

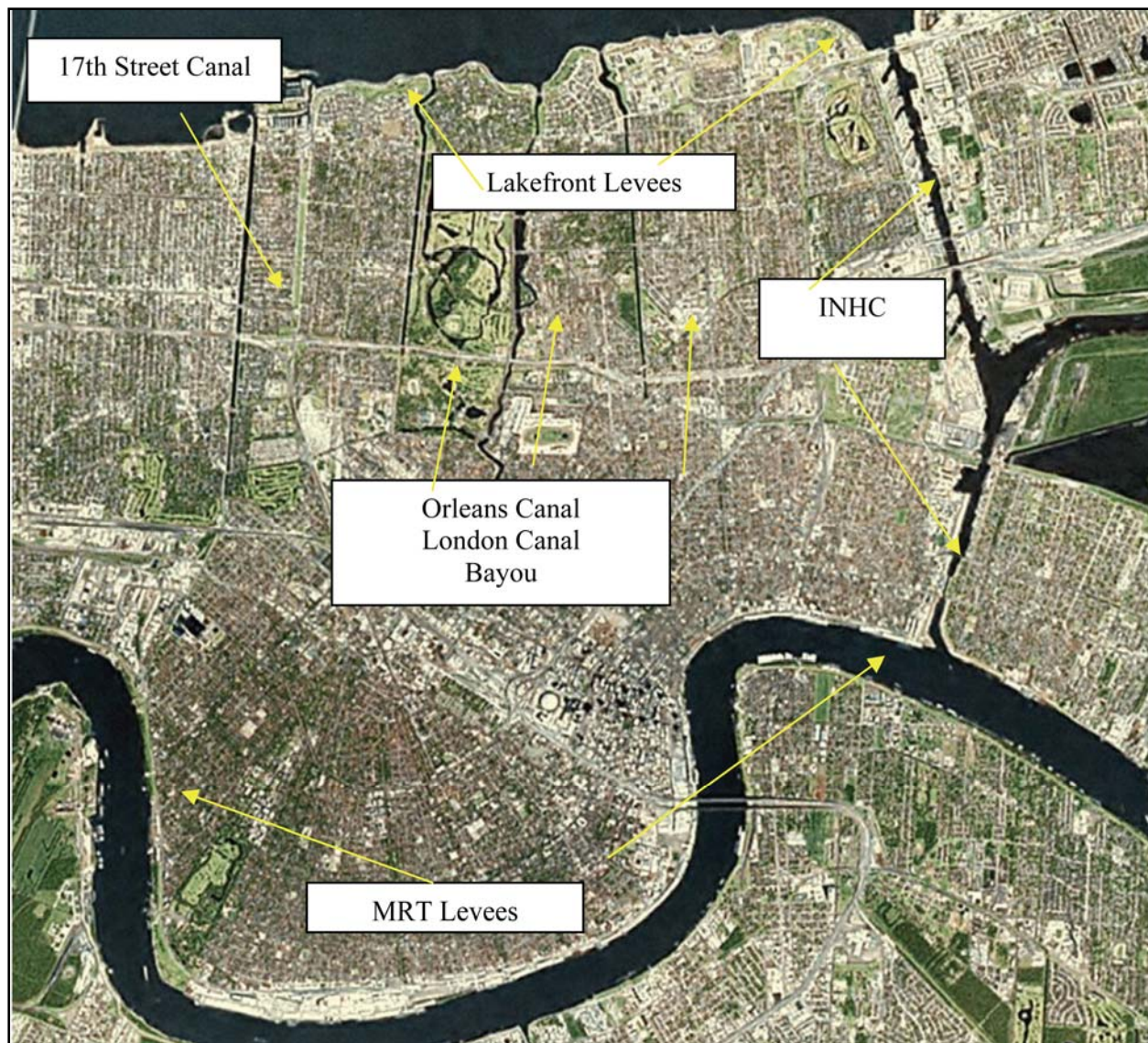
Appendix 7

Orleans Basin

Field Reconnaissance and Definition of Reaches in Orleans East Bank Basin

The basin for Orleans East Bank has been broken down into seven distinct sections to develop both reaches and features definitions for the risk model. These sections are based on General Design Memorandum (GDMs) published by the New Orleans District, USACE and updated by field reconnaissance by IPET Team 10. The Orleans East Bank Basin has been defined by the following sections shown in the figure below:

1. 17th Street Canal
2. Orleans Canal
3. London Canal
4. Bayou St. John Canal
5. Lakefront Levees
6. INHC
7. Mississippi River Levees



Overview of Orleans East Bank Basin

Elevations

All vertical elevations in this report are defined in **NAVD88 2004.65** datum unless otherwise noted within the text. All horizontal datums are defined in State Plane Coordinates NAD83 – 1702 Louisiana South, UTM NAD83 Zone 15, and GCS NAD83. Elevations for transition features are top elevation of feature and elevation for the gates are inverts.

Section 1: 17th Street Canal (East Side)

Narrative

The 17th Street Canal Floodwall cross section is typical from station 125+87.45 W/L to 0+00.00 W/L (also Sta. 340+40.00 B/L Lakefront) with a I-wall section at elevation of 14.0 feet

NGVD. The elevation changes from station 80+10.00 W/L to 80+40.00 W/L, where the I-Wall crosses under Veterans Highway and the elevation is 14.5 feet NGVD. The elevation changes again from station 100+86.00 W/L to 102+06.00, where the I-Wall elevation is 15.0 feet NGVD.

There was a major failure of the I-wall floodwall protection on the east side of the 17th Street Outfall Canal. This failure resulted in a breach located approximately N30°01.02 and W90°07.28. The length of the breach is 455 feet long. Floodwall monoliths, founding levee and foundation materials were scoured away resulting in scour hole with an approximate bottom elevation -21 feet NGVD. A temporary levee was constructed up to elevation +10 NGVD to provide temporary flood protection. Figure 1 shows the breach along the 17th Street Canal. Figure 2 shows the sheetpile repair along the 17th Street Canal.



Figure 1. Breach in the 17th Street Canal



Figure 2. Sheetpile repair along the 17th Street Canal

Elevation Stationing (used East Bank for OEB)										
<u>Section</u>	<u>Start</u>	<u>End</u>	<u>Structure</u>	<u>EL</u>	<u>Section/Point</u>	<u>Length</u>	<u>Avg Height</u>		<u>Weighted Average</u>	
1	0+00	7+45.59	I-Wall	14	S	745.59	14			
2	7+45.59	7+52.09	T-Wall	14	P	6.5	14			
3	7+52.09	8+14.09	Gate No. 3	14	P	62	14			
4	8+14.09	8+20.59	T-Wall	14	P	6.5	14			
5	8+20.59	80+10.00	I-Wall	14	S	7189.41	14	↓	Reach 1	14.0
6	80+10.00	80+40.00	I-Wall Transition	14.0 - El 14.5	S	30	14.25			
7	80+40.00	80+51.70	I-Wall	14.5	P	11.7	14.5			
8	80+51.70	81+63.70	Veterans Hwy	14.5	S	112	14.5			
9	81+63.70	100+86.00	I-Wall	14.5	S	1922.3	14.5	↓	Reach 2	14.5
10	100+86.00	102+06.00	I-Wall Transition	14.5 - El 15.0	S	120	14.75			
11	102+06.00	125+87.45	I-Wall	15	S	2381.45	15	↓	Reach 3	15.0

End at Hammond Highway

Features

<u>Elevation</u>	<u>Feature</u>
15	Pump Station #6 - End of 17th Street Canal
15	Pump Station OP#10
10.6	Gate E9 - Southern RR
7	Gate at OP#10 Pump Station
7	Gate north of I-10
7.3	Gate E4 - Veterans Blvd.
7.3	Gate E5 - Veterans Blvd

Definition of Reaches

Reach 1-3 (now 45) – This reach consists of I-wall on the east side of the 17th Street Canal at average elevation 15.5 feet with a length of approximately 12,740 feet. There are two transitions (Pump Stations 6 and 10) and five gates in this reach.

