

ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO EMERGENCY  
OPERATIONS PLAN

**EMERGENCY EMPLOYMENT  
OF ARMY RESOURCES**

**EMERGENCY ACTION PLAN  
ADDICKS AND BARKER RESERVOIRS**

**U S A R M Y E N G I N E E R D I S T R I C T , G A L V E S T O N  
C O R P S O F E N G I N E E R S  
G A L V E S T O N , T E X A S**



**US Army Corps  
of Engineers®**

CESWG PLAN 500-1-3  
1 June 2005

ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO EMERGENCY  
OPERATIONS PLAN

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**Emergency Employment of Army and Other Resources  
Emergency Action Plan for Addicks and Barker Reservoirs**

**1. Purpose.**

This document meets requirements of Engineering Regulations 1130-2-530, and 1110-2-1156 which require an emergency action plan be provided for each Corps of Engineers dam. This Emergency Action Plan for Addicks and Barker Dams is directed at recognizing potential dangers, outlining actions to be taken, and assuring key individuals are aware of their responsibilities and have ready access to a plan of action outlining their roles. This document serves as a ready reference for both Corps personnel and local authorities to identify early signs of potentially dangerous conditions and the subsequent actions to be taken including notification of key personnel, immediate corrective action and evacuation of upstream and downstream areas if necessary. This document describes a plan to be followed by the Galveston District in the event of an impending dam safety emergency at Addicks and Barker Dams that consists of reservoir regulation, advance emergency planning, monitoring of instruments, embankment and foundation surveillance coordination, and warning the resident population of potential or imminent flooding. Resultant or coincident flooding will be addressed in accordance with the Flood Fight Annex of the Emergency Operations Plan and ER 500-1-1.

**2. Authority.**

Pertinent authorities, administration, contracting procedures and funding are contained in ER 1110-2-1156 and ER 1130-2-530.

**3. Implementation.**

The emergency procedures prescribed herein become automatically effective when actual or predicted water surface elevations within the reservoirs reach designated limits. The extent to which emergency elements are activated will be dependent upon conditions at Addicks and Barker Reservoirs and flooding on Buffalo Bayou downstream of the reservoir. Inundation maps have been forwarded to Harris County Flood Control District and Harris County Emergency Management. No evacuation plans have been formalized to date. The extensive area affected by a dam failure cannot be readily delineated by easily identifiable boundaries for public awareness. Therefore, warning the public of potential or pending disaster will be emphasized. The Senior Local Elected Officials and Local Emergency Management Offices will initiate mass evacuation upon necessity through the news media and Texas Department of Public Safety.

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**4. Emergency Action Plan.**

The Emergency Action Plan consists of advance preparation and four execution phases as follows:

- a. Advance Preparation. Ongoing activities and coordination with other agencies to insure maximum performance of the Galveston District and timely and orderly execution of duties in an emergency situation.
- b. Extended Watch. Addicks Reservoir pool reaches 90 feet NGVD (1973 adjustment) or Barker Reservoir pool elevation reaches 87 feet NGVD (1973 adjustment). Reservoir pools have reached significant levels to warrant extended watch of the structures due to surrounding conditions.

Mission Manning The project will be manned 0800 – 2200 weekdays, and spot checked in the morning and evening on weekends. One individual from the project office will work extended hours to fulfill this manning requirement.

- c. Phase I - Alert. Addicks Reservoir pool elevation reaches, or is predicted to reach 103 feet NGVD (1973 adjustment), or Barker Reservoir pool elevation reaches, or is predicted to reach 97 feet NGVD (1973 adjustment).

Mission Manning The project will be manned 24 hours. The following personnel will deploy to the project office within 6 hours of notification.

Dam Safety Engineer (1)  
Chief Foundation Observer (1)  
Foundation Observers (8)  
Cloth & Stone Placement (2)  
Chief Hydrologic Observer (1)  
Hydrologic Observers (6)  
Area Engineer, Bay Area Office (1)  
Contracting Officer (1)  
Contract Specialist (1)  
Public Affairs Specialist (1)  
Water Control (1)  
Administrative Assistant

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- d. Phase II - Emergency. Sand boils and/or seepage through the embankment or piezometer readings are observed at either Addicks Dam or Barker Dam that require corrective measures.

Mission Manning The project will be manned 24 hours. It will be manned by the same personnel as in Phase 1 – Alert.

- e. Phase III - Evacuation. Conditions are such that failure of either Addicks Dam or Barker Dam is judged to be imminent by the District Engineer, Deputy District Engineer, or the District Engineer's Authorized Representative.

**5. Organizations.**

The Addicks & Barker mission organization and flow charts are shown in Appendix B.

**6. Action Levels/Responsibilities.**

**a. Advance Preparation**

**Engineering – Construction Division**

1. Chief, Engineering-Construction Division serves as Dam Safety Officer.
2. Appoint Dam Safety Engineer (Commander's Authorized Representative).
3. Provide estimated cost of Engineering-Construction Division activities for advance preparation to the Operation Manager in Project Operations Division.
4. Ensure that all actions required for Advanced Preparation are accomplished.

**Dam Safety Engineer**

5. The Dam Safety Engineer will be the custodian of the Emergency Action Plan for Addicks & Barker.

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Advance Preparation (continued)

6. Coordinate District efforts under advance preparation and keep the Chief, Engineering-Construction Division and Emergency Management apprized of progress.
7. Develop scope of work for emergency contractors.
8. Setup and conduct training for response personnel as required by regulation.

**Geotechnical and Structures Section**

9. Verify that Foundation Observer equipment listed in Appendix G is maintained at Addicks Field Project Office.
10. Maintain and update standard operating procedures for foundation observer teams, Appendix G.
11. Prepare, appoint, and maintain a list of foundation observer teams.
12. Annually confirm, prior to hurricane season, that 1,900 tons of stone, 2,200 square yards of filter cloth and 500 pins are stock piled at the Addicks Field Project Office and are available and suitable for emergency use.
13. Ten bound brochures will be maintained containing drawings for Addicks and Barker Dams and cross sections at piezometer locations for both dams. These brochures will be furnished to Division Chiefs and other key personnel as required for Phase II conditions.

**Hydrology and Hydraulics Section**

14. Update standard operating procedure for hydrologic observer teams, Appendix I.
15. Chief Hydrology and Hydraulics Section will assign 3 hydrologic observer teams consisting of one Hydrology and Hydraulics Section member and one requested person from Engineer-Construction Division.

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Advance Preparation (continued)

16. Coordinate with Water Control personnel on condition and location of rain gages.
17. Prepare maps and routes for each hydrologic observer team and add to Appendix I.
18. Verify that equipment listed in Appendix I is maintained at Addicks Field Project Office.

**Area Engineer, Bay Area Office**

19. Develop a list of contractors for response to Phase 1 emergencies.

**Operations Division**

20. Provide estimated cost of Operations Division activities under advanced preparation to the Operation Manager in Project Operations Division. Estimate should include wages and cost of equipment and materials to be purchased.

