

Bank Sta: Left	Right	Coeff Contr.	Expan.
7830.66	10029.39	.3	.5

Downstream Deck/Roadway Coordinates
num= 32

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5435	726.51		5649	726.12		5869	725.83	
6092	725.45		6314	725.04		6540	724.78	
6758	724.48		6973	724.21		7185	723.8	
7395	723.45		7611	723.03		7833	722.68	
7895	722.61		8051	722.42		8278	722.16	
8508	721.91		8744	721.9		8985	721.69	
9193	721.77		9418	721.62		9651	721.75	
9887	722.16		10000	722.35		10237	722.42	
10449	722.69		10698	722.77		10948	723.04	
11195	723.07		11398	723.12		11611	723.05	
11826	722.92		12044	723.44				

Downstream Bridge Cross Section Data
Station Elevation Data num= 144

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6912.25	720.2	6943.07	720.25	6967.83	720.34	6979.87	720.77	6995.99	720.83
7008.35	720.5	7028.94	720.53	7075.98	720.71	7124.58	720.92	7144.25	720.98
7163.51	720.9	7186.07	720.95	7238.13	720.86	7331.18	720.92	7358.79	720.9
7382.24	720.9	7408.49	720.89	7432.86	720.94	7458.66	720.94	7486.89	720.99
7524.5	721	7550.45	720.96	7579.85	720.85	7604.53	720.35	7629.51	720.28
7655.98	720.1	7683.53	719.77	7724.85	718.74	7749.67	718.69	7770.64	717.68
7800.69	718.1	7815.93	717.23	7838.65	716.14	7866.04	714.41	7886.37	713.05
7905.78	712.3	7936.36	710	7948.07	709.41	7957.87	709.3	7965.25	708.88
8007.02	708.5	8013.59	709.17	8014.22	709.41	8052.42	711.71	8063.36	711.93
8083.81	713.2	8105.96	714.89	8126.61	715.35	8148.57	716.03	8167.61	716.25
8195.17	717.4	8216.07	717.43	8244.18	717.8	8261.15	718.09	8310.75	718.77
8361.86	719.1	8386.86	719.43	8408.15	719.47	8417.37	719.81	8468.22	720.06
8483.27	720	8505.89	719.68	8554.6	719.77	8593.18	719.75	8618.39	719.91
8672.29	719.9	8734.92	720.06	8751.73	720.12	8774.24	720.25	8821.99	719.36
8837.77	719.3	8858.65	719.67	8884.43	719.68	8938.79	719.4	8972.69	719.31
9095.5	719.2	9161.03	719.02	9168.99	719.31	9201.97	719.41	9240.62	717.73
9281.24	716.9	9325.93	716.29	9366.02	715.7	9394.25	715.23	9407.69	715.28
9449.52	715.3	9529.72	715.17	9542.42	715.22	9590.63	715.21	9640.07	715.18

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 9688.23   715.6 9739.41  715.91 9786.17  715.94 9801.44  715.99  9831.1  716.62
 9862.25   718.2 9878.83  718.66 9900.97  717.68 9906.65  717.62 9932.77  714.76
 9941.85     714 9946.95  714.08 9967.56  712.97  9976.2  711.31 9977.48  708.74
 9999.93  708.7410013.52  708.7410029.17  710.6710033.76  711.8910072.82  712.37
10112.87   714.310116.09  714.5710158.36  716.5310164.96  716.5710202.55  717.15
10213.98     71710221.26  717.0910242.62  717.1510256.51  717.5610268.46   717.3
10288.79   717.310312.97  717.0810386.17  716.8210415.58  716.7710447.47  716.84
 10506.8   715.910541.94  715.9810551.55  716.1510610.88  717.7810617.83  717.72
10653.18   717.810685.51  717.8410713.51  717.8710727.76  718.3410734.55  718.35
 10764.3   719.110781.46  719.0910798.68  719.1810810.19  719.0210841.23  718.19
10850.24   718.210887.76  718.06 10928.8  718.0110966.47      718

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
 6912.25     .03 7683.53     .04 8408.15     .03 9201.97    .04210158.36    .034

Bank Sta: Left   Right    Coeff Contr.   Expan.
       7815.9310158.36             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

Upstream Embankment side slope                =       3 horiz. to 1.0 vertical
Downstream Embankment side slope              =       3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd    =       2
       Yarnell                 KVal =       .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

Number of Culverts =  2

Culvert Name      Shape      Rise    Span
Culvert #2            Box       8      12
FHWA Chart # 11- Skewed headwall; Chamfered or beveled Inlet
FHWA Scale # 4 - Headwall skewed 10 to 45 deg.; inlet edges beveled
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                 23   381.5       .013                   .4                1
Number of Barrels =  3
Upstream   Elevation =  710.23
Centerline Stations
    Sta.     Sta.     Sta.
    7895     7908     7921
Downstream Elevation =  708
Centerline Stations
    Sta.     Sta.     Sta.
    7967     7980     7993

Culvert Name      Shape      Rise    Span
```

Culvert #1 Box 8 12
FHWA Chart # 11- Skewed headwall; Chamfered or beveled Inlet
FHWA Scale # 4 - Headwall skewed 10 to 45 deg.; inlet edges beveled
Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	n Value	Entrance Loss Coef	Exit Loss Coef
23	382	.013	.4	1

Number of Barrels = 3
Upstream Elevation = 711.22
Centerline Stations

Sta.	Sta.	Sta.
9987	10000	10013

Downstream Elevation = 708.74
Centerline Stations

Sta.	Sta.	Sta.
9987	10000	10013

Multiple Opening Stagnation Limits

	Upstream		Downstream	
Opening Type	Sta. Left	Sta. Right	Sta. Left	Sta. Right
Culvert Group	5435	9100	5435	9100
Culvert Group	9100	12044	9100	12044

CROSS SECTION RIVER: Quilotosa
REACH: Reach-4 RS: 3.793

INPUT
Description:
Station Elevation Data num= 144

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6912.25	720.2	6943.07	720.25	6967.83	720.34	6979.87	720.77	6995.99	720.83
7008.35	720.5	7028.94	720.53	7075.98	720.71	7124.58	720.92	7144.25	720.98
7163.51	720.9	7186.07	720.95	7238.13	720.86	7331.18	720.92	7358.79	720.9
7382.24	720.9	7408.49	720.89	7432.86	720.94	7458.66	720.94	7486.89	720.99
7524.5	721	7550.45	720.96	7579.85	720.85	7604.53	720.35	7629.51	720.28
7655.98	720.1	7683.53	719.77	7724.85	718.74	7749.67	718.69	7770.64	717.68
7800.69	718.1	7815.93	717.23	7838.65	716.14	7866.04	714.41	7886.37	713.05
7905.78	712.3	7936.36	710	7948.07	709.41	7957.87	709.3	7965.25	708.88
8007.02	708.5	8013.59	709.17	8014.22	709.41	8052.42	711.71	8063.36	711.93
8083.81	713.2	8105.96	714.89	8126.61	715.35	8148.57	716.03	8167.61	716.25
8195.17	717.4	8216.07	717.43	8244.18	717.8	8261.15	718.09	8310.75	718.77
8361.86	719.1	8386.86	719.43	8408.15	719.47	8417.37	719.81	8468.22	720.06
8483.27	720	8505.89	719.68	8554.6	719.77	8593.18	719.75	8618.39	719.91
8672.29	719.9	8734.92	720.06	8751.73	720.12	8774.24	720.25	8821.99	719.36
8837.77	719.3	8858.65	719.67	8884.43	719.68	8938.79	719.4	8972.69	719.31
9095.5	719.2	9161.03	719.02	9168.99	719.31	9201.97	719.41	9240.62	717.73
9281.24	716.9	9325.93	716.29	9366.02	715.7	9394.25	715.23	9407.69	715.28
9449.52	715.3	9529.72	715.17	9542.42	715.22	9590.63	715.21	9640.07	715.18
9688.23	715.6	9739.41	715.91	9786.17	715.94	9801.44	715.99	9831.1	716.62
9862.25	718.2	9878.83	718.66	9900.97	717.68	9906.65	717.62	9932.77	714.76
9941.85	714	9946.95	714.08	9967.56	712.97	9976.2	711.31	9977.48	708.74
9999.93	708.74	10013.52	708.74	10029.17	710.67	10033.76	711.89	10072.82	712.37
10112.87	714.31	10116.09	714.57	10158.36	716.53	10164.96	716.57	10202.55	717.15
10213.98	717	10221.26	717.09	10242.62	717.15	10256.51	717.56	10268.46	717.3
10288.79	717.31	10312.97	717.08	10386.17	716.82	10415.58	716.77	10447.47	716.84
10506.8	715.91	10541.94	715.98	10551.55	716.15	10610.88	717.78	10617.83	717.72
10653.18	717.81	10685.51	717.84	10713.51	717.87	10727.76	718.34	10734.55	718.35
10764.3	719.11	10781.46	719.09	10798.68	719.18	10810.19	719.02	10841.23	718.19
10850.24	718.21	10887.76	718.06	10928.8	718.01	10966.47	718		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
6912.25	.03	7683.53	.04	8408.15	.03	9201.97	.04	10158.36	.034

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
7815.93	10158.36	90	89.76	90	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent

888 F

CROSS SECTION RIVER: Quilotosa
REACH: Reach-4 RS: 3.776

INPUT
Description:
Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7270.86	717.93	7357.12	717.36	7382.54	717.11	7402.64	717.1	7470.86	716.95
7598.91	716.97	7670.87	716.77	7797.88	716.67	7870.87	716.7	7923.59	716.38
7927.75	716.37	8070.87	716.34	8148.14	714.21	8181.39	713.9	8212.17	716.91
8220.9	717.52	8227.74	714.92	8247.15	709.07	8257.89	713.1	8269.08	717.11
8281.87	716.26	8345.52	716.51	8421.91	716.91	8474.39	717.1	8494.6	717.19
8503.81	717.47	8540.97	718.06	8584.94	718.56	8631.88	719.3	8635.29	719.36
8670.83	719.84	8681.07	719.8	8699.01	719.95	8712.09	719.8	8732.71	719.99
8785.74	719.64	8843.07	719.19	8874.84	719	8962.78	718.9	9047.75	718.89
9109.69	718.58	9122.45	718.26	9168.94	717.67	9193.75	714.7	9276.93	716.31
9291.29	716.56	9436.05	716.61	9499.71	716.61	9547.65	715.9	9572.72	715.8
9701.31	716.33	9718.72	716.49	9737.25	716.59	9785.84	716.2	9813.78	716.21
9830.46	716.49	9915.77	716.8	9921.56	717.03	9948.9	718.7	9977.14	711.14
9980	710.55	10000	709.92	10020.22	709.27	10037.06	714.8	10043.38	716.26
10073.64	716.23	10117.49	715.81	10160.09	715.83	10192.73	716.2	10256.72	716.29
10363.49	715.56	10533.27	715.84	10582.74	716.71	10608.67	717.4	10639.56	717.15
10683.72	717.21	10709.41	717.3	10749.23	717.74	10769.9	717.68	10783.91	717.66

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
7270.86	.03	8070.87	.04	8281.87	.03	9168.94	.042	9276.93	.032
9948.9	.042	10043.38	.034						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8070.87	10043.38	0	0	0	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

CROSS SECTION RIVER: Quilotosa (east
REACH: Reach-2 RS: 5.372

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8898.04	762.66	8979.3	762.47	8995.17	762.46	9027.81	762.33	9126.24	762.21
9184.69	762.23	9215.14	762.32	9286.27	762.2	9326.76	762.11	9331.58	761.89
9475.25	761.83	9511.93	761.67	9591.58	761.58	9629.17	761.32	9688.41	761.4
9737.3	761.34	9840.66	761.29	9896.52	761.12	9912.76	761.05	9956.68	760.97
9975.49	760.83	10000	760.85	10027.59	760.97	10074.6	761.37	10115.33	761.86
10186.62	762.41	10217.19	763.19	10235.78	763.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8898.04	.035	9975.49	.041	10027.59	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.49	10027.59	530	547.93	520	.1	.3

CROSS SECTION RIVER: Quilotosa (east
REACH: Reach-2 RS: 5.269

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8905.06	759.38	8931.36	759.24	8989.24	759.17	9016.97	759.02	9083.35	758.96
9153.25	758.69	9246.88	758.53	9349.31	758.4	9407.07	758.41	9497.58	758.46
9580	758.56	9604.79	758.36	9681.48	758.27	9757.66	758.21	9801.2	758.09
9868.24	757.98	9936.12	757.92	9979.28	757.93	9991.47	757.79	10000	757.75
10017.24	757.95	10044.38	758.28	10058.71	758.57	10098.65	759.16	10129.39	759.68
10171.14	760.01	10192.1	760.14	10211.71	759.46	10246.27	758.92	10281.94	758.29

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10295.37  758.2610308.58  758.3510336.15  758.7410388.75  759.2210412.38  759.61
10449.49     76010568.91  760.88

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8905.06    .035 9979.28     .0410017.24    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.2810017.24               410   437.2     440              .1       .3

CROSS SECTION           RIVER: Quilotosa  (east
REACH: Reach-2            RS: 5.186

INPUT
Description:
Station Elevation Data    num=      56
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8571.29  757.13 8602.59  756.92 8641.58  756.72 8653.58  756.64 8691.25  756.62
 8730.11  756.57 8791.96  756.58 8814.26  756.51 8890.47  756.45 8931.16  756.49
  8987.8  756.53 9052.26  756.55 9136.61  756.61 9169.98  756.68 9189.76  756.45
 9216.38  756.32 9240.45   756.2 9297.56  756.13 9331.27  756.08 9380.22     756
 9437.92  755.81 9482.43  755.72 9515.74  755.58 9540.05  755.63  9584.6  755.69
 9609.18  755.73 9678.32  755.76 9699.29     756 9725.67  756.37 9798.59  756.94
 9810.04  757.07 9820.17  756.91 9856.65  756.51 9894.26  756.18 9910.23     756
 9954.06  755.47 9977.16  755.19 9986.66  755.06   10000  754.9710016.26  755.04
10048.96  755.2310071.33  755.55   10097  755.3610111.99  755.1910141.21  755.22
10160.64  755.1710196.56  755.1810231.15  755.2910257.83  755.5110266.46  755.69
10291.84  755.9210304.19     75610377.51  756.29 10402.7  756.6810461.58  757.09
10503.59  757.32

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8571.29    .035 9977.16     .0410048.96    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.1610048.96               420  458.54     490              .1       .3

CROSS SECTION           RIVER: Quilotosa  (east
REACH: Reach-2            RS: 5.099

INPUT
Description:
Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  8502.4  755.48 8541.28  755.24 8598.14  755.15 8656.37   755.1 8749.18  755.02
 8792.85  754.86 8838.73  754.71 8891.51  754.66 8942.74  754.57 8995.57  754.51
 9059.62  754.45 9120.46  754.43 9176.68  754.18 9223.18  753.89 9294.64  753.56
 9359.69  753.65 9440.06   753.8 9455.17  753.75 9543.84  753.69 9606.42  753.79
 9714.98  753.82 9790.59  753.91 9825.48  753.66 9879.59  753.27 9943.26  752.94
 9965.48  752.61   10000  752.4710041.34  752.5910059.19  752.73   10070  752.82
10101.55   752.9 10158.9  753.2110207.73  753.43 10260.1     75410341.51  754.39
10411.29  754.2410478.82  755.6610510.89     75610649.48   756.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  8502.4    .035 9965.48     .0410041.34    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9965.4810041.34               550  627.95     610              .1       .3

CROSS SECTION           RIVER: Quilotosa  (east
REACH: Reach-2            RS: 4.980

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8298.78  753.62 8368.75  753.23  8401.4  752.94 8456.39  752.78 8559.17  752.89
 8598.27  752.71 8634.03  752.45 8690.54  752.19 8771.29  752.11 8878.61     752
 8933.67  751.74 9090.45  751.66 9169.37  751.56 9225.82   751.4 9302.16  751.29
 9378.54   751.1 9459.25  750.89  9466.2  750.75 9541.53  750.91 9647.28  750.66
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 9720.14  750.32  9788.6  750.04 9815.34     750 9873.98  749.87  9931.4  749.75
 9972.35  749.51   10000  749.4610026.71  749.4910051.48  749.5810069.36  749.77
 10082.1     75010141.79  750.6610201.44  751.6310245.27  751.1610312.26  750.94
10391.48  751.0310434.16  751.2210492.76  751.3610525.14  751.5110620.92  752.16
10754.79  751.4110828.17  751.0610915.63     75211024.21     75411093.29     756
11151.84   757.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8298.78    .035  9931.4     .0410069.36    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9931.410069.36               600  581.42     630             .1       .3

CROSS SECTION           RIVER: Quilotosa  (east
REACH: Reach-2             RS: 4.870

INPUT
Description:
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8636.18  748.69 8696.44  748.65 8758.13  748.53 8919.25  748.42 9010.11  748.25
 9123.29  748.09 9265.53     748 9301.05  747.72 9326.91  747.36  9360.4     747
 9424.58  747.12  9491.1  746.95 9547.67  746.88 9606.41  747.06 9685.13  747.21
 9720.78  747.45 9783.16  747.59 9831.67  747.78 9890.17  748.05 9938.44  746.74
 9952.74  746.34   10000  746.2410041.03  746.3310067.59  746.7810139.57     748
10199.83     74810277.98  747.7910340.08     74810372.25  748.4410408.49  748.29
10530.62  748.41 10553.8  748.2510611.14  748.8510654.18  748.5610699.23  748.26
10771.18     74810805.43  748.0510829.41  748.2510978.45     75011121.93     752
11168.86   752.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8636.18    .035 9938.44     .0410067.59    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9938.4410067.59               560  529.78     550             .1       .3

CROSS SECTION           RIVER: Quilotosa  (east
REACH: Reach-2             RS: 4.770

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8020  745.54 8087.46  745.21 8192.53  745.11 8336.47  745.17 8475.29  745.31
 8588.26  745.34 8723.32  745.23  8858.7  745.19 8933.43  745.54 8979.15  745.64
 9042.66  745.68 9190.14  745.36 9245.63  745.05 9299.11  744.41 9390.23   744.1
 9456.79  744.12 9507.34  744.39  9551.3  744.81 9618.51  744.68 9683.45  744.57
 9770.02   744.5 9809.43  744.28 9878.13  744.17 9925.24  744.03 9968.48  743.47
   10000  743.1310046.56  743.4510097.56     74410170.37  743.9810241.91  744.34
10364.86  745.06 10380.1  744.6510395.33   745.110430.19     74610461.67  745.88
10488.37  745.9710540.06   745.810573.58  745.7810641.96  745.1610701.36  744.79
10719.34  744.7210738.56  744.8110859.64     74610941.29     74811070.43     750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8020    .035 9968.48     .0410046.56    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9968.4810046.56               450  508.59     460             .1       .3

CROSS SECTION           RIVER: Quilotosa  (east
REACH: Reach-2             RS: 4.673

INPUT
Description: new station, needs X-section data
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    7910  744.46    7940  743.17    7980  743.35    8200  743.22    8350   743.1
    8600  743.28    8690  743.06    8900  742.85    9020     744 9075.41  744.48
```

9173.36	744	9249.66	743.15	9371.31	742.85	9525.93	742.4	9596.11	742.26
9694.87	742.31	9786.54	742	9852.63	741.13	9914.4	740.59	9956.68	740.35
10000	740	10069.22	740.22	10118.58	740.48	10173.72	741.19	10202.85	742
10259.17	742.27	10325.69	742.57	10561.09	742.2	10789.71	742.91	10918.43	744
10989.15	744.85								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7910	.035	9956.68	.04	10069.22	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9956.68	10069.22	530	583.11	620	.1	.3

CROSS SECTION RIVER: Quilotosa (west)
REACH: Reach-3 RS: 5.379

INPUT
Description:
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8376.72	769.5	8378.57	769.58	8413.25	767.37	8469.51	763.86	8475.48	763.63
8493.13	762.6	8514.86	760.97	8535.92	760.2	8549.54	759.9	8566.81	758.92
8666.42	757.4	8724.34	757.47	8786.76	756.87	8927.52	756.65	8998.12	757.14
9037.69	756.9	9102.73	757.07	9114.52	757.42	9147.11	756.36	9158.83	756.57
9162.14	756.9	9204.6	759	9213.06	759.51	9216.77	759.54	9243.36	759.29
9258.85	759.8	9297.27	760.27	9304.69	760.33	9346.95	761.52	9355.71	761.64
9391.73	762.9	9399.39	763.17	9417.98	762.18	9447.47	760.5	9462.8	760.17
9488.46	760.2	9644.09	760.71	9756.38	761.43	9776.92	761.74	9788.61	762
9816.16	762.2	9860.75	762.62	9885.4	762.73	9889.21	762.54	9902.29	761.93
9910.3	761.68	9929.48	760.3	9950.83	761.55	9971.98	762.32	9992.54	760.2
9995.66	759.82	10000	759.8	10002.55	759.69	10028.21	758.99	10033.85	759.53
10048.74	761.22	10060.22	762.3	10081.45	763.43	10108.56	764.94	10119.39	764.61
10170.98	762.91	10181.27	762.9	10226.2	762.51	10252.04	762.64	10426.12	763.15
10431.99	763.17	10450.58	762.2	10466.5	763.22	10606.02	763.54		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8376.72	.035	9889.21	.05	10060.22	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9889.21	10060.22	400	475.2	550	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

CROSS SECTION RIVER: Quilotosa (west)
REACH: Reach-3 RS: 5.289

INPUT
Description:
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8425.64	767.9	8449.36	768.11	8472.83	768	8488.93	767.55	8496.95	766.67
8519.76	765.5	8548.56	765.83	8591.19	764.29	8605.25	763.97	8613.64	763.64
8636.37	764.4	8660.05	764.05	8703	763.34	8713.11	763.3	8744.46	763.67
8750.75	763.5	8815.98	761.1	8824.92	760.81	8843.23	759.9	8859.42	759.49
8897.64	759.9	8900.45	759.79	8940.67	757.02	8949.56	756.99	8979.98	755.92
9056.79	755.5	9092.36	755.6	9139.86	755.92	9158.55	755.97	9215.33	756.24
9304.01	756.3	9343.33	756.95	9362.26	757.34	9371.26	757.88	9434.58	758.74
9438.33	758.7	9466.99	758.83	9479.71	758.39	9485.76	758.51	9532.81	758.65
9547.32	758.6	9584.35	759.1	9614.29	759.31	9637.16	759.42	9695.96	758.58
9713.44	759.8	9729.28	756.62	9748.52	758.13	9829.06	759.37	9832.21	759.16
9858.91	758.2	9873.35	758.26	9892.85	757.95	9900.25	758.14	9925.68	756.37
9949.76	758.7	9966.68	759.05	9978.54	758.99	9985.83	757.47	9999.36	755.46
10019.72	758	10053.01	758.32	10248.84	759.56	10305.25	760.09	10321.45	760.88
10330.75	759.5	10351.73	760.19	10365.43	760.12	10458.17	763.09	10462.38	762.94
10520.64	760.8	10545.72	759.46	10551.6	758.64	10574.94	758.88	10593.5	759.85
10691.78	759.7	10742.5	759.54	10791.13	759.75	10851.18	760.34	10868.09	759.15
10879.28	760.5	10964.3	760.16	11089.79	760.32	11172.89	760.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8425.64	.035	9978.54	.05	10053.01	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9978.54	10053.01	520	454.08	400	.1	.3

CROSS SECTION RIVER: Quilotosa (west)
REACH: Reach-3 RS: 5.203

INPUT
Description:
Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8713.32	765.3	8750.65	764.87	8766.18	764.71	8812.39	763.29	8838.09	762.56
8855.06	762.2	8888.03	762.45	8916.21	761.75	8934.28	761.47	8962.23	760.92
8984.94	760.8	8994.62	761.15	9013.46	760.87	9038.36	760.42	9050.75	760.48
9095.72	760.4	9099.14	760.6	9111.21	760.28	9137.82	759.4	9180.76	760.59
9189.14	760.7	9192.6	760.55	9224.59	758.09	9260.35	757.2	9270.46	756.66
9313.04	756	9321.42	755.99	9346.26	755.13	9379.6	754.58	9398.02	753.15
9418.82	754.5	9569.2	755.6	9578.98	753.79	9586.56	750.82	9603.44	753.49
9611.37	754.6	9647.06	755.02	9647.82	755.36	9650.7	754.87	9654.45	755.43
9683.91	755.3	9693.93	755.43	9747.21	755.71	9751.57	754.7	9764.08	752.17
9792.41	755.8	9806.75	756.09	9812.62	756.1	9835.16	756.36	9856.13	755.97
9894.62	756.1	9962.22	756.29	9984.04	755.01	9986.89	754.2	9995.39	752.16
10015.23	755.1	10020.29	756.25	10038.87	756.49	10063.64	756.98	10113.94	757.39
10235.31	757	10365.76	756.57	10374.24	756.52	10386.86	756.71	10401.94	757.22
10448.71	758.6	10460.82	756.6	10470.62	756.74	10516.44	757.34	10521.33	757.56
10532.93	757.7	10565.86	757.13	10585.4	756.52	10590.35	756.51	10784.64	756.92
10807.42	756.8	10812.35	756.7	10827.06	755.42	10831.84	756.1	10844.78	755.86
10866.03	756.3	10958.57	757.55	10988.69	757.93	11056.68	758.2	11193.77	758.63

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8713.32	.035	9569.2	.05	9603.44	.035	9747.21	.052	9792.41	.031
9962.22	.05	10020.29	.031						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9962.22	10020.29	300	469.92	275	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888			T

CROSS SECTION RIVER: Quilotosa (west)
REACH: Reach-3 RS: 5.114

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9362.6	764.52	9375.79	764.6	9419.39	763.84	9465.81	762.39	9478.53	762.02
9502.69	760.6	9513.62	760	9537.14	760.15	9558.96	759.81	9602.44	760.18
9613.45	760.24	9621.59	760.4	9651.57	758.87	9675.59	757.85	9709.25	756.51
9735.67	754.82	9782.09	754.5	9824.45	754.79	9832.54	754.94	9837.15	754.87
9858.34	753.84	9874.28	747.4	9887.87	750.78	9896.02	752.97	9901.08	753.32
9912.54	753.04	9916.73	752.7	9919.01	751.72	9926.84	749.14	9937.72	751.67
9944.33	752.98	9972.48	754.2	9976.04	752.88	9991.69	748.5	9994.56	749.83
10000	750.39	10014.96	752.2	10027.93	753.65	10057.96	753.8	10111.25	753.93
10141.38	753.98	10158.7	754.1	10278.75	754.34	10330.89	754.55	10354.63	754.81
10396.88	755.07	10574.38	755.39	10689.51	755.64	10710.78	75	10774.76	756.01
10778.07	756.02	10785.56	755.7	10789.29	755.72	10789.96	756.09	10822.05	755.95
10833.88	756.01	10838.79	756.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9362.6	.035	9837.15	.06	10027.93	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9837.15	10027.93	450	469.92	350	.1	.3

CROSS SECTION RIVER: Quilotosa (west)
REACH: Reach-3 RS: 5.025

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INPUT
Description:
Station Elevation Data     num=       70
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9596.16   762.21  9624.37      761  9627.14   760.77  9654.39   759.25   9673.1   758.13
 9717.06   756.91  9723.76    756.6  9752.62   753.74  9770.77    753.4  9797.41    754.1
 9814.58   754.65  9829.22    754.7  9836.69   754.55  9846.16   754.02  9863.45   752.62
  9870.4   752.46  9881.62    752.8  9919.73   754.61  9938.41   753.21   9950.3751.9907
 9958.01    751.2   9970.5   749.78  9980.26      748   9999.7   744.8610017.31   748.41
10035.11   750.0410042.74   749.4510054.17   751.910057.63   752.1110099.58   752.34
10124.69   752.35 10141.3   752.2910189.12   752.310224.33   752.1410242.39   752.23
10259.38   753.2610272.14   753.4710287.68   754.1 10302.1   753.8510320.27   752.66
10327.95   751.7710364.32   751.1410399.24   749.610407.86   750.3610433.72   749.09
10463.27   747.2910487.06   746.6110497.36   747.810503.45   748.91 10564.3   755.15
10587.28   759.5710603.17   760.7410640.08   760.910653.59   753.5710757.35   754.33
10765.25   754.2410795.17   754.4210887.79   754.310943.29   753.0910985.29   752.89
11001.41   752.9211023.01   753.0811038.72     75311062.72   754.2611094.68   754.58
11099.42   754.6711149.89   755.0711269.73   755.6 11300.9   755.6911433.75      756

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9596.16     .035   9950.3     .06510054.17     .035

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
         9950.310054.17                475  469.92      420               .1        .3
Ineffective Flow      num=        2
   Sta L    Sta R     Elev  Permanent
888         T
888         T

CROSS SECTION            RIVER: Quilotosa (west)
REACH: Reach-3              RS: 4.936

INPUT
Description:
Station Elevation Data     num=       68
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9843.63   759.44  9914.79      759  9916.21   758.72  9930.17   757.04  9957.72    753.4
 9961.49752.4399   9965.3   751.47  9995.79    744.6    10000   745.8210013.21   749.77
10023.47   752.1910080.47   751.86 10086.4    754.210096.32   758.63 10107.9   758.13
10113.89   758.0410142.72    749.210161.97    743.410198.71   743.3910214.74   743.51
10222.62   744.5310270.05   752.9110275.91    753.410286.37   753.2110302.58   753.69
10315.56   753.8710352.54   754.84 10360.9    754.8 10378.1   753.0210386.95   753.58
10441.08   743.3210445.43   742.3110449.51    742.210467.66   741.8210479.28   741.86
 10503.8   742.2810534.75   742.63 10563.8    744.710589.26   747.0210605.73   748.09
10666.41      75710682.61   757.8710686.61    758.810699.39   759.09    10721    759.4
10745.33   754.21 10750.1   753.4210755.42    753.410816.12   752.6410893.51   752.27
10961.67   752.7510987.41      75311026.07    752.911083.11   753.0411095.06   753.04
 11176.4    752.811215.37   752.8111246.53      75311285.46   753.0911289.63   753.34
11313.97   753.5111361.17   753.0611368.72      75311397.71   753.6411410.47      754
11432.48   754.5111460.13   754.8811466.52    755.1

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9843.63     .035   9961.49     .06510023.47     .035

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
        9961.4910023.47                460   475.2      400               .1        .3
Ineffective Flow      num=        2
   Sta L    Sta R     Elev  Permanent
888         T
888         T

CROSS SECTION            RIVER: Quilotosa (west)
REACH: Reach-3              RS: 4.846

INPUT
Description:
Station Elevation Data     num=       37
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
```

```
 9741.31  758.51  9761.6  754.47 9778.33  750.02 9808.81     750 9857.82  749.22
 9871.53  749.28 9894.99  748.96 9933.95  748.88 9941.13   748.7 9977.48  744.11
10001.82  741.8510026.75  745.9310044.82748.755910050.41  749.6310068.47   749.4
10086.06  749.4210111.41  748.9610126.46  745.9710146.57  743.0210156.52   746.6
10162.11   749.210201.79  749.13 10220.6  749.0610289.34  749.7210311.54   749.8
10331.86  749.4510383.54  748.3410519.48  745.4910548.96  747.7110592.31   749.7
10629.56  751.4910639.43  751.4610725.25  750.7610805.27  751.3310931.65   751.6
11119.08   752.311138.05  752.37

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9741.31    .035 9941.13    .06510044.82    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.1310044.82               450  480.48     410              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION          RIVER: Quilotosa (west)
REACH: Reach-3            RS: 4.755

INPUT
Description:
Station Elevation Data     num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9714.72  746.92    9794  747.28 9832.75  747.08  9859.3  747.04 9868.27   747.2
 9895.59  747.24 9931.04  746.72 9987.54  740.1210006.45  740.3410032.91   741.9
10061.49   741.610102.75  740.9710119.42  740.7710121.27  740.6210127.89   740.6
10144.96  740.1810165.16  740.2110198.09  740.6810266.37   740.3 10310.4   739.9
10335.04  739.8410350.24  739.8510488.74   740.210516.06  740.2210520.91   740.2
10640.02  739.0310660.34  739.3910678.22  740.6310717.97  743.0510737.23   743.9
10765.99  745.99 10781.5  746.7210808.95  748.1310844.07  749.8210912.41   748.5
10938.95  748.0411037.34  748.8711146.54   749.8

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9714.72    .035 9931.04    .065 10781.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9931.04 10781.5               480.3  480.48     420              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        T

CROSS SECTION          RIVER: Quilotosa (west)
REACH: Reach-3            RS: 4.664

INPUT
Description:
Station Elevation Data     num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9769.33  745.31 9785.02  745.13 9791.02744.5765  9809.3  742.89 9834.65   740.7
 9917.36     738 9961.88  736.53 9984.75  736.8610042.42  737.9410117.75  737.84
 10173.7   737.710211.56  741.6210240.77744.491910246.04  745.0110255.97  744.97
10285.94  744.4410338.79   744.310369.94  744.1310415.31  743.6410473.15  743.89
10494.29  743.7510538.71   743.710553.85  743.6610579.86  743.8410587.76  743.83
10650.59  744.0410693.63   744.810724.34  744.7310760.76  744.5710770.32  744.62
10804.32  737.2810891.64     73811128.98  745.2911134.26     74611210.16  746.97

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9769.33    .035 9791.02    .06510240.77    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9791.0210240.77               420  512.16     440              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        T

CROSS SECTION          RIVER: Quilotosa (west)
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REACH: Reach-3 RS: 4.567

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8256.67	740.9	8449.61	739.59	8482.92	739.87	8493.7	739.92	8596.02	739.66
8645.83	739.8	8659.1	739.61	8782.36	741.21	8852.75	741.46	9038.85	741.99
9045.02	742	9058.57	742.23	9268.38	742.62	9287.55	742.57	9504.78	743.13
9670.16	743.6	9719.89	741.37	9745.19	739.61	9825.97	734.09	9902.31	734.38
9915.99	734.4	9925.64	734.43	9999.97	734.161	0048.56	733.97	10106.24	734.19
10154.46	734.3	10320.3	734.25	10374.82	734.34	10563	735.27	10571.67	735.33
10757.23	740.71	0818.75	743.12	10850.05	743.48	10995	743.51	1034.82	744.18
11076.7	744.41	1088.94	744.71	11109.76	745.54	11144.98	744.25	11167.99	744.66
11212.15	74	511363.22	744.02	11428.65	743.51	11521.09	743.82	11567.41	744.02

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8256.67	.035	9670.16	.065	10818.75	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9670.16	10818.75	400	475.2	375	.1	.3

Ineffective Flow num= 3

Sta L	Sta R	Elev	Permanent
888	F		
888	F		
888	F		

CROSS SECTION RIVER: Quilotosa (west)
REACH: Reach-3 RS: 4.477

INPUT
Description:
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8067.81	739.9	8103.99	739.07	8118.87	738.55	8147.4	738.39	8215.52	738.37
8247.56	738.5	8298.74	738.6	8340.2	738.38	8390.13	739.08	8492.69	740.96
8513.27	740.8	8525.97	740.78	8563.25	740.98	8609.26	741.13	8621.98	741.3
8655.93	741.3	8712.22	741.16	8748.79	741.82	8774.8	741.31	8799.99	742.64
8810.05	742.8	8836.9	742.51	8848.9	742.03	8862.46	741.07	8875.33	740.57
8904.19	740.9	8949.66	740.38	8955.75	740.85	8984.34	742.22	8998.94	743.02
9012.1	742	9029.77	741.08	9038.47	741.16	9068.1	741.13	9100.54	741.19
9174.52	743.1	9217.44	743.3	9329.76	742.79	9353.67	742	9390.46	742.11
9458.3	741.4	9485.14	741.5	9568.49	741.55	9602.74	743.07	9665.53	743.23
9810.49	743.9	9824.18	743.9	9888.82	744.84	9913.78	745.1	9934.12	745.31
9950.9	744.9	9983.43	743.91	0029.01	743.7	10101.3	742.78	10129.36	742.64
10165.23	742.61	0218.82	742.51	0244.86	742.57	10279.22	742.55	10303.29	742.57
10324.01	741.91	0360.22	741.25	10370.09	740.82	10405.67	740.61	10454.84	739.61
10464.4	739.71	0491.14	739.24	10504.64	739.31	10531.51	740.31	0553.45	742.57
10588.84	742.71	0661.55	743.35	10682.92	743.31	10690.06	743.36	10709.89	743.27
10762.87	743.21	0871.23	742.89	10939.01	742.83	10957.54	742.98	10969.98	743.97
10980.64	744.61	1018.06	742.69	11060.64	743.17	11081.78	743.35	11102.64	743.26
11166	743.11	1292.34	742.61	11502.9	742.57	11577.88	742.65	11713.46	742.36
11805.67	741.91	1908.91	741.72						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8067.81	.035	9983.43	.065	10244.86	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9983.43	10244.86	200	332.64	350	.3	.5

Ineffective Flow num= 3

Sta L	Sta R	Elev	Permanent
888	F		
888	F		
888	F		

SUMMARY OF MANNING'S N VALUES

River:Quilotosa

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7
Reach-1	6.084	.035	.05	.03				
Reach-1	5.993	.035	.05	.03				
Reach-1	5.907	.035	.05	.03				
Reach-1	5.841	.035	.05	.03				
Reach-1	5.749	.035	.05	.03				
Reach-1	5.663	.035	.05	.03				
Reach-1	5.569	.035	.05	.03				
Reach-1	5.480	.035	.05	.03				
Reach-4	4.414	.024	.018	.024				
Reach-4	4.399	.024	.018	.024				
Reach-4	4.386	.03	.04	.035				
Reach-4	4.290	.03	.04	.035				
Reach-4	4.201	.03	.04	.035				
Reach-4	4.109	.03	.04	.035				
Reach-4	4.013	.03	.04	.035				
Reach-4	3.921	.03	.04	.03	.042	.034		
Reach-4	3.895	Mult Open						
Reach-4	3.892	.03	.04	.03	.042	.034		
Reach-4	3.874	.03	.04	.03	.042	.034		
Reach-4	3.870	Mult Open						
Reach-4	3.793	.03	.04	.03	.042	.034		
Reach-4	3.776	.03	.04	.03	.042	.032	.042	.034

River:Quilotosa (east

Reach	River Sta.	n1	n2	n3
Reach-2	5.372	.035	.04	.035
Reach-2	5.269	.035	.04	.035
Reach-2	5.186	.035	.04	.035
Reach-2	5.099	.035	.04	.035
Reach-2	4.980	.035	.04	.035
Reach-2	4.870	.035	.04	.035
Reach-2	4.770	.035	.04	.035
Reach-2	4.673	.035	.04	.035

River:Quilotosa (west)

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7
Reach-3	5.379	.035	.05	.03				
Reach-3	5.289	.035	.05	.03				
Reach-3	5.203	.035	.05	.035	.052	.031	.052	.031
Reach-3	5.114	.035	.065	.035				
Reach-3	5.025	.035	.065	.035				
Reach-3	4.936	.035	.065	.035				
Reach-3	4.846	.035	.065	.035				
Reach-3	4.755	.035	.065	.035				
Reach-3	4.664	.035	.065	.035				
Reach-3	4.567	.035	.065	.035				
Reach-3	4.477	.035	.065	.035				

SUMMARY OF REACH LENGTHS

River: Quilotosa

Reach	River Sta.	Left	Channel	Right

Reach-1	6.084	480	480.48	475
Reach-1	5.993	450	454.08	450
Reach-1	5.907	350	348.48	370
Reach-1	5.841	480	485.76	480
Reach-1	5.749	460	454.08	460
Reach-1	5.663	500	496.32	480
Reach-1	5.569	470.49	469.92	470.49
Reach-1	5.480	550	533.28	500
Reach-4	4.414	80	79.2	80
Reach-4	4.399	120	68.64	120
Reach-4	4.386	516	506.88	450
Reach-4	4.290	447	469.92	438
Reach-4	4.201	500	485.76	490
Reach-4	4.109	520	506.88	500
Reach-4	4.013	600	485.76	425
Reach-4	3.921	170	153.12	170
Reach-4	3.895	Mult Open		
Reach-4	3.892	100	95.04	100
Reach-4	3.874	425	427.68	425
Reach-4	3.870	Mult Open		
Reach-4	3.793	90	89.76	90
Reach-4	3.776	0	0	0

River: Quilotosa (east

Reach	River Sta.	Left	Channel	Right
Reach-2	5.372	530	547.93	520
Reach-2	5.269	410	437.2	440
Reach-2	5.186	420	458.54	490
Reach-2	5.099	550	627.95	610
Reach-2	4.980	600	581.42	630
Reach-2	4.870	560	529.78	550
Reach-2	4.770	450	508.59	460
Reach-2	4.673	530	583.11	620

River: Quilotosa (west)

Reach	River Sta.	Left	Channel	Right
Reach-3	5.379	400	475.2	550
Reach-3	5.289	520	454.08	400
Reach-3	5.203	300	469.92	275
Reach-3	5.114	450	469.92	350
Reach-3	5.025	475	469.92	420
Reach-3	4.936	460	475.2	400
Reach-3	4.846	450	480.48	410
Reach-3	4.755	480.3	480.48	420
Reach-3	4.664	420	512.16	440
Reach-3	4.567	400	475.2	375
Reach-3	4.477	200	332.64	350

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Quilotosa

Reach	River Sta.	Contr.	Expan.
Reach-1	6.084	.1	.3
Reach-1	5.993	.1	.3
Reach-1	5.907	.1	.3
Reach-1	5.841	.1	.3
Reach-1	5.749	.1	.3
Reach-1	5.663	.1	.3
Reach-1	5.569	.1	.3
Reach-1	5.480	.1	.3

Reach-4	4.414	.3	.5
Reach-4	4.399	.3	.5
Reach-4	4.386	.3	.5
Reach-4	4.290	.1	.3
Reach-4	4.201	.1	.3
Reach-4	4.109	.1	.3
Reach-4	4.013	.1	.3
Reach-4	3.921	.3	.5
Reach-4	3.895	Mult Open	
Reach-4	3.892	.3	.5
Reach-4	3.874	.3	.5
Reach-4	3.870	Mult Open	
Reach-4	3.793	.3	.5
Reach-4	3.776	.1	.3

River: Quilotosa (east

Reach	River Sta.	Contr.	Expan.
Reach-2	5.372	.1	.3
Reach-2	5.269	.1	.3
Reach-2	5.186	.1	.3
Reach-2	5.099	.1	.3
Reach-2	4.980	.1	.3
Reach-2	4.870	.1	.3
Reach-2	4.770	.1	.3
Reach-2	4.673	.1	.3

River: Quilotosa (west)

Reach	River Sta.	Contr.	Expan.
Reach-3	5.379	.1	.3
Reach-3	5.289	.1	.3
Reach-3	5.203	.1	.3
Reach-3	5.114	.1	.3
Reach-3	5.025	.1	.3
Reach-3	4.936	.1	.3
Reach-3	4.846	.1	.3
Reach-3	4.755	.1	.3
Reach-3	4.664	.1	.3
Reach-3	4.567	.1	.3
Reach-3	4.477	.3	.5