Section 2: Orleans Avenue Canal

Narrative

The protection on the east side of the Orleans Outfall Canal starts at the intersection of Lakeshore Drive and Marconi Drive. After short lengths of floodwall and cantilever sheeting, the protection consists of a levee that extends to Robert E. Lee Boulevard. South of this intersection, the protection consists of floodwall that extends to the pumping station near Interstate Highway 610. This line of protection is in satisfactory condition and does not appear to have been damaged during Hurricane Katrina.

Definition of Reaches

Reach 4-10 (now 46-49) – These reaches consists primarily of I-walls with levees at the lakefront entrance on both on the east side of the Orleans Avenue Canal at average elevation 14.0 feet with a length of approximately 9,280 feet, 3,155 feet, 9,110 feet, and 3,610 feet respectively. There are one transition (Pump Stations 7) and four gates in this reach.

<u>Section</u>	<u>Structure</u>	<u>Length</u>	<u>Elevation</u>		<u>Section</u>	<u>Structure</u>	<u>Length</u>	<u>Elevation</u>	
1	I-Wall	3404	13.6		1	I-Wall	3430	13.6	
2	I-Wall	2712	13.6		2	I-Wall	2545	13.6	
3	I-Wall	2627	13.4		3	I-Wall	2643	13.4	
4	I-wall	180	13	↓	4	I-wall	160	13	Reach 8
5	Levee	2210	13	Reach 4	5	Levee	2948	13	↓
6	I-wall	500	12	Reach 5	6	Levee	226	12	Reach 9
7	Levee	665	13	Reach 6	7	I-wall	482	13	Reach 10
				Reach 7					

Features

<u>Elevation</u>	<u>Feature</u>
15	Pump Station OP#7 FW - End of Orleans Canal
7	Gate at Harrison Ave
7	Gate at Harrison Ave
7	Gate at Filmore Ave
7	Gate at Filmore Ave



Pump Station #6

Section 3: London Avenue Canal

Narrative

There was a major failure of the I-wall floodwall protection on the east side of the London Avenue Outfall Canal immediately north of Mirabeau Avenue Bridge. This failure resulted in a breach located approximately N30° 00.52' and W90° 04.167. The length of the breach was 425 feet long. Floodwall monoliths, founding levee and foundation materials were scoured away resulting in scour hole with an approximate bottom elevation -28 feet NGVD. A provisional levee was constructed up to elevation +10 NGVD to provide temporary flood protection. Figure 3 shows the sheetpile repair along the London Avenue Outfall Canal.

There was a second major failure of the I-wall floodwall protection on the west side of the London Ave Outfall Canal immediately south of Robert E. Lee Boulevard Bridge. This failure resulted in a breach located approximately N30°01.218' and W90°04.26'. The length of the breach was 720 feet long. Floodwall monoliths, founding levee and foundation materials were scoured away resulting in scour hole with an approximate bottom elevation -20 feet NGVD. A provisional levee was constructed up to elevation +10 NGVD to provide temporary flood protection. Figure 4 shows the sheet pile repair and also a failed I-wall floodwall section.



Figure 3. Sheetpile repair along the London Ave Canal – East Side Failure



Figure 4. Sheetpile repair along the London Ave Canal – West Side Failure

Definition of Reaches

Reach 11-18 (now 50-53) – These reaches consists primarily of I-walls with levees at the lakefront entrance on both on the east side of the London Avenue Canal at average elevation 14.0 feet with a length of approximately 12,130 feet, 3,880 feet, 12,765 feet and 3,030 feet respectively. There are two transitions (Pump Stations 3 and 4) and three gates in this reach.

Elevation Stationing - WEST (START AT PUMP STATION #3)				Elevation Stationing - EAST (START AT PUMP STATION #3)						
Section	Structure	Length	Elevation			Section	Structure	Length	Elevation	
1	I-Wall	9712	13			1	I-Wall	9827	13.2	Reach 16
2	T-Wall	300	15	Reach 11		2	T-wall	240	18	Transition
3	I-Wall	1984	13.4	Transition	PS #4	3	I-Wall	1974	13.2	
4	Levee	537	12	Reach 12		4	I-wall	672	13.1	↓
5	I-wall	190	12.5	Reach 13	Between Robert Lee and Simon	5	I-wall	130	13	Reach 17
6	I-wall	92	13	↓	Between Robert Lee and Simon	6	Levee	3647	12.5	Reach 18
7	Levee	3276	12.5	Reach 14						
				Reach 15						

Features

<u>Elevation</u>	<u>Feature</u>
9.0	Unprotected area adjacent Pump Station #3
14.6	Pump Station #4 West FW - Middle of London Canal
13.6	Pump Station #3 FW - End of London Canal
10	West CSX RR gate near Pump Station #3
7	Gate at Filmore Ave
7	Gate at Filmore Ave



Pump Station #3



Pump Station #3



I-610 overpass

Section 4: Bayou St. John Canal

Narrative

The protection on the east and west banks of the Bayou St. John Canal meets the Lakefront protection. This protection extends approximately 800 feet to the south where there is a closure structure across Bayou St. John. The closure structure has both a sector gate and slice gates. South of the closure structure, the protection along the banks is approximately ten feet lower. There are no reaches considered for this canal. The gate structure is included as both a transition (tie-in on both sides) and a gate structure.



Inlet to Bayou St. John



Protection Gate Structure at Bayou St. John

Section 5: Lakefront Levees

Narrative

Orleans East Bank Lakefront Levee Reaches 9 and 8, as designated in Design Memorandum No.13, extend from the 17th Street Canal at station 340+40 to the Orleans Avenue Canal at station 250+72. Starting at the east bank of the 17th Street Canal, the protection begins with a slide gate across Marina Boulevard. At this junction, construction work was ongoing under contract number W912P8-06-C-0008, titled “17th Street Canal Interim Closure Structure.” Contract completion date is scheduled for 1 June 2006. The flood protection along Marina Boulevard consists of an I-wall with a series of street gates that provide access through the line of protection. The I-wall transitions into the levee just beyond the intersection at Lake Shore drive at longitude-latitude coordinates 30°1’19” North by 90°06’47” West.