**Project Operations Branch**

21. Establish training program for emergency action and conduct a minimum of one tabletop exercise every 3 years and a functional exercise every 5 years.
22. Provide an area at Addicks Field Project Office for crushed stone, sand stockpile and sandbag filling work.
23. Provide a minimum of 2,000 sandbags, 2,500 ties, 10 twisters and 25 shovels, and store at the Addicks Field Project Office.
24. Procure 100 cubic yards of sand, and stockpile on leveled area, (20) above.
25. Inspect the roadways at Addicks and Barker Dams to enable vehicle access during inclement weather.

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Advance Preparation (continued)

26. Assure that equipment needed for hydrologic and foundation observers are stored at Addicks Field Project Office. (Reference Appendices G & I)
27. Arrange for rental or purchase of suitable type sandbagging equipment.
28. Check Addicks Field Project Office auxiliary power plant (regularly) for operability and portability.
29. Coordinate, arrange and hold a training session on use of radio equipment.
30. Assure availability of ten portable radios for field personnel.
31. Be prepared to provide an Electronic Technician.
32. Provide wheel-mounted floodlights to the Addicks Field Project Office.
33. Prepare estimate of cost for personnel, procurement of equipment and materials etc., for Project Operations Branch advance preparation responsibilities to the Operation Manager in Project Operations Division.
34. Establish and maintain rain gage and rating curve network in Addicks, Barker, and Cypress Creek watershed.
35. Coordinate with National Weather Service, United States Geological Survey and Harris County Flood Control District concerning public advisories, stream flow data and exchange of data.
36. Familiarize Hydrology and Hydraulics Section personnel with reservoir forecasting techniques.
37. Prepare flood area maps resulting from damaging releases from Addicks and Barker Reservoirs, Appendix H.

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Advance Preparation (continued)

**Emergency Management**

38. Prepare a scenario for an emergency situation at Addicks and Barker Reservoirs.  
Offices assisting in preparation of training scenario:  
(Chief, Engineering-Construction Division)  
(Dam Safety Engineer)  
(Geotechnical and Structures Section)  
(Hydrology and Hydraulics Section)  
(Operations Division)  
(Area Engineer, Bay Area Office)
39. Coordinate Emergency Action Plan for Addicks and Barker Reservoirs with pertinent State, County and City Offices.
40. Make necessary arrangements for the exercise through coordination with Project Operations Branch.
41. Prepare list of pertinent State, County and City officials.
42. Determine location for evacuation of Addicks/Barker Incident Command Center to be used during Phase III.
43. Familiarize key personnel with Appendix A, Section 4.

**Logistics Management Office**

44. Develop procedures for requesting a Rapid Response Vehicle (RRV) through USACE Headquarters
45. Coordinate with Electronic Technician to furnish field vehicles with radio equipment or cell phones. Radios will be on same frequency as Addicks Field Project Office radio.

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Advance Preparation (continued)

**Contracting Division**

46. Provide assistance in developing the Specification for scope of work for emergency contractors.
47. Appoint a Contracting Officer and Contract Specialist for the Addicks/Barker Incident Command Center.
48. Determine the type and method of contracting needed to satisfy requirements of an unusual and compelling urgency (Seal Bidding, Negotiations, or Small Purchase).

**Public Affairs**

49. Appoint a Public Affairs Representative for the Addicks/Barker Incident Command Center.
50. Prepare a public release regarding condition of Addicks and Barker Dams for Phase III - Evacuation.
51. Arrange for spokesman to respond to calls from the general public.

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**b. Extended Watch**

**Engineering-Construction Division**

1. Situational awareness.

**Dam Safety Engineer**

2. Evaluate piezometer readings.
3. Notify key personnel in Engineering-Construction of Extended Watch status of the project.

**Geotechnical and Structures Section**

4. Situational awareness.

**Hydrology and Hydraulics Section**

5. Situational awareness.

**Area Engineer, Bay Area Office**

6. None.

**Operations Division**

7. Situational awareness.

**Project Operations Branch**

8. Situational awareness.
9. Notify by telephone or in person - Operations, Dam Safety Engineer and Emergency Management of Extended Watch Status of Project.

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Extended Watch (continued)

10. Water Control personnel will notify the Addicks Field Office that the reservoirs have reached extended watch status and watch procedures will commence or be discontinued as the reservoir pools indicate.
11. Notify District Personnel. "Distribution A" email message.
12. Notify Emergency Management when the trigger level for notification of Emergency Action Plan Phase 1 response personnel and vehicle identification is reached. i.e Addicks 100.0', Barker 94.0' per Appendix L.

**Emergency Management**

13. Situational awareness.

**Logistics Management Office**

14. None.

**Contracting Division**

15. None.

**Public Affairs**

16. Situational awareness.

**Addicks Field Project Office**

17. Collect piezometer readings.
18. Situational awareness.

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**c. Phase 1 - Alert**

**Engineering – Construction Division**

1. Dispatch the Dam Safety Engineer to the Addicks/Barker Incident Command Center, Addicks Field Project Office. Standard operating procedure for the Addicks/Barker Incident Command Center is contained in Appendix C.
2. Provide manning as required by the plan thru the Crisis Management Team (CMT).

**Dam Safety Engineer**

3. Proceed to Addicks/Barker Incident Command Center, Addicks Field Project Office.
4. Assume role as mission manager, take charge of emergency activities.
5. Assure that the Emergency Operation Center is kept informed of activities and changing conditions at the site. This is done through the Field Operations Lead on the Crisis Action Team (CAT) or during larger events, through a Mission Coordinator specifically assigned to Addicks & Barker mission and working for the Field Operations Lead.
6. Notify Contracting Division to issue Emergency Contracts as required by the situation. This is to be coordinated through the Field Operations Lead or Mission Coordinator.

**Geotechnical and Structures Section**

7. Chief Foundation Observer and foundation observer teams will proceed to Addicks Field Project Office in accordance with Appendix G.
8. Maintain liaison with Chief Foundations Observer through the Emergency Operation Center.

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Phase 1 - Alert (continued)

**Hydrology and Hydraulics Section**

9. Chief Hydrologic Observer and hydrologic observer teams will proceed to Addicks Field Project Office in accordance with Appendix I.
10. Maintain liaison with Chief Hydrologic Observer through the Emergency Operation Center

**Area Engineer, Bay Area Office**

11. Notify radio-monitoring personnel to keep informed of conditions at Addicks and Barker Reservoirs through the Addicks/Barker Incident Command Center, Addicks Field Project Office, and assist as requested. These instructions will continue through duration of emergency.
12. Proceed to Addicks/Barker Incident Command Center, Addicks Field Project Office.
13. Notify contractors to be on standby alert with equipment, operators, and laborers ready to mobilize. This can only be done after a contractor has been chosen by contracting division.