HEC-RAS Plan: Imported Fla

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Quilotosa (west)	Reach-3	5.379	PF 1	4450.00	758.99	762.11	762.11	762.77	0.019182	5.12	699.87	1406.15	0.77
Quilotosa (west)	Reach-3	5.379	PF 2	4450.00	758.99	762.63	762.23	763.04	0.009470	4.24	877.19	545.11	0.56
Quilotosa (west)	Reach-3	5.289	PF 1	4450.00	755.46	758.49		758.70	0.003269	1.76	1220.62	751.01	0.30
Quilotosa (west)	Reach-3	5.289	PF 2	4450.00	755.46	759.41		759.68	0.006809	3.81	1072.95	815.86	0.48
Quilotosa (west)	Reach-3	5.203	PF 1	4450.00	752.16	757.04	756.06	757.19	0.002590	2.65	1433.77	1367.13	0.30
Quilotosa (west)	Reach-3	5.203	PF 2	4450.00	752.16	757.38	756.38	757.57	0.002705	2.95	1293.75	610.00	0.31
Quilotosa (west)	Reach-3	5.114	PF 1	4450.00	747.40	755.14		755.48	0.010770	5.04	985.94	707.45	0.50
Quilotosa (west)	Reach-3	5.114	PF 2	4450.00	748.50	755.65		756.04	0.008198	4.76	894.16	400.00	0.44
Quilotosa (west)	Reach-3	5.025	PF 1	4450.00	744.88	754.94	753.13	754.98	0.000351	1.43	2687.66	1303.92	0.10
Quilotosa (west)	Reach-3	5.025	PF 2	4450.00	744.86	755.32	753.15	755.39	0.000541	1.65	2083.57	500.00	0.12
Quilotosa (west)	Reach-3	4.936	PF 1	4450.00	744.60	753.88	753.40	754.48	0.011599	7.38	784.99	1253.77	0.56
Quilotosa (west)	Reach-3	4.936	PF 2	4450.00	744.60	754.34	753.40	754.77	0.007020	6.08	883.69	469.12	0.44
Quilotosa (west)	Reach-3	4.846	PF 1	4450.00	741.85	748.20	747.82	748.92	0.013959	5.95	666.38	310.53	0.58
Quilotosa (west)	Reach-3	4.846	PF 2	4450.00	741.85	748.81	748.36	750.10	0.016844	7.28	524.26	144.23	0.65
Quilotosa (west)	Reach-3	4.755	PF 1	4450.00	739.03	747.00	745.01	747.06	0.001624	1.84	2415.83	893.41	0.19
Quilotosa (west)	Reach-3	4.755	PF 2	4450.00	739.64	747.36	745.28	747.45	0.002311	2.42	1835.82	550.00	0.23
Quilotosa (west)	Reach-3	4.664	PF 1	4450.00	736.53	744.52	744.52	744.95	0.037479	4.33	873.33	1179.33	0.78
Quilotosa (west)	Reach-3	4.664	PF 2	4450.00	736.53	745.07		745.33	0.012351	3.37	1136.40	800.00	0.48
Quilotosa (west)	Reach-3	4.567	PF 1	4450.00	733.97	744.45	740.03	744.46	0.000022	0.44	10526.38	3109.96	0.03
Quilotosa (west)	Reach-3	4.567	PF 2	4450.00	733.97	745.20	740.02	745.20	0.000026	0.54	8197.29	800.00	0.03
Quilotosa (west)	Reach-3	4.477	PF 1	4450.00	742.50	744.41	742.50	744.43	0.000253	0.46	4194.76	3726.99	0.07
Quilotosa (west)	Reach-3	4.477	PF 2	4450.00	742.50	745.13	742.61	745.17	0.000341	0.70	2977.84	1124.55	0.08
Quilotosa (east	Reach-2	5.372	PF 1	3400.00	760.83	762.62		762.77	0.006309	4.27	1104.75	1278.63	0.57
Quilotosa (east	Reach-2	5.372	PF 2	3400.00	760.83	763.47		763.91	0.005392	5.15	641.58	275.00	0.56
Quilotosa (east	Reach-2	5.269	PF 1	3400.00	757.75	759.35	759.05	759.49	0.006066	3.81	1149.49	1375.76	0.55
Quilotosa (east	Reach-2	5.269	PF 2	3400.00	757.75	760.32		760.82	0.006261	5.40	604.91	270.00	0.60
Quilotosa (east	Reach-2	5.186	PF 1	3400.00	754.97	758.75	756.47	756.91	0.006186	4.11	1193.00	1717.98	0.56
Quilotosa (east	Reach-2	5.186	PF 2	3400.00	754.97	757.48		757.98	0.007066	5.60	602.21	285.00	0.64
Quilotosa (east	Reach-2	5.099	PF 1	3400.00	752.47	754.65		754.76	0.003724	3.74	1374.43	1536.06	0.45
Quilotosa (east	Reach-2	5.099	PF 2	3400.00	752.47	755.12		755.43	0.004241	4.55	760.61	350.00	0.50
Quilotosa (east	Reach-2	4.980	PF 1	3400.00	749.46	751.39	751.23	751.62	0.006330	5.06	957.35	1322.48	0.66
Quilotosa (east	Reach-2	4.980	PF 2	3400.00	749.46	752.04		752.46	0.005796	5.19	656.23	290.00	0.58
Quilotosa (east	Reach-2	4.870	PF 1	3400.00	746.24	748.52	748.09	748.62	0.003284	3.54	1522.52	1994.77	0.43
Quilotosa (east	Reach-2	4.870	PF 2	3400.00	746.24	749.52	748.69	749.80	0.003437	4.68	804.60	340.00	0.46
Quilotosa (east	Reach-2	4.770	PF 1	3400.00	743.13	744.98	744.98	745.30	0.014258	6.28	813.35	1206.97	0.85
Quilotosa (east	Reach-2	4.770	PF 2	3400.00	743.13	745.42	745.42	746.25	0.016200	7.81	466.61	280.00	0.94
Quilotosa (east	Reach-2	4.673	PF 1	3400.00	740.00	744.41		744.42	0.000100	0.98	5275.78	3020.20	0.08
Quilotosa (east	Reach-2	4.673	PF 2	3400.00	740.00	745.13		745.16	0.000176	1.45	2559.13	690.00	0.11
Quilotosa	Reach-1	6.084	PF 1	7850.00	780.61	782.88	782.63	783.23	0.006744	2.67	1681.29	1383.78	0.44
Quilotosa	Reach-1	6.084	PF 2	7850.00	780.61	783.74	783.45	784.25	0.006898	3.88	1375.47	973.71	0.47
Quilotosa	Reach-1	5.993	PF 1	7850.00	778.00	780.70	780.20	780.86	0.003683	2.25	2470.11	2267.11	0.33
Quilotosa	Reach-1	5.993	PF 2	7850.00	778.00	781.59	781.03	781.85	0.003640	3.11	1941.30	1196.50	0.35
Quilotosa	Reach-1	5.907	PF 1	7850.00	776.09	777.60	777.60	778.09	0.011945	2.66	1409.85	1441.34	0.54
Quilotosa	Reach-1	5.907	PF 2	7850.00	776.09	778.59	778.59	779.29	0.009631	4.04	1179.42	860.20	0.55
Quilotosa	Reach-1	5.841	PF 1	7850.00	775.01	776.19	775.34	776.32	0.002000	0.93	2673.46	1827.68	0.21
Quilotosa	Reach-1	5.841	PF 2	7850.00	775.01	776.68	775.81	776.96	0.002781	1.48	1860.53	1006.53	0.26
Quilotosa	Reach-1	5.749	PF 1	7850.00	772.29	774.24	774.08	774.55	0.008686	3.33	1756.32	1778.57	0.51
Quilotosa	Reach-1	5.749	PF 2	7850.00	772.29	774.82	774.48	775.14	0.005363	3.34	1752.42	1216.50	0.43
Quilotosa	Reach-1	5.663	PF 1	7850.00	769.72	771.65		771.83	0.004091	1.84	2057.14	1553.34	0.33
Quilotosa	Reach-1	5.663	PF 2	7850.00	769.72	772.32	771.92	772.71	0.005187	2.94	1580.25	951.23	0.39
Quilotosa	Reach-1	5.569	PF 1	7850.00	765.82	768.72	768.57	769.09	0.008790	3.87	1625.68	1523.95	0.53
Quilotosa	Reach-1	5.569	PF 2	7850.00	765.82	769.11	768.94	769.57	0.008450	4.36	1452.06	1086.65	0.53
Quilotosa	Reach-1	5.480	PF 1	7850.00	763.52	766.07	765.70	766.26	0.004223	2.55	2217.38	1907.74	0.36
Quilotosa	Reach-1	5.480	PF 2	7850.00	763.52	766.18	765.86	766.44	0.005198	2.97	1952.54	1608.46	0.41
Quilotosa	Reach-4	4.414	PF 1	9170.00	732.46	744.03		744.26	0.000341	5.97	4594.37	3671.77	0.36
Quilotosa	Reach-4	4.414	PF 2	9170.00	732.46	744.61		744.96	0.000390	6.67	3433.37	1700.00	0.39

HEC-RAS Plan: Imported Pla (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Quilotosa	Reach-4	4.399	PF 1	9170.00	732.46	743.73	743.73	744.18	0.000577	7.57	3677.32	3651.89	0.47
Quilotosa	Reach-4	4.399	PF 2	9170.00	732.46	744.16	744.16	744.83	0.000681	8.52	2680.67	1671.54	0.52
Quilotosa	Reach-4	4.386	PF 1	9170.00	733.09	737.69	737.64	738.20	0.007484	6.86	1835.83	1680.40	0.68
Quilotosa	Reach-4	4.386	PF 2	9170.00	733.09	738.26		738.75	0.005043	6.30	1735.69	808.42	0.58
Quilotosa	Reach-4	4.290	PF 1	9170.00	727.20	734.45	734.45	734.97	0.005552	7.69	1979.64	1992.15	0.63
Quilotosa	Reach-4	4.290	PF 2	9170.00	727.20	734.97		735.61	0.006508	8.93	1483.31	845.63	0.69
Quilotosa	Reach-4	4.201	PF 1	9170.00	724.32	731.91	731.91	732.34	0.004560	7.18	2375.33	2288.65	0.57
Quilotosa	Reach-4	4.201	PF 2	9170.00	724.32	732.46	732.46	733.13	0.005101	8.12	1700.25	980.00	0.62
Quilotosa	Reach-4	4.109	PF 1	9170.00	721.02	728.32	728.32	728.79	0.005325	7.54	2177.34	2202.16	0.61
Quilotosa	Reach-4	4.109	PF 2	9170.00	721.02	728.88	728.88	729.72	0.006404	8.92	1479.45	817.52	0.69
Quilotosa	Reach-4	4.013	PF 1	9170.00	717.20	726.38		726.45	0.000670	3.22	4847.65	2790.26	0.23
Quilotosa	Reach-4	4.013	PF 2	9170.00	717.20	726.48		726.83	0.002048	5.70	2101.46	700.00	0.40
Quilotosa	Reach-4	3.921	PF 1	15200.00	713.10	726.37	722.32	726.39	0.000046	0.87	19060.86	4787.49	0.07
Quilotosa	Reach-4	3.921	PF 2	15200.00	713.10	726.62	722.32	726.64	0.000085	1.22	12498.80	2400.00	0.09
Quilotosa	Reach-4	3.895		Mult Open									
Quilotosa	Reach-4	3.892	PF 1	15200.00	710.83	723.11		723.14	0.000206	1.51	11336.60	4350.96	0.15
Quilotosa	Reach-4	3.892	PF 2	15200.00	710.83	723.17		723.23	0.000371	2.04	7489.14	2360.00	0.20
Quilotosa	Reach-4	3.874	PF 1	15200.00	709.88	723.10	720.74	723.12	0.000150	1.35	12633.28	4557.69	0.13
Quilotosa	Reach-4	3.874	PF 2	15200.00	709.88	723.14	719.54	723.20	0.000305	1.94	7839.08	2330.00	0.19
Quilotosa	Reach-4	3.870		Mult Open									
Quilotosa	Reach-4	3.793	PF 1	15200.00	708.50	717.95		718.10	0.001416	3.17	5066.81	1916.29	0.30
Quilotosa	Reach-4	3.793	PF 2	15200.00	708.50	718.62		718.74	0.000968	2.79	5445.00	1416.64	0.25
Quilotosa	Reach-4	3.776	PF 1	15200.00	709.07	717.21	717.21	717.72	0.008691	6.18	2608.92	2567.41	0.91
Quilotosa	Reach-4	3.776	PF 2	15200.00	709.07	718.21	717.38	718.53	0.003303	4.53	3375.39	1517.92	0.53

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
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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
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PROJECT DATA
Project Title: Unnamed No 6 (West Quilotosa Wash)
Project File : WQuilotosa.prj
Run Date and Time: 1/22/02 8:44:30 AM

Project in English units

Project Description:
Study Name: Gila Bend Area Drainage Master Plan

Study Contractors:
Engineering and Environmental Consultants, Inc. and Premier Engineering Corporation

Source of Hydrology: Gila Bend Area Floodplain Delineation Study (FCD 90-67) by Bburgess & Niple for FCDMC, March 1991

Source of Survey: Gila Bend Area Floodplain Delineation Study (FCD 90-67); new topographic mapping and survey by Cooper Aerial Mapping, Inc. 1999.

FCD
Contract number FCD 99-18
Datum: NGVD 1929

PLAN DATA

Plan Title: West Quilotosa Wash, FW Meth 1
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\West Quilotosa Wash\WQuilotosa.p06

Geometry Title: West Quilotosa Wash
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\West Quilotosa Wash\WQuilotosa.g03

Flow Title : West Quilotosa Wash, FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\West Quilotosa Wash\WQuilotosa.f02

Plan Summary Information:

Number of:	Cross Sections	= 27	Mulitple Openings	=	2
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 0			

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 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 = West Quilotosa Reach = Reach-1

RS	Profile	Method	Value1	Value2
2.155	PF 2	1	9500	10525
2.058	PF 2	1	9360	10550
1.969	PF 2	1	9350	10400
1.873	PF 2	1	9350	10450
1.772	PF 2	1	9600	10450
1.675	PF 2	1	9730	10625
1.593	PF 2	1	9500	10600
1.515	PF 2	1	9200	10400
1.449	PF 2	1	9200	10450
1.371	PF 2	1	9300	10650
1.293	PF 2	1	9260	10740
1.202	PF 2	1	9260	10740
1.107	PF 2	1	9245	10755
1.018	PF 2	1	9245	10755
0.926	PF 2	1	9260	10740
0.890	PF 2	1	9310	10690
0.879	PF 2	1	9400	10600
0.832	PF 2	1	9700	10400
0.742	PF 2	1	9808.33	10350
.654	PF 2	1	9785.97	10300
.563	PF 2	1	9700	10300
0.475	PF 2	1	9650	10350
0.387	PF 2	1	9800	12250
0.358	PF 2	1		
0.355	PF 2	1	9840	12210
0.337	PF 2	1	9850	12190
0.333	PF 2	1		
0.256	PF 2	1	9800	12150
0.239	PF 2	1	9800	11880

FLOW DATA

Flow Title: West Quilotosa Wash, FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\West Quilotosa Wash\WQuilotosa.f02

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
West Quilotosa	Reach-1	2.155	10700	10700
West Quilotosa	Reach-1	0.879	10600	10600
West Quilotosa	Reach-1	0.387	15200	15200

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
West Quilotosa	Reach-1	PF 1	Normal S = .0054	Known WS = 0
West Quilotosa	Reach-1	PF 2	Normal S = .0054	Known WS = 718.21

GEOMETRY DATA

Geometry Title: West Quilotosa Wash
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\West Quilotosa Wash\WQuilotosa.g03

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 2.155

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9045.51	777.17	9091.66	778.55	9113.67	778.46	9134.67	778.1	9139.09	778.17
9157.45	778.01	9186.21	777.09	9225.62	775.61	9275.37	776.3	9280.59	776.21

9284.79	775.75	9319.85	774.3	9425.81	770.04	9444.13	770.1	9458.63	770.18
9487.93	769.98	9625.28	770.08	9690.61	770.42	9799.35	771	9893.29	770.86
9945.43	770.74	9970.34	770.88	9986.64	768.37	10000	768.61	0005.03	768.7
10025.66	769.99	10041.84	770.09	10129.14	770.53	10279.38	773.21	0305.98	773.14
10466.65	773.11	10482.34	772.98	10505.46	772.86	10582.62	772.91	0646.44	773
[illegible]65.63	772.98	10718.7	772.66	10744.69	772.95	10776.99	773	10794.51	770.68
[illegible]7.45	771.86	10818.2	772.61	0846.11	772.48	10860	772.51	0912.36	772.54
10972.58	772.61	10989.68	771.17	11007.75	771.46	11071.67	772.31	1099.82	772.71
11112.29	772.83	11164.01	772.68	11228.84	772.11	1288.57	771.41	1298.99	773.08
11324.45	773.05	11339.33	773.32	11521.07	776.74	11529.51	777.31	1642.06	775.47

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9045.51	.03	9799.35	.05	10129.14	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9799.35	10129.14	475	512.16	520	.1	.3

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 2.058

INPUT
Description:
Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9163.87	773.99	9232.75	772.76	9246.99	772.9	9318.45	770	9380.63	767.55
9391.86	767.36	9528.89	767.27	9577.82	767.4	9614.77	767.13	9659.06	767.38
9817.44	768.64	9854.73	768.58	9901.66	768.2	9922.22	767.66	9949.59	768.61
9968.78	768.99	9982.88	766.6	10000	765.31	10002.96	765.18	10006.45	765.86
10014.07	766.75	10024.02	768.13	10138.21	768.51	10193.86	768.59	10214.5	768.98
10232.86	769.88	10263.18	769.91	10284.66	769.71	10316.46	769.85	10373.71	769.87
10434.49	769.56	10497.16	769.61	0641.47	769.51	0653.73	769.55	10732.4	769.33
10852.98	769.18	10876.89	769.23	10891.39	767	10899.17	766.74	10915.91	767.11
11055.41	769.22	11150.9	768.63	11262.39	767.81	1314.93	767.02	11351.44	766.19
11371.44	766.02	11385.34	767.54	11457.79	767.31	1486.98	767.52	11500.78	767.78
11621.51	770.15	11700.41	768.13	11752.43	766.81	1787.54	767.19	11939.44	769.38
11945.03	769.35	11977.9	769.67	11995.42	770.61	1999.64	770.74	12032.6	771.24
12045.66	771.98	12065.13	772.76	12085.68	772.91	2107.31	772.25	12137.2	775.92
12144.49	777.13	12150.65	777.32	12154.86	777.81	2178.53	780.01	12187.85	780.13
[illegible]9.14	779.95	12222.71	779.77						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9163.87	.03	9949.59	.05	10138.21	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9949.59	10138.21	420	469.92	520	.1	.3

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 1.969

INPUT
Description:
Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9306.51	767.42	9329.67	766.1	9368.7	763.19	9483.31	763.8	9537.17	764.13
9609.53	764.75	9743.96	764.7	9827.68	765.59	9957.72	764.88	9971.84	764.29
9975.39	764	9995.03	763.2	10000	763.66	10017.89	765.19	10046.31	765.31
10160.14	764.79	10191.65	764.65	10352.6	764.95	10370.33	765.61	10437.14	766
10545.5	765.87	10580.53	766.2	10741.3	766.73	10799	766.36	10890.93	766.35
10944.36	766.88	10958.74	764.61	0988.61	765.29	11038.45	765.79	11162	766.02
11190.05	765.47	11207.39	765.51	11313.58	763.43	11365.86	762.16	11389.25	763.01
11412.64	762.53	11419.11	763.11	11426.73	764.09	11533.21	764.22	11552.18	764.26
11561.37	764.06	11606.61	763.31	11621.63	763.15	11676.37	762.31	11698.12	762.49
11773.07	763.23	11804.56	763.51	11812.13	763.48	11841.69	763.04	12003.53	765.06
12056.21	765.81	12074.09	766	12078.26	765.99	12108.89	766.59	12149.41	767.75
12171.49	768.28	12208.55	770.81	12213.45	770.99	12226.72	771.84	12264.03	773.73
12311.42	775.37	12322.23	774.41	2329.19	774.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9306.51	.03	9827.68	.05	10046.31	.03

[illegible]k Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9827.68	10046.31	450	506.88	425	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888			F

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 1.873

INPUT
Description:
Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8171.89	765.9	8253.68	765.34	8270.72	765.04	8308.48	765.29	8523.01	765.14
8548.42	765.5	8634.49	764.99	8673.23	764.58	8737.55	764.33	8778.33	764.23
8952.08	764	9031.72	764.31	9105.4	764.09	9157.18	763.95	9166.4	764.19
9183.09	763.5	9204.89	762.54	9211.66	762.34	9274.84	762.35	9315.12	762.31
9334.7	762.2	9381.14	761.85	9492.34	761.62	9595.67	761.66	9678.96	761.98
9719.08	762.1	9785.54	761.67	9814.14	761.61	9852.48	761.79	9930.04	762.21
9945.45	761	9976	761.97	9989.61	761.48	10003.26	760.66	10008.47	760.38
10011.13	760.5	10038.43	762.21	10121.39	762.46	10287.23	762.84	10433.54	761.58
10550.61	762.6	10635	763.44	10707.96	763.42	10843.31	763.55	10927.03	763.6
11048.2	763.4	11146.11	764.29	11184.04	764.33	11217.27	764.46	11230.64	764.42
11248.92	762.8	11273.1	761.6	11316.03	762.43	11337.04	762.44	11349.83	762.61
11369.3	762.5	11377.81	762.61	11447.92	762.23	11466.32	762.11	11578.53	761.99
11602.81	761.6	11622.05	761.33	11636.84	761.85	11651.37	761.7	11697.44	761.47
11867.74	760.3	11963.34	760.93	12072.63	761.71	12258.28	765.2	12277.35	765.52
12280.7	765.4	12298.23	765.41	12315.53	766.08	12342.54	766.17	12350.7	765.67
12395.04	766.7	12420.46	767.51	12453.78	768.61	12476.51	770	12523.31	771.59
12531.04	771.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8171.89	.03	9930.04	.05	10038.43	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9930.04	10038.43	550	533.28	420	.1	.3

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 1.772

INPUT
Description:
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8172.32	765.3	8179.39	765.3	8208.53	765.07	8218.91	764.82	8290.47	764.53
8404.92	763.6	8443.4	763.63	8490.44	762.65	8528.92	761.97	8611.52	761.62
8720.87	760.9	8816.84	760.44	8940.91	760.78	9022.8	761.03	9158.1	760.25
9228.76	759.9	9271.53	759.98	9434.72	760.04	9439.32	760.1	9488.39	760.37
9505.94	760.7	9541.63	759.48	9561.53	759.33	9565.3	759.18	9647.98	759.29
9661.19	758.3	9675.75	760.09	9843.54	759.11	9861.61	759.09	9983.66	759.64
10000	757.9	10009.12	756.98	10023.86	759.7	10041.13	759.53	10154.99	759.47
10253.45	759.3	10449.16	759.61	10460.04	759.61	10637.45	759.08	10657.25	759.08
10859.14	760	10992.26	760.93	11061.04	761.36	11151.85	761.56	11262.94	761.74
11464.83	761.3	11620.31	760.45	11666.73	760.22	11676.73	760.21	11858.73	759.74
11956.6	759.5	12062.64	759.37	12070.52	759.24	12272.42	760.13	12324.58	761.19
12444.94	763.1	12483.11	763.5	12511.43	763.86	12529.44	764.47	12532.28	764.47
12567.11	765.8	12575.97	765.88	12582.02	766.08	12624.21	768.45	12634.34	768.94

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8172.32	.03	9983.66	.05	10041.13	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9983.66	10041.13	560	512.16	400	.1	.3

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 1.675

INPUT
Description:
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8374.08	764	8400.36	763.55	8414.49	763.67	8476.59	763.47	8488.12	763.73
8500.83	763.7	8532.35	762.88	8560.02	762.74	8588.29	762.63	8610.16	762.18
8636.54	762.5	8655.21	762.21	8660.31	761.98	8708.53	760.08	8752.28	757.34
8795.89	757.6	8980.11	756.5	9004.61	756.46	9192.9	757.94	9196.05	757.93
9392.04	757.5	9396.13	757.51	9550.59	756.48	9598	756.55	9796.29	756.23
9974.9	756.7	9982.46	755.8	9991.71	754.46	10000.23	755.89	10006.65	756.91
10090.53	757	10189.82	756.68	10298.05	756.82	10396.79	756.73	10495.45	756.76
10610.21	756.8	10701.76	756.9	10797.21	757.06	10849.33	757.33	10997.41	757.87
11132.55	759.2	11197.63	759.55	11268.94	759.7	11397.84	759.77	11446.66	759.6
11549.48	759.5	11598.04	759.26	11688.55	759	11798.25	758.36	11831.08	758.52

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11945.56   758.411998.46     75812108.16  757.8912198.67  757.7112217.94  758.01
12302.66   758.512398.88  759.2812486.58  761.12 12501.7  761.1912512.42  761.55
12521.78   761.712561.23  763.1612609.68  764.1212644.09  764.5812654.19   764.5
12679.46   764.412692.62  764.56 12703.5  764.2712725.13  766.5112727.03  766.64
 12744.6     76712777.29  767.3412814.86  768.1812840.91   769.5 12849.2  770.01
 12888.87   772.2

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8374.08     .03  9974.9    .05510006.65     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9974.910006.65              360  432.96     340             .1       .3

CROSS SECTION           RIVER: West Quilotosa
REACH: Reach-1             RS: 1.593

INPUT
Description:
Station Elevation Data     num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8182.29   761.3 8234.79  762.34 8257.34  761.88 8292.29  761.38 8321.09  760.85
 8340.92   760.6 8368.88  759.68 8397.04  760.21 8418.86  759.79 8485.23  759.57
 8523.99   760.3    8553  760.73 8559.88  761.47 8568.43  761.47  8581.7  760.89
  8632.7   758.3 8703.23  755.94 8722.16  755.94 8842.22  755.22  8902.4  755.12
 9010.92   754.8 9043.13  754.73 9118.11  754.96 9244.04  755.13  9301.5  754.84
 9444.95   754.7 9618.69  755.59 9645.86  755.61 9693.85  755.76 9738.63  755.77
 9809.06   755.7    9828  754.78 9829.54  754.82 9847.72  755.34 9850.87   755.3
10051.61   755.510246.71  754.9110646.73  755.3610653.81  755.4110819.63  756.31
10841.74   756.710846.05  756.8510850.52   758.211023.34  757.7411046.74  757.71
11054.69   757.811238.98  757.9811253.15  757.9411446.76  757.5911455.06  757.55
11646.77   757.211834.91  757.0111854.87   756.712037.03  756.4512058.12  756.52
12140.87   756.912249.58  758.1812260.82  758.4812278.93  759.0512306.07  760.82
12316.42   761.1 12329.3  761.2612347.44  761.0512370.28  760.6912381.68  760.43
 12420.4     76112465.41  761.7112510.47  762.7912520.58  762.9512554.09   764.2

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8182.29     .03  9809.06    .05510051.61     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9809.0610051.61             370  411.84     360             .1       .3

CROSS SECTION           RIVER: West Quilotosa
REACH: Reach-1             RS: 1.515

INPUT
Description:
Station Elevation Data     num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 7933.16   761.5 7959.56  761.43 7977.36   761.6 7996.95  761.53 8014.63  761.34
  8048.8   760.7 8076.07  759.92 8120.42  759.17 8169.09  759.02 8176.58  758.92
 8248.28   757.5 8296.87  756.71 8316.25  756.52 8363.82   755.5 8394.25  754.99
 8504.32   754.5 8547.14  754.28 8568.35  754.15 8583.54  754.16 8800.29  753.19
 8963.31   752.8 9103.97  752.58 9169.33  752.57 9220.89  752.81 9369.66  754.05
 9409.39   754.4 9539.67  754.44 9569.98  753.99 9770.31  754.13 9855.76     754
 9957.53   753.6 9970.63  753.4110020.46  753.3910085.33  753.3710156.08  753.22
10221.77   753.810258.95  754.3310276.28  754.6710298.81  755.0410341.08  755.83
10393.66   755.710421.86  755.3810451.29  755.3810541.16  755.1310571.59  754.59
10639.64   755.110771.92  755.3110829.23  755.1910972.24  755.2511132.43  755.56
11172.56   755.711344.78  755.5311372.88  755.3911397.96   755.4 11573.2   755.3
11587.54  754.9711773.52  754.7511778.37   754.611835.61  754.25 11860.7  755.44
11945.57  755.3111964.82  756.2711973.84   756.412011.24  757.6612185.28  758.59
12250.72  757.6812292.29   758.812338.25   760.9   12363  762.4112382.12  763.17
12398.52  764.09

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 7933.16     .03  9539.67    .05510258.95     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9539.6710258.95             300  348.48     340             .1       .3

CROSS SECTION           RIVER: West Quilotosa
REACH: Reach-1             RS: 1.449

INPUT
Description:
```

Station Elevation Data num= 82

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7817.51	759.8	7922.61	758.23	7968.15	757.78	8011.93	757.97	8027.57	757.99
8047.26	757.8	8070.97	757.53	8125.5	757.18	8145.08	757.62	8182.46	756.88
8199.28	756.9	8259.26	756.31	8274.23	756.36	8293.44	756.25	8323.37	756.28
8343.23	756.1	8365.11	755.2	8410.44	754.12	8417.86	753.97	8437.72	753.35
8485.62	753.3	8504.09	753.22	8573.95	752.72	8680.85	752.71	8774.99	752.4
8890.56	752.3	8976.03	751.81	9045.67	751.81	9177.07	752.44	9338.38	752.53
9378.11	752.7	9396.93	752.85	9573.17	752.57	9579.15	752.48	9727.46	752.24
9780.19	752.1	9798.44	752.06	9983.11	751.76	10003.75	751.03	10032.6	752.35
10088.04	751.81	10163.38	751.33	10174.86	751.73	10215.17	752.03	10248.13	752.42
10259.77	752.51	10316.64	752	10329.3	752.12	10372.1	752.99	10377.9	753.13
10433.38	753.11	10457.25	753.03	10487.96	753.01	10529.53	752.91	10583.71	752.76
10698.1	752.81	10783.98	752.84	10888.62	753	10984.24	752.72	11184.5	753.1
11301.22	753.51	11384.76	753.54	11435.44	753.86	11557.05	753.97	11585.02	753.73
11668.7	754.11	11760.96	754.18	11768.51	754.44	11798.3	754.69	11841.69	754.18
11857.09	754.11	11898.92	754.07	11911.12	752.91	11928.95	754.07	11938.96	753.83
11985.55	753.51	12029.07	754.33	12090.76	754.63	12185.81	754.66	12244.4	756.53
12248.52	756.61	12272.43	756.61						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7817.51	.04	9983.11	.055	10248.13	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9983.11	10248.13	380	411.84	440	.1	.3

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 1.371

INPUT
Description:
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8283.47	756.6	8291.82	756.63	8373.99	754.88	8396.98	753.91	8430.36	752.79
8479.99	750.9	8484.28	750.8	8553.2	750.88	8689.07	750.59	8800.83	750.42
8889.08	750.2	8955.28	750.3	9017.07	750.56	9048.03	750.24	9081.08	750.23
9289.09	750.8	9369.61	750.66	9446.02	750.7	9486.56	750.76	9489.14	750.76
9640.13	750.4	9693.41	750.32	9744.03	750.36	9897.98	750.24	10101.96	749.41
10235.75	749.81	10306.23	749.56	10413.67	749.45	10510.5	749.46	10579.17	750.39
10611.47	750.41	10651.86	750.55	10712.62	749.83	10765.09	749.92	10912.64	749.73
11065.38	750.11	11091.61	750.15	11219	750.64	11249.58	750.77	11277.54	750.82
11283.73	750.3	11303.2	749.07	11313.8	750.67	11324.42	749.72	11330.34	749.32
11350.52	751.41	11359.81	751.41	11425.39	751.12	11452.06	751.76	11470.24	751.84
11500.83	752.21	11506.54	752.16	11546.76	753.41	11562.39	754.39	11577.44	754.49
11583.77	754.11	11631.29	750.81	11666.71	750.31	11683.39	750.14	11701.61	749.53
11705.49	749.21	11729.97	751.67	11797.19	751.58	11848.35	751.58	11899.52	751.17
11932.3	751	12009.96	750.83	12033.07	750.72	12053.6	750.14	12064.04	751.12
12073.18	751.91	2088.76	751.61	12122.72	751.2	12124.8	751.03	12134.01	749.59
12140.21	750.11	2155.14	751.78	12178.37	750.86	12192.87	749.28	12195.98	750.13
12204.1	751.41	2254.43	751.81	2312.77	752.42	12456.06	754.05		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8283.47	.04	9897.98	.055	10235.75	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9897.98	10235.75	470	411.84	300	.1	.3

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 1.293

INPUT
Description:
Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8277.26	754.1	8286.87	754.01	8299.57	753.5	8391.16	752.33	8401.84	752.17
8413.45	751.8	8440.15	751.24	8510.62	749.49	8516.58	749.36	8556.32	748.89
8577.59	748.7	8596.64	748.67	8632.64	748.46	8794.71	747.8	8855.7	747.01
8864.7	747.1	8937.04	747.92	8997.45	748.29	9013.93	746.44	9177.72	748.09
9197.38	748.3	9390.37	748.58	9404.7	748.56	9597.44	748.24	9783.36	748.22
9824.57	748.1	9836.25	748.24	9963.65	748.36	9969.6	748.44	9977.34	747.57
9995.69	746.51	10003.38	744.86	10005.7	744.51	10012.68	745.91	10029.01	748.51
10134.99	748.61	10180.35	748.99	10186.45	749.01	10200.3	748.61	10288.34	748.61
10380.66	748.41	10400.54	748.25	10460.31	747.21	10546.15	747.77	10584.4	747.99
10597.5	748.21	10610.26	748.08	10792.01	747.66	10997.51	748.61	11179.42	747.82
11197.51	747.71	11379.41	748.27	11397.5	748.36	11407.04	748.86	11440.22	748.17
11458.37	748.1	11597.5	747.96	11779.39	749.1	11797.5	749.16	11816.86	749.47

11855.4	749.71	1937.51	750.44	1970.88	749.84	12012.17	749.21	12048.9	748.81		
12092	748.81	2183.77	748.88	12191.05	747.73	12197.21	746.91	12211.08	748.55		
12320.73	748.61	2358.92	748.76	12400.07	748.91	12403.91	749.13	12416.68	749.38		
12480.29	750.41	2587.16	750.61	2604.84	750.61	12702.68	751.34	12738.91	751.66		
12788.14	751.91	2823.64	752.88	12832.14	753.49	12861.37	754.41	12950.62	759.79		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8277.26	.04	9963.65	.055	10034.99	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9963.65	10034.99	475	480.48	450	.1	.3

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 1.202

INPUT
Description:
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8193.64	752.8	8241.42	752.13	8286.49	751.91	8367.76	750.26	8443.94	747.01
8495.68	746	8537.11	746.11	8569.93	746.11	8622.99	745.03	8696.59	743.55
8816.66	745.2	8861.32	744.87	8905.68	744.82	8967.88	745.45	8998.3	745.68
9113.39	745.9	9167.81	745.87	9250.15	745.74	9367.82	745.75	9482.91	746.01
9567.83	746.4	9632.48	745.89	9706.06	745.76	9767.85	745.87	9861.57	745.23
9880.47	745.1	9924.32	744.89	9937.12	744.73	9964.07	745.04	9992.74	745.31
10001.74	743.51	0007.73	742.08	10012.45	743.12	10021.61	745.48	10049.1	745.64
10219.29	746.91	0233.43	746.92	10290.76	745.82	10339.32	746.03	10367.93	745.92
10449.94	745.31	0567.97	745.56	10690.64	746.12	10768	746.13	10849.82	746.29
10964.21	745.61	1083.81	745.85	11168.08	745.51	11302.56	745.61	11368.11	745.63
11506.53	745.91	1568.15	746.05	11755.52	747.54	11768.19	747.32	11817.4	748.6
11845.19	749	11953.67	750.71	11987.41	749.75	12041.78	747.76	12178.51	748.26
12182.81	747.91	2192.31	746.37	12198.31	748.19	12278.06	747.92	12368.3	747.68
12477.74	748.31	2566.66	749.12	12578.19	749.31				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8193.64	.04	9964.07	.055	10049.1	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9964.07	10049.1	480	501.6	450	.1	.3

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 1.107

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8603.68	747.7	8610.8	747.41	8625.25	747.64	8780.87	742.15	8818.01	742.22
8992.31	742.7	9165.63	743.26	9219.13	743.23	9392.31	743.84	9564.51	743.36
9592.31	743.5	9763.96	743.07	9792.31	743.04	9810.59	742.84	9926.03	741.45
9927.11	741.4	9937.5	741.75	9992.57	743.36	9995.15	743.37	10002.42	742.43
10017.97	740.41	0021.62	741.26	10026.76	742.16	10065.22	742.31	10095.84	742.54
10192.61	743.41	0344.51	742.91	0392.92	742.96	10447.1	742.77	10593.24	742.79
10659.34	743	10793.56	744.04	10836.07	743.81	0863.47	744.89	10889.43	743.8
10922.88	743.81	0993.87	743.21	11103.15	742.96	11194.19	742.97	11296.06	743.01
11394.5	743.31	1444.36	743.66	11513.26	743.98	11564.01	744.11	11588.5	744.28
11597.57	744.31	1685.37	743.65	11718.83	743.33	11823.18	742.64	11960.01	743.21
11995.45	743.31	2145.03	744.83	12195.77	745.28	12241.11	745.37	12347.88	745.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8603.68	.04	9992.57	.055	10065.22	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9992.57	10065.22	450	469.92	490	.1	.3

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 1.018

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8602.56	743.9	8731.87	740.73	8899.98	741.14	8931.88	740.98	8985.05	741.25
8996.44	741.3	9131.88	741.28	9300.88	741.34	9331.88	741.11	9501.34	740.59
9531.88	740.7	9539.52	740.63	9707.44	740.47	9731.88	740.47	9902.25	740.67

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 9931.88   740.5 9966.78  741.05 9989.11  741.3410004.05  739.7210017.52  740.87
10036.16   740.610082.81  740.8610105.29  740.69 10131.9  740.7110307.28  740.39
10331.92   740.410531.95   740.410596.63  740.2110732.44  740.41 10735.3  740.32
10744.41   740.710896.62  740.34   10932  740.1510976.33  740.0911135.41  739.92
 11140.9   739.911164.22  739.8811223.05  742.0411257.32  743.2211314.56  744.73
 11323.2   743.311343.79  742.8711356.16  742.9511454.49  743.1411470.72  743.54
 11524.65  744.111532.93  744.0911727.72  739.6911741.15  739.74 11859.7  741.12
 11929.9   739.711932.12  739.6712050.99  742.12

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 8602.56     .04 9989.11    .05510082.81     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9989.1110082.81               440  485.76     440              .1       .3

CROSS SECTION            RIVER: West Quilotosa
REACH: Reach-1              RS: 0.926

INPUT
Description:
Station Elevation Data      num=       74
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 8399.74   742.1 8446.51  741.77 8603.44  740.16 8616.51  739.82 8633.22  738.92
 8650.68   739.9 8658.15  739.94 8706.08  741.06 8799.12  742.44 8859.75  741.52
 8999.14   739.7 9134.57  740.04 9199.16  740.34 9331.75  740.29 9399.18  739.73
  9432.5   739.7 9571.68  739.76  9599.2  739.02  9617.2  739.53 9633.48  739.36
 9763.36   738.7 9794.87  738.43 9812.45  738.35 9887.81  738.81 9942.86  738.88
 9955.33   738.8 9965.68  738.88 9980.86  737.91  9991.9  737.0210000.25  737.61
10012.33   738.610034.68  738.6610061.12  738.1810178.06  737.9510199.27  737.96
10239.64   738.710351.81  738.7710378.48  739.0110422.05  738.9710441.67  739.02
10554.42   738.410593.67  738.5910617.97  738.6110641.85  738.7210751.48  738.62
10774.69   738.610817.23  738.5610932.26  738.0610943.97  738.05 10973.5  738.78
11007.59   739.811017.65  739.6511036.49  739.5811047.74   739.611128.05  738.45
11187.87   737.411210.38  737.3711238.46  738.4311258.12  738.7311323.33  738.74
11349.42   739.811369.37  739.2611414.04  738.4211427.94  738.4511571.15  738.62
11604.64   738.511621.21  738.3711666.47  739.2711725.95  740.7311791.97  739.67
11822.57   739.611883.73  740.1911996.05  741.8412014.75  741.67

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 8399.74     .04 9887.81    .05510239.64     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9887.8110239.64               250  190.08     180              .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION            RIVER: West Quilotosa
REACH: Reach-1              RS: 0.890

INPUT
Description: Gila Bend Canal U/S
Station Elevation Data      num=       19
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    8131  742.12     8343  741.78     8546  742.15     8747  742.37     8955  741.91
    9179  741.87     9387  741.83     9588  741.46     9791  741.54    10000  741.47
   10201   741.7    10405  741.69    10622  741.67    10824  741.86    11025   741.9
   11236  742.22    11445  743.44    11646  742.19    11857  742.12

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    8131    .032     8131    .053    11857    .032

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          8131   11857            58.08   58.08   58.08              .1       .3

CROSS SECTION            RIVER: West Quilotosa
REACH: Reach-1              RS: 0.879

INPUT
Description: Gila Bend Canal D/S
Station Elevation Data      num=       19
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    8131  742.12     8343  741.78     8546  742.15     8747  742.37     8955  741.91
    9179  741.87     9387  741.83     9588  741.46     9791  741.54    10000  741.47
   10201   741.7    10405  741.69    10622  741.67    10824  741.86    11025   741.9
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   11236  742.22   11445  743.44   11646  742.19   11857  742.12

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    8131    .032     8131    .053    11857    .032

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          8131   11857               180  248.16     250              .1       .3

CROSS SECTION           RIVER: West Quilotosa
REACH: Reach-1             RS: 0.832

INPUT
Description:
Station Elevation Data     num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9637.58     736 9680.87  736.09 9717.34   735.3 9854.36  733.19 9872.15  732.93
 9911.68  732.69 9924.31  732.67   10000  732.910064.32  732.9410102.98  732.76
10159.97  732.5810279.26  733.8310302.16  734.210346.86  734.2410371.31  734.22
10453.75  734.3110482.16  734.3710499.44  733.710502.36  734.1210629.78  734.28
10677.91  734.2110703.96  734.2710881.01  734.210904.86  734.2710910.29  734.19
11064.08  734.1311105.76  734.3211243.98  735.511324.27  735.9211332.11  736.54
 11336.1   736.5

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9637.58    .035 9854.36    .04510279.26    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9854.3610279.26               425   475.2     480              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: West Quilotosa
REACH: Reach-1             RS: 0.742

INPUT
Description:
Station Elevation Data     num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8717.65   733.4 8814.45  733.85 8860.57  733.85 9014.59   733.6 9180.59   733.4
 9246.41   733.5 9414.87  733.49 9439.33   733.5 9615.01  733.46 9626.35  733.44
 9644.79   733.5 9671.66  733.41  9768.9  732.42 9803.89  732.16  9810.1  732.01
 9854.32   731.2 9991.63  728.63   10000  728.5210015.07  728.3110020.56  728.32
10126.42   729.210168.25  729.6210217.32  729.8810371.45  731.3610419.22  731.97
10538.28   732.810602.48  733.2510623.06  732.1710669.66  732.1510823.01  731.39
10903.66   731.511024.91  731.4511081.06  731.3811226.81   731.411289.51  731.96
11430.71   732.611434.96  732.98

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 8717.65    .035 9854.32    .04510371.45    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9854.3210371.45               425  464.64     400              .1       .3

CROSS SECTION           RIVER: West Quilotosa
REACH: Reach-1             RS: .654

INPUT
Description:
Station Elevation Data     num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8962.59   734.3  8974.4  734.33 9033.58  733.62  9191.7  730.98 9242.63  730.95
 9393.91   731.3 9418.63  731.28 9596.11  730.72 9639.84  730.34 9642.27  730.36
 9728.17   730.5 9765.46  729.66  9778.5  729.23 9798.32  728.87   10000  725.75
10012.35   725.510082.65  726.5310200.53  728.0810250.01  728.5310377.04   729.9
10400.55   730.310498.36  731.3710582.37  732.1610603.15  730.45 10665.4  729.98
10761.69     72910800.59  728.9110952.65  729.3611155.48  729.4211200.63  729.42
11313.58   730.511413.17  731.2211427.21  731.7311429.97  731.69

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 8962.59    .035 9798.32    .04510250.01    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9798.3210250.01               500  480.48     480              .1       .3
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CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: .563

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8858.84	728	8954.82	728.4	9114.6	728.24	9154.85	728.12	9212.3	728.14
9355.52	728.4	9491.74	728.31	9554.92	728.15	9611.23	728.26	9659.4	728.25
9705.78	727.2	9793.78	725.63	9883.31	724.51	9943.78	724.03	9975.55	723.62
10043.44	723.8	10155.02	724.45	10255.92	725.51	10321.7	726.27	10355.05	726.6
10380.55	727.14	8910485.14	729.41	0540.74	730.33	10554.33	729.69	10563.81	729.32
10594.39	729.01	10755.12	727	10898.54	726.81	10942.15	726.83	10987.8	726.89
11298.72	728.06								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8858.84	.035	9705.78	.045	10380.55	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9705.78	10380.55	340	464.64	440	.1	.3

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 0.475

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8742.25	726.5	8885.69	726.4	8918.32	726.41	9084.31	725.97	9106.8	725.84
9140.94	725.9	9323.14	726.19	9411.09	726.07	9525.55	726.19	9572.44	725.96
9603.82	726.1	9621.11	725.9	9680.22	724.95	9727.96	724.27	9790.65	722.98
9828.18	722	9914.44	720.1	9928.03	720.06	9939.09	720.11	9975.67	720.16
10000	720.2	10131.28	720.5	10324.45	723.68	10331.39	723.76	10370.73	724.64
10420	725.76	7310530.69	728.3	10540.49	727.43	10558.18	725.98	10582.01	725.7
10603.64	725.51	10689.96	725.2	10731.6	725.13	10905.65	724.82	10931.71	724.79
10959.54	724.81	11131.82	725.2	11228.28	725.07				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8742.25	.035	9603.82	.045	10420	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9603.82	10420	420	464.64	550	.1	.3

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 0.387

INPUT
Description: Same x-sect as 3.924 on Quilotosa Wash
Station Elevation Data num= 189

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8702.93	724.1	8710.58	724.29	8721.33	724.36	8737.42	724.56	8772.34	724.56
8781.24	724.7	8823.86	724.71	8832.05	725.05	8913.39	725.07	8918.57	724.97
8957.12	725.2	8965.23	724.98	9002.44	725.01	9010.35	724.7	9050.9	724.78
9060.24	724.7	9099.44	724.7	9108.85	724.58	9146.62	724.61	9155.67	724.53
9193.94	724.5	9244.79	724.39	9284	724.27	9305.6	724.12	9341.04	723.77
9394.46	723.8	9429.03	723.86	9440.81	723.8	9476.89	723.75	9488.85	723.67
9522.04	723.8	9563.52	723.55	9566.72	723.62	9581.06	723.4	9611.2	723.69
9640.25	723.6	9653.24	723.45	9692.08	722.92	9713.16	722.58	9746.02	722.67
9789.79	722.1	9831.72	721.89	9837.79	722.01	9874.26	721.68	9893.07	721.78
9924.39	721.7	9964.97	721.02	9969.71	720.98	9976.32	714	10004.06	713.1
10013.7	713.2	10020.32	714	10027.32	721	10036.69	721.4	10049.31	721.25
10063.11	721.36	10103.23	720.75	10113.99	721.68	10136.8	721.61	0157.93	721.74
10184.13	721.83	10204.11	722.08	10247.85	722.42	10277.53	722.61	0299.02	722.51
10318.77	722.64	10334.26	722.14	10379.23	722.69	10413.82	722.71	0423.54	722.82
10463.39	722.59	10473.44	722.67	10511.94	722.63	10520.01	722.51	0571.26	722.61
10612.68	722.81	10624.06	722.65	10663.58	722.71	0673.82	722.61	0705.67	722.59
10718.72	721.03	10725.2	720.99	10757.42	722.46	10816.12	721.91	0844.82	721.55
10855.21	721.57	10891.97	721.95	10936.81	722.12	10946.7	722.11	1030.24	721.77
11049.1	721.88	11076.28	722.01	11112.56	722.48	11176.93	722.61	1211.68	722.28
11256.64	721.83	11261.1	721.91	11299.59	721.78	11305.83	721.9	11345.6	721.91
11354.5	722.25	11368.83	721.77	11401.43	721.47	11425.43	721.41	1442.18	721.83
11473.41	722.02	11485.63	721.96	11533.43	721.97	11581.71	722	11583.53	721.88
11610.29	721.68	11624.45	721.84	11629.63	721.71	11658.8	721.5	11660.8	721.57
11695.78	721.67	11708.62	721.84	11742.6	721.81	11797.28	722.11	1807.96	722.07
11846.81	722.22	11857.95	722.18	11888.68	722.22	11904.19	722.5	11932.3	722.31

11942.8	721.4511966.54	721.1211979.23	721.04 11983.3	721.112011.64	720.26
12028.47	720.0712033.56	719.8812067.47	714.112069.71	71412075.94	713.94
12078.32	713.912098.24	714.2512108.08	717.0712117.11	717.612119.26	717.6
12160.44	718.6112163.52	718.74 12197.3	719.2312245.17	720.212249.07	720.19
12340.31	721.4912383.45	721.8612427.16	721.3112474.41	721.612515.47	721.86
[illegible]28.14	721.6712560.47	721.5712591.11	721.5512597.77	721.712639.62	721.81
[illegible]7.38	721.8212686.97	721.7412734.81	721.6512761.63	720.812765.22	720.82
12781.56	721.8912820.47	722.3812865.75	722.5512920.79	722.512961.03	722.64
12970.95	722.7813008.68	722.7413016.07	722.6513051.27	722.413059.24	722.46
13101.84	722.9813122.69	722.9613139.94	722.5413198.55	722.813233.42	722.98
13276.03	723.3513284.02	723.5613330.24	723.713367.22	724.213378.75	724.23
13449.98	725.0413462.25	725.9213501.28	726.5513510.32	726.813550.28	727.19
13564.8	727.76 13593.4	728.6713620.55	729.2913663.11	729.5	

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8702.93	.03	9746.02	.04	10247.85	.03	11904.19	.04	21383.45	.034

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9893.07	12245.17	170	168.96	170	.3	.8

MULTIPLE OPENING RIVER: West Quilotosa
REACH: Reach-1 RS: 0.358

INPUT
Description:
Distance from Upstream XS = 130
Deck/Roadway Width = 16
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 19

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5673	727.68		5953	727.2		6173	726.96	
8752	726.39		9252	725.92		9751	725.49	
9978.37	725.2	721.69	10000	725.19	721.69	10021.63	725.18	721.69
10500	725.13		11000	725.29		11500	725.38	
12057.5	725.3	721.12	12079	725.29	721.12	12100.5	725.28	721.12
12579	725.49		13080	725.94		13580	726.66	
14079	727.26							

[illegible]stream Bridge Cross Section Data
Station Elevation Data num= 189

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8702.93	724.1	8710.58	724.29	8721.33	724.36	8737.42	724.56	8772.34	724.56
8781.24	724.7	8823.86	724.71	8832.05	725.05	8913.39	725.07	8918.57	724.97
8957.12	725.2	8965.23	724.98	9002.44	725.01	9010.35	724.7	9050.9	724.78
9060.24	724.7	9099.44	724.7	9108.85	724.58	9146.62	724.61	9155.67	724.53
9193.94	724.5	9244.79	724.39	9284	724.27	9305.6	724.12	9341.04	723.77
9394.46	723.8	9429.03	723.86	9440.81	723.8	9476.89	723.75	9488.85	723.67
9522.04	723.8	9563.52	723.55	9566.72	723.62	9581.06	723.4	9611.2	723.69
9640.25	723.6	9653.24	723.45	9692.08	722.92	9713.16	722.58	9746.02	722.67
9789.79	722.1	9831.72	721.89	9837.79	722.01	9874.26	721.68	9893.07	721.78
9924.39	721.7	9964.97	721.02	9969.71	720.98	9976.32	71410004.06		713.1
10013.7	713.210020.32		71410027.32		72110036.69		721.410049.31		721.25
10063.11	721.3610103.23		720.7510113.99		721.68 10136.8		721.610157.93		721.74
10184.13	721.8310204.11		722.0810247.85		722.4210277.53		722.610299.02		722.51
10318.77	722.6410334.26		722.1410379.23		722.6910413.82		722.710423.54		722.82
10463.39	722.5910473.44		722.6710511.94		722.6310520.01		722.510571.26		722.61
10612.68	722.8110624.06		722.6510663.58		722.710673.82		722.610705.67		722.59
10718.72	721.03 10725.2		720.9910757.42		722.4610816.12		721.910844.82		721.55
10855.21	721.5710891.97		721.9510936.81		722.12 10946.7		722.111030.24		721.77
11049.1	721.8811076.28		722.0111112.56		722.4811176.93		722.611211.68		722.28
11256.64	721.83 11261.1		721.9111299.59		721.7811305.83		721.9 11345.6		721.91
11354.5	722.2511368.83		721.7711401.43		721.4711425.43		721.411442.18		721.83
11473.41	722.0211485.63		721.9611533.43		721.9711581.71		72211583.53		721.88
11610.29	721.6811624.45		721.8411629.63		721.71 11658.8		721.5 11660.8		721.57
11695.78	721.6711708.62		721.84 11742.6		721.8111797.28		722.111807.96		722.07
11846.81	722.2211857.95		722.1811888.68		722.2211904.19		722.5 11932.3		722.31
11942.8	721.4511966.54		721.1211979.23		721.04 11983.3		721.112011.64		720.26
12028.47	720.0712033.56		719.8812067.47		714.112069.71		71412075.94		713.94
12078.32	713.912098.24		714.2512108.08		717.0712117.11		717.612119.26		717.6
12160.44	718.6112163.52		718.74 12197.3		719.2312245.17		720.212249.07		720.19
[illegible]40.31	721.4912383.45		721.8612427.16		721.3112474.41		721.612515.47		721.86
[illegible]28.14	721.6712560.47		721.5712591.11		721.5512597.77		721.712639.62		721.81
12677.38	721.8212686.97		721.7412734.81		721.6512761.63		720.812765.22		720.82
12781.56	721.8912820.47		722.3812865.75		722.5512920.79		722.512961.03		722.64
12970.95	722.7813008.68		722.7413016.07		722.6513051.27		722.413059.24		722.46
13101.84	722.9813122.69		722.9613139.94		722.5413198.55		722.813233.42		722.98