The typical cross section for the Lakefront Levee has a ten-foot top width with vegetated side slopes. The crest has an undulant profile, and there appears to be a low spot in the protection where Canal Boulevard intersects the levee. Design Memorandum No. 13 indicates the net grade for the levee crest to be elevation 18 feet NGVD. At the Orleans Outfall Canal, the Lakefront Levee drops approximately four feet and transitions into the west levee for the Orleans Outfall Canal. At this junction, construction work was ongoing under Contract Number W912P8-06-C – 0097, titled “Interim Closure Structure, Orleans Avenue.” A review of the contract documents indicates the at the west levee will be raised from Lake Shore Drive to the new Closure Structure and the southern limit of the work will extend to West Robert E. Lee Boulevard. Contract completion date is scheduled for 1 June 2006. South of Robert E. Lee Boulevard, the protection on the west side of the Orleans Outfall Canal consists of floodwall up to the pumping station at 29°59’40” North by 90°06’02” West. South of the pumping station, the canal is contained in an underground conduit.

Orleans East Bank Lakefront Levee Reach 7 extends from the Orleans Avenue Canal at station 246+37 to the Bayou St. John Canal at station 199+42. On the east side of the Orleans Outfall Canal, there is a street gate marked “L8” across Marconi Drive and then an approximate 20-foot length of sheeting that transitions into the typical levee cross-section that Design Memorandum No. 13 indicates to have a net crest elevation of 17.5 feet NGVD. The Lakeshore Levee then continues along the south side of Lake Shore Drive until coordinate point 30°1’39” North by 90°05’17” West where the alignment shifts to the north side of Lake Shore Drive where a flood wall serves as the protection. The point where the protection intersects Lake Shore Drive appears to be a low point. The floodwall transitions back to the typical levee cross section at coordinate point 30°1’39” North by 90°05’-15” West where minor erosion was observed on the lakeside slope. The typical levee cross section then continues toward Bayou St. John where it transitions back to a floodwall that ties into the bridge abutments where Lake Shore Drive passes over Bayou St. John.

Orleans East Bank Lakefront Levee Reach 6 extends from the Bayou St. John Canal at station 196+50 to the London Ave Canal at station 163+98. Starting at the east bridge abutment, the protection consists of floodwall up to Lake Terrace Drive where it then transitions back to the typical levee cross-section that Design Memorandum No. 13 indicates was to be constructed to a net elevation of 18 feet NGVD. The transition area appears to be a low point in the protection. The levee section runs along the north side of Lake Shore Drive until it approaches the London Avenue Outfall Canal where it then crosses to the south side of Lake Shore Drive where it ties into the London Avenue west levee. Corps survey markers were found in this area with spot elevations of 14.47 feet NGVD on the crest of Lakeshore Levee and elevation 12.84 feet NGVD on the crest of the west levee along the canal. The point where the protection crosses Lake Shore Drive appears to be a low point.

Orleans East Bank Lakefront Levee Reach 4 extends from the London Ave Canal at station 161+00.18 B/L to the Inner Harbor Navigational Canal at station 0+00.00. This reach is typically levee. The section from station 136+13.19 B/L to station 102+23.16 B/L has been removed and a new floodwall has been constructed on the back side of the University of New Orleans. The original DM showed the floodwall on the front side of what is not the University of New Orleans. This area includes floodwall and levee. Figure 5 shows the new floodwall and levee.

The majority of the damage in this reach is lake side erosion, scour at the base of the floodwalls, and damaged floodwalls.



Figure 5. Floodwall and Levee behind the University of New Orleans

Reach 23-32 (now 54-60) – These reaches consist primarily of levees on the lakefront with walls at certain protection areas. Elevations range from 12 to 18 feet depending upon the section. The lengths of the reaches are shown with their respective elevations. There are eleven transitions and eighteen gates in this reach.

<u>Reach</u>	<u>Length</u>	<u>Elevations</u>
54	2,925	12.00
55	6,310	18.00
56	9,940	17.00
57	2,380	16.50
58	3,220	16.50
59	7,605	16.50
60	1,155	14.40

Elevation Stationing

Section	Start	End	Structure	EL	Section/Point	Length	Avg Height	Weighted Average
1	0+00	1+13.57	I-Wall	EI 14.5	S	113.57	14.5	
2	1+13.57	1+21.07	I-Wall	EI 14.0	P	7.5	14	
3	1+21.07	1+51.07	Ramp formerly Gate No 1	EI 10.0	P	30	14	
4	1+51.07	1+58.57	I-Wall	EI 14.0	P	7.5	14	
5	1+58.57	2+54.51	I-Wall	EI 14.5	S	95.94	14.5	
6	2+54.51	5+60.00	Levee	EI 14.0	S	305.49	14	Reach 32
7	5+60.00	5+74.37	Levee Transition	EI 14.0 - EI 15.0	S	14.37	14.5	
8	5+74.37	7+04.00	Levee	EI 15.0	S	129.63	15	Reach 31
9	7+04.00	7+62.87	I-Wall	EI 15.5	S	58.87	15.5	
10	7+62.87	7+69.37	I-Wall	EI 15.0	S	6.5	15	
11	7+69.37	8+02.37	Gate No. 2	EI 8.0	S	33	15	
12	8+02.37	8+08.87	I-Wall	EI 15.0	S	6.5	15	
13	8+08.87	8+59.15	I-Wall	EI 15.5	S	50.28	15.5	
14	8+59.15	8+63.15	I-Wall	EI 15.0	S	4	15	
15	8+63.15	8+91.15	Gate No. 3	EI 10.75	S	28	15	
16	8+91.15	8+95.15	I-Wall	EI 15.0	S	4	15	
17	8+95.15	9+88.10	Seabrook Bridge	EI 19.19	S	92.95	19.19	
18	9+88.10	14+31.42	I-Wall	EI 15.5	S	443.32	15.5	
19	14+31.42	14+40.23	Levee	EI 15.0	S	8.88	15	Reach 30
20	14+40.23	15+30.23	Levee Transition	EI 15.0 - EI 18.0	S	90	16.5	
21	15+30.23	15+85.23	Levee	EI 18.0	S	55	18	
22	15+85.23	15+90.23	I-Wall	EI 18.5	S	5	18.5	
23	15+90.23	16+08.23	I-Wall Transition	EI 18.5 - EI 18.0	S	18	18.25	
24	16+08.23	16+27.23	I-Wall	EI 18.0	S	19	18	
25	16+27.23	16+36.23	I-Wall	EI 18.5	S	9	18.5	
26	16+36.23	16+70.23	Gate No. 4	EI 12.25	S	34	17.5	
27	16+70.23	16+79.18	I-Wall	EI 18.5	S	8.95	18.5	
28	16+79.18	16+95.46	I-Wall	EI 18.0	S	16.28	18	
29	16+95.46	17+13.46	I-Wall Transition	EI 18.0 - EI 18.5	S	18	18.25	
30	17+13.46	17+18.46	I-Wall	EI 18.5	S	5	18.5	
31	17+18.46	20+00.00	Levee	EI 18.0	S	281.4	18	
32	20+00.00	20+05.00	I-Wall	EI 18.5	S	5	18.5	
33	20+05.00	20+22.25	I-Wall Transition	EI 18.5 - EI 18.0	S	17.25	18.25	
34	20+22.25	20+33.43	I-Wall	EI 18.0	S	11.18	18	
35	20+33.43	20+40.43	I-Wall	EI 17.5	S	7	17.5	
36	20+40.43	20+62.43	Gate No. 5	EI 12.5	S	22	17.5	
37	20+62.43	20+69.43	I-Wall	EI 17.5	S	7	17.5	
38	20+69.43	20+76.30	I-Wall	EI 18.0	S	6.87	18	
39	20+76.30	20+93.55	I-Wall Transition	EI 18.0 - EI 18.5	S	17.25	18.25	
40	20+93.55	20+98.55	I-Wall	EI 18.5	S	5	18.5	
41	20+98.55	42+10.0	Levee	EI 18.0	S	2111.45	18	
42	42+10.0	42+16.00	Ramp No 1 - Levee Transition	EI 18.0 - EI 14.5	P	6	16.25	
43	42+16.00	42+26.00	Ramp No 1 - Levee	EI 14.5	P	10	14.5	
44	42+26.00	42+62.00	Ramp No 1 - Roadway	EI 14.5	P	46	14.5	
45	42+62.00	42+68.00	Ramp No 1 - Levee	EI 14.5	P	6	14.5	
46	42+68.00	42+80.00	Ramp No 1 - Levee Transition	EI 14.5 - EI 18	P	12	16.25	
47	42+80.00	78+55.24	Levee	EI 18.0	S	3575.24	18	Reach 29
48	78+55.24	78+65.24	Ramp No 2 - Levee Transition	EI 18.0 - EI 14.5	P	10	16.25	
49	78+65.24	78+70.24	Ramp No 2 - Levee	EI 14.5	P	5	14.5	
50	78+70.24	78+98.24	Ramp No 2 - Roadway	EI 14.5	P	28	14.5	
51	78+98.24	79+36.24	Ramp No 2 - Shoulder	EI 15.0	P	38	15	
52	79+36.24	79+64.24	Ramp No 2 - Roadway	EI 14.5	P	928	14.5	
53	79+64.24	79+75.24	Ramp No 2 - Levee	EI 14.5	P	11	14.5	
54	79+75.24	79+81.24	Ramp No 2 - Concrete Capping	EI 18.0	P	6	18	
55	79+81.24	91+50.00	Levee (Now Floodwall)	EI 19.5	S	1168.76	19.5	Reach 28
56	91+50.00	94+60.00	Levee Transition	EI 19.5 - EI 17.0	S	310	18.25	
57	94+60.00	102+23.16	Levee (Ramp 3 included)	EI 17.0	S	763.16	17	Reach 27
58	102+23.16	136+13.19	FLOODWALL AT UNO - 1984			3390.07	20	Reach 26
59	136+13.19	159+70.00	Levee	EI 17.5	S	2356.81	17.5	Reach 25
60	159+70.00	163+98.15	London Ave. Outfall Canal		P	-	-	-
61	163+98.15	166+38.00	Levee	EI 18.0	S	239.85	18	
62	166+38.00	167+02.00	Ramp No. 5 (SEE PLATE 24 FOR DETAILS)		P	64	15.5	
63	167+02.00	196+50.00	Levee	EI 18.0	S	2948	18	Reach 24
64	196+50.00	199+41.52	Bayou St. John		P	-	-	-
65	199+41.52	203+18.00	Levee	EI 17.5	S	376.48	17.5	
66	203+18.00	204+28.30	Gate No 8 (SEE PLATE 17 FOR DETAIL)		P	110.3	17.5	
67	204+28.30	218+14.5	Levee (with 300 ft concrete capped wall at Ramp 6)	EI 17.5	S	1386.2	17.5	
68	218+14.5	218+77.5	Ramp No. 6 (SEE PLATE 24 FOR DETAILS)		P	63	14.5	
69	218+77.5	244+59.81	Levee	EI 17.5	S	2582.31	17.5	
70	244+59.81	246+10.04	Gate No 9 Marconi (SEE PLATE 18 FOR DETAIL)		P	150.23	17.5	
71	246+10.04	246+37.18	Levee (now concrete capped floodwall)	EI 17.5	S	27.14	17.5	Reach 23

