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McMicken Dam Outlet Channel Inundation Report

Emergency Action Plan Update for McMicken Outlet Channel

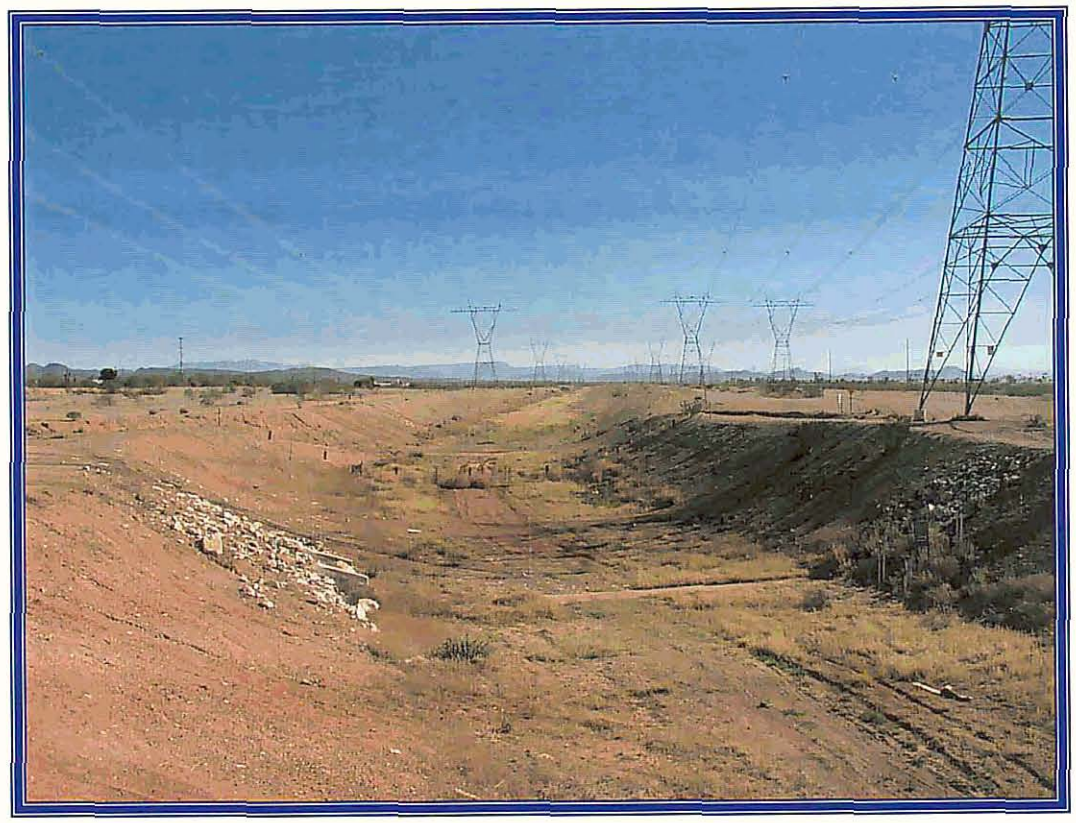
Prepared for:

Flood Control District of Maricopa County (FCD No. 2003C062) and LTM Engineering, Inc.

Kimley-Horn and Associates, Inc.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 34151
LAURA S. MARIN
Date Signed 6/18/04
ARIZONA U.S.A.

McMicken Dam Outlet Channel Inundation Report



FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
FCD 2003C062

KIMLEY-HORN AND ASSOCIATES, INC.
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JUNE 2004

Registered Professional Engineer (Civil)
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MARIN
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ARIZONA U.S.A.

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Emergency Action Plan Update for McMicken Dam Outlet Channel

FCD 2003C062

McMicken Dam Outlet Channel Inundation Report

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Registered Professional Engineer (Civil) CERTIFICATE NO. 34151 LAURA S. MARIN Date Signed 6/18/04 ARIZONA U.S.A.

Emergency Action Plan Update for McMicken Dam Outlet Channel

FCD 2003C062

McMicken Dam Outlet Channel Inundation Report

A. Introduction

The Flood Control District of Maricopa County (District) operates and maintains twenty-two (22) dry flood retarding structures (FRS) and dams. McMicken Dam is an earth embankment dam with a principal spillway and emergency spillway. The principal spillway is a concrete-lined open channel. The emergency spillway has been excavated into earth or rock.

The McMicken Dam is a 10-mile long earth embankment dam located in western Maricopa County near Sun City West. The dam is classified, according to the Arizona Department of Water Resources (ADWR), Office of Dam Safety, as a high hazard dam. Hazard classification is based on the potential for property damage and the lives at risk in the event of a dam failure or significant impoundment. The dam falls within the jurisdiction of ADWR.

The District is currently coordinating with ADWR to develop the emergency action plans (EAP) for its dams and to address other issues relating to the dams. Presently the EAPs do not meet current ADWR dam safety rules and regulations that are required for significant or high hazard dams. ADWR has requested that EAPs be prepared for each dam and that the EAPs meet the minimum requirements provided in the Federal Emergency Management Agency document "Emergency Action Planning – FEMA 64" (October, 1999).

The McMicken Dam Outlet Channel drains the principal spillway, and extends from the principal spillway northeast to the McMicken Outlet Wash, which drains into the Agua Fria River. This study encompasses the easternmost 4.7 miles of outlet channel, from Grand Avenue to the Outlet Wash (Figure 1). The right bank of the Outlet Channel is a constructed levee, designed to protect downstream properties from flooding. The Outlet Channel inundation study consisted of two steps. The first step was to conduct an overtopping analysis. The second step was to conduct an inundation analysis and mapping of overtopping flows within the downstream inundation limits. These results are to be included in the Emergency Action Plan Update for McMicken Outlet Channel.

B. Authority and Purpose

The District has retained LTM Engineering, Inc. to develop an Emergency Action Plan Update for McMicken Outlet Channel. Kimley-Horn and Associates, Inc. (KHA) is

assisting LTM Engineering in the inundation analysis of potential overtopping for preparation of the EAP.

Specifically, this report documents the overtopping analysis conducted by KHA of the Outlet Channel. The hydraulic analysis was conducted for both existing and future conditions 100-year, 24-hour runoff from the upstream contributing watershed, plus discharge from the principal spillway. The hydraulic analysis is to be used to map the downstream inundation due to overtopping of the levee on the south side of the Outlet Channel.

C. Study Tasks

The following is a description of the overtopping and inundation analysis tasks completed:

1. Hydrology

The hydrologic analysis of the Outlet Channel was conducted by others (FCD, 2004). The discharge from the principal spillway was estimated to be 4,450 cfs from Table 3-2 of the McMicken Dam Individual Structure Assessment Report (FCD, 2003). Additional flows contributing to the Outlet Channel were estimated from the Wittmann Area Drainage Master Study Update (WADMSU), McMicken Dam Hydrology Report (FCD, 2004). (See Appendix A)

Table 1 contains the flow rates used in the Outlet Channel Inundation Study as determined from the abovementioned resources. There are three locations of flow contribution to the Outlet Channel, the principal spillway, and WADMSU concentration points 600 and 710.

Table 1: Flow Rates Used in Overtopping Analysis

Inflow Point	KHA's HEC-RAS Cross Section	Existing Conditions (cfs)	Future Conditions (cfs)
Principal spillway	14.711	4,450	4,450
WADMSU Conc. Point 600	12.463	7,290	7,850
WADMSU Conc. Point 710	11.376	4,100	4,460
Total Flow at Outlet Wash	10.000	15,840	16,760

2. Hydraulic Modeling

The U.S. Army Corps of Engineers hydraulic modeling software HEC-RAS (version 3.1.1) was used to model the Outlet Channel. The starting (initial) condition was the normal depth method, with a channel slope of 0.009 ft/ft. Channel cross sections were surveyed by others and provided by the District. Twenty-one cross sections were used extending from the Burlington Northern – Santa Fe Railway at the upstream end of the Outlet Channel east to the end of the

levee. Survey cross-sections covered from the levee on the south side of the channel to 300 ft to the north, picking up the channel. The sections were appended with data extracted from USGS Quadrangle maps, as the survey cross section did not extend the full floodplain of the channel. The additional data was determined from the quadrangle maps by extending the sections north until the elevation was higher than the levee to create a complete section (Figure 2, Appendix A). The datum of the quadrangle maps was NGVD 29, the datum of the surveyed cross sections was NAVD 88, and so an elevation conversion was applied to the quad map elevations by adding 1.936 ft to convert them to NAVD 88. This conversion factor was obtained from the National Geodetic Survey web site.

Manning's n-values for the outlet channel were verified from field reconnaissance and coincide with the McMicken Dam Spillway Outlet Channel Analysis (FCD, 2003). The n-values used were 0.035 for the channel and 0.045 for the overbank areas.

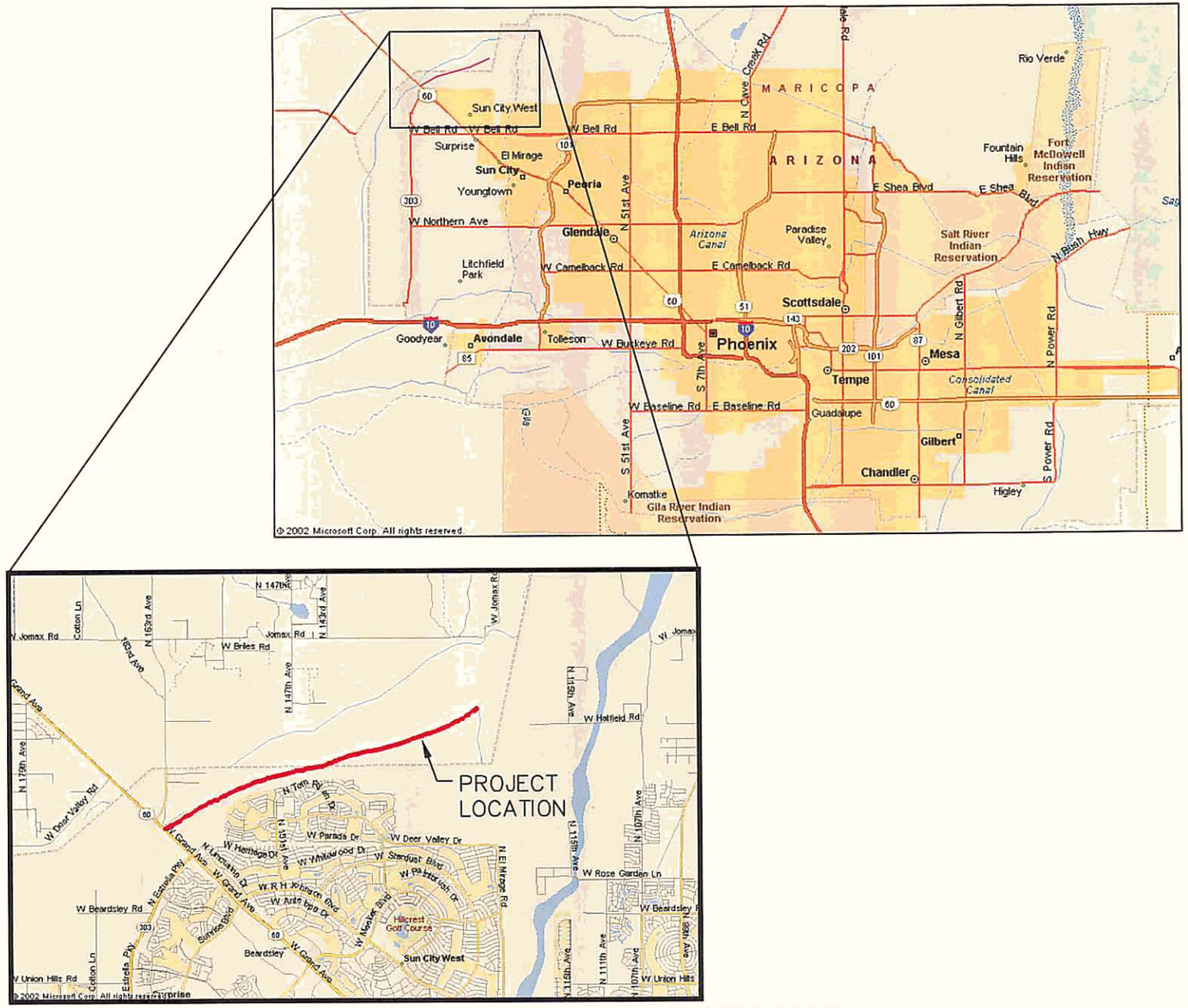


FIGURE 1: VICINITY MAP
MCMICKEN DAM OUTLET CHANNEL
N.T.S.

Kimley-Horn and Associates, Inc.

K:\-Municipal\91725003\CADD\2503VM.dwg Jun 17, 2004

D. Hydraulic Analysis Results

The results of the hydraulic modeling are summarized in Table 2 and Table 3.

Table 2: Existing Conditions HEC-RAS Results

HEC-RAS Cross Section	Flow Rate [cfs]	Minimum Channel Elevation [ft]	Water Surface Elevation [ft]	Critical Water Surface Elevation [ft]	Energy Grade Elevation [ft]	Energy Grade Slope [ft/ft]	Velocity in Channel [ft/s]	Flow Area [sq ft]	Top Width [ft]	Froude Number Channel
14.711	4450	1325.23	1335.23	1330.87	1335.73	0.00131	5.68	784.01	106.79	0.37
14.289	4450	1323.32	1332.94	1328.39	1333.28	0.00090	4.65	972.64	182.21	0.31
13.962	4450	1322.33	1331.45	1327.01	1331.77	0.00084	4.55	1033.18	189.89	0.30
13.728	4450	1320.55	1330.69	1326.16	1330.90	0.00056	3.89	1532.89	323.32	0.25
13.487	4450	1320.00	1329.83	1325.76	1330.06	0.00079	4.15	1366.98	297.19	0.29
13.211	4450	1319.27	1328.81	1324.01	1329.06	0.00061	4.06	1302.60	327.11	0.26
13.161	4450	1319.21	1328.75	1323.87	1328.90	0.00039	3.43	2247.35	648.99	0.21
12.935	4450	1317.38	1328.50	1322.88	1328.56	0.00019	2.58	3374.50	735.91	0.15
12.665	4450	1316.50	1328.32	1321.44	1328.36	0.00011	2.09	4715.77	1030.13	0.11
12.463	11740	1316.39	1327.65	1324.08	1327.95	0.00080	5.57	4657.03	1094.60	0.31
12.102	11740	1313.98	1325.95	1322.73	1326.32	0.00091	5.99	4121.52	950.06	0.33
11.825	11740	1312.28	1325.34	1320.36	1325.47	0.00035	3.97	7039.45	1381.00	0.21
11.555	11740	1312.10	1324.73	1319.78	1324.91	0.00043	4.32	5802.98	1202.18	0.23
11.376	15840	1311.01	1324.01	1320.22	1324.33	0.00081	5.98	5946.63	1219.60	0.32
11.270	15840	1309.85	1323.24	1319.40	1323.80	0.00103	6.99	4399.92	913.53	0.36
10.992	15840	1309.17	1322.20	1317.77	1322.50	0.00069	5.66	6021.98	1123.91	0.29
10.826	15840	1307.89	1321.45	1317.55	1321.83	0.00085	6.51	5731.96	1207.67	0.33
10.637	15840	1307.55	1321.16	1315.16	1321.28	0.00030	3.93	9476.03	1632.12	0.20
10.436	15840	1306.65	1320.83	1315.00	1320.94	0.00033	4.17	9745.87	1641.36	0.21
10.230	15840	1306.22	1319.93	1315.66	1320.34	0.00093	6.47	5164.12	1246.73	0.34
10.000	15840	1304.65	1316.00	1316.00	1317.90	0.00567	12.20	2156.95	662.55	0.78

Table 3: Future Conditions HEC-RAS Results

HEC-RAS Cross Section	Flow Rate [cfs]	Minimum Channel Elevation [ft]	Water Surface Elevation [ft]	Critical Water Surface Elevation [ft]	Energy Grade Elevation [ft]	Energy Grade Slope [ft/ft]	Velocity in Channel [ft/s]	Flow Area [sq ft]	Top Width [ft]	Froude Number Channel
14.711	4450	1325.23	1335.23	1330.87	1335.73	0.00131	5.67	784.48	106.81	0.37
14.289	4450	1323.32	1332.96	1328.39	1333.29	0.00090	4.64	975.67	183.36	0.31
13.962	4450	1322.33	1331.49	1327.01	1331.80	0.00083	4.53	1039.97	191.32	0.30
13.728	4450	1320.55	1330.75	1326.16	1330.95	0.00054	3.86	1550.64	324.29	0.24
13.487	4450	1320.00	1329.91	1325.76	1330.14	0.00076	4.08	1393.08	300.88	0.28
13.211	4450	1319.27	1328.96	1324.01	1329.20	0.00056	3.96	1353.12	336.12	0.25
13.161	4450	1319.21	1328.91	1323.87	1329.05	0.00036	3.33	2353.24	668.34	0.20
12.935	4450	1317.38	1328.68	1322.88	1328.74	0.00017	2.50	3510.81	750.96	0.14
12.665	4450	1316.50	1328.52	1321.44	1328.55	0.00010	2.02	4923.62	1054.03	0.11
12.463	12300	1316.39	1327.86	1324.23	1328.15	0.00079	5.62	4886.50	1123.45	0.31
12.102	12300	1313.98	1326.18	1322.88	1326.55	0.00089	6.02	4347.94	976.08	0.33
11.825	12300	1312.28	1325.59	1320.50	1325.71	0.00034	3.99	7387.40	1413.55	0.21
11.555	12300	1312.10	1324.99	1319.96	1325.17	0.00042	4.33	6121.92	1232.79	0.23

HEC-RAS Cross Section	Flow Rate [cfs]	Minimum Channel Elevation [ft]	Water Surface Elevation [ft]	Critical Water Surface Elevation [ft]	Energy Grade Elevation [ft]	Energy Grade Slope [ft/ft]	Velocity in Channel [ft/s]	Flow Area [sq ft]	Top Width [ft]	Froude Number Channel
11.376	16760	1311.01	1324.27	1320.42	1324.60	0.00081	6.06	6274.61	1252.15	0.32
11.270	16760	1309.85	1323.49	1319.67	1324.06	0.00104	7.12	4634.70	942.06	0.36
10.992	16760	1309.17	1322.44	1317.97	1322.75	0.00069	5.77	6301.23	1146.65	0.30
10.826	16760	1307.89	1321.69	1317.79	1322.08	0.00085	6.62	6027.29	1242.27	0.33
10.637	16760	1307.55	1321.39	1315.35	1321.52	0.00031	4.02	9864.76	1666.16	0.20
10.436	16760	1306.65	1321.06	1315.17	1321.17	0.00034	4.27	10126.02	1673.37	0.21
10.230	16760	1306.22	1320.14	1315.88	1320.56	0.00095	6.61	5429.14	1289.52	0.34
10.000	16760	1304.65	1316.22	1316.22	1318.11	0.00555	12.30	2299.98	681.17	0.78

Table 4: Estimated Levee Freeboard

HEC-RAS Cross Section	Top of Levee Elevation[1] [ft]	Existing Conditions Water Surface Elevation [ft]	Existing Conditions Freeboard [ft]	Future Conditions Water Surface Elevation [ft]	Future Conditions Freeboard [ft]	Levee Stationing	Recommended Revised Levee Elevation[2] [ft]
14.711	1339.69	1335.23	4.46	1335.23	4.46	355+71.84	
14.289	1338.72	1332.94	5.78	1332.96	5.76	333+44.67	
13.962	1337.11	1331.45	5.66	1331.49	5.62	316+18.05	
13.728	1334.99	1330.69	4.30	1330.75	4.24	303+81.65	
13.487	1334.23	1329.83	4.40	1329.91	4.32	291+13.51	
13.211	1333.21	1328.81	4.40	1328.96	4.25	276+53.70	
13.161	1332.94	1328.75	4.19	1328.91	4.03	273+89.20	
12.935	1331.93	1328.50	3.43	1328.68	3.25	261+97.86	
12.665	1330.24	1328.32	1.92	1328.52	1.72	247+69.33	1331.52
12.463	1329.08	1327.65	1.43	1327.86	1.22	237+06.91	1330.86
12.102	1329.03	1325.95	3.08	1326.18	2.85	218+01.04	1329.18
11.825	1328.07	1325.34	2.73	1325.59	2.48	203+34.69	1328.59
11.555	1326.31	1324.73	1.58	1324.99	1.32	189+09.51	1327.99
11.376	1326.16	1324.01	2.15	1324.27	1.89	179+66.13	1327.27
11.270	1326.61	1323.24	3.37	1323.49	3.12	174+03.11	
10.992	1324.82	1322.20	2.62	1322.44	2.38	159+38.76	1325.44
10.826	1322.88	1321.45	1.43	1321.69	1.19	150+61.69	1324.69
10.637	1321.69	1321.16	0.53	1321.39	0.30	140+62.27	1324.39
10.436	1321.78	1320.83	0.95	1321.06	0.72	130+02.35	1324.06
10.230	1321.74	1319.93	1.81	1320.14	1.60	119+13.16	1323.14
10.000	N/A	1316.00	N/A	1316.22	N/A	107+00.15	

[1] NGVD 1988
[2] For future conditions, based on FEMA requirement of three feet of freeboard.

Table 4 indicates that there is no overtopping of the levee in either the existing or future conditions hydrology. The existing levee contains the flow from the McMicken Dam principal spillway and the adjacent contributing areas. Downstream inundation mapping was not prepared as there is no overtopping of the levee.

E. Comparison with Subsidence Data

According to Figure SU-10 of the Wittmann Area Drainage Master Study Update, Land Subsidence and Earth Fissure Investigation Report, Volume SU, dated

January 30, 2004, the estimated subsidence through the year 2000 in the area of the Outlet Channel is between zero and two feet. Table 4 shows that if subsidence had not occurred, only two sections of the levee would need to be raised to meet FEMA's three foot height requirement for certification. Those two locations are station 140+62.27 and station 130+02.35, which are 2.7 ft and 2.28 ft below the FEMA requirement.

F. Conclusions

The original objectives of this study were to perform an overtopping analysis, and to determine and map the downstream inundation limits due to the overtopping. The hydraulic analysis results indicated that there is no overtopping in the 100-year, 24-hour storm under existing or future land use conditions. Table 4 indicates that there are two stations, 10.637 and 10.436, with freeboard less than one foot, and several with freeboard less than three feet (see Figure 2).

G. Recommendations

1. It is recommended that the District raise and/or monitor the levee in locations with freeboard less than three feet. The Federal Emergency Management Agency requires a minimum of 3 feet of freeboard above the BFE for certification of the levee. If a future goal of the District is to have the levee certified, all areas with less than three feet of freeboard must be raised.[1]
2. At the east end of the levee the flow turns ninety degrees to the south around the end of the levee and flows into the McMicken Outlet Wash to the Agua Fria River. It is recommended that the District add bank protection in this area to protect against erosion of the end of the levee as the flow makes the turn.

[1] "MT-2 FEMA Form 81-89 Series Sept 02", Instructions for Completing the Riverine Hydrology & Hydraulics Form, Section E: Levee/Floodwall, Number 2, page 19, see Appendix B.

APPENDIX A

Figure 2: HEC-RAS Cross Section Location Map

LEGEND

- SURVEYED CROSS-SECTION
- CROSS-SECTION EXTENSION
- RS HEC-RAS SECTION NUMBER
- WADMS DRAINAGE BOUNDARY
- INUNDATION LIMIT – FUTURE CONDITIONS
- WADMS CONCENTRATION POINT
- DRAINAGE FLOWLINE

FUTURE CONDITIONS FREEBOARD

[IN FEET]

- 0–1
- 1–2
- 2–3
- >3

NOTES:

Q100 DENOTES ADDITIONAL FLOW FROM WITTMANN AREA DRAINAGE MASTER STUDY UPDATE (FCD, 2004).

TOTAL Q100 DENOTES COMBINED FLOW FROM WITTMANN AREA DRAINAGE MASTER STUDY UPDATE AND DISCHARGE FROM McMICKEN DAM PRINCIPAL SPILLWAY.