**Operations Division**

14. Apprise Project Operations Branch of situation and instruct them to provide radio surveillance.

**Project Operations Branch**

15. Contact Addicks/Barker Incident Command Center, Addicks Field Project Office, and assure that sandbags and stockpiled materials are intact and that the filter cloth, shovels, ties and twisters are in stock.
16. Electronic Technician should be available for EOC.

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Phase 1 - Alert (continued)

17. Maintain liaison with Addicks Field Project Office Manager through the Emergency Operation Center.
18. Water Control Manager will proceed to Addicks/Barker Incident Command Center, Addicks Field Project Office.
19. Issue instructions to Addicks Field Project Office concerning operation of reservoir gates based on reservoir conditions, inflow forecasts, and downstream conditions.
20. Maintain liaison with National Weather Service, United States Geological Survey and Harris County Flood Control District to exchange and gather data.
21. Update reservoir forecasts as required.
22. When conditions require, coordinate with National Weather Service concerning flood advisories.
23. Notify District personnel (positive contact) listed in Appendix F.

**Emergency Management**

24. Coordinate with appropriate State, County and City Offices and apprise them of alert status. See appendix F.
25. Activate and maintain the Emergency Operation Center.
26. Coordinate situation reporting to higher authority with Project Operations Branch.
27. Notify Addicks & Barker emergency response personnel to proceed to the Addicks/Barker Incident Command Center, Addicks Field Project Office.
28. Provide information to Public Affairs Office for public releases.

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Phase 1 - Alert (continued)

**Logistics Management Office**

29. Assure four-wheel drive vehicles, ATVs, (listed in Appendices G&I) are available upon request for personnel to proceed to Addicks and Barker Dams. Make necessary arrangements to assure that required vehicles can be provided in a timely manner.
30. Request a Rapid Response Vehicle (RRV) through USACE Headquarters.

**Contracting Division**

31. Prepare Solicitation packages as necessary.
32. Determine if Bid Guarantees will be required.
33. Advertise requirements through the most expedient means. Contract Vendors.
34. Issue Plans and Specifications.
35. Conduct Bid openings, evaluate bids and award contract.
36. Appoint the Administrative Contracting Officer.
37. Request Performance and Payment Bonds.
38. Issue Notice to Proceed to the contractor.
39. Prepare and submit Justification and Approval for Contracts for Other Than Full And Open Competition to appropriate authority as required.

**Public Affairs**

40. Establish contacts with news media.

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Phase 1 - Alert (continued)

41. Prepare and release public news releases to congressional representatives, news media, city, county, emergency operations, and government offices explaining conditions at Addicks and Barker Dams and the Emergency Operation Plan, as deemed necessary by the District Engineer.
42. Coordinate with Operations Branch and Emergency Management Office regarding status of reservoirs at or approaching 80 percent capacity, predictions, recommendations and the preparation of Public Announcements.

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**d. Phase II - Emergency**

**Engineering – Construction Division**

1. Assure that appropriate Engineering-Construction Division personnel are aware of the conditions and that they have initiated action commensurate with their assigned responsibilities.

**Dam Safety Engineer**

2. Dispatch all available personnel and equipment to the problem area.
3. Instruct the Area Engineer, Bay Area Office of required repairs and emergency operations by the contract work crews. A list of equipment is contained in Appendix E.
4. Notify Emergency Operation Center, Galveston District Office of the situation and directed remedial action.
5. Should communications to the District Office fail, notify Federal, State, County and City Offices, Appendix F.

**Geotechnical and Structures Section**

6. Maintain liaison with Chief Foundation Observer through the Emergency Operation Center.

**Hydrology and Hydraulics Section**

7. Maintain liaison with Chief Hydrologic Observer through the Emergency Operation Center.
8. Assist in preparation of flood area maps resulting from suspected breaches of Addicks and Barker embankments.

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Phase II - Emergency (continued)

**Area Engineer, Bay Area Office**

9. Serve as Contracting Officers Representative.
10. Notify contractors to mobilize equipment, operators, and laborers to the problem area.

**Operations Division**

11. Assure that appropriate Operations personnel are aware of conditions and that they have initiated their responsibilities.

**Project Operations Branch**

12. Continue liaison with the Addicks Field Project Office Manager through the Emergency Operation Center.
13. Update reservoir forecasts to reflect current conditions.
14. Direct releases from Addicks and Barker Reservoirs based on reservoir conditions and inflow. Coordinate with Dam Safety Engineer in regard to dam emergencies and possible emergency releases.
15. Exchange data with National Weather Service, United States Geological Survey and Harris County Flood Control District.
16. Cooperate with National Weather Service on advisories.

**Emergency Management**

17. Coordinate with appropriate State, County and City Offices and apprise them of emergency status.
18. Coordinate reporting to higher authority with Project Operations Branch.

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Phase II - Emergency (continued)

**Logistics Management Office**

19. Provide any additional equipment or logistical assistance as required.

**Contracting Division**

20. Assist the Administrative Contracting Officer.

21. Request additional contracting support if required.

22. Exercise staff supervision and oversight over the acquisition process of Service, Supply and Construction contract actions.

**Public Affairs**

23. Make public release regarding condition of Addicks and Barker Dam as deemed necessary by the District Engineer.

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**e. Phase III - Evacuation**

**Engineering-Construction Division**

1. None

**Dam Safety Engineer**

2. Consult with the Chief Foundations Observer, Chief Hydrologic Observer, Water Control Manager, Area Engineer, Bay Area Office and Addicks Field Project Office Manager in decision to evacuate.
3. Evacuate all personnel and equipment at the site and notify all field teams not at the site of evacuation.
4. Notify Emergency Operation Center, Galveston District Office of evacuation.
5. Should communications to the Galveston District Office fail, direct Public Affairs representative to contact Federal, State, County and City offices, Appendix F, and the news media and issue public statement pre-planned by the Public Affairs Office.
6. Provide information to Public Affairs Office for public releases.

**Geotechnical and Structures Section**

7. Continue liaison with Chief Foundations Observer.

**Hydrology and Hydraulics Section**

8. Maintain liaison with the Chief Hydrologic Observer through Emergency Operations Center.
9. Assist in preparation of flood area maps resulting from other suspected breaches of Addicks and Barker embankments.

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Phase III - Evacuation (continued)

**Area Engineer, Bay Area Office**

10. Direct contractor equipment relocation/removal.

**Operations Division**

11. Assure that appropriate Operations personnel are aware of conditions and that they have initiated their responsibilities.

**Project Operations Branch**

12. Continue liaison with the Addicks Park Manager through the Emergency Operation Center.
13. Exchange data with National Weather Service, United States Geological Survey and Harris County Flood Control District - advise of condition and cooperate in advisories.

**Emergency Management**

14. Coordinate with appropriate State, County and City Offices and apprise them of evacuation status. See Appendix F.
15. Coordinate reporting to higher authority with Project Operations Branch.