Features

<u>Elevation</u>	<u>Feature</u>
13.8	Gate at W. Roadway Street
14	WLT - OM 10/11
7.55	Gate 10 - Topaz Dr
13.8	NB Ramp at Canal Blvd
13.8	SB Ramp at Canal Blvd
12.05	Gate 9 - Marconi Dr.
16	Ramp 6 - Lakeshore Dr.
16	Ramp Lake Terrace Dr.
16	Ramp 5 - Lakeshore Dr.
16.8	Ramp 4 - Lakeshore Dr.
16.8	Ramp 3 - Lakeshore Dr.
16.3	Ramp 2 - Franklin Ave - double wide ramp
14.5	Ramp 1 - Leroy Johnson Drive
11.8	Gate 5 - Navy Reserve
11.55	Gate 4 - Navy Reserve
14	WLT O 16/15
10.05	Road Gate 3
7.3	RR - Gate 2
7	Gate at Filmore Ave
7	Gate at Filmore Ave
7	Gate at Leon C Simon Blvd
8.8	W. Roadway St
8.8	Gate 15 - Into Marina Parking
8.8	Gate 14 - Into Marina Parking
8.8	Gate 13 - Into Marina Parking
8.8	Gate 12 - Entrance to Marina
6.05	Gate 11 - Lakeshore Dr.
7.55	Gate 10 - Topaz Dr
12.05	Gate 9 - Marconi Dr.
-5	Bayou St John Floodgate
10	Gate 3 UNO
10	Gate 2 UNO
10	Gate 1 UNO
11.8	Gate 5 - Navy Reserve
11.55	Gate 4 - Navy Reserve
10.05	Road Gate 3
7.3	RR - Gate 2

Section 6: Inner Harbor Navigation Canal (IHNC)

Narrative

The Inner Harbor Navigational Canal (IHNC) reach extends along the west side of the IHNC from the lock at St. Claude Avenue northward to Lake Pontchartrain. Flood protection along this reach consists of levee and floodwall. From Station 0+00.00 to Highway 90 (Station 118+85.00) the floodwall sustained minor damage in the form of scour along its base. Figure 8 shows the repair to the floodwall scour. The Levee and floodwall between Hwy 90 (Station 118+85.00) and Florida Ave sustained scour damage. In this area, the floodwall breached at N29 59.315 and W90 01.612. Figure 9 shows the repairs in the breached area. The floodwall between Florida Avenue and the Lock sustained damage along the base of the floodwall in the form of scour.



Repair to Scour Along Floodwall.



Repairs Along the IHNC Where The Floodwall Breached Levee Section.

Definition of Reaches

Reach 33-41 (now 61-65)– These reaches consists primarily of I-walls along the canal with a levee section at the Port of New Orleans facility. The elevations of the I-walls and lengths of reaches are shown below. There are fourteen transitions (Pump Stations 3 and 4) and thirty five gates in this reach.