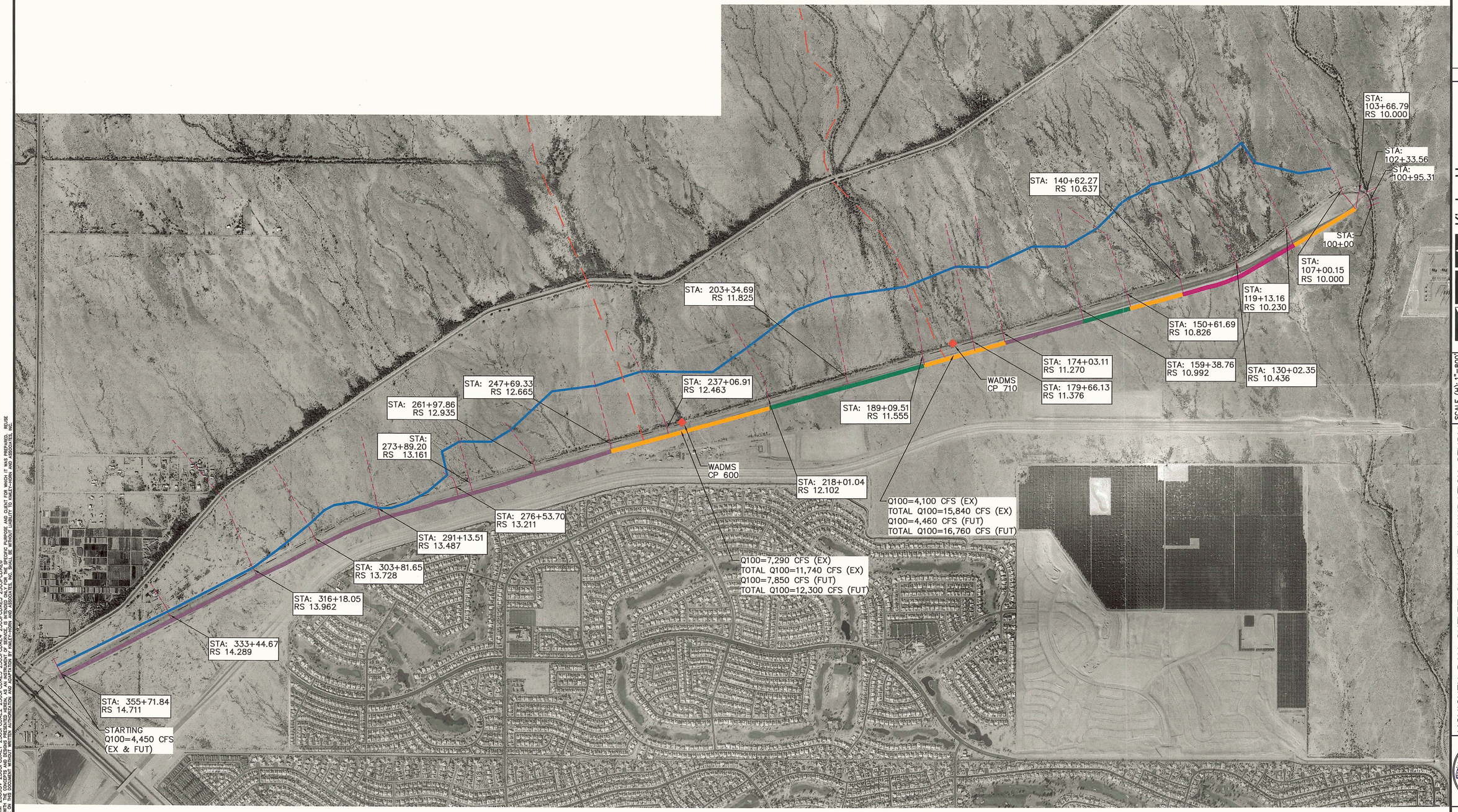
DATUM = NGVD 88

GRAPHIC SCALE

800 0 400 800 1600

(IN FEET)

N



NO.	REVISION	BY	DATE	APPR.

Kimley-Horn and Associates, Inc.

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Engineering, Planning, and Environmental Consultants
7878 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

SCALE (H): 1"=800'
SCALE (V): NONE

DESIGNED BY: LSM
DRAWN BY: PAC
CHECKED BY: LSM

DATE: 6/22/04

MCMICKEN DAM OUTLET CHANNEL INUNDATION STUDY

FIGURE 2
HEC-RAS CROSS SECTION LOCATION MAP

Registered Professional Engineer (Civil)
CERTIFICATE NO. 34151
LAURA S. MARIN
Date Signed 06/22/04
ARIZONA, U.S.A.

PROJECT NO.
091725003

DRAWING NAME
2503EX02

1 OF 1

FCD CONTRACT NUMBER 2003C062

K:\~Municipal\91725003\CADD\2503EX02.dwg Jun 22, 2004 Pat Crawford
XREFS: 2503AE 2503IM 2503SV 2503FCDAE1 2503FCDAE2 2503FCDAE3 2503FCDAE4 2503FCDAE5 2503FCDAE6
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APPENDIX B

Table 3-2 of the McMicken Dam Individual Structure Assessment Report (FCD 2001C012), by URS, dated June 2003

McMicken Dam Hydrology Output (FCD 2002C029) by Entellus

Figure SU-10, WADMSU, Land Subsidence and Earth Fissure Investigation by Geological Consultants Inc.

MT-2 FEMA Form 81-89

URS

McMICKEN DAM
INDIVIDUAL STRUCTURE
ASSESSMENT REPORT

Prepared for
FLOOD CONTROL DISTRICT OF
MARICOPA COUNTY

URS Job No. 23442027
June 2003

Registered Professional Engineer (Civil)
Certificate No.
30016
RAVI
MURTHY
Date Signed 6/4/03
ARIZONA, U.S.A.

TABLE 3-2 (Continued)
McMicken Dam Summary of Hydrology and Hydraulic Data

Item	Design Data	Data Source	Most Current Status	Data Source
Outlet Channel Characteristic				
Type	Unlined Trapezidal		As per design	
Length (ft)	30,000		N/A	
Depth (ft)	11 to 15		N/A	
Width bottom (ft)	TBD		N/A	
Maximum Discharge (cfs)	4,450		N/A	
Emergency Spillway				
Location	Left end	U.S. Army Corps of Engineers, 1953	As per design	
Crest Elevation (ft)	1,354		1,353.0	The District, 2001
Control Section Width (ft)	2,000		N/A	
Inflow Flood During a SDS	35,000		42,000	Rumann and Sutko, 1987
Inflow Flood During 100 year storm (cfs)	N/A		56,200	Collar, Williams and White Eng., 1986
Inflow Flood During PMF (cfs)	120,000	U.S. Army Corps of Engineers, 1953	114,850	Rumann and Sutko, 1987
Discharge Capacity at 1361 ft (dam crest elev.)	95,000		109,095	Cruff, 2000
Elevation (ft)/discharge (cfs) during 100 year storm	N/A		1354.44/7,500[1]	Collar, Williams and White Eng., 1986
Elevation (ft)/discharge (cfs) during PMF -starting with reservoir full	1,360/95,000	U.S. Army Corps of Engineers, 1953	1,361.43/109,100	Cruff, 2000

N/A – information not available or still being reviewed
1. Figure estimated from the discharge elevation curve

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

McMICKEN DAM HYDROLOGY REPORT

VOLUME MD

Contract FCD 2002C029

December 12, 2003

Revised February 18, 2004

Prepared by:

Intelligent Engineering

Environmental Solutions

Entellus™

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Suite 125
Phoenix, AZ 58008
Phone (602) 244 2566
Fax (602) 244 8947
Web: www.entellus.com

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1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY   1991           *
*           VERSION 4.0.1E          *
*     Lahey F77L-EM/32 version 5.01 *
*       Dodson & Associates, Inc.   *
* RUN DATE  02/18/04  TIME  15:23:52 *
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*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET         *
*      DAVIS, CALIFORNIA 95616      *
*          (916) 551-1748           *
*                                   *
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X     X  XXXXXXX   XXXXX          X
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X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX        XXX
```

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.

THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY, DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


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

  1           ID
  2           ID   ******************************************************************************
  3           ID   **                                                                          **
  4           ID   **                    McMICKEN DAM HYDROLOGY MODEL                          **
  5           ID   **                                                                          **
  6           ID   ******************************************************************************
  7           ID   ******************************************************************************
  8           ID   PROJECT:                 WITTMANN ADMS Update
  9           ID   CLIENT:                  Flood Control District of Maricopa County
 10           ID   PREPARED BY:             Entellus, Inc.
 11           ID   PROJECT No:              FCD 2002C029              Entellus 310.032
 12           ID   FILE NAME: ex-100.hc1                     CREATED DATE: Sept 3, 2003
 13           ID                                            MODIFIED DATE: Feb 12, 2004
 14           ID   STORM:                   100-year 24-hour Storm
 15           ID   DEVELOPMENT CONDITIONS:  Existing Conditions
 16           ID
 17           ID
 18           ID   Changes made to Model:
 19           ID                        -Basin WT130 was adjusted to reflect improvements at

 20           ID                          southwest portion of the dam.

 21           ID                        -Basins PD790 and PD780 were combined to form PD780.

 22           ID                        -Basins PI640 and PI620 were combined to form PI640.

 23           ID                        -Basins PD720 and PD710 were combined to form PD710.

 24           ID                        -Changed the following concentration point names:

 25           ID                                CP 400 changed to 400*

 26           ID                                CP 510 changed to 510*

 27           ID                                CP 500 changed to 500.3

 28           ID                                CP 600 changed to 600*

 29           ID                                CP 710 changed to 710*

 30           ID                                CP 700 changed to 700*

 31           ID                        -Added concentration points 400, 510, 500.1, 500.2,

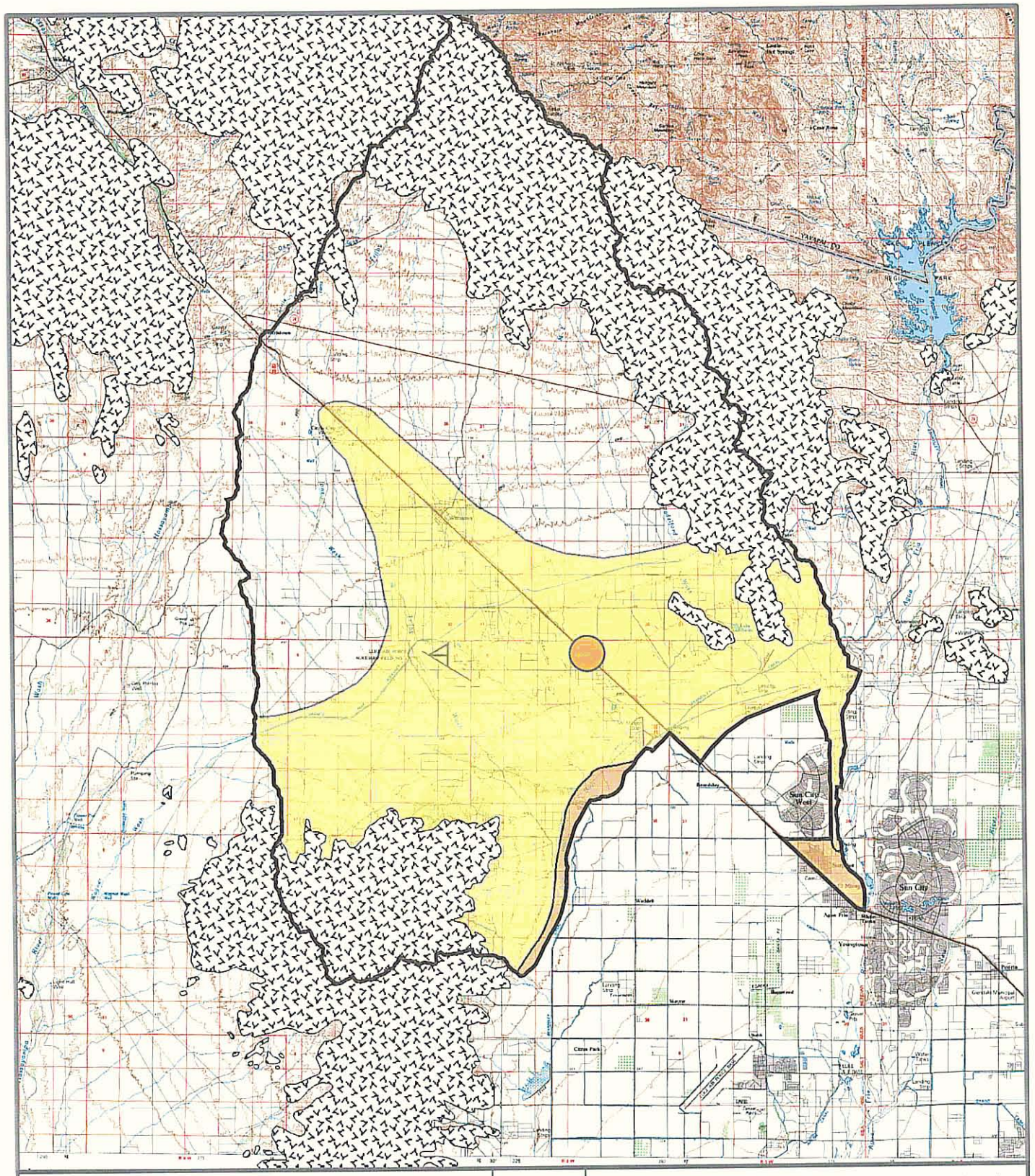
 32           ID                          600, 710 and 700.
```

	ROUTED TO							
+		640600	1822.	17.75	1698.	746.	366.	69.96
	2 COMBINED AT							
+		600	7289.	13.25	2631.	1282.	634.	30.22
	2 COMBINED AT							
+		600*	26100.	18.25	21495.	9072.	4494.	260.20
	ROUTED TO							
+		600710	25908.	18.75	21395.	9071.	4493.	260.20
	HYDROGRAPH AT							
+		CAP4	3397.	15.75	3286.	1703.	843.	69.96
	ROUTED TO							
+		760710	3380.	17.25	3255.	1700.	843.	69.96
	HYDROGRAPH AT							
+		PD710	3617.	13.50	910.	242.	117.	6.72
	HYDROGRAPH AT							
+		PD740	1457.	12.25	127.	34.	16.	0.87
	ROUTED TO							
+		CAP200	378.	12.75	127.	34.	16.	0.87
	ROUTED TO							
+		740710	273.	15.50	121.	34.	16.	0.87
	3 COMBINED AT							
+		710	4102.	13.50	3466.	1990.	986.	41.17
	2 COMBINED AT							
+		710*	28898.	18.50	24372.	10751.	5334.	301.37
	ROUTED TO							
+		710700	28460.	19.00	24116.	10747.	5331.	301.37
	HYDROGRAPH AT							
+		PD730	613.	12.50	85.	26.	12.	0.48
	ROUTED TO							
+		CAP220	457.	12.50	86.	26.	13.	0.48
	HYDROGRAPH AT							
+		PD735	2721.	12.75	539.	162.	78.	3.23
	ROUTED TO							
+		CAP210	2526.	12.75	539.	162.	78.	3.23
	2 COMBINED AT							
+		736	2973.	12.75	622.	187.	90.	3.71
	ROUTED TO							
+		735700	1355.	14.50	613.	186.	90.	3.71
	HYDROGRAPH AT							
+		PD700	6281.	13.00	1130.	313.	151.	7.26
	2 COMBINED AT							
+		700	6366.	13.00	1700.	489.	239.	10.97
	2 COMBINED AT							
+		700*	28487.	19.00	24226.	11083.	5506.	312.34

*** NORMAL END OF HEC-1 ***

+	ROUTED TO 640600	1880.	17.75	1766.	816.	401.	69.96
+	2 COMBINED AT 600	7848.	13.25	2963.	1467.	734.	30.22
+	2 COMBINED AT 600*	30223.	18.25	25428.	11043.	5535.	260.20
+	ROUTED TO 600710	30049.	18.50	25329.	11041.	5533.	260.20
+	HYDROGRAPH AT CAP4	3458.	15.75	3348.	1843.	917.	69.96
+	ROUTED TO 760710	3443.	17.25	3328.	1840.	917.	69.96
+	HYDROGRAPH AT PD710	3724.	13.50	970.	268.	130.	6.72
+	HYDROGRAPH AT PD740	1473.	12.25	139.	39.	19.	0.87
+	ROUTED TO CAP200	381.	12.75	139.	40.	19.	0.87
+	ROUTED TO 740710	282.	15.50	132.	39.	19.	0.87
+	3 COMBINED AT 710	4455.	13.50	3631.	2161.	1077.	41.17
+	2 COMBINED AT 710*	33127.	18.50	28444.	12884.	6456.	301.37
+	ROUTED TO 710700	32685.	18.75	28176.	12875.	6453.	301.37
+	HYDROGRAPH AT PD730	633.	12.50	93.	29.	14.	0.48
+	ROUTED TO CAP220	462.	12.50	94.	29.	14.	0.48
+	HYDROGRAPH AT PD735	2857.	12.75	605.	190.	92.	3.23
+	ROUTED TO CAP210	2581.	12.75	605.	190.	92.	3.23
+	2 COMBINED AT 736	3035.	12.75	696.	219.	106.	3.71
+	ROUTED TO 735700	1684.	14.50	690.	217.	106.	3.71
+	HYDROGRAPH AT PD700	6357.	13.00	1171.	330.	159.	7.26
+	2 COMBINED AT 700	6472.	13.00	1817.	537.	262.	10.97
+	2 COMBINED AT 700*	32743.	18.75	28341.	13254.	6648.	312.34

*** NORMAL END OF HEC-1 ***



Legend

- 0-2' Subsidence
- 2-5' Subsidence
- Bedrock
- Wittmann ADMSU Boundary

N

1:250,000

Land Subsidence and Earth Fissure Investigation
Wittmann ADMSU
Figure SU-10
Estimated Subsidence Map through 2002

GEOLOGICAL CONSULTANTS INC.

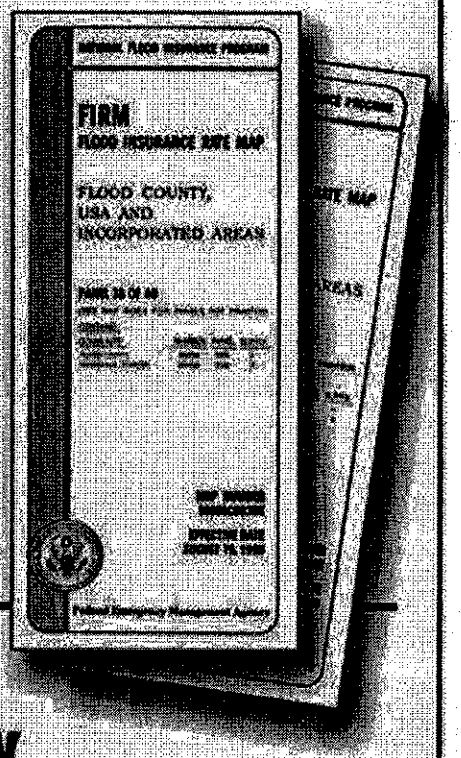
Flood Control District of Maricopa County

MT-2

FEDERAL INSURANCE AND MITIGATION ADMINISTRATION
HAZARD MAPPING DIVISION

REVISIONS TO NATIONAL FLOOD INSURANCE PROGRAM MAPS

APPLICATION FORMS AND INSTRUCTIONS FOR CONDITIONAL LETTERS OF MAP REVISION AND LETTERS OF MAP REVISION



MT-2
FEMA FORM 81-89 SERIES
SEPT 02

FEMA

Federal Emergency Management Agency

Section D: Dam

This section is to be filled out when there is an existing, proposed, or modified dam along a stream studied in detail. Provide a complete engineering analysis and engineering drawings of the dam. The drawings should indicate the dam dimensions (height, top width, side slopes), the crest elevation of the top of the dam, the type of spillway, the spillway dimensions, the crest elevation of the spillway, the type of outlet, the outlet dimensions, and the invert elevation of the outlet.

1. Indicate the reason for the revision request involving a dam.

2. Indicate the agency or organization that designed the dam.

3. Indicate if the hydrologic analysis is revised as a result of the dam. Any storage upstream of the dam, considered in the hydrologic analysis to reduce the peak base flood discharge, should be totally dedicated to flood control. If the outflow of the dam is regulated, submit an explanation of the flow regulation plan. Complete Form 2, Riverine Hydrology & Hydraulics Form, if the hydrology changes.

4. In locations where sediment transport will affect the BFEs, the effects of sediment transport should be considered in the dam analysis and Section F of Form 3 should be submitted.

5. Indicate if the Base Flood Elevations change as a result of the dam. If impacted, list the elevations. Indicate the stillwater elevations behind the dam.

6. Attach a copy of the Operation and Maintenance Plan for the dam with the revision request.

Section E: Levee/Floodwall

This section is to be completed when the revision request involves a new or modified levee and/or floodwall system. A levee is a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding. The purpose of this section is to ensure that the levee or floodwall is designed and/or constructed to provide protection from the 1% annual chance flood, in full compliance with National Flood Insurance Program (NFIP) Regulation 44 CFR Ch. 1, Section 65.10, before reflecting its effects on an NFIP map.

In addition, a vicinity map along with a complete set of flood profile sheets, plan sheets, and layout detail sheets must be submitted. These sheets must be numbered, and an index must be provided that clearly identifies those sheets specifically relating to the levee or floodwall in question.

1. Indicate all the applicable levee/floodwall system elements, including their locations and types, and provide engineering drawings certified by a registered professional engineer. The drawings should show the items indicated.

2. Indicate the amount of freeboard that the levee has above the base flood elevation. Riverine levees must provide a minimum freeboard of three feet above the BFE. An additional one-half foot above the minimum must be provided at the upstream end of the levee, tapering to not less than the minimum at the downstream end of the levee. An additional one-foot above the minimum freeboard is required on both sides of the river or stream for a distance of 100 feet upstream of structures (such as bridges) riverward of the levee or wherever the flow is constricted. If exceptions to the minimum freeboard requirements are requested, attach documentation addressing NFIP Regulation 44 CFR Ch. 1, Subparagraph 65.10(b)(1)(ii).

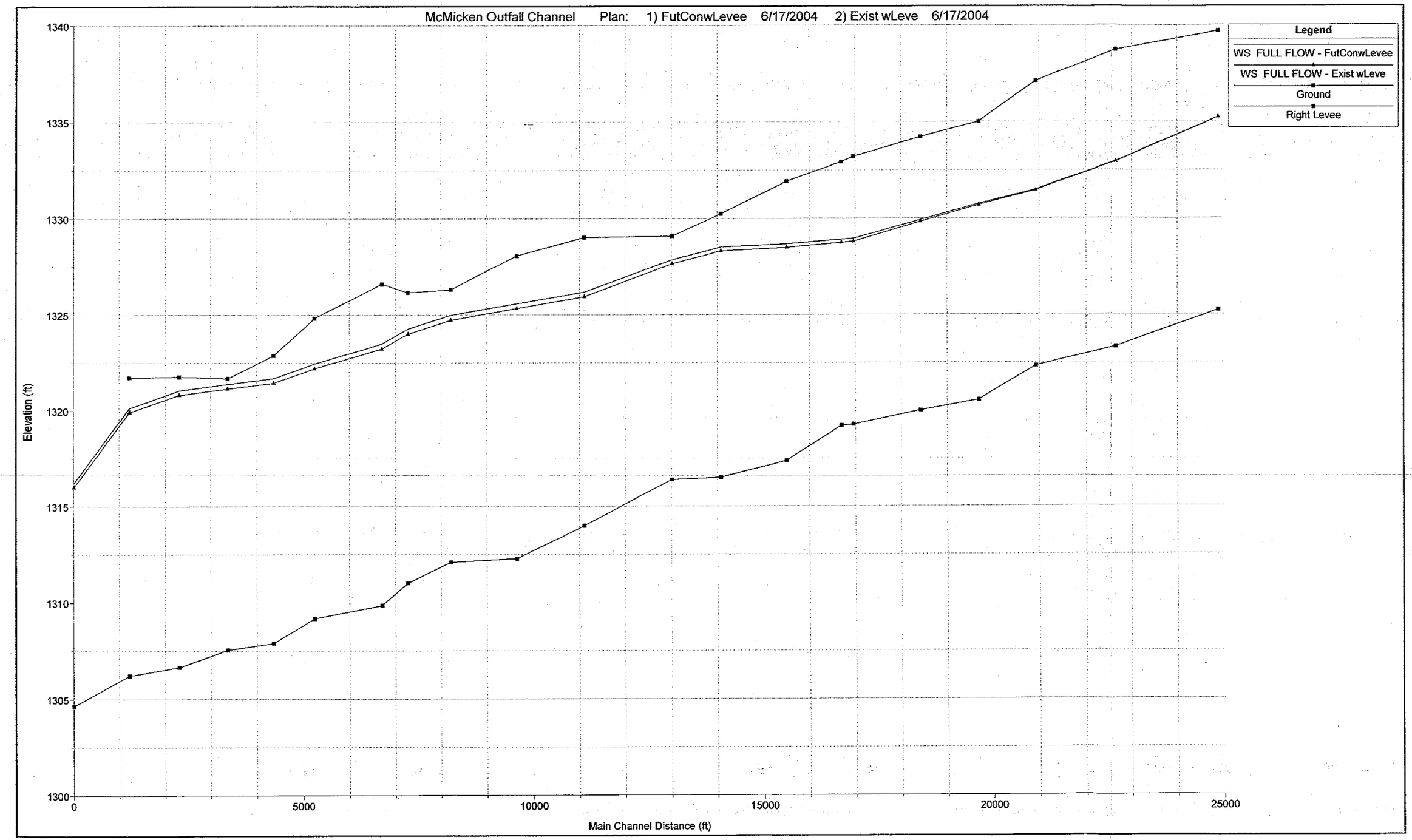
   Ice-jams can increase the flood elevations on a stream. Indicate if the stream has a history of ice-jams, and, if so, provide evidence that the minimum freeboard still exists with the ice-jam effects.

3. List the closure devices for all openings through the levee system. All openings must be provided with closure devices that are structural parts of the system during operation and design.