**Logistics Management Office**

16. None

**Contracting Division**

17. None

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Phase III - Evacuation (continued)

**Public Affairs**

18. Make public release concerning possible/actual failure of the dam and evacuation.

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**9. Appendixes.**

- A. Reservoir Regulation
- B. Emergency Organization and Flow Charts
- C. Standard Operating Procedure, Addicks/Barker Incident Command Center
- D. Standard Operating Procedure, Emergency Operation Center
- E. Equipment and Contractors
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Appendix A  
Reservoir Regulation

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- 2. Addicks and Barker Reservoir ..... 2
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**Appendix A  
Reservoir Regulation**

**1. General.**

The Galveston District Commander has determined that conditions at Addicks and Barker Dams are such that increased monitoring and surveillance program is required when impounded water in the reservoir exceeds elevation 103 feet NGVD (1973 adjustment) or 97 feet NGVD (1973 adjustment), respectively. Other conditions that warrant increased monitoring and surveillance at Addicks and Barker Dams are sand boils, seepage, and rapidly increasing piezometer readings at low pool elevations.

**2. Addicks and Barker Reservoir.**

Project Operations Branch has the responsibility for directing reservoir releases. Should communications fail between the Galveston District and Addicks/Barker Emergency Center, Water Control Personnel on site will direct reservoir releases in concurrence with the Dam Safety Engineer.

**3. Operating Procedure.**

**A. Phase I - Alert**

Standard reservoir operating procedures will be maintained in accordance with the Addicks and Barker Water Control Manual.

**B. Phase II - Emergency**

**Condition 1.**

Corrective measures are being implemented for sand boils and/or seepage through the foundation or embankment, under this condition all allowable releases will be from the affected reservoir. An additional gate will be opened to 3 gate-feet every hour until 3 gates are opened 3 feet. Releases from both reservoirs will continue to be limited to the normal operation criteria of 2,000 cfs at Piney Point. Any deviation from the approved Addicks and Barker Water Control Manual procedures will require a concerted effort to contact Southwestern Division for Approval and documentation of this request.

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**Condition 2.**

Dam Safety Engineer determines corrective measures are ineffective and/or the number of areas requiring corrective measures is excessive and control is not probable. All gates of the reservoir experiencing the problems will be opened in accordance with the following table without regard to downstream conditions. If gate operations have been in accordance with Condition 1, enter the Table A1 at 5 gates open 3 feet.

TABLE A1

(Gates will be opened in 30 minute intervals)

TIME	GATES*	OPENING (ft.)
Time of condition 2 decision	5	1
30 minutes later	5	2
30 minutes later	5	3
30 minutes later	5	4
30 minutes later	5	5
30 minutes later	5	6

\*Middle conduit has 2 small gates to be referred to and operated as one gate.

**C. Phase III – Evacuation.**

If, after consultation with Chief Foundations Observer and Water Control Personnel, the Dam Safety Engineer judges dam failure to be imminent, gates of that reservoir will be fully opened immediately.

**4. Areas Above the Reservoirs.**

The 80 percent capacity of government owned land (GOL) (93,040 acre-feet, elevation 104.15 feet NGVD (1973 adjustment) at Addicks and 66,720 acre-feet, elevation 95.88 feet NGVD (1973 adjustment) at Barker) is established as the alert mechanism for informing local officials of the potential for flooding above GOL. Chief, Project Operations Branch has the responsibility for notifying the Emergency Operations Center and the Public Affairs Office. The Emergency Operations Center will coordinate with the Commander, Public Affairs Office, and Emergency Management Coordinators for Fort Bend and Harris Counties (Appendix F). Reservoir status, predictions, and

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recommendations will be evaluated and presented by Project Operations Branch to the Emergency Operations Center and Public Affairs Office on a situational case-by-case basis. Dam Safety Engineer and Water Control Personnel will assume these responsibilities should communications break down between the Addicks/Barker Incident Command Post and the District Office. Public Affairs representative will coordinate with Project Operations Branch and the Emergency Operations Center in the preparation of the Public Affairs announcements.

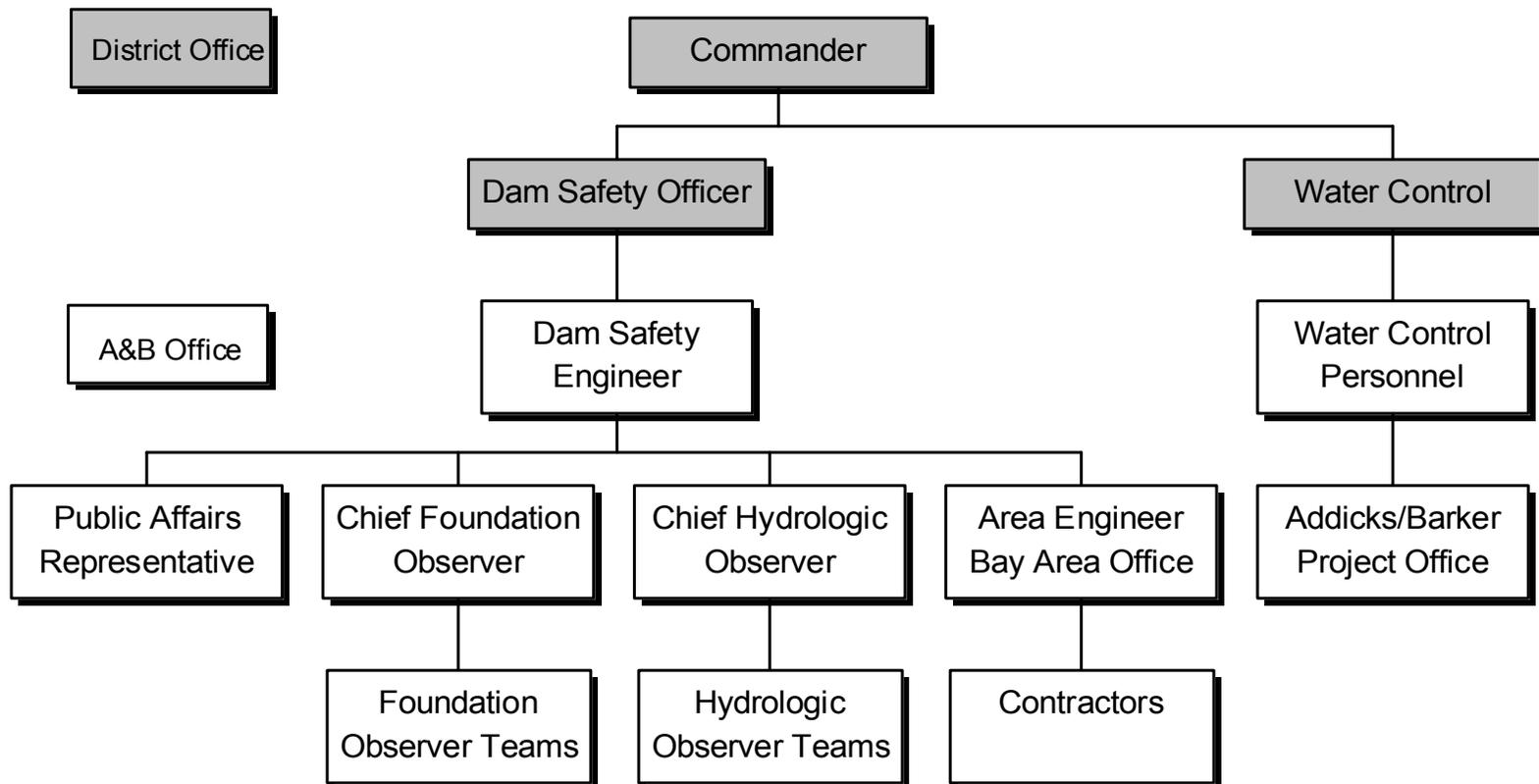
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Appendix B  
Emergency Organization and Flow Charts