<u>Reaches</u>	<u>Length</u>	<u>Elevations</u>
61	9,095	13.50
62	9,170	13.80
63	1,490	13.80
64	8,390	13.80
65	875	20.10

Elevation Stationing									
Section	Start	End	Structure	EL	Section/Point	Length	Avg Height		Weighted Average
1	31+05	46+00	I-Wall	14	S	1495	14	Reach 33	14.00
2	46+00	46+30	I-Wall Transition	14.0 - 14.25		30	14.125	↓	
3	46+30	61+00	I-Wall	14.25		1470	14	Reach 34	14.00
4	61+00	61+30	I-Wall Transition	14.25 - 14.5		30	14.375	↓	
5	61+30	76+00	I-Wall	14.5		1470	14.5	Reach 35	14.50
6	76+00	76+30	I-Wall Transition	14.5 - 14.75		30	14.625	↓	
7	76+30	90+70	I-Wall	14.75		1440	14.75	Reach 36	14.75
8	90+70	91+00	I-Wall Transition	14.75 - 15.0		30	14.875		
9	91+00	106+25	I-Wall	15		1525	15		
10	106+25	106+57	France Road Ramp	14.5		32	14.5		
11	106+57	106+84.5	I-Wall	15		27.5	15		
12	106+84.5	109+81.5	I-Wall	14.5		297	14.5		
13	109+81.5	110+37.5	Gate 1W / T-Wall	14		56	14		
14	110+37.5	112+15	I-Wall	14.5		177.5	14.5		
15	112+15	112+56	Gate 2W / T-Wall	14		41	14		
16	112+56	116+53	I-Wall	14.5		397	14.5		
17	116+53	118+85	I-Wall	15		232	15		
18	118+85	119+59	Hwy 90	17		74	17		
19	119+59	121+78.5	I-Wall	14.5		219.5	14.5		
20	121+78.5	122+07.5	Gate 3W	14		29	14		
21	122+07.5	124+88.5	I-Wall	14.5		281	14.5		
22	124+88.5	125+17.5	Gate 4W	14		29	14		
23	125+17.5	128+41.5	I-Wall	14.5		324	14.5		
24	128+41.5	128+70.5	Gate 5W	14		29	14		
25	128+70.5	130+53.5	I-Wall	14.5		183	14.5		
26	130+53.5	130+82.5	Gate 6W	14		29	14		
27	130+82.5	132+00	I-Wall	14.5		117.5	14.5		
28	132+00	135+31	I-Wall	15		331	15		
29	135+31	136+10	Gate 7W	14		79	14		
30	136+10	136+27	T-Wall	14		17	14		
31	136+27	136+94.5	Gate 8W	14		67.5	14		
32	136+94.5	137+42	I-Wall	15		46.5	15		
33	137+42	137+72	I-Wall	14.5		30	14.5		
34	137+72	141+20	Levee	15		348	15		
35	141+20	143+94	I-Wall	15		274	15		
36	143+94	144+01	T-Wall	14		7	14		
37	144+01	144+48	Gate 9W	14		47	14		
38	144+48	145+39	I-Wall	15		91	15		
39	145+39	145+76	I-Wall	14.5		37	14.5		
40	145+76	148+28	Levee	15		252	15		
41	148+28	210+10	I-Wall	15		6182	15		
			Double Hung Gates (France Rd Parkw	80					
42	210+10	210+89	T-Wall	14		79	14		
43	210+89	211+03	Gate 10W	14		14	14		
44	211+03	211+17	T-Wall	14		14	14		
45	211+17	211+46	I-Wall	15		29	15		
46	211+46	211+81	I-Wall	14.5		35	14.5	Reach 37	14.88
			France Road Ramp	14.5					
47	211+81	226+44	Levee	15		1463	15	Reach 38	15.00
48	226+44	226+60	I-Wall	15		16	15	↓	
49	226+60	235+77	T-wall	14		917	14	Reach 39	14.02
Start at Pump Station #14									
50		390	I-wall/Twall	15	Transition		Pumping Station #14		
51		2293	I-wall	13	Reach 40				
53		875	Levee	20	Reach 41		IHNC Lock		

Features

Elevation	Feature
13.25	Ramp east of France Road near Hickey Bridge
14.75	France Road Ramp near Chef Mentuer Hwy
6.25	Road Gate 7W
7.4	RR Gate 8W
9	Ramp to Bridge
4.75	RR Gate 9W
14.75	France Rd Ramp
4.25	Gate 10W - RR open

14.75	France Road Ramp
2.25	Gate in Levee at Port of NO
2.25	Gate in Levee at Port of NO
6	Pump Station near Florida Ave Bridge
14	LWT OM 22/23
5	Gate in France Road
7.25	Gate 1W road closed
7.55	Gate 2W RR open
9.5	Gate 3W access open
11.25	Gate 4W access open
11.25	Gate 5W access open
11.25	Gate 6W access open
6.25	Gate 7W road closed – damaged
7.4	Gate 8W RR open – Failed during Katrina
4.75	Gate 9W RR open – damaged
4.25	Double Gates - France Rd Parkway – damaged
4.25	Gate 10W - RR open – damaged
4.25	Gate in levee at Port of NO – Failed during Katrina
4.25	Gate in levee at Port of NO – Failed during Katrina
2.5	Gate in pier access – no damage
2.5	Gate in pier access – no damage
6	Gate next to pump station
2.25	Road closed – Florida Avenue Bridge Gate W20
2	RR closed
2.25	RR open – Gate W21
2.75	Road open – Florida Ave Bridge
7.45	Road open – Florida Avenue Wharf
4.45	RR open – Florida Avenue Wharf
7.25	Road open – Florida Avenue Wharf
8	Road open
8.25	Road open
7.5	Road open
1.75	Road open – Gate W6
2.35	RR closed – Gate W5
5.35	Road open – Gate W4
5.35	RR Access closed – Gate W3
3.5	Road open – Gate W2
2.25	Road open – Gate W1

Section 7: Mississippi River and Levees (MRT)

References

General design information was not available for the MRT walls and levees within Orleans Parish at the time of the report. Information was gathered from discussion with the Orleans Parish Levee Board and from the field recon.

Narrative

The MRT connects to the IHNC at the navigation lock facility. The MRT structures consist of levees into the INHC lock, a series of flood walls (as shown below) that surround the City of New Orleans up to the Port of New Orleans and a MRT levees from the Port of New Orleans to the Jefferson/Orleans Parish border.



Typical Area on the Mississippi River East Levee and Floodwall.

Definition of Reaches

Reach 42-50 (now 66-71) – These reaches consists primarily of I-walls with levees at the lakefront entrance on both on the east side of the London Avenue Canal at average elevation 14.0 feet with a length of approximately 12,130 feet, 3,880 feet, 12,765 feet and 3,030 feet respectively. There are two transitions (Pump Stations 3 and 4) and three gates in this reach.

Reaches	Length	Elevations
66	1,980	21.50
67	8,915	22.50
68	25,450	23.60

69	10,780	24.30
70	14,180	24.80
71	3,350	25.80

Section	Structure	EL	Length	Section/Point		Weighted Elevations
1	Levee	21	1774	S		21
2	I-Wall	17	19661	S	Reach 42	17
3	I-Wall	20	2951	S	Reach 43	
4	I-wall	17	1469	S	Reach 44	20
5	I-Wall	14	8371	S	↓	
6	I-Wall	17	3437	S	Reach 45	15.1
7	I-Wall	20	1843	S	↓	
8	I-Wall	18	5920	S	Reach 46	18.8
9	I-Wall	20	1902	S	Reach 47	
10	I-Wall	24	2961	S	Reach 48	
11	Levee	24	5917	S	Reach 49	24
12	Levee	20	2732	S	Reach 50	20
13	Levee	24	4526	S		24