```
13276.03  723.3513284.02  723.5613330.24   723.713367.22   724.213378.75  724.23
13449.98  725.0413462.25  725.9213501.28  726.5513510.32   726.813550.28  727.19
 13564.8  727.76 13593.4  728.6713620.55  729.2913663.11   729.5

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
   [illegible]2.93     .03 9746.02     .0410247.85     .0311904.19    .04212383.45    .034

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9893.0712245.17              .3       .8

Downstream  Deck/Roadway Coordinates
    num=      19
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    5673  727.68            5953   727.2            6173  726.96
    8752  726.39            9252  725.92            9751  725.49
 9978.37   725.2  721.69   10000  725.19  721.6910021.63  725.18  721.69
   10500  725.13           11000  725.29           11500  725.38
 12057.5   725.3  721.12   12079  725.29  721.12 12100.5  725.28  721.12
   12579  725.49           13080  725.94           13580  726.66
   14079  727.26

Downstream Bridge Cross Section Data
Station Elevation Data    num=     166
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8776.15   724.2  8806.3  725.35 8815.35  725.55 8820.56  725.51 8852.55  725.49
 8869.88   725.4 8894.15  725.49 8897.01   725.4 8915.97  724.34 8938.82  723.32
  8959.2     723 8978.58  722.73 9008.56   721.7 9034.59  721.04 9044.47  720.85
 9081.76   720.9 9085.99  720.57 9129.62  720.91  9160.4  720.97 9204.06     721
 9239.97   720.7 9277.29  720.93 9313.71  721.32 9358.68  721.25 9399.19  721.32
 9411.64   721.4 9459.99  721.36 9543.47   721.1 9592.09     721 9641.18  721.03
  9645.9     721 9693.79  720.88 9729.99  720.76 9777.74  720.69 9782.57  720.66
 9835.44   720.6 9880.22  720.38 9917.23  719.32 9950.44  717.62  9973.7  711.63
  9994.4     71110007.91  710.8310014.94  710.9810037.58  718.8610084.19  719.28
10090.68     72010096.02  720.7610141.55  720.5610181.65   720.610225.13  720.68
10266.75  720.710305.13  720.7910346.46  720.79 10373.5   720.710416.26   720.7
10456.14  720.610494.88  720.6510538.07   720.710623.75  720.7310666.39  720.56
10722.23  720.510763.78  720.51 10806.3  720.34 10809.4  720.3610854.82  720.29
10904.51  720.4 10924.1  719.8110940.04  719.8910946.98  720.5110990.84  720.43
[illegible]51.01  720.411130.81  720.5111171.61  720.6211209.59  720.6611256.91  720.43
[illegible]85.17  720.111301.16  720.1111413.76   719.711458.34   719.7 11502.8  719.81
11598.31  719.8 11618.4  719.8111641.82  719.79 11688.9  720.06 11734.7  720.09
11771.67  720.311815.85  720.33   11830  720.3911877.39  720.3911887.54  720.27
11927.95  720.411930.23  720.3711956.01   720.111964.33  720.4511985.81  720.89
12005.98     72112024.01  721.7312027.56  721.5412045.13  722.1112052.86   717.5
12057.18     71612065.14     71412078.89  713.9512085.63   713.912100.63     714
 12102.9   714.112107.95  714.2512111.13721.900512111.62  723.0812128.67  722.76
12164.12  722.5112172.13   722.612210.04  721.8112214.78  721.8112249.29  721.04
12300.46  721.1512342.54     72112390.84   720.812434.52  720.7612481.09  720.62
12523.01  720.6212529.12   720.512565.67  720.5112611.54  720.0212621.03  719.66
12633.48  719.9712638.27   719.912657.99  719.05 12666.4  718.8712674.83  719.32
12692.08  719.3412711.66     72012722.65  720.0512748.22  720.3812758.39  720.32
 12791.8  720.6912821.35   721.312833.03  721.9712840.44  721.9112885.33   722.4
 12921.7  723.1612928.73   723.112963.97  723.2912973.29  722.3412977.64  722.25
13018.39   722.213053.09   721.313099.12  720.7913147.24  720.7113173.47  720.82
13185.96  721.2713218.88   721.6 13228.7  721.7313242.17  721.7213275.19  722.54
13300.78  722.4613319.73   722.713339.66  722.8413363.04  723.79 13414.8  725.22
13465.72  725.7313502.78     72713549.87  727.7413555.69  727.7513592.68  728.36
13595.29  728.37

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
 8776.15     .03 9880.22     .0410090.68     .0312045.13    .04212111.62    .034

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9880.2212111.13              .3       .5

Upstream Embankment side slope              =       2 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
[illegible]illway height used in design     =
[illegible]r crest shape                    = Broad Crested

Number of Piers =  4

Pier Data
```

```
Pier Station     Upstream= 9992.29    Downstream= 9992.29
Upstream     num=        2
    Width   Elev    Width   Elev
       3   713.1       3  721.69
Downstream     num=        2
    Width   Elev    Width   Elev
       3   713.1       3  721.69

Pier Data
Pier Station     Upstream=10007.71    Downstream=10007.71
Upstream     num=        2
    Width   Elev    Width   Elev
       3   713.1       3  721.69
Downstream     num=        2
    Width   Elev    Width   Elev
       3   713.1       3  721.69

Pier Data
Pier Station     Upstream= 12071.5    Downstream= 12071.5
Upstream     num=        2
    Width   Elev    Width   Elev
       2  713.91       2   721.2
Downstream     num=        2
    Width   Elev    Width   Elev
       2  713.91       2   721.2

Pier Data
Pier Station     Upstream= 12086.5    Downstream= 12086.5
Upstream     num=        2
    Width   Elev    Width   Elev
       2  713.91       2  721.12
Downstream     num=        2
    Width   Elev    Width   Elev
       2  713.91       2  721.12

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
       Yarnell                 KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

Multiple Opening Stagnation Limits

                         Upstream                Downstream

  Opening Type     Sta. Left  Sta. Right   Sta. Left  Sta. Right

     Bridge            8702       11000        8776       11000
     Bridge           11000       13664       11000       13596


CROSS SECTION          RIVER: West Quilotosa
REACH: Reach-1            RS: 0.355

INPUT
Description: Same x-sect as 3.892 on Quilotosa Wash
Station Elevation Data    num=     166
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    76.15    724.2   8806.3   725.35  8815.35   725.55  8820.56   725.51  8852.55   725.49
  8869.88    725.4  8894.15   725.49  8897.01    725.4  8915.97   724.34  8938.82   723.32
   8959.2      723  8978.58   722.73  9008.56    721.7  9034.59   721.04  9044.47   720.85
  9081.76    720.9  9085.99   720.57  9129.62   720.91   9160.4   720.97  9204.06      721
  9239.97    720.7  9277.29   720.93  9313.71   721.32  9358.68   721.25  9399.19   721.32
```

9411.64	721.4	9459.99	721.36	9543.47	721.1	9592.09	721	9641.18	721.03
9645.9	721	9693.79	720.88	9729.99	720.76	9777.74	720.69	9782.57	720.66
9835.44	720.6	9880.22	720.38	9917.23	719.32	9950.44	717.62	9973.7	711.63
9994.4	711	10007.91	710.83	10014.94	710.98	10037.58	718.86	10084.19	719.28
10090.68	720	10096.02	720.76	10141.55	720.56	10181.65	720.61	10225.13	720.68
10266.75	720.71	10305.13	720.79	10346.46	720.79	10373.5	720.71	10416.26	720.7
10456.14	720.61	10494.88	720.65	10538.07	720.71	10623.75	720.73	10666.39	720.56
10722.23	720.51	10763.78	720.51	10806.3	720.34	10809.4	720.36	10854.82	720.29
10904.51	720.4	10924.1	719.81	10940.04	719.89	10946.98	720.51	10990.84	720.43
11051.01	720.41	11130.81	720.51	11171.61	720.62	11209.59	720.66	11256.91	720.43
11285.17	720.11	11301.16	720.11	11413.76	719.71	11458.34	719.7	11502.8	719.81
11598.31	719.8	11618.4	719.81	11641.82	719.79	11688.9	720.06	11734.7	720.09
11771.67	720.31	11815.85	720.33	11830	720.39	11877.39	720.39	11887.54	720.27
11927.95	720.41	11930.23	720.37	11956.01	720.11	11964.33	720.45	11985.81	720.89
12005.98	721	12024.01	721.73	12027.56	721.54	12045.13	722.11	12052.86	717.5
12057.18	716	12065.14	714	12078.89	713.95	12085.63	713.91	12100.63	714
12102.9	714.11	12107.95	714.25	12111.13	721.90	12111.62	723.08	12128.67	722.76
12164.12	722.51	12172.13	722.6	12210.04	721.81	12214.78	721.81	12249.29	721.04
12300.46	721.15	12342.54	721	12390.84	720.8	12434.52	720.76	12481.09	720.62
12523.01	720.62	12529.12	720.5	12565.67	720.51	12611.54	720.02	12621.03	719.66
12633.48	719.97	12638.27	719.9	12657.99	719.05	12666.4	718.87	12674.83	719.32
12692.08	719.34	12711.66	720	12722.65	720.05	12748.22	720.38	12758.39	720.32
12791.8	720.69	12821.35	721.31	12833.03	721.97	12840.44	721.91	12885.33	722.4
12921.7	723.16	12928.73	723.11	12963.97	723.29	12973.29	722.34	12977.64	722.25
13018.39	722.2	13053.09	721.31	13099.12	720.79	13147.24	720.71	13173.47	720.82
13185.96	721.27	13218.88	721.6	13228.7	721.73	13242.17	721.72	13275.19	722.54
13300.78	722.46	13319.73	722.7	13339.66	722.84	13363.04	723.79	13414.8	725.22
13465.72	725.73	13502.78	727	13549.87	727.74	13555.69	727.75	13592.68	728.36
13595.29	728.37								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8776.15	.03	9880.22	.04	10090.68	.03	12045.13	.04	12111.62	.034

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9880.22	12111.13	100	95.04	100	.3	.5

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 0.337

INPUT
Description: Same x-sect as 3.874 on Quilotosa Wash
Station Elevation Data num= 110

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8743.47	722	8749.73	722.05	8797.25	721.5	8798.3	721.51	8848.66	720.62
8904.85	720.5	8909.41	720.36	8926.45	720.4	9385.86	721.55	9425.46	721.73
9483.65	721.7	9672.92	719.81	9716.49	719.37	9745.31	719.05	9797.51	718.92
9839.85	718.7	9865.78	718.71	9903.47	718.86	07 9910.79	718.89	9942.29	717.71
9959.77	710.72	9978.16	710.41	10000.88	709.88	10027.43	714.17	10074.71	721
10123.19	720.86	10153.81	720.91	10360.56	720.18	10619.25	720.12	10741.57	720.56
10764.97	720.65	10965.19	720.41	11010.42	720.41	11013.98	720.37	11155.23	720.23
11274.35	720.12	11574.08	720.11	11619.41	720.45	11632.81	720.48	11654.08	720.47
11856.81	720.73	11894.28	720.81	11909.23	720.67	11923.68	720.86	11990.79	720.78
11994.87	720.84	12015.62	720.71	12038.11	720.64	12049.54	720.29	12051.52	717.67
12054.19	713.13	12054.2	715.81	12060.52	717.46	12070.14	711.22	12082.34	711.22
12095.2	711.22	12107.47	711.22	12109.52	720.51	12157.42	721.12	12165.02	720.96
12197.92	720.95	12204.93	720.79	12279.05	720.81	12319.48	720.74	12328.08	720.7
12433.4	720.64	12515.12	720.57	12554.75	719.91	12559.29	719.86	12583.95	718.9
12596.35	716.85	12624.41	720.11	12667.53	720.61	12713.82	720.91	12716.69	720.95
12752.94	720.98	12759.88	721.41	12795.09	721.81	12809.62	721.85	12840.49	721.87
12860.24	722.16	12883.82	721.99	12902.04	721.81	12926.38	721.95	12942.96	721.19
12977.16	721.08	12994.82	720.93	13028.45	721.11	13038.84	721.92	13047.62	722.03
13071.51	721.32	13123.24	721.32	13160.22	721.51	13175.27	721.54	13229.26	722.56
13241.4	723.04	13260.72	722.96	13287.47	722.71	13308.78	723.32	13335.88	723.94
13367	724.25	13386.44	724.59	13416.87	725.51	13451.13	725.02	13503.66	726.6
13520.16	726.95	13549.09	727.69	13562.77	727.71	13574.65	727.23	13591.57	727.98

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8743.47	.03	9910.79	.04	10074.71	.03	12049.54	.04	12109.52	.034

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9910.79	12109.52	425	427.68	425	.3	.5

MULTIPLE OPENING RIVER: West Quilotosa
REACH: Reach-1 RS: 0.333

INPUT

Description:
Distance from Upstream XS = 20
Deck/Roadway Width = 360
Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates
num= 32

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
7525	726.51		7739	726.12		7959	725.83	
8182	725.45		8404	725.07		8630	724.78	
8848	724.48		9063	724.21		9275	723.8	
9485	723.45		9701	723.03		9923	722.68	
9985	722.61		10141	722.42		10368	722.16	
10598	721.91		10834	721.9		11075	721.69	
11283	721.77		11508	721.62		11741	721.75	
11977	722.16		12090	722.35		12327	722.42	
12539	722.69		12788	722.77		13038	723.04	
13285	721.36		13488	721.56		13701	721.98	
13916	722.92		14134	723.44				

Upstream Bridge Cross Section Data
Station Elevation Data num= 110

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8743.47	722	8749.73	722.05	8797.25	721.5	8798.3	721.51	8848.66	720.62
8904.85	720.5	8909.41	720.36	8926.45	720.4	9385.86	721.55	9425.46	721.73
9483.65	721.7	9672.92	719.81	9716.49	719.37	9745.31	719.05	9797.51	718.92
9839.85	718.7	9865.78	718.71	9903.47	718.8607	9910.79	718.89	9942.29	717.71
9959.77	710.72	9978.16	710.41	10000.88	709.881	10027.43	714.171	10074.71	721
10123.19	720.861	10153.81	720.91	10360.56	720.181	10619.25	720.121	10741.57	720.56
10764.97	720.651	10965.19	720.41	11010.42	720.411	11013.98	720.371	11155.23	720.23
11274.35	720.121	11574.08	720.11	11619.41	720.451	11632.81	720.481	11654.08	720.47
11856.81	720.731	11894.28	720.81	11909.23	720.671	11923.68	720.861	11990.79	720.78
11994.87	720.841	12015.62	720.71	12038.11	720.641	12049.54	720.291	12051.52	717.67
12054.19	713.13	12054.2	715.81	12060.52	717.461	12070.14	711.221	12082.34	711.22
12095.2	711.221	12107.47	711.221	12109.52	720.51	12157.42	721.121	12165.02	720.96
12197.92	720.951	12204.93	720.791	12279.05	720.81	12319.48	720.741	12328.08	720.7
12433.4	720.641	12515.12	720.571	12554.75	719.91	12559.29	719.861	12583.95	718.9
12596.35	716.851	12624.41	720.111	12667.53	720.61	12713.82	720.911	12716.69	720.95
12752.94	720.981	12759.88	721.411	12795.09	721.81	12809.62	721.851	12840.49	721.87
12860.24	722.161	12883.82	721.991	12902.04	721.81	12926.38	721.951	12942.96	721.19
[illegible]77.16	721.081	12994.82	720.931	13028.45	721.11	13038.84	721.921	13047.62	722.03
[illegible]71.51	721.321	13123.24	721.321	13160.22	721.51	13175.27	721.541	13229.26	722.56
[illegible]3241.4	723.041	13260.72	722.961	13287.47	722.71	13308.78	723.321	13335.88	723.94
13367	724.251	13386.44	724.591	13416.87	725.51	13451.13	725.021	13503.66	726.6
13520.16	726.951	13549.09	727.691	13562.77	727.71	13574.65	727.231	13591.57	727.98

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8743.47	.03	9910.79	.041	10074.71	.031	12049.54	.042	12109.52	.034

Bank Sta: Left	Right	Coeff Contr.	Expan.
9910.79	12109.52	.3	.5

Downstream Deck/Roadway Coordinates
num= 32

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
7525	726.51		7739	726.12		7959	725.83	
8182	725.45		8404	725.07		8630	724.78	
8848	724.48		9063	724.21		9275	723.8	
9485	723.45		9701	723.03		9923	722.68	
9985	722.61		10141	722.42		10368	722.16	
10598	721.91		10834	721.9		11075	721.69	
11283	721.77		11508	721.62		11741	721.75	
11977	722.16		12090	722.35		12327	722.42	
12539	722.69		12788	722.77		13038	723.04	
13285	721.36		13488	721.56		13701	721.98	
13916	722.92		14134	723.44				

Downstream Bridge Cross Section Data
Station Elevation Data num= 144

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8917.55	720.2	8948.37	720.25	8973.13	720.34	8985.17	720.77	9001.29	720.83
9013.65	720.5	9034.24	720.53	9081.28	720.71	9129.88	720.92	9149.55	720.98
[illegible]168.81	720.9	9191.37	720.95	9243.43	720.86	9336.48	720.92	9364.09	720.9
[illegible]7.54	720.9	9413.79	720.89	9438.16	720.94	9463.96	720.94	9492.19	720.99
[illegible]29.8	721	9555.75	720.96	9585.15	720.85	9609.83	720.35	9634.81	720.28
9661.28	720.1	9688.83	719.77	9730.15	718.74	9754.97	718.69	9775.94	717.68
9805.99	718.1	9821.23	717.23	9843.95	716.14	9871.34	714.41	9891.67	713.05
9911.08	712.3	9941.66	710	9953.37	709.41	9963.17	709.3	9970.55	708.8[illegible]

```
 10012.32   708.510018.89  709.1710019.52  709.4110057.72  711.7110068.66  711.93
 10089.11   713.210111.26  714.8910131.91  715.3510153.87  716.0310172.91  716.25
 10200.47   717.410221.37  717.4310249.48   717.810266.45  718.0910316.05  718.77
 10367.16   719.110392.16  719.4310413.45  719.4710422.67  719.8110473.52  720.06
 10488.57     72010511.19  719.68 10559.9  719.7710598.48  719.7510623.69  719.91
 [illegible]77.59   719.910740.22  720.0610757.03  720.1210779.54  720.2510827.29  719.36
 [illegible]13.07   719.310863.95  719.6710889.73  719.6810944.09   719.410977.99  719.31
 11100.8    719.211166.33  719.0211174.29  719.3111207.27  719.4111245.92  717.73
 11286.54   716.911331.23  716.2911371.32   715.711399.55  715.2311412.99  715.28
 11454.82   715.311535.02  715.1711547.72  715.2211595.93  715.2111645.37  715.18
 11693.53   715.611744.71  715.9111791.47  715.9411806.74  715.99 11836.4  716.62
 11867.55   718.211884.13  718.6611906.27  717.6811911.95  717.6211938.07  714.76
 11947.15     71411952.25  714.0811972.86  712.97 11981.5  711.3111982.78  708.74
 12005.23  708.7412018.82  708.7412034.47  710.6712039.06  711.8912078.12  712.37
 12118.17   714.312121.39  714.5712163.66  716.5312170.26  716.5712207.85  717.15
 12219.28     71712226.56  717.0912247.92  717.1512261.81  717.5612273.76   717.3
 12294.09   717.312318.27  717.0812391.47  716.8212420.88  716.7712452.77  716.84
  12512.1   715.912547.24  715.9812556.85  716.1512616.18  717.7812623.13  717.72
 12658.48   717.812690.81  717.8412718.81  717.8712733.06  718.3412739.85  718.35
  12769.6   719.112786.76  719.0912803.98  719.1812815.49  719.0212846.53  718.19
 12855.54   718.212893.06  717.41 12934.1  717.4212971.77  717.34

Manning's n Values          num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  8917.55     .03 9688.83     .0410316.05     .0311207.27    .04212207.85    .034

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9821.2312207.85              .3       .5

Upstream Embankment side slope                =       3 horiz. to 1.0 vertical
Downstream Embankment side slope              =       3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  2

[illegible]vert Name     Shape      Rise    Span
[illegible]vert #2          Box        8      12
FHWA Chart # 11- Skewed headwall; Chamfered or beveled Inlet
FHWA Scale # 4 - Headwall skewed 10 to 45 deg.; inlet edges beveled
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                 23     264       .013                   .4                 1
Number of Barrels =  3
Upstream   Elevation =  710.5
Centerline Stations
    Sta.    Sta.    Sta.
    9985    9998   10011
Downstream Elevation =  709
Centerline Stations
    Sta.    Sta.    Sta.
    9985    9998   10011

Culvert Name     Shape      Rise    Span
Culvert #1          Box        8      12
FHWA Chart # 11- Skewed headwall; Chamfered or beveled Inlet
FHWA Scale # 4 - Headwall skewed 10 to 45 deg.; inlet edges beveled
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                 23     382       .013                   .4                 1
Number of Barrels =  3
Upstream   Elevation =  711.22
Centerline Stations
    Sta.    Sta.    Sta.
   12077   12090   12103
Downstream Elevation =  708.74
Centerline Stations
    Sta.    Sta.    Sta.
   11995   12008   12021

[illegible]tiple Opening Stagnation Limits

                        Upstream                Downstream

  Opening Type    Sta. Left  Sta. Right   Sta. Left  Sta. Right
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Conveyance	8740	8740	8740	8740
Culvert Group	8740	11000	8740	11000
Culvert Group	11000	13592	11000	13592

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 0.256

INPUT
Description: Same x-sect as 3.793 on Quilotosa Wash
Station Elevation Data num= 144

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8917.55	720.2	8948.37	720.25	8973.13	720.34	8985.17	720.77	9001.29	720.83
9013.65	720.5	9034.24	720.53	9081.28	720.71	9129.88	720.92	9149.55	720.98
9168.81	720.9	9191.37	720.95	9243.43	720.86	9336.48	720.92	9364.09	720.9
9387.54	720.9	9413.79	720.89	9438.16	720.94	9463.96	720.94	9492.19	720.99
9529.8	721	9555.75	720.96	9585.15	720.85	9609.83	720.35	9634.81	720.28
9661.28	720.1	9688.83	719.77	9730.15	718.74	9754.97	718.69	9775.94	717.68
9805.99	718.1	9821.23	717.23	9843.95	716.14	9871.34	714.41	9891.67	713.05
9911.08	712.3	9941.66	710	9953.37	709.41	9963.17	709.3	9970.55	708.88
10012.32	708.5	10018.89	709.17	10019.52	709.41	10057.72	711.71	10068.66	711.93
10089.11	713.2	10111.26	714.89	10131.91	715.35	10153.87	716.03	10172.91	716.25
10200.47	717.4	10221.37	717.43	10249.48	717.8	10266.45	718.09	10316.05	718.77
10367.16	719.1	10392.16	719.43	10413.45	719.47	10422.67	719.81	10473.52	720.06
10488.57	720	10511.19	719.68	10559.9	719.77	10598.48	719.75	10623.69	719.91
10677.59	719.9	10740.22	720.06	10757.03	720.12	10779.54	720.25	10827.29	719.36
10843.07	719.3	10863.95	719.67	10889.73	719.68	10944.09	719.4	10977.99	719.31
11100.8	719.2	11166.33	719.02	11174.29	719.31	11207.27	719.41	11245.92	717.73
11286.54	716.9	11331.23	716.29	11371.32	715.7	11399.55	715.23	11412.99	715.28
11454.82	715.3	11535.02	715.17	11547.72	715.22	11595.93	715.21	11645.37	715.18
11693.53	715.6	11744.71	715.91	11791.47	715.94	11806.74	715.99	11836.4	716.62
11867.55	718.2	11884.13	718.66	11906.27	717.68	11911.95	717.62	11938.07	714.76
11947.15	714	11952.25	714.08	11972.86	712.97	11981.5	711.31	11982.78	708.74
12005.23	708.74	12018.82	708.74	12034.47	710.67	12039.06	711.89	12078.12	712.37
12118.17	714.3	12121.39	714.57	12163.66	716.53	12170.26	716.57	12207.85	717.15
12219.28	717	12226.56	717.09	12247.92	717.15	12261.81	717.56	12273.76	717.3
12294.09	717.3	12318.27	717.08	12391.47	716.82	12420.88	716.77	12452.77	716.84
12512.1	715.9	12547.24	715.98	12556.85	716.15	12616.18	717.78	12623.13	717.72
[illegible]58.48	717.8	12690.81	717.84	12718.81	717.87	12733.06	718.34	12739.85	718.35
[illegible]769.6	719.1	12786.76	719.09	12803.98	719.18	12815.49	719.02	12846.53	718.19
12855.54	718.2	12893.06	717.41	12934.1	717.42	12971.77	717.34		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8917.55	.03	9688.83	.04	10316.05	.03	11207.27	.04	12207.85	.034

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9821.23	12207.85	90	89.76	90	.3	.5

CROSS SECTION RIVER: West Quilotosa
REACH: Reach-1 RS: 0.239

INPUT
Description: Same x-sect as 3.776 on Quilotosa Wash
Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9027.25	717.93	9113.51	717.36	9138.93	717.11	9159.03	717.1	9227.25	716.95
9355.3	716.97	9427.26	716.77	9554.27	716.67	9627.26	716.7	9679.98	716.38
9684.14	716.37	9827.26	716.34	9904.53	714.21	9937.78	713.9	9968.56	716.91
9977.29	717.52	9984.13	714.92	10003.54	709.07	10014.28	713.11	10025.47	717.11
10038.26	716.26	10101.91	716.51	10178.3	716.91	10230.78	717.11	10250.99	717.19
10260.2	717.47	10297.36	718.06	10341.33	718.56	10388.27	719.31	10391.68	719.36
10427.22	719.84	10437.46	719.8	10455.4	719.95	10468.48	719.8	10489.1	719.99
10542.13	719.64	10599.46	719.19	10631.23	719	10719.17	718.91	10804.14	718.89
10866.08	718.58	10878.84	718.26	10925.33	717.67	10950.14	714.71	11033.32	716.31
11047.68	716.56	11192.44	716.61	11256.1	716.61	11304.04	715.91	11329.11	715.8
11457.7	716.33	11475.11	716.49	11493.64	716.59	11542.23	716.21	11570.17	716.21
11586.85	716.49	11672.16	716.81	11677.95	717.03	11705.29	718.71	11733.53	711.14
11736.39	710.55	11756.39	709.92	11776.61	709.27	11793.45	714.81	11799.77	716.26
11830.03	716.23	11873.88	715.81	11916.48	715.83	11949.12	716.21	12013.11	716.29
12119.88	715.56	12289.66	715.84	12339.13	716.71	12365.06	717.41	12395.95	717.15
[illegible]440.11	717.21	12465.8	717.31	12505.62	717.74	12526.29	717.68	12540.3	717.66

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9027.25	.03	9827.26	.04	10038.26	.03	10925.33	.04	11033.32	.032
11705.29	.04	11799.77	.034						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9827.26	11799.77	0	0	0	.1	.3

HEC-RAS Plan: West Quiloto River: West Quilotosa Reach: Reach-1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	2.155	PF 1	10700.00	768.37	772.67		773.21	0.006591	3.79	2086.62	1340.17	0.44
Reach-1	2.155	PF 2	10700.00	768.37	773.10		773.72	0.006014	4.06	1913.81	830.08	0.44
Reach-1	2.058	PF 1	10700.00	765.18	769.07	768.90	769.48	0.008441	2.78	2151.95	1784.78	0.45
Reach-1	2.058	PF 2	10700.00	765.18	769.93	769.67	770.58	0.006940	3.62	1845.46	1190.00	0.45
Reach-1	1.969	PF 1	10700.00	763.20	765.34	765.18	765.77	0.006861	1.52	2120.49	1800.24	0.36
Reach-1	1.969	PF 2	10700.00	763.20	766.29	766.25	767.02	0.009497	3.25	1699.54	1050.00	0.49
Reach-1	1.873	PF 1	10700.00	760.38	763.13	762.76	763.35	0.004411	2.61	2840.56	2314.96	0.35
Reach-1	1.873	PF 2	10700.00	760.38	764.10		764.45	0.003558	3.14	2328.50	1100.00	0.34
Reach-1	1.772	PF 1	10700.00	756.98	760.74		760.97	0.006005	3.35	2762.79	2798.35	0.41
Reach-1	1.772	PF 2	10700.00	756.98	761.41		762.02	0.006838	4.32	1718.00	850.00	0.46
Reach-1	1.675	PF 1	10700.00	754.46	758.16	757.84	758.38	0.005048	3.50	2785.90	2552.19	0.39
Reach-1	1.675	PF 2	10700.00	754.46	758.79	758.31	759.29	0.004890	4.01	1912.53	895.00	0.40
Reach-1	1.593	PF 1	10700.00	754.78	756.67		756.87	0.003608	1.94	3034.71	2371.52	0.30
Reach-1	1.593	PF 2	10700.00	754.78	757.62		757.93	0.002888	2.50	2543.23	1100.00	0.29
Reach-1	1.515	PF 1	10700.00	753.22	755.21		755.45	0.004012	2.17	3094.65	2465.76	0.32
Reach-1	1.515	PF 2	10700.00	753.22	756.08		756.44	0.005492	3.48	2502.08	1200.00	0.41
Reach-1	1.449	PF 1	10700.00	751.03	753.68		753.85	0.006567	3.33	3330.57	3033.14	0.43
Reach-1	1.449	PF 2	10700.00	751.03	754.32		754.60	0.005789	3.81	2545.53	1250.00	0.42
Reach-1	1.371	PF 1	10700.00	749.41	751.45	750.99	751.57	0.004748	2.66	3861.93	3379.21	0.36
Reach-1	1.371	PF 2	10700.00	749.41	752.06		752.32	0.005449	3.50	2665.98	1350.00	0.40
Reach-1	1.293	PF 1	10700.00	744.51	749.11	748.82	749.27	0.008170	3.97	3327.11	3625.02	0.48
Reach-1	1.293	PF 2	10700.00	744.51	750.09		750.33	0.004954	4.00	2759.32	1480.00	0.40
Reach-1	1.202	PF 1	10700.00	742.08	747.07	746.39	747.16	0.002830	2.46	4417.82	3260.36	0.29
Reach-1	1.202	PF 2	10700.00	742.08	747.55	746.97	747.81	0.005941	4.05	2615.90	1480.00	0.43
Reach-1	1.107	PF 1	10700.00	740.40	743.76	743.76	744.15	0.025681	6.15	2168.79	2879.56	0.83
Reach-1	1.107	PF 2	10700.00	740.40	744.76		745.02	0.005959	4.03	2628.90	1510.00	0.43
Reach-1	1.018	PF 1	10700.00	739.72	743.49		743.52	0.000304	0.95	8579.41	3286.79	0.10
Reach-1	1.018	PF 2	10700.00	739.72	744.37		744.43	0.000454	1.38	5689.50	1510.00	0.13
Reach-1	0.926	PF 1	10700.00	737.02	743.44		743.45	0.000081	0.72	12403.24	3615.01	0.05
Reach-1	0.926	PF 2	10700.00	737.02	744.27	740.07	744.30	0.000166	1.14	7928.54	1480.00	0.08
Reach-1	0.890	PF 1	10700.00	741.46	743.33	742.53	743.40	0.003561	2.08	5133.75	3689.80	0.31
Reach-1	0.890	PF 2	10700.00	741.46	744.04		744.20	0.004043	3.21	3338.17	1380.00	0.36
Reach-1	0.879	PF 1	10600.00	741.46	742.52	742.52	742.86	0.048213	4.68	2266.50	3422.01	1.01
Reach-1	0.879	PF 2	10600.00	741.46	742.94	742.94	743.61	0.037754	6.60	1605.03	1200.00	1.01
Reach-1	0.832	PF 1	10600.00	732.58	735.55	735.10	735.84	0.005998	4.87	2489.94	1547.43	0.53
Reach-1	0.832	PF 2	10600.00	732.58	736.12		736.63	0.006782	5.90	1857.65	700.00	0.58
Reach-1	0.742	PF 1	10600.00	728.31	732.66		733.01	0.005924	5.18	2431.79	1591.44	0.54
Reach-1	0.742	PF 2	10600.00	728.31	733.36		733.84	0.005172	5.63	1899.74	541.67	0.52
Reach-1	.654	PF 1	10600.00	725.50	730.74	729.94	731.00	0.003462	4.54	2833.50	1597.81	0.42
Reach-1	.654	PF 2	10600.00	725.50	731.08	729.75	731.56	0.004716	5.63	1904.73	514.03	0.50
Reach-1	.563	PF 1	10600.00	723.62	727.29	727.10	727.98	0.014070	6.75	1647.15	1046.47	0.79
Reach-1	.563	PF 2	10600.00	723.62	727.48	726.95	728.18	0.011354	6.73	1576.43	600.00	0.73
Reach-1	0.475	PF 1	10600.00	720.06	726.24		726.36	0.001344	2.96	3995.89	2130.35	0.27
Reach-1	0.475	PF 2	10600.00	720.06	726.24		726.43	0.001622	3.51	3017.41	700.00	0.30
Reach-1	0.387	PF 1	15200.00	713.10	726.26	722.26	726.27	0.000049	0.89	18869.08	4780.62	0.07
Reach-1	0.387	PF 2	15200.00	713.10	726.26	722.36	726.28	0.000106	1.30	11779.48	2450.00	0.10
Reach-1	0.358		Mult Open									
Reach-1	0.355	PF 1	15200.00	710.83	723.05		723.08	0.000220	1.54	11086.60	4337.91	0.15
Reach-1	0.355	PF 2	15200.00	710.83	723.09		723.16	0.000398	2.09	7327.79	2370.00	0.21
Reach-1	0.337	PF 1	15200.00	709.88	723.04	720.74	723.07	0.000160	1.39	12367.40	4555.69	0.13
Reach-1	0.337	PF 2	15200.00	709.88	723.06	719.54	723.13	0.000326	1.96	7684.85	2340.00	0.19
Reach-1	0.333		Mult Open									

HEC-RAS Plan: West Quiloto River: West Quilotosa Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	0.256	PF 1	15200.00	708.50	717.95		718.10	0.001419	3.14	5123.01	2021.41	0.30
Reach-1	0.256	PF 2	15200.00	708.50	718.63		718.75	0.000965	2.79	5452.76	1428.82	0.25
Reach-1	0.239	PF 1	15200.00	709.07	717.21	717.21	717.72	0.008670	6.17	2811.91	2568.38	0.91
Reach-1	0.239	PF 2	15200.00	709.07	718.21	717.40	718.54	0.003405	4.60	3324.22	1497.92	0.54

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U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
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: I-8 Wash West
Project File : I8WWest.prj
Run Date and Time: 6/21/01 9:01:47 AM

Project in English units

Project Description:
Study Name: Gila Bend Area Drainage Master Plan

Study Contractors:
Engineering and Environmental Consultants, Inc. and Premier Engineering Corporation

Source of Hydrology: Gila Bend Area Floodplain Delineation Study (FCD 90-67) by Bburgess & Niple for FCDMC, March 1991

Source of Survey: Gila Bend Area Floodplain Delineation Study (FCD 90-67); new topographic mapping and survey by Cooper Aerial Mapping, Inc. 1999.

FCD
Contract number FCD 99-18
Datum: NGVD 1929

PLAN DATA

Plan Title: I-8 Wash West, Method 1
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\I-8 Wash West\I8WWest.p04

Geometry Title: I-8 Wash West
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\I-8 Wash West\I8WWest.g01

Flow Title : I-8 Wash West, FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\I-8 Wash West\I8WWest.f02

Plan Summary Information:

Number of:	Cross Sections =	6	Mulitple Openings =	0
	Culverts =	0	Inline Weirs =	0
	Bridges =	0		

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculaton tolerance =	0.01
Maximum number of interations =	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 = River-1 Reach = Reach-1

	Profile	Method	Value1	Value2
[illegible]0	PF 2	1	9959.86	10190
0.428	PF 2	1	9956.33	10190
0.332	PF 2	1	9936.43	10170
0.235	PF 2	1	9896.9	10150
0.163	PF 2	1	9975.94	10100
0.076	PF 2	1	9963.47	10090

FLOW DATA

Flow Title: I-8 Wash West, FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\I-8 Wash West\I8WWest.f02

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
I-8 West	Reach-1	0.520	3910	3910
I-8 West	Reach-1	0.428	3560	3560
I-8 West	Reach-1	0.332	2640	2640
I-8 West	Reach-1	0.235	700	700
I-8 West	Reach-1	0.163	40	40

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
I-8 West	Reach-1	PF 1	Normal S = .001	Known WS = 726.4
I-8 West	Reach-1	PF 2	Normal S = .001	Known WS = 727.4

[illegible]ETRY DATA

Geometry Title: I-8 Wash West
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\I-8 Wash West\I8WWest.g01

CROSS SECTION RIVER: I-8 West
REACH: Reach-1 RS: 0.520

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9950.14	726	9959.86	727.85	9962.64	727.43	9990.55	723.99	10000	723.82
10036.02	724.91	10083.96	726.25	10091.49	725.86	10120.29	724.65	10165.22	724.75
10190.56	724.81	10206.98	725.47	10230.84	725.61	10266.75	725.84	10339.5	726.38
10427.18	726.81	10512.95	727.38	10566.39	728.26	10591.12	727.88	10601.19	727.96
10814.71	728.91	10866.96	729.18	11018.17	728.78	11209.82	729.09	11221.63	729.19
11373.68	730.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9950.14	.04	9959.86	.04	10083.96	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9959.8 10083.96 419.19 419.19 419.19 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

CROSS SECTION RIVER: I-8 West
REACH: Reach-1 RS: 0.428

[illegible]UT
[illegible]ription:
[illegible]tion Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9931.25	723.66	9946.78	726.61	9956.33	726.75	9982.39	721.2	10002.7	722.28
10081.09	726.14	10088.46	726.03	10093.68	726.12	10298.31	725.51	10364.83	725.1[illegible]

```
10502.14  726.4410703.15  727.79 10909.8  729.2610960.38   729.611113.63   730.8
11214.09  731.0311317.46  730.7711386.86  731.2311458.21   731.9

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 [illegible]1.25     .04 9956.33     .0410081.09     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9956.3310081.09            422.65  422.65  422.65            .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: I-8 West
REACH: Reach-1             RS: 0.332

INPUT
Description:
Station Elevation Data     num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9904.53  720.12 9926.84  725.69 9936.43  725.81 9949.24  723.35 9964.45   720.5
 9978.29   721.410040.44  723.5610063.21   723.910162.31   723.6 10175.7  723.57
10355.09   725.110373.12  725.2810407.22  725.4510537.97  726.2910583.76  726.64
10604.65   726.710627.06  727.2210723.21  727.8310746.24  727.9210771.05  727.91
10791.07   727.210825.21  728.04 10855.2  728.0710909.67  728.5210925.84  728.55
10938.92   728.710995.84  728.52 11039.1  729.6511077.09  729.9111098.77  730.11
11132.28   730.311156.17  730.2711177.44  730.5811241.19  731.5511276.28  731.84
11287.65   732.1

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9904.53     .04 9936.43     .0410063.21     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9936.4310063.21            511.91  511.91  511.91            .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

[illegible]S SECTION           RIVER: I-8 West
[illegible]H: Reach-1             RS: 0.235

INPUT
Description:
Station Elevation Data     num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9886.24     724 9891.25  725.17  9896.9  725.25 9906.42     724  9934.4  723.27
 9944.98  721.18 9954.59  722.59 9964.07   723.1 9997.03  721.6710009.76  722.54
10029.69  723.3210046.72  722.67 10068.1   722.310087.84  723.2410099.23  724.22
10111.69  725.1510120.58  724.8310139.19   724.110143.63  725.2810157.46  724.28
10159.78   724.210176.84  724.3410240.79   724.6 10265.6  724.6610454.11  725.11
10571.04  725.9510655.69  726.6410801.61   727.710857.26  727.9111032.19  729.45
11058.84  729.5911244.07  732.0111256.67   732.2

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9886.24     .04  9896.9     .0410099.23     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9896.910099.23             507.5   507.5   507.5            .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: I-8 West
REACH: Reach-1             RS: 0.163

INPUT
Description:
Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9957.74  720.31 9966.94  726.32 9976.84   726.4   10002  722.2410029.05  723.96
[illegible]47.31   725.110077.57  724.7210148.54  723.4210285.29  724.5510351.83  725.07
[illegible]6.21   725.510551.27  726.9810555.12  727.0610575.42  727.1710655.42  727.61
[illegible]58.07   728.210880.91  728.7210919.48  728.7810960.97  729.4611024.01  729.93
 11160.1   730.1

Manning's n Values          num=       3
```

Sta	n Val	Sta	n Val	Sta	n Val
9957.74	.04	9976.84	.04	10047.31	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9976.84	10047.31	483.82	483.82	483.82	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

CROSS SECTION RIVER: I-8 West
REACH: Reach-1 RS: 0.076

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9907.25	723.21	9909.44	724.37	9917.11	724.4	9937.73	721.13	9945.78	719.7
9950.73	721.22	9967.47	725.91	9982.43	722.63	9985.15	721.78	10003.61	720.8
10009.94	721.31	10040.28	724.64	10081.91	723.05	10100.51	723.08	10118.34	723.4
10203.69	723.31	10225.28	723.49	10260.94	723.41	10361.77	724.01	10393.33	724.3
10406.34	724.29	10419.27	724.39	10448.64	724.82	10468.8	724.87	10587.72	725.5
10607.66	725.49	10633.83	725.65	10683.14	726.07	10760.54	726.52	10789.84	727.1
10821.52	727.21	10862.37	727.71	10912.94	728.13	10924.42	728.27	10999.45	728.6
11053.13	728.71	11091.34	728.76	11122.38	728.95	11190.96	729.58	11226.66	729.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9907.25	.04	9967.47	.04	10040.28	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9967.47	10040.28	0	0	0	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

SUMMARY OF MANNING'S N VALUES

River:I-8 West

Reach	River Sta.	n1	n2	n3
Reach-1	0.520	.04	.04	.04
Reach-1	0.428	.04	.04	.04
Reach-1	0.332	.04	.04	.04
Reach-1	0.235	.04	.04	.04
Reach-1	0.163	.04	.04	.04
Reach-1	0.076	.04	.04	.04

SUMMARY OF REACH LENGTHS

River: I-8 West

Reach	River Sta.	Left	Channel	Right
Reach-1	0.520	419.19	419.19	419.19
Reach-1	0.428	422.65	422.65	422.65
Reach-1	0.332	511.91	511.91	511.91
Reach-1	0.235	507.5	507.5	507.5
Reach-1	0.163	483.82	483.82	483.82
Reach-1	0.076	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: I-8 West

Reach	River Sta.	Contr.	Expan.
Reach-1	0.520	.1	.3
Reach-1	0.428	.1	.3
Reach-1	0.332	.1	.3

Reach-1	0.235	.1	.3
Reach-1	0.163	.1	.3
Reach-1	0.076	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	0.520	3910.00	723.82	728.33	726.93	728.46	0.00	3.56	1440.17	735.94	0
Reach-1	0.520	3910.00	723.82	729.14	727.13	729.41	0.00	4.15	935.83	230.14	0
Reach-1	0.428	3560.00	721.20	727.12		727.37	0.00	4.90	1035.39	672.18	0
Reach-1	0.428	3560.00	721.20	727.91		728.32	0.00	5.54	726.33	233.67	0
Reach-1	0.332	2640.00	720.50	726.53		726.60	0.00	2.67	1348.87	664.53	0
Reach-1	0.332	2640.00	720.50	727.48		727.59	0.00	2.80	1007.34	233.57	0
Reach-1	0.235	700.00	721.18	726.41		726.41	0.00	0.64	1428.98	740.88	0
Reach-1	0.235	700.00	721.18	727.41		727.42	0.00	0.69	1056.73	253.10	0
Reach-1	0.163	40.00	722.24	726.40		726.40	0.00	0.05	905.76	528.85	0
Reach-1	0.163	40.00	722.24	727.40		727.40	0.00	0.11	387.24	124.06	0
Reach-1	0.076	40.00	720.80	726.40	721.12	726.40	0.00	0.03	1830.92	832.65	0
Reach-1	0.076	40.00	720.80	727.40	721.63	727.40	0.00	0.08	[illegible]50	126.53	0

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
		(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	0.520	728.46	728.33	0.13	1.07	0.01		1398.54	2511.46	735.94
Reach-1	0.520	729.41	729.14	0.27	1.07	0.01		2043.88	1866.12	230.14
Reach-1	0.428	727.37	727.12	0.25	0.72	0.05		2053.69	1506.31	672.18
Reach-1	0.428	728.32	727.91	0.42	0.64	0.09		2868.52	691.48	233.67
Reach-1	0.332	726.60	726.53	0.07	0.17	0.02		1300.45	1339.55	664.53
Reach-1	0.332	727.59	727.48	0.11	0.14	0.03		1703.41	936.59	233.57
Reach-1	0.235	726.41	726.41	0.00	0.01	0.00		459.74	240.26	740.88
Reach-1	0.235	727.42	727.41	0.01	0.02	0.00		634.73	65.27	253.10
Reach-1	0.163	726.40	726.40	0.00	0.00	0.00	0.00	9.57	30.43	528.85
Reach-1	0.163	727.40	727.40	0.00	0.00	0.00	0.03	27.41	[illegible]6	124.06
Reach-1	0.076	726.40	726.40	0.00			6.05	8.14	25.82	832.65
Reach-1	0.076	727.40	727.40	0.00			0.27	27.9[illegible]		

11.76 126.53

Profile Output Table - Encroachment 1

Reach	River Sta	W.S. Elev	Prof Delta WS	E.G. Elev	Top Wdth Act	Q Left	Q Channel	Q
Enc Sta L	Ch Sta L	Ch Sta R	Enc Sta R					
		(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)
(ft)	(ft)	(ft)						
Reach-1	0.520	728.33		728.46	726.22		1398.54	2511.46
9959.86	10083.96							
Reach-1	0.520	729.14	0.81	729.41	230.14		2043.88	1866.12
9959.86	9959.86	10083.96	10190.00					
Reach-1	0.428	727.12		727.37	647.10		2053.69	1506.31
9956.33	10081.09							
Reach-1	0.428	727.91	0.79	728.32	233.67		2868.52	691.48
9956.33	9956.33	10081.09	10190.00					
Reach-1	0.332	726.53		726.60	632.63		1300.45	1339.55
9936.43	10063.21							
Reach-1	0.332	727.48	0.95	727.59	233.57		1703.41	936.59
9936.43	9936.43	10063.21	10170.00					
Reach-1	0.235	726.41		726.41	730.22		459.74	240.26
9896.90	10099.23							
Reach-1	0.235	727.41	1.00	727.42	253.10		634.73	65.27
9896.90	9896.90	10099.23	10150.00					
Reach-1	0.163	726.40		726.40	510.65	0.00	9.57	30.43
9976.84	10047.31							
Reach-1	0.163	727.40	1.00	727.40	124.06	0.03	27.41	12.56
9975.94	9976.84	10047.31	10100.00					
Reach-1	0.076	726.40		726.40	822.79	6.05	8.14	25.82
9967.47	10040.28							
Reach-1	0.076	727.40	1.00	727.40	126.53	0.27	27.97	11.76
9963.47	9967.47	10040.28	10090.00					

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
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
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PROJECT DATA
Project Title: Sauceda Wash
Project File : Sauceda1.prj
Run Date and Time: 5/13/02 2:26:00 PM

Project in English units

Project Description:
Study Name: Gila Bend Area Drainage Master Plan

Study Contractors:
Engineering and Environmental Consultants, Inc. and Premier Engineering Corporation

Source of Hydrology: Gila Bend Area Floodplain Delineation Study (FCD 90-67) by Bburgess & Niple for FCDMC, March 1991

Source of Survey: Gila Bend Area Floodplain Delineation Study (FCD 90-67); new Topographic mapping and survey by Cooper Aerial Mapping, Inc. 1999.