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Addicks/Barker Incident Command Post .....	4
Phase 1 – Alert, Notification Tree .....	5
Phase 2 – Emergency, Notification Tree .....	6
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Radio Net.....	8

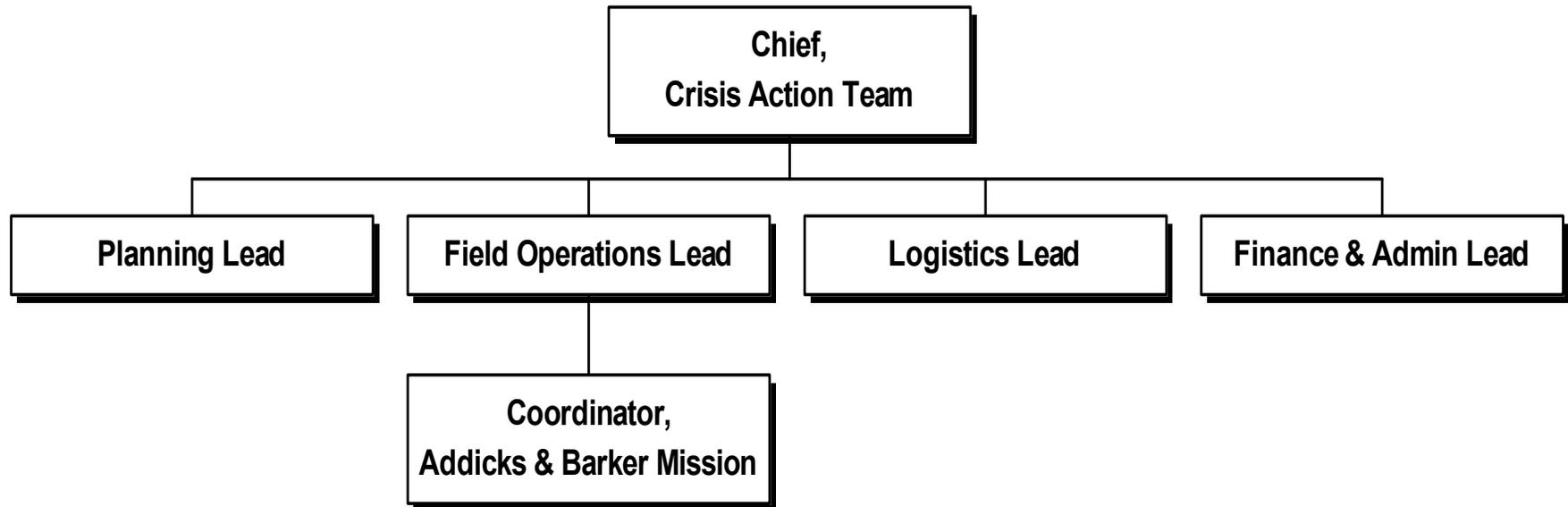
APPENDIX B TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO EMERGENCY OPERATIONS PLAN

**B-1. Lines of Authority for Emergency Operations at Addicks Project Office**



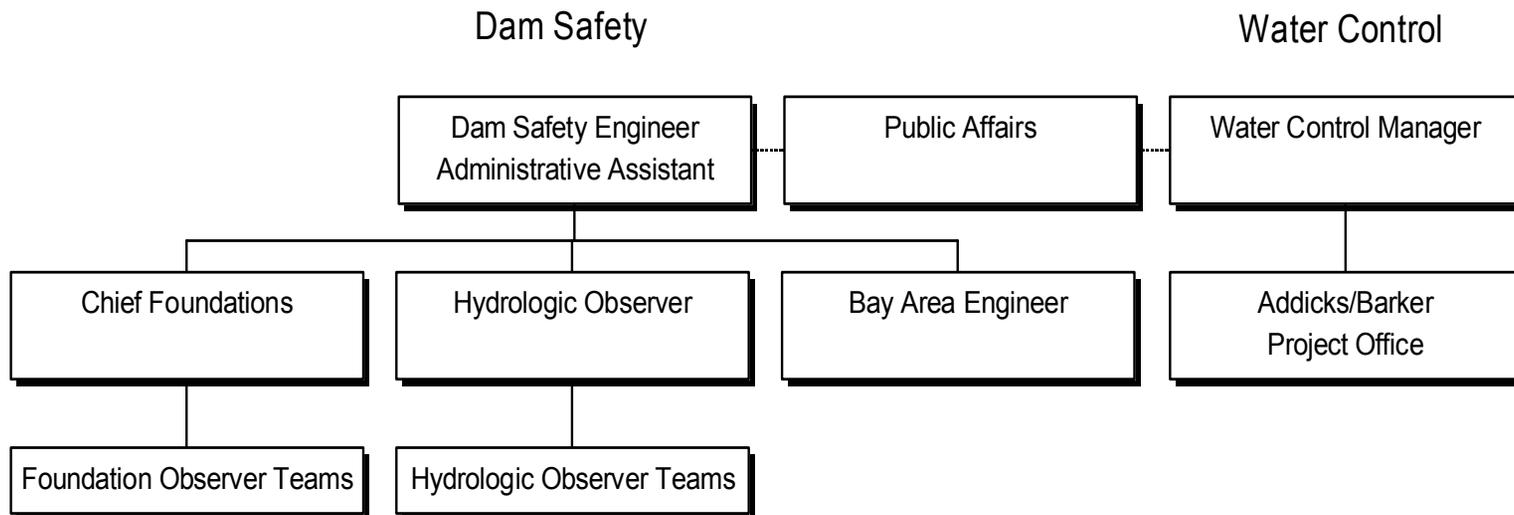
APPENDIX B TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO EMERGENCY OPERATIONS PLAN