Features

Elevation	Feature
7.5	Road Access — Off Poland Ave - Navy Complex
7.5	Road Access — Off Poland Ave - Navy Complex
7.5	RR Gate — Pauline St Wharf
7.5	Road Access — Pauline St Wharf
7.5	RR Gate — Pauline St Wharf
7.5	RR Gate — Off Charles St. – photo
7.5	Road Access — Off Charles St.
7.5	Road Access — Off Charles St.
7.5	RR Gate — Press St. Wharf
7.5	Road Access — Esplande St and Wharf
7.5	Road Access — To riverfront parking off N Peters
7.5	Road Access — To riverfront parking - St Peters
7.5	Road Access — To riverfront parking – Toulouse
7.5	Road Access — To riverfront parking - St. Louis
7.5	Road Access — To riverfront parking - Conti St
7.5	Road Access — To riverfron parking – Bienville
7.5	Pedestrian Crossing — North end of Riverwalk
7.5	Road Access — Convention Center openings
5	Road Access — Henderson Street
5	Road Access — Race Street
5	Road Access — Orange Street
5	Road Access — Celeste St – photo
5	Road Access — Port of NO - near Felicity St
5	Road Access — Port of NO - 3rd St
5	Road Access — Port of NO - Washington St
5	RR Gate — Port of NO - across from 9th ST
5	Road Access — Port of NO
5	RR Gate — Port of NO
7.5	Road Access — Port of NO - Louisiana Ave
7.5	Road Access — Port of NO
7.5	RR Gate — Port of NO - Napoleon Ave

- 7.5 Road Access — Port of NO - Warehouse Rd
- 7.5 Road Access — Port of NO
- 7.5 Road Access — Port of NO - Coffee Dr
- 7.5 Road Access — Port of NO - Leake Ave
- 7.5 Road Access — Port of NO - Henry Clay Dr

Orleans West Bank

The Orleans Parrish West Bank Basin is composed of two sub-basins (Figure 6). These are located on either side of the upper end of the Algiers. OW1, on the west side of Algiers Canal, was designed as part of the Algiers Canal to Hero Canal Project. OW2, on the east side of the Algiers Canal, was designed as part of the Harvey Canal to Algiers Project.



Figure 6. Orleans Parish West Bank Basin with sub-basins (OW1 and OW2)

OW1

Orleans West Bank – OW1 (Algiers Canal to Hero Canal Project)

Sub-basin OW1, as shown above, is located on the west bank of the Mississippi River in Orleans Parish and is generally bounded by a portion of the Algiers Canal, the Mississippi River and the Orleans-Plaquemines Parish line. Topography is flat with ground elevations ranging from +5 feet NGVD on the alluvial ridges along the Mississippi River to -7 feet NGVD in the interior of the area. Approximately 40 percent of the area is below sea level. The surface area is 4.7 square miles. The sub-basin area is protected by 15.0 miles of levees and floodwalls. There are no floodgates, drainage structures or control structures in the protection system. There is one pumping station that drains the protected area (NOS&WB Pumping Station #11 at location 29.90962 -89.978).

Segment 1 is a low, all earth (clay) non-federal levee separating Orleans Parish from Jefferson Parish. It extends from the main line Mississippi River levee (MRL) inside the US Coast Guard Station to the Algiers Canal levee with an elevation of 3–4 ft NVGD.









Back levee continues outside US Coast Guard toward GIWW Station. Crown is rutted



Drainage structure under Back Levee outside US Coast Guard station. Screw gate closure on culvert





Segment 2 is the East bank of the Algiers Canal levee that extends between the local interior levee (Segment 1) and the Algiers Lock. This 9.5 ft NVGD clay levee is interrupted by a floodwall segment that crosses in front of NOS&WB Pumping Station #11.



Abandoned pipe crossing through the Algiers Canal

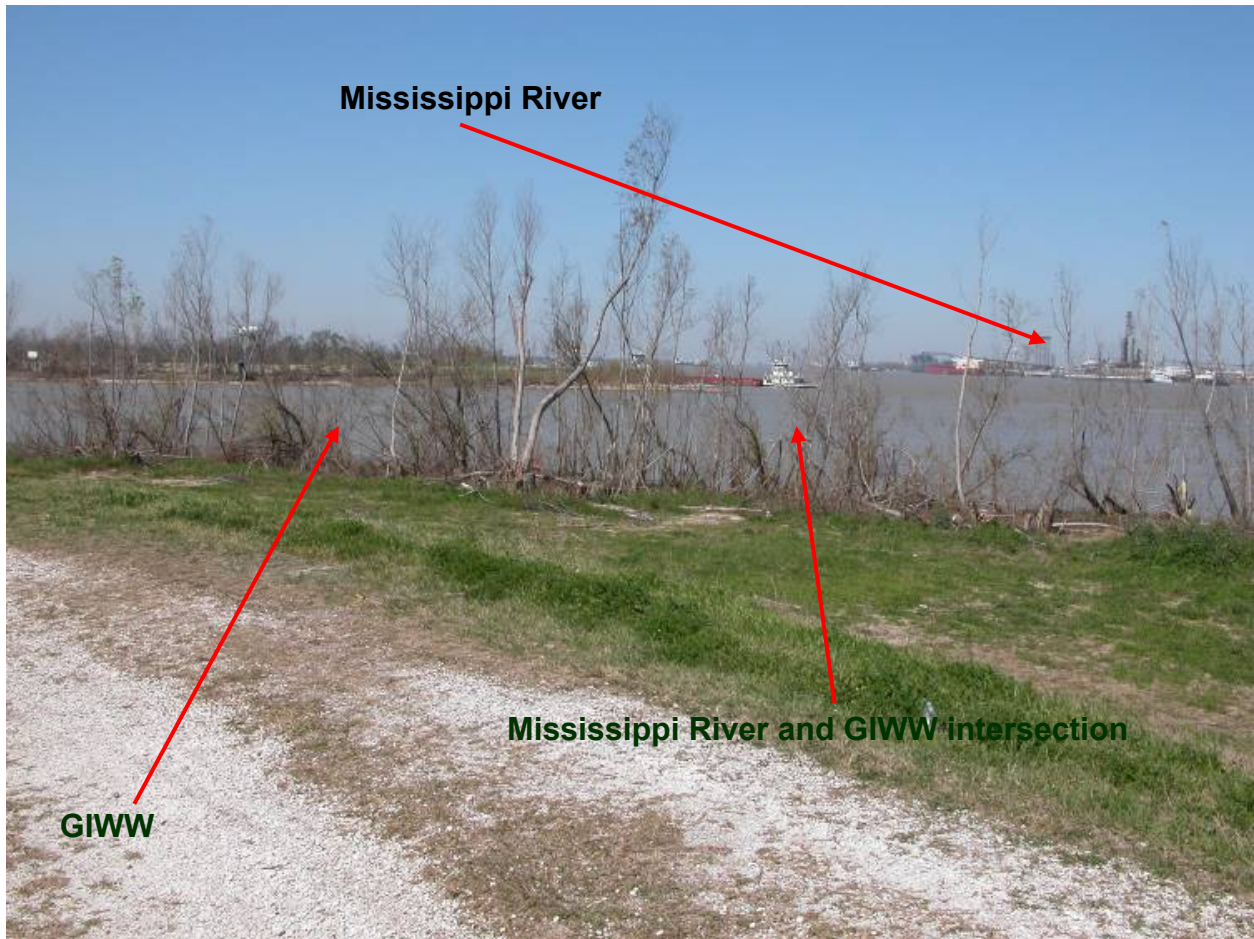


Typical Algiers Canal levee; no armor



South end of Algiers Lock

Segment 3 is the Orleans West Levee District Mississippi River levee. This levee segment closes the North and East side of the sub-basin. It extends from the GIWW and Mississippi River intersection to where it intersects the interior levee (Segment 1) inside the US Coast Guard Station. The MRL is an all clay levee with crushed stone surfacing on the 10-ft wide crown at elevation 22 ft NVGD.