APPENDIX C

HEC-RAS Output
Existing Conditions
Future Conditions

McMicken Dam Outlet Channel
Inundation Report


McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Right Levee
Elevation (ft)
1340
1335
1330
1325
1320
1315
1310
1305
1300
0
5000
10000
15000
20000
25000
Main Channel Distance (ft)

```
                    HEC-RAS Version 3.1.1 May 2003
                     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: McMicken Outfall Channel
Project File : McMicken.prj
Run Date and Time: 6/17/2004 4:00:58 PM

Project in English units

Project Description:
McMICKEN DAM SPILLWAY OUTLET CHANNEL ANALYSIS

Kimley-Horn and Associates,
Inc. May 2004

PLAN DATA

Plan Title: Existing Conditions with Rt Levee
Plan File : k:\-Municipal\91725003\Drainage\HEC-RAS\McMicken.p02

Geometry Title: Existing Conditions Geometry w/RT Levee
Geometry File : k:\-Municipal\91725003\Drainage\HEC-RAS\McMicken.g02

Flow Title : Existing Conditions Flow
Flow File : k:\-Municipal\91725003\Drainage\HEC-RAS\McMicken.f01

Plan Summary Information:

Number of:	Cross Sections	= 21	Mulitple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	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

FLOW DATA

Flow Title: Existing Conditions Flow
Flow File : k:\-Municipal\91725003\Drainage\HEC-RAS\McMicken.f01

Flow Data (cfs)

River	Reach	RS	FULL FLOW
McMicken Outfall1		14.711	4450
McMicken Outfall1		12.463	11740
McMicken Outfall1		11.376	15840

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
McMicken Outfall1		FULL FLOW		Normal S = 0.009

GEOMETRY DATA

Geometry Title: Existing Conditions Geometry w/RT Levee
Geometry File : k:\-Municipal\91725003\Drainage\HEC-RAS\McMicken.g02

CROSS SECTION

```
RIVER: McMicken Outfall
REACH: 1                    RS: 14.711

INPUT
Description: Q=4,450 cfs (ex/fut)
Station Elevation Data     num=       11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9807.23 1339.96 9866.28 1339.03 9908.77 1338.31 9933.41 1339.76  9972.8 1325.23
 10027.2 1325.7710052.96  1335.410070.76 1337.24 10081.1 1339.6910101.42 1339.83
10131.08 1339.12

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9807.23     .07 9933.41    .03510052.96     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9933.4110052.96             2227    2227    2227             .1        .3
Right Levee     Station= 10081.1      Elevation= 1339.69

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 14.289

INPUT
Description:
Station Elevation Data     num=       14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9348 1341.94 9848.03 1335.24 9901.01 1334.03 9926.27 1332.28 9944.85  1333.7
 9978.27 1323.3210021.73 1323.5610057.47 1325.7810082.23 1332.1810123.54 1333.26
10143.72 1338.6810144.17 1338.7210160.49 1338.1410164.81 1337.27

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9348     .07 9944.85    .03510082.23     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9944.8510082.23             1727    1727    1727             .1        .3
Right Levee     Station=10144.17      Elevation= 1338.72

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 13.962

INPUT
Description:
Station Elevation Data     num=       14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8695 1341.94 9854.85 1332.86 9911.15 1332.53 9936.86 1331.27 9953.07 1332.39
 9976.14 1322.5510023.86 1322.3310068.79 1324.6910088.73 1329.3810137.09 1330.86
10155.72 1337.1110155.88 1337.0510172.07 1335.9110180.92 1335.13

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    8695     .07 9953.07    .03510088.73     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9953.0710088.73             1236    1236    1236             .1        .3
Right Levee     Station=10155.72      Elevation= 1337.11

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 13.728

INPUT
Description:
Station Elevation Data     num=       14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8470 1341.94    9810 1331.94 9870.311327.899 9922.931327.214 9972.521327.354
   100001320.54710046.721321.96910085.631324.29110103.851326.77610146.741328.912
10164.371334.923 10164.51334.98910177.141335.00710195.251327.687

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    8470     .07 9972.52    .03510103.85     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9972.5210103.85             1283    1268    1232             .1        .3
Right Levee     Station=10164.52      Elevation= 1334.99

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 13.487

INPUT
Description:
Station Elevation Data     num=       14
```

```
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     8691 1341.94 9790.58 1330.49 9793.01 1326.93 9889.66  1325.6 9922.58 1330.02
  9967.15 1330.34   10000    132010049.26  1321.6 10085.3 1323.9110113.12 1329.09
 10151.84 1330.3410167.01 1334.2310182.37 1334.0110192.84 1333.41

 Manning's n Values         num=        3
      Sta   n Val      Sta   n Val      Sta   n Val
     8691     .07 9967.15    .03510113.12     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9967.1510113.12             1454    1460    1460             .1       .3
 Right Levee     Station=10167.01      Elevation= 1334.23

 CROSS SECTION


 RIVER: McMicken Outfall
 REACH: 1                   RS: 13.211

 INPUT
 Description:
 Station Elevation Data     num=       13
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
  9654.77 1331.94 9874.77 1328.03 9926.19 1327.96 9976.42 1327.17   10000 1319.27
 10055.57 1319.5410091.94 1322.1110111.58 1324.9910150.72 1326.3110170.71 1333.21
 10171.09 1333.0910184.14 1332.7410201.64  1325.2

 Manning's n Values         num=        3
      Sta   n Val      Sta   n Val      Sta   n Val
  9654.77     .07 9976.42    .03510111.58     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9976.4210111.58             265     265     265             .1       .3
 Right Levee     Station=10170.71      Elevation= 1333.21

 CROSS SECTION


 RIVER: McMicken Outfall
 REACH: 1                   RS: 13.161

 INPUT
 Description:
 Station Elevation Data     num=       13
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     9133 1331.94  9872.8 1325.65 9928.13 1324.67 9981.58 1323.97   10000 1319.28
 10049.36 1319.2110091.37 1321.8910104.47 1323.1310146.38  1324.910168.39 1332.94
 10168.66 1332.8810182.09 1332.5210200.23 1324.19

 Manning's n Values         num=        3
      Sta   n Val      Sta   n Val      Sta   n Val
     9133     .07 9981.58    .03510104.47     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9981.5810104.47             1191    1191    1191             .1       .3
 Right Levee     Station=10168.39      Elevation= 1332.94

 CROSS SECTION


 RIVER: McMicken Outfall
 REACH: 1                   RS: 12.935

 INPUT
 Description:
 Station Elevation Data     num=       12
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     9137 1331.94 9856.89 1322.86 9913.35 1322.53 9967.28 1322.05   10000 1317.38
 10031.99 1318.2610084.85 1320.8710129.03 1322.4610155.78 1331.9310156.62 1331.83
 10168.54 1331.52 10191.4 1321.05

 Manning's n Values         num=        3
      Sta   n Val      Sta   n Val      Sta   n Val
     9137     .07 9967.28    .03510084.85     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9967.2810084.85             1429    1429    1429             .1       .3
 Right Levee     Station=10155.78      Elevation= 1331.93

 CROSS SECTION


 RIVER: McMicken Outfall
 REACH: 1                   RS: 12.665

 INPUT
 Description:
 Station Elevation Data     num=       13
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     8697 1331.94 9856.56 1322.04 9912.99 1321.99 9969.13 1321.21  9985.8 1316.73
    10000  1316.510033.44  1317.310084.57 1319.3310131.16 1320.81 10156.7 1330.24
 10157.12  1330.210169.38 1330.0310192.46  1319.1

 Manning's n Values         num=        3
      Sta   n Val      Sta   n Val      Sta   n Val
     8697     .07 9969.13    .03510084.57     .07
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9969.1310084.57             1062    1062    1062              .1       .3
Right Levee     Station= 10156.7      Elevation= 1330.24

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                  RS: 12.463

INPUT
Description: Q=11,740 cfs (ex), 12,300 cfs (fut)
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8475 1331.94 9875.29 1321.68 9945.31 1321.52  9968.1 1320.84   10000 1316.39
10030.41 1316.5510091.07  1318.810133.79 1320.4110159.33 1329.0610160.14 1329.08
10171.84 1328.5810196.07 1318.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8475     .07  9968.1    .03510091.07     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
        9968.110091.07             1906    1906    1906              .1       .3
Right Levee     Station=10160.14      Elevation= 1329.08

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                  RS: 12.102

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8558 1331.94    9638 1321.94 9878.08 1320.46 9918.33 1320.24 9969.06 1320.08
   10000 1313.9810035.33 1314.44 10075.5  1316.310091.25 1318.9810140.04 1320.37
10163.43 1329.0310163.84 1328.9210175.51 1328.7210197.15 1319.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8558     .07 9969.06    .03510091.25     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9969.0610091.25             1466    1466    1466              .1       .3
Right Levee     Station=10163.43      Elevation= 1329.03

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                  RS: 11.825

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    7922 1331.94    9202 1321.94 9862.37  1317.6 9911.23 1317.27 9960.82 1317.68
   10000 1312.2810027.48 1313.1610074.69 1314.4710087.28 1316.14 10126.4 1317.26
10155.35    132810155.76 1328.0710168.07 1327.68 10190.7  1316.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    7922     .07 9960.82    .03510087.28     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9960.8210087.28             1425    1425    1425              .1       .3
Right Levee     Station=10155.76      Elevation= 1328.07

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                  RS: 11.555

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8119 1331.94    9259 1321.94 9863.34 1318.18 9911.57 1317.34 9933.54 1317.37
   10000  1312.210035.85  1312.110069.66  1313.810084.77 1315.9410122.25 1317.29
10147.52 1326.1610147.58 1326.3110160.72  1326.210183.78 1316.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8119     .07 9933.54    .03510084.77     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9933.5410084.77             943     943     943               .1       .3
Right Levee     Station=10147.58      Elevation= 1326.31

CROSS SECTION
```

```
RIVER: McMicken Outfall
REACH: 1                    RS: 11.376

INPUT
Description: Q=15,840 cfs (ex), 16,760 cfs (fut)
Station Elevation Data     num=      15
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 7981.26 1331.94 9181.26 1321.94 9841.26 1317.19 9891.94 1316.83 9940.79 1316.48
 9951.76 1318.24   10000 1311.0110043.17 1311.3410069.24 1313.1810083.48  1314.4
 10131.6 1315.8410157.89  1325.910158.26 1326.1610170.91  1325.810191.92 1315.45

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 7981.26      .07 9951.76    .03510083.48     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9951.7610083.48               563      563      563              .1       .3
Right Levee     Station=10158.26      Elevation= 1326.16

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 11.270

INPUT
Description:
Station Elevation Data     num=      14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    8319 1331.94    9419 1321.94 9885.08 1317.38 9935.98 1317.27 9991.61 1316.55
   10000 1309.8510084.09 1311.0210107.21 1312.8710128.96 1315.4310171.08 1316.62
 10198.45 1326.4910198.52 1326.6110211.56 1326.3910234.54 1316.05

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    8319      .07 9991.61    .03510128.96     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9991.6110128.96               1464     1464     1464              .1       .3
Right Levee     Station= 10198.6      Elevation= 1326.61

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 10.992

INPUT
Description:
Station Elevation Data     num=      18
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    8143 1331.94    9043 1321.94 9838.99 1314.54 9896.81 1314.08 9913.85 1314.55
 9918.68 1311.59 9924.85 1315.14 9943.47 1313.51 9975.29 1309.92   10000 1309.17
 10042.09 1310.3510063.69 1311.3710083.61 1312.9210125.46 1314.7410150.12 1324.82
 10150.34 1324.6610161.97 1324.6310189.02 1312.85

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    8143      .07 9943.47    .03510083.61     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9943.4710083.61               877      877      877              .1       .3
Right Levee     Station=10150.12      Elevation= 1324.82

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 10.826

INPUT
Description:
Station Elevation Data     num=      17
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    8092 1331.94    8898 1321.94 9811.61 1315.45 9866.92 1314.95  9923.4 1315.57
 9955.02  1309.9 9984.13  1308.8   10000 1307.8910015.98 1309.5210062.87 1310.11
 10090.43 1311.3410105.98 1312.4110154.76 1314.0710178.27 1322.7410178.75 1322.88
 10190.82 1322.5310214.42 1312.46

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    8092      .07 9955.02    .03510062.87     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9955.0210062.87               999      999      999              .1       .3
Right Levee     Station=10178.75      Elevation= 1322.88

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 10.637

INPUT
Description:
Station Elevation Data     num=      16
```

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    7037 1331.94    8437 1321.94 9836.51 1312.06 9886.76 1311.62 9936.24 1311.12
 9947.77 1309.22 9990.68 1308.28   10000 1307.5510013.96 1308.5610049.45 1308.59
10088.81 1310.2110154.31 1311.7110181.74 1321.6910181.97 1321.6910194.89 1321.54
10219.74 1310.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    7037     .07 9936.24    .03510088.81     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9936.2410088.81             1040    1060    1100             .1       .3
Right Levee     Station=10181.84      Elevation= 1321.69

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                  RS: 10.436

INPUT
Description:
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    6690 1331.94    8390 1321.94 9870.11 1311.14 9920.35 1311.08 9969.81 1311.31
 9986.52  1307.5   10000 1306.6510012.57 1307.7610051.15 1308.4910074.04 1309.58
10103.03 1309.5910158.41 1310.8210185.77  1321.710185.94 1321.5710199.63 1321.78
10229.32 1309.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    6690     .07 9969.81    .03510074.04     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.8110074.04             1083    1089    1089             .1       .3
Right Levee     Station=10199.63      Elevation= 1321.78

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                  RS: 10.230

INPUT
Description:
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 7349.38 1331.94 8649.38 1321.94 9849.38    1316 9904.27 1315.37 9958.19 1314.66
 9983.12  1307.2   10000 1306.2210073.91 1309.6910086.53  1312.310143.44 1312.04
10209.06 1311.3110280.77    131210307.55 1321.7410307.79 1321.6310320.22 1321.66
10347.19 1310.25

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 7349.38     .07 9958.19    .03510086.53     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9958.1910086.53             1213    1213    1213             .1       .3
Right Levee     Station=10307.55      Elevation= 1321.74

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                  RS: 10.000

INPUT
Description:
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9828.85 1316.48  9889.3 1316.22  9947.9 1315.55 9981.91 1305.53   10000 1304.65
10058.44 1308.4610086.32 1315.2710142.23 1315.11 10195.6 1314.7810250.84  1314.2
10305.69 1312.2310344.57 1312.41 10413.3 1312.8610431.41 1313.1510434.36 1313.65
10456.25 1312.9210520.54 1314.6110570.74 1312.69

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9828.85     .07  9947.9    .03510086.32     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9947.910086.32                0       0       0             .1       .3


SUMMARY OF MANNING'S N VALUES

River:McMicken Outfall

      Reach          River Sta.       n1        n2        n3

 1                    14.711            .07       .035      .07
 1                    14.289            .07       .035      .07
 1                    13.962            .07       .035      .07
 1                    13.728            .07       .035      .07
 1                    13.487            .07       .035      .07
 1                    13.211            .07       .035      .07
```

1	13.161	.07	.035	.07
1	12.935	.07	.035	.07
1	12.665	.07	.035	.07
1	12.463	.07	.035	.07
1	12.102	.07	.035	.07
1	11.825	.07	.035	.07
1	11.555	.07	.035	.07
1	11.376	.07	.035	.07
1	11.270	.07	.035	.07
1	10.992	.07	.035	.07
1	10.826	.07	.035	.07
1	10.637	.07	.035	.07
1	10.436	.07	.035	.07
1	10.230	.07	.035	.07
1	10.000	.07	.035	.07

SUMMARY OF REACH LENGTHS

River: McMicken Outfall

Reach	River Sta.	Left	Channel	Right
1	14.711	2227	2227	2227
1	14.289	1727	1727	1727
1	13.962	1236	1236	1236
1	13.728	1283	1268	1232
1	13.487	1454	1460	1460
1	13.211	265	265	265
1	13.161	1191	1191	1191
1	12.935	1429	1429	1429
1	12.665	1062	1062	1062
1	12.463	1906	1906	1906
1	12.102	1466	1466	1466
1	11.825	1425	1425	1425
1	11.555	943	943	943
1	11.376	563	563	563
1	11.270	1464	1464	1464
1	10.992	877	877	877
1	10.826	999	999	999
1	10.637	1040	1060	1100
1	10.436	1083	1089	1089
1	10.230	1213	1213	1213
1	10.000	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: McMicken Outfall

Reach	River Sta.	Contr.	Expan.
1	14.711	.1	.3
1	14.289	.1	.3
1	13.962	.1	.3
1	13.728	.1	.3
1	13.487	.1	.3
1	13.211	.1	.3
1	13.161	.1	.3
1	12.935	.1	.3
1	12.665	.1	.3
1	12.463	.1	.3
1	12.102	.1	.3
1	11.825	.1	.3
1	11.555	.1	.3
1	11.376	.1	.3
1	11.270	.1	.3
1	10.992	.1	.3
1	10.826	.1	.3
1	10.637	.1	.3
1	10.436	.1	.3
1	10.230	.1	.3
1	10.000	.1	.3

```
                    HEC-RAS Version 3.1.1 May 2003
                     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: McMicken Outfall Channel
Project File : McMicken.prj
Run Date and Time: 6/17/2004 4:00:14 PM

Project in English units

Project Description:
McMICKEN DAM SPILLWAY OUTLET CHANNEL ANALYSIS

Kimley-Horn and Associates,
Inc. May 2004

PLAN DATA

Plan Title: Future Conditions with Rt Levee
Plan File : k:\-Municipal\91725003\Drainage\HEC-RAS\McMicken.p03

Geometry Title: Existing Conditions Geometry w/RT Levee
Geometry File : k:\-Municipal\91725003\Drainage\HEC-RAS\McMicken.g02

Flow Title : Future Conditions Flow
Flow File : k:\-Municipal\91725003\Drainage\HEC-RAS\McMicken.f03

Plan Summary Information:

Number of:	Cross Sections	= 21	Mulitple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	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

FLOW DATA

Flow Title: Future Conditions Flow
Flow File : k:\-Municipal\91725003\Drainage\HEC-RAS\McMicken.f03

Flow Data (cfs)

River	Reach	RS	FULL FLOW
McMicken Outfall1		14.711	4450
McMicken Outfall1		12.463	12300
McMicken Outfall1		11.376	16760

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
McMicken Outfall1		FULL FLOW		Normal S = 0.009

GEOMETRY DATA

Geometry Title: Existing Conditions Geometry w/RT Levee
Geometry File : k:\-Municipal\91725003\Drainage\HEC-RAS\McMicken.g02

CROSS SECTION

```
RIVER: McMicken Outfall
REACH: 1                    RS: 14.711

INPUT
Description: Q=4,450 cfs (ex/fut)
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9807.23 1339.96 9866.28 1339.03 9908.77 1338.31 9933.41 1339.76  9972.8 1325.23
 10027.2 1325.7710052.96  1335.410070.76 1337.24 10081.1 1339.6910101.42 1339.83
10131.08 1339.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9807.23     .07 9933.41    .03510052.96     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9933.4110052.96             2227    2227    2227             .1       .3
Right Levee     Station= 10081.1      Elevation= 1339.69

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 14.289

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9348 1341.94 9848.03 1335.24 9901.01 1334.03 9926.27 1332.28 9944.85  1333.7
 9978.27 1323.3210021.73 1323.5610057.47 1325.7810082.23 1332.1810123.54 1333.26
10143.72 1338.6810144.17 1338.7210160.49 1338.1410164.81 1337.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9348     .07 9944.85    .03510082.23     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9944.8510082.23             1727    1727    1727             .1       .3
Right Levee     Station=10144.17      Elevation= 1338.72

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 13.962

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8695 1341.94 9854.85 1332.86 9911.15 1332.53 9936.86 1331.27 9953.07 1332.39
 9976.14 1322.5510023.86 1322.3310068.79 1324.6910088.73 1329.3810137.09 1330.86
10155.72 1337.1110155.88 1337.0510172.07 1335.9110180.92 1335.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8695     .07 9953.07    .03510088.73     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9953.0710088.73             1236    1236    1236             .1       .3
Right Levee     Station=10155.72      Elevation= 1337.11

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 13.728

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8470 1341.94    9810 1331.94 9870.311327.899 9922.931327.214 9972.521327.354
   100001320.54710046.721321.96910085.631324.29110103.851326.77610146.741328.912
10164.371334.923 10164.51334.98910177.141335.00710195.251327.687

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8470     .07 9972.52    .03510103.85     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9972.5210103.85             1283    1268    1232             .1       .3
Right Levee     Station=10164.52      Elevation= 1334.99

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 13.487

INPUT
Description:
Station Elevation Data    num=      14
```

```
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     8691 1341.94 9790.58 1330.49 9793.01 1326.93 9889.66  1325.6 9922.58 1330.02
  9967.15 1330.34   10000    132010049.26  1321.6 10085.3 1323.9110113.12 1329.09
 10151.84 1330.3410167.01 1334.2310182.37 1334.0110192.84 1333.41

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     8691     .07 9967.15    .03510113.12     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9967.1510113.12             1454    1460    1460             .1       .3
 Right Levee     Station=10167.01      Elevation= 1334.23

 CROSS SECTION


 RIVER: McMicken Outfall
 REACH: 1                  RS: 13.211

 INPUT
 Description:
 Station Elevation Data    num=      13
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9654.77 1331.94 9874.77 1328.03 9926.19 1327.96 9976.42 1327.17   10000 1319.27
 10055.57 1319.5410091.94 1322.1110111.58 1324.9910150.72 1326.3110170.71 1333.21
 10171.09 1333.0910184.14 1332.7410201.64  1325.2

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
  9654.77     .07 9976.42    .03510111.58     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9976.4210111.58             265     265     265              .1       .3
 Right Levee     Station=10170.71      Elevation= 1333.21

 CROSS SECTION


 RIVER: McMicken Outfall
 REACH: 1                  RS: 13.161

 INPUT
 Description:
 Station Elevation Data    num=      13
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     9133 1331.94  9872.8 1325.65 9928.13 1324.67 9981.58 1323.97   10000 1319.28
 10049.36 1319.2110091.37 1321.8910104.47 1323.1310146.38  1324.910168.39 1332.94
 10168.66 1332.8810182.09 1332.5210200.23 1324.19

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     9133     .07 9981.58    .03510104.47     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9981.5810104.47             1191    1191    1191             .1       .3
 Right Levee     Station=10168.39      Elevation= 1332.94

 CROSS SECTION


 RIVER: McMicken Outfall
 REACH: 1                  RS: 12.935

 INPUT
 Description:
 Station Elevation Data    num=      12
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     9137 1331.94 9856.89 1322.86 9913.35 1322.53 9967.28 1322.05   10000 1317.38
 10031.99 1318.2610084.85 1320.8710129.03 1322.4610155.78 1331.9310156.62 1331.83
 10168.54 1331.52 10191.4 1321.05

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     9137     .07 9967.28    .03510084.85     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9967.2810084.85             1429    1429    1429             .1       .3
 Right Levee     Station=10155.78      Elevation= 1331.93

 CROSS SECTION


 RIVER: McMicken Outfall
 REACH: 1                  RS: 12.665

 INPUT
 Description:
 Station Elevation Data    num=      13
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     8697 1331.94 9856.56 1322.04 9912.99 1321.99 9969.13 1321.21  9985.8 1316.73
    10000  1316.510033.44  1317.310084.57 1319.3310131.16 1320.81 10156.7 1330.24
 10157.12  1330.210169.38 1330.0310192.46  1319.1

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     8697     .07 9969.13    .03510084.57     .07
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.1310084.57             1062    1062    1062             .1       .3
Right Levee     Station= 10156.7      Elevation= 1330.24

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                  RS: 12.463

INPUT
Description: Q=11,740 cfs (ex), 12,300 cfs (fut)
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8475 1331.94 9875.29 1321.68 9945.31 1321.52  9968.1 1320.84   10000 1316.39
10030.41 1316.5510091.07  1318.810133.79 1320.4110159.33 1329.0610160.14 1329.08
10171.84 1328.5810196.07 1318.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8475     .07  9968.1    .03510091.07     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9968.110091.07             1906    1906    1906             .1       .3
Right Levee     Station=10160.14      Elevation= 1329.08

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                  RS: 12.102

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8558 1331.94    9638 1321.94 9878.08 1320.46 9918.33 1320.24 9969.06 1320.08
   10000 1313.9810035.33 1314.44 10075.5  1316.310091.25 1318.9810140.04 1320.37
10163.43 1329.0310163.84 1328.9210175.51 1328.7210197.15 1319.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8558     .07 9969.06    .03510091.25     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.0610091.25             1466    1466    1466             .1       .3
Right Levee     Station=10163.43      Elevation= 1329.03

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                  RS: 11.825

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    7922 1331.94    9202 1321.94 9862.37  1317.6 9911.23 1317.27 9960.82 1317.68
   10000 1312.2810027.48 1313.1610074.69 1314.4710087.28 1316.14 10126.4 1317.26
10155.35    132810155.76 1328.0710168.07 1327.68 10190.7  1316.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    7922     .07 9960.82    .03510087.28     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9960.8210087.28             1425    1425    1425             .1       .3
Right Levee     Station=10155.76      Elevation= 1328.07