**B-2. Emergency Operation Center, Galveston District Office**



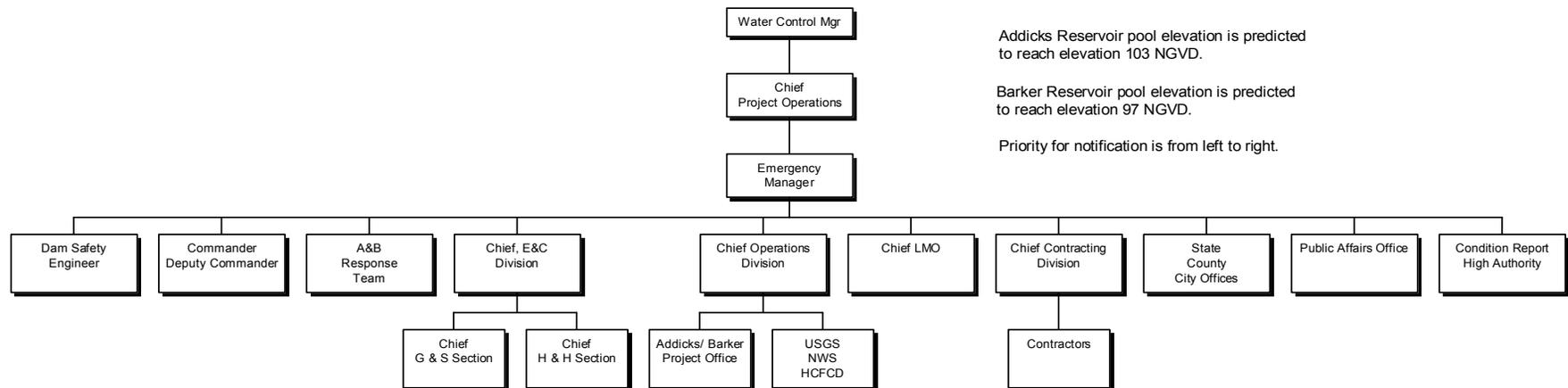
APPENDIX B TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO EMERGENCY OPERATIONS PLAN

**B-3. Addicks/Barker Incident Command Post**



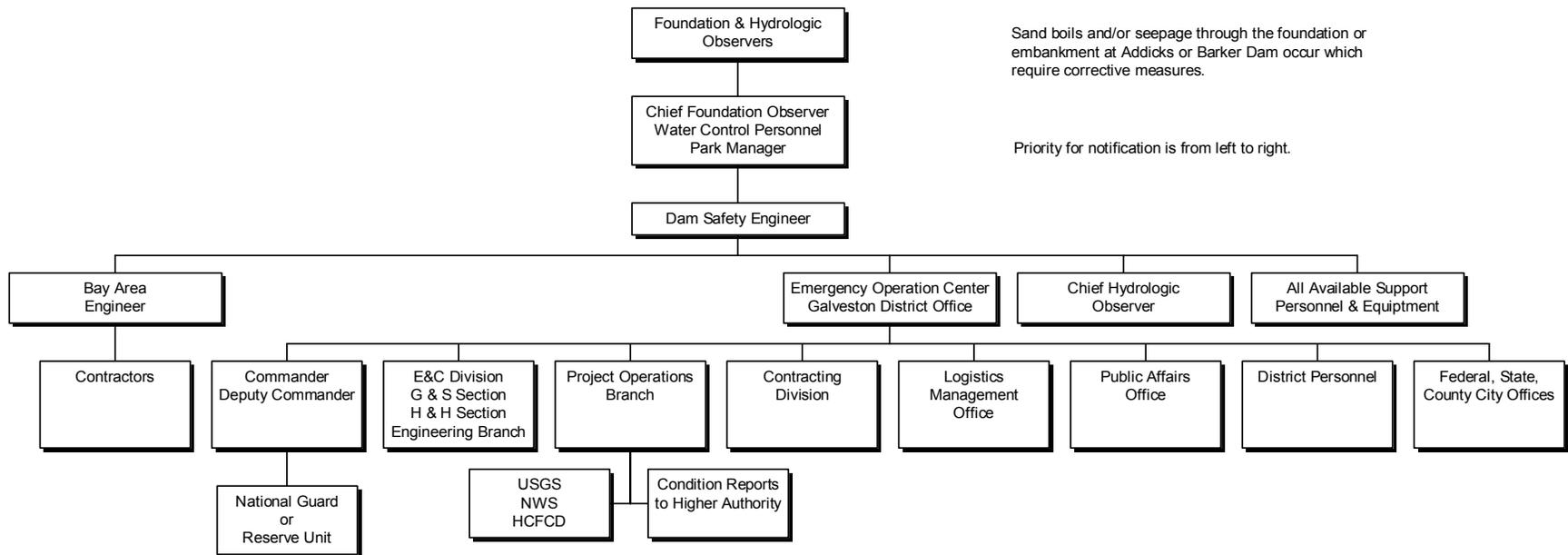
APPENDIX B TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO EMERGENCY OPERATIONS PLAN

**B-4. Phase 1 – Alert, Notification Tree**



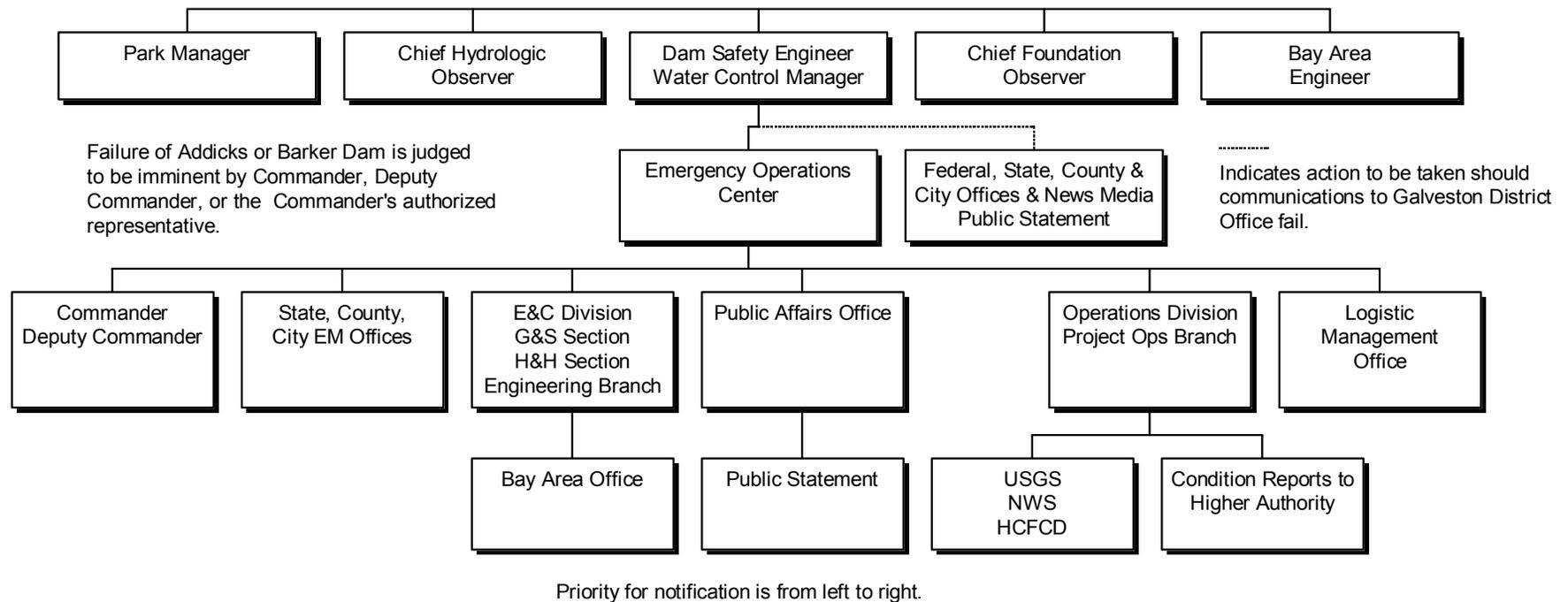
APPENDIX B TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO EMERGENCY OPERATIONS PLAN