Pipe crossing along MRL just east of GIWW and MRL intersection



Barge sitting on foot of MRL



OW2

Orleans West Bank – OW2 (Harvey Canal to Algiers Canal)

Sub-basin OW2, as shown in figure above, is located on the west bank of the Mississippi River in Orleans Parish. It is generally bounded by the Mississippi River, the Algiers Canal, and the Orleans-Jefferson-Plaquemines Parish boundary. The topography is flat with ground elevations ranging from +10 feet NGVD on the alluvial ridges along the Mississippi River to -5 feet NGVD in the interior of the area. Approximately 25 percent of the area is below sea level. The surface area is 6.3 square miles and the population is approximately 57,000. The sub-basin is protected by 12.6 miles of levees and floodwalls.

Segment 1 is a clay, non-federal levee that begins at the Greater New Orleans Bridge (US 90) crossing of the Mississippi River Levee and runs along the Orleans-Jefferson Parish line to the Algiers Canal levee, near the NOS&WB Pump Station #13. This interior levee is approximately 4 miles long and is at elevation 3–4 ft NGVD.

Segment 2 is the West bank of the Algiers Canal levee (GIWW) that extends between the local interior levee and the Algiers Lock. This clay levee is interrupted by a floodwall segment that crosses in front of NOS & WB Pumping Station #13. It is 1.8 miles long at elevation 9.5 ft NGVD.

Segment 3 is the Orleans West Levee District Mississippi River Levee extending from the Algiers Canal Lock west to the Orleans Parish Line (beneath the Greater New Orleans Bridge, US 90), completing the sub-basin. This MRL is a predominately all clay levee with small reaches of short concrete I-Walls atop the clay levee base. It is 6.8 miles long at elevation 22-23.5 ft NGVD. There are no floodgates, drainage culverts or control structures in the protection system. There is one pumping station that drains the protected area (NOS & WB Pumping Station #13 at location 29.8959, -89.9978).

Risk Model Idealization

The West Bank HPS was discretized into two sub-basins (OW 1 and OW 2) as shown in Figure 7. The sub-basins were defined to correspond to the known interior drainage areas. This reach idealization follows from the basin description information presented above, which was collected from project documents and field inspections. Figure 8 shows the elevations for the Orleans Parish West Bank HPS: **Pre-Katrina**—at the time of Katrina and **Current**—as of 1 June 2007.

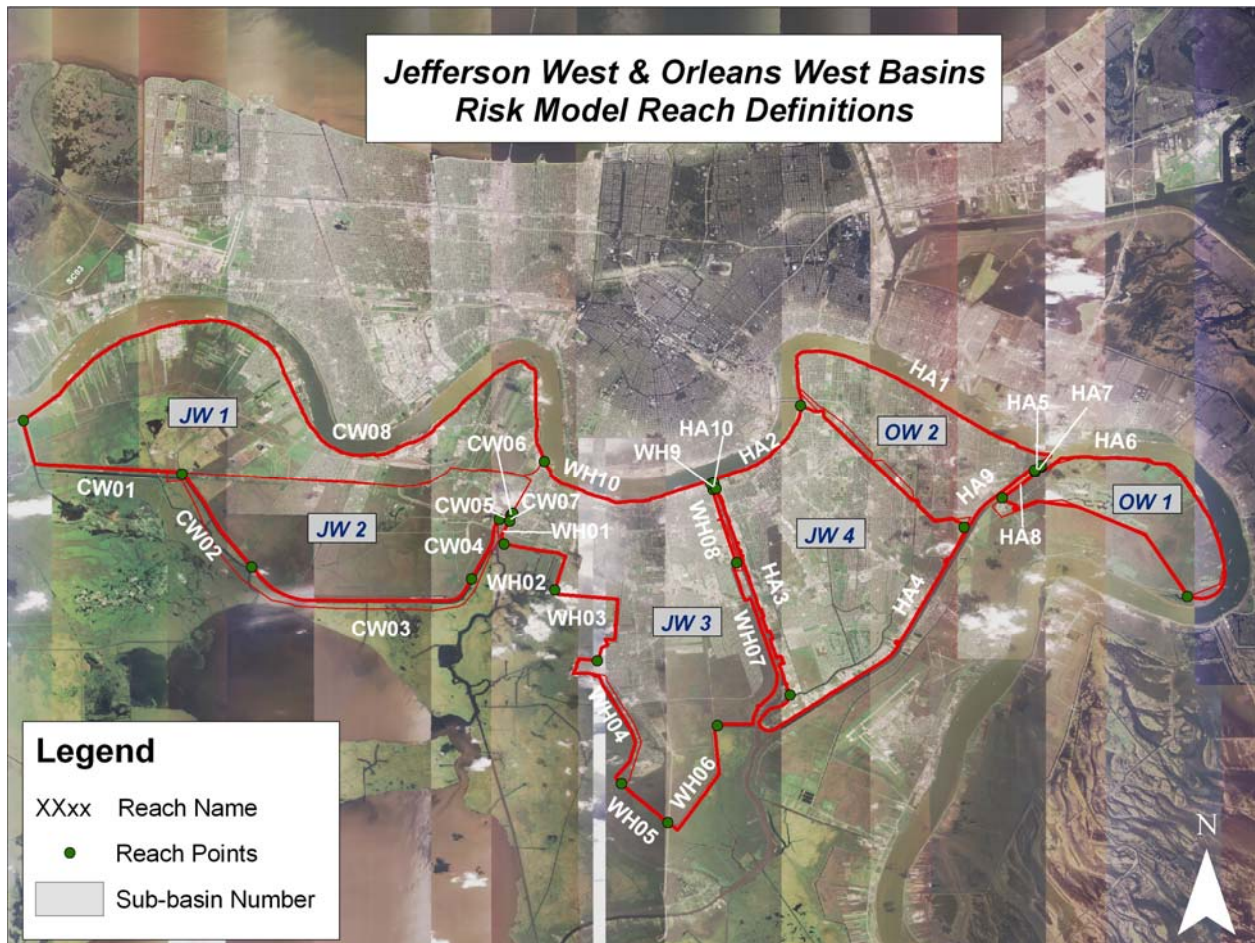


Figure 7. Orleans Parrish West bank Basin reaches (HA1,HA 5-HA9) and sub-basins (OW 1 and OW 2) definition for use in the risk model.