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                  RS: 11.555

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8119 1331.94    9259 1321.94 9863.34 1318.18 9911.57 1317.34 9933.54 1317.37
   10000  1312.210035.85  1312.110069.66  1313.810084.77 1315.9410122.25 1317.29
10147.52 1326.1610147.58 1326.3110160.72  1326.210183.78 1316.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8119     .07 9933.54    .03510084.77     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9933.5410084.77             943     943     943              .1       .3
Right Levee     Station=10147.58      Elevation= 1326.31

CROSS SECTION
```

```
RIVER: McMicken Outfall
REACH: 1                    RS: 11.376

INPUT
Description: Q=15,840 cfs (ex), 16,760 cfs (fut)
Station Elevation Data     num=       15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 7981.26 1331.94 9181.26 1321.94 9841.26 1317.19 9891.94 1316.83 9940.79 1316.48
 9951.76 1318.24   10000 1311.0110043.17 1311.3410069.24 1313.1810083.48  1314.4
 10131.6 1315.8410157.89  1325.910158.26 1326.1610170.91  1325.810191.92 1315.45

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 7981.26     .07 9951.76    .03510083.48     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9951.7610083.48              563     563     563             .1       .3
Right Levee     Station=10158.26      Elevation= 1326.16

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 11.270

INPUT
Description:
Station Elevation Data     num=       14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8319 1331.94    9419 1321.94 9885.08 1317.38 9935.98 1317.27 9991.61 1316.55
   10000 1309.8510084.09 1311.0210107.21 1312.8710128.96 1315.4310171.08 1316.62
10198.45 1326.4910198.52 1326.6110211.56 1326.3910234.54 1316.05

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    8319     .07 9991.61    .03510128.96     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9991.6110128.96             1464    1464    1464             .1       .3
Right Levee     Station= 10198.6      Elevation= 1326.61

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 10.992

INPUT
Description:
Station Elevation Data     num=       18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8143 1331.94    9043 1321.94 9838.99 1314.54 9896.81 1314.08 9913.85 1314.55
 9918.68 1311.59 9924.85 1315.14 9943.47 1313.51 9975.29 1309.92   10000 1309.17
10042.09 1310.3510063.69 1311.3710083.61 1312.9210125.46 1314.7410150.12 1324.82
10150.34 1324.6610161.97 1324.6310189.02 1312.85

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    8143     .07 9943.47    .03510083.61     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.4710083.61              877     877     877             .1       .3
Right Levee     Station=10150.12      Elevation= 1324.82

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 10.826

INPUT
Description:
Station Elevation Data     num=       17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8092 1331.94    8898 1321.94 9811.61 1315.45 9866.92 1314.95  9923.4 1315.57
 9955.02  1309.9 9984.13  1308.8   10000 1307.8910015.98 1309.5210062.87 1310.11
10090.43 1311.3410105.98 1312.4110154.76 1314.0710178.27 1322.7410178.75 1322.88
10190.82 1322.5310214.42 1312.46

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    8092     .07 9955.02    .03510062.87     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9955.0210062.87              999     999     999             .1       .3
Right Levee     Station=10178.75      Elevation= 1322.88

CROSS SECTION


RIVER: McMicken Outfall
REACH: 1                    RS: 10.637

INPUT
Description:
Station Elevation Data     num=       16
```

```
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     7037 1331.94    8437 1321.94 9836.51 1312.06 9886.76 1311.62 9936.24 1311.12
  9947.77 1309.22 9990.68 1308.28   10000 1307.5510013.96 1308.5610049.45 1308.59
 10088.81 1310.2110154.31 1311.7110181.74 1321.6910181.97 1321.6910194.89 1321.54
 10219.74 1310.27

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     7037     .07 9936.24    .03510088.81     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9936.2410088.81             1040    1060    1100             .1       .3
 Right Levee     Station=10181.84      Elevation= 1321.69

 CROSS SECTION


 RIVER: McMicken Outfall
 REACH: 1                  RS: 10.436

 INPUT
 Description:
 Station Elevation Data    num=      16
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     6690 1331.94    8390 1321.94 9870.11 1311.14 9920.35 1311.08 9969.81 1311.31
  9986.52  1307.5   10000 1306.6510012.57 1307.7610051.15 1308.4910074.04 1309.58
 10103.03 1309.5910158.41 1310.8210185.77  1321.710185.94 1321.5710199.63 1321.78
 10229.32 1309.74

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     6690     .07 9969.81    .03510074.04     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9969.8110074.04             1083    1089    1089             .1       .3
 Right Levee     Station=10199.63      Elevation= 1321.78

 CROSS SECTION


 RIVER: McMicken Outfall
 REACH: 1                  RS: 10.230

 INPUT
 Description:
 Station Elevation Data    num=      16
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  7349.38 1331.94 8649.38 1321.94 9849.38    1316 9904.27 1315.37 9958.19 1314.66
  9983.12  1307.2   10000 1306.2210073.91 1309.6910086.53  1312.310143.44 1312.04
 10209.06 1311.3110280.77    131210307.55 1321.7410307.79 1321.6310320.22 1321.66
 10347.19 1310.25

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
  7349.38     .07 9958.19    .03510086.53     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9958.1910086.53             1213    1213    1213             .1       .3
 Right Levee     Station=10307.55      Elevation= 1321.74

 CROSS SECTION


 RIVER: McMicken Outfall
 REACH: 1                  RS: 10.000

 INPUT
 Description:
 Station Elevation Data    num=      18
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9828.85 1316.48  9889.3 1316.22  9947.9 1315.55 9981.91 1305.53   10000 1304.65
 10058.44 1308.4610086.32 1315.2710142.23 1315.11 10195.6 1314.7810250.84  1314.2
 10305.69 1312.2310344.57 1312.41 10413.3 1312.8610431.41 1313.1510434.36 1313.65
 10456.25 1312.9210520.54 1314.6110570.74 1312.69

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
  9828.85     .07  9947.9    .03510086.32     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         9947.910086.32                0       0       0             .1       .3