**B-5. Phase 2 – Emergency, Notification Tree**



APPENDIX B TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO EMERGENCY OPERATIONS PLAN

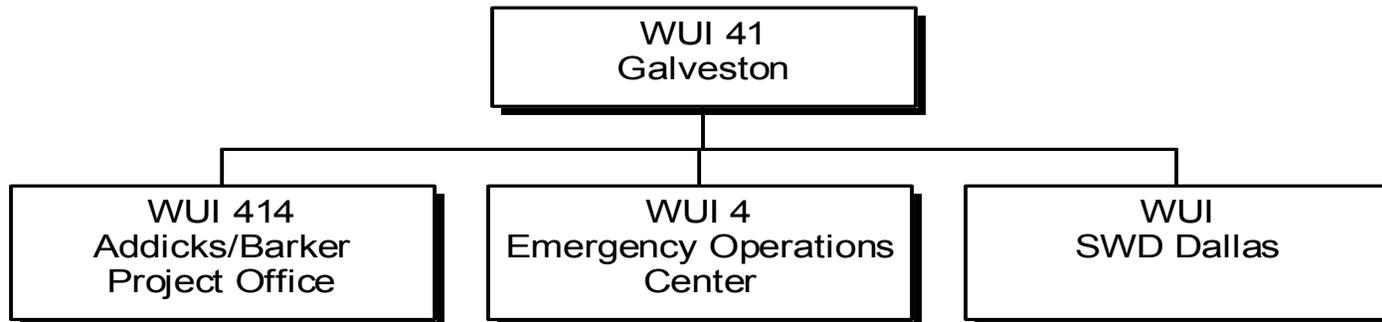
**B-6. Phase 3 - Evacuation**



APPENDIX B TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO EMERGENCY OPERATIONS PLAN

**B-7. Radio Net**

**EMERGENCY OPERATIONS CENTER  
RADIO NET**



Other associated call signs:  
WUI 42 - Corpus Christi  
WUI 411 - Freeport  
WUI 412 - Colorado River  
WUI 45 - Brownsville  
WUI 43 - Port Arthur  
WUI 41 - Area Office in Bldg.

APPENDIX C TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

Appendix C  
Standard Operating Procedure Addicks/Barker Incident Command Post

- 1. General..... 2
- 2. Duties: Phases I, II, and III..... 2
- 3. Personnel..... 2

APPENDIX C TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

**Appendix C  
Standard Operating Procedure  
Addicks/Barker Incident Command Post**

**1. General.**

The Addicks/Barker Incident Command Post at Addicks/Barker Project Office is the focal point for activities at Addicks and Barker Projects. All data and condition reports (Appendix K) transmitted to the Emergency Operation Center will be initiated at the Addicks/Barker Incident Command Post by the Dam Safety Engineer, Chief of the Center.

**2. Duties: Phases I, II, and III.**

- a. Obtain hydrologic data, foundation conditions and flooding information from hydrologic and foundations observers and transmit these data to the Emergency Operation Center.
- b. Direct reservoir releases should communications fail.
- c. Direct required emergency repairs to the dams' foundations.
- d. Notify appropriate Federal, State, County and City agencies, Appendix F, of serious or critical situations should communications to the Emergency Operation Center, Galveston District Office fail.

**3. Personnel.**

Addicks/Barker Incident Command Post personnel are listed on the following page.

APPENDIX C TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

**ADDICKS/BARKER  
INCIDENT COMMAND POST  
PERSONNEL LIST**

ADDICKS/BARKER INCIDENT COMMAND POST  
TELEPHONE NUMBER (281) 497-0740 (Houston)  
RADIO CALL WUI 414

PERSONNEL

Dam Safety Engineer  
Administrative Assistant  
Water Control Manager  
Public Affairs Representative  
Park Manager  
Area Engineer, Bay Area Office  
Chief Hydrologic Observer  
Hydrologic Observers (6)  
Chief Foundations Observer  
Foundation Observers (8)  
Cloth & Stone Placement (2)  
Contracting Officer  
Contract Specialist

CESWG PLAN 500-1-3  
1 June 2005

APPENDIX C TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

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APPENDIX D TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
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Appendix D  
Standard Operating Procedure Emergency Operation Center

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3. Duties. ....	2
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APPENDIX D TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

**Appendix D**  
**Standard Operating Procedure Emergency Operation Center**

**1. General.**

The Emergency Manager, as the Crisis Action Team Lead, is responsible for establishing, maintaining and supervising activities of the Emergency Operation Center (EOC). The EOC, located at the Jadwin Building, will be activated upon notice of Phase I conditions. Should a Phase I - Alert condition exist during or immediately following a hurricane, the EOC established in accordance with the Hurricane Plan (CESWG plan 500-1-3), will assume support for the mission for Addicks and Barker as part of the total district response function. The Emergency Operation Center may have relocated to the Addicks Project Office if the District Office was anticipated to be adversely affected by the hurricane. This may impact personnel and workspace, but should not change methods for implementing the Addicks and Barker Emergency Action Plan.

**2. Function.**

Functions of the Emergency Operation Center are:

- a. Coordinate all types of support required to conduct the mission.
- b. Give overall direction to the emergency operation in accordance with established policy.
- c. Serve as liaison between the Addicks/Barker Incident Command Post and the District staff.
- d. Conduct upward reporting of emergency response.

**3. Duties.**

- a. Phase I

APPENDIX D TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

1. Establish and maintain daily contact with State and local emergency officials.
2. Receive basic data and condition reports from the Addicks/Barker Incident Command Post.
3. Convey information to appropriate offices and personnel listed in Appendix F, Communication.

b. Phases II and III.

1. Conduct twice daily conference calls with State and local emergency officials.
2. Transmit instructions and information to the Addicks/Barker Incident Command Post, and other Federal, State, County and City officials as required.
3. Assist in preparation and transmission of situation reports in accordance with Appendix J, Reports.

**4. Personnel.**

Emergency Operation Center will be manned in relation to the magnitude of events. Specifics can be found in the main portion of this Emergency Operations Plan.