FCD
Contract number FCD 99-18
Datum: NGVD 1929

PLAN DATA

Plan Title: Sauceda Wash, FW Meth 1
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Sauceda Wash\Sauceda1.p05

Geometry Title: Sauceda Wash
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Sauceda Wash\Sauceda1.g02

Flow Title : Sauceda Wash, FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Sauceda Wash\Sauceda1.f01

Plan Summary Information:

Number of:	Cross Sections =	27	Mulitple Openings =	0
	Culverts =	0	Inline Weirs =	0
	Bridges =	4		

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 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 = Sauceda Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.734	PF 2	1	9928.9210144.51	
5.639	PF 2	1	9889.1310128.77	
5.551	PF 2	1	9850	10165
5.453	PF 2	1	9772.4110055.56	
5.367	PF 2	1	989010150.85	
5.270	PF 2	1	9850	10090
5.187	PF 2	1	9858.6910073.52	
5.091	PF 2	1	9890	10140
5.001	PF 2	1	9850	10180
4.909	PF 2	1	9820	10260
4.821	PF 2	1	9780	10120
4.728	PF 2	1	9772	10230
4.640	PF 2	1	9750	10300
4.543	PF 2	1	9010	10700
4.497	PF 2	1	9010	10775
4.482	PF 2	1	9010	10775
4.457	PF 2	1	9945	10300
4.364	PF 2	1	9880	10250
4.270	PF 2	1	9880	10200
4.184	PF 2	1	9825	10200
4.129	PF 2	1	9800	10200
4.119	PF 2	1	9900	10060
4.107	PF 2	1	9940	10043
4.090	PF 2	1	9940	10045
4.088	PF 2	1	9940	10042
4.079	PF 2	1	9925	10060
4.077	PF 2	1	9920	10060
4.062	PF 2	1	9930	10060
4.055	PF 2	1	9940	10055
4.045	PF 2	1	9940	10058
4.011	PF 2	1	9948	10080

FLOW DATA

Flow Title: Sauceda Wash, FW Meth 1
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Sauceda Wash\Sauceda1.f01

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
Sauceda	Reach-1	5.734	5690	5690
Sauceda	Reach-1	4.543	8720	8720
Sauceda	Reach-1	4.129	4670	4670

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Sauceda	Reach-1	PF 1	Normal S = .004	Normal S = .0057
Sauceda	Reach-1	PF 2	Normal S = .004	Known WS = 722.39

GEOMETRY DATA

Geometry Title: Sauceda Wash
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Sauceda Wash\Sauceda1.g02

CROSS SECTION RIVER: Sauceda
REACH: Reach-1 RS: 5.734

INPUT
Description:

```
Station Elevation Data     num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9785.66   774.7 9793.44  774.41  9805.7  772.65 9809.98  772.26 9814.08  772.52
  9816.5     772 9857.28   765.9 9869.24  764.61 9943.23  765.01 9970.24  762.33
 9980.82   762.2   10000 761.7410002.29  761.6810018.62  763.1410022.27  763.34
10171.86  765.810190.95 766.0310214.55   767.210232.44  767.1910256.24   766.3
10277.29  764.410297.85 765.7610329.77  766.1610339.25  766.6710346.52  767.23
10401.32  769.710426.32 771.0110432.88  770.7210438.77  770.82 10455.8  770.73
10498.95  771.710507.74 772.1510580.05  773.3210614.84  772.24 10627.2  772.01
10679.78  770.510700.95 769.8510735.65  769.6710835.22   770.310997.15   769.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9785.66    .035 9943.23     .0610022.27     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.2310022.27               480  501.25     500              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 5.639

INPUT
Description:
Station Elevation Data     num=      67
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8473.23   768.6 8491.84  768.54 8492.83  768.59 8522.74  768.74 8639.07   769.2
 8647.99   769.2 8663.38   769.4 8670.76  769.36 8696.34  768.88 8742.18  769.51
 8775.15   767.2 8823.92  767.72 8856.86  767.89 8871.94  768.01 8922.94   767.8
 8973.86   767.5 8992.49  766.55 9011.13  767.46  9023.8  768.01 9078.57  767.79
 9097.92   767.7 9242.22  768.34 9293.05  768.48 9315.42  768.38 9505.13  766.99
 9508.92     767 9541.28  767.49 9589.63  767.33 9592.38  767.36 9611.03  767.13
 9704.94   766.4 9708.22  765.98 9734.38  763.39 9752.06  763.96 9801.33  765.21
 9812.23   765.7 9842.64  765.93 9852.82  765.95 9874.02  762.96  9883.3  762.64
 9910.94   760.8 9915.82  760.51 9928.17  761.61 9951.26  761.02 9969.15  760.99
 9994.17   759.3   10000 759.9110021.28  762.2210067.67  762.36 10134.5  762.29
10181.36     763 10196.1  763.4110200.33  764.1810215.29  766.5810228.03  765.03
10244.96  766.110309.58  769.8210319.21   770.310369.34  769.3410429.63   768.7
10484.93  768.3 10500.2  768.3110571.07  768.7510601.69  769.35 10624.3  769.61
10638.49  769.610645.93  769.43

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8473.23    .035  9883.3     .0610067.67     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9883.310067.67               480  462.42     450              .1       .3

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 5.551

INPUT
Description:
Station Elevation Data     num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9518.35  765.35  9572.2  765.18 9599.52   765.1 9632.47  765.14 9647.96  764.89
  9718.1  764.39 9729.66  764.32 9737.43   763.5 9755.07  761.77 9759.52  761.94
 9773.84  763.06 9787.36  763.52 9795.96   763.5 9807.93  761.95 9817.39  761.51
 9827.19  761.41 9844.87  761.43 9924.63   762.5 9947.53  762.82 9957.45  761.47
 9981.69  757.21 9986.91  757.2710006.92   759.310031.88  762.1310051.66  761.36
10075.21   761.810087.33  760.0110099.05   760.8 10110.5  760.8210152.77  761.56
10182.79  761.0610200.27  761.9410217.16   763.110311.62   765.2

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9518.35    .035 9947.53     .0610031.88     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9947.5310031.88               470  520.31     510              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F
```

CROSS SECTION RIVER: Sauceda
REACH: Reach-1 RS: 5.453

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9418.27	764.19	9420.92	764.11	9470.84	762.6	9476.02	762.5	9501.69	763.3
9610.47	762.77	9661.4	762.16	9673.43	762.1	9679.25	761	9704.04	757.44
9742.92	757.78	9788.73	758.39	9804.86	758.7	9811.23	758.95	9822.82	760.37
9840.66	760.87	9973.65	759.59	10001.04		75310003.36	753.57	10029.93	759.19
10070.7	759.63	10073.13	759.42	10090.65	757.31	10101.09	758.68	10103.46	759.09
10115	758.85	10121.49	759.03	10129.03	759.1	10143.8		75810146.71	758.4
10160.73	759.34	10168.4	759.44	10181.47	760.11	10206.24	761.45	10230.7	762.66
10269.27	765.84	10324.36	765.82	10367.31	765.61	10463.98	765.47	10482.25	765.43
10493.5	765.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9418.27	.035	9973.65	.06	10029.93	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9973.65	10029.93	440	451.93	460	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

CROSS SECTION RIVER: Sauceda
REACH: Reach-1 RS: 5.367

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9503.11	760.17	9596.88	760.13	9791.57	759.8	9818.07	759.7	9828.21	757.99
9837.13	755.65	9847.88	755.6	9857	755.86	9911.56	756.3	9913.18	756.54
9960.36	757.27	9990.97	752.06	10000	753.23	10016.05	755.3	10023.73	756.57
10035.94	756.56	10068.37	756.68	10094.86	755.69	10111.83	755.1	10149.1	756.04
10184.28	756.84	10195.98	758.58	10207.47	759.45	10235.87	760.9	10240.66	761.32
10250.39	761.13	10280.31	761.32	10304.59	761.69	10315.58	762.11	10352.75	763.2
10371.29	763.26	10398.47	763.55	10406.96	763.58	10432.9	764.7	10463.93	766.24
10502.11	766.49								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9503.11	.035	9960.36	.06	10023.73	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9960.36	10023.73	500	502.05	440	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

CROSS SECTION RIVER: Sauceda
REACH: Reach-1 RS: 5.270

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8446.06	760.3	8454.55	759.99	8506.64	759.71	8662.95	758.17	8690.19	758.41
8773.98	758.4	8863.58	757.33	8892.17	757.27	8912.36	757.29	9044.81	757.51
9064.21	757.5	9105.28	757.55	9264.84	758	9296.26	757.74	9312.89	757.55
9430.39	755.8	9449.13	755.32	9470.94	756.24	9477	756.06	9637.7	756.26
9666.11	756.3	9837.84	754.63	9843.2	753.82	9845.02	753.95	9865.12	751.8
9872.12	752.2	9882.75	752.35	9927.84	755.82	9948	755.92	9959.38	753.79
9992.74	748.4	10000.31	749.41	10007.05	750.5	10039.22	753.96	10052.87	754.48
10079.53	755.8	10127.63	756.71	10174.62	758.63	10195.48	760.26	10222.88	761.78
10269.11	761.2	10277.95	761.19	10301.9	761.68	10359.1	763.1	10388.47	761.98
10416.93	761.1	10464.8	759.74	10490.7	761.06	10548.52	762.76	10572.69	762.54
10606.04	762.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8446.06	.035	9948	.06	10079.53	.04

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          994810079.53              450  449.44     430              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 5.187

INPUT
Description:
Station Elevation Data     num=      55
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8505.59     757 8563.88  756.99 8629.01  756.87 8764.08  756.58 8949.75  754.84
 8964.29   754.8 8979.44   754.7 9146.27   754.8 9164.49  754.89 9332.81  756.26
  9364.7   756.6 9417.55  756.68 9481.57  756.92 9501.81  756.94 9508.05  756.89
 9532.28   756.5  9564.9  756.24 9681.07  754.05 9704.05  753.58 9711.59  752.35
 9724.43   749.9 9735.54  752.39 9741.52  753.94  9746.7  753.81 9868.54  753.41
 9904.37     749 9927.89  748.83 9943.68  748.89 9960.11  750.96 9964.85  751.68
 9979.61   752.8 9984.04   751.610000.53  746.9310026.68  752.5910041.54  752.66
10074.05   752.710209.65  753.6310254.48  753.5510274.38  753.4510281.42  753.29
10330.28   755.310357.25  755.2910378.87   755.710420.14   756.610444.36  756.69
10465.18   757.410510.83  758.0710541.05  758.9110592.25  759.9210602.92  760.19
10639.04   760.510674.67  761.1310687.77  761.0610708.08  761.9310732.98  761.88

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8505.59    .035 9868.54     .0610026.68     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9868.5410026.68              510  509.24     490              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 5.091

INPUT
Description:
Station Elevation Data     num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9338.67   753.5  9455.3  753.67 9527.44  753.34 9555.15  752.61 9607.82   752.9
 9677.16   752.7 9704.92  752.51 9858.64  751.54 9877.19  751.17 9910.01  750.24
 9918.16   750.3 9935.85  749.73 9944.88  749.53 9959.17  748.01 9997.38  744.49
   10000   744.710018.98  746.56 10033.3   748.110061.84  747.8510157.15  749.41
10226.11   750.6 10241.4  749.9810270.37  750.4110282.57  750.6310373.19  754.38
10403.27   755.510476.39  755.9710487.28  756.12   10526  756.1710542.74  756.95
10586.94   758.710625.11  757.6310666.15  756.4410686.86  755.8910700.14  754.63
 10706.7   754.210712.33  754.2310741.41  754.8410784.29  754.65 10796.1  754.52
10808.61   754.310830.37  754.1510873.14  754.6410891.46   754.110907.68  754.65
10942.66     75610996.42  757.9511003.91  757.9811007.86  758.2911013.01  758.09
11044.98   757.911064.43  757.9311080.79  757.61

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9338.67    .045 9959.17     .05 10033.3    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.17 10033.3              430  474.23     460              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 5.001

INPUT
Description:
Station Elevation Data     num=      56
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9007.26   750.3 9108.59  749.88  9221.6  749.63 9284.09  749.72 9312.89  749.89
 9329.42   749.8 9337.72  749.85  9405.1  749.62 9463.14   749.4 9485.82  749.36
 9511.89   749.2 9537.46  749.22  9707.6  748.34  9720.9  748.32 9766.16  749.09
 9804.59   749.7 9812.89  749.11 9837.66  746.82 9860.93  747.94 9867.72  748.13
 9905.29   748.6 9938.28  748.08  9955.1  747.41 9977.15  745.41 9999.62  743.44
```

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10034.22   748.410040.79   749.210044.74   748.910061.29   746.410080.33  747.26
 10103.6   748.210115.34  748.3810133.14  748.4110154.94  748.8710212.54  749.83
10246.45   749.810299.49  749.51 10316.8  749.5410456.43  749.6310517.37  749.37
 10533.5   749.210588.46  749.3210718.89   749.810738.27  750.23   10759  750.32
 10795.5   750.810823.48  750.7910832.27  750.7110873.17  750.7410879.88   750.9
10933.19   752.410961.03  753.1410986.69  754.06 11035.9  755.1911094.99  756.23
11123.72   756.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9007.26    .045 9938.28     .0510040.79    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9938.2810040.79               480  481.92     490              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 4.909

INPUT
Description:
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9149.24  749.68 9178.42  748.37 9275.25   748.3 9284.23   748.3 9299.94   748.1
  9349.5  748.11 9443.64  748.23 9487.09  748.47 9520.09  748.45 9534.68   748.1
 9550.28  747.74 9571.44  746.82 9585.34  746.15 9726.13  746.61 9752.01     744
 9781.41  746.58  9813.4  746.41 9862.05  745.92 9887.13  745.61 9904.34   744.5
 9915.03  744.83 9924.28  746.26 9955.97  745.95 9966.13  746.07 9987.08   741.5
 9999.01  738.7910004.42  740.2710029.01745.897910036.84  747.6910131.67  746.45
10151.49   746.110168.07  746.22 10251.4  746.7910356.45  746.7410553.01  745.39
10585.69   746.110594.87  746.1610646.61  747.0710735.51   748.510751.78  748.85
 10758.9   748.910783.29  749.5310862.62  751.6910934.27  750.6310948.88  751.42
10976.55   751.910999.29  752.0311099.47  752.74 11109.4  753.6711115.24  753.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9149.24    .045 9966.13     .0510029.01    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.1310029.01               450  469.21     450              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 4.821

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9632.67  747.52  9665.5  747.53 9689.91   747.6 9742.17  744.03 9792.36  744.12
 9815.29  742.87 9820.45  743.12 9839.64   744.3 9862.31  743.98 9906.65  743.39
 9981.34  742.57 9994.03  738.1610017.92   740.5 10044.3  743.4210098.35  743.66
10109.85  743.6510164.78  744.7410188.97   744.610232.81   745.110285.73  746.47
10295.13  746.4410303.67  746.2510345.68   745.6 10364.4  745.1910447.41   742.4
10521.97  742.8410529.34  742.8410634.65   742.510676.78  743.1910717.02  744.39
10726.64  744.4110741.68  744.0910906.96   745.610929.09  745.9210977.49  747.02
11130.34  750.6511219.85   749.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9632.67    .045 9981.34      .05 10044.3    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.34 10044.3               500  486.92     475              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 4.728
```

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9745.95	745.65	9758.46	742.79	9773.58	739.88	9774.95	739.08	9808.01	737.9
9822.28	737.59	9869.05	737.75	9945.61	737.6475	9981.15	737.6	9993.45	736.43
10002.04	737.210014.26	738.265110059.86	742.2410066.67	740.9910085.07	737.14				
10121.25	737.1510145.69	737.210194.73	737.7210201.25	737.8210248.16	739.63				
10271.87	739.4610351.15	739.510366.42	739.7910374.24	740.1710401.44	739.95				
10420.82	740.2410497.37	740.910525.02	740.7610535.87	740.8810547.41	741.13				
10578.47	741.3110733.54	743.810778.58	744.2210927.28	747.6110978.69	748.26				
11003.18	747.7711060.98	748.511152.81	749.14						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9745.95	.045	9945.61	.0510014.26	.045	

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945.6110014.26		450	465.06	420	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

CROSS SECTION RIVER: Sauceda
REACH: Reach-1 RS: 4.640

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8099.28	743.55	8184.31	741.42	8213.62	740.48	8417.27	740.7	8507.66	738.93
8541.45	738.8	8570.38	738.67	8609.15	738.1	8626.26	738.06	8638.09	738.5
8653.25	738.1	8701.83	738.29	8750.23	739.19	8817.46	739.92	8831.43	739.92
8984.88	739.1	9023.89	739.28	9066.81	739.27	9218.57	738.71	9348.84	739.22
9418.42	739.8	9558.33	741.81	9618.71	742.12	9637.15	742.36	9793.26	742.87
9798.95	742.8	9806.84	741.4	9830.05	737.62	9835.47	737.03	9860.18	737.55
9881.45	737.98	9894.39	738.33	9906.35	738.55	9915.31	738.96	9926.94	737.53
9953.33	734.88	9980.11	734.21	10000	734.1910005.79		734.2610024.89		736.01
10058.16	739.5510080.88		734.85	10085.3	734.0710161.19		734.38	10190.1	734.93
10202.42	735.310233.34		735.4910296.01		735.8210315.69		741.1810323.72		743.02
10330.3	745.8	10354.9	745.5910366.85		749.7810373.62		749.310410.32		750.5
10418.67	749.610433.37		751.77						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8099.28	.045	9915.31	.0510058.16	.045	

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9915.3110058.16		420	515.76	450	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

CROSS SECTION RIVER: Sauceda
REACH: Reach-1 RS: 4.543

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7710.93	738.3	7773.91	739.41	7792.37	739.86	7820.82	739.55	7929.1	738.54
7932.23	738.3	7954.1	736.12	7982.29	736.48	7991.37	736.84	8028.3	737.16
8042.16	736.8	8050.4	739.31	8055.5	740.19	8065.9	740.28	8187.44	739.45
8213.94	739.6	8234.72	739.52	8239.5	739.37	8369.97	738.14	8381.27	737.77
8399.66	737.7	8414.06	737.76	8428.18	737.58	8442.15	737.18	8567.12	737.77
8582.7	737.7	8616.03	738.09	8634.75	738.61	8645.14	738.34	8763.69	737.68
8771.71	737.5	8808.88	737.42	8826.7	737.56	8939.69	736.41	8955.58	736.11
9003.65	736.1	9041.07	736.13	9056.27	736.36	9085.45	736.94	9096.27	736.99
9104.33	737.2	9144.57	737.55	9195.38	737.88	9237.08	738.67	9299.21	739.13
9357.99	739.4	9430.28	739.22	9476.71	739.23	9563.63	739.37	9587.89	739.05
9611.49	738.5	9673.05	738.06	9732.67	737.27	9756.13	736.57	9760.62	736.7
9767.28	736.5	9783.22	737.46	9799.91	737.04	9811.76	737.33	9819.21	737.12
9822.54	737.2	9832.99	737.23	9848.07	737.29	9861.67	737.56	9877.09	738.16
9897.73	736.5	9912.36	735.49	9947.79	732.05	9974.21	730.46	9993.84	729.98
10000	729.710032.35		731.0110036.68		731.4410042.48		732.2910072.73		735.58
10095.35	735.610108.81		734.7810133.08		732.5710162.73		730.8310167.36		730.5

```
10179.72     73010208.83  732.2410231.86  732.9810244.58  733.6210250.75  733.84
10267.68   733.910291.39   733.110330.62  732.7710347.75  732.7610391.68  732.96
10404.78   733.2 10461.4  733.5710474.14  733.7310488.78  733.8110519.25  737.62
10531.64   739.810557.49  740.5110614.86  739.6410633.65  738.8910733.63  742.52
10775.14   743.710783.73  744.15

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 7710.93    .045 9912.36     .0510072.73    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9912.3610072.73               140     135     220              .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 4.497

INPUT
Description: GBC, concrete lined spillway
Station Elevation Data     num=       30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    7925  741.62    8132  741.77    8336  741.42    8547  741.17    8747  740.94
    8948   741.2    9174  741.66    9377  741.91    9578  741.82    9784  742.92
    9948  743.33  9957.1 742.849    9976  741.85    9990  727.92   10000   727.9
   10011  727.8510030.45742.8359   10032  744.03   10056   744.6   10168  742.47
   10274  741.82   10493  741.99   10702  742.05   10906  742.09   11113  742.12
   11324  741.78   11527  742.15   11728  742.37   11936  741.91   12160  741.91

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    7925     .03  9957.1    .01810030.45     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.110030.45                80      80      80              .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 4.482

INPUT
Description: d/s x-xection of GBC.
Station Elevation Data     num=       30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    7925  741.62    8132  741.77    8336  741.42    8547  741.17    8747  740.94
    8948   741.2    9174  741.66    9377  741.91    9578  741.82    9784  742.92
    9948  743.33  9957.1 742.849    9976  741.85    9990  727.92   10000   727.9
   10011  727.8510030.45742.8359   10032  744.03   10056   744.6   10168  742.47
   10274  741.82   10493  741.99   10702  742.05   10906  742.09   11113  742.12
   11324  741.78   11527  742.15   11728  742.37   11936  741.91   12160  741.91

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    7925     .03  9957.1    .01810030.45     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.110030.45               220     220     160              .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 4.457

INPUT
Description:
Station Elevation Data     num=       40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8415.35   736.2 8592.41  735.58 8751.65  735.82 8779.51  735.77 8835.64   736.1
 8990.74   736.3 9123.82  736.66 9166.21  736.78 9179.55   736.9 9191.95  737.15
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 9218.34   736.9 9379.28  738.52 9386.72  738.57  9394.8  738.39 9556.85  735.53
 9573.37   735.4 9593.36  736.11 9611.89  735.09 9621.09  735.07 9736.84  734.03
 9759.36   733.8 9765.31  733.66 9818.49  732.33 9918.05     732 9935.94  731.78
 9965.59   725.9   10000  726.2110019.66  726.1510037.83  731.1410064.02  730.93
10180.47  730.4710213.83  730.2110225.71  730.2510389.14  730.04 10415.5   730.3
10471.05   731.310597.98  733.2910687.96  733.4410728.36  733.5810737.19  733.75

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 8415.35    .035 9935.94     .0510037.83     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9935.9410037.83               480  490.78     500              .3       .5

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 4.364

INPUT
Description:
Station Elevation Data     num=       36
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 8201.22   736.6 8216.39  736.03 8269.31  734.09 8426.69  734.58 8472.45  734.79
 8504.38   734.5  8675.6   732.6 8805.87  731.93 8848.83  732.98 8878.75  733.58
  9021.7   733.4 9081.89  734.12 9194.14  734.87 9285.04  735.28 9418.57  736.03
 9431.88   736.1 9460.37   736.3 9468.01     736 9644.71  734.02 9679.53  734.16
 9824.46   731.2 9894.48  729.27 9944.26  729.03 9964.12  728.96 9983.26  723.51
10043.12   724.510058.17  729.7610069.78  729.2210097.67  728.1210228.35  728.44
10300.92   728.910400.47  729.3210504.16  729.4110653.63  731.11 10744.7  731.78
10910.65   731.5

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 8201.22    .035 9964.12     .0510058.17     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.1210058.17               490  496.32     480              .1       .3

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 4.270

INPUT
Description:
Station Elevation Data     num=       37
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9351.77   733.3 9368.62  733.18 9472.74  733.15 9498.98   733.9 9532.14  733.55
 9554.77   733.1 9606.39  732.74 9757.77  732.03 9915.79  728.33 9950.92   727.5
 9966.94   721.6   10000  721.6810028.14  721.7610044.93  727.9610076.23  727.76
10145.63   726.710181.29  726.2610207.25  726.0310224.82  726.01 10364.3  727.12
10554.58   729.610574.71  729.7210643.26  729.3810744.25  728.9510767.57  728.79
 10932.2   729.3 10969.2  729.2411110.94  727.8211170.83  727.3611289.68  727.48
11372.47   727.511569.95  728.4811585.79  728.6211698.41  728.4111775.73  728.73
11825.92   729.211977.37  730.15

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9351.77    .035 9950.92     .0510044.93     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9950.9210044.93               450  454.08     450              .1       .3
Ineffective Flow      num=        2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 4.184

INPUT
Description:
Station Elevation Data     num=       39
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 9489.31  729.87 9548.42   729.9 9552.51  729.88 9627.78  729.21 9700.83  729.09
 9792.85  727.71 9830.11   726.2 9899.92  725.21 9944.03  724.83 9967.29  719.79
   10000  719.16 10020.8  718.810041.89  725.1410068.25   724.710071.02  724.56
10156.59  724.4710205.68   724.610235.82  724.5510399.26  725.3210439.06  725.53
10481.14  726.2510510.24   726.710525.24  727.5710536.16   728.410553.61  728.14
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10642.29  727.8610743.55   727.210845.52  726.7810992.43  725.0611048.75  724.94
11087.85  724.6611252.75   724.811304.37  724.8511432.15   724.811455.22  724.75
11517.45  725.1811586.31   725.711638.92  726.1311739.62   725.2

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9489.31    .035 9944.03     .0510041.89     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9944.0310041.89               280   290.4     300              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 4.129

INPUT
Description:
Station Elevation Data    num=      82
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9457.27   729.9 9469.75  729.91 9482.91   730.1 9500.56  729.89 9523.27   729.9
 9543.37   729.8 9571.13   729.1 9574.48  729.07 9602.82  727.53 9628.13  727.26
 9667.87   726.3  9760.1  725.88 9763.77  725.84 9780.38  726.23 9804.05  723.48
 9809.08   723.2 9811.16  723.23 9834.93  721.46 9846.26  722.73 9852.63  723.03
 9881.43   725.7 9896.78  726.56 9900.03  726.81 9915.74  725.27 9941.12  722.85
 9962.85  717.25 9968.56   717.1   10000   717.110027.24  717.2510034.77   717.3
 10046.5   726.410049.37  726.21 10065.2   721.910086.03  722.2210108.07  721.96
 10110.9   722.110126.19  722.2510152.29  722.4310197.86   723.410209.89  723.61
10226.86   723.710243.16   723.810253.34  723.9610289.03  724.2410298.91   724.5
10307.32   724.510313.33  724.7110336.11  724.82 10360.8  724.7110387.92   724.8
10403.05   724.910446.23  725.2810468.32  725.3710480.98  725.5210527.13   725.7
10539.44     72610548.77  726.0610569.22  725.7510594.76   725.910621.52  726.08
10638.16   726.310664.37  726.17   10704  726.2110749.51  726.2410761.61   726.2
10807.28   726.210844.79  726.2610847.23   726.210869.82  726.2610875.01  726.13
10890.45   724.910891.96  724.8810910.04  725.9610934.36  725.6910979.93  725.33
11072.04   725.411085.41  725.43   11141  725.15   11223  724.93   11326  724.66
   11405  724.04   11510  723.71

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9457.27    .035 9915.74     .05 10046.5     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9915.74 10046.5               110  116.16     110              .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

BRIDGE                  RIVER: Sauceda
REACH: Reach-1             RS: 4.119

INPUT
Description: Railroad
Distance from Upstream XS =      50
Deck/Roadway Width        =      15
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      14
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    7918  729.66            8418  729.46            8918  729.61
    9418  729.65            9963  729.23  725.06  9989.6   729.2  725.06
   10000   729.2  725.06  10036  729.18  725.06   10448  728.56
   10949  727.68           11228   727.2           11448  726.96
   11948  726.39           12448  725.92

Upstream Bridge Cross Section Data
Station Elevation Data    num=      82
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9457.27   729.9 9469.75  729.91 9482.91   730.1 9500.56  729.89 9523.27   729.9
 9543.37   729.8 9571.13   729.1 9574.48  729.07 9602.82  727.53 9628.13  727.26
 9667.87   726.3  9760.1  725.88 9763.77  725.84 9780.38  726.23 9804.05  723.48
 9809.08   723.2 9811.16  723.23 9834.93  721.46 9846.26  722.73 9852.63  723.03
 9881.43   725.7 9896.78  726.56 9900.03  726.81 9915.74  725.27 9941.12  722.85
 9962.85  717.25 9968.56   717.1   10000   717.110027.24  717.2510034.77   717.3
```

```
 10046.5   726.410049.37  726.21 10065.2   721.910086.03  722.2210108.07  721.96
 10110.9   722.110126.19  722.2510152.29  722.4310197.86   723.410209.89  723.61
10226.86   723.710243.16   723.810253.34  723.9610289.03  724.2410298.91   724.5
10307.32   724.510313.33  724.7110336.11  724.82 10360.8  724.7110387.92   724.8
10403.05   724.910446.23  725.2810468.32  725.3710480.98  725.5210527.13   725.7
10539.44     72610548.77  726.0610569.22  725.7510594.76   725.910621.52  726.08
10638.16   726.310664.37  726.17   10704  726.2110749.51  726.2410761.61   726.2
10807.28   726.210844.79  726.2610847.23   726.210869.82  726.2610875.01  726.13
10890.45   724.910891.96  724.8810910.04  725.9610934.36  725.6910979.93  725.33
11072.04   725.411085.41  725.43   11141  725.15   11223  724.93   11326  724.66
   11405  724.04   11510  723.71

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9457.27    .035 9915.74     .05 10046.5     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9915.74 10046.5             .3       .5
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
888        F

Downstream  Deck/Roadway Coordinates
    num=      14
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    7918  729.66            8418  729.46            8918  729.61
    9418  729.65            9963  729.23  725.06  9989.6   729.2  725.06
   10000   729.2  725.06   10036  729.18  725.06   10448  728.56
   10949  727.68           11228   727.2           11448  726.96
   11948  726.39           12448  725.92

Downstream Bridge Cross Section Data
Station Elevation Data     num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9844.6  728.62 9869.25   728.4    9896  728.27 9912.46726.6558 9944.64   723.5
 9947.44  720.68 9953.96   717.4 9975.01   716.9 9992.76     71710019.77   717.2
 10030.2  717.2510043.06726.658510043.54  727.0110049.55   727.410066.65  727.45

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
  9844.6    .035 9912.46     .0510043.06     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9912.4610043.06             .3       .5
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

Upstream Embankment side slope              =       2 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  4

Pier Data
Pier Station     Upstream=  9977.5    Downstream=  9977.5
Upstream     num=       2
    Width   Elev    Width   Elev
        2    717        2  730.1
Downstream     num=       2
    Width   Elev    Width   Elev
        2    717        2  730.1

Pier Data
Pier Station     Upstream=  9992.5    Downstream=  9992.5
Upstream     num=       2
    Width   Elev    Width   Elev
        2  717.25        2  730.1
Downstream     num=       2
    Width   Elev    Width   Elev
        2  717.25        2  730.1
```

```
Pier Data
Pier Station     Upstream= 10007.5    Downstream= 10007.5
Upstream     num=       2
    Width   Elev    Width   Elev
       2  717.25       2   730.1
Downstream     num=       2
    Width   Elev    Width   Elev
       2  717.25       2   730.1

Pier Data
Pier Station     Upstream= 10022.5    Downstream= 10022.5
Upstream     num=       2
    Width   Elev    Width   Elev
       2  717.25       2   730.1
Downstream     num=       2
    Width   Elev    Width   Elev
       2  717.25       2   730.1

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
       Yarnell                 KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION          RIVER: Sauceda
REACH: Reach-1            RS: 4.107

INPUT
Description:
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9844.6  728.62 9869.25   728.4    9896  728.27 9912.46726.6558 9944.64   723.5
 9947.44  720.68 9953.96   717.4 9975.01   716.9 9992.76     71710019.77   717.2
 10030.2  717.2510043.06726.658510043.54  727.0110049.55   727.410066.65  727.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9844.6    .035 9912.46     .0510043.06     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9912.4610043.06                90   89.76      90              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION          RIVER: Sauceda
REACH: Reach-1            RS: 4.090

INPUT
Description:
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9799.44   727.5 9814.74  727.37 9910.01  726.88 9912.52726.4259 9940.63  721.34
 9970.11  716.98 9992.52   717.210032.08  718.0610044.56   724.210047.24  726.38
10072.85  726.3310083.24   726.110125.69  724.4310152.59   724.810170.99  725.19

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9799.44    .035 9912.52     .0510047.24     .03
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9912.5210047.24                58   58.08      58              .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888       F
888       F

BRIDGE                    RIVER: Sauceda
REACH: Reach-1               RS: 4.088

INPUT
Description: Frontage Road
Distance from Upstream XS =       10
Deck/Roadway Width        =     26.9
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=       8
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    6827     732            7235     728            8749     728
    9575     728           9957.2   726.9  724.01   10000   726.8  724.01
 10042.8   726.7  724.01   10983     724

Upstream Bridge Cross Section Data
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9799.44   727.5 9814.74  727.37 9910.01  726.88 9912.52726.4259 9940.63  721.34
 9970.11  716.98 9992.52   717.210032.08  718.0610044.56   724.210047.24  726.38
10072.85  726.3310083.24   726.110125.69  724.4310152.59   724.810170.99  725.19

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9799.44    .035 9912.52     .0510047.24     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
      9912.5210047.24              .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888       F
888       F

Downstream  Deck/Roadway Coordinates
    num=       8
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    6827     732            7235     728            8749     728
    9575     728           9957.2   726.9  724.01   10000   726.8  724.01
 10042.8   726.7  724.01   10983     724

Downstream Bridge Cross Section Data
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8557.04   728.5  8657.4  728.38 8753.81  728.26  8857.3  728.15 8913.93  728.09
 8977.08   728.1 9034.15  728.03 9114.28  727.98 9176.76  727.97 9234.36  727.93
 9296.68   727.9 9354.44  727.87  9416.6  727.86 9484.43  727.82 9656.65   727.5
 9736.71   727.3 9794.29  727.14 9822.34  727.07 9834.35  726.99 9856.77  726.94
 9874.46   726.8 9896.65  726.77 9914.58  726.64 9926.52   726.6 9927.27725.1215
 9931.39     717  9947.4     716  9949.4     716 9950.35  715.58 9975.92  716.08
10024.58  717.27 10029.9   721.510034.32 725.15910035.36  726.02 10038.4  726.53
10057.03  726.53 10078.4  726.48   10451   725.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8557.04    .035 9927.27     .0510034.32     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
      9927.2710034.32              .3        .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
```

Weir crest shape = Broad Crested

Number of Piers = 3

Pier Data
Pier Station Upstream= 9978 Downstream= 9978
Upstream num= 2

Width	Elev	Width	Elev
2	716.09	2	724.01

Downstream num= 2

Width	Elev	Width	Elev
2	716.09	2	724.01

Pier Data
Pier Station Upstream= 9998.85 Downstream= 9998.85
Upstream num= 2

Width	Elev	Width	Elev
1.5	716.09	1.5	724.01

Downstream num= 2

Width	Elev	Width	Elev
1.5	716.09	1.5	724.01

Pier Data
Pier Station Upstream= 10020.1 Downstream= 10020.1
Upstream num= 2

Width	Elev	Width	Elev
1.5	716.09	1.5	724.01

Downstream num= 2

Width	Elev	Width	Elev
1.5	716.09	1.5	724.01

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
Yarnell KVal = .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd = .8
Max Low Cord =

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION RIVER: Sauceda
REACH: Reach-1 RS: 4.079

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8557.04	728.5	8657.4	728.38	8753.81	728.26	8857.3	728.15	8913.93	728.09
8977.08	728.1	9034.15	728.03	9114.28	727.98	9176.76	727.97	9234.36	727.93
9296.68	727.9	9354.44	727.87	9416.6	727.86	9484.43	727.82	9656.65	727.5
9736.71	727.3	9794.29	727.14	9822.34	727.07	9834.35	726.99	9856.77	726.94
9874.46	726.8	9896.65	726.77	9914.58	726.64	9926.52	726.6	9927.27	725.1215
9931.39	717	9947.4	716	9949.4	716	9950.35	715.58	9975.92	716.08
10024.58	717.27	10029.9	721.51	10034.32	725.159	10035.36	726.02	10038.4	726.53
10057.03	726.53	10078.4	726.48	10451	725.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8557.04	.035	9927.27	.051	10034.32	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9927.27	10034.32	89.87	89.87	89.87	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent

888 F

BRIDGE RIVER: Sauceda
REACH: Reach-1 RS: 4.077

INPUT
Description: I-8, East Bound Lane
Distance from Upstream XS = 10
Deck/Roadway Width = 45
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 26

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
7981	728.81		8230	728.55		8440	728.33	
8652	728.35		8869	728.08		9088	727.85	
9307	727.52		9524	727.4		9740	727.05	
9956	726.48		9956.9	726.49	724.43	10000	726.51	724.43
10043.1	726.53	724.43	10167	726.61		10376	726.75	
10587	726.64		10796	726.51		11009	726.12	
11229	725.83		11452	725.45		11676	725.04	
11901	724.78		12121	724.48		12335	724.21	
12548	723.8		12758	723.48				

Upstream Bridge Cross Section Data
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8557.04	728.5	8657.4	728.38	8753.81	728.26	8857.3	728.15	8913.93	728.09
8977.08	728.1	9034.15	728.03	9114.28	727.98	9176.76	727.97	9234.36	727.93
9296.68	727.9	9354.44	727.87	9416.6	727.86	9484.43	727.82	9656.65	727.5
9736.71	727.3	9794.29	727.14	9822.34	727.07	9834.35	726.99	9856.77	726.94
9874.46	726.8	9896.65	726.77	9914.58	726.64	9926.52	726.6	9927.27	725.1215
9931.39	717	9947.4	716	9949.4	716	9950.35	715.58	9975.92	716.08
10024.58	717.27	10029.9	721.5	10034.32	725.159	10035.36	726.02	10038.4	726.53
10057.03	726.53	10078.4	726.48	10451	725.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8557.04	.035	9927.27	.051	10034.32	.03

Bank Sta: Left	Right	Coeff Contr.	Expan.
9927.27	10034.32	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

Downstream Deck/Roadway Coordinates
num= 26

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
7981	728.81		8230	728.55		8440	728.33	
8652	728.35		8869	728.08		9088	727.85	
9307	727.52		9524	727.4		9740	727.05	
9956	726.48		9956.9	726.49	724.43	10000	726.51	724.43
10043.1	726.53	724.43	10167	726.61		10376	726.75	
10587	726.64		10796	726.51		11009	726.12	
11229	725.83		11452	725.45		11676	725.04	
11901	724.78		12121	724.48		12335	724.21	
12548	723.8		12758	723.48				

Downstream Bridge Cross Section Data
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9874.12	724.76	9902.41	725	9907.06	724.75	9940.13	724.12	9940.34	723.7945
9944.71	717.02	9960.45	716.99	9968.2	717.11	10004.49	717	10042.22	717.43
10053.29	723.842	10055.53	725.141	10058.19	725.26				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9874.12	.03	9940.34	.051	10053.29	.03