 SUMMARY OF MANNING'S N VALUES

 River:McMicken Outfall

       Reach          River Sta.       n1        n2        n3

  1                    14.711            .07       .035      .07
  1                    14.289            .07       .035      .07
  1                    13.962            .07       .035      .07
  1                    13.728            .07       .035      .07
  1                    13.487            .07       .035      .07
  1                    13.211            .07       .035      .07
```

1	13.161	.07	.035	.07
1	12.935	.07	.035	.07
1	12.665	.07	.035	.07
1	12.463	.07	.035	.07
1	12.102	.07	.035	.07
1	11.825	.07	.035	.07
1	11.555	.07	.035	.07
1	11.376	.07	.035	.07
1	11.270	.07	.035	.07
1	10.992	.07	.035	.07
1	10.826	.07	.035	.07
1	10.637	.07	.035	.07
1	10.436	.07	.035	.07
1	10.230	.07	.035	.07
1	10.000	.07	.035	.07

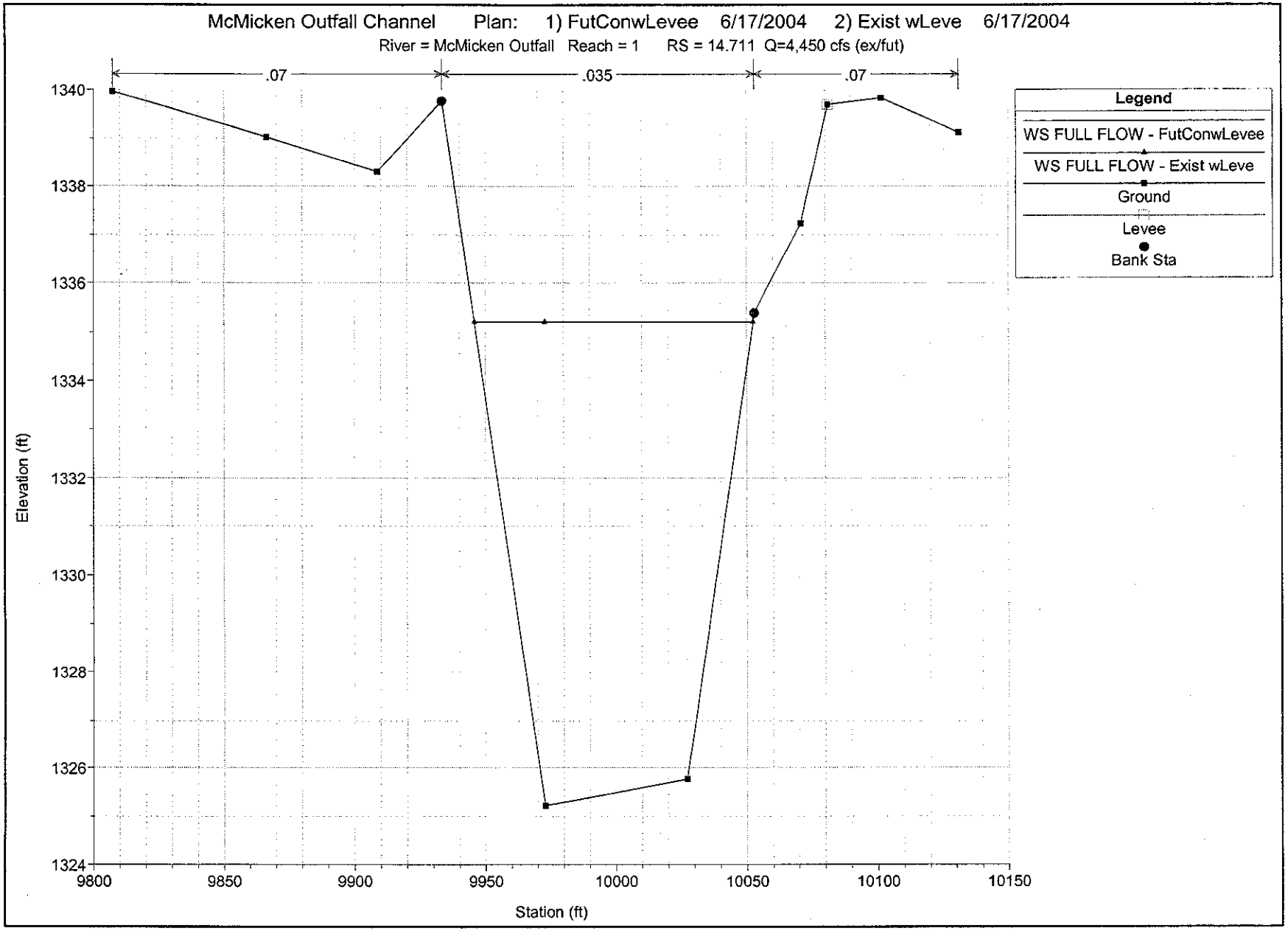
SUMMARY OF REACH LENGTHS

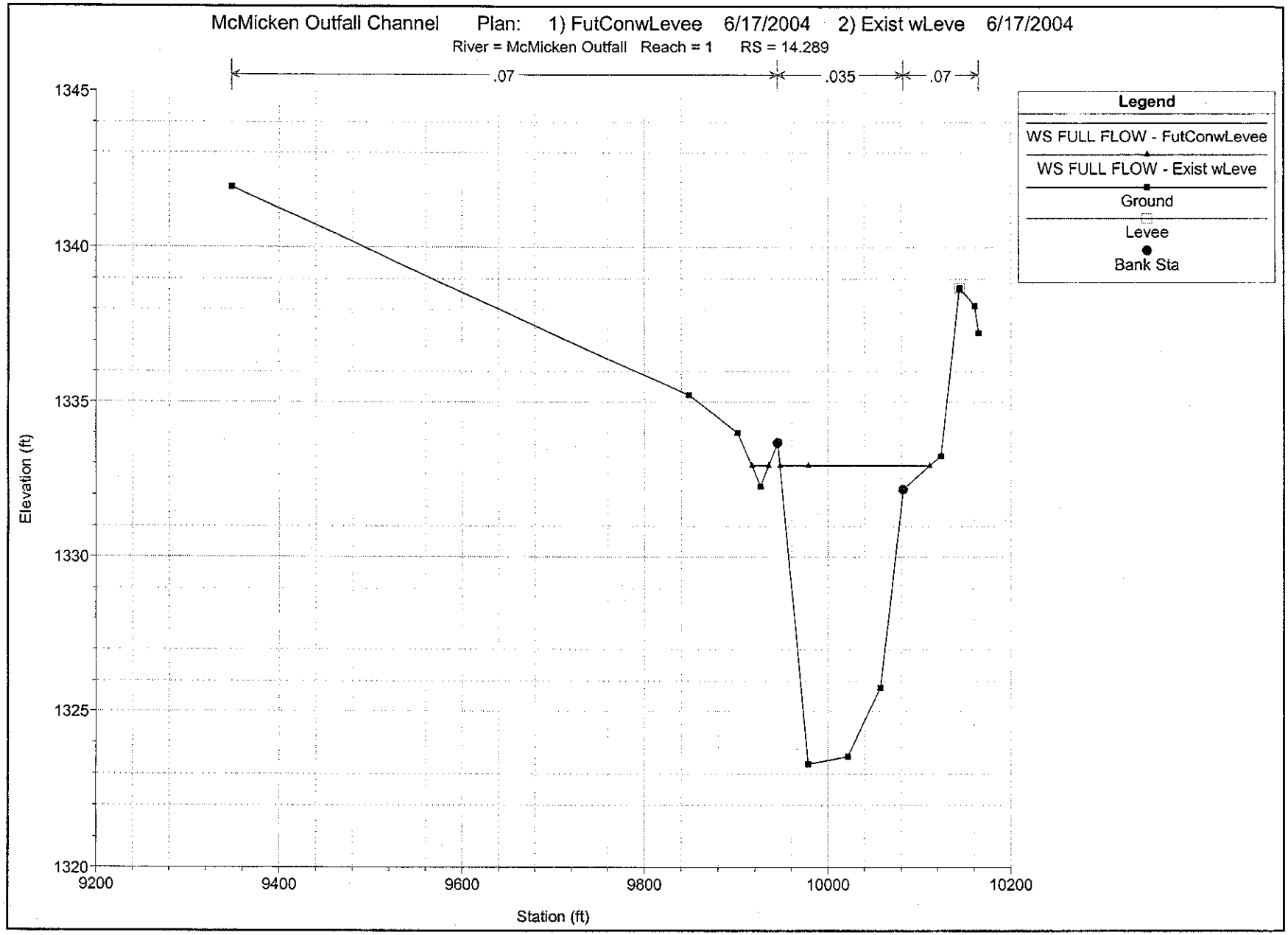
River: McMicken Outfall

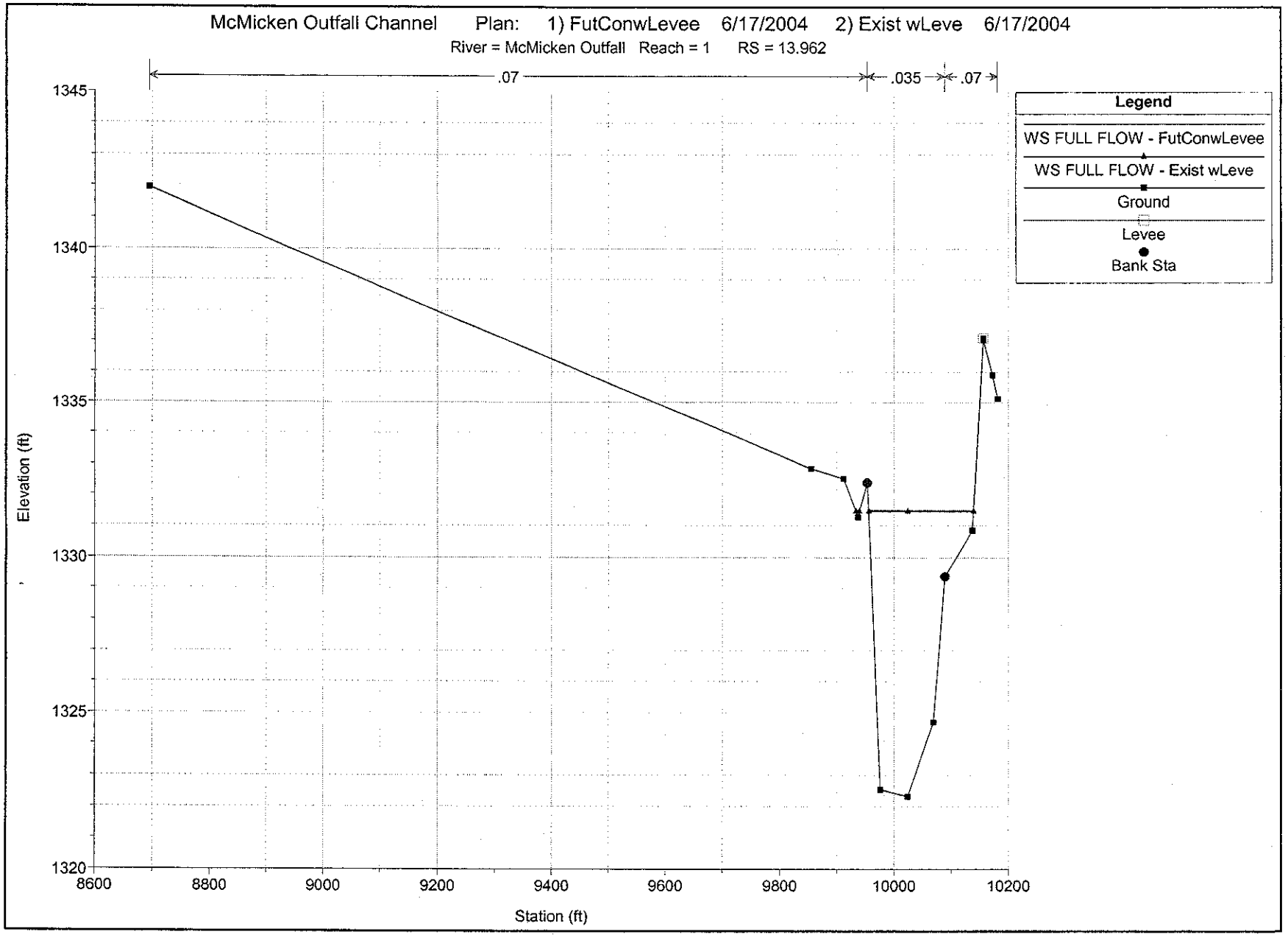
Reach	River Sta.	Left	Channel	Right
1	14.711	2227	2227	2227
1	14.289	1727	1727	1727
1	13.962	1236	1236	1236
1	13.728	1283	1268	1232
1	13.487	1454	1460	1460
1	13.211	265	265	265
1	13.161	1191	1191	1191
1	12.935	1429	1429	1429
1	12.665	1062	1062	1062
1	12.463	1906	1906	1906
1	12.102	1466	1466	1466
1	11.825	1425	1425	1425
1	11.555	943	943	943
1	11.376	563	563	563
1	11.270	1464	1464	1464
1	10.992	877	877	877
1	10.826	999	999	999
1	10.637	1040	1060	1100
1	10.436	1083	1089	1089
1	10.230	1213	1213	1213
1	10.000	0	0	0

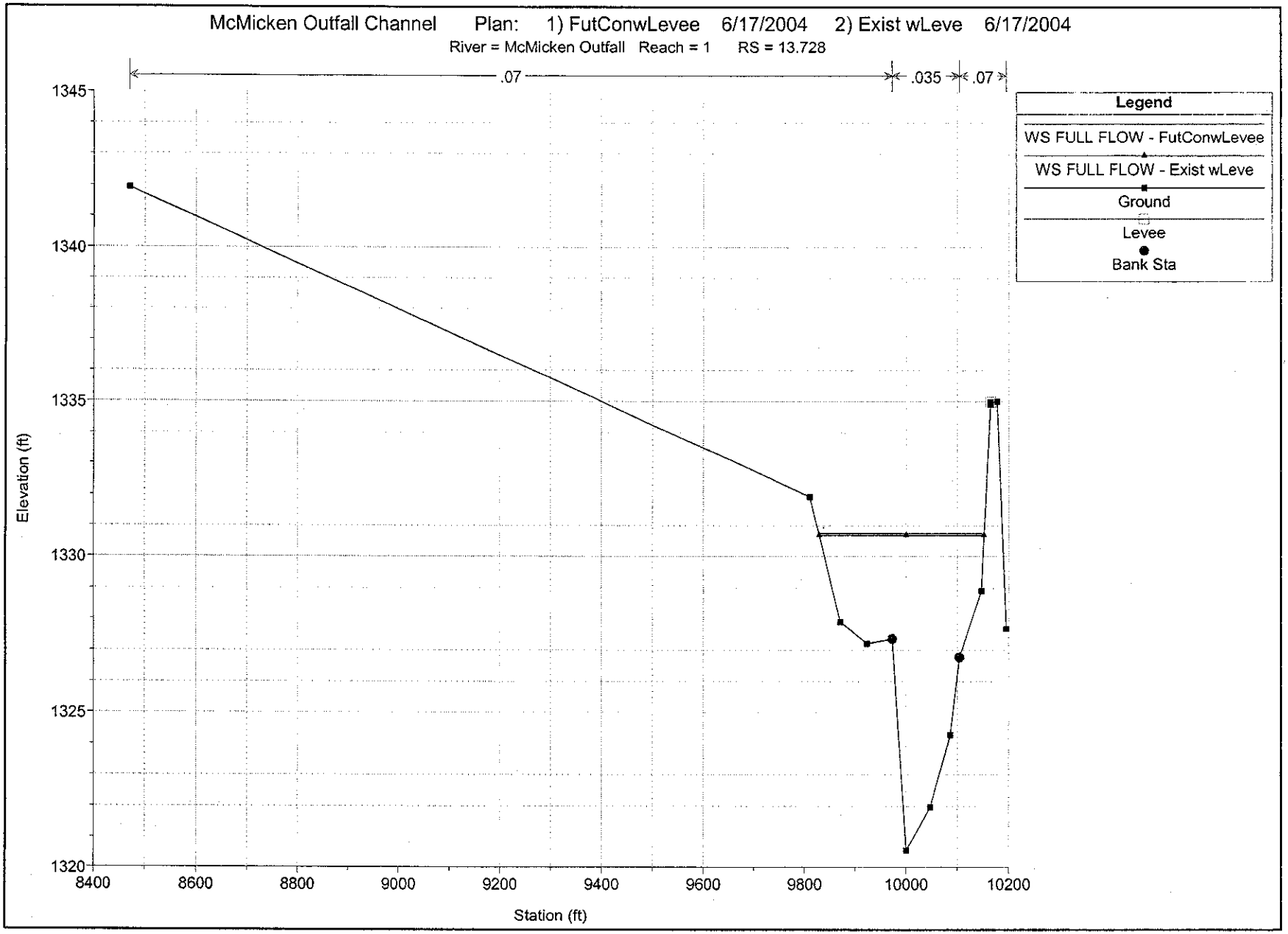
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: McMicken Outfall

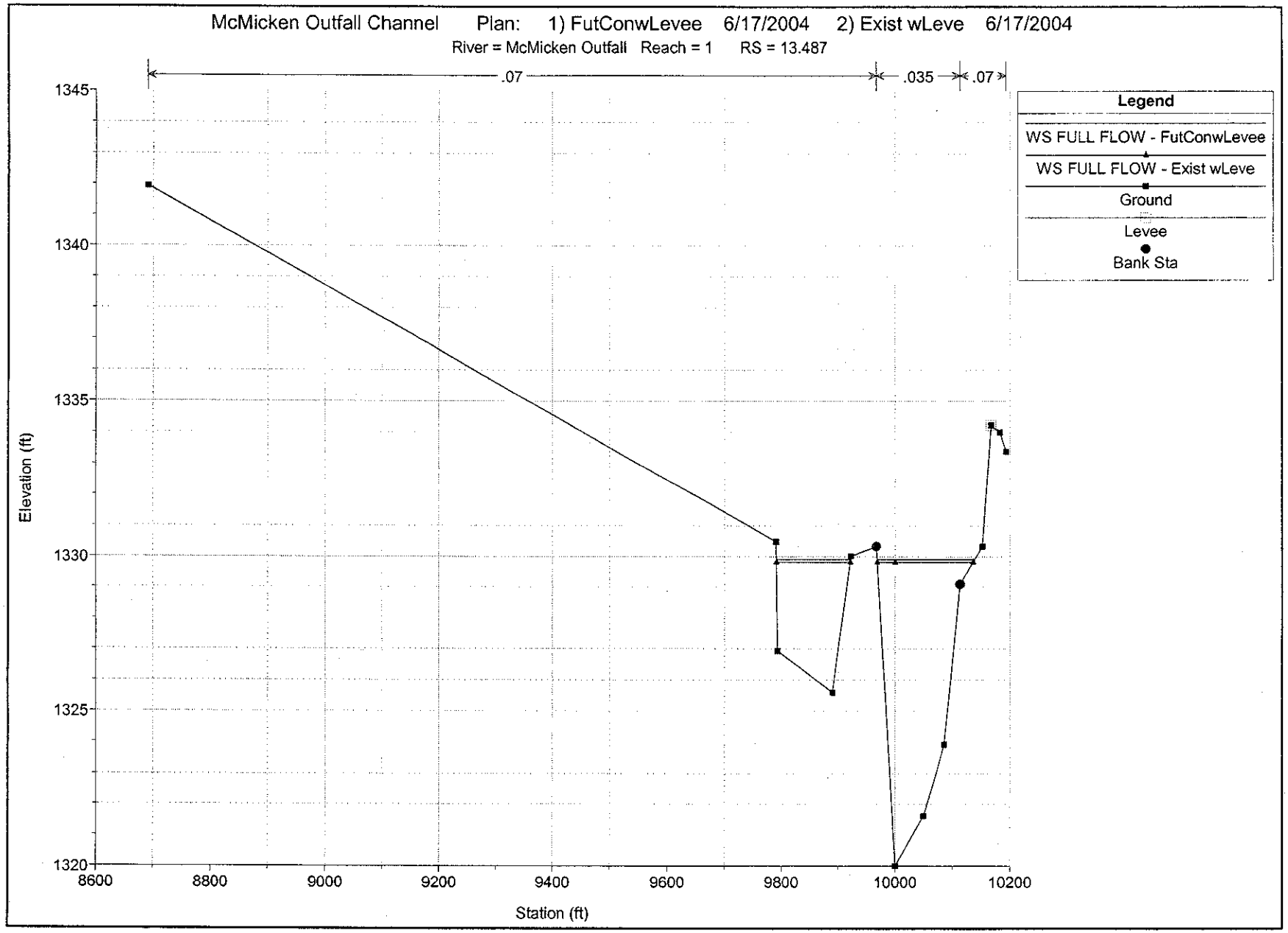
Reach	River Sta.	Contr.	Expan.
1	14.711	.1	.3
1	14.289	.1	.3
1	13.962	.1	.3
1	13.728	.1	.3
1	13.487	.1	.3
1	13.211	.1	.3
1	13.161	.1	.3
1	12.935	.1	.3
1	12.665	.1	.3
1	12.463	.1	.3
1	12.102	.1	.3
1	11.825	.1	.3
1	11.555	.1	.3
1	11.376	.1	.3
1	11.270	.1	.3
1	10.992	.1	.3
1	10.826	.1	.3
1	10.637	.1	.3
1	10.436	.1	.3
1	10.230	.1	.3
1	10.000	.1	.3

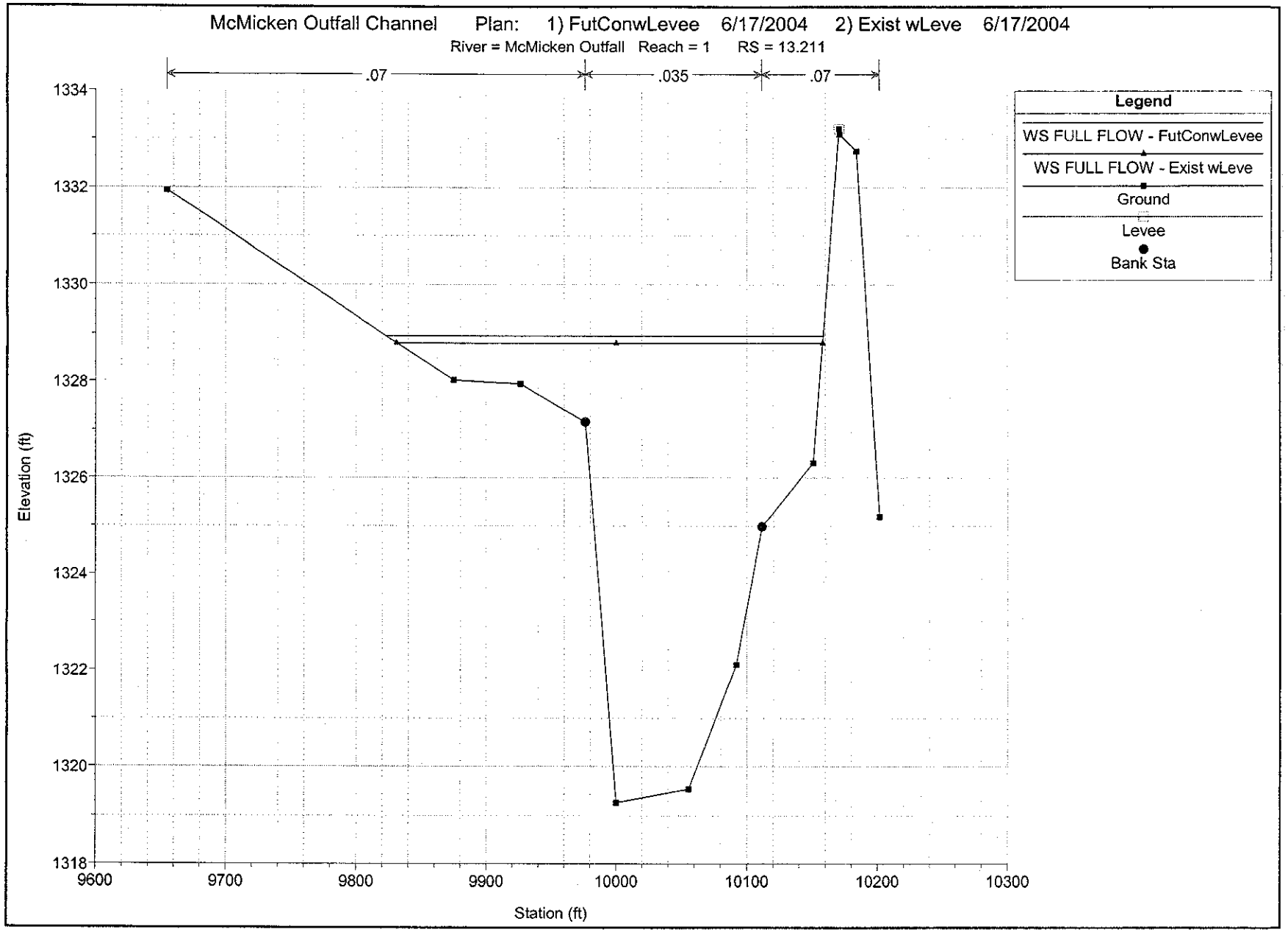

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 14.711 Q=4,450 cfs (ex/fut)
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1340
1338
1336
1334
1332
1330
1328
1326
1324
9800
9850
9900
9950
10000
10050
10100
10150
Station (ft)

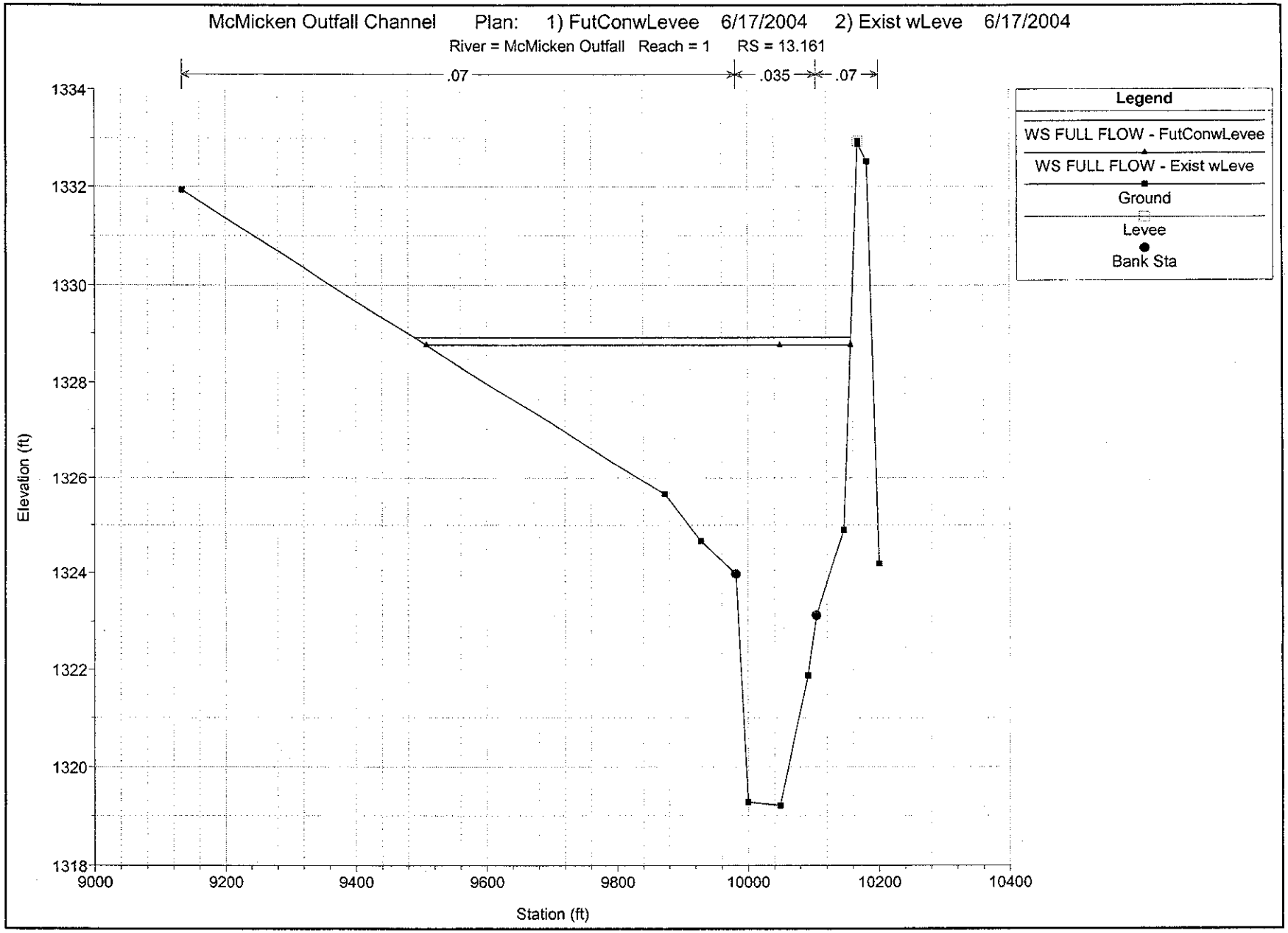

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 14.289
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1345
1340
1335
1330
1325
1320
9200
9400
9600
9800
10000
10200
Station (ft)

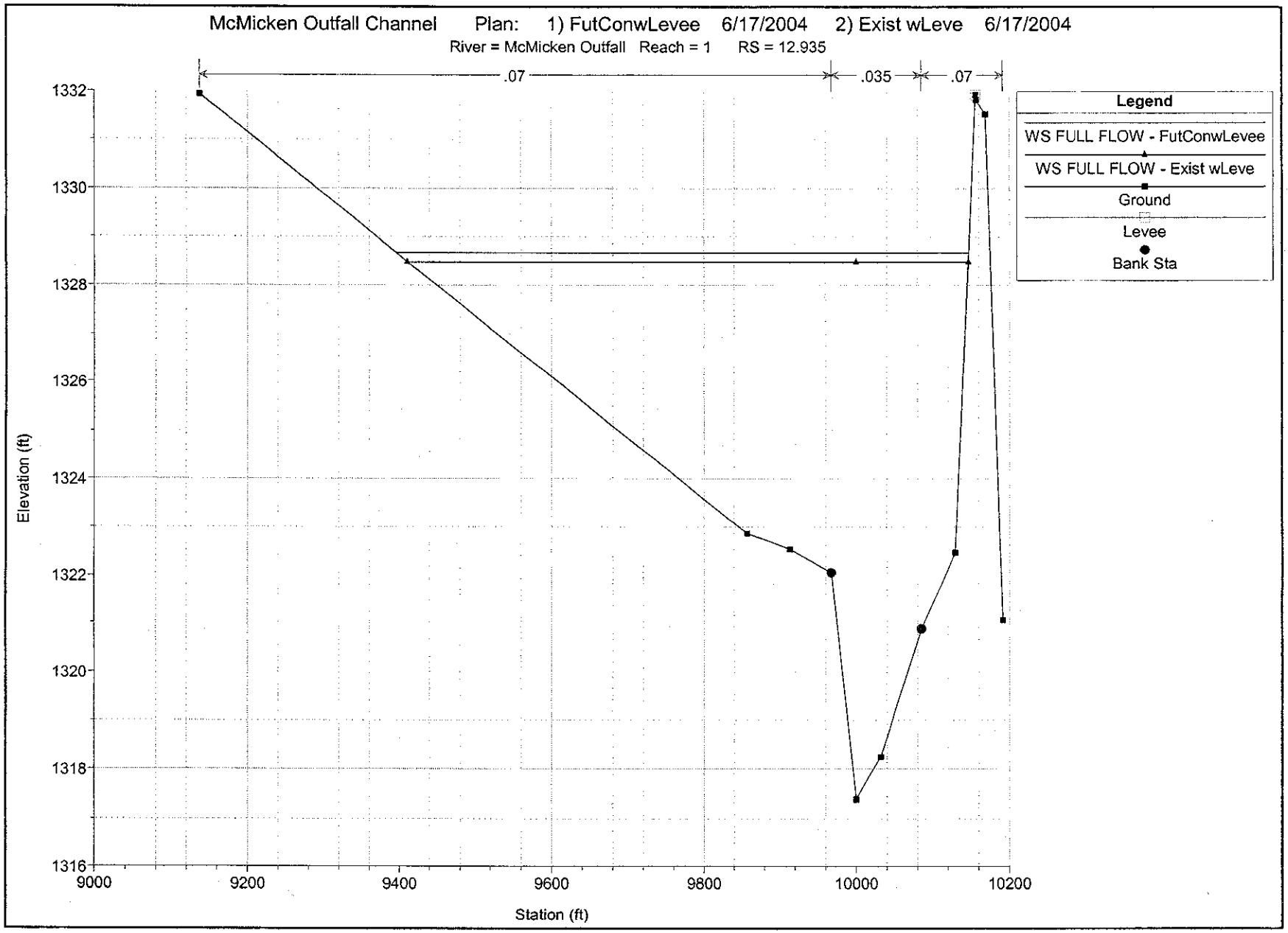

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 13.962
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1345
1340
1335
1330
1325
1320
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

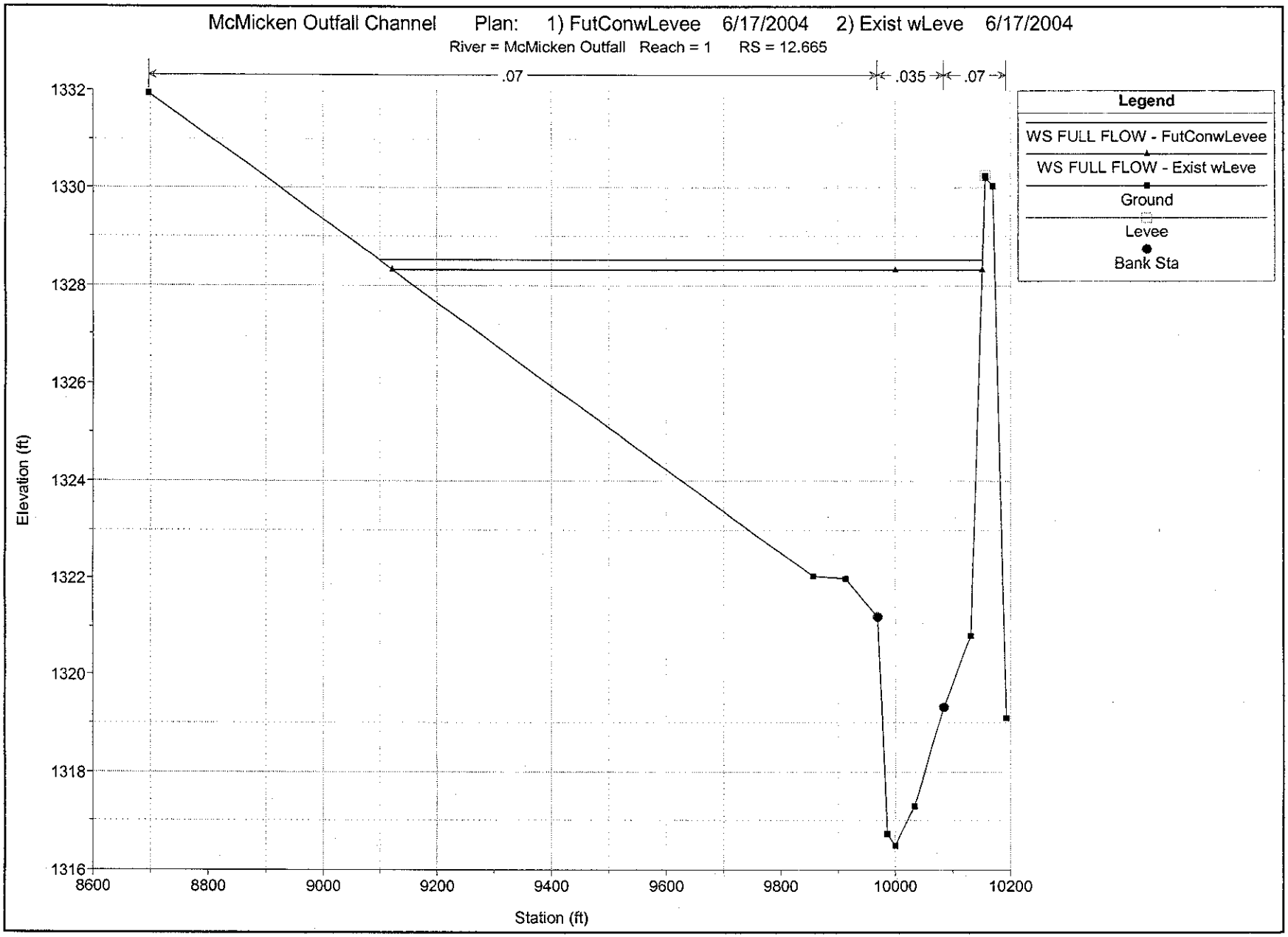

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 13.728
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1345
1340
1335
1330
1325
1320
8400
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

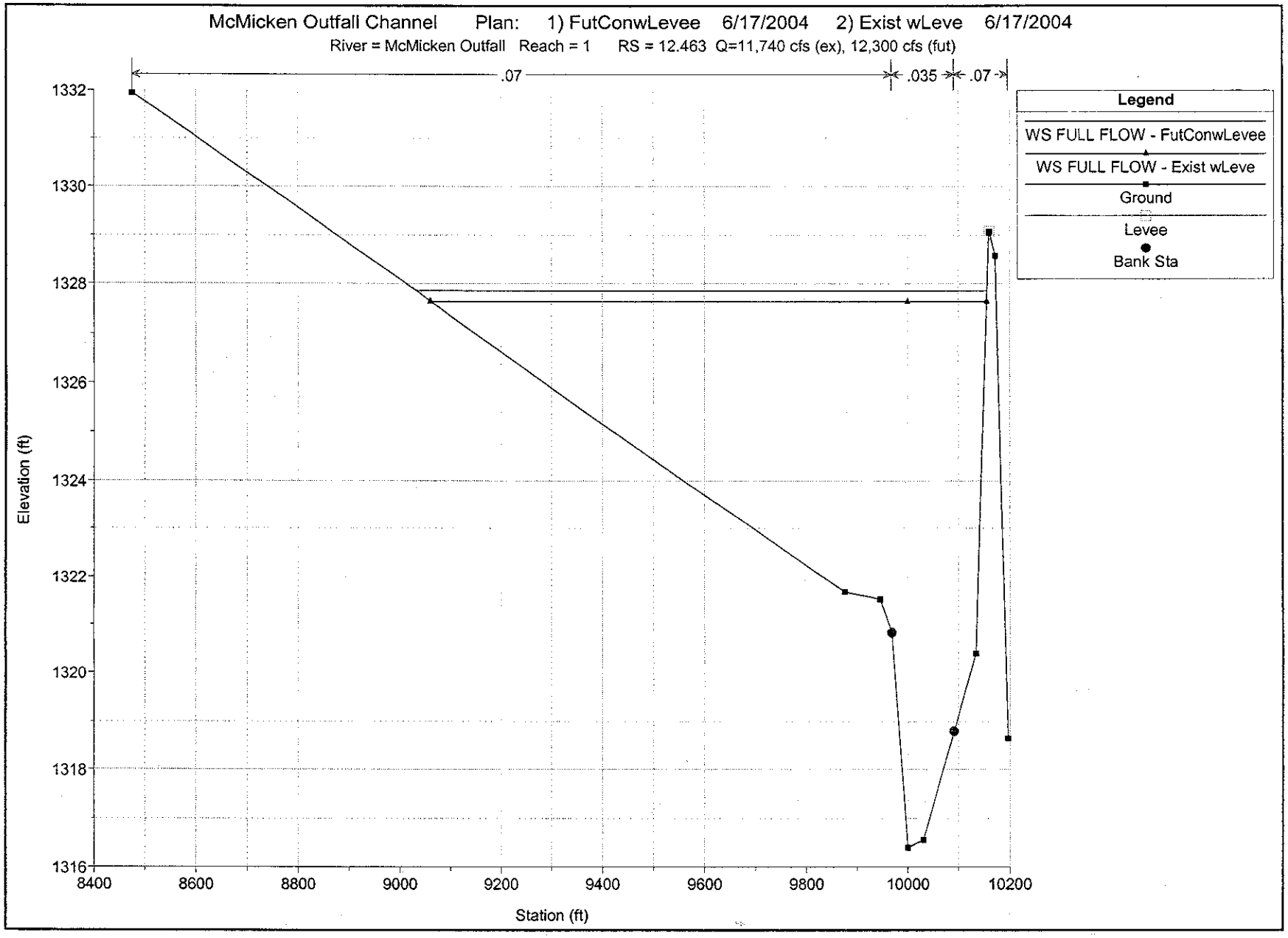

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 13.487
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1345
1340
1335
1330
1325
1320
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

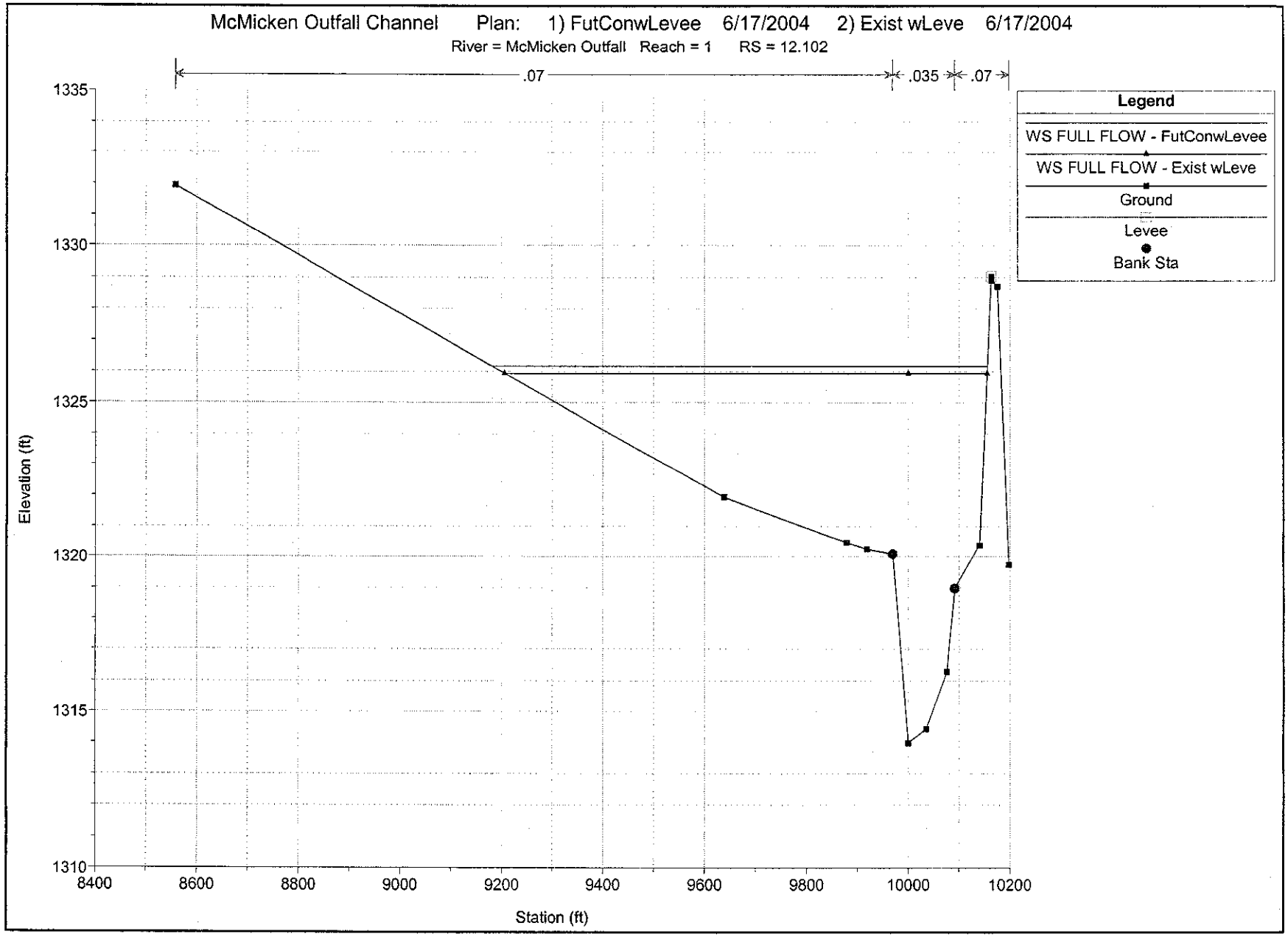

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 13.211
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1334
1332
1330
1328
1326
1324
1322
1320
1318
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

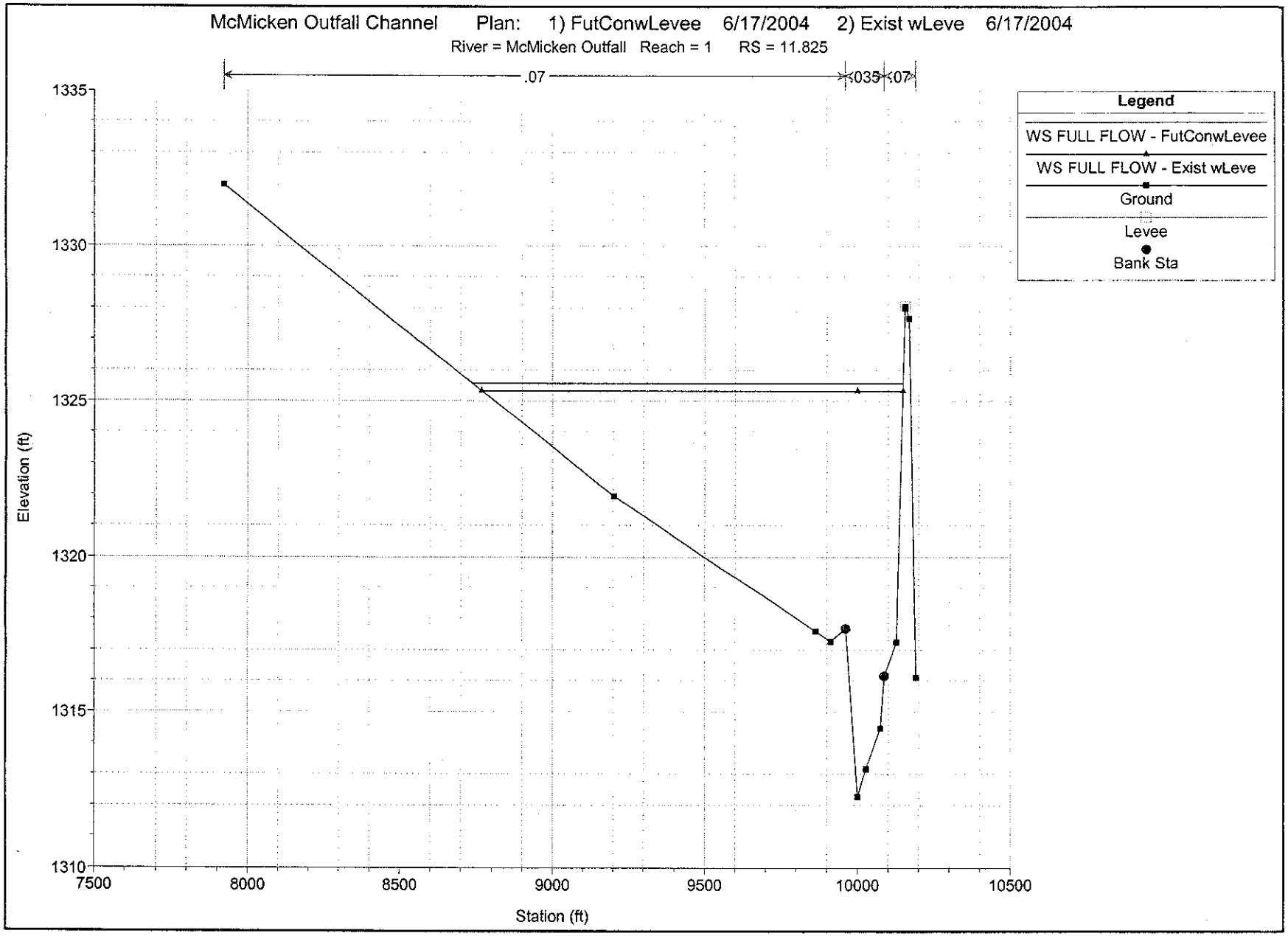

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 13.161
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1334
1332
1330
1328
1326
1324
1322
1320
1318
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

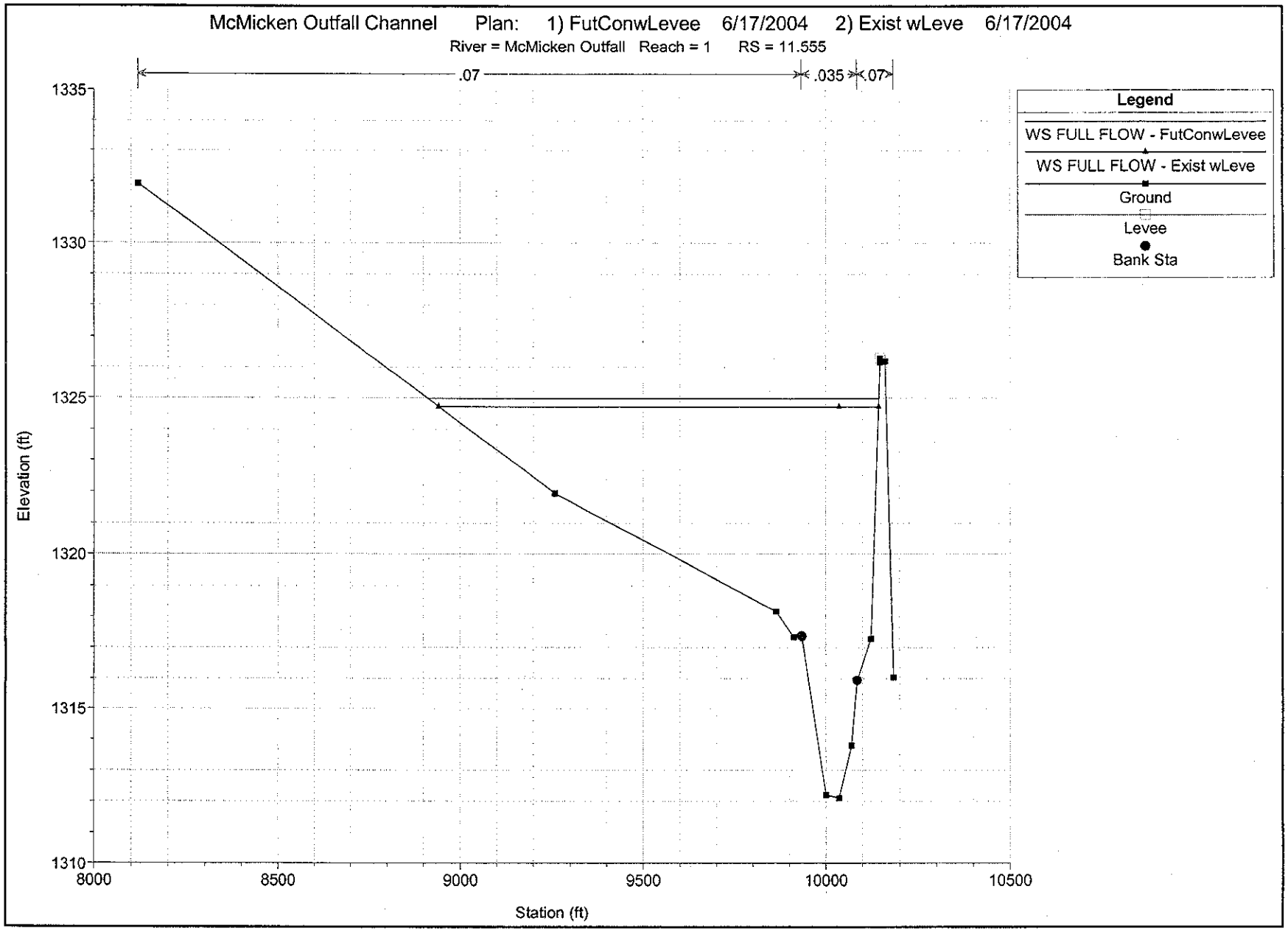

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 12.935
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1332
1330
1328
1326
1324
1322
1320
1318
1316
9000
9200
9400
9600
9800
10000
10200
Station (ft)

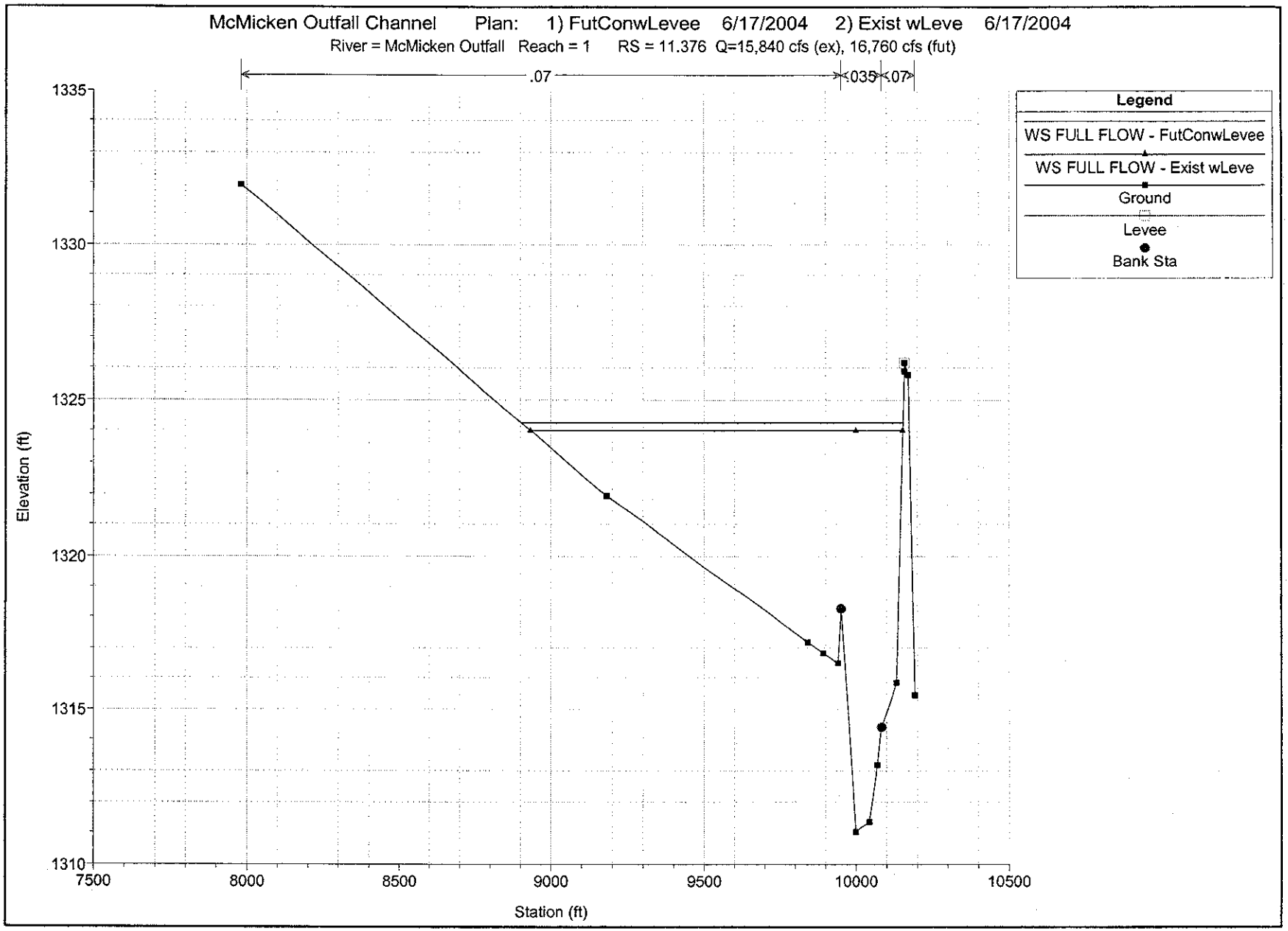

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 12.665
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1332
1330
1328
1326
1324
1322
1320
1318
1316
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

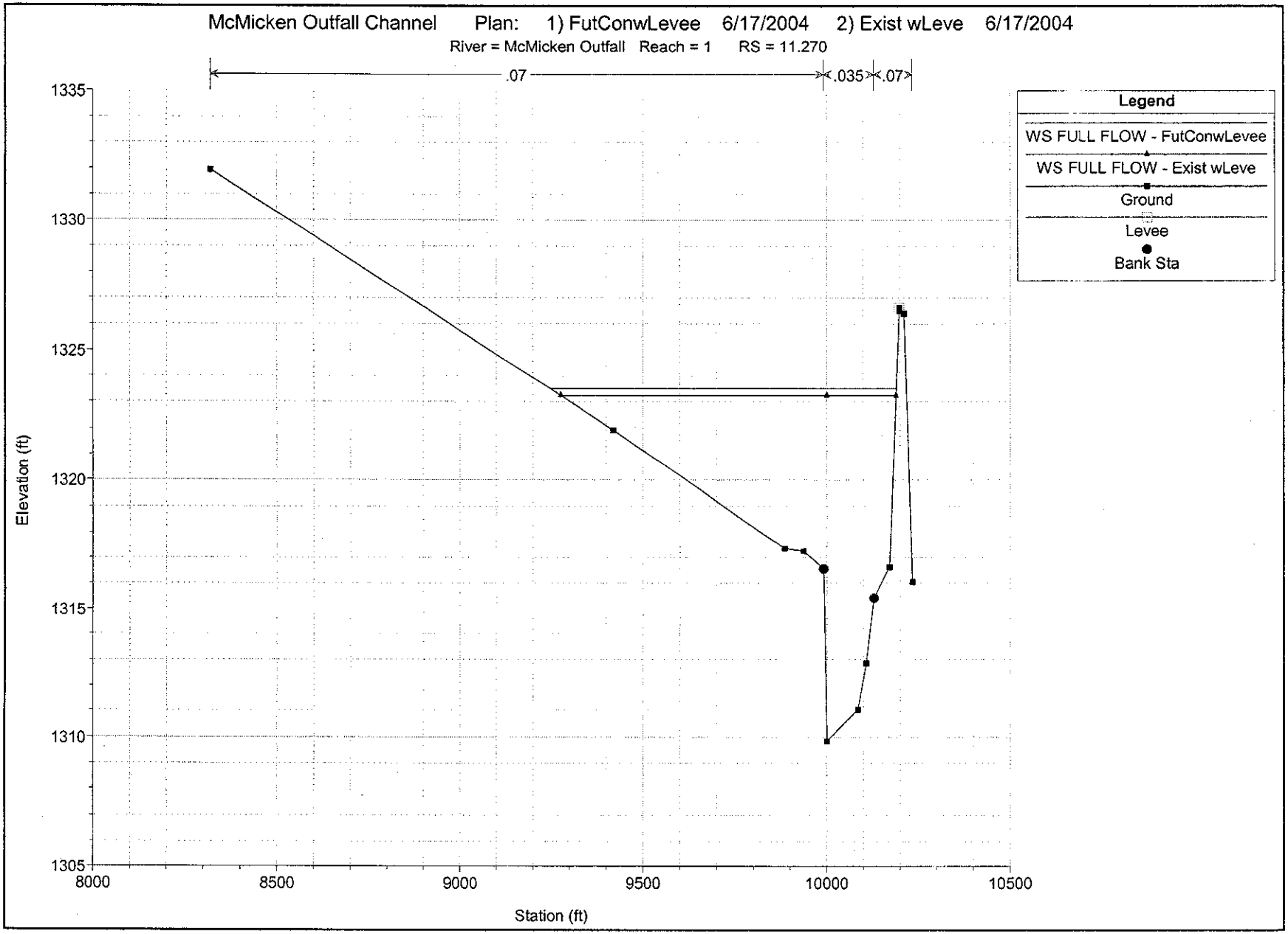

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 12.463 Q=11,740 cfs (ex), 12,300 cfs (fut)
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1332
1330
1328
1326
1324
1322
1320
1318
1316
8400
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

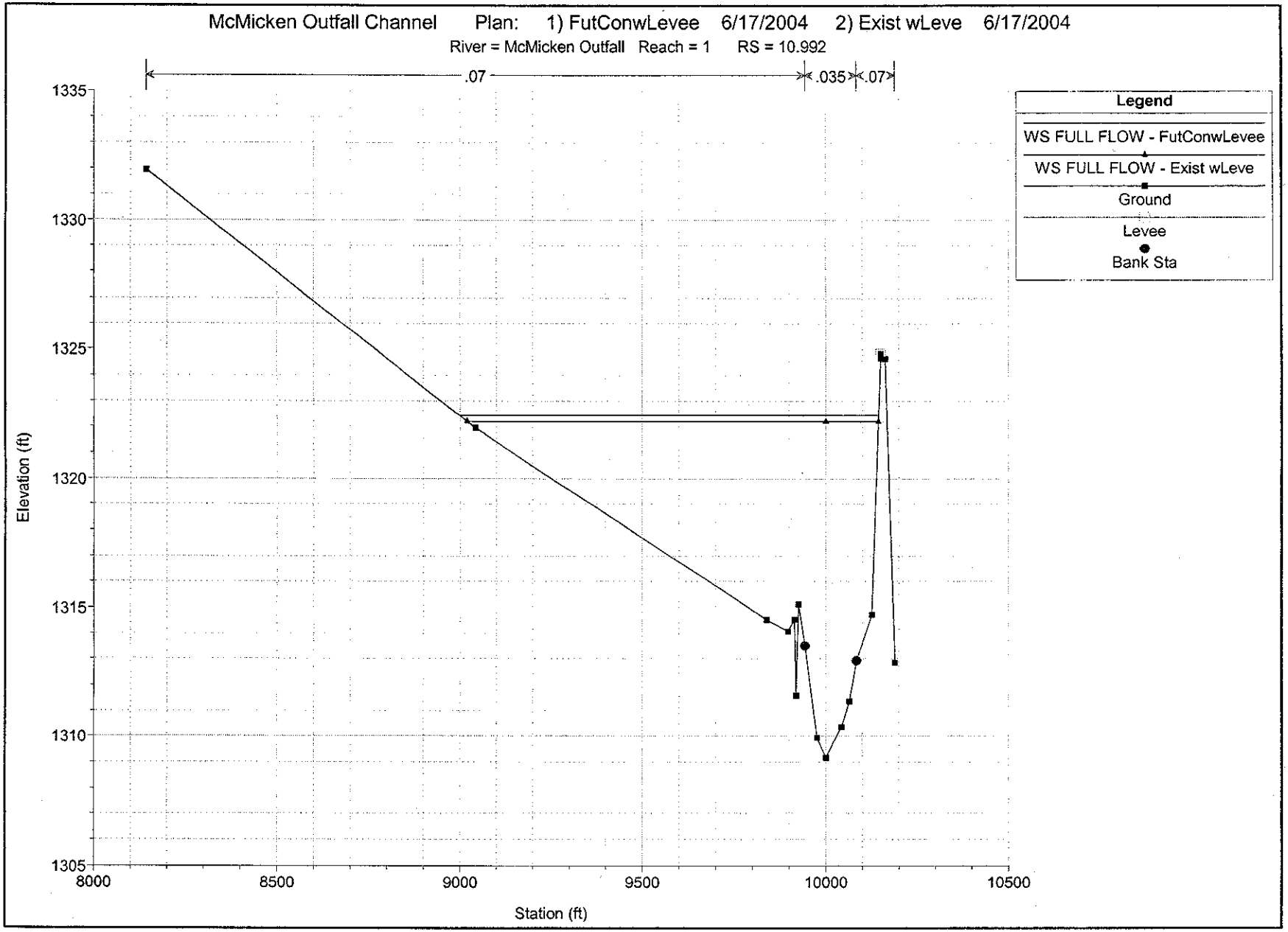

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 12.102
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1335
1330
1325
1320
1315
1310
8400
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

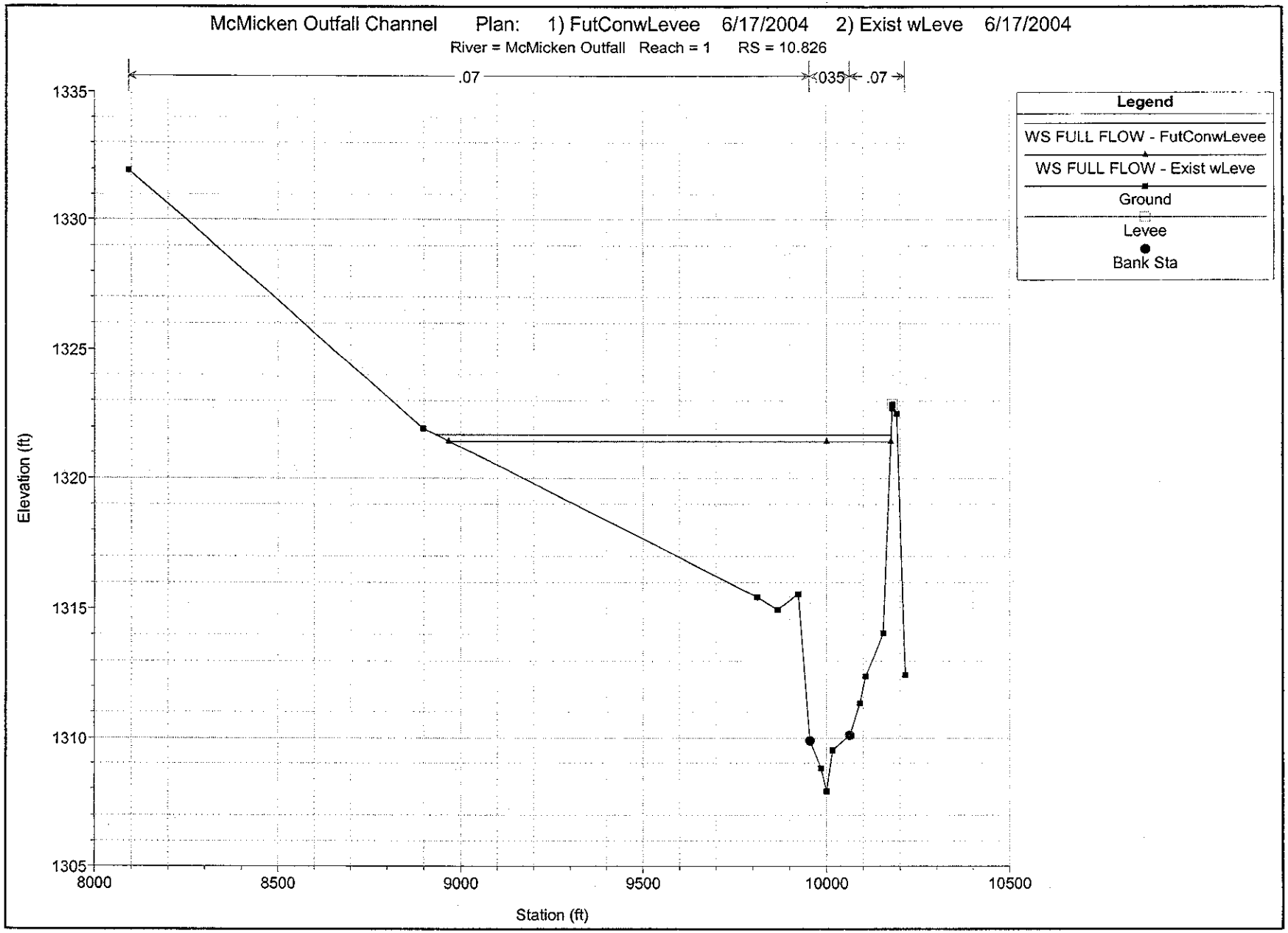

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 11.825
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1335
1330
1325
1320
1315
1310
7500
8000
8500
9000
9500
10000
10500
Station (ft)

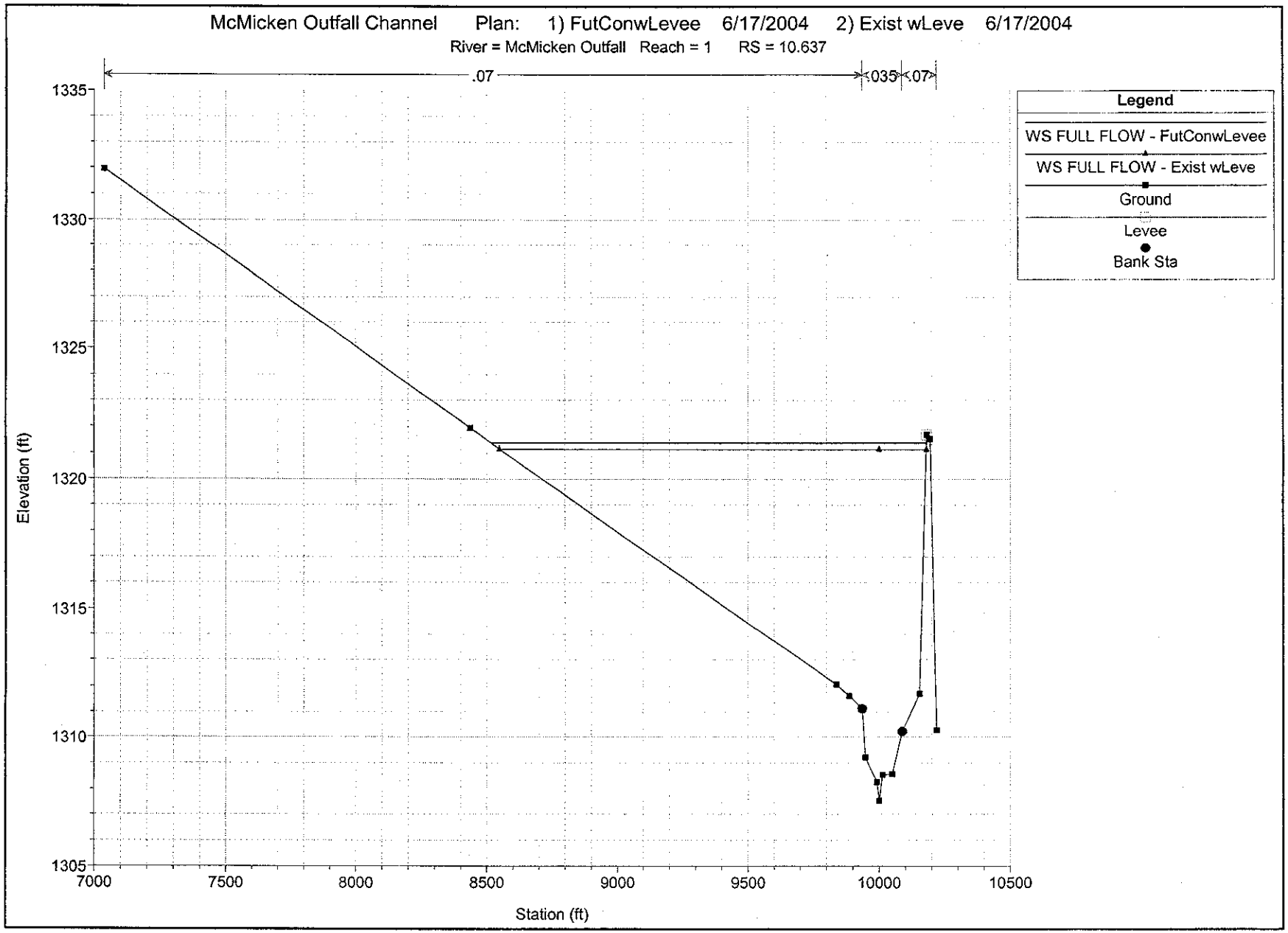

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 11.555
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1335
1330
1325
1320
1315
1310
8000
8500
9000
9500
10000
10500
Station (ft)

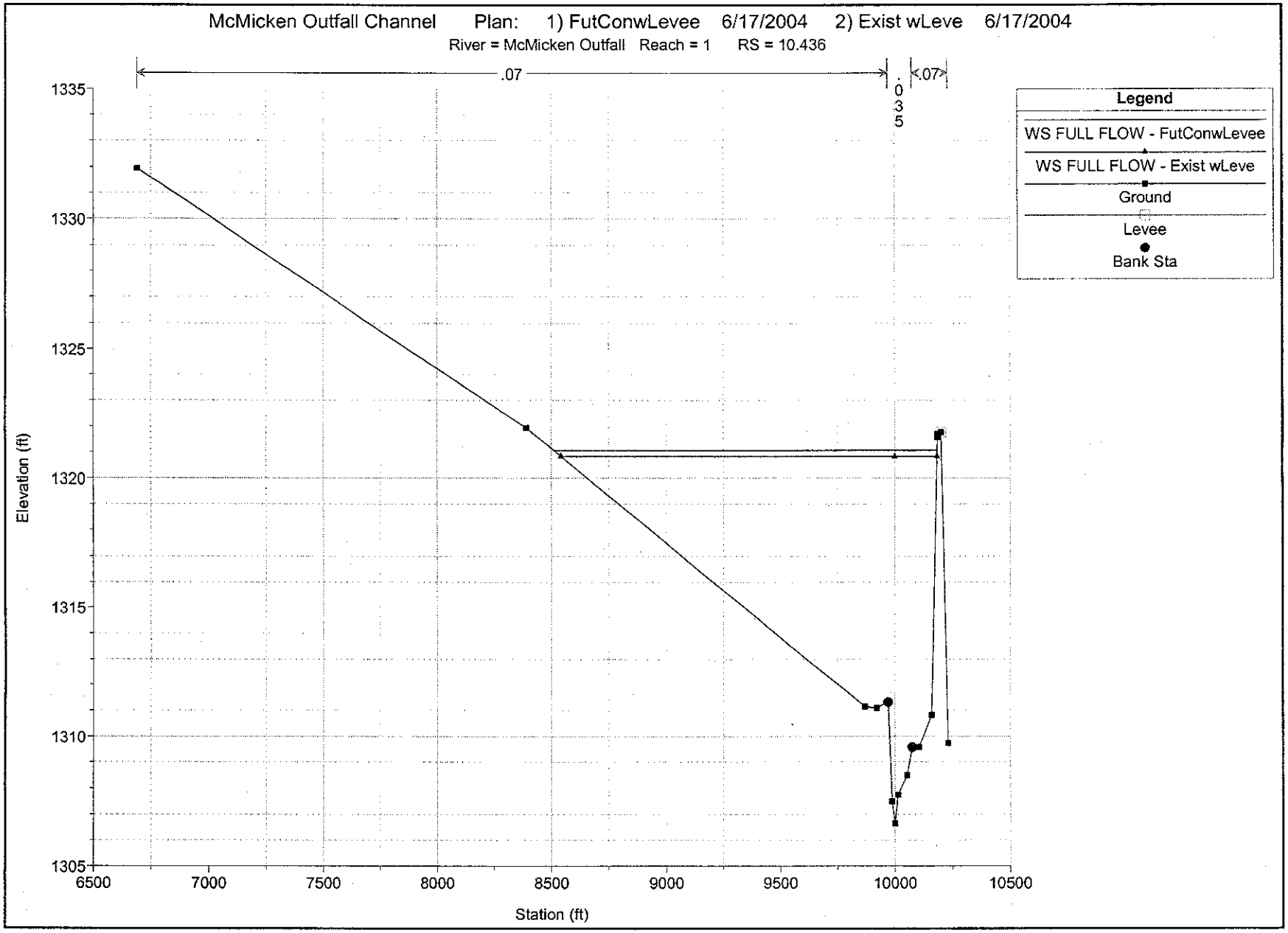

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 11.376 Q=15,840 cfs (ex), 16,760 cfs (fut)
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1335
1330
1325
1320
1315
1310
7500
8000
8500
9000
9500
10000
10500
Station (ft)

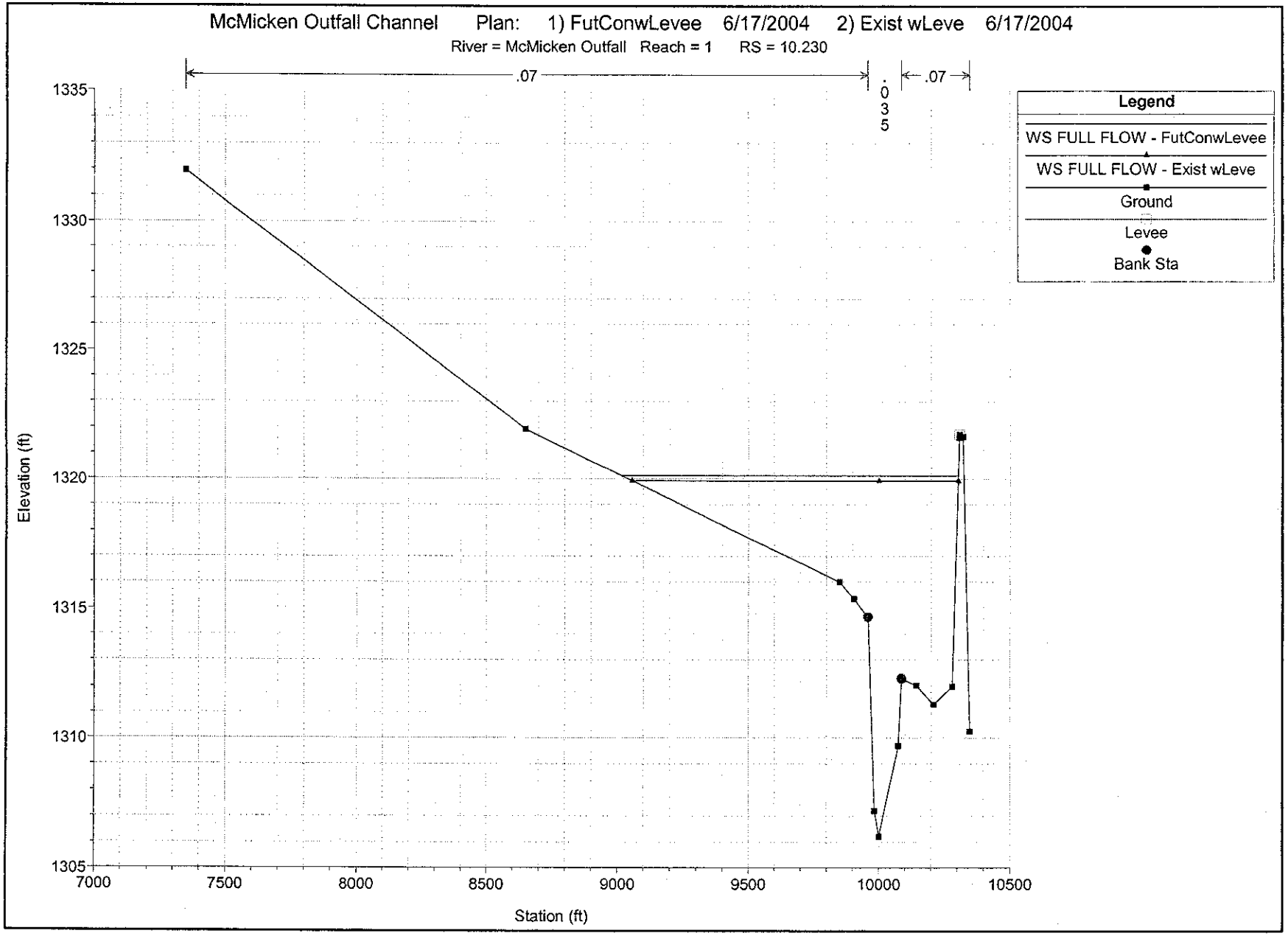

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 11.270
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1335
1330
1325
1320
1315
1310
1305
8000
8500
9000
9500
10000
10500
Station (ft)

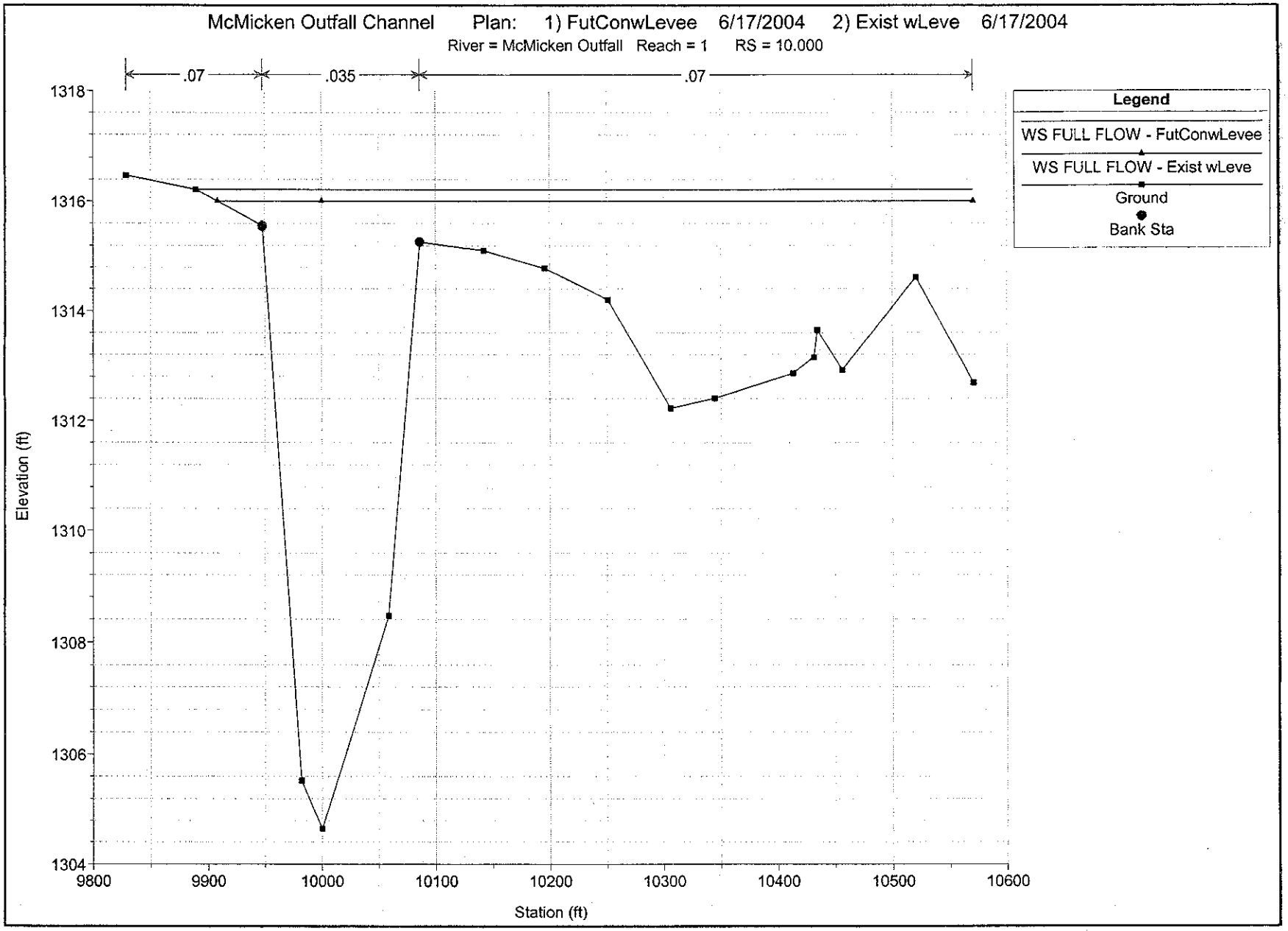

McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 10.992
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1335
1330
1325
1320
1315
1310
1305
8000
8500
9000
9500
10000
10500
Station (ft)


McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 10.826
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1335
1330
1325
1320
1315
1310
1305
8000
8500
9000
9500
10000
10500
Station (ft)


McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 10.637
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1335
1330
1325
1320
1315
1310
1305
7000
7500
8000
8500
9000
9500
10000
10500
Station (ft)


McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 10.436
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1335
1330
1325
1320
1315
1310
1305
6500
7000
7500
8000
8500
9000
9500
10000
10500
Station (ft)


McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 10.230
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Levee
Bank Sta
Elevation (ft)
1335
1330
1325
1320
1315
1310
1305
7000
7500
8000
8500
9000
9500
10000
10500
Station (ft)


McMicken Outfall Channel Plan: 1) FutConwLevee 6/17/2004 2) Exist wLeve 6/17/2004
River = McMicken Outfall Reach = 1 RS = 10.000
.07
.035
.07
Legend
WS FULL FLOW - FutConwLevee
WS FULL FLOW - Exist wLeve
Ground
Bank Sta
Elevation (ft)
1318
1316
1314
1312
1310
1308
1306
1304
9800
9900
10000
10100
10200
10300
10400
10500
10600
Station (ft)

APPENDIX D

Supplemental Survey Work
Provided by the District

McMicken Dam Outlet Channel
Inundation Report

(File Name: 04-03-26 GPS1.CSV)

3859	976020	567292.5	1275.85	4HB1
3867	991524.7	549957.2	1423.783	4IC1
9001	991524.7	549957.2	1423.736	3867-4IC1-CKPT
9002	978755.3	550148.8	1345.361	3867-4IC1-CKPT
9003	988788.7	572213.7	1335.66	SET 60D NAIL
9004	986182.7	573511.6	1314.682	SET 60D NAIL