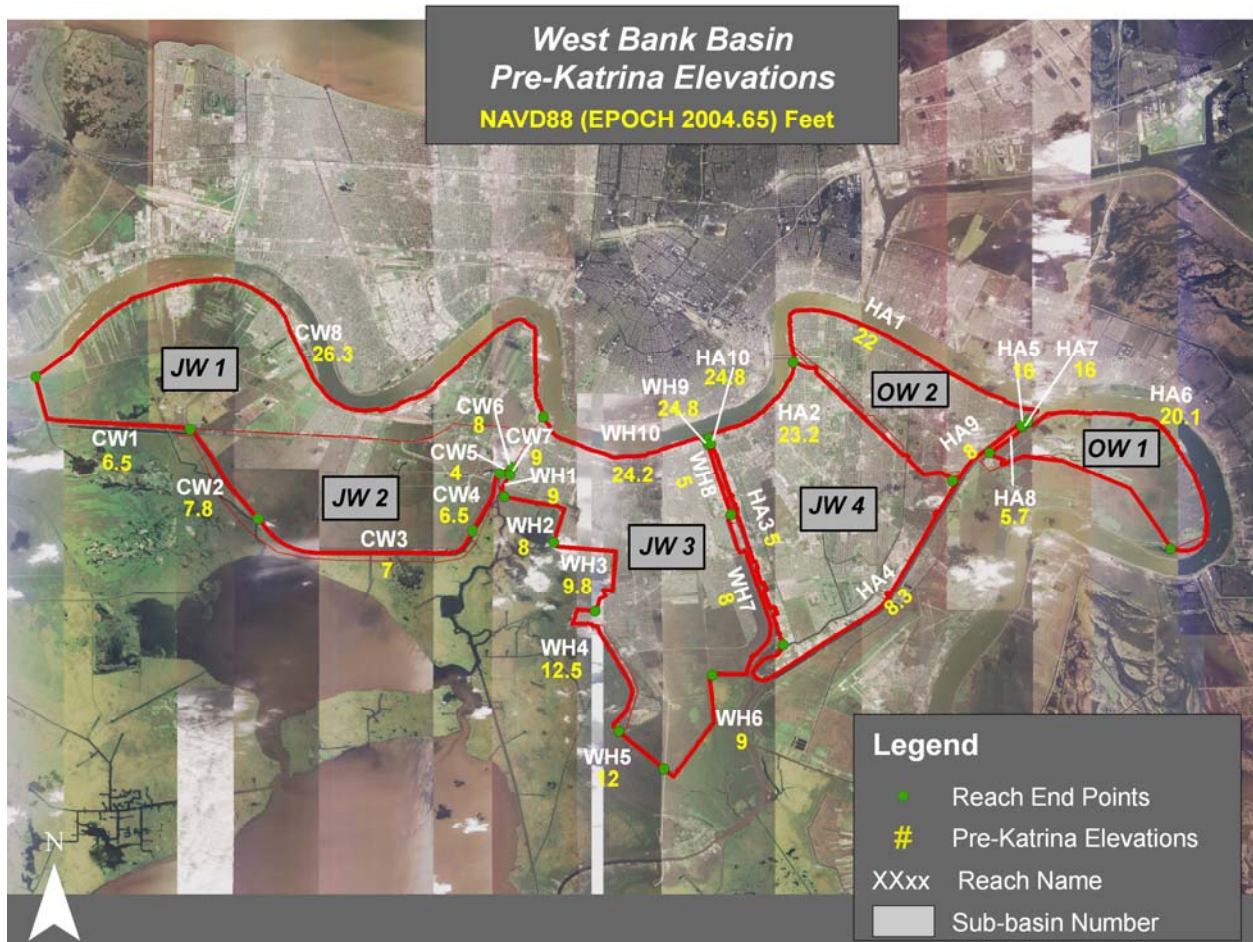


Figure 8. Elevations for the Orleans Parrish West Bank (OW1 and OW2) for the Pre-Katrina HPS (in place when Katrina occurred), the Current HPS (as of 1 June 2007), and the Authorized HPS (authorized at the time Katrina occurred) (continued)

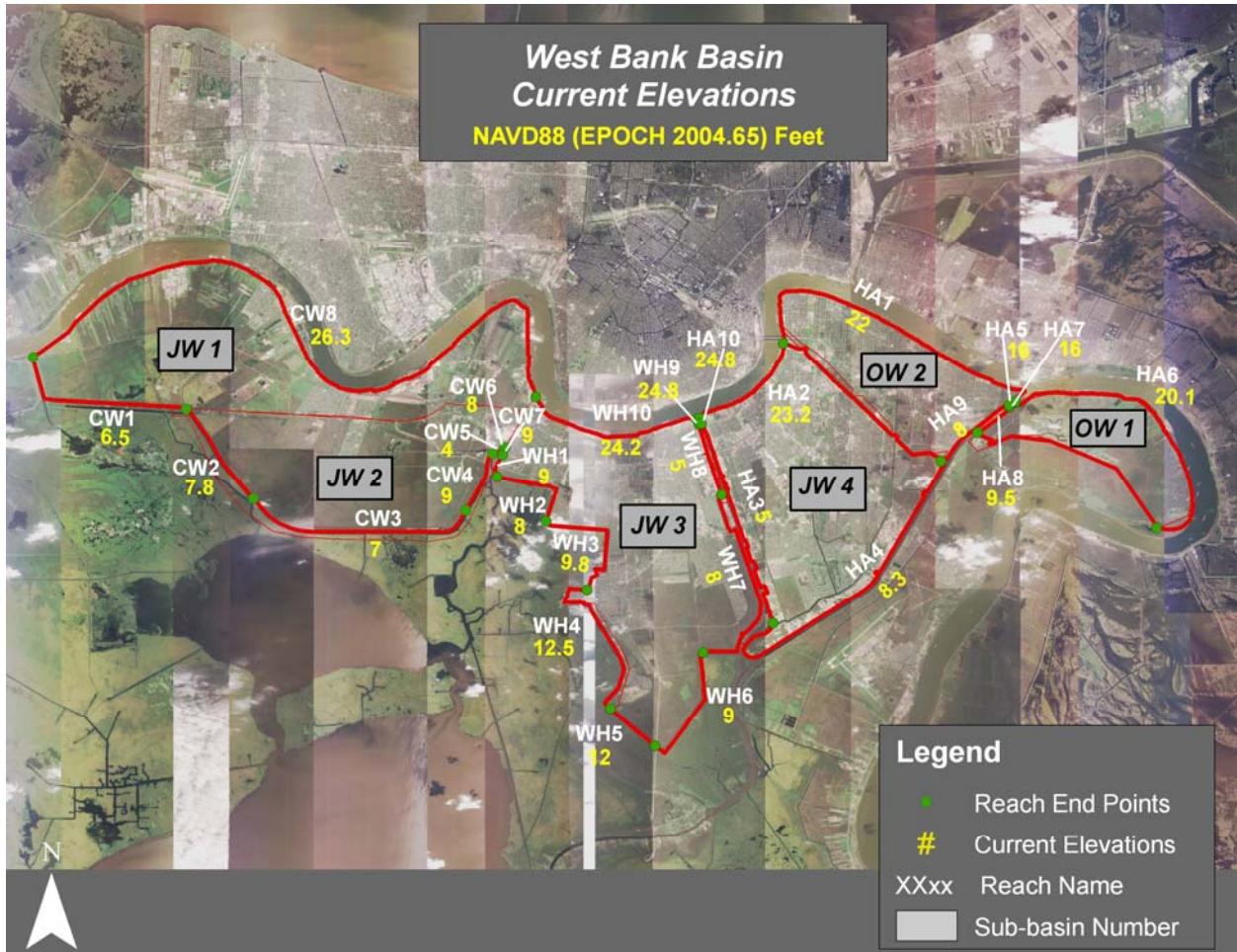


Figure 8. Continued