Bank Sta: Left	Right	Coeff Contr.	Expan.
9940.34	10053.29	.3	.5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =

```
Energy head used in spillway design          =
Spillway height used in design               =
Weir crest shape                             = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream=  9977.7    Downstream=  9977.7
Upstream     num=       2
    Width   Elev    Width   Elev
       2   717.1       2  724.43
Downstream     num=       2
    Width   Elev    Width   Elev
       2   717.1       2  724.43

Pier Data
Pier Station     Upstream=  9998.6    Downstream=  9998.6
Upstream     num=       2
    Width   Elev    Width   Elev
       1   717.1       1  724.43
Downstream     num=       2
    Width   Elev    Width   Elev
       1   717.1       1  724.43

Pier Data
Pier Station     Upstream= 10023.6    Downstream= 10023.6
Upstream     num=       2
    Width   Elev    Width   Elev
       1   717.1       1  724.43
Downstream     num=       2
    Width   Elev    Width   Elev
       1   717.1       1  724.43

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
       Yarnell                 KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION          RIVER: Sauceda
REACH: Reach-1            RS: 4.062

INPUT
Description:
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9874.12  724.76 9902.41     725 9907.06  724.75 9940.13  724.12 9940.34723.7945
 9944.71  717.02 9960.45  716.99  9968.2   717.110004.49     71710042.22  717.43
10053.29723.842210055.53  725.1410058.19  725.26

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9874.12     .03 9940.34     .0510053.29     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9940.3410053.29                90   89.76      90              .3       .5

BRIDGE                 RIVER: Sauceda
REACH: Reach-1            RS: 4.055

INPUT
```

```
Description: I-8 West Bound Lanes
Distance from Upstream XS =       10
Deck/Roadway Width        =     45.6
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=        6
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    5759  732.53             9414  728.53          9953.35   727.9  725.37
   10000   727.9  725.3410046.65   727.9  725.31   11723  724.53

Upstream Bridge Cross Section Data
Station Elevation Data    num=       13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9874.12  724.76 9902.41     725 9907.06  724.75 9940.13  724.12 9940.34723.7945
 9944.71  717.02 9960.45  716.99  9968.2   717.110004.49     71710042.22  717.43
10053.29723.842210055.53  725.1410058.19  725.26

Manning's n Values        num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9874.12     .03 9940.34     .0510053.29     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9940.3410053.29             .3       .5

Downstream  Deck/Roadway Coordinates
    num=        6
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    5759  732.53             9414  728.53          9953.35   727.9  725.37
   10000   727.9  725.3410046.65   727.9  725.31   11723  724.53

Downstream Bridge Cross Section Data
Station Elevation Data    num=       80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  8862.2   728.6 8889.25  728.56 8891.48  728.52 8929.55  728.48 8931.46  728.44
 8971.47   728.4 9049.25   728.3 9131.46  728.22 9209.35  728.21 9211.35  728.24
  9249.6   728.2 9252.72  728.14 9326.59  728.11 9331.22  728.27 9409.55  728.24
 9450.74   728.2 9457.62  727.29  9486.4  727.27 9491.05  728.19 9569.54   727.9
 9571.04   727.8  9651.1  727.49 9771.16  727.07 9891.25  726.61 9899.38   725.9
 9932.25   725.8  9937.4722.3559 9940.37  720.37  9945.1  716.78   10000  716.67
10044.69  717.39 10058.9722.314710066.36   724.910071.36  725.9210096.02  726.04
10169.72  726.2110291.84   726.510334.43   726.610373.21  726.4310389.95  726.22
10401.67  726.1810414.09  726.4110426.11   726.510449.62  726.5210458.33  726.34
10539.56  726.4710610.54  726.2310646.32   726.2 10651.7  726.0810687.14  726.01
10692.97  725.8710733.05  725.7510806.69   725.610810.24  725.6510887.99  725.48
10891.01  725.4410971.06   725.311008.46   725.211011.42  725.2711088.13  725.12
11208.87  724.9611210.41  724.9911248.61   724.911251.14  724.8111288.97  724.75
11291.31  724.8611330.05   724.8 11331.4   724.811394.16  724.6611447.95  724.48
11450.64  724.4411506.62  724.2911527.89   724.211531.83  724.2511647.59  724.07
11691.08  724.0311769.23  723.9211771.47     72411812.07  723.8811852.92  723.81

Manning's n Values        num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  8862.2    .035  9937.4     .05 10058.9     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        9937.4 10058.9             .3       .5
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
888        F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream= 9974.03    Downstream= 9974.03
Upstream     num=        2
    Width   Elev    Width   Elev
   1.167   716.7   1.167  725.37
Downstream     num=        2
```

```
    Width   Elev    Width   Elev
   1.167   716.7   1.167  725.37

Pier Data
Pier Station     Upstream=   10000    Downstream=   10000
Upstream     num=        2
    Width   Elev    Width   Elev
   1.167   716.7   1.167  725.37
Downstream     num=        2
    Width   Elev    Width   Elev
   1.167   716.7   1.167  725.37

Pier Data
Pier Station     Upstream=10026.07    Downstream=10026.07
Upstream     num=        2
    Width   Elev    Width   Elev
   1.167   716.7   1.167  725.37
Downstream     num=        2
    Width   Elev    Width   Elev
   1.167   716.7   1.167  725.37

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =        2
       Yarnell                 KVal =       .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION           RIVER: Sauceda
REACH: Reach-1             RS: 4.045

INPUT
Description:
Station Elevation Data     num=       80
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
  8862.2    728.6  8889.25   728.56  8891.48   728.52  8929.55   728.48  8931.46   728.44
 8971.47    728.4  9049.25    728.3  9131.46   728.22  9209.35   728.21  9211.35   728.24
  9249.6    728.2  9252.72   728.14  9326.59   728.11  9331.22   728.27  9409.55   728.24
 9450.74    728.2  9457.62   727.29   9486.4   727.27  9491.05   728.19  9569.54    727.9
 9571.04    727.8   9651.1   727.49  9771.16   727.07  9891.25   726.61  9899.38    725.9
 9932.25    725.8   9937.4722.3559  9940.37   720.37   9945.1   716.78    10000   716.67
10044.69   717.39 10058.9722.314710066.36    724.910071.36   725.9210096.02   726.04
10169.72   726.2110291.84    726.510334.43    726.610373.21   726.4310389.95   726.22
10401.67   726.1810414.09   726.4110426.11    726.510449.62   726.5210458.33   726.34
10539.56   726.4710610.54   726.2310646.32    726.2 10651.7   726.0810687.14   726.01
10692.97   725.8710733.05   725.7510806.69    725.610810.24   725.6510887.99   725.48
10891.01   725.4410971.06    725.311008.46    725.211011.42   725.2711088.13   725.12
11208.87   724.9611210.41   724.9911248.61    724.911251.14   724.8111288.97   724.75
11291.31   724.8611330.05    724.8 11331.4    724.811394.16   724.6611447.95   724.48
11450.64   724.4411506.62   724.2911527.89    724.211531.83   724.2511647.59   724.07
11691.08   724.0311769.23   723.9211771.47      72411812.07   723.8811852.92   723.81

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
  8862.2     .035   9937.4      .05  10058.9      .03

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
        9937.4 10058.9                 298   179.5     159               .3        .5
Ineffective Flow      num=        1
   Sta L    Sta R     Elev  Permanent
888         F
```

CROSS SECTION RIVER: Sauceda
REACH: Reach-1 RS: 4.011

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9422.76	724.45	9568.13	723.38	9622.79	722.9	9697.59	723.45	9801.82	721.35
9837.62	721.31	9846.32	721.18	9867.87	721.2	9897.01	720.61	9928.92	722.02
9942.58	722.93	9948.4	721.1933	9957.96	718.34	9967.6	715.3	10000	715.7
10024.57	715.97	10047.65	716.17	10058.72	716.76	10080.19	720.6	10081.95	720.86
10120.44	719.84	10142.96	720.21	10178.91	720.37	10185.5	720.41	10200.42	720.31
10241.78	720.57	10255.97	720.61	10360.41	721.54	10376.16	721.71	10448.68	722.52
10557.15	723.63	10634.52	722.96						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9422.76	.035	9948.4	.05	10080.19	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9948.4	10080.19	0	0	0	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

SUMMARY OF MANNING'S N VALUES

River:Sauceda

Reach	River Sta.	n1	n2	n3
Reach-1	5.734	.035	.06	.04
Reach-1	5.639	.035	.06	.04
Reach-1	5.551	.035	.06	.04
Reach-1	5.453	.035	.06	.04
Reach-1	5.367	.035	.06	.04
Reach-1	5.270	.035	.06	.04
Reach-1	5.187	.035	.06	.04
Reach-1	5.091	.045	.05	.045
Reach-1	5.001	.045	.05	.045
Reach-1	4.909	.045	.05	.045
Reach-1	4.821	.045	.05	.045
Reach-1	4.728	.045	.05	.045
Reach-1	4.640	.045	.05	.045
Reach-1	4.543	.045	.05	.045
Reach-1	4.497	.03	.018	.03
Reach-1	4.482	.03	.018	.03
Reach-1	4.457	.035	.05	.03
Reach-1	4.364	.035	.05	.03
Reach-1	4.270	.035	.05	.03
Reach-1	4.184	.035	.05	.03
Reach-1	4.129	.035	.05	.03
Reach-1	4.119	Bridge		
Reach-1	4.107	.035	.05	.03
Reach-1	4.090	.035	.05	.03
Reach-1	4.088	Bridge		
Reach-1	4.079	.035	.05	.03
Reach-1	4.077	Bridge		
Reach-1	4.062	.03	.05	.03
Reach-1	4.055	Bridge		
Reach-1	4.045	.035	.05	.03
Reach-1	4.011	.035	.05	.03

SUMMARY OF REACH LENGTHS

River: Sauceda

Reach	River Sta.	Left	Channel	Right
Reach-1	5.734	480	501.25	500

Reach-1	5.639	480	462.42	450
Reach-1	5.551	470	520.31	510
Reach-1	5.453	440	451.93	460
Reach-1	5.367	500	502.05	440
Reach-1	5.270	450	449.44	430
Reach-1	5.187	510	509.24	490
Reach-1	5.091	430	474.23	460
Reach-1	5.001	480	481.92	490
Reach-1	4.909	450	469.21	450
Reach-1	4.821	500	486.92	475
Reach-1	4.728	450	465.06	420
Reach-1	4.640	420	515.76	450
Reach-1	4.543	140	135	220
Reach-1	4.497	80	80	80
Reach-1	4.482	220	220	160
Reach-1	4.457	480	490.78	500
Reach-1	4.364	490	496.32	480
Reach-1	4.270	450	454.08	450
Reach-1	4.184	280	290.4	300
Reach-1	4.129	110	116.16	110
Reach-1	4.119	Bridge		
Reach-1	4.107	90	89.76	90
Reach-1	4.090	58	58.08	58
Reach-1	4.088	Bridge		
Reach-1	4.079	89.87	89.87	89.87
Reach-1	4.077	Bridge		
Reach-1	4.062	90	89.76	90
Reach-1	4.055	Bridge		
Reach-1	4.045	298	179.5	159
Reach-1	4.011	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Sauceda

Reach	River Sta.	Contr.	Expan.
Reach-1	5.734	.1	.3
Reach-1	5.639	.1	.3
Reach-1	5.551	.1	.3
Reach-1	5.453	.1	.3
Reach-1	5.367	.1	.3
Reach-1	5.270	.1	.3
Reach-1	5.187	.1	.3
Reach-1	5.091	.1	.3
Reach-1	5.001	.1	.3
Reach-1	4.909	.1	.3
Reach-1	4.821	.1	.3
Reach-1	4.728	.1	.3
Reach-1	4.640	.1	.3
Reach-1	4.543	.3	.5
Reach-1	4.497	.3	.5
Reach-1	4.482	.3	.5
Reach-1	4.457	.3	.5
Reach-1	4.364	.1	.3
Reach-1	4.270	.1	.3
Reach-1	4.184	.1	.3
Reach-1	4.129	.3	.5
Reach-1	4.119	Bridge	
Reach-1	4.107	.3	.5
Reach-1	4.090	.3	.5
Reach-1	4.088	Bridge	
Reach-1	4.079	.3	.5
Reach-1	4.077	Bridge	
Reach-1	4.062	.3	.5
Reach-1	4.055	Bridge	
Reach-1	4.045	.3	.5
Reach-1	4.011	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl

			Flow Area	Top Width	Froude # Chl						
						(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)
			(sq ft)	(ft)								
Reach-1	5.734					5690.00	761.68	767.59		767.88	0.00	4.54
			1326.95	508.41	0							
Reach-1	5.734					5690.00	761.68	768.44		768.96	0.00	5.18
			1002.28	215.59	0							
Reach-1	5.639					5690.00	759.30	765.91		766.14	0.00	3.72
			1512.99	510.68	0							
Reach-1	5.639					5690.00	759.30	766.55		766.91	0.00	4.49
			1200.31	239.64	0							
Reach-1	5.551					5690.00	757.21	763.95		764.29	0.01	4.86
			1211.38	522.23	0							
Reach-1	5.551					5690.00	757.21	764.95		765.30	0.00	4.30
			1208.99	315.00	0							
Reach-1	5.453					5690.00	753.00	761.28	760.41	761.62	0.01	5.13
			1214.72	525.30	0							
Reach-1	5.453					5690.00	753.00	762.18	761.55	762.85	0.01	6.98
			867.68	283.15	1							
Reach-1	5.367					5690.00	752.06	759.07		759.46	0.00	4.60
			1143.83	380.64	0							
Reach-1	5.367					5690.00	752.06	759.81		760.28	0.00	4.93
			1038.60	260.85	0							
Reach-1	5.270					5690.00	748.40	757.00	755.93	757.24	0.00	4.34
			1480.55	785.32	0							
Reach-1	5.270					5690.00	748.40	757.77		758.24	0.00	4.68
			1072.17	240.00	0							
Reach-1	5.187					5690.00	746.93	754.49		754.84	0.01	5.31
			1261.66	652.65	0							
Reach-1	5.187					5690.00	746.93	755.00		755.64	0.01	6.53
			886.17	214.83	1							
Reach-1	5.091					5690.00	744.49	752.24		752.55	0.00	5.58
			1439.21	573.47	0							
Reach-1	5.091					5690.00	744.49	752.74		753.15	0.00	5.69
			1147.71	250.00	0							
Reach-1	5.001					5690.00	743.44	750.03	749.66	750.37	0.01	6.29
			1498.78	1656.73	1							
Reach-1	5.001					5690.00	743.44	750.83		751.29	0.01	6.13
			1076.15	330.00	1							
Reach-1	4.909					5690.00	738.79	747.82	747.26	748.02	0.00	5.15
			1930.50	1146.92	0							
Reach-1	4.909					5690.00	738.79	748.82	747.86	749.16	0.00	5.90
			1330.23	440.00	0							
Reach-1	4.821					5690.00	738.16	744.41	744.41	745.11	0.02	9.07
			997.72	798.93	1							
Reach-1	4.821					5690.00	738.16	745.30	745.30	746.28	0.01	9.66
			792.19	340.00	1							
Reach-1	4.728					5690.00	736.43	743.52		743.56	0.00	1.72
			3862.03	961.06	0							
Reach-1	4.728					5690.00	736.43	744.44		744.50	0.00	1.91
			2932.77	458.00	0							
Reach-1	4.640					5690.00	734.19	743.44		743.47	0.00	1.34
			4616.05	2221.12	0							
Reach-1	4.640					5690.00	734.19	744.39		744.42	0.00	1.31
			4206.09	550.00	0							
Reach-1	4.543					8720.00	729.70	743.44		743.44	0.00	0.83
			13292.15	3054.89	0							
Reach-1	4.543					8720.00	729.70	744.39		744.39	0.00	0.78
			13432.78	1690.00	0							
Reach-1	4.497					8720.00	727.85	743.10		743.36	0.00	6.09
			4902.62	4035.17	0							

Reach-1	4.497		8720.00	727.85	743.91		744.28	0.00	6.67	3564.45	1704.62	0
Reach-1	4.482		8720.00	727.85	742.82	742.82	743.27	0.00	7.48	3953.09	3924.15	0
Reach-1	4.482		8720.00	727.85	743.38	743.38	744.12	0.00	8.72	2663.21	1675.89	1
Reach-1	4.457		8720.00	725.90	732.78		733.21	0.00	5.70	1716.41	765.39	0
Reach-1	4.457		8720.00	725.90	733.50		734.12	0.00	6.25	1383.50	355.00	0
Reach-1	4.364		8720.00	723.51	731.28	730.32	731.57	0.00	5.14	2059.43	855.36	0
Reach-1	4.364		8720.00	723.51	732.01		732.49	0.00	5.53	1589.02	370.00	0
Reach-1	4.270		8720.00	721.60	729.42	728.44	730.01	0.00	6.44	1460.48	1899.11	0
Reach-1	4.270		8720.00	721.60	730.04	729.03	730.81	0.00	7.41	1270.44	320.00	0
Reach-1	4.184		8720.00	718.80	729.22		729.35	0.00	2.89	3173.91	2112.67	0
Reach-1	4.184		8720.00	718.80	729.55		729.82	0.00	4.04	2147.78	375.00	0
Reach-1	4.129		4670.00	717.10	729.24	722.69	729.26	0.00	0.97	4881.78	1944.53	0
Reach-1	4.129		4670.00	717.10	729.60	722.69	729.64	0.00	1.42	3035.16	400.00	0
Reach-1	4.119		Bridge									
Reach-1	4.107		4670.00	716.90	727.56	721.81	727.89	0.00	4.57	1027.67	163.44	0
Reach-1	4.107		4670.00	716.90	727.76	721.81	728.11	0.00	4.77	978.73	103.00	0
Reach-1	4.090		4670.00	716.98	727.47	722.29	727.73	0.00	4.09	1215.07	368.49	0
Reach-1	4.090		4670.00	716.98	727.61	722.24	727.98	0.00	4.83	966.11	105.00	0
Reach-1	4.088		Bridge									
Reach-1	4.079		4670.00	715.58	726.07	720.62	726.43	0.00	4.81	971.26	352.27	0
Reach-1	4.079		4670.00	715.58	726.07	720.62	726.43	0.00	4.81	971.08	108.86	0
Reach-1	4.077		Bridge									
Reach-1	4.062		4670.00	716.99	724.06	721.18	724.69	0.00	6.38	731.62	113.49	0
Reach-1	4.062		4670.00	716.99	724.42	721.19	724.99	0.00	6.04	775.52	124.29	0
Reach-1	4.055		Bridge									
Reach-1	4.045		4670.00	716.67	722.41		723.32	0.01	7.66	609.62	121.84	1
Reach-1	4.045		4670.00	716.67	723.18		723.87	0.01	6.69	697.99	118.00	0
Reach-1	4.011		4670.00	715.30	721.39	719.99	721.93	0.01	6.28	870.27	510.91	1
Reach-1	4.011		4670.00	715.30	722.39	719.95	722.99	0.00	6.19	754.29	132.00	0

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width

		(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	5.734	767.88	767.59	0.29	1.72	0.02	1212.38	1739.75	2737.87	508.41
Reach-1	5.734	768.96	768.44	0.51	1.99	0.05	274.27	2339.70	3076.03	215.59
Reach-1	5.639	766.14	765.91	0.23	1.84	0.01	573.82	3151.94	1964.25	510.68
Reach-1	5.639	766.91	766.55	0.36	1.62	0.00		4230.89	1459.11	239.64
Reach-1	5.551	764.29	763.95	0.34	2.67	0.00	1618.02	1742.47	2329.50	522.23
Reach-1	5.551	765.30	764.95	0.35	2.41	0.03	1294.47	1903.48	2492.05	315.00
Reach-1	5.453	761.62	761.28	0.34	2.16	0.00	2672.23	1463.93	1553.84	525.30
Reach-1	5.453	762.85	762.18	0.67	2.51	0.06	2903.56	2342.70	443.74	283.15
Reach-1	5.367	759.46	759.07	0.39	2.17	0.04	1945.26	1352.74	2392.00	380.64
Reach-1	5.367	760.28	759.81	0.47	2.03	0.00	1259.26	1678.51	2752.23	260.85
Reach-1	5.270	757.24	757.00	0.24	2.39	0.01	3140.93	2479.27	69.80	785.32
Reach-1	5.270	758.24	757.77	0.48	2.58	0.02	2482.61	3143.90	63.49	240.00
Reach-1	5.187	754.84	754.49	0.35	2.27	0.01	845.96	3616.58	1227.46	652.65
Reach-1	5.187	755.64	755.00	0.64	2.42	0.07	75.09	4969.16	645.75	214.83
Reach-1	5.091	752.55	752.24	0.31	2.17	0.00	471.38	2480.63	2737.99	573.47
Reach-1	5.091	753.15	752.74	0.41	1.86	0.01	710.69	2742.73	2236.58	250.00
Reach-1	5.001	750.37	750.03	0.34	2.31	0.05	2099.65	2482.75	1107.59	1656.73
Reach-1	5.001	751.29	750.83	0.46	2.09	0.03	1026.37	2917.81	1745.83	330.00
Reach-1	4.909	748.02	747.82	0.19	2.87	0.05	1976.42	1740.40	1973.19	1146.92
Reach-1	4.909	749.16	748.82	0.35	2.83	0.06	1785.08	2362.32	1542.60	440.00
Reach-1	4.821	745.11	744.41	0.70	0.45	0.20	760.95	2152.16	2776.90	798.93
Reach-1	4.821	746.28	745.30	0.98	0.46	0.28	2144.03	2833.17	712.80	340.00
Reach-1	4.728	743.56	743.52	0.04	0.09	0.00	1759.46	721.18	3209.35	961.06
Reach-1	4.728	744.50	744.44	0.06	0.08	0.01	2280.10	920.29	2489.62	458.00
Reach-1	4.640	743.47	743.44	0.03	0.02	0.01	1068.81	1440.80	3180.39	2221.12
Reach-1	4.640	744.42	744.39	0.03	0.02	0.01	739.92	1581.77	3368.31	550.00
Reach-1	4.543	743.44	743.44	0.01	0.01	0.07	3527.37	1519.76	3672.87	3054.89
Reach-1	4.543	744.39	744.39	0.01	0.01	0.11	3082.21	1546.34	4091.46	1690.00
Reach-1	4.497	743.36	743.10	0.25	0.04	0.06	3369.15	3653.82	1697.02	4035.17
Reach-1	4.497	744.28	743.91	0.36	0.04	0.11	2526.99	4393.11		

1799.90 1704.62

Reach-1	4.482	743.27	742.82	0.45	0.25	0.01	3116.57	4331.78	1271.65	3924.15
Reach-1	4.482	744.12	743.38	0.75	0.29	0.06	1907.57	5402.16	1410.27	1675.89
Reach-1	4.457	733.21	732.78	0.42	1.57	0.06	155.13	3157.57	5407.30	765.39
Reach-1	4.457	734.12	733.50	0.62	1.57	0.07		3769.54	4950.46	355.00
Reach-1	4.364	731.57	731.28	0.30	1.53	0.03	656.01	3052.99	5011.00	855.36
Reach-1	4.364	732.49	732.01	0.48	1.65	0.03	1025.57	3670.97	4023.46	370.00
Reach-1	4.270	730.01	729.42	0.58	0.52	0.13	201.01	4049.15	4469.84	1899.11
Reach-1	4.270	730.81	730.04	0.77	0.84	0.15	488.73	5090.85	3140.43	320.00
Reach-1	4.184	729.35	729.22	0.13	0.05	0.04	895.24	2439.92	5384.85	2112.67
Reach-1	4.184	729.82	729.55	0.26	0.10	0.07	1643.39	3549.44	3527.18	375.00
Reach-1	4.129	729.26	729.24	0.02			843.66	1244.73	2581.61	1944.53
Reach-1	4.129	729.64	729.60	0.04			848.13	1896.69	1925.18	400.00
Reach-1	4.119	Bridge								
Reach-1	4.107	727.89	727.56	0.32	0.13	0.04	4.20	4663.21	2.59	163.44
Reach-1	4.107	728.11	727.76	0.35	0.14	0.00		4670.00	103.00	
Reach-1	4.090	727.73	727.47	0.25			25.32	4308.88	335.79	368.49
Reach-1	4.090	727.98	727.61	0.36				4670.00	105.00	
Reach-1	4.088	Bridge								
Reach-1	4.079	726.43	726.07	0.36			0.14	4669.42	0.45	352.27
Reach-1	4.079	726.43	726.07	0.36			0.14	4669.42	0.45	108.86
Reach-1	4.077	Bridge								
Reach-1	4.062	724.69	724.06	0.63			0.01	4669.96	0.03	113.49
Reach-1	4.062	724.99	724.42	0.57			2.22	4667.45	0.34	124.29
Reach-1	4.055	Bridge								
Reach-1	4.045	723.32	722.41	0.91	1.19	0.19	0.00	4669.99	0.01	121.84
Reach-1	4.045	723.87	723.18	0.70	0.84	0.05		4670.00	118.00	
Reach-1	4.011	721.93	721.39	0.54			37.04	3910.36	722.61	510.91
Reach-1	4.011	722.99	722.39	0.60			0.58	4669.42	132.00	

Profile Output Table - Encroachment 1

Reach	River Sta	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Wdth Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right	Enc Sta L	Ch Sta L	Ch Sta R	Enc Sta R

(cfs)		(ft)	(ft)	(ft)	(ft)					
Reach-1		5.734		767.59			767.88	508.41	1212.38	1739.75
2737.87			9943.23	10022.27						
Reach-1		5.734		768.44		0.86	768.96	215.59	274.27	2339.70
3076.03	9928.92		9943.23	10022.27	10144.51					
Reach-1		5.639		765.91			766.14	510.68	573.82	3151.94
1964.25			9883.30	10067.67						
Reach-1		5.639		766.55		0.64	766.91	239.64		4230.89
1459.11	9889.13		9883.30	10067.67	10128.77					
Reach-1		5.551		763.95			764.29	522.23	1618.02	1742.47
2329.50			9947.53	10031.88						
Reach-1		5.551		764.95		1.00	765.30	315.00	1294.47	1903.48
2492.05	9850.00		9947.53	10031.88	10165.00					
Reach-1		5.453		761.28			761.62	525.30	2672.23	1463.93
1553.84			9973.65	10029.93						
Reach-1		5.453		762.18		0.90	762.85	283.15	2903.56	2342.70
443.74	9772.41		9973.65	10029.93	10055.56					
Reach-1		5.367		759.07			759.46	380.64	1945.26	1352.74
2392.00			9960.36	10023.73						
Reach-1		5.367		759.81		0.74	760.28	260.85	1259.26	1678.51
2752.23	9890.00		9960.36	10023.73	10150.85					
Reach-1		5.270		757.00			757.24	785.32	3140.93	2479.27
69.80			9948.00	10079.53						
Reach-1		5.270		757.77		0.76	758.24	240.00	2482.61	3143.90
63.49	9850.00		9948.00	10079.53	10090.00					
Reach-1		5.187		754.49			754.84	652.65	845.96	3616.58
1227.46			9868.54	10026.68						
Reach-1		5.187		755.00		0.51	755.64	214.83	75.09	4969.16
645.75	9858.69		9868.54	10026.68	10073.52					
Reach-1		5.091		752.24			752.55	573.47	471.38	2480.63
2737.99			9959.17	10033.30						
Reach-1		5.091		752.74		0.50	753.15	250.00	710.69	2742.73
2236.58	9890.00		9959.17	10033.30	10140.00					
Reach-1		5.001		750.03			750.37	1200.00	2099.65	2482.75
1107.59			9938.28	10040.79						
Reach-1		5.001		750.83		0.80	751.29	330.00	1026.37	2917.81
1745.83	9850.00		9938.28	10040.79	10180.00					
Reach-1		4.909		747.82			748.02	1146.92	1976.42	1740.40
1973.19			9966.13	10029.01						
Reach-1		4.909		748.82		0.99	749.16	440.00	1785.08	2362.32
1542.60	9820.00		9966.13	10029.01	10260.00					
Reach-1		4.821		744.41			745.11	798.93	760.95	2152.16
2776.90			9981.34	10044.30						
Reach-1		4.821		745.30		0.89	746.28	340.00	2144.03	2833.17
712.80	9780.00		9981.34	10044.30	10120.00					
Reach-1		4.728		743.52			743.56	961.06	1759.46	721.18
3209.35			9945.61	10014.26						
Reach-1		4.728		744.44		0.92	744.50	458.00	2280.10	920.29
2489.62	9772.00		9945.61	10014.26	10230.00					
Reach-1		4.640		743.44			743.47	974.72	1068.81	1440.80
3180.39			9915.31	10058.16						
Reach-1		4.640		744.39		0.95	744.42	550.00	739.92	1581.77
3368.31	9750.00		9915.31	10058.16	10300.00					
Reach-1		4.543		743.44			743.44	1965.82	3527.37	1519.76
3672.87			9912.36	10072.73						
Reach-1		4.543		744.39		0.95	744.39	1690.00	3082.21	1546.34
4091.46	9010.00		9912.36	10072.73	10700.00					
Reach-1		4.497		743.10			743.36	3470.17	3369.15	3653.82
1697.02			9957.10	10030.45						
Reach-1		4.497		743.91		0.81	744.28	1704.62	2526.99	4393.11
1799.90	9010.00		9957.10	10030.45	10775.00					

```
  Reach-1       4.482                742.82                    743.27       3359.15    3116.57    4331.78
1271.65                 9957.10   10030.45
  Reach-1       4.482                743.38            0.56    744.12       1675.89    1907.57    5402.16
1410.27    9010.00    9957.10   10030.45   10775.00

  Reach-1       4.457                732.78                    733.21        765.39     155.13    3157.57
5407.30                 9935.94   10037.83
  Reach-1       4.457                733.50            0.72    734.12        355.00               3769.54
4950.46    9945.00    9935.94   10037.83   10300.00

  Reach-1       4.364                731.28                    731.57        855.36     656.01    3052.99
5011.00                 9964.12   10058.17
  Reach-1       4.364                732.01            0.74    732.49        370.00    1025.57    3670.97
4023.46    9880.00    9964.12   10058.17   10250.00

  Reach-1       4.270                729.42                    730.01        455.92     201.01    4049.15
4469.84                 9950.92   10044.93
  Reach-1       4.270                730.04            0.62    730.81        320.00     488.73    5090.85
3140.43    9880.00    9950.92   10044.93   10200.00

  Reach-1       4.184                729.22                    729.35        808.05     895.24    2439.92
5384.85                 9944.03   10041.89
  Reach-1       4.184                729.55            0.33    729.82        375.00    1643.39    3549.44
3527.18    9825.00    9944.03   10041.89   10200.00

  Reach-1       4.129                729.24                    729.26        934.53     843.66    1244.73
2581.61                 9915.74   10046.50
  Reach-1       4.129                729.60            0.36    729.64        400.00     848.13    1896.69
1925.18    9800.00    9915.74   10046.50   10200.00

  Reach-1       4.119   BR U         729.24                    729.26        553.63               3500.15
1169.86                 9915.74   10046.50
  Reach-1       4.119   BR U         729.60            0.36    729.64        160.00      19.10    4619.70
32.10    9900.00    9915.74   10046.50   10060.00

  Reach-1       4.119   BR D         729.24                    729.26        120.28               4320.12
349.88                  9912.46   10043.06
  Reach-1       4.119   BR D         729.49            0.25    729.63        160.00       8.38    4635.54
26.97    9900.00    9912.46   10043.06   10060.00

  Reach-1       4.107                727.56                    727.89        146.34       4.20    4663.21
2.59                    9912.46   10043.06
  Reach-1       4.107                727.76            0.19    728.11        103.00               4670.00
9940.00    9912.46   10043.06   10043.00

  Reach-1       4.090                727.47                    727.73        275.00      25.32    4308.88
335.79                  9912.52   10047.24
  Reach-1       4.090                727.61            0.14    727.98        105.00               4670.00
9940.00    9912.52   10047.24   10045.00

  Reach-1       4.088   BR U         727.47                    727.72        275.00     220.83    3711.32
730.23                  9912.52   10047.24
  Reach-1       4.088   BR U         727.61            0.14    727.98        102.00               4666.40
9940.00    9912.52   10047.24   10042.00

  Reach-1       4.088   BR D         727.47                    727.72        302.23     252.44    4024.68
385.26                  9927.27   10034.32
  Reach-1       4.088   BR D         727.55            0.07    727.89        102.00               4624.10
42.30    9940.00    9927.27   10034.32   10042.00

  Reach-1       4.079                726.07                    726.43        108.88       0.14    4669.42
0.45                    9927.27   10034.32
  Reach-1       4.079                726.07            0.00    726.43        108.86       0.14    4669.42
0.45    9925.00    9927.27   10034.32   10060.00

  Reach-1       4.077   BR U         724.43                    726.43                             4670.00
9927.27   10034.32
  Reach-1       4.077   BR U         724.43            0.00    726.43                             4670.00
9920.00    9927.27   10034.32   10060.00

  Reach-1       4.077   BR D         724.06                    724.69         82.23               4670.00
9940.34   10053.29
  Reach-1       4.077   BR D         724.42            0.37    724.99         82.20               4670.00
9920.00    9940.34   10053.29   10060.00
```

Reach-1	4.062			724.06		724.69	113.49	0.01	4669.96	
0.03		9940.34	10053.29							
Reach-1	4.062			724.42	0.37	724.99	124.29	2.22	4667.45	
0.34	9930.00	9940.34	10053.29	10060.00						
Reach-1	4.055	BR U		723.67		724.61	91.93		4670.00	
9940.34	10053.29									
Reach-1	4.055	BR U		724.09	0.43	724.92	91.39		4670.00	
9940.00	9940.34	10053.29	10055.00							
Reach-1	4.055	BR D		722.47		723.69	93.48		4670.00	
9937.40	10058.90									
Reach-1	4.055	BR D		723.15	0.68	724.12	92.60		4670.00	
9940.00	9937.40	10058.90	10055.00							
Reach-1	4.045			722.41		723.32	121.84	0.00	4669.99	
0.01		9937.40	10058.90							
Reach-1	4.045			723.18	0.77	723.87	118.00		4670.00	
9940.00	9937.40	10058.90	10058.00							
Reach-1	4.011			721.39		721.93	510.91	37.04	3910.36	
722.61		9948.40	10080.19							
Reach-1	4.011			722.39	1.00	722.99	132.00	0.58	4669.42	
9948.00	9948.40	10080.19	10080.00							

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
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: Citrus Valley Wash
Project File : CitrusVW.prj
Run Date and Time: 5/13/02 3:18:12 PM

Project in English units

Project Description:
Study Name: Gila Bend Area Drainage Master Plan

Study Contractors:
Engineering and Environmental Consultants, Inc. and Premier Engineering Corporation

Source of Hydrology: Gila Bend Area Floodplain Delineation Study (FCD 90-67) by Bburgess & Niple for FCDMC, March 1991

Source of Survey: Gila Bend Area Floodplain Delineation Study (FCD 90-67); new Topographic mapping and survey by Cooper Aerial Mapping, Inc. 1999.

FCD
Contract number FCD 99-18
Datum: NGVD 1929

PLAN DATA

Plan Title: Citrus Valley Wash, FW Meth 1
Plan File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Citrus Valley Wash\CitrusVW.p05

Geometry Title: Citrus Valley Wash
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Citrus Valley Wash\CitrusVW.g03

Flow Title : Citrus Valley Wash, FW Meth 1a
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Citrus Valley Wash\CitrusVW.f06

Plan Summary Information:

Number of:	Cross Sections	= 21	Mulitple Openings	=	0
	Culverts	= 2	Inline Weirs	=	0
	Bridges	= 1			

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 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 = Citrus Valley Reach = Reach-1

RS	Profile	Method	Value1	Value2
6.298	PF 2	1	9930	10156
6.206	PF 2	1	9920	10100
6.114	PF 2	1	9935.61	10112.49
6.026	PF 2	1	9875	10080
5.944	PF 2	1	9880	10055
5.841	PF 2	1	9944.95	10058.01
5.750	PF 2	1	9860	10060
5.660	PF 2	1	9745.78	10096.38
5.569	PF 2	1	9864.28	10153.96
5.483	PF 2	1	9890	10175
5.385	PF 2	1	9865	10200
5.294	PF 2	1	9818.73	10150
5.202	PF 2	1	9852.51	10140
5.102	PF 2	1	9890	10150
5.015	PF 2	1	9920	10090
4.920	PF 2	1	9875	10200
4.856	PF 2	1	9870	10200
4.847	PF 2	1	9880	10170
4.841	PF 2	1	9890	10150
4.821	PF 2	1	9890	10130
4.820	PF 2	1	9880	10115
4.778	PF 2	1	9940	10060
4.721	PF 2	1	9955	10105

FLOW DATA

Flow Title: Citrus Valley Wash, FW Meth 1a
Flow File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Citrus Valley Wash\CitrusVW.f06

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
Citrus Valley	Reach-1	6.298	3210	3210
Citrus Valley	Reach-1	5.483	2190	2190
Citrus Valley	Reach-1	5.294	3210	3210
Citrus Valley	Reach-1	4.721	3110	3110

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Citrus Valley	Reach-1	PF 1	Normal S = .004	Normal S = .004
Citrus Valley	Reach-1	PF 2	Normal S = .004	Known WS = 719.95

GEOMETRY DATA

Geometry Title: Citrus Valley Wash
Geometry File : q:\99541\FEMA Submittal\Floodplain-Floodways HEC-RAS\Citrus Valley Wash\CitrusVW.g03

CROSS SECTION RIVER: Citrus Valley
REACH: Reach-1 RS: 6.298

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9782.59	757.2	9802	756.36	9828.91	755.73	9848.74	755.77	9863.39	755.58
9885.42	755.7	9903.36	756.41	9933.97	753.84	9941.25	753.17	9959.31	753.94
9980.97	753.1	9983.09	753.07	9996.02	749.92	10004.29	750.91	10018.7	752.37

```
10027.69   753.810046.48  752.3710059.05  751.55 10076.7  752.6510086.57  753.69
 10108.8   752.510117.66  751.6910126.62  751.4110141.58   750.610145.61  751.53
10155.03   754.710175.45   754.410227.56  753.7310242.32  752.5510254.55   755.2
10288.35   753.910293.39  754.49 10316.2  756.4410320.17  756.6610338.23  756.74
10372.13   757.410399.84  757.4110505.54  757.8210534.17  757.2510559.89  757.23
10618.67   759.410654.77  760.4510713.59  760.5710755.27  760.6910778.55  760.46
10812.67   760.310857.48   760.611012.69  760.7711172.46  760.6611212.72   760.7
11251.82   760.711412.74   761.311578.38  760.8411612.76  760.94 11698.3  761.09

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9782.59     .04 9959.31     .0510155.03    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.3110155.03               470  488.56     440              .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Citrus Valley
REACH: Reach-1             RS: 6.206

INPUT
Description:
Station Elevation Data     num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 7890.59   761.3 8033.06  761.48 8117.16  761.27 8127.52  761.41 8154.56  760.94
 8196.41   760.5 8215.58  760.18 8233.67  760.03 8280.44  759.75 8434.28  759.62
 8614.14   760.8 8634.88  760.85 8787.53  759.69 8802.46  759.63 8836.43   759.1
  8880.1   758.8 9036.44  757.89 9107.26  757.43 9210.72  757.21 9228.41   757.1
 9240.51   756.9 9257.52  756.81 9267.92  756.64 9406.87   756.3 9415.46  756.24
 9442.14   755.8 9464.99  755.69 9483.48  757.21 9510.36  758.22 9537.73   758.8
  9578.3   753.4 9582.84  753.43 9650.94  753.02 9677.37  753.18 9697.25  752.93
 9721.69   752.8 9762.31  752.33 9785.69  752.16 9811.88  752.06 9837.01  751.49
 9858.44   750.7 9869.21  751.82 9880.59  751.85 9942.31  751.74 9950.41  750.93
 9955.36   750.2 9982.37  748.88 9994.73  748.2410012.54  748.2310043.82  748.11
 10059.4   748.310067.03  751.1410069.94  751.8210073.21  751.8910092.37  751.99
10145.49   752.110239.74  752.0110297.34  752.7310329.93  753.0410343.75     753
   10363   753.310373.17  754.7710376.81  754.8410389.48  754.6810407.12  755.84
10418.08   756.510455.55  756.4410640.95   756.410789.79  757.0210841.56  757.08
10953.63   758.310972.54  758.3810976.09  758.5210990.09  758.6611042.16  759.05
11224.89   759.111242.77   759.211443.38  758.4511643.98  758.9111659.99  758.86
11844.59   759.412002.51  758.5212045.19  758.2812091.26  758.2512235.41  758.87
12260.56   758.912266.87  759.0212360.62  758.5912426.12  758.2512475.07  758.55
12647.01   759.512747.73  760.4412847.62   760.912883.01   761.912893.53  762.05
12983.86   766.213004.71  767.0613014.84  766.52

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 7890.59     .04 9942.31     .0510092.37    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9942.3110092.37               460  486.47     450              .1       .3

CROSS SECTION           RIVER: Citrus Valley
REACH: Reach-1             RS: 6.114

INPUT
Description:
Station Elevation Data     num=      80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8396.23   757.6 8472.37  757.85 8509.99  757.71 8517.73  757.78 8702.31  758.32
 8709.99   758.4 8747.22  757.61 8797.23  756.57 8885.04  755.74 8909.99  755.48
 9091.46   755.3 9109.99  755.23 9221.21  754.98 9299.26  754.78 9318.75   755.1
 9327.51   755.4 9357.84  756.44 9386.77  756.68 9432.03     757 9471.59  757.29
 9502.26   755.5 9514.01  754.97 9519.72  755.68  9538.6  757.14 9558.51  757.44
 9577.09   756.6 9618.96  754.04 9634.11  753.42 9675.75  751.27 9707.48  750.86
 9713.72   751.2 9794.34  750.96 9834.09  751.07 9897.58  751.17 9925.32   750.9
 9935.79   750.4  9971.4  748.33 9974.77  747.8810000.18  744.9810013.06  749.69
10062.43   749.710187.43  750.2610225.45  750.4710239.51  751.1410245.21  751.18
10255.64   751.710278.08  752.0510291.92  751.92 10316.9   751.810338.58  754.44
10357.54     75510387.02  755.2910400.39   755.410437.29  755.0510471.16   754.9
10543.07   754.210562.82  754.65 10654.1  754.8210715.69  754.83 10866.7  757.15
   10878   757.110882.92  756.46 10897.1  756.5110938.15  756.0510956.62  756.14
11116.77   756.811191.66  756.4911316.77  755.6611441.88  755.7111516.77  755.87
11641.88   755.811716.77  756.1111791.65  756.0811916.77  756.2711991.66  755.84
```

12116.77 755.412191.66 755.912316.77 756.1712441.88 757.2912520.58 757.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8396.23	.04	9935.79	.0510062.43		.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9935.7910062.43		400	459.75	470	.1	.3

CROSS SECTION RIVER: Citrus Valley
REACH: Reach-1 RS: 6.026

INPUT
Description:
Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8088.03	758.5	8253.58	757.23	8356.13	756.35	8453.99	755.94	8509.37	756.33
8545.88	756.8	8556.09	756.69	8603.24	756.21	8646.54	756.53	8690.69	756.64
8725.59	756.2	8750.4	756.04	8756.12	756.05	8777.52	755.71	8829.04	755.25
8893.79	754.5	8970.35	754.24	9055.21	753.53	9107.65	753.44	9145.4	753.02
9161.73	752.8	9168.08	753.17	9177.59	753.51	9217.37	754.24	9266.82	755.48
9298.58	755.6	9312.84	755.94	9330	755.21	9390.65	753.08	9404.87	752.92
9451.85	752.1	9464.9	751.58	9476.1	751.47	9501.48	750.67	9516.93	750.29
9585.5	750.1	9593.61	749.93	9630.85	749.77	9660.81	749.39	9669.22	749.32
9720	748.2	9747.93	747.72	9854.58	748.64	9862.33	748.57	9957.17	747.28
9972.28	744.910000.52		743.8210006.18		745.2610015.85		747.9810053.22		747.4
10059.7	747.610239.02		747.6710256.84		748.2810283.58		749.8110316.26		751.62
10348.7	751.610363.76		751.8510415.66		751.8210487.33		751.910498.49		751.15
10503.6	750.610515.37		750.9110629.95		751.3110687.37		751.5610705.45		751.75
10760.05	751.710863.97		752.510938.15		75210981.58		752.0611064.84		752.19
11129.01	752.211264.93		751.6911409.12		752.2711465.02		752.2211549.15		752.58
11586.28	753.311614.72		751.3511637.21		750.4811647.35		750.8111722.21		750.89
11865.19	751.1	11906.4	751.2412065.28		752.3412233.83		752.6912265.37		752.97
12295.1	753.1	12371.8	754.4						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8088.03	.04	9957.17	.0510015.85		.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9957.1710015.85		370	434.67	460	.1	.3

CROSS SECTION RIVER: Citrus Valley
REACH: Reach-1 RS: 5.944

INPUT
Description:
Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8062.1	756.6	8136.13	756.53	8232.96	756.11	8347.33	755.24	8440.82	754.32
8535.17	753.8	8604.97	754.41	8623.93	754.55	8641.05	755.03	8652.98	755.46
8666.3	755.4	8681.89	755.3	8706.25	755.25	8839.91	754.2	8894.92	753.59
8994.78	752.6	9017.66	752.45	9055.01	752.46	9148.04	751.53	9201.89	752.53
9283.23	751.1	9357.68	748.31	9369.77	748.2	9378.08	747.91	9386.33	748.8
9397.59	750.3	9407.72	750.19	9418.98	748.7	9428.88	748.48	9444.65	750.78
9454.09	752	9480.96	752.45	9502.86	753.33	9534.06	751.69	9545.57	751.49
9556	751.8	9580.97	753.57	9605.09	755.13	9626.86	752.78	9640.64	751.1
9670.5	747.4	9758.8	747.07	9813.11	745.64	9845.52	744.86	9857.09	744.73
9870.1	744.5	9882.49	744.2099	9916.23	743.42	9946.64	742.83	9960.17	742.58
9973.6	741.99	9977.45	741.510000.49		741.1110013.78		745.1810045.63		745.13
10175.21	745.4410258.97		74710388.88		751.9510404.13		751.8810571.36		750.21
10590.1	750.2810606.56		750.110759.55		749.2310790.36		749.110934.97		749.94
10988.84	750.2710990.63		750.211178.35		749.16	11190.9	749.1411192.56		749.31
11225.61	749.6511260.15		749.711391.16		748.6411415.95		748.5711591.43		748.77
11749.7	748.3911791.69		748.511838.25		748.6111991.96		749.9412016.58		750.2
12160.71	749.9912192.22		750.212392.49		751.9	12511.5	752.2812596.57		752.83

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8062.1	.04	9882.49	.0510013.78		.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9882.4910013.78		540	544.21	450	.1	.3

CROSS SECTION RIVER: Citrus Valley
REACH: Reach-1 RS: 5.841

INPUT
Description:
Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8146.55	755.6	8152.59	755.67	8324.31	753.68	8353.38	753.53	8373.27	753.54
8551.12	753.7	8651.26	752.83	8754.96	751.81	8930.88	751.37	8962.58	751.38
9126.13	750.7	9156.54	750.71	9299.67	751.36	9357.33	750.87	9426.24	750.98
9558.11	749.9	9565.28	749.87	9580.2	749.32	9645.14	747.63	9665.54	748.12
9685.28	748.7	9779.57	751.74	9798.37	751.61	9803.72	751.35	9823.53	750.09
9851.32	746.2	9865.37	744.13	9869.95	744.07	9907.47	743.88	9928.67	743.62
9944.26	742.2	9949.91	741.6	10000	738.13	10004.96	737.8	10013.52	739.37
10026.57	741.3	10044.32	741.11	10091.76	741.54	10161.64	742.14	10238.28	742.96
10359.85	744.9	10440.39	747.29	10559.85	751.42	10679.31	749.81	10759.85	749.24
10886.53	748.7	10935.91	748.48	10972.68	749.07	11032.64	750.23	11058.69	749.91
11137.11	748.4	11176.53	747.54	11194.13	747.44	11221.89	747.21	11222.47	747.57
11239.26	747.7	11359.85	747.68	11440.4	747.84	11559.85	747.12	11679.31	747.23
11759.85	747	11792.23	746.85	11888.41	747.21	11959.85	747.57	12079.31	748.22
12159.85	748.3	12200.24	748.74	12359.85	749.74	12476.21	750.7	12483.23	751.08
12512.58	752.1	12517.53	752.03						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8146.55	.04	9949.91	.05	10026.57	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9949.91	10026.57	480	480.8	460	.1	.3