9005	986004.3	565818.2	1335.697	SET 60D NAIL
9006	983470.5	566551.1	1316.647	SET 60D NAIL
9007	980707.3	554727.3	1332.929	SET 60D NAIL
2	978398.9	552611	1338.718	X-SEC 92+32.14
3	979205.6	554139.5	1337.045	X-SEC 109+41.80
4	979784.6	555228.2	1334.923	X-SEC 121+62.65
5	980307.5	556349.5	1334.161	X-SEC 133+88.77
6	980704.7	557750.2	1333.085	X-SEC 148+36.15
7	980777.4	558007.6	1332.877	X-SEC 151+03.48
8	981101.1	559158.5	1331.825	X-SEC 162+91.65
9	981486.6	560524.6	1330.202	X-SEC 177+13.07
10	981775.9	561553.2	1329.08	X-SEC 187+55.25
11	982291.8	563383.8	1328.924	X-SEC 206+37.39
12	982691.1	564796.5	1328.072	X-SEC 220+98.48
13	983078	566164.4	1326.314	X-SEC 235+11.05
14	983333.1	567072.3	1326.164	X-SEC 244+60.76
15	983487.8	567615.3	1326.606	X-SEC 250+03.54
16	983885.8	569028.7	1324.664	X-SEC 264+52.63
17	984124.2	569877.6	1322.876	X-SEC 273+29.08
18	984392.8	570828.3	1321.686	X-SEC 282+95.28
19	984710	571867.2	1321.573	X-SEC 293+68.13
20	985213.6	572823.7	1321.63	X-SEC 304+42.89
21	985860.4	573934.1	1312.916	X-SEC 317+20

(File Name: 04-03-26 GPS2.CSV)

1	977356.4	550635.6		X-SEC 69+98.46
2	978398.9	552611	1338.718	X-SEC 92+32.14
3	979205.6	554139.5	1337.045	X-SEC 109+41.80
4	979784.6	555228.2	1334.923	X-SEC 121+62.65
5	980307.5	556349.5	1334.161	X-SEC 133+88.77
6	980704.7	557750.2	1333.085	X-SEC 148+36.15
7	980777.4	558007.6	1332.877	X-SEC 151+03.48
8	981101.1	559158.5	1331.825	X-SEC 162+91.65
9	981486.6	560524.6	1330.202	X-SEC 177+13.07
10	981775.9	561553.2	1329.08	X-SEC 187+55.25
11	982291.8	563383.8	1328.924	X-SEC 206+37.39
12	982691.1	564796.5	1328.072	X-SEC 220+98.48
13	983078	566164.4	1326.314	X-SEC 235+11.05
14	983333.1	567072.3	1326.164	X-SEC 244+60.76
15	983487.8	567615.3	1326.606	X-SEC 250+03.54
16	983885.8	569028.7	1324.664	X-SEC 264+52.63
17	984124.2	569877.6	1322.876	X-SEC 273+29.08
18	984392.8	570828.3	1321.686	X-SEC 282+95.28
19	984710	571867.2	1321.573	X-SEC 293+68.13
20	985213.6	572823.7	1321.63	X-SEC 304+42.89
21	985860.4	573934.1	1312.916	X-SEC 317+20
9002	978755.3	550148.8	1345.361	BCHH
9003	988788.7	572213.7	1335.66	SET 60D NAIL
9004	986182.7	573511.6	1314.682	SET 60D NAIL
9005	986004.3	565818.2	1335.697	SET 60D NAIL
9006	983470.5	566551.1	1316.647	SET 60D NAIL
9007	980707.3	554727.3	1332.929	SET 60D NAIL
3867	991524.7	549957.2	1423.783	4IC1
3859	976020	567292.5	1275.85	4HB1
9009	986004.4	565818.2	1335.715	9005 CKPT
9010	991524.7	549957.3	1423.707	3867 CKPT
100	977354.5	550644.2	1339.122	TOE1
101	977381.4	550631.6	1339.833	EPD1
102	977399.8	550623.1	1339.694	EPD2
103	977409.1	550618.5	1337.243	GB1
104	977425.3	550611.2	1335.404	GB2
105	977448.9	550600.8	1325.77	TOE2
106	977496.6	550574.8	1325.226	TOE3
107	977532.1	550557.6	1339.758	TB3
108	977554.1	550546.5	1338.31	GB3
109	977592.9	550529.2	1339.03	NG
110	977646	550503.3	1339.955	NG
3000	977485.4	550868.1	1339.728	EPD1
3001	977504.1	550860.1	1339.881	EPD2
3002	977589	551087.7	1339.061	EPD1 75+00
3003	977606.6	551080.2	1339.549	EPD2 75+00
3004	977715	551314.7	1340.01	EPD2
3005	977701.2	551321.4	1339.021	EPD1
3006	977816.6	551537.9	1339.119	EPD1 80+00
3007	977829.2	551531.6	1339.508	EPD2 80+00
3008	977939.6	551735.2	1339.185	EPD2

(File Name: 04-03-26 GPS2.CSV)

3009	977927.7	551741.4	1338.651	EPD1
3010	978006.5	551893.5	1339.993	EPD1
3011	978018.4	551888	1340.243	EPD2
3012	978042.1	551931.6	1339.884	EPD2 85+00
3013	978030.4	551938	1339.549	EPD1 85+00
3014	978086	552011.9	1338.959	EPD2
3015	978075.2	552018.5	1338.282	EPD1
3016	978150.9	552171.3	1338.902	EPD1
3017	978163.6	552164.9	1339.044	EPD2
3018	978275.3	552412.9	1339.114	EPD1 90+00
3019	978288.9	552406.3	1339.421	EPD2 90+00
200	978380.1	552619.4	1337.268	TOE1
201	978383.9	552617.4	1338.135	EPD1
202	978399.1	552610.6	1338.678	EPD2
203	978417.4	552602	1333.262	GB1
204	978454.1	552583.2	1332.183	GB2
205	978476.6	552572.8	1325.778	GB4
206	978509.2	552558.2	1323.561	TOE2
207	978548.3	552539.2	1323.318	TOE3
208	978578.9	552525.8	1333.696	TB3
209	978595.6	552517.5	1332.281	GB3
210	978618.7	552507.3	1334.032	NG
211	978667	552485.6	1335.238	NG
3020	978408.8	552630.1	1338.539	EPD2
3021	978395.1	552637.7	1337.989	EPD1
3022	978515.2	552861.5	1337.091	EPD1 95+00
3023	978528	552854.9	1337.489	EPD2 95+00
3024	978647.7	553083.7	1337.637	EPD2
3025	978635.4	553090	1337.058	EPD1
3026	978751.5	553311.5	1336.927	EPD1 100+00
3027	978764.5	553305.2	1337.628	EPD2 100+00
3028	978886	553534.2	1337.698	EPD2
3029	978872.9	553541.1	1337.058	EPD1
3030	978984.8	553750.1	1336.723	EPD1 105+00
3031	978997.6	553743.8	1337.1	EPD2 105+00
3032	979115.3	553966.7	1337.354	EPD2
3033	979101.9	553973.6	1336.735	EPD1
300	979183	554150.3	1335.129	TOE1
301	979191	554146.6	1335.91	EPD1
302	979205.7	554139.5	1337.108	EPD2
303	979222.9	554132.3	1330.862	GB1
304	979266.4	554111.2	1329.382	GB2
305	979284.5	554102.9	1324.689	GB4
306	979324.3	554081.9	1322.325	TOE2
307	979367.1	554060.8	1322.55	TOE3
308	979385	554046.3	1332.389	TB3
309	979399.3	554038.7	1331.265	GB3
310	979423.5	554030	1332.533	NG
311	979476.1	554009.8	1332.864	NG
3034	979232.7	554190.5	1336.711	EPD2 110+00
3035	979218.8	554197.7	1335.868	EPD1 110+00

(File Name: 04-03-26 GPS2.CSV)

3036	979337.4	554421.6	1335.605	EPD1
3037	979351.2	554414.7	1336.295	EPD2
3038	979458	554648.5	1335.037	EPD1 115+00
3039	979471.9	554640.5	1335.558	EPD2 115+00
3040	979512.9	554721.8	1335.554	EPS1-CATTLE GUARD
3041	979516.1	554728.3	1335.68	EPS1
3042	979507	554732.8	1335.612	EPS1
3043	979503.7	554726.3	1335.448	EPS1+*
3044	979591.8	554867.3	1335.902	EPD2
3045	979583	554871.5	1335.6	EPD1
3046	979696.1	555090.4	1335.165	EPD1 120+00
3047	979708.2	555084.7	1335.177	EPD2 120+00
400	979756.7	555241	1327.687	TOE1
401	979773.2	555233.5	1335.007	EPD1
402	979784.7	555228.3	1334.989	EPD2
403	979800.6	555220.9	1328.912	GB1
404	979839.3	555202.3	1326.776	GB2
405	979855.6	555194.1	1324.291	GB4
406	979891.2	555178.4	1321.969	TOE2
407	979933.4	555158.4	1320.547	TOE3
408	979956.8	555144	1327.354	TB3
409	980003.3	555126.8	1327.214	NG
410	980050.9	555104.4	1327.899	NG
3048	979813	555308.6	1334.808	EPD1
3049	979824.1	555303	1334.592	EPD2
3050	979932.3	555535.5	1334.371	EPD1 125+00
3051	979943.1	555530.4	1334.314	EPD2 125+00
3052	980061.9	555756.7	1334.145	EPD2
3053	980050.8	555762.4	1334.138	EPD1
3054	980159.5	555979.6	1333.88	EPD1 130+00
3055	980171.4	555975.6	1334.277	EPD2 130+00
3056	980282	556263.7	1334.148	EPD2
3057	980269.9	556266.8	1333.706	EPD1
500	980282.5	556355.3	1333.41	TOE1
501	980292.7	556353	1334.014	EPD1
502	980307.6	556349.3	1334.226	EPD2
503	980322.4	556345.8	1330.337	GB1
504	980360	556336.6	1329.087	GB2
505	980386.9	556329.7	1323.906	GB4
506	980421.7	556320	1321.602	TOE2
507	980469.3	556307.6	1320.003	TOE3
508	980501.4	556300.5	1330.335	TB3
509	980544.6	556289.6	1330.021	NG/TB ERROSION AREA
510	980576.1	556280	1325.604	TOE ERROSION AREA
511	980671.3	556263.5	1326.932	TOE ERROSION AREA
512	980673.7	556262.8	1330.491	NG
3058	980325.9	556459.6	1334.009	EPD1 135+00
3059	980338.4	556456.3	1334.21	EPD2 135+00
3060	980407.3	556700.5	1334.458	EPD2
3061	980394.7	556704	1333.975	EPD1
3062	980463.1	556944.1	1333.647	EPD1 140+00

(File Name: 04-03-26 GPS2.CSV)

3063	980476	556940.7	1333.912	EPD2	140+00
3064	980544.7	557182.1	1334.141	EPD2	
3065	980531.4	557185.6	1333.65	EPD1	
3066	980600.4	557428.3	1333.019	EPD1	145+00
3067	980613.3	557425.6	1333.351	EPD2	145+00
3068	980681.7	557665.4	1333.109	EPD2	
3069	980668.4	557668.7	1332.734	EPD1	
600	980675.1	557757.7	1325.196	TOE1	
601	980692.2	557753.7	1332.744	EPD1	
602	980705.1	557750.3	1333.206	EPD2	
603	980724.6	557745.6	1326.314	GB1	
604	980762.8	557737.4	1324.989	GB2	
605	980782	557733.3	1322.114	GB4	
606	980817.4	557724.7	1319.539	TOE2	
607	980871.3	557711.4	1319.267	TOE3	
608	980892.8	557701.8	1327.171	TB3	
609	980940.8	557686.7	1327.962	NG	
610	980990.2	557672.7	1328.032	NG	
3070	980736.7	557911.7	1332.669	EPD1	150+00
3071	980749.3	557908	1333.001	EPD2	150+00
700	980746.5	558014.2	1324.194	TOE1	
701	980764.4	558010.9	1332.524	EPD1	
702	980777.6	558007.4	1332.939	EPD2	
703	980798.8	558001.7	1324.896	GB1	
704	980839.5	557991.6	1323.133	GB2	
705	980852.4	557989	1321.889	GB4	
706	980892.9	557978.1	1319.211	TOE2	
707	980940.9	557966.6	1319.284	TOE3	
708	980958.7	557961.8	1323.969	TB3	
709	981010.4	557948.3	1324.67	NG	
710	981063.7	557933.3	1325.652	NG	
3072	980816.9	558148.3	1332.656	EPD2	
3073	980803.9	558151.2	1332.217	EPD1	
3074	980873.3	558397.7	1331.915	EPD1	155+00
3075	980886.2	558394.7	1332.392	EPD2	155+00
3076	980952.6	558631.5	1331.739	EPD2	
3077	980940.5	558634.7	1331.552	EPD1	
3078	981009.9	558880.8	1331.771	EPD1	160+00
3079	981022.5	558877.7	1331.841	EPD2	160+00
3080	981091.1	559119.8	1331.943	EPD2	
3081	981078	559123.3	1331.616	EPD1	
800	981068.4	559170.1	1321.053	TOE1	
801	981089.6	559161.7	1331.522	EPD1	
802	981101.9	559158.4	1331.927	EPD2	
803	981127.6	559150.9	1322.456	GB1	
804	981170.4	559140	1320.866	GB2	
805	981220.8	559123.9	1318.262	TOE2	
806	981251.7	559115.7	1317.381	TOE3	
807	981282.6	559104.8	1322.052	TB3	
808	981334.2	559089.3	1322.526	NG	
809	981389	559075.5	1322.864	NG	

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3082	981146.6	559365.5	1330.834	EPD1 165+00
3083	981158.9	559362.1	1331.386	EPD2 165+00
3084	981226.4	559602.8	1330.892	EPD2
3085	981214.7	559606.1	1330.389	EPD1
3086	981280	559835.7	1330.477	EPD1 170+00
3087	981291.8	559832.3	1330.806	EPD2 170+00
4000	981303.2	559867	1330.624	ADOT ALF *BULL* 1986
3088	981358.5	560071.3	1330.963	EPD2
3089	981347.3	560074	1330.612	EPD1
3090	981416.7	560322.4	1329.825	EPD1 175+00
3091	981428	560319.8	1330.045	EPD2 175+00
900	981452.7	560534.6	1319.099	TOE1
901	981474.7	560527.7	1330.026	EPD1
902	981486.9	560524.3	1330.242	EPD2
903	981511.9	560519.1	1320.812	GB1
904	981557.2	560508.2	1319.33	GB2
905	981607.2	560497.7	1317.297	TOE2
906	981640.1	560491.7	1316.501	TOE3
907	981654.1	560494.4	1316.728	GB5
908	981669.3	560487.7	1321.211	TB3
909	981724.5	560477.3	1321.99	NG
910	981779.9	560466.7	1322.043	NG
3092	981487	560572.1	1329.961	EPD1
3093	981499.3	560568.6	1330.195	EPD2
3094	981569.5	560819	1329.625	EPD2 180+00
3095	981557.6	560821.9	1329.058	EPD1 180+00
3096	981624.3	561059.8	1328.496	EPD1
3097	981636.3	561056.4	1329.069	EPD2
3098	981695.7	561310.6	1328.554	EPD1 185+00
3099	981708	561307.6	1328.717	EPD2 185+00
3100	981763.2	561552.2	1328.625	EPD1
3101	981775.1	561548.1	1329.07	EPD2
1000	981741	561561.9	1318.653	TOE1
1001	981764.6	561556.2	1328.582	EPD1
1002	981776.7	561553	1329.055	EPD2
1003	981801.5	561546.7	1320.41	GB1
1004	981842.8	561535.9	1318.797	GB2
1005	981901.5	561520.5	1316.549	TOE2
1006	981930.8	561512.4	1316.39	TOE3
1007	981958.9	561497.4	1320.836	TB3
1008	981981.4	561493.4	1321.518	NG
1009	982049.4	561476.6	1321.683	NG
3102	981833.5	561795.5	1328.891	EPD1 190+00
3103	981845.5	561792.4	1329.173	EPD2 190+00
3104	981912.9	562033	1329.118	EPD2
3105	981902.9	562035.1	1328.71	EPD1
3106	981972.4	562292.6	1328.509	EPD1 195+00
3107	981984	562290.2	1328.842	EPD2 195+00
3108	982051.5	562530	1328.663	EPD2
3109	982039.2	562533.2	1328.387	EPD1
3110	982106.4	562769.8	1328.287	EPD1 200+00

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3111	982118.6	562766.6	1328.543	EPD2	200+00
3112	982185.4	563006.3	1328.41	EPD2	
3113	982174.5	563009.5	1328.235	EPD1	
3114	982243.5	563253.9	1328.553	EPD1	205+00
3115	982254.9	563251.2	1328.678	EPD2	205+00
1100	982259.5	563391.7	1319.738	TOE1	
1101	982280.5	563386.6	1328.723	EPD1	
1102	982292.2	563383.6	1329.025	EPD2	
1103	982314.8	563377.8	1320.374	GB1	
1104	982362.4	563366.8	1318.984	GB2	
1105	982377.7	563363.2	1316.296	GB10	
1106	982417	563354.7	1314.438	TOE2	
1107	982451.2	563346.1	1313.98	TOE3	
1108	982481	563337.7	1320.083	TB3	
1109	982531.2	563330.1	1320.236	NG	
1110	982570.9	563324	1320.463	NG	
3116	982324.8	563500	1328.75	EPD2	
3117	982312.9	563503.2	1328.525	EPD1	
3118	982378.9	563738.5	1327.909	EPD1	210+00
3119	982393.3	563735.1	1328.121	EPD2	210+00
3120	982460.5	563979.8	1327.708	EPD2	
3121	982448	563983.1	1327.421	EPD1	
3122	982516.9	564222.3	1327.554	EPD1	215+00
3123	982528.7	564219.2	1327.895	EPD2	215+00
3124	982596.3	564457.6	1328.215	EPD2	
3125	982583.5	564461.2	1327.808	EPD1	
3126	982652.5	564704.3	1327.504	EPD1	220+00
3127	982665.6	564701.6	1328	EPD2	220+00
1200	982657.6	564806.2	1316.102	TOE1	
1201	982679.5	564800.4	1327.681	EPD1	
1202	982691.5	564796.5	1327.997	EPD2	
1203	982719.7	564789.8	1317.261	GB1	
1204	982757.7	564780.5	1316.136	GB2	
1205	982769.9	564777.6	1314.469	GB10	
1206	982815.6	564765.7	1313.16	TOE2	
1207	982842.4	564759.7	1312.279	TOE3	
1208	982881.6	564758.2	1317.682	TB3	
1209	982930.8	564752.5	1317.274	NG	
1210	982978.2	564740.3	1317.596	NG	
3128	982733.1	564944.2	1328.018	EPD2	
3129	982720.7	564947.7	1327.531	EPD1	
3130	982789.9	565189.7	1327.556	EPD1	225+00
3131	982801.9	565187.1	1327.829	EPD2	225+00
3132	982869.3	565427.7	1327.465	EPD2	
3133	982857	565430.9	1327.284	EPD1	
3134	982926.2	565674.4	1327.316	EPD1	230+00
3135	982939.5	565671.1	1327.338	EPD2	230+00
3136	983006.1	565908.4	1326.971	EPD2	
3137	982993.1	565912.1	1326.713	EPD1	
3138	983062.2	566156.6	1326.183	EPD1	235+00
3139	983075.3	566153.9	1326.432	EPD2	235+00

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1300	983042.7	566172.3	1316.035	TOE1
1301	983065.2	566167.2	1326.196	EPD1
1302	983078	566164.5	1326.158	EPD2
1303	983102.6	566158.7	1317.288	GB1
1304	983139.4	566151.5	1315.936	GB2
1305	983154.2	566148.7	1313.796	GB10
1306	983187.3	566141.6	1312.099	TOE2
1307	983222.1	566133.1	1312.198	TOE3
1308	983288.4	566127.7	1317.368	TB3
1309	983310.3	566127.2	1317.344	NG
1310	983358.2	566121.5	1318.181	NG
3140	983141.5	566389.4	1326.853	EPD2
3141	983129.5	566392	1326.589	EPD1
3142	983227	566697	1326.416	EPD2 240+00
3143	983214.8	566700.5	1326.203	EPD1 240+00
3144	983281.1	566935.9	1326.045	EPD1
3145	983293.6	566931.1	1326.366	EPD2
1400	983300.6	567080.9	1315.446	TOE1
1401	983320.9	567075.3	1325.801	EPD1
1402	983333.5	567072.2	1325.903	EPD2
1403	983359.4	567067.6	1315.839	GB1
1404	983406.3	567056.8	1314.404	GB2
1405	983420.1	567053.6	1313.182	GB10
1406	983445.7	567048.4	1311.335	TOE2
1407	983488	567039.8	1311.014	TOE3
1408	983535.4	567030.8	1318.241	TB3
1409	983546.1	567033.1	1316.483	NG
1410	983593.2	567020	1316.825	NG
1411	983643.4	567013.1	1317.188	NG
3146	983343.5	567110.4	1326.165	EPD2 245+00
3147	983331.5	567113.6	1325.973	EPD1 245+00
3148	983401.2	567356.9	1326.269	EPD1
3149	983413.4	567353.3	1326.409	EPD2
3150	983486.9	567611.9	1326.576	EPD2 250+00
3151	983474.2	567615.1	1326.458	EPD1 250+00
1500	983453.1	567625	1316.048	TOE1
1501	983475.2	567618.7	1326.393	EPD1
1502	983487.8	567615.2	1326.487	EPD2
1503	983514.6	567609.7	1316.621	GB1
1504	983555.4	567599.2	1315.433	GB2
1505	983576.6	567594.5	1312.874	GB10
1506	983599.1	567589.3	1311.023	TOE2
1509	983678.4	567576.6	1316.553	TB3
1510	983733	567565.8	1317.27	NG
1511	983782.4	567553.8	1317.379	NG
3152	983543.7	567860.5	1326.104	EPD1
3153	983555.5	567857.3	1326.129	EPD2
3154	983610.9	568101.7	1325.579	EPD1 255+00
3155	983623.4	568098.6	1325.687	EPD2 255+00
3156	983691.2	568343.1	1325.218	EPD2
3157	983679.8	568346.1	1324.801	EPD1

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3158	983749.7	568591.4	1324.562	EPD1 260+00
3159	983761.3	568588.1	1324.777	EPD2 260+00
3160	983829	568828.4	1324.929	EPD2*
3161	983818	568830.8	1324.495	EPD1*
1508	983680.6	567568.5	1309.852	TOE3

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16	983885.8	569028.7	1324.664	X-SEC 264+52.63