CROSS SECTION RIVER: Citrus Valley
REACH: Reach-1 RS: 5.750

INPUT
Description:
Station Elevation Data num= 91

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8075.55	752.9	8259.52	752.65	8369.43	751.7	8467.9	751.01	8633.13	749.27
8676.27	748.9	8706.15	748.86	8884.65	748.96	9005.49	749.22	9093.02	749.03
9261.59	747.4	9269.24	747.28	9296.4	747.78	9369.81	749.35	9387.12	749.76
9422.52	750.2	9436.47	749.3	9451.35	749.77	9483.96	749.3	9496.24	750.48
9502.17	750.5	9510.68	750.1	9516.25	749.65	9531.53	747.18	9569.11	744.48
9578.84	743.8	9586.46	743.19	9696.76	741.65	9703.66	741.64	9714.06	741.42
9897.81	740.3	9912.06	739.96	9945.67	738.5	9995.67	736.44	10010.04	738.91
10014.52	738.95	10026.62	737	10055.67	738.19	10610101.04	740.05	10106.61	740.22
10111.23	740.57	10139.67	742.25	10169.49	744.4	10192.7	746.3	10234.56	742.84
10238.94	742.66	10300.69	747.4	10304.06	747.6	10371.24	748.7	10412.44	749.29
10504.33	749.83	10698.68	749.08	10705.59	749	10719.39	748.25	10774.76	746.69
10815.15	746.08	10835.45	745.78	10897.39	745.4	10904.26	745.36	10925.58	745.32
11019.3	744.92	11033.63	744.98	11104.28	744.9	11112.15	744.94	11304.3	746.39
11314.68	746.38	11504.31	745.63	11556.5	744.6	11577.35	744.94	11595.24	745.29
11654.66	744.64	11694.16	744.17	11704.33	744	11719.73	743.98	11904.34	744.4
12009.34	745.18	12112.42	745.5	12203.11	746.5	12304.37	747.29	12316	747.4
12495.51	748.62	12504.39	748.58	12529.84	748.7	12704.41	749.47	12742.63	749.32
12771.71	749.16	12891.32	748.88	12900.99	748.9	12940.24	750.25	12963.99	750.8
13042.15	750.19								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8075.55	.05	9945.67	.05	10055.67	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945.67	10055.67	450	475.66	450	.1	.3

CROSS SECTION RIVER: Citrus Valley
REACH: Reach-1 RS: 5.660

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7988.95	749.8	8066.25	749.9	8101.6	749.64	8239.18	749.71	8289.21	749.74
8454.74	749.4	8500.64	751.21	8512.11	750.49	8526.18	749.81	8538.91	748.99
8554.29	748.8	8649.33	748.02	8673.62	747.91	8808.49	745.47	8894.1	745.04
8993.49	744.8	9106	745.34	9152.01	745.56	9177.57	746.13	9247.55	748
9279.39	746.8	9287.36	746.6	9336.12	745.54	9459.3	741.5	9492.93	740.52
9499	740.3	9514.13	740.34	9566.86	740.59	9604.78	739.75	9685.55	738.5
9743.48	738	9822.02	738.38	9841.04	738.9	9885.55	740.38	9893.64	740.58

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 9900.62   740.2 9945.66737.4987 9995.66   734.5   10000  734.6710011.98  735.15
10090.59  737.94 10101.9     73810164.48   739.410194.73  740.3210218.28  740.73
 10244.8  741.0910288.99   741.610291.88  741.5910309.92   742.710318.68  743.31
10335.05  745.0710343.87   745.410361.77  745.3710388.25  745.5310417.42  745.48
10453.89  745.8510457.97   746.110472.79  747.53

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 7988.95     .05 9945.66     .0510090.59     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9945.6610090.59              447  479.51     447             .1       .3

CROSS SECTION          RIVER: Citrus Valley
REACH: Reach-1            RS: 5.569

INPUT
Description:
Station Elevation Data    num=      73
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8134.44   748.4 8208.71  748.27 8315.63   747.5 8391.99  747.18 8516.56  747.36
 8661.95   746.6 8688.78  746.32 8735.29  745.08 8741.62  744.83 8784.99  744.87
 8841.08   744.3 8865.12  744.26 8888.24   744.5 8926.24  744.99 8943.01  744.35
 8956.54   744.1  8961.3  744.15 8987.19  743.64 8998.58  743.53 9051.57  742.37
 9103.28   742.2 9120.68  742.61 9122.38  742.08 9162.03  741.86 9173.41  741.76
 9241.36   745.6 9247.44  745.91  9270.9  745.52 9305.82   745.4 9320.26  745.25
 9417.58   745.1 9484.01  745.43 9521.18  745.06 9568.69  745.19 9588.68  745.29
 9634.28   745.4 9656.01  742.35 9658.81  742.03 9680.97   743.7 9686.91  743.69
 9721.84     744 9728.68  743.25 9738.47   742.5 9755.36  738.94  9771.3  739.64
 9781.12   739.4 9798.67   737.3 9803.33  736.33 9807.93   736.4 9834.16  736.51
 9860.01   736.4 9883.27   736.4 9902.54  736.19 9950.41734.1006 9992.12  732.28
10000.41  731.9610005.28  732.210050.41733.3605   10162  736.2310225.17  737.19
10252.05  740.7410263.54  739.4110275.78     74010315.93  739.7410339.37   740.6
10386.65  741.2610405.29  741.2410450.58   742.710464.74  742.8710481.98  743.26
 10509.6  745.0810657.91  745.7910733.98   745.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8134.44     .05 9950.41     .0510050.41     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9950.4110050.41              470  455.03     420             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION          RIVER: Citrus Valley
REACH: Reach-1            RS: 5.483

INPUT
Description:
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9675.24  745.78 9696.92  743.61 9710.02  741.84 9714.88   741.4  9723.5  740.88
  9740.9  739.26 9764.41  736.93 9780.24  736.06  9802.5   737.6 9805.53  737.74
 9812.13  737.36 9842.02   738.6 9850.71  738.93 9903.76   733.8 9935.58  732.76
 9997.76  730.8210017.48  731.3110141.39  735.08 10224.8   736.310238.85  736.64
10248.32  736.6510263.55  737.0110360.77  741.5810386.96   742.410419.77  743.82
10431.35  743.9310447.25  744.3510462.01  745.2810464.84   745.8 10476.2  745.56
10490.86  744.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9675.24     .05 9903.76     .0510141.39     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9903.7610141.39              520  516.65     500             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION          RIVER: Citrus Valley
REACH: Reach-1            RS: 5.385

INPUT
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Description:
Station Elevation Data num= 107

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8782.21	741.52	8785.77	741.06	8789.84	740.7	8974.75	738.63	9039.05	737.97
9084.2	737.45	9112.2	737.05	9174.89	737.1	9289.57	737.86	9363.63	738.01
9385.42	738.54	9419.16	738.91	9461.08	739	9473.41	739.15	9499.96	739.47
9529.53	739.54	9570.85	739.22	9594.68	738.9	9607.78	738.6	9620.38	738.58
9651.93	738.26	9696.31	738.12	9740.93	738.6	9781.89	738.42	9819.82	738.42
9845.69	738.67	9846.83	738.64	9870.32	734	9891.15	733.76	9904.15	733.52
9918.25	734.92	9942.28	732.37	9950.59	732	9982.43	731.31	10005.82	727.03
10027.89	730.96	10058.76	732.51	10081.63	732.31	10171.66	733.25	10185.62	733.29
10202.58	733.57	10270.18	733.91	10281.79	734	10335.47	734.96	10339.62	735.23
10368.83	737.71	10414.42	736.46	10416.14	736.41	10450.77	734.25	10461.77	733.76
10486.4	736.53	10490.23	736.9	10523.4	737.61	10529.27	737.94	10560.8	739.01
10592.19	740.17	10599.07	740.23	10666.21	739	10701.41	738.94	10736.91	738.53
10801.88	740.33	10832.89	740.23	10872.45	740.41	10887.41	740.43	10900.57	740.2
10928.57	740.13	10938.69	739.98	10978.13	739.61	11019.81	738.92	11045.23	738.35
11088.41	737.83	11094.96	737.41	11120.57	735.31	11131.35	734.89	11145.65	734.91
11160.3	736.17	11178.84	735.79	11185.55	735.51	11188.08	735.75	11194.2	735.6
11332.89	734.96	11408.82	735.15	11416.32	735.31	11428.61	735.14	11449.41	735.23
11506.82	735.31	11666.78	735.32	11748.23	735.61	11776.04	735.49	11809.42	735.01
11836.33	734.66	11860.97	734.88	11871.16	734.81	11885.23	734.92	11945.86	735.72
12009.43	736.78	12027.91	737.47	12058	738.11	2068.61	737.98	12082.66	738.1
12101.58	738.13	12125.27	738.47	12167.16	738.21	2192.15	738.29	12256.14	738.7
12395.63	740.34	12548.27	741.28						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8782.21	.05	9950.59	.05	10058.76	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9950.59	10058.76	550	480.14	430	.6	.8

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888			F
888			F

CULVERT RIVER: Citrus Valley
REACH: Reach-1 RS: 5.339

INPUT
Description: Gila Bend Canal
Distance from Upstream XS = 240
Deck/Roadway Width = 65
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 14

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
8674	740.26		8819	740.83		8956	740.91	
9059	741.15		9272	740.96		9476	740.85	
9697	740.9		9915	740.84		10184	740.78	
10384	741.25		10586	741.14		10796	741.04	
10999	741.18		11210	741.04				

Upstream Bridge Cross Section Data
Station Elevation Data num= 107

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8782.21	741.52	8785.77	741.06	8789.84	740.7	8974.75	738.63	9039.05	737.97
9084.2	737.45	9112.2	737.05	9174.89	737.1	9289.57	737.86	9363.63	738.01
9385.42	738.54	9419.16	738.91	9461.08	739	9473.41	739.15	9499.96	739.47
9529.53	739.54	9570.85	739.22	9594.68	738.9	9607.78	738.6	9620.38	738.58
9651.93	738.26	9696.31	738.12	9740.93	738.6	9781.89	738.42	9819.82	738.42
9845.69	738.67	9846.83	738.64	9870.32	734	9891.15	733.76	9904.15	733.52
9918.25	734.92	9942.28	732.37	9950.59	732	9982.43	731.31	10005.82	727.03
10027.89	730.96	10058.76	732.51	10081.63	732.31	10171.66	733.25	10185.62	733.29
10202.58	733.57	10270.18	733.91	10281.79	734	10335.47	734.96	10339.62	735.23
10368.83	737.71	10414.42	736.46	10416.14	736.41	10450.77	734.25	10461.77	733.76
10486.4	736.53	10490.23	736.9	10523.4	737.61	10529.27	737.94	10560.8	739.01
10592.19	740.17	10599.07	740.23	10666.21	739	10701.41	738.94	10736.91	738.53
10801.88	740.33	10832.89	740.23	10872.45	740.41	10887.41	740.43	10900.57	740.2
10928.57	740.13	10938.69	739.98	10978.13	739.61	11019.81	738.92	11045.23	738.35
11088.41	737.83	11094.96	737.41	11120.57	735.31	11131.35	734.89	11145.65	734.91
11160.3	736.17	11178.84	735.79	11185.55	735.51	11188.08	735.75	11194.2	735.6
11332.89	734.96	11408.82	735.15	11416.32	735.31	11428.61	735.14	11449.41	735.23
11506.82	735.31	11666.78	735.32	11748.23	735.61	11776.04	735.49	11809.42	735.01
11836.33	734.66	11860.97	734.88	11871.16	734.81	11885.23	734.92	11945.86	735.72

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12009.43  736.7812027.91  737.47   12058   738.112068.61  737.9812082.66   738.1
12101.58  738.1312125.27  738.4712167.16   738.212192.15  738.2912256.14   738.7
12395.63  740.3412548.27  741.28

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8782.21     .05 9950.59     .0510058.76     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9950.5910058.76              .6       .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

Downstream  Deck/Roadway Coordinates
    num=      14
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8674  740.26            8819  740.83            8956  740.91
    9059  741.15            9272  740.96            9476  740.85
    9697   740.9            9915  740.84           10184  740.78
   10384  741.25           10586  741.14           10796  741.04
   10999  741.18           11210  741.04

Downstream Bridge Cross Section Data
Station Elevation Data    num=      69
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8746.12   736.1 8780.11  735.77    8820  735.55 8829.05  735.57 8872.72  735.38
 8897.87   735.2 9006.43  734.33 9031.81   734.2 9054.31  734.13 9108.13  734.19
 9149.12   734.3 9174.18   734.2 9205.83  734.33 9235.81  734.36 9270.06  735.12
 9309.32   735.8 9337.71  735.87 9343.47  732.76 9345.58  732.13 9353.61  733.42
 9361.08   735.7 9420.86   734.8 9466.95   734.6 9556.66   733.8 9580.61  733.85
 9610.83   734.4 9614.64  731.79 9619.22  734.91 9624.34  735.59 9711.48  732.62
 9717.26   732.5 9754.89   732.4 9774.54  731.53 9790.23  731.35 9848.72  729.85
 9854.41   729.7  9893.8  728.65 9905.53  727.99 9917.32  727.66 9942.46  728.42
 9954.41     729 9972.47   728.9 9986.89  726.06 9995.26  723.13   10000  723.13
10024.52  727.610043.75  727.9810073.99   728.110174.77  729.8610334.49     732
10349.91  732.110376.78  732.5410392.98  732.72 10409.7  732.9810526.92  733.87
10549.62  734.210616.31  734.38 10624.6  734.4310644.63  734.3110668.75  734.06
10695.26  733.610759.66  733.0610827.55  732.9310851.62  733.2510955.72  733.23
10976.72  733.311009.26  733.1511023.87  732.9811142.92  733.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8746.12    .035 9972.47    .04510024.52     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9972.4710024.52              .6       .8

Upstream Embankment side slope              =       2 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
5.339-Canal     Circular       4
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                240   113.2        .02                   .5                1
Number of Barrels =  2
Upstream   Elevation =  727.03
Centerline Stations
    Sta.    Sta.
  9997.5 10002.5
Downstream Elevation =  723.13
Centerline Stations
    Sta.    Sta.
  9997.5 10002.5
```

CROSS SECTION RIVER: Citrus Valley
REACH: Reach-1 RS: 5.294

INPUT
Description:
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8746.12	736.1	8780.11	735.77	8820	735.55	8829.05	735.57	8872.72	735.38
8897.87	735.2	9006.43	734.33	9031.81	734.2	9054.31	734.13	9108.13	734.19
9149.12	734.3	9174.18	734.2	9205.83	734.33	9235.81	734.36	9270.06	735.12
9309.32	735.8	9337.71	735.87	9343.47	732.76	9345.58	732.13	9353.61	733.42
9361.08	735.7	9420.86	734.8	9466.95	734.6	9556.66	733.8	9580.61	733.85
9610.83	734.4	9614.64	731.79	9619.22	734.91	9624.34	735.59	9711.48	732.62
9717.26	732.5	9754.89	732.4	9774.54	731.53	9790.23	731.35	9848.72	729.85
9854.41	729.7	9893.8	728.65	9905.53	727.99	9917.32	727.66	9942.46	728.42
9954.41	729	9972.47	728.9	9986.89	726.06	9995.26	723.13	10000	723.13
10024.52	727.6	10043.75	727.98	10073.99	728.1	10174.77	729.86	10334.49	732
10349.91	732.1	10376.78	732.54	10392.98	732.72	10409.7	732.98	10526.92	733.87
10549.62	734.2	10616.31	734.38	10624.6	734.43	10644.63	734.31	10668.75	734.06
10695.26	733.6	10759.66	733.06	10827.55	732.93	10851.62	733.25	10955.72	733.23
10976.72	733.3	11009.26	733.15	11023.87	732.98	11142.92	733.27		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8746.12	.035	9972.47	.045	10024.52	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9972.47	10024.52	460	487.19	500	.6	.8

CROSS SECTION RIVER: Citrus Valley
REACH: Reach-1 RS: 5.202

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8767.84	733.2	8990.96	732.94	9154.54	733.43	9199.66	733.57	9315.3	733.66
9408.37	733.5	9476.06	733.3	9606.7	733.51	9616.3	733.78	9618.66	731.79
9621.8	730.5	9623.52	731.47	9626.23	734.72	9629.29	734.72	9780.68	732.67
9799.96	731.4	9865.63	728.46	9918.71	726.17	9956.92	728.47	9966.41	727.28
9995.01	722.2	9997.5	721.69	10000	722.25	10015.16	725.54	10029.32	727.47
10058.45	726.7	10064.18	726.52	10234.4	728.56	10402.01	730.97	10450.45	731.56
10458.53	731.6	10526.41	731.14	10636.73	730.3	10809.64	730.83	10837.9	730.76
11035.2	730.6	11071	730.8	11223.72	731.68	11240.23	731.71	11454.83	733.35

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8767.84	.035	9956.92	.045	10029.32	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9956.92	10029.32	490	526.51	530	.1	.3

CROSS SECTION RIVER: Citrus Valley
REACH: Reach-1 RS: 5.102

INPUT
Description:
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8419.52	735.2	8458.44	735.47	8468.82	735.07	8506.69	734.69	8573.59	733.15
8579.04	733.2	8675.71	733.04	8697.31	732.97	8760.37	732.63	8868.85	731.89
8884.46	731.8	8920.23	731.96	8961.82	732.01	9070.81	732.28	9077.73	732.2
9127.33	732.3	9181.46	732.33	9288.7	732.04	9398.94	731.97	9490.82	731.69
9563.21	732	9613.46	731.94	9618.91	729.01	9619.52	729.34	9622.78	733.31
9624.23	732.7	9627.6	732.58	9657	732.3	9745.85	731.31	9782.25	730.86
9786.94	730.8	9800.15	730.34	9869.79	727.24	9916.29	725.21	9923.54	724.92
9927.18	725	9962.13	726.61	9969.48	726.23	9973.5	725.15	9994.56	719.14
10000	720.4	10006.17	721.75	10018.27	724.67	10031.13	725.54	10058.62	724.01
10095.46	724.4	10238.22	728.48	10291.98	730.12	10296.65	728.78	10332.08	728.84
10457.62	729.6	10475.68	729.53	10497.46	729.32	10510.05	729.31	10697.97	728.46
10861.03	727.9	10898.47	727.85	10941.61	7281	11098.97	728.41	11157.38	728.84
11299.47	729.4	11344.45	730.7	11365.7	731.2	11366.75	731.41	11378.54	730.95
11391.68	730.7	11499.97	729.58	11653.36	729.78	11717.89	730.28	11770.18	730.63
11900.97	731.6	12020.48	731.96	12101.47	732.93	12189.83	733.55		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8419.52	.035	9969.48	.045	10031.13	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9969.48	10031.13	450	459.71	475	.1	.3

CROSS SECTION RIVER: Citrus Valley
REACH: Reach-1 RS: 5.015

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9631	729.69	9668.36	729.64	9735.72	729.28	9784.4	729.15	9866.42	726.3
9922.59	724.39	9944.12	724.6	9964.26	724.87	9997.41	718.88	10032.86	723.3
10035.7	723.68	10092.01	724.07	10143.74	724.08	10159.41	724.35	10185.66	725
10297.67	726.65	10376.72	726.92	10537.88	725.71	10577	725.38	10598.1	725
10613.12	724.83	10673.08	724.08	10737.6	724.49	10777.29	724.9	10802.27	725.3
10977.57	725.97	11012.27	726.42	11179.78	727.77	11222.17	727.99	11352.94	728.9
11374.11	729.29	11386.78	729.69	11391.35	729.71	11577.27	730.55	11584.16	730.5
11626.04	730.42	11637.04	730.47	11781	731.89	11784.84	731.92	11915.23	732.3
11979.01	732.71	12034.13	733.53						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9631	.035	9964.26	.045	10035.7	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9964.26	10035.7	480	502.18	530	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

CROSS SECTION RIVER: Citrus Valley
REACH: Reach-1 RS: 4.920

INPUT
Description:
Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8099.44	727.9	8112.18	728.05	8121.5	728.07	8163.69	728.44	8173.95	728.9
8226.77	729.9	8244.51	730.14	8255.5	729.96	8290.41	730.49	8303.57	729.15
8322.25	727.6	8350.02	727.44	8385.04	726.88	8422.77	727.81	8434.7	727.42
8444.96	728	8460.78	729.07	8477.71	728.79	8496.92	728.09	8504.46	728.07
8525.06	727.7	8576.17	727.8	8586.29	727.78	8624.6	727.16	8632.21	727.3
8668.95	727.1	8719.3	727.07	8759.51	727.06	8795.08	727.2	8833.22	728.51
8837.7	728.5	8880.37	727.46	8913.89	727.61	8955.88	727.43	9037.79	727.34
9076.03	726.8	9135.77	725.37	9201.47	727.24	9218.26	727.86	9237.88	727.93
9291.09	727.4	9333.05	727.43	9437.98	727.97	9469.32	727.64	9496.93	727.29
9545.92	726.8	9555.63	727.31	9593.29	729.08	9607.85	723.8	9620.44	723.64
9625.54	725	9634.65	728.57	9664.43	725.85	9673.46	725.24	9686.57	727.55
9726.83	725	9733.2	724.96	9858.67	723.17	9931.33	722.75	9947.22	722.44
9958.05	722.5	9996.04	717.17	10000.32	717.67	10037.92	722.15	10087.97	722.34
10238.24	722.8	10345.83	721.7	10364.77	721.89	10403.17	722.38	10421.87	722.57
10483.86	722.6	10554.46	723.42	10626.81	724.3	10657.68	724.46	10704.65	726.12
10766.42	726.8	10805.84	727.29	10816.41	727.44	10847.37	728.03	10853.89	728.27
10894.71	728.8	10903.5	729.03	10944.47	729.48	10951.31	729.52	10993.94	729.97
11003.06	730	11013.22	730.33	11024.12	730.39	11048.17	731.22	11052.14	731.26
11224.59	732.5	11236.93	732.45	11253.56	732.81	11267.53	732.97	11384.55	733.93
11395.4	734	11438.25	734.64	11568.43	734.23				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8099.44	.035	9958.05	.045	10037.92	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9958.05	10037.92	280	337.9	350	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

CROSS SECTION RIVER: Citrus Valley
REACH: Reach-1 RS: 4.856

INPUT
Description:

Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8235.52	728.2	8252.02	728	8258.72	727.5	8295.32	727.64	8342.94	727.51
8418.37	727.7	8471.58	727.84	8497.61	727.58	8525.63	727.41	8554.62	727.17
8583.01	727	8607.51	726.87	8634.85	727.46	8660.32	727.91	8686.19	727.67
8734.74	727.6	8761.41	727.71	8814.87	727.42	9047.43	726.45	9068.21	726.19
9105.77	726.2	9129.86	726.32	9160.66	726.36	9216.06	726	9247.59	725.83
9277.6	725.6	9345.73	725.87	9359.06	725.6	9395.94	725.43	9428.28	725.56
9678.29	725.1	9802.12	724.08	9826.55	723.82	9854.84	722.21	9885.72	721.79
9911.78	721.8	9922.33	721.35	9942.94	721.46	9960.87	720.91	9968.78	715.8
9983.45	715.42	9994.92	715.25	10007.15	715.8	10036.36	719.58	10043.42	719.45
10072.04	718.41	10084.08	718.21	10118.18	717.74	10165.83	718.04	10168.37	717.97
10207.02	717.91	10210.57	717.89	10259.81	718.23	10300.07	718.71	10306.51	718.86
10385.72	721.71	10426.97	723.08	10436.61	722.53	10448.88	724.67	10468.05	725.77
10480.93	726	10513.8	726.91	10531.31	727.11	10563.84	728.26	10593.11	728.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8235.52	.035	9960.87	.045	10036.36	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9960.87	10036.36	79.2	79.2	79.2	.3	.5

BRIDGE RIVER: Citrus Valley
REACH: Reach-1 RS: 4.847

INPUT
Description: SPRR
Distance from Upstream XS = 1
Deck/Roadway Width = 16
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
7888	730.97		8387	730.04		8887	728.77	
9387	727.39		9978.5	727.09	723.09	10000	727.09	723.09
10021.5	727.09	723.09	10500	729.24		11000	732.54	
11501	735.77							

Upstream Bridge Cross Section Data
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8235.52	728.2	8252.02	728	8258.72	727.5	8295.32	727.64	8342.94	727.51
8418.37	727.7	8471.58	727.84	8497.61	727.58	8525.63	727.41	8554.62	727.17
8583.01	727	8607.51	726.87	8634.85	727.46	8660.32	727.91	8686.19	727.67
8734.74	727.6	8761.41	727.71	8814.87	727.42	9047.43	726.45	9068.21	726.19
9105.77	726.2	9129.86	726.32	9160.66	726.36	9216.06	726	9247.59	725.83
9277.6	725.6	9345.73	725.87	9359.06	725.6	9395.94	725.43	9428.28	725.56
9678.29	725.1	9802.12	724.08	9826.55	723.82	9854.84	722.21	9885.72	721.79
9911.78	721.8	9922.33	721.35	9942.94	721.46	9960.87	720.91	9968.78	715.8
9983.45	715.42	9994.92	715.25	10007.15	715.8	10036.36	719.58	10043.42	719.45
10072.04	718.41	10084.08	718.21	10118.18	717.74	10165.83	718.04	10168.37	717.97
10207.02	717.91	10210.57	717.89	10259.81	718.23	10300.07	718.71	10306.51	718.86
10385.72	721.71	10426.97	723.08	10436.61	722.53	10448.88	724.67	10468.05	725.77
10480.93	726	10513.8	726.91	10531.31	727.11	10563.84	728.26	10593.11	728.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8235.52	.035	9960.87	.045	10036.36	.03

Bank Sta: Left	Right	Coeff Contr.	Expan.
9960.87	10036.36	.3	.5

Downstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
7888	730.97		8387	730.04		8887	728.77	
9387	727.39		9978.5	727.09	723.09	10000	727.09	723.09
10021.5	727.09	723.09	10500	729.24		11000	732.54	
11501	735.77							

Downstream Bridge Cross Section Data
Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9196.68	726.8	9379.23	724.13	9394.71	723.95	9454.66	722.5	9457.57	722.51
9493.79	722.51	9499.57	722.48	9545.85	722.62	9592.11	722.7	9595.5	722.8[illegible]

```
 9641.48  723.18 9671.27  723.43 9702.95  723.41 9725.93   723.2 9772.46  721.93
 9820.58  721.26  9823.9  721.16 9873.87  720.34 9917.46   719.7 9957.81  718.42
 9958.43  717.66 9974.43  716.46 9989.71  716.0110006.55   715.810018.33   716.5
10046.94  716.5210072.58  716.2610142.97  720.2210170.32   720.3   10204  720.58
10233.79  720.7810281.85  720.0410291.25  720.1610309.55   720.710338.46  725.35
10340.86  725.14 10349.3  725.5410351.84  726.2110367.95   726.710461.91  726.92
10564.28   727.410599.44  727.7810626.31  725.99 10647.3   728.710668.92  729.22
10741.41  729.7610764.37  729.7210780.35  728.9310904.99   730.110908.81  730.18
10915.97  729.9210932.14  729.7210976.52  728.4911027.35   729.211055.19  729.47
11083.72  729.4311145.28  731.0311195.79  731.8311224.54   732.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9196.68     .04 9917.46     .0510142.97    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9917.4610142.97             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

Upstream Embankment side slope              =       2 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=  9992.5    Downstream=  9992.5
Upstream     num=       2
    Width   Elev    Width   Elev
       2   714.8       2  723.09
Downstream     num=       2
    Width   Elev    Width   Elev
       2   714.8       2  723.09

Pier Data
Pier Station     Upstream= 10007.5    Downstream= 10007.5
Upstream     num=       2
    Width   Elev    Width   Elev
       2   714.8       2  723.09
Downstream     num=       2
    Width   Elev    Width   Elev
       2   714.8       2  723.09

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
       Yarnell                 KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION          RIVER: Citrus Valley
REACH: Reach-1            RS: 4.841

INPUT
Description:
Station Elevation Data    num=      59
```

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9196.68   726.8 9379.23  724.13 9394.71  723.95 9454.66   722.5 9457.57  722.51
 9493.79  722.51 9499.57  722.48 9545.85  722.62 9592.11   722.7  9595.5  722.86
 9641.48  723.18 9671.27  723.43 9702.95  723.41 9725.93   723.2 9772.46  721.93
 9820.58  721.26  9823.9  721.16 9873.87  720.34 9917.46   719.7 9957.81  718.42
 9958.43  717.66 9974.43  716.46 9989.71  716.0110006.55   715.810018.33   716.5
10046.94  716.5210072.58  716.2610142.97  720.2210170.32   720.3   10204  720.58
10233.79  720.7810281.85  720.0410291.25  720.1610309.55   720.710338.46  725.35
10340.86  725.14 10349.3  725.5410351.84  726.2110367.95   726.710461.91  726.92
10564.28   727.410599.44  727.7810626.31  725.99 10647.3   728.710668.92  729.22
10741.41  729.7610764.37  729.7210780.35  728.9310904.99   730.110908.81  730.18
10915.97  729.9210932.14  729.7210976.52  728.4911027.35   729.211055.19  729.47
11083.72  729.4311145.28  731.0311195.79  731.8311224.54   732.4

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9196.68     .04 9917.46     .0510142.97    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9917.4610142.97               105   105.6     108              .3       .5
Ineffective Flow      num=        1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Citrus Valley
REACH: Reach-1             RS: 4.821

INPUT
Description:
Station Elevation Data      num=       35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8791.43   726.8 8817.61   726.8 8839.12     727 8843.57  726.96 8977.28  726.71
 8989.01   726.5 9003.92  726.54 9368.97  724.58 9395.93  724.44 9409.07  724.18
  9541.1   723.1 9554.77  723.05 9561.51   723.5 9582.51  723.23 9776.04  719.14
    9920     720    9985   714.1   10000  714.08   10015  714.110058.82  718.81
10064.75  718.47 10130.5  722.5710144.91  722.6610157.08  722.510174.76  723.33
10651.29   726.110659.26  725.9710676.05  726.1210678.59    72610688.06  726.51
10702.79  726.2510720.53  726.6410802.45  727.46 11156.1  730.611169.45  730.65

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8791.43    .035    9920    .04510058.82     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          992010058.82               258  224.89     248              .3       .5

CULVERT                 RIVER: Citrus Valley
REACH: Reach-1             RS: 4.820

INPUT
Description: I-8
Distance from Upstream XS =        2
Deck/Roadway Width        =      220
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=       10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8680  726.39            8907  725.79            9205  725.03
    9439  724.45            9673  724.09            9953  724.32
   10190     725           10427  726.37           10644  727.73
   10853  728.91

Upstream Bridge Cross Section Data
Station Elevation Data      num=       35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8791.43   726.8 8817.61   726.8 8839.12     727 8843.57  726.96 8977.28  726.71
 8989.01   726.5 9003.92  726.54 9368.97  724.58 9395.93  724.44 9409.07  724.18
  9541.1   723.1 9554.77  723.05 9561.51   723.5 9582.51  723.23 9776.04  719.14
    9920     720    9985   714.1   10000  714.08   10015  714.110058.82  718.81
10064.75  718.47 10130.5  722.5710144.91  722.6610157.08  722.510174.76  723.33
10651.29   726.110659.26  725.9710676.05  726.1210678.59    72610688.06  726.51
10702.79  726.2510720.53  726.6410802.45  727.46 11156.1  730.611169.45  730.65

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8791.43    .035    9920    .04510058.82     .03
```

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
          992010058.82             .3       .5

Downstream  Deck/Roadway Coordinates
    num=      10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8680  726.39            8907  725.79            9205  725.03
    9439  724.45            9673  724.09            9953  724.32
   10190     725           10427  726.37           10644  727.73
   10853  728.91

Downstream Bridge Cross Section Data
Station Elevation Data    num=      54
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8720.02   726.3  8728.2  726.26 8943.26  726.46  8991.2  726.49 9026.88  726.35
 9300.73     725 9444.29  723.84 9475.64   723.8 9479.84  723.94 9492.83  723.87
 9962.04   723.2 9965.31   723.2  9971.7720.2888  9987.7     713 9995.76     713
   10000     71310010.87     713 10020.8720.275110024.15  722.7310167.59  722.48
10182.07  722.7710213.16  723.0410231.38   723.910339.02  724.3510366.08   724.9
10390.05  724.7810419.98  724.5310522.81     72510576.91  725.15 10610.6  725.38
10628.01  725.0510649.61  726.8910658.82   727.210674.59  727.0810735.97  726.59
10769.57  726.2410781.19  726.1510823.52   727.110860.66  727.5310883.98     728
10895.76  728.3111006.27  728.8711050.29   728.811122.96  729.5211195.64  730.39
11251.68   731.311260.43  731.5211287.44   731.911308.15  731.6411361.03  731.83
11366.56  731.8911401.26  732.0111408.78     73211451.86  732.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8720.02    .035  9971.7    .045 10020.8     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        9971.7 10020.8             .3       .5

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1          Box        8      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Inlet control
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  1     220       .013                   .3               .5
Number of Barrels =  2
Upstream   Elevation =  714.08
Centerline Stations
    Sta.    Sta.
  9989.5 10010.5
Downstream Elevation =  713
Centerline Stations
    Sta.    Sta.
  9989.5 10010.5

CROSS SECTION          RIVER: Citrus Valley
REACH: Reach-1            RS: 4.778

INPUT
Description:
Station Elevation Data    num=      54
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8720.02   726.3  8728.2  726.26 8943.26  726.46  8991.2  726.49 9026.88  726.35
 9300.73     725 9444.29  723.84 9475.64   723.8 9479.84  723.94 9492.83  723.87
 9962.04   723.2 9965.31   723.2  9971.7720.2888  9987.7     713 9995.76     713
   10000     71310010.87     713 10020.8720.275110024.15  722.7310167.59  722.48
10182.07  722.7710213.16  723.0410231.38   723.910339.02  724.3510366.08   724.9
10390.05  724.7810419.98  724.5310522.81     72510576.91  725.15 10610.6  725.38
10628.01  725.0510649.61  726.8910658.82   727.210674.59  727.0810735.97  726.59
10769.57  726.2410781.19  726.1510823.52   727.110860.66  727.5310883.98     72
```

```
10895.76  728.3111006.27  728.8711050.29   728.811122.96  729.5211195.64  730.39
11251.68   731.311260.43  731.5211287.44   731.911308.15  731.6411361.03  731.83
11366.56  731.8911401.26  732.0111408.78     73211451.86  732.14

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8720.02    .035  9971.7    .045 10020.8     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9971.7 10020.8               318  299.78     328             .3       .5

CROSS SECTION           RIVER: Citrus Valley
REACH: Reach-1             RS: 4.721

INPUT
Description:
Station Elevation Data     num=      69
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 8448.43   720.8 8489.86  720.99  8500.4  720.94 8544.33  721.48 8560.71  722.22
 8606.71     724 8659.39   724.9 8698.31  725.47 8713.97  726.15 8775.76  724.87
 8787.13   724.5 8826.49   724.5 8834.26  724.44 8875.17  725.06 8901.27  725.21
 9016.03   722.8 9037.67  722.48 9093.17  721.97 9185.34     722 9253.35  722.59
 9281.98   723.1 9297.24  723.06 9332.74  722.48 9416.57  720.77    9467  719.42
 9477.38   719.3 9547.47  719.09 9606.39  718.71 9620.07  719.06 9704.58  721.75
 9709.26   721.8 9857.59  719.14 9898.61  718.72 9937.78  719.93 9945.08  719.89
 9954.33718.6641 9999.33   712.710039.74  717.94 10081.3  716.9610095.14  716.71
10198.07  717.2410205.24   717.310302.82  718.4310460.17  723.8710507.16   724.9
10560.17  727.3310617.42   728.710686.36   728.210713.11  727.9110775.41  728.95
10813.67  729.5110828.02   729.510850.35   729.910866.19  729.89 10943.1  729.23
10961.92  729.2810999.44   729.211111.95  729.9711121.78  730.1511153.22  730.37
11194.16  730.62 11234.6   730.8 11266.5   731.511290.92  731.8911323.38  732.11
11335.11  732.0711431.06   733.211452.79  733.1611525.06  734.27