17	984124.2	569877.6	1322.876	X-SEC 273+29.08
18	984392.8	570828.3	1321.686	X-SEC 282+95.28
19	984710	571867.2	1321.573	X-SEC 293+68.13
20	985213.6	572823.7	1321.63	X-SEC 304+42.89
21	985860.4	573934.1	1312.916	X-SEC 317+20
9003	988788.7	572213.7	1335.66	SET 60D NAIL
9004	986182.7	573511.6	1314.682	SET 60D NAIL
9006	983470.5	566551.1	1316.647	SET 60D NAIL
9012	988788.7	572213.7	1335.681	9003 CKPT
9013	983470.5	566551.2	1316.617	9006 CKPT
1600	983848.3	569038.3	1312.851	TOE1
1601	983874.5	569031.6	1324.632	EPD1
1602	983885.7	569028.5	1324.821	EPD2
1603	983909.6	569022.6	1314.742	GB1
1604	983950.1	569011.9	1312.924	GB2
1605	983969.5	569007.4	1311.374	GB10
1606	983990.3	569001.8	1310.354	TOE2
1607	984031.1	568991.1	1309.167	FL1
1608	984054.4	568983.1	1309.915	TOE3
1609	984085	568974.3	1313.508	TB3
1610	984103	568969.6	1315.137	TB10
1611	984106.8	568974.4	1311.59	FL DITCH
1612	984109.4	568978.5	1314.552	TB11
1613	984124.2	568970	1314.079	TB11
1614	984180.6	568957.3	1314.542	NG
3162	983887	569077	1324.385	EPD1 265+00
3163	983898.6	569074.2	1324.5	EPD2 265+00
3164	983966.3	569316.9	1324.129	EPD2
3165	983955	569320.1	1323.844	EPD1
3166	984023.5	569565.5	1323.169	EPD1 270+00
3167	984035.9	569562.1	1323.608	EPD2 270+00
3168	984103	569802.5	1322.67	EPD2
3169	984091.5	569805.7	1322.445	EPD1
1700	984089.6	569885.9	1312.459	TOE1
1701	984112.8	569881.4	1322.526	EPD1
1702	984124.7	569877.5	1322.742	EPD2
1703	984147.5	569871.8	1314.065	GB1
1704	984194.3	569857.9	1312.409	GB2
1705	984209.1	569853.2	1311.34	GB10
1706	984235.4	569845	1310.114	NG
1707	984280.1	569831	1309.524	TB12
1708	984295.5	569826.5	1307.891	TOE2.FL1*
1709	984310.7	569822	1308.799	NG
1710	984338.1	569812.3	1309.904	TOE3
1711	984368.6	569803.8	1315.571	TB3
1712	984423	569788.7	1314.946	NG
1713	984475.6	569771.7	1315.453	NG
3170	984162	570055.7	1322.292	EPD1 275+00
3171	984173.7	570052.4	1322.534	EPD2 275+00

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3172	984241	570288	1322.607	EPD2
3173	984228.6	570292	1322.349	EPD1
3174	984298.9	570541.2	1321.487	EPD1 280+00
3175	984311.4	570538.2	1321.751	EPD2 280+00
3176	984380.2	570784.2	1321.571	EPD2
3177	984368	570787.6	1321.242	EPD1
1800	984356.3	570838	1310.271	TOE1
1801	984380.6	570832.5	1321.541	EPD1
1802	984392.9	570828.5	1321.694	EPD2
1803	984419.5	570822	1311.711	GB1
1804	984483.3	570806.9	1310.212	GB2
1805	984521.9	570799.2	1308.593	NG
1806	984556.3	570790.6	1308.562	TB12
1807	984570	570787.7	1307.551	TOE2
1808	984578.9	570784.9	1308.28	NG
1809	984620.4	570774.1	1309.22	TOE3
1810	984631.7	570771.8	1311.118	TB3
1811	984679.5	570759.2	1311.62	NG
1812	984727.9	570745.4	1312.057	NG
3178	984436.7	571029.8	1321.052	EPD1 285+00
3179	984449	571026.4	1321.591	EPD2 285+00
3180	984516.3	571262.4	1321.969	EPD2
3181	984504	571265.5	1321.846	EPD1
3182	984574.9	571516.1	1321.288	EPD1 290+00-PC +/-
3183	984587	571513	1321.357	EPD2 290+00 PC +/-
3184	984666.7	571755.4	1321.686	EPD2
3185	984653.8	571760.2	1321.756	EPD1
1900	984669.6	571882.9	1309.736	TOE1
1901	984697.3	571872.2	1321.778	EPD1
1902	984710.1	571867.1	1321.7	EPD2
1903	984735.7	571857.2	1310.817	GB1
1904	984787.3	571837.3	1309.589	GB2
1905	984814.3	571826.7	1309.584	GB10
1906	984835.1	571817.1	1308.492	NG
1907	984870.4	571801.6	1307.763	TB12
1908	984881.7	571796	1306.649	TOE2.FL1
1909	984893.9	571790.4	1307.504	TOE3
1910	984909	571783.1	1311.311	TB3
1911	984955.4	571766.1	1311.075	NG
1912	985001.9	571747	1311.144	NG
3186	984750.3	571994.1	1321.423	EPD1 295+00 PT +/-
3187	984762.3	571988.5	1321.587	EPD2 295+00 PT +/-
3188	984875.3	572209.7	1321.357	EPD2
3189	984863.8	572215.7	1321.142	EPD1
3190	984985.5	572438.7	1321.402	EPD1 300+00
3191	984998.1	572433	1321.525	EPD2 300+00
4001	985004.9	572477.8	1321.15	AZ DOT HD *MAC* 1986
3192	985113.4	572667.8	1321.531	EPD1
3193	985124.2	572662.2	1321.644	EPD2
2000	985179.2	572843	1310.249	TOE1

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2001	985202.7	572829.7	1321.66	EPD1
2002	985213.6	572823.9	1321.737	EPD2
2003	985238.1	572813.1	1312.001	GB1
2004	985303.3	572783.3	1311.314	NG
2005	985363.9	572758.1	1312.043	NG
2006	985415.8	572734.8	1312.296	TB12
2007	985427.3	572729.6	1309.688	TOE2
2008	985493.1	572695.8	1306.223	FL1
2009	985507.6	572687.2	1307.195	TOE3
2010	985530.8	572678.1	1314.657	TB3
2011	985581.4	572659.6	1315.367	NG
2012	985632.5	572639.4	1316.002	NG
3194	985229.5	572879.5	1321.413	EPD1 305+00
3195	985240.8	572873.9	1321.578	EPD2 305+00
3196	985360.2	573091.9	1321.023	EPD2
3197	985348.5	573097.9	1320.899	EPD2
3198	985479.4	573335.6	1320.953	EPD1 310+00
3199	985491.1	573329.8	1321.337	EPD2 310+00
3200	985612.7	573548.5	1321.534	EPD2
3201	985600.7	573554.6	1321.371	EPD1
3202	985714.1	573764	1320.704	EPD1 315+00 PC +/-
3203	985701.3	573771	1320.236	EPD1 315+00
3204	985726.3	573758.3	1321.171	EPD2 315+00 PC +/-
2100	985768.9	574002.9	1312.686	NG
2101	985809.1	573972.9	1314.613	NG
2102	985843.1	573947.6	1313.65	NG
2103	985845.5	573945.8	1313.147	EPD1
2104	985859.8	573934.7	1312.861	EPD2
2105	985914.2	573892.7	1312.406	NG
2106	985943.8	573867.5	1312.234	NG
2107	985987.2	573834	1314.199	NG
2108	986031.3	573800.6	1314.778	NG
2109	986070.9	573764.9	1315.11	NG
2110	986104.5	573720.2	1315.274	TB
2111	986129.2	573707.2	1308.463	TOE
2112	986185	573689.7	1304.65	TOE2
2113	986201.8	573683.2	1305.533	TOE3
2114	986234.4	573673.3	1315.55	TB3
2115	986288.7	573651.4	1316.224	NG
2116	986347	573635.4	1316.475	NG
3205	985882.8	573955.1	1311.741	EPD1
3206	985870.2	573969	1311.716	EPD2
3207	986111.3	573994.4	1311.329	TB
3208	986129.4	574001.7	1307.106	TOE
3209	986188.4	574020.3	1304.498	TB
3210	986190.6	574021.3	1303.028	TOE
3211	986198.8	574025.6	1302.702	TOE
3212	986217.3	574033.4	1309.908	TB
3213	986282.6	574049.7	1310.189	NG
3214	986283	574000	1311.11	NG

(File Name: 04-03-26 GPS3.CSV)

3215	986285.8	573957.7	1313.933	NG
3216	986255.1	573885.7	1314.716	TB MCMICKEN/NORTH
3217	986291	574086.9	1309.413	TB20
3218	986297	574098.6	1303.341	TOE20
3219	986300.8	574121.6	1302.966	TOE21
3220	986306	574136.3	1309.957	TB21
3221	986313.9	574169.4	1309.003	NG
3222	986326.3	574209.6	1307.258	LOW PT
3223	986337.4	574234.1	1310.131	NG
3224	986355.2	574297.8	1313.921	NG
3225	986188.9	574173.5	1309.404	TB21
3226	986178.4	574188.4	1309.675	TB21
3227	986183.8	574157.3	1302.394	TOE21
3228	986183.3	574135.4	1302.292	TOE20
3229	986170.7	574134	1302.351	TOE20.TOE3*
3230	986147.4	574133.3	1302.55	TOE2*
3231	986043.9	574056.8	1309.024	EPD2
3232	986036.7	574069.3	1308.612	EPD1
3233	986093.4	574110	1306.671	EPD1
3234	986103.2	574101.7	1306.696	EPD2
3235	986138	574142	1302.461	EPD2.TOE20
3236	986125.1	574147.5	1302.321	EPD1.TOE20
3237	986153.6	574166	1302.307	EPD2.TOE21
3238	986143.4	574172.5	1302.396	EPD1.TOE21
3239	986169.8	574242.9	1309.898	EPD1
3240	986187.3	574239.6	1309.94	EPD2.TB21*
3241	986233.7	574337.7	1312.65	EPD2*
3242	986236.8	574336.5	1313.633	NG
3243	986208	574349.1	1313.137	EPD1*
3244	986203	574350.8	1313.447	TB30
3245	986151.5	574247.8	1312.151	TB30
3246	986139.2	574196.1	1308.293	TB30
3247	986106.8	574133.4	1305.168	TB31
3248	985982.4	574146.7	1307.457	NG
3249	985994.6	574182.2	1304.962	TB31
3250	986001.2	574198.1	1301.38	TOE20
3251	986010.2	574226.3	1301.295	TOE21
3252	985918.2	574253	1300.375	TOE21*
3253	985911.6	574230	1300.822	TOE20*
3254	985904.6	574211.6	1308.317	TB31*
3255	985896.7	574203.3	1303.739	TOE
3256	985885.1	574184.2	1304.342	TOE
3257	985863	574153.6	1306.704	NG
3258	985919.8	574270.1	1307.897	TB30*
3259	985964.6	574371.6	1312.461	NG
3260	986051.3	574357.4	1312.199	NG
3261	986041.2	574318.7	1310.197	LOW PT
3262	986025.4	574264.2	1311.444	NG
3263	986019.7	574234.5	1307.921	TB30
3264	986213.7	574045.9	1309.753	TB20*.TB3*