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 8448.43    .035 9954.33    .04510039.74     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.3310039.74                 0       0       0             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F
```

SUMMARY OF MANNING'S N VALUES

River:Citrus Valley

Reach	River Sta.	n1	n2	n3
Reach-1	6.298	.04	.05	.035
Reach-1	6.206	.04	.05	.035
Reach-1	6.114	.04	.05	.035
Reach-1	6.026	.04	.05	.035
Reach-1	5.944	.04	.05	.035
Reach-1	5.841	.04	.05	.035
Reach-1	5.750	.05	.05	.04
Reach-1	5.660	.05	.05	.04
Reach-1	5.569	.05	.05	.04
Reach-1	5.483	.05	.05	.04
Reach-1	5.385	.05	.05	.04
Reach-1	5.339	Culvert		
Reach-1	5.294	.035	.045	.03
Reach-1	5.202	.035	.045	.03
Reach-1	5.102	.035	.045	.03
Reach-1	5.015	.035	.045	.03
Reach-1	4.920	.035	.045	.03
Reach-1	4.856	.035	.045	.03
Reach-1	4.847	Bridge		
Reach-1	4.841	.04	.05	.035
Reach-1	4.821	.035	.045	.03
Reach-1	4.820	Culvert		
Reach-1	4.778	.035	.045	.03
Reach-1	4.721	.035	.045	.03

SUMMARY OF REACH LENGTHS

River: Citrus Valley

Reach	River Sta.	Left	Channel	Right
Reach-1	6.298	470	488.56	440
Reach-1	6.206	460	486.47	450
Reach-1	6.114	400	459.75	470
Reach-1	6.026	370	434.67	460
Reach-1	5.944	540	544.21	450
Reach-1	5.841	480	480.8	460
Reach-1	5.750	450	475.66	450
Reach-1	5.660	447	479.51	447
Reach-1	5.569	470	455.03	420
Reach-1	5.483	520	516.65	500
Reach-1	5.385	550	480.14	430
Reach-1	5.339	Culvert		
Reach-1	5.294	460	487.19	500
Reach-1	5.202	490	526.51	530
Reach-1	5.102	450	459.71	475
Reach-1	5.015	480	502.18	530
Reach-1	4.920	280	337.9	350
Reach-1	4.856	79.2	79.2	79.2
Reach-1	4.847	Bridge		
Reach-1	4.841	105	105.6	108
Reach-1	4.821	258	224.89	248
Reach-1	4.820	Culvert		
Reach-1	4.778	318	299.78	328
Reach-1	4.721	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Citrus Valley

Reach	River Sta.	Contr.	Expan.
Reach-1	6.298	.1	.3
Reach-1	6.206	.1	.3
Reach-1	6.114	.1	.3
Reach-1	6.026	.1	.3
Reach-1	5.944	.1	.3
Reach-1	5.841	.1	.3
Reach-1	5.750	.1	.3
Reach-1	5.660	.1	.3
Reach-1	5.569	.1	.3
Reach-1	5.483	.1	.3
Reach-1	5.385	.6	.8
Reach-1	5.339	Culvert	
Reach-1	5.294	.6	.8
Reach-1	5.202	.1	.3
Reach-1	5.102	.1	.3
Reach-1	5.015	.1	.3
Reach-1	4.920	.1	.3
Reach-1	4.856	.3	.5
Reach-1	4.847	Bridge	
Reach-1	4.841	.3	.5
Reach-1	4.821	.3	.5
Reach-1	4.820	Culvert	
Reach-1	4.778	.3	.5
Reach-1	4.721	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	

Reach-1	6.298		3210.00	749.92	755.00	754.38	755.36	0.01	5.03	687.24	373.21	1
Reach-1	6.298		3210.00	749.92	755.75	754.37	756.05	0.00	4.43	731.92	226.00	0
Reach-1	6.206		3210.00	748.11	753.36		753.50	0.00	3.46	1216.16	768.80	0
Reach-1	6.206		3210.00	748.11	754.27		754.52	0.00	4.10	801.18	180.00	0
Reach-1	6.114		3210.00	744.98	751.74	751.19	751.99	0.00	4.40	860.00	591.32	0
Reach-1	6.114		3210.00	744.98	752.63	751.17	753.02	0.00	4.87	644.17	176.88	0
Reach-1	6.026		3210.00	743.82	748.95		749.30	0.01	5.98	754.44	582.35	1
Reach-1	6.026		3210.00	743.82	749.42		750.14	0.01	7.59	491.76	205.00	1
Reach-1	5.944		3210.00	741.11	746.34		746.65	0.01	4.99	767.71	436.84	0
Reach-1	5.944		3210.00	741.11	747.31		747.65	0.00	4.79	686.77	175.00	0
Reach-1	5.841		3210.00	737.80	743.69	742.98	744.03	0.00	5.26	720.90	361.58	0
Reach-1	5.841		3210.00	737.80	744.32	743.14	745.06	0.01	6.89	466.48	113.06	1
Reach-1	5.750		3210.00	736.44	742.00		742.22	0.00	4.27	983.05	463.58	0
Reach-1	5.750		3210.00	736.44	742.30		742.62	0.00	4.91	732.42	200.00	0
Reach-1	5.660		3210.00	734.50	741.70		741.74	0.00	1.93	2312.25	840.63	0
Reach-1	5.660		3210.00	734.50	741.75		741.84	0.00	2.70	1406.60	350.60	0
Reach-1	5.569		3210.00	731.96	741.63		741.65	0.00	1.31	3194.33	674.78	0
Reach-1	5.569		3210.00	731.96	741.65		741.68	0.00	1.60	2112.08	289.68	0
Reach-1	5.483		2190.00	730.82	741.62		741.62	0.00	0.68	3792.83	649.45	0
Reach-1	5.483		2190.00	730.82	741.62		741.64	0.00	0.92	2439.70	285.00	0
Reach-1	5.385		2190.00	727.03	741.61	733.06	741.61	0.00	0.43	6922.65	3766.06	0
Reach-1	5.385		2190.00	727.03	741.61	733.06	741.62	0.00	0.73	3108.06	335.00	0
Reach-1	5.339		Culvert									
Reach-1	5.294		3210.00	723.13	730.62		730.89	0.00	5.03	831.19	413.01	0
Reach-1	5.294		3210.00	723.13	730.66		730.94	0.00	4.81	798.41	331.27	0
Reach-1	5.202		3210.00	721.69	729.06		729.34	0.00	4.88	786.47	416.86	0
Reach-1	5.202		3210.00	721.69	729.27		729.58	0.00	4.64	739.21	287.49	0
Reach-1	5.102		3210.00	719.14	727.90		728.09	0.00	3.83	946.90	417.86	0
Reach-1	5.102		3210.00	719.14	728.63		728.79	0.00	3.01	1040.54	260.00	0
Reach-1	5.015		3210.00	718.88	727.54		727.62	0.00	2.69	1460.05	1320.48	0
Reach-1	5.015		3210.00	718.88	728.11		728.34	0.00	3.81	854.67	170.00	0

Reach-1	4.920		3210.00	717.17	727.54		727.55	0.00	0.72	4774.62	1966.43	0
Reach-1	4.920		3210.00	717.17	728.11		728.15	0.00	1.51	2029.84	325.00	0
Reach-1	4.856		3210.00	715.25	727.54	719.28	727.55	0.00	0.54	6897.05	1920.64	0
Reach-1	4.856		3210.00	715.25	728.10	719.47	728.12	0.00	0.91	3078.29	330.00	0
Reach-1	4.847		Bridge									
Reach-1	4.841		3210.00	715.80	725.09		725.10	0.00	0.94	4049.76	1023.14	0
Reach-1	4.841		3210.00	715.80	726.07		726.11	0.00	1.51	2154.45	260.00	0
Reach-1	4.821		3210.00	714.08	725.08	718.59	725.09	0.00	1.18	3792.82	1198.80	0
Reach-1	4.821		3210.00	714.08	726.05	718.59	726.09	0.00	1.67	1953.84	240.00	0
Reach-1	4.820		Culvert									
Reach-1	4.778		3210.00	713.00	720.16	719.99	722.58	0.02	12.49	257.04	48.65	1
Reach-1	4.778		3210.00	713.00	721.13		722.85	0.01	10.53	305.77	52.10	1
Reach-1	4.721		3110.00	712.70	718.95	718.32	719.25	0.00	4.74	715.44	443.29	0
Reach-1	4.721		3110.00	712.70	719.95	718.65	720.44	0.00	5.47	556.97	150.00	0

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach-1	6.298	755.36	755.00	0.36	1.80	0.07	162.43	2619.53	428.04	373.21
Reach-1	6.298	756.05	755.75	0.30	1.52	0.01	248.27	2959.90	1.83	226.00
Reach-1	6.206	753.50	753.36	0.14	1.50	0.01	612.39	2049.46	548.16	768.80
Reach-1	6.206	754.52	754.27	0.25	1.49	0.01	172.54	2985.92	51.54	180.00
Reach-1	6.114	751.99	751.74	0.25	2.68	0.01	359.17	1713.35	1137.48	591.32
Reach-1	6.114	753.02	752.63	0.39	2.84	0.03	0.30	2449.26	760.44	176.88
Reach-1	6.026	749.30	748.95	0.36	2.64	0.01	605.11	1317.21	1287.68	582.35
Reach-1	6.026	750.14	749.42	0.72	2.37	0.11	640.60	1882.52	686.88	205.00
Reach-1	5.944	746.65	746.34	0.32	2.63	0.00	322.82	2308.93	578.25	436.84
Reach-1	5.944	747.65	747.31	0.34	2.55	0.04	20.94	2826.98	362.09	175.00
Reach-1	5.841	744.03	743.69	0.33	1.77	0.03	51.91	1619.11	1538.98	361.58
Reach-1	5.841	745.06	744.32	0.74	2.32	0.12	53.91	2453.27	702.82	113.06
Reach-1	5.750	742.22	742.00	0.22	0.42	0.05	630.24	2038.54	541.23	463.58
Reach-1	5.750	742.62	742.30	0.33	0.71	0.07	637.23	2509.5		

63.26 200.00

Reach-1	5.660		741.74	741.70	0.04	0.09	0.01	1265.96	1553.45	
390.59	840.63									
Reach-1	5.660		741.84	741.75	0.09	0.14	0.02	983.73	2185.27	
41.00	350.60									
Reach-1	5.569		741.65	741.63	0.02	0.02	0.00	851.74	1146.39	
1211.86	674.78									
Reach-1	5.569		741.68	741.65	0.04	0.04	0.01	611.58	1406.98	
1191.44	289.68									
Reach-1	5.483		741.62	741.62	0.01	0.01	0.00	293.17	1436.71	
460.12	649.45									
Reach-1	5.483		741.64	741.62	0.01	0.02	0.00	60.13	1957.66	
172.21	285.00									
Reach-1	5.385		741.61	741.61	0.00			384.77	507.43	
1297.81	3766.06									
Reach-1	5.385		741.62	741.61	0.01			377.54	870.08	
942.38	335.00									
Reach-1	5.339		Culvert							
Reach-1	5.294		730.89	730.62	0.26	1.53	0.01	782.77	1308.74	
1118.49	413.01									
Reach-1	5.294		730.94	730.66	0.28	1.34	0.02	774.77	1260.82	
1174.42	331.27									
Reach-1	5.202		729.34	729.06	0.28	1.21	0.03	556.58	1388.12	
1265.30	416.86									
Reach-1	5.202		729.58	729.27	0.31	0.75	0.05	633.38	1391.70	
1184.92	287.49									
Reach-1	5.102		728.09	727.90	0.19	0.44	0.03	489.66	1184.56	
1535.78	417.86									
Reach-1	5.102		728.79	728.63	0.15	0.44	0.01	558.90	1066.42	
1584.68	260.00									
Reach-1	5.015		727.62	727.54	0.08	0.04	0.02	448.27	1149.34	
1612.39	1320.48									
Reach-1	5.015		728.34	728.11	0.22	0.14	0.06	479.44	1785.11	
945.45	170.00									
Reach-1	4.920		727.55	727.54	0.01	0.01	0.00	535.59	447.52	
2226.88	1966.43									
Reach-1	4.920		728.15	728.11	0.04	0.02	0.01	612.97	1010.72	
1586.31	325.00									
Reach-1	4.856		727.55	727.54	0.00			608.95	447.58	
2153.47	1920.64									
Reach-1	4.856		728.12	728.10	0.02			463.70	787.38	
1958.92	330.00									
Reach-1	4.847		Bridge							
Reach-1	4.841		725.10	725.09	0.01	0.01	0.00	825.87	1616.48	
767.64	1023.14									
Reach-1	4.841		726.11	726.07	0.03	0.01	0.00	225.18	2938.97	
45.84	260.00									
Reach-1	4.821		725.09	725.08	0.01			1342.37	1452.62	
415.01	1198.80									
Reach-1	4.821		726.09	726.05	0.04			254.72	2271.79	
683.49	240.00									
Reach-1	4.820		Culvert							
Reach-1	4.778		722.58	720.16	2.42	2.27	1.06		3210.00	
48.65										
Reach-1	4.778		722.85	721.13	1.72	1.79	0.62	1.70	3207.11	
1.19	52.10									
Reach-1	4.721		719.25	718.95	0.30			2.50	1392.28	
1715.22	443.29									
Reach-1	4.721		720.44	719.95	0.49				2068.2[illegible]	

1041.78 150.00

Profile Output Table - Encroachment 1

Reach	River Sta	W.S. Elev (ft)	Prof Delta (ft)	WS E.G. Elev (ft)	Top Wdth Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	6.298	755.00		755.36	373.21	162.43	2619.53	428.04		9959.31	10155.03	
Reach-1	6.298	755.75	0.75	756.05	226.00	248.27	2959.90	1.83	9930.00	9959.31	10155.03	10156.00
Reach-1	6.206	753.36		753.50	768.80	612.39	2049.46	548.16		9942.31	10092.37	
Reach-1	6.206	754.27	0.91	754.52	180.00	172.54	2985.92	51.54	9920.00	9942.31	10092.37	10100.00
Reach-1	6.114	751.74		751.99	591.32	359.17	1713.35	1137.48		9935.79	10062.43	
Reach-1	6.114	752.63	0.90	753.02	176.88	0.30	2449.26	760.44	9935.61	9935.79	10062.43	10112.49
Reach-1	6.026	748.95		749.30	582.35	605.11	1317.21	1287.68		9957.17	10015.85	
Reach-1	6.026	749.42	0.47	750.14	205.00	640.60	1882.52	686.88	9875.00	9957.17	10015.85	10080.00
Reach-1	5.944	746.34		746.65	436.84	322.82	2308.93	578.25		9882.49	10013.78	
Reach-1	5.944	747.31	0.97	747.65	175.00	20.94	2826.98	362.09	9880.00	9882.49	10013.78	10055.00
Reach-1	5.841	743.69		744.03	361.58	51.91	1619.11	1538.98		9949.91	10026.57	
Reach-1	5.841	744.32	0.63	745.06	113.06	53.91	2453.27	702.82	9944.95	9949.91	10026.57	10058.01
Reach-1	5.750	742.00		742.22	463.58	630.24	2038.54	541.23		9945.67	10055.67	
Reach-1	5.750	742.30	0.30	742.62	200.00	637.23	2509.51	63.26	9860.00	9945.67	10055.67	10060.00
Reach-1	5.660	741.70		741.74	840.63	1265.96	1553.45	390.59		9945.66	10090.59	
Reach-1	5.660	741.75	0.05	741.84	350.60	983.73	2185.27	41.00	9745.78	9945.66	10090.59	10096.38
Reach-1	5.569	741.63		741.65	674.78	851.74	1146.39	1211.86		9950.41	10050.41	
Reach-1	5.569	741.65	0.02	741.68	289.68	611.58	1406.98	1191.44	9864.28	9950.41	10050.41	10153.96
Reach-1	5.483	741.62		741.62	649.45	293.17	1436.71	460.12		9903.76	10141.39	
Reach-1	5.483	741.62	0.01	741.64	285.00	60.13	1957.66	172.21	9890.00	9903.76	10141.39	10175.00
Reach-1	5.385	741.61		741.61	1301.92	384.77	507.43	1297.81		9950.59	10058.76	
Reach-1	5.385	741.61	0.00	741.62	335.00	377.54	870.08	942.38	9865.00	9950.59	10058.76	10200.00
Reach-1	5.339	Culvert										
Reach-1	5.294	730.62		730.89	413.01	782.77	1308.74	1118.49		9972.47	10024.52	
Reach-1	5.294	730.66	0.04	730.94	331.27	774.77	1260.82	1174.42	9818.73	9972.47	10024.52	10150.00
Reach-1	5.202	729.06		729.34	416.86	556.58	1388.12	1265.30		9956.92	10029.32	
Reach-1	5.202	729.27	0.22	729.58	287.49	633.38	1391.70	1184.92	9852.51	9956.92	10029.32	10140.00

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  Reach-1       5.102              727.90                    728.09        417.86      489.66    1184.56
1535.78                9969.48   10031.13
  Reach-1       5.102              728.63            0.73    728.79        260.00      558.90    1066.42
1584.68    9890.00    9969.48   10031.13   10150.00

  Reach-1       5.015              727.54                    727.62        545.98      448.27    1149.34
1612.39                9964.26   10035.70
  Reach-1       5.015              728.11            0.57    728.34        170.00      479.44    1785.11
945.45    9920.00    9964.26   10035.70   10090.00

  Reach-1       4.920              727.54                    727.55       1135.25      535.59     447.52
2226.88                9958.05   10037.92
  Reach-1       4.920              728.11            0.56    728.15        325.00      612.97    1010.72
1586.31    9875.00    9958.05   10037.92   10200.00

  Reach-1       4.856              727.54                    727.55       1920.64      608.95     447.58
2153.47                9960.87   10036.36
  Reach-1       4.856              728.10            0.56    728.12        330.00      463.70     787.38
1958.92    9870.00    9960.87   10036.36   10200.00

  Reach-1       4.847   BR U       727.54                    727.55        789.26      754.98    2384.06
70.97                9960.87   10036.36
  Reach-1       4.847   BR U       728.10            0.56    728.12        290.00      616.98    2023.54
569.48    9880.00    9960.87   10036.36   10170.00

  Reach-1       4.847   BR D       727.42                    727.51        720.44      510.87    2670.54
9917.46   10142.97
  Reach-1       4.847   BR D       727.78            0.36    728.03        290.00      383.75    2565.28
260.97    9880.00    9917.46   10142.97   10170.00

  Reach-1       4.841              725.09                    725.10       1023.14      825.87    1616.48
767.64                9917.46   10142.97
  Reach-1       4.841              726.07            0.98    726.11        260.00      225.18    2938.97
45.84    9890.00    9917.46   10142.97   10150.00

  Reach-1       4.821              725.08                    725.09       1198.80     1342.37    1452.62
415.01                9920.00   10058.82
  Reach-1       4.821              726.05            0.97    726.09        240.00      254.72    2271.79
683.49    9890.00    9920.00   10058.82   10130.00

  Reach-1       4.820             Culvert

  Reach-1       4.778              720.16                    722.58         48.65                3210.00
9971.70   10020.80
  Reach-1       4.778              721.13            0.97    722.85         52.10        1.70    3207.11
1.19    9940.00    9971.70   10020.80   10060.00

  Reach-1       4.721              718.95                    719.25        396.11        2.50    1392.28
1715.22                9954.33   10039.74
  Reach-1       4.721              719.95            1.00    720.44        150.00                2068.22
1041.78    9955.00    9954.33   10039.74   10105.00
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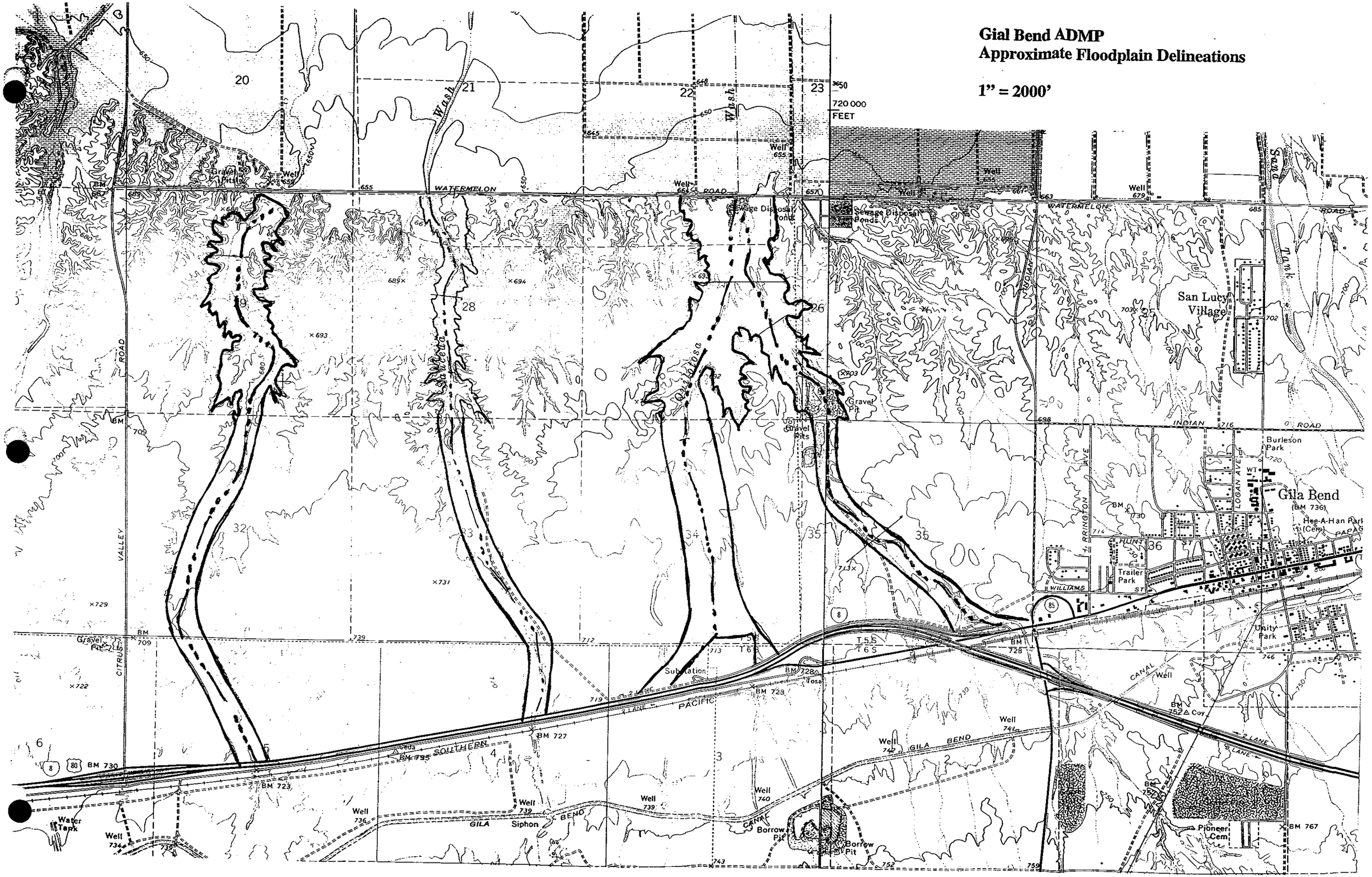
Appendix E.6

APPROXIMATE FLOODPLAIN DELINEATIONS

Gial Bend ADMP
Approximate Floodplain Delineations

1" = 2000'



Hacker Wash, Section 1
Worksheet for Irregular Channel

Project Description	
Worksheet	Hacker #1
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.004500	ft/ft
Discharge	8,250.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Metho	Horton's Method

Results		
Mannings Coefficient	0.033	
Water Surface Elevation	716.06	ft
Elevation Range	712.70 to 720.00	
Flow Area	1,670.6	ft^2
Wetted Perimeter	811.36	ft
Top Width	811.32	ft
Actual Depth	3.36	ft
Critical Elevation	715.36	ft
Critical Slope	0.013235	ft/ft
Velocity	4.94	ft/s
Velocity Head	0.38	ft
Specific Energy	716.44	ft
Froude Number	0.61	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	7+00	0.030
7+00	12+00	0.035
12+00	17+00	0.030

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	720.00
3+00	718.00
5+00	716.00
7+00	714.00
11+00	712.70
12+00	714.00
13+00	716.00
15+00	718.00
17+00	720.00

Hacker Wash, Section 2
Worksheet for Irregular Channel

Project Description	
Worksheet	Hacker Wash #2
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.004500	ft/ft
Discharge	8,250.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Metho	Horton's Method

Results		
Mannings Coefficient	0.035	
Water Surface Elevation	702.90	ft
Elevation Range	696.00 to 710.00	
Flow Area	1,650.9	ft²
Wetted Perimeter	710.25	ft
Top Width	709.94	ft
Actual Depth	6.90	ft
Critical Elevation	702.04	ft
Critical Slope	0.014688	ft/ft
Velocity	5.00	ft/s
Velocity Head	0.39	ft
Specific Energy	703.29	ft
Froude Number	0.58	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	16+00	0.035

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	710.00
1+80	705.00
4+00	700.00
5+25	702.00
6+00	700.00
6+75	696.00
7+00	697.00
7+50	700.00
11+50	705.00
16+00	710.00

Hacker Wash, Section 3
Worksheet for Irregular Channel

Project Description	
Worksheet	Hacker Wash #3
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.004500	ft/ft
Discharge	8,250.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Metho	Horton's Method

Results		
Mannings Coefficient	0.035	
Water Surface Elevation	683.88	ft
Elevation Range	677.00 to 690.00	
Flow Area	1,289.9	ft²
Wetted Perimeter	383.29	ft
Top Width	383.00	ft
Actual Depth	6.88	ft
Critical Elevation	682.67	ft
Critical Slope	0.012675	ft/ft
Velocity	6.40	ft/s
Velocity Head	0.64	ft
Specific Energy	684.52	ft
Froude Number	0.61	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	7+00	0.035

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	690.00
1+50	685.00
3+50	680.00
4+20	677.00
4+40	677.00
5+00	680.00
6+00	685.00
7+00	690.00

Notes: Desert rangeland

Quilotosa #1, 1000' north of I-8
Worksheet for Irregular Channel

Project Description	
Worksheet	Quilotosa #2
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.004600	ft/ft
Discharge	15,550.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Metho	Horton's Method

Results		
Mannings Coefficient	0.033	
Water Surface Elevation	712.95	ft
Elevation Range	700.00 to 716.00	
Flow Area	4,424.7	ft²
Wetted Perimeter	3,630.29	ft
Top Width	3,626.03	ft
Actual Depth	12.95	ft
Critical Elevation	712.53	ft
Critical Slope	0.016372	ft/ft
Velocity	3.51	ft/s
Velocity Head	0.19	ft
Specific Energy	713.15	ft
Froude Number	0.56	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	21+40	0.033
21+40	22+30	0.038
22+30	40+55	0.032

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	713.35
3+98	712.00
7+60	709.90
14+20	712.00
18+10	712.60
21+40	712.00
21+63	704.00
21+78	700.00
21+84	700.00
21+95	704.00
22+00	708.00

Quilotosa #1, 1000' north of I-8
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
22+30	712.00
25+50	712.30
30+20	712.50
33+10	712.00
34+80	711.50
36+45	712.00
40+55	716.00

Notes: Survey from contours off new mapping by Cooper Aerial

Quilotosa Wash, Section 2, 300 ft. south of Indian Road
Worksheet for Irregular Channel

Project Description	
Worksheet	*Quilotosa #1*
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.004600	ft/ft
Discharge	16,200.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	*Improved Lotter's Method*
Closed Channel Weighting Metho	Horton's Method

Results		
Mannings Coefficient	0.031	
Water Surface Elevation	97.59	ft
Elevation Range	89.38 to 98.30	
Flow Area	2,703.2	ft^2
Wetted Perimeter	1,088.28	ft
Top Width	1,084.95	ft
Actual Depth	8.21	ft
Critical Elevation	96.84	ft
Critical Slope	0.010803	ft/ft
Velocity	5.99	ft/s
Velocity Head	0.56	ft
Specific Energy	98.15	ft
Froude Number	0.67	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	7+00	0.030
7+00	7+62	0.038
7+62	12+62	0.031

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	98.25
1+00	97.55
2+00	96.95
3+00	96.50
4+00	94.02
5+00	94.29
6+00	93.90
7+00	94.83
7+10	89.40
7+52	89.38
7+62	95.78

Quilotosa Wash, Section 2, 300 ft. south of Indian Road
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
8+62	94.64
9+62	95.10
10+62	95.20
11+62	97.45
12+62	98.30

Quilotosa Wash, Section 3, 2000' south of Watermelon Road
Worksheet for Irregular Channel

Project Description	
Worksheet	Quilotosa #3
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.004600	ft/ft
Discharge	21,200.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Metho	Horton's Method

Results		
Mannings Coefficient	0.035	
Water Surface Elevation	669.43	ft
Elevation Range	664.00 to 680.00	
Flow Area	3,883.0	ft²
Wetted Perimeter	1,487.22	ft
Top Width	1,486.97	ft
Actual Depth	5.43	ft
Critical Elevation	668.45	ft
Critical Slope	0.013886	ft/ft
Velocity	5.46	ft/s
Velocity Head	0.46	ft
Specific Energy	669.89	ft
Froude Number	0.60	
Flow Type	Subcritical	

Calculation Messages:
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00	35+00	0.035

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00	680.00
0+70	670.00
3+00	670.00
8+00	665.00
8+50	665.00
12+00	670.00
17+00	670.00
23+00	664.00
23+50	664.00
24+50	670.00

Quilotosa Wash, Section 3, 2000' south of Watermelon Road
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
30+00	675.00
35+00	680.00

Sauceda [redacted], 1000' north of I-8
Worksheet for Irregular Channel

Project Description	
Worksheet	Sauceda #2
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.005100	ft/ft
Discharge	4,800.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Metho	Horton's Method

Results		
Mannings Coefficient	0.033	
Water Surface Elevation	714.65	ft
Elevation Range	708.50 to 718.40	
Flow Area	914.8	ft²
Wetted Perimeter	443.46	ft
Top Width	441.91	ft
Actual Depth	6.15	ft
Critical Elevation	713.96	ft
Critical Slope	0.013048	ft/ft
Velocity	5.25	ft/s
Velocity Head	0.43	ft
Specific Energy	715.08	ft
Froude Number	0.64	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
7+75	9+60	0.032
9+60	10+30	0.037
10+30	17+00	0.032

Natural Channel Points

Station (ft)	Elevation (ft)
7+75	718.40
8+85	716.00
9+00	715.50
9+45	716.00
9+60	712.00
9+70	708.50
10+20	708.50
10+30	712.00
13+10	713.90
15+40	716.00
17+00	716.80

Sauceda #2, 1000' north of I-8
Worksheet for Irregular Channel

Notes: Survey from contours off new mapping by Cooper Aerial

Sauceda Wash, 150' south of Indian Road
Worksheet for Irregular Channel

Project Description	
Worksheet	Sauceda #1
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.005100	ft/ft
Discharge	4,700.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Metho	Horton's Method

Results		
Mannings Coefficient	0.033	
Water Surface Elevation	95.27	ft
Elevation Range	89.69 to 102.12	
Flow Area	1,073.6	ft^2
Wetted Perimeter	689.91	ft
Top Width	688.64	ft
Actual Depth	5.58	ft
Critical Elevation	94.23	ft
Critical Slope	0.012665	ft/ft
Velocity	4.38	ft/s
Velocity Head	0.30	ft
Specific Energy	95.57	ft
Froude Number	0.62	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	6+00	0.032
6+00	6+98	0.037
6+98	10+98	0.032

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	98.70
1+00	95.50
2+00	94.70
3+00	95.20
4+00	95.10
5+00	92.76
6+00	93.17
6+08	89.69
6+86	89.82
6+98	93.27
7+98	94.62

Sauceda Wash, 150' south of Indian Road
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
8+98	97.99
9+98	100.92
10+98	102.12

Notes: Assumed Survey Elevation of 100.00

Sauceda Wash, Section 3, 1500' south of Watermelon Road
Worksheet for Irregular Channel

Project Description	
Worksheet	Sauceda Wash, #3
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.005100	ft/ft
Discharge	4,700.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Metho	Horton's Method

Results		
Mannings Coefficient	0.035	
Water Surface Elevation	666.60	ft
Elevation Range	662.00 to 690.00	
Flow Area	840.1	ft²
Wetted Perimeter	335.11	ft
Top Width	334.97	ft
Actual Depth	4.60	ft
Critical Elevation	665.74	ft
Critical Slope	0.014009	ft/ft
Velocity	5.59	ft/s
Velocity Head	0.49	ft
Specific Energy	667.09	ft
Froude Number	0.62	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	13+50	0.035

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	684.00
2+60	680.00
3+40	670.00
6+00	662.00
6+30	662.00
9+00	670.00
10+10	680.00
13+50	690.00

citrus Valley Wash #2, 1800' north of I-8
Worksheet for Irregular Channel

Project Description	
Worksheet	CVW #2
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.003700	ft/ft
Discharge	3,100.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Metho	Horton's Method

Results		
Mannings Coefficient	0.036	
Water Surface Elevation	706.35	ft
Elevation Range	700.00 to 712.00	
Flow Area	926.4	ft²
Wetted Perimeter	594.39	ft
Top Width	593.58	ft
Actual Depth	6.35	ft
Critical Elevation	705.46	ft
Critical Slope	0.017891	ft/ft
Velocity	3.35	ft/s
Velocity Head	0.17	ft
Specific Energy	706.52	ft
Froude Number	0.47	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	6+60	0.036
6+60	7+20	0.039
7+20	13+70	0.036

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	712.00
1+40	708.00
6+60	704.00
6+80	700.00
7+00	700.00
7+20	704.00
11+10	708.00
13+70	712.00

Notes: Survey from contours off new mapping by Cooper Aerial

Citrus Valley Wash, 300' north of Indian Road
Worksheet for Irregular Channel

Project Description	
Worksheet	CVW #1
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.003700	ft/ft
Discharge	3,100.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results		
Mannings Coefficient	0.035	
Water Surface Elevation	96.38	ft
Elevation Range	88.92 to 100.60	
Flow Area	744.9	ft²
Wetted Perimeter	365.10	ft
Top Width	363.10	ft
Actual Depth	7.46	ft
Critical Elevation	95.51	ft
Critical Slope	0.015836	ft/ft
Velocity	4.16	ft/s
Velocity Head	0.27	ft
Specific Energy	96.65	ft
Froude Number	0.51	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	2+36	0.036
2+36	3+05	0.039
3+05	5+05	0.036

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	100.60
1+00	95.14
1+36	94.65
2+36	95.27
2+55	89.48
2+85	88.92
3+05	95.50
3+57	94.34
4+05	95.51
5+05	97.96

Citrus Valley Wash, 300' north of Indian Road
Worksheet for Irregular Channel

Notes: Assumed Survey elevation of 100.00

Citrus Valley Wash, Section 3, 1000' south of Watermelon Road
Worksheet for Irregular Channel

Project Description	
Worksheet	CVW #3
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.003600	ft/ft
Discharge	3,100.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Metho	Horton's Method

Results		
Mannings Coefficient	0.045	
Water Surface Elevation	666.80	ft
Elevation Range	664.00 to 680.00	
Flow Area	901.9	ft²
Wetted Perimeter	394.69	ft
Top Width	394.58	ft
Actual Depth	2.80	ft
Critical Elevation	665.59	ft
Critical Slope	0.026424	ft/ft
Velocity	3.44	ft/s
Velocity Head	0.18	ft
Specific Energy	666.98	ft
Froude Number	0.40	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+40	0.035
0+40	6+00	0.045
6+00	6+75	0.035

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	680.00
0+40	670.00
2+00	664.00
4+50	664.00
6+00	670.00
6+75	680.00

Appendix F

EROSION AND SEDIMENT TRANSPORT ANALYSIS SUPPORTING DOCUMENTATION

APPENDIX F: EROSION AND SEDIMENT TRANSPORT ANALYSIS SUPPORTING DOCUMENTATION

This section was not included in the scope of work. It was deemed unnecessary since there are only minor sedimentation concerns. Field observation confirmed that the banks of the existing channels are relatively stable and that there appears to be little deposition of sediment at the culvert and bridge structures.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOODPLAIN DELINEATION STUDY OF GILA BEND AREA

FCD CONTRACT NO. 99–18

DATUM

HORIZONTAL: North American Datum of 1983
VERTICAL: National Geodetic Vertical Datum of 1929

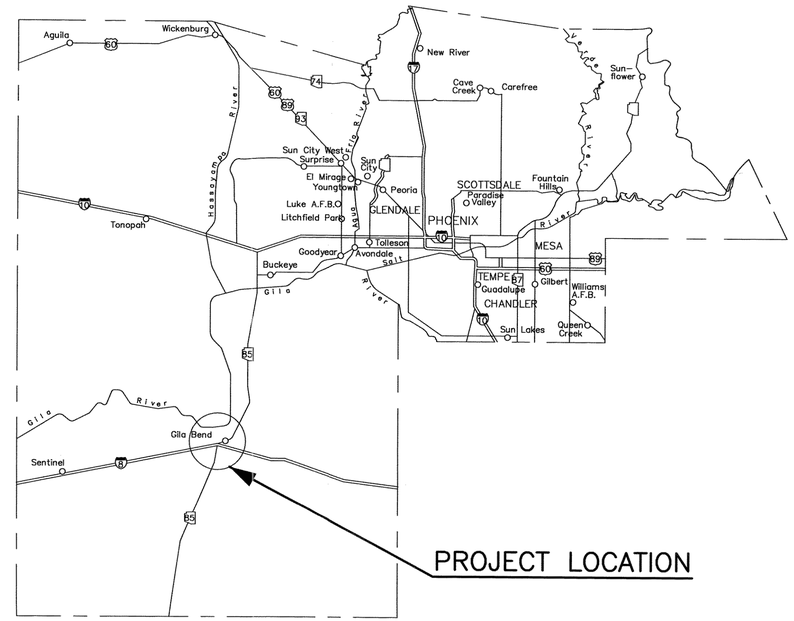
STATEMENTS BY PROFESSIONAL REGISTRANTS

The following statements apply to the individual seals affixed to each of the maps following the cover sheet.

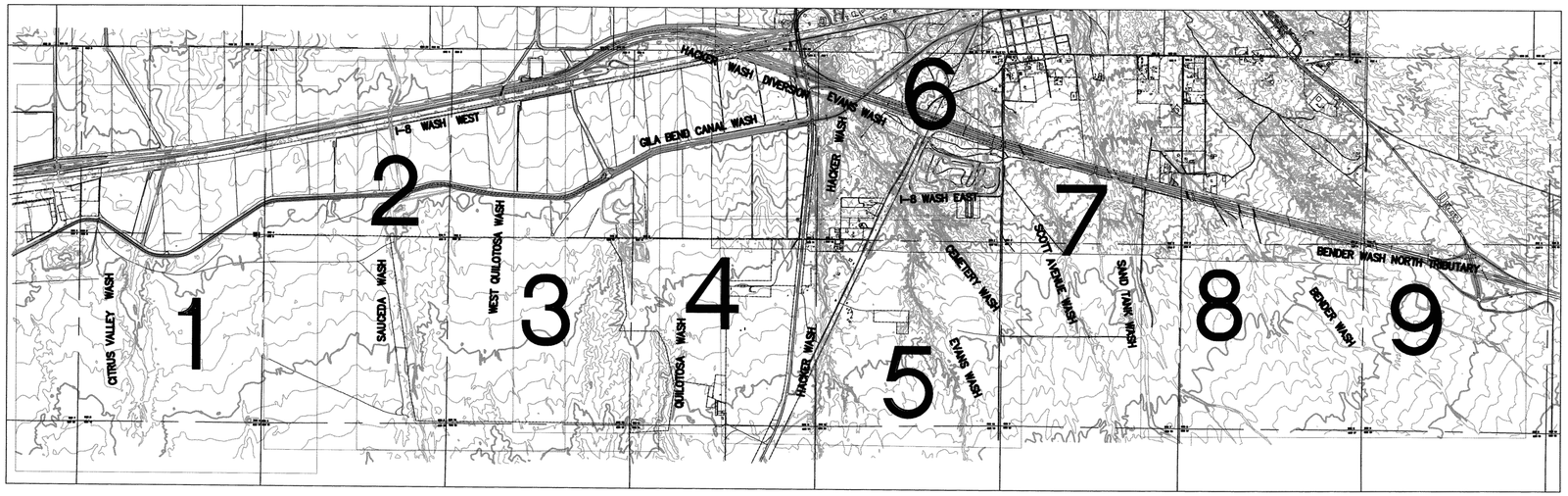
The ground control survey was prepared under my direct supervision

The photogrammetry and topographic mapping were prepared under my direct supervision:

The floodplain and floodway delineation were prepared under my direct supervision:



MARICOPA COUNTY
Not to Scale



STUDY AREA MAP AND SHEET INDEX

AERIAL MAPPING

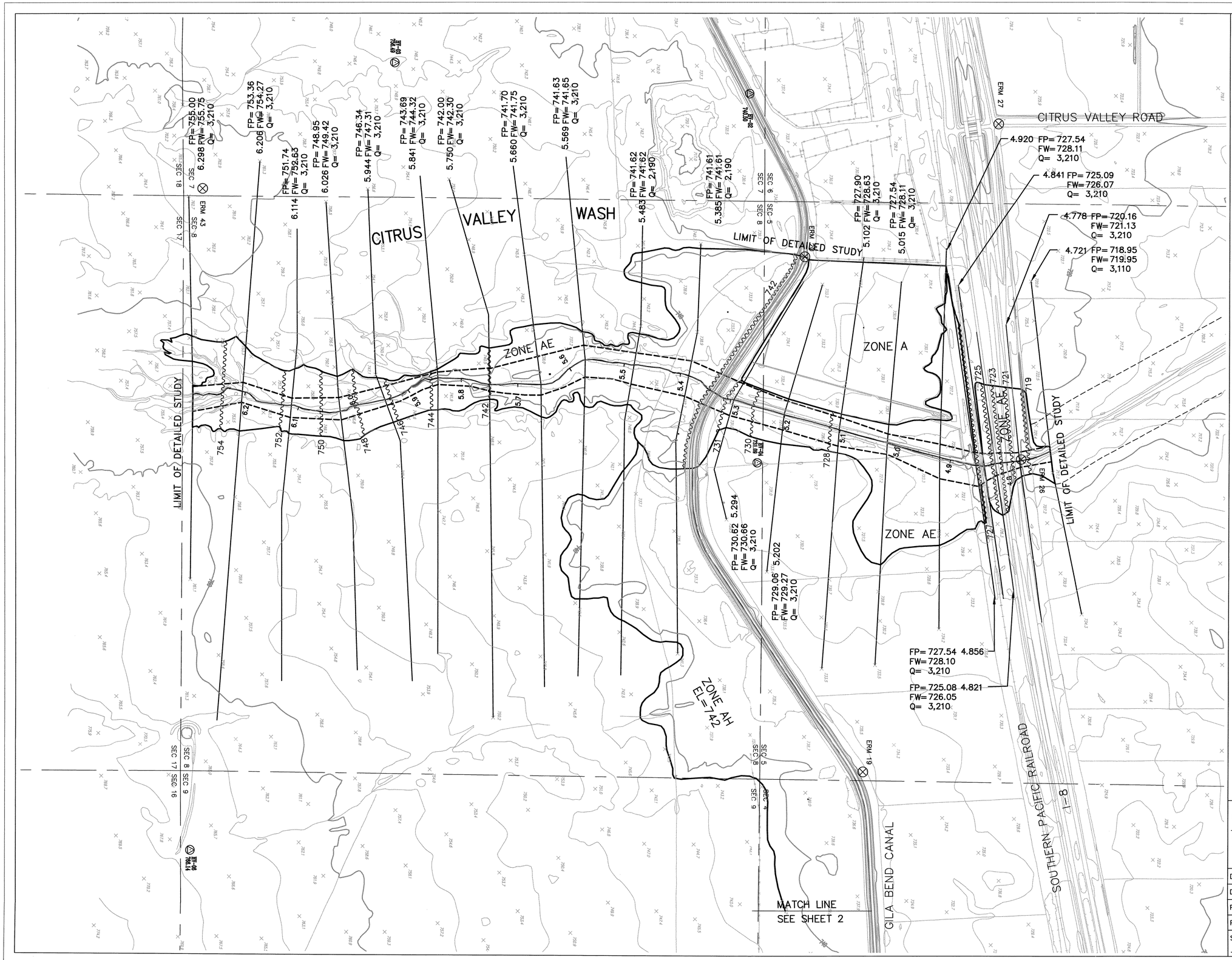
COOPER AERIAL SURVEYS CO.
11402 N. CAVE CREEK ROAD
PHOENIX, ARIZONA 85020
FLIGHT DATE: 9–7–99 & 9–30–99
CONTOUR INTERVAL: 2' & 4'

GROUND CONTROL

SURVNET INC.
150 N. STAPLEY DRIVE
MESA, ARIZONA 85203

HYDRAULICS

ENGINEERING AND ENVIRONMENTAL CONSULTANTS
3003 N. CENTRAL AVENUE, SUITE 600
PHOENIX, AZ. 85012–2905 602–248–7702



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF CITRUS VALLEY WASH

F.C.D. CONTRACT NO. 99-18

GILA BEND ADMP

LEGEND

100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
EXISTING APPROXIMATE FLOODPLAIN BOUNDARY	
HYDRAULIC BASE LINE & RIVER MILE	2.0
CROSS SECTION	FP=100 Yr WSEL FW=Floodway WSEL 5.519 Q=100 Yr Flow
ELEVATION REFERENCE MARK	ERM26
BASE FLOOD ELEVATIONS	1770
ZONE DESIGNATIONS	ZONE AE
SECTION LINE	

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

I.D. NUM.	ELEV. (FT)	DESCRIPTION/LOCATION

ERM #19 EL=738.01
Chiseled square at the northeast corner of 9.5' x 9.5' masonry foundation at well site, 3.0 miles west of Highway 85 along the Gila Bend Canal, on the north side of north canal road. Section 5, T 6 S, R 5 W.

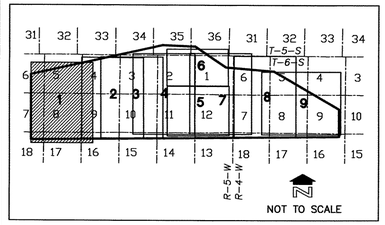
ERM #20 EL=740.09 Chiseled square at the northwest corner of bridge over canal at base of 4" x 4" metal gatepost, 4.0 miles west of Highway 85 along the Gila Bend Canal, on the south side of north canal road. Section 5, T 6 S, R 5 W.

ERM #26 EL=721.20 ADOT Brass Cap marked "4855.71" at centerline of headwall on north side of west bound Interstate 8, +/- 120 feet east of milepost 112. Section 5, T 6 S, R 5 W.

ERM #27 EL=730.88
Brass cap in centerline of headwall on the west end of a cattle guard, on the west side of Citrus Valley Road, 55 feet north of the west bound Interstate 8 off ramp. Section 6, T 6 S, R 5 W.

ERM #43 EL=762.57
Brass cap in concrete. 4.0 miles west of Highway 85 on the north side of the Gila Bend Canal to a bridge, then southerly across bridge 0.05 miles to a Y, right at Y then southerly along dirt track 0.95 miles then left 150 feet to the point. Brass cap lies +/-15 feet west of a mesquite tree and +/-145 feet north of 8' high metal post. Section 8, T 6 S, R 5 W.

INDEX MAP



400' 0' 400' 800'
SCALE: 1"= 400'
CONTOUR INTERVAL = 4 FEET

eec
Engineering and Environmental Consultants, Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012-2905
TEL: (602)248-7702 FAX: (602)248-7851

15594 MARK T. GAVAN 8/15/03 REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.

	BY	DATE
DESIGN	LAV	10/01
DESIGN CHK.	FCDMC	10/01
PLANS	KLH	10/01
PLANS CHK.	LAV	10/01

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET 1 OF 9

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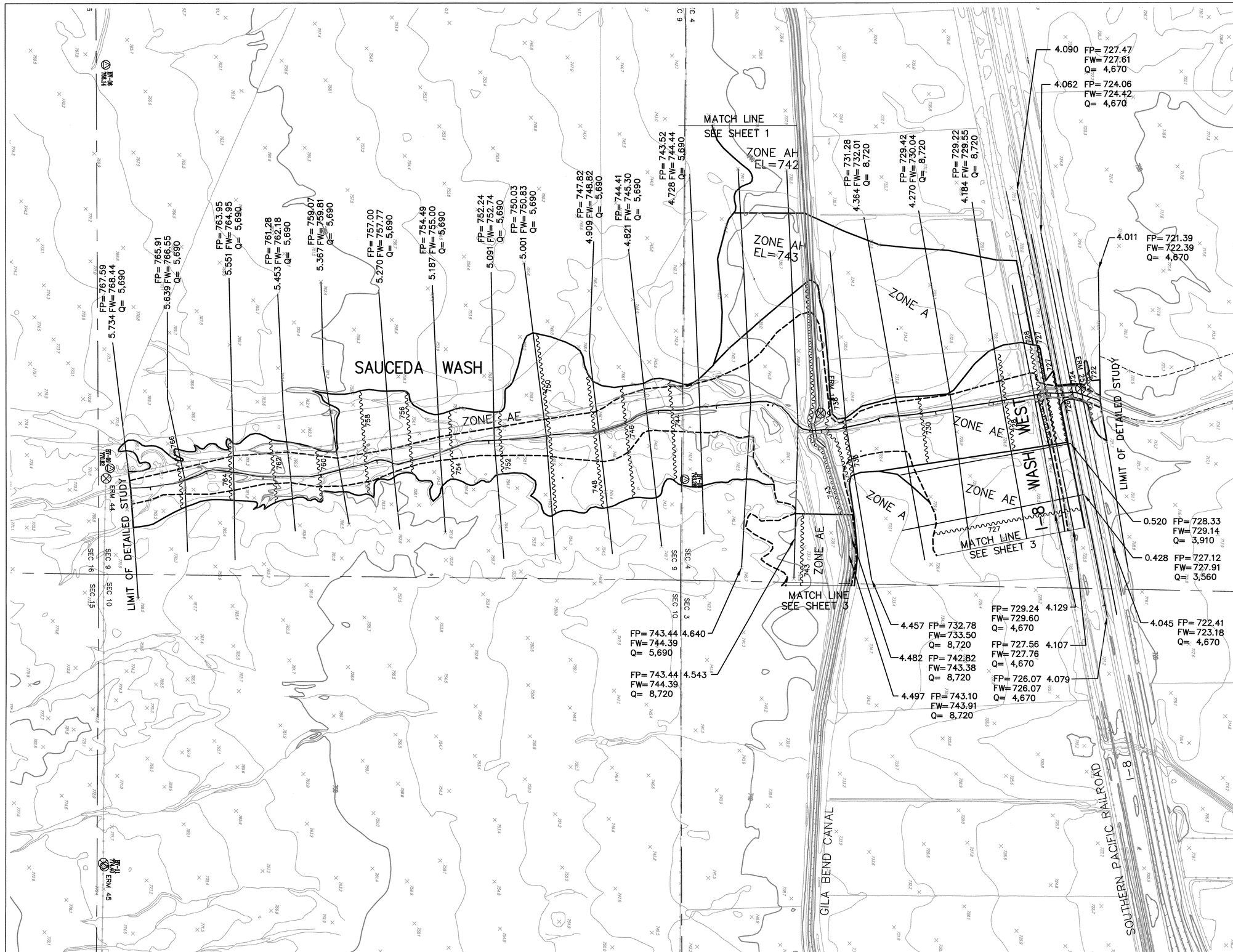


FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF SAUCEDA WASH

F.C.D. CONTRACT NO. 99-18

GILA BEND ADMP

LEGEND

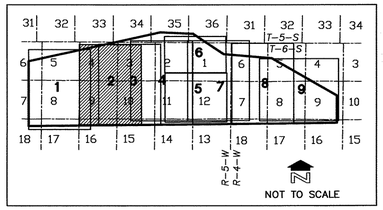
100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
EXISTING APPROXIMATE FLOODPLAIN BOUNDARY	
HYDRAULIC BASE LINE & RIVER MILE	2.0
CROSS SECTION	FP=100 Yr WSEL FW=Floodway WSEL Q=100 Yr Flow — 5.519
ELEVATION REFERENCE MARK	ERM26
BASE FLOOD ELEVATIONS	1770
ZONE DESIGNATIONS	ZONE AE
SECTION LINE	

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

I.D. NUM.	ELEV. (FT)	DESCRIPTION/LOCATION
ERM #18	EL=742.84	Chiseled square at centerline of headwall at gate valve, north side of canal, +/- 95 feet west of west side of siphon, 2.3 miles west of Highway 85 along Gila Bend Canal, on the south side of north canal road. Section 4, T 6 S, R 5 W.
ERM #25	EL=725.56	Chiseled square on top of headwall at northwest corner of bridge on west bound Interstate 8, 0.25 miles east of milepost 113. Section 4, T 6 S, R 5 W.
ERM #44	EL=766.52	Brass cap in concrete. 4.0 miles west of Highway 85 on the north side of the Gila Bend Canal to a bridge, then southerly across bridge 0.05 miles to a Y, left at Y and south easterly and easterly 1.45 miles to a Y, right at Y then southeasterly 0.95 miles to a gate in fence. Station at north end of gate, 2 feet north and 2 feet west of a 6"x8" post. Section 9, T 6 S, R 5 W.
ERM #45	EL=774.62	Brass cap in concrete. 4.0 miles west of Highway 85 on the north side of the Gila Bend Canal to a bridge, then southerly across bridge 0.05 miles to a Y, left at Y and south easterly and easterly 1.45 miles to a Y, left at Y and continue easterly 0.85 miles to a line of utility poles running north and south, south along utility line 0.95 miles to a gate in a fence. Station at west end of gate, 2.5' north and 1.5' west of a 6"x8" post. Section 10, T 6 S, R 5 W.

INDEX MAP



400' 0' 400' 800'

SCALE: 1"= 400'

CONTOUR INTERVAL = 4 FEET

eac
Engineering and Environmental Consultants, Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012-2905
TEL: (602)248-7702 FAX: (602)248-7851
15594 MARK T. GAVAN 2/15/03 ARIZONA, U.S.A.

	BY	DATE
DESIGN	LAV	10/01
DESIGN CHK.	FCDMC	10/01
PLANS	KLH	10/01
PLANS CHK.	LAV	10/01

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET 2 OF 9

WEST QUILOTOSA WASH

CROSS SECTION	FP	FW	Q
0.239	717.21	718.21	15,200
0.256	717.95	718.63	15,200
0.337	723.04	723.06	15,200
0.355	723.05	723.09	15,200
0.387	726.26	726.25	15,200
0.475	726.24	726.24	10,600
0.563	727.29	727.48	10,600
0.654	730.74	731.08	10,600
0.742	732.66	733.36	10,600
0.832	735.55	736.12	10,600
0.879	742.52	742.94	10,600
0.890	743.33	744.04	10,700
0.926	743.44	744.27	10,700

I-8 WASH WEST

CROSS SECTION	FP	FW	Q
0.332	726.53	727.48	2,640
0.235	726.41	727.41	700
0.163	726.40	727.40	40
0.076	726.40	727.40	40

QUILOTOSA WASH

CROSS SECTION	FP	FW	Q
3.776	717.21	718.21	15,200
3.793	717.95	718.62	15,200
3.874	723.10	723.14	15,200
3.892	723.11	723.17	15,200
3.921	726.37	726.62	15,200
4.013	726.38	726.48	9,170
4.109	728.32	728.88	9,170
4.201	731.91	732.46	9,170
4.290	734.45	734.97	9,170

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF WEST QUILOTOSA WASH

F.C.D. CONTRACT NO. 99-18

GILA BEND ADMP

LEGEND

100-YR FLOODPLAIN BOUNDARY

FLOODWAY BOUNDARY

EXISTING APPROXIMATE FLOODPLAIN BOUNDARY

HYDRAULIC BASE LINE & RIVER MILE — 2.0

CROSS SECTION — FP=100 Yr WSEL; FW=Floodway WSEL; Q=100 Yr Flow — 5.519

ELEVATION REFERENCE MARK — ⊗ ERM26

BASE FLOOD ELEVATIONS — 1770

ZONE DESIGNATIONS — ZONE AE

SECTION LINE

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

I.D. NUM. ELEV. (FT) DESCRIPTION/LOCATION

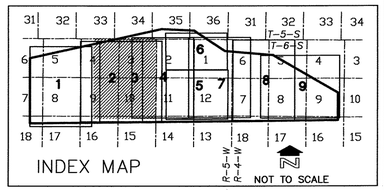
ERM #17 EL=742.46
Chiseled square in north end of headwall, on the west side of canal siphon, 1.15 miles west of Highway 85 along the Gila Bend Canal, on the south side of north canal road.
Section 3, T 6 S, R 5 W.

ERM #24 EL=727.69
NGS Point "TOSA", (PID DA0685) Located West of Gila Bend along the Union Pacific Railroad, 2.1 miles west of Martin Avenue. Point lies 1.6 miles west of the I-8 overpass, 50 feet north of the north rail, and 96.5 feet south of the extended centerline of the I-8 frontage road
Section 3, T 6 S, R 5 W.

ERM #25 EL=725.56
Chiseled square on top of headwall at northwest corner of bridge on west bound Interstate 8, 0.25 miles east of milepost 113.
Section 4, T 6 S, R 5 W.

ERM #44 EL=766.52
Brass cap in concrete. 4.0 miles west of Highway 85 on the north side of the Gila Bend Canal to a bridge, then southerly across bridge 0.05 miles to a Y, left at Y and south easterly and easterly 1.45 miles to a Y, right at Y then southeasterly 0.95 miles to a gate in fence. Station at north end of gate, 2 feet north and 2 feet west of a 6"x8" post.
Section 9, T 6 S, R 5 W.

ERM #45 EL=774.62
Brass cap in concrete. 4.0 miles west of Highway 85 on the north side of the Gila Bend Canal to a bridge, then southerly across bridge 0.05 miles to a Y, left at Y and south easterly and easterly 1.45 miles to a Y, left at Y and continue easterly 0.85 miles to a line of utility poles running north and south, south along utility line 0.95 miles to a gate in a fence. Station at west end of gate, 2.5' north and 1.5' west of a 6"x8" post.
Section 10, T 6 S, R 5 W.



400' 0' 400' 800'

SCALE: 1"= 400'

CONTOUR INTERVAL = 4 FEET

eec
Engineering and Environmental Consultants, Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012-2905
TEL:(602)248-7702 FAX:(602)248-7851

15594 MARK T. GAVAN ARIZONA, U.S.A.

	BY	DATE
DESIGN	LAV	10/01
DESIGN CHK.	FCDMC	10/01
PLANS	KLH	10/01
PLANS CHK.	LAV	10/01

SUBMITTED BY: DATE:

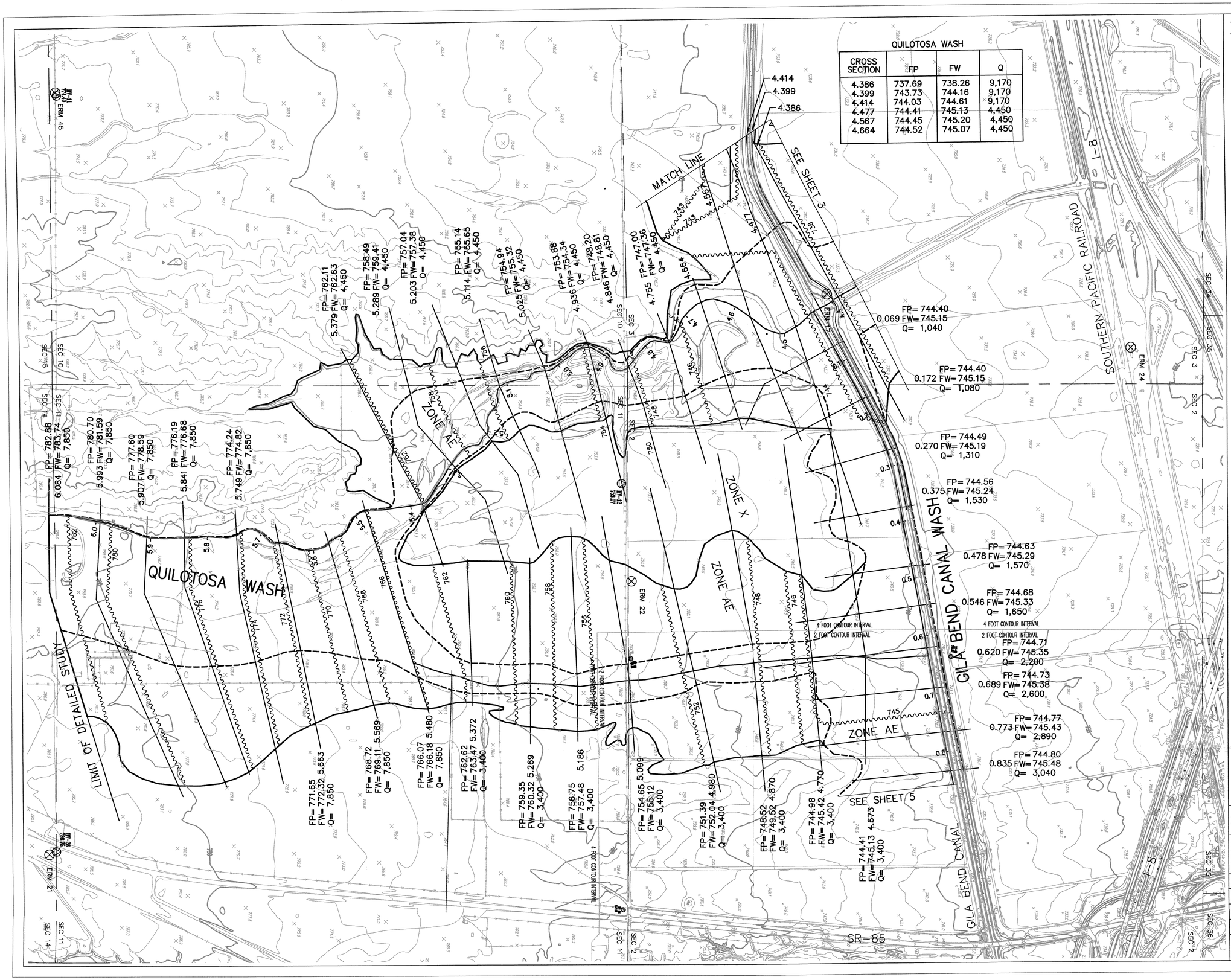
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET 3 OF 9



QUILOTOSA WASH

CROSS SECTION	FP	FW	Q
4.386	737.69	738.26	9,170
4.399	743.73	744.16	9,170
4.414	744.03	744.61	9,170
4.477	744.41	745.13	4,450
4.567	744.45	745.20	4,450
4.664	744.52	745.07	4,450

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF QUILOTOSA WASH

F.C.D. CONTRACT NO. 99-18
GILA BEND ADMP

LEGEND

100-YR FLOODPLAIN BOUNDARY
FLOODWAY BOUNDARY
EXISTING APPROXIMATE FLOODPLAIN BOUNDARY
HYDRAULIC BASE LINE & RIVER MILE — 2.0
CROSS SECTION — FP=100 Yr WSEL, FW=Floodway WSEL, Q=100 Yr Flow — 5.519
ELEVATION REFERENCE MARK — ERM26
BASE FLOOD ELEVATIONS — 1770
ZONE DESIGNATIONS — ZONE AE
SECTION LINE

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

I.D. NUM. ELEV. (FT) DESCRIPTION/LOCATION

ERM #17 EL=742.46
Chiseled square in north end of headwall, on the west side of canal siphon, 1.15 miles west of Highway 85 along the Gila Bend Canal, on the south side of north canal road. Section 3, T 6 S, R 5 W.

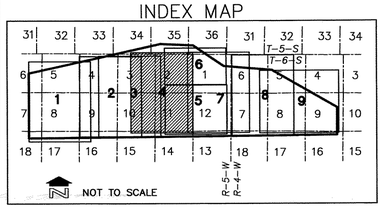
ERM #21 EL=787.94
NGS Point "R-1", (PID DA0499) Located SW of Gila Bend along the E side of SR 85, 1.9 miles S of I-18. Point lies between SR 85 and the Railroad tracks, 66 feet SE of the SR 85 centerline, 90 feet NW rail of the tracks, and 5 feet SE of Railway milepost 3. Section 14, T 6 S, R 5 W.

ERM #22 EL=754.46
Chiseled square on the southwest corner of an electrical equipment pad at pump, 25 feet north of a utility pole, 0.55 miles west of Highway 85 from the intersection of Highway 85 and Thayer Road. Section 2, T 6 S, R 5 W.

ERM #24 EL=727.69
NGS Point "TOSA", (PID DA0685) Located West of Gila Bend along the Union Pacific Railroad, 2.1 miles west of Martin Avenue. Point lies 1.6 miles west of the I-8 overpass, 50 feet north of the north rail, and 96.5 feet south of the extended centerline of the I-8 frontage road Section 3, T 6 S, R 5 W.

ERM #45 EL=774.62
Brass cap in concrete. 4.0 miles west of Highway 85 on the north side of the Gila Bend Canal to a bridge, then southerly across bridge 0.05 miles to a Y, left at Y and south easterly and easterly 1.45 miles to a Y, left at Y and continue easterly 0.85 miles to a line of utility poles running north and south, south along utility line 0.95 miles to a gate in a fence. Station at west end of gate, 2.5' north and 1.5' west of a 6"x8" post. Section 10, T 6 S, R 5 W.

INDEX MAP



400' 0' 400' 800'
SCALE: 1"= 400'
CONTOUR INTERVAL = 4 FEET

eec
Engineering and Environmental Consultants, Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012-2905
TEL:(602)248-7702 FAX:(602)248-7851

15594 MARK T. GAVAN ARIZONA, U.S.A. 8/15/03

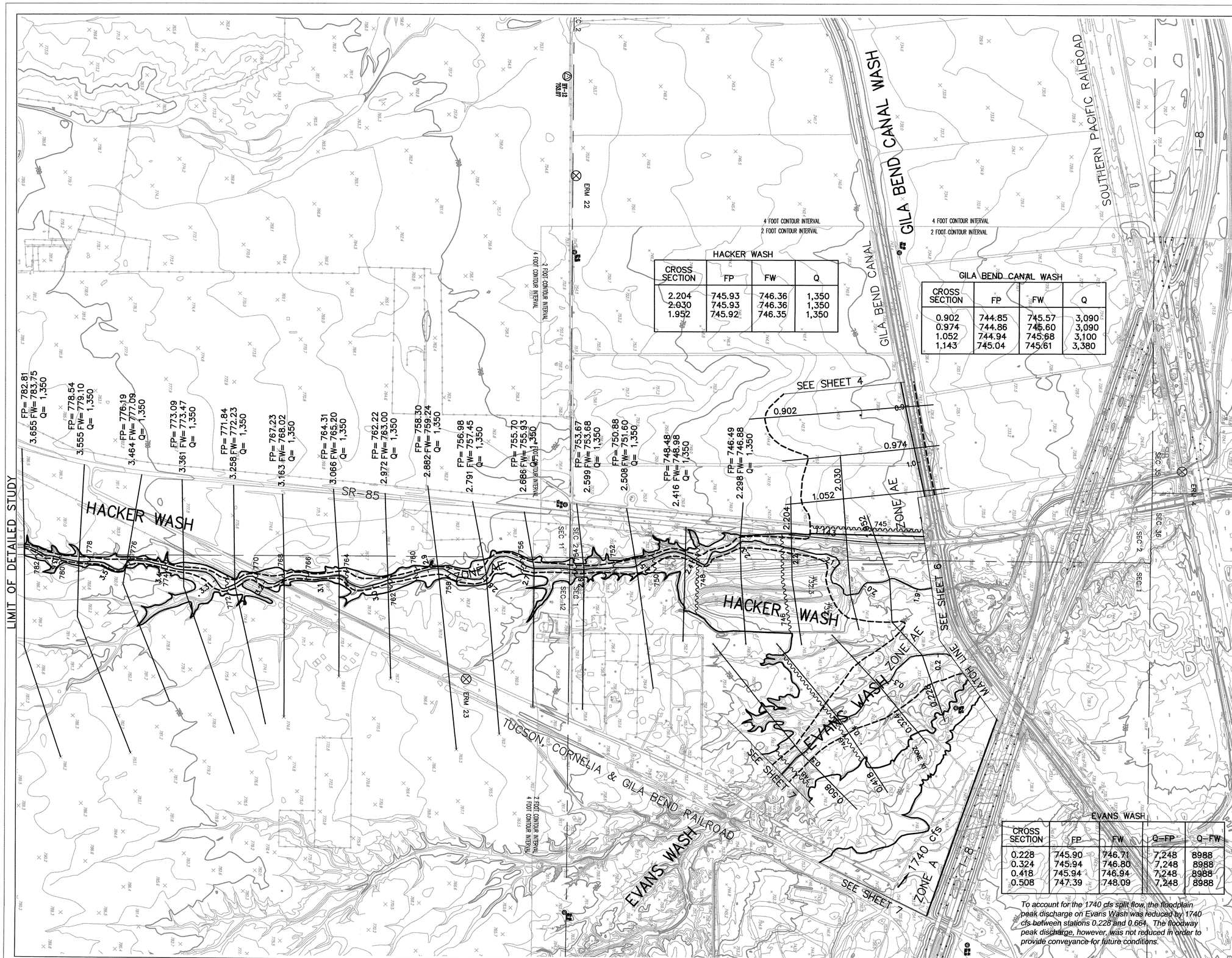
	BY	DATE
DESIGN	LAV	10/01
DESIGN CHK.	FCDMC	10/01
PLANS	KLH	10/01
PLANS CHK.	LAV	10/01

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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

SHEET 4 OF 9



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF HACKER WASH

F.C.D. CONTRACT NO. 99-18 GILA BEND ADMP

LEGEND

100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
EXISTING APPROXIMATE FLOODPLAIN BOUNDARY	
HYDRAULIC BASE LINE & RIVER MILE	2.0
CROSS SECTION	FP=100 Yr WSEL 5.519 FW=Floodway WSEL 100 Yr Flow
ELEVATION REFERENCE MARK	⊗ ERM26
BASE FLOOD ELEVATIONS	1770
ZONE DESIGNATIONS	ZONE AE
SECTION LINE	

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

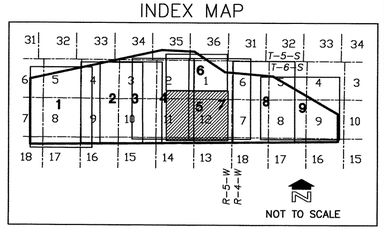
I.D. NUM.	ELEV. (FT)	DESCRIPTION/LOCATION

ERM #4 EL=727.68
1.1 Miles west along the Southern Pacific Railroad from the depot at Gila Bend to a bridge, 8 Feet north of the north rail of the north track set in a drill hole in the top of the northwest concrete abutment and about 5 inches lower than the track. The mark is a brass cap stamped Coast & Geodetic Survey K354

ERM #22 EL=754.46
Chiseled square on the southwest corner of an electrical equipment pad at pump, 25 feet north of a utility pole, 0.55 miles west of Highway 85 from the intersection of Highway 85 and Thayer Road. Section 2, T 6 S, R 5 W.

ERM #23 EL=765.42
NGS Point "J-331", (PID DA0498) Located 1.65 mi. SW along the Tucson, Cornelia and Gila Bend Railway from the Martin Avenue crossing in Gila Bend, at the second telegraph pole SW of railway milepole 2, at a dip in the old highway 8, 195,5 feet North of the NW corner of a wooden railway bridge number 21, 95.4 feet NW of the NW rail of the tracks, 46.0 feet SE of the centerline of the old highway, 5.0 feet NE oth the telegraph pole, 2 ft. SW from a witness post, and 1 ft. below the tracks. Section 12 T 6 S, R 5 W.

INDEX MAP



400' 0' 400' 800'

SCALE: 1"= 400'
CONTOUR INTERVAL = 2 FEET AND 4 FEET

HACKER WASH

CROSS SECTION	FP	FW	Q
2.204	745.93	746.36	1,350
2.030	745.93	746.36	1,350
1.952	745.92	746.35	1,350

GILA BEND CANAL WASH

CROSS SECTION	FP	FW	Q
0.902	744.85	745.57	3,090
0.974	744.86	745.60	3,090
1.052	744.94	745.68	3,100
1.143	745.04	745.61	3,380

EVANS WASH

CROSS SECTION	FP	FW	Q-FP	Q-FW
0.228	745.90	746.71	7,248	8988
0.324	745.94	746.80	7,248	8988
0.418	745.94	746.94	7,248	8988
0.508	747.39	748.09	7,248	8988

To account for the 1740 cfs split flow, the floodplain peak discharge on Evans Wash was reduced by 1740 cfs between stations 0.228 and 0.664. The floodway peak discharge, however, was not reduced in order to provide conveyance for future conditions.

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TEL: (602)248-7702 FAX: (602)248-7851

12594 MARK T. GAVAN 6/10/03 ARIZONA, U.S.A.

	BY	DATE
DESIGN	LAV	10/01
DESIGN CHK.	FCDMC	10/01
PLANS	KLH	10/01
PLANS CHK.	LAV	10/01

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET 5 OF 9

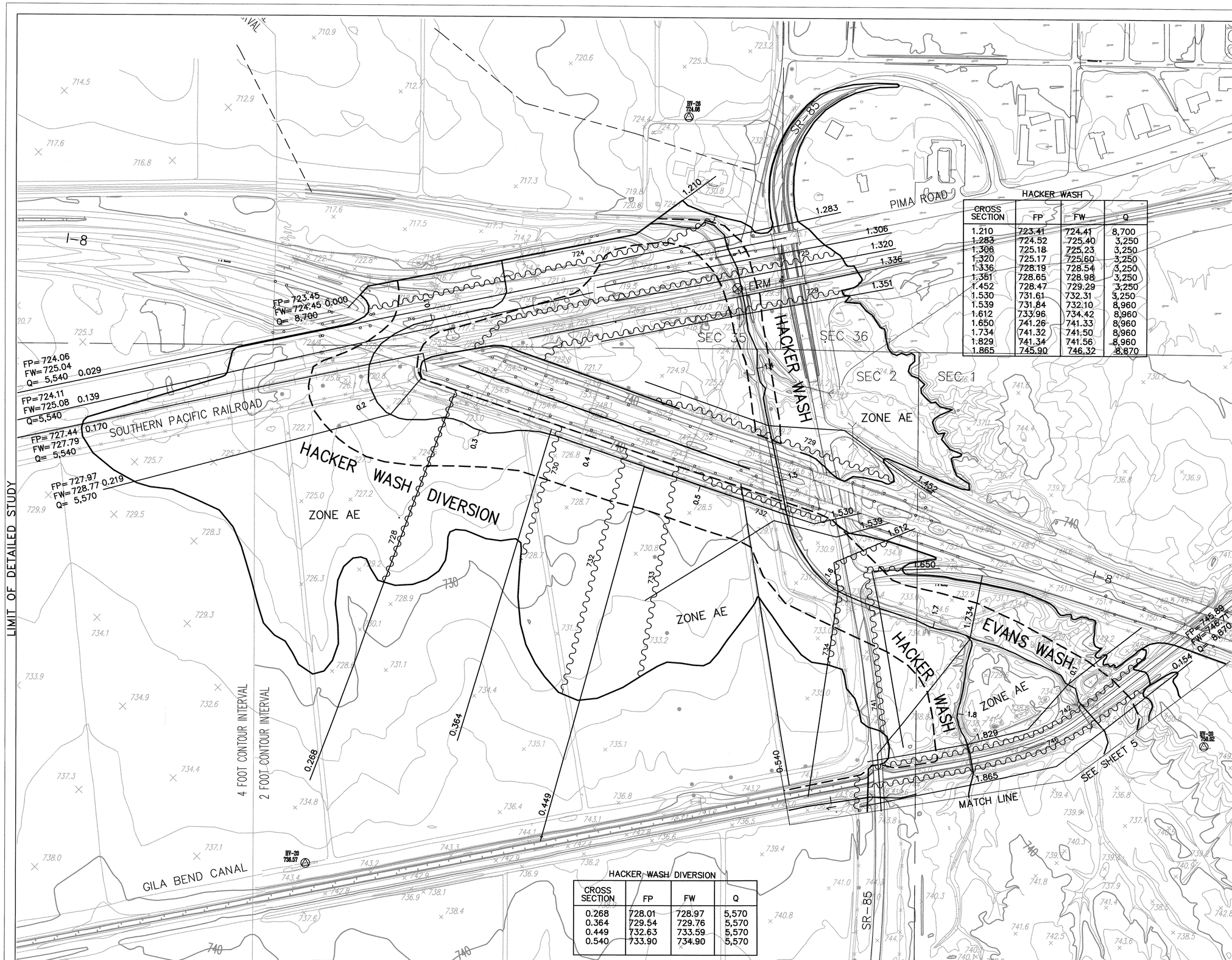
N:\99541\fpfw-sheets\floodway\99541-fpfw-sh05.dwg, 06/13/2003 12:27:02 PM

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF HACKER WASH

F.C.D. CONTRACT NO. 99-18

GILA BEND ADMP



HACKER WASH			
CROSS SECTION	FP	FW	Q
1.210	723.41	724.41	8,700
1.283	724.52	725.40	3,250
1.306	725.18	725.23	3,250
1.320	725.17	725.60	3,250
1.336	728.19	728.54	3,250
1.351	728.65	728.98	3,250
1.452	728.47	729.29	3,250
1.530	731.61	732.31	3,250
1.539	731.84	732.10	8,960
1.612	733.96	734.42	8,960
1.650	741.26	741.33	8,960
1.734	741.32	741.50	8,960
1.829	741.34	741.56	8,960
1.865	745.90	746.32	8,870

HACKER WASH DIVERSION			
CROSS SECTION	FP	FW	Q
0.268	728.01	728.97	5,570
0.364	729.54	729.76	5,570
0.449	732.63	733.59	5,570
0.540	733.90	734.90	5,570

LEGEND

100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
EXISTING APPROXIMATE FLOODPLAIN BOUNDARY	
HYDRAULIC BASE LINE & RIVER MILE	2.0
CROSS SECTION	FP=100 Yr WSEL FW=Floodway WSEL 5.519 Q=100 Yr Flow
ELEVATION REFERENCE MARK	⊗ ERM26
BASE FLOOD ELEVATIONS	1770
ZONE DESIGNATIONS	ZONE AE
SECTION LINE	

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

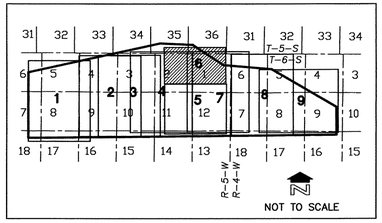
I.D. NUM. ELEV. (FT) DESCRIPTION/LOCATION

ERM #4 EL=727.68
1.1 Miles west along the Southern Pacific Railroad from the depot at Gila Bend to a bridge, 8 Feet north of the north rail of the north track set in a drill hole in the top of the northwest concrete abutment and about 5 inches lower than the track. The mark is a brass cap stamped Coast & Geodetic Survey K354

ERM #22 EL=754.46
Chiseled square on the southwest corner of an electrical equipment pad at pump, 25 feet north of a utility pole, 0.55 miles west of Highway 85 from the intersection of Highway 85 and Thayer Road. Section 2, T 6 S, R 5 W.

ERM #23 EL=765.42
NGS Point "J-331", (PID DA0498) Located 1.65 mi. SW along the Tucson, Cornelia and Gila Bend Railway from the Martin Avenue crossing in Gila Bend, at the second telegraph pole SW of railway milepole 2, at a dip in the old highway 8, 195.5 feet North of the NW corner of a wooden railway bridge number 21, 95.4 feet NW of the NW rail of the tracks, 46.0 feet SE of the centerline of the old highway, 5.0 feet NE oth the telegraph pole, 2 ft. SW from a witness post, and 1 ft. below the tracks. Section 12 T 6 S, R 5 W.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'
CONTOUR INTERVAL = 2 FEET AND 4 FEET

eec
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3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012-2905
TEL:(602)248-7702 FAX:(602)248-7851

15594 MARK T. GAVAN ARIZONA, U.S.A.

	BY	DATE
DESIGN	LAV	10/01
DESIGN CHK.	FCDMC	10/01
PLANS	KLH	10/01
PLANS CHK.	LAV	10/01

SUBMITTED BY: DATE:

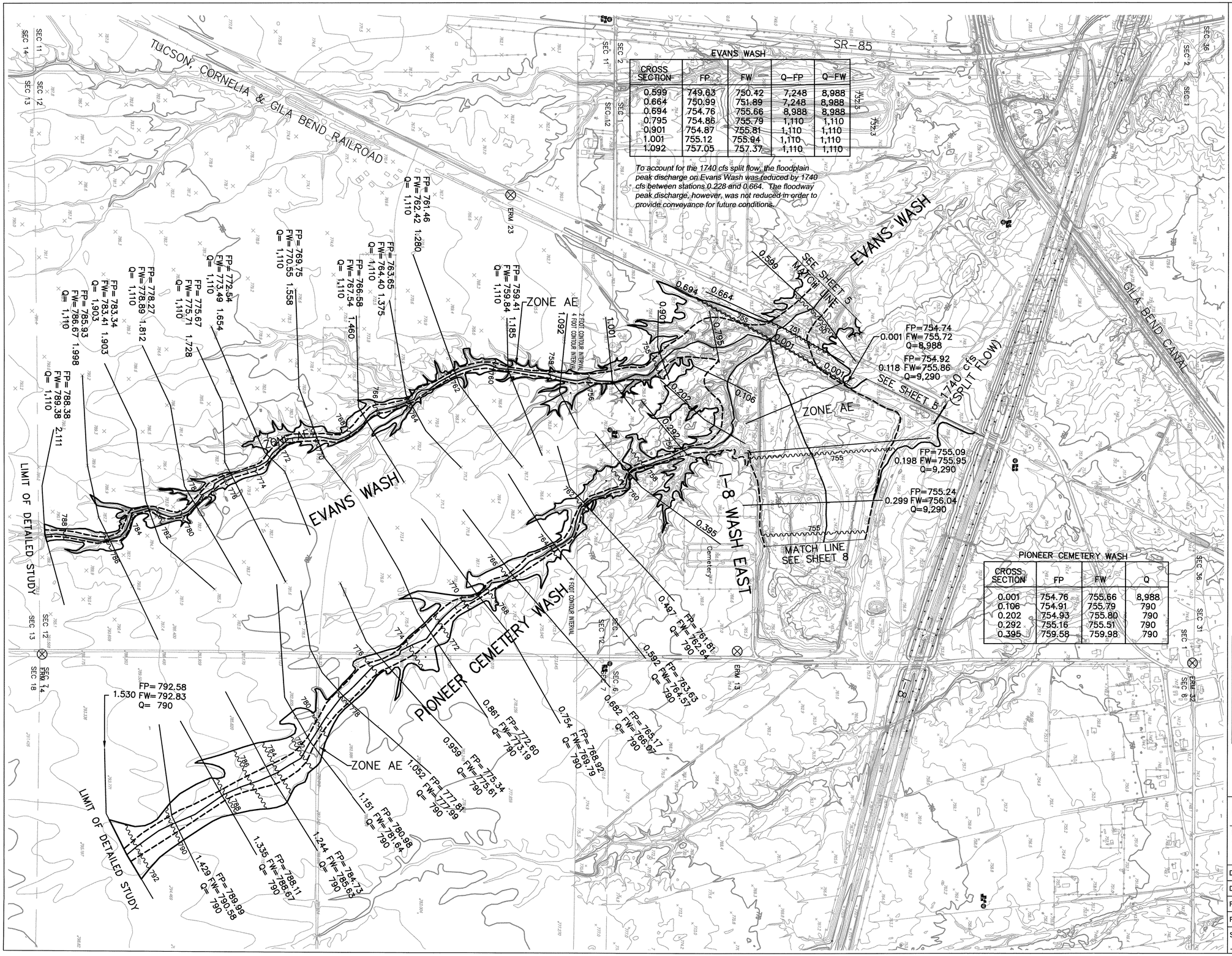
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET 6 OF 9



EVANS WASH

CROSS SECTION	FP	FW	Q-FP	Q-FW
0.599	749.63	750.42	7,248	8,988
0.664	750.99	751.89	7,248	8,988
0.694	754.76	755.66	8,988	8,988
0.795	754.86	755.79	1,110	1,110
0.901	754.87	755.81	1,110	1,110
1.001	755.12	755.94	1,110	1,110
1.092	757.05	757.37	1,110	1,110

To account for the 1740 cfs split flow, the floodplain peak discharge on Evans Wash was reduced by 1740 cfs between stations 0.228 and 0.664. The floodway peak discharge, however, was not reduced in order to provide conveyance for future conditions.

PIONEER CEMETERY WASH

CROSS SECTION	FP	FW	Q
0.001	754.76	755.66	8,988
0.106	754.91	755.79	790
0.202	754.93	755.80	790
0.292	755.16	755.51	790
0.395	759.58	759.98	790

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF EVANS WASH & CEMETERY WASH

F.C.D. CONTRACT NO. 99-18

GILA BEND ADMP

LEGEND

100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
EXISTING APPROXIMATE FLOODPLAIN BOUNDARY	
HYDRAULIC BASE LINE & RIVER MILE	2.0
CROSS SECTION	FP=100 Yr WSEL FW=Floodway WSEL 5.519 Q=100 Yr Flow
ELEVATION REFERENCE MARK	⊗ ERM26
BASE FLOOD ELEVATIONS	1770
ZONE DESIGNATIONS	ZONE AE
SECTION LINE	

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

I.D. NUM. ELEV. (FT) DESCRIPTION/LOCATION

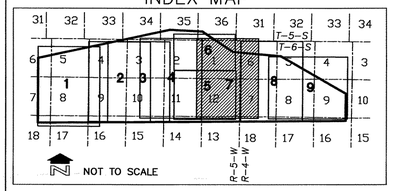
ERM #13 EL=795.60
Located 0.3 miles south along State Highway 85 from the Southern Pacific Company Railroad Station at gila bend, thence 1.9 miles south along graded road at the "T" junction of a graded road leading east of a fence corner, 51 feet north of the centerline of the road east, 45 feet east of the centerline of the centerline of the road south, 36 feet north of the fence corner 2.8 feet north of a witness post 2.4 feet west of a fence, and set in the top of a concrete post projecting 0.6 feet above the ground and level with the road. The mark is a brass cap stamped "U.S. Coast & Geodetic Survey N298"

ERM #14 EL=766.82
Located 0.3 miles south along State Highway 85 from the Southern Pacific Company Railroad Station at Gila Bend. Thence 0.7 mile south along a graded road on a small barren patch, 59 feet south of the centerline of the road, 2.4 feet north of a witness post and set in the top of a concrete post projecting 0.5 foot above the ground and about 1 foot higher than the road. The mark is a brass cap stamped "U.S. Coast and Geodetic Survey M298"

ERM #23 EL=765.42
NGS Point "J-331", (PID DA0498) Located 1.65 mi. SW along the Tucson, Cornelia and Gila Bend Railway from the Martin Avenue crossing in Gila Bend, at the second telegraph pole SW of railway mile pole 2, at a dip in the old highway 8, 195,5 feet North of the NW corner of a wooden railway bridge number 21, 95.4 feet NW of the NW rail of the tracks, 46.0 feet SE of the centerline of the old highway, 5.0 feet NE oth the telegraph pole, 2 ft. SW from a witness post, and 1 ft. below the tracks.
Section 12 T 6 S, R 5 W.

ERM #32 EL=744.75
1" iron pipe, 2.8 feet east and 1.0 foot north of a utility pole and 2.6 feet north of a #4 rebar with cap stamped "LS 9087", +/- 30 feet south of a building corner and +/- 150 feet west of the intersection of Main St. and Martin Ave.
Section 31, T 5 S, R 5 W.

INDEX MAP



400' 0' 400' 800'

SCALE: 1"= 400'
CONTOUR INTERVAL = 2 FEET AND 4 FEET

eec
Engineering and Environmental Consultants, Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012-2905
TEL:(602)248-7702 FAX:(602)248-7851

15594 MARK T. GAVAN REGISTERED ARIZONA, U.S.A.

	BY	DATE
DESIGN	LAV	10/01
DESIGN CHK.	FCDMC	10/01
PLANS	KLH	10/01
PLANS CHK.	LAV	10/01

SUBMITTED BY: DATE:

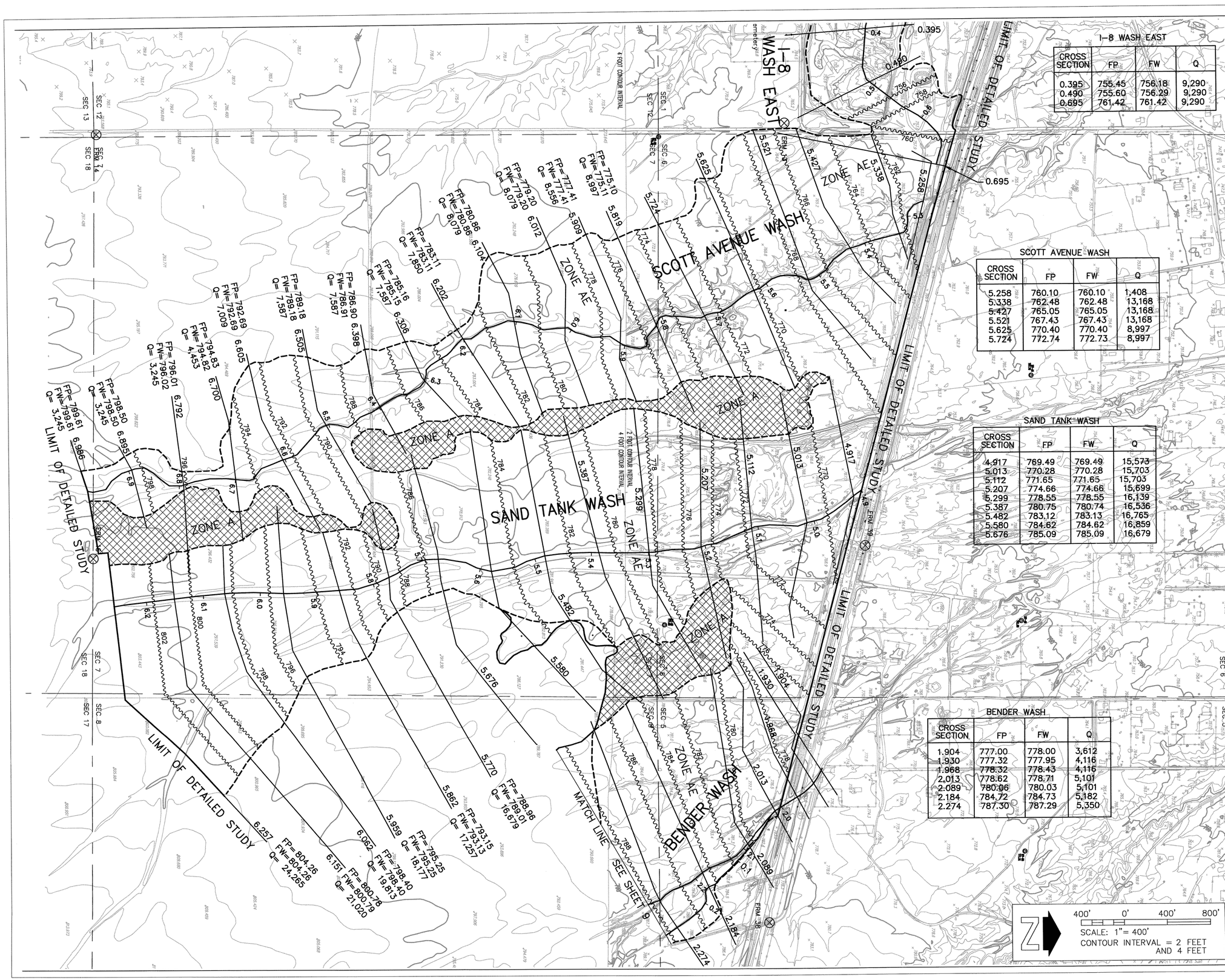
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET 7 OF 9



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF SAND TANK WASH & SCOTT AVENUE WASH

F.C.D. CONTRACT NO. 99-18

GILA BEND ADMP

I-8 WASH EAST

CROSS SECTION	FP	FW	Q
0.395	755.45	756.18	9,290
0.490	755.60	756.29	9,290
0.695	761.42	761.42	9,290

SCOTT AVENUE WASH

CROSS SECTION	FP	FW	Q
5.258	760.10	760.10	1,408
5.338	762.48	762.48	13,168
5.427	765.05	765.05	13,168
5.521	767.43	767.43	13,168
5.625	770.40	770.40	8,997
5.724	772.74	772.73	8,997

SAND TANK WASH

CROSS SECTION	FP	FW	Q
4.917	769.49	769.49	15,573
5.013	770.28	770.28	15,703
5.112	771.65	771.65	15,703
5.207	774.66	774.66	15,699
5.299	778.55	778.55	16,139
5.387	780.75	780.74	16,536
5.482	783.12	783.13	16,765
5.580	784.62	784.62	16,859
5.676	785.09	785.09	16,679

BENDER WASH

CROSS SECTION	FP	FW	Q
1.904	777.00	778.00	3,612
1.930	777.32	777.95	4,116
1.968	778.32	778.43	4,116
2.013	778.62	778.71	5,101
2.089	780.06	780.03	5,101
2.184	784.72	784.73	5,182
2.274	787.30	787.29	5,350

LEGEND

- 100-YR FLOODPLAIN BOUNDARY
- FLOODWAY BOUNDARY
- EXISTING APPROXIMATE FLOODPLAIN BOUNDARY
- HYDRAULIC BASE LINE & RIVER MILE — 2.0
- CROSS SECTION — FP=100 Yr WSEL; FW=Floodway WSEL 5.519; Q=100 Yr Flow
- ELEVATION REFERENCE MARK — ⊗ ERM26
- BASE FLOOD ELEVATIONS — 1770
- ZONE DESIGNATIONS — ZONE AE
- SECTION LINE
- ZONE A WITH SPECIAL FLOOD HAZARD AREAS THAT EXPERIENCE SIGNIFICANT LATERAL FLOW BETWEEN WASHES. NO DEVELOPMENT SHALL BE ALLOWED THAT WOULD INHIBIT THE LATERAL CROSS FLOW.

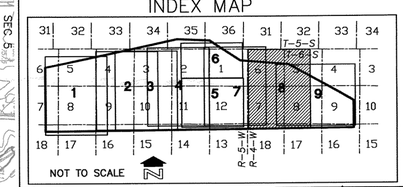
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

I.D. NUM. ELEV. (FT) DESCRIPTION/LOCATION

ERM #13 EL=795.60
Located 0.3 miles south along State Highway 85 from the Southern Pacific Company Railroad Station at gila bend, thence 1.9 miles south along graded road at the "T" junction of a graded road leading east of a fence corner, 51 feet north of the centerline of the road east, 45 feet east of the centerline of the centerline of the road south, 36 feet north of the fence corner 2.8 feet north of a witness post 2.4 feet west of a fence, and set in the top of a concrete post projecting 0.6 feet above the ground and level with the road. The mark is a brass cap stamped "U.S. Coast & Geodetic Survey N298"
ERM #14 EL=766.82
Located 0.3 miles south along State Highway 85 from the Southern Pacific Company Railroad Station at Gila Bend. Thence 0.7 mile south along a graded road on a small barren patch, 59 feet south of the centerline of the road, 2.4 feet north of a witness post and set in the top of a concrete post projecting 0.5 foot above the ground and about 1 foot higher than the road. The mark is a brass cap stamped "U.S. Coast and Geodetic Survey M298"
ERM #16 ERM EL=804.28
Located 0.3 mile south along State Highway 85 from the Southern Pacific Railroad Station at Gila Bend. Thence 1.9 miles south along a graded road, thence 0.7 mile east along a graded road at a gravel pit and a large mound of dirt at the junction of a track road leading south along a fence line, 86 feet north of the remains of a fnece corner. 111 feet north of the junction of the tracked road, 18 feet east of the dirt mound, 5.0 feet northwest of a 6 foot high wooden post, 1.6 feet southwest of a witness post, set in the top of a concrete post projecting 0.4 foot above the ground and level with the roads. The mark is a brass cap stamped "U.S. Coast & Geodetic Survey R60"
ERM #38 EL=786.03
ADOT Brass Cap marked "786.19" on headwall on the north side of west bound Interstate 8, 0.8 miles west of milepost 119. Section 5, T 6 S, R 4 W.
ERM #39 EL=773.63
ADOT Brass Cap marked "Elev 773.79 MED. STA. 5145+22.66", on headwall on north side of west bound Interstate 8, 0.5 miles west of milepost 118 and 0.1 miles west of bridge over Sand Tank Wash. Section 6, T 6 S, R 4 W.

INDEX MAP



eec
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Phoenix, Arizona 85012-2905
TEL:(602)248-7702 FAX:(602)248-7851

REGISTERED PROFESSIONAL ENGINEER 16594 MARK T. GAVAN 8/5/03 ARIZONA, U.S.A.

400' 0' 400' 800'
SCALE: 1"= 400'
CONTOUR INTERVAL = 2 FEET AND 4 FEET

DESIGN	BY LAV	DATE 10/01
DESIGN CHK.	FCDMC	10/01
PLANS	KLH	10/01
PLANS CHK.	LAV	10/01

SUBMITTED BY: DATE:

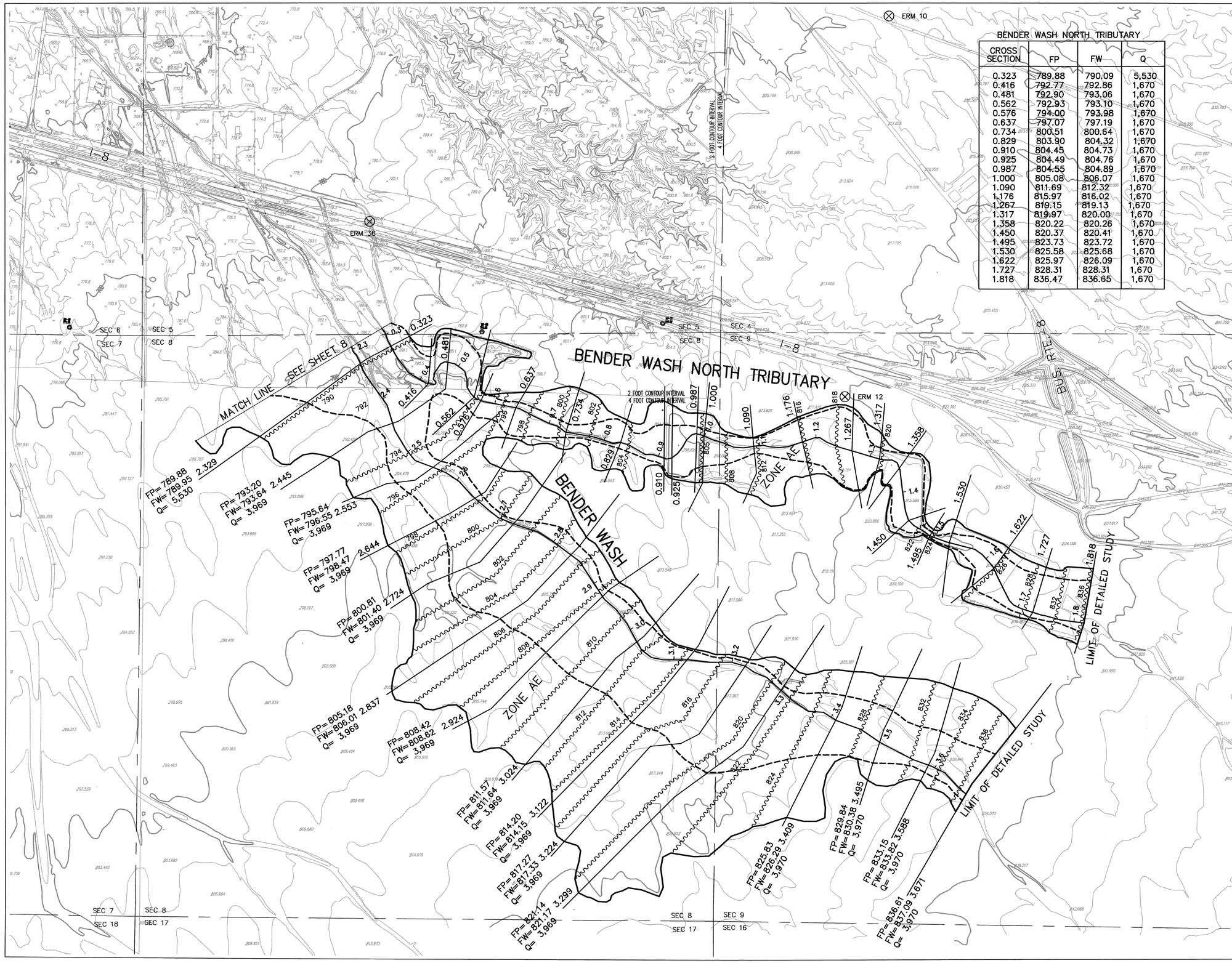
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET 8 OF 9



BENDER WASH NORTH TRIBUTARY

CROSS SECTION	FP	FW	Q
0.323	789.88	790.09	5,530
0.416	792.77	792.86	1,670
0.481	792.90	793.06	1,670
0.562	792.93	793.10	1,670
0.576	794.00	793.98	1,670
0.637	797.07	797.19	1,670
0.734	800.51	800.64	1,670
0.829	803.90	804.32	1,670
0.910	804.45	804.73	1,670
0.925	804.49	804.76	1,670
0.987	804.55	804.89	1,670
1.000	805.08	806.07	1,670
1.090	811.69	812.32	1,670
1.176	815.97	816.02	1,670
1.267	819.15	819.13	1,670
1.317	819.97	820.00	1,670
1.358	820.22	820.26	1,670
1.450	820.37	820.41	1,670
1.495	823.73	823.72	1,670
1.530	825.58	825.68	1,670
1.622	825.97	826.09	1,670
1.727	828.31	828.31	1,670
1.818	836.47	836.65	1,670

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF

BENDER WASH & BENDER WASH NORTH TRIBUTARY F.C.D. CONTRACT NO. 99-18 GILA BEND ADMP

LEGEND

100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
EXISTING APPROXIMATE FLOODPLAIN BOUNDARY	
HYDRAULIC BASE LINE & RIVER MILE	2.0
CROSS SECTION	FP=100 Yr WSEL FW=Floodway WSEL Q=100 Yr Flow 5.519
ELEVATION REFERENCE MARK	ERM26
BASE FLOOD ELEVATIONS	1770
ZONE DESIGNATIONS	ZONE AE
SECTION LINE	

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

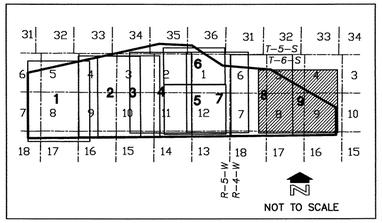
I.D. NUM. ELEV. (FT) DESCRIPTION/LOCATION

ERM # 10: ERM EL = 806.43
This station is located 2.6 miles east along State Highway 84 from the Southern Pacific Company Railroad Station at Gila Bend about 0.3 miles east of a ranch house, 50 feet north of the centerline of the highway, 1 foot north of the highway boundary line, and about 1 foot above the surface of the highway; set in the top of a concrete post projecting 3 inches above ground. The mark is a brass cap stamped "U.S. Coast & Geodetic Survey A84".

ERM#12 EL = 819.24
This station is located 2.5 miles southeast on State Highway 84 from the junction of U.S. Highway 80, 1.0 miles east of Gila Bend, to a gate in right-of-way fence, pass thru gate and go 0.2 miles southerly to the proposed Interstate Route, thence 0.5 miles on the proposed route, 70.19 feet north of F.M. 2, 52.85 feet southwest of R.M.I., 4 feet south of a metal witness post with sign, set in a cylindrical concrete post projecting 4 inches. The mark is a brass cap stamped "Coast & Geodetic Survey GIANT".

ERM #38 EL=786.03
ADOT Brass Cap marked "786.19" on headwall on the north side of west bound Interstate 8, 0.8 miles west of milepost 119.
Section 5, T 6 S, R 4 W.

INDEX MAP



400' 0' 400' 800'

SCALE: 1"= 400'
CONTOUR INTERVAL = 2 FEET AND 4 FEET

eec
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15594 MARK T. GAVAN ARIZONA, U.S.A.

	BY	DATE
DESIGN	LAV	10/01
DESIGN CHK.	FCDMC	10/01
PLANS	KLH	10/01
PLANS CHK.	LAV	10/01

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET 9 OF 9