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1 June 2005

APPENDIX D TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

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APPENDIX E TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

Appendix E  
Equipment and Contractors

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APPENDIX E TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

**Appendix E  
Equipment and Contractors**

**1. General.**

Equipment and operators required to effect emergency embankment and foundation repair have been determined and compiled. A general scope of work and list of potential contractors are maintained by Contracting Division and the Dam Safety Engineer. A list of equipment and personnel are as follows.

**Required Rental Equipment and Contract Personnel**

- 4 - Crawler Loaders, 1 C.Y. - 2 1/2 C.Y.
- 2 - Crawler Tractors, D6 or equal, w/dozer blade and 50' tow cable
- 1 - Crawler crane, w/100' boom, or trackhoe w/ 50' boom clam shell and skip
- 4 - Dump truck, 8 C.Y.
  
- 11 Operators
- 20 Laborers
- 1 Foreman

APPENDIX F TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
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Appendix F  
Communication

Emergency Operations Planner Coordination List..... 2  
US Army Corps of Engineers Contacts ..... 4  
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APPENDIX F TO ANNEX I (ADDICKS & BARKER EMERGENCY OPERATIONS PLAN) TO EMERGENCY OPERATIONS PLAN

**Appendix F  
Communication**

**Emergency Operations Planner Coordination List**

<b><u>Office</u></b>	<b><u>Office Phone</u></b>
Department of Public Safety, Houston	281-517-1317
Texas Commission on Environmental Quality (TCEQ) – Texas Dam Safety Program	512-239-1000/0400
TCEQ Region 12, Houston	713-767-3500
Harris County and City of Houston Emergency Management	713-884-4500
Harris County Emergency Management	713-881-3100
Fort Bend County Emergency Management	281-341-4665 (24-hour) 281-342-6185
Piney Point Village Police Department City Secretary	713-468-7878 713-782-0271
Hunters Creek Village Police Department City Secretary	713-468-7878 713-465-2150
Hedwig Village Police Department City Secretary Emergency Management	713-461-4797 713-465-6009 713-662-8206
Bunker Hill Police Department City Secretary	713-468-7878 713-467-9762

APPENDIX F TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

City of Bellaire	
Police Department	713-668-0487
City Secretary	713-667-8222

City of West University Place	
Police Department	713-668-0330
City Secretary	713-662-5813

APPENDIX F TO ANNEX I (ADDICKS & BARKER EMERGENCY OPERATIONS PLAN) TO EMERGENCY OPERATIONS PLAN

**US Army Corps of Engineers Contacts**

<b><u>Office of the Chief of Engineers</u></b>	<b><u>Office Phone</u></b>	<b><u>Home Phone</u></b>	<b><u>Cell Phone</u></b>
<b><u>The individuals are listed in the order that notification should be made.</u></b>			
HQUSACE Dam Safety Officer, CECW-CE Donald L. Basham, P.E. Chairman of the Dam Safety Committee Chief, Engineering and Construction	202-761-8826	703-922-1819	
Special Assistant for Dam Safety, CECW-CE VACANT	202-761-7169		
HQUSACE Dam Safety Program Manager, CECW-CE-R/SWD Charles M. Pearre, P.E.	202-761-8994	703-590-7571	703-314-0254
Geotechnical Specialist, CECW-CE-R/MVD David A. Pezza, P.E.	202-761-4831	703-812-8655	978-239-3628
Operations Specialist, CECW-CO Barry W. Holliday, P.E.	202-761-8648	540-786-0552	703-203-7716
USACE Operations Center (24-hour Operations, ask for HQS Duty Officer)	202-761-1001		

APPENDIX F TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

<b><u>Southwestern Division</u></b>	<b><u>Office Phone</u></b>
Commander, Southwestern Division	469-487-7001
Engineering-Construction Division	469-487-7075
Operations Division	469-487-7059
Public Affairs	469-487-7106
Emergency Operations Manager	469-487-7018
Reservoir Control Center	469-487-7096
Dam Safety Engineer	469-487-7091

<b><u>Galveston District Emergency Offices</u></b>	<b><u>Office Phone</u></b>
Emergency Operation Center	409-762- 6300
Commander, Galveston District	409-766- 3001
Emergency Management	409-766- 3956
Addicks/Barker Emergency Center	281-497- 0740
Park Manager	281-497- 0740
Dam Safety Engineer	409-766- 3088

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APPENDIX F TO ANNEX I (ADDICKS & BARKER EMERGENCY OPERATIONS PLAN) TO EMERGENCY OPERATIONS PLAN

**Galveston District Alert Roster**

	<b><u>Office</u></b>	<b><u>Office</u></b>
Commander		3001
(Alternate) Deputy Commander		3003
Chief, Engineering-Construction Division		3013
(Alternate) Engineering Branch		3012
Dam Safety Engineer		3088
(Alternate) Geotechnical and Structures Section		3810
Chief, Public Affairs Office		3005
Chief, Operations Division		3071
(Alternate) Asst. Chief, Operations Division		3973
Emergency Manager		3956
Chief, Contracting Division		3850
Chief, Geotechnical and Structures Section		3810
Chief, Hydrology and Hydraulics Section		3975
Reservoir Control		3113
Chief, Project Operations Branch		6313
Project Operations Branch, Electronics		6308
Bay Area Engineer		6323

Addicks/Barker Project Office

281-497-0740

Note: All extensions are to be preceded by 409-766-xxxx, unless specified otherwise.

APPENDIX F TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

**Other Agencies**

<b><u>Office</u></b>	<b><u>Office Phone</u></b>
U.S. Geological Survey, Houston Subdistrict Chief	936-271-5300
National Weather Service, Houston Meteorologist in charge	281-534-3876
National Weather Service, San Antonio Weather Service Forecast Office	830-606-3617
National Weather Service, Fort Worth River Forecast Center, Hydrologist in charge	817-831-3289 x322
Harris County Flood Control District	713-684-4050

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APPENDIX F TO ANNEX I (ADDICKS & BARKER EMERGENCY OPERATIONS  
PLAN) TO EMERGENCY OPERATIONS PLAN

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APPENDIX G TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

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APPENDIX G TO ANNEX I (ADDICKS & BARKER EMERGENCY OPERATIONS PLAN) TO EMERGENCY OPERATIONS PLAN

**Appendix G**  
**Standard Operation Procedure Foundation Observers**

**1. General.**

Chief, Geotechnical and Structures Section is responsible for alerting foundations observers of Phase I activities. Observers will proceed to Addicks and Barker Dams and monitor foundation conditions and seepage at the dams and transmit data by radio to the Chief Foundations Observer at the Addicks/Barker Incident Command Post. Chief Foundations Observer, coordinating with Dam Safety Engineer, will relay these data to the Emergency Operation Center, Galveston District Office.

**2. Phase I - Alert.**

1. Chief Foundations Observer will report to Dam Safety Engineer and brief him on responsibilities of foundations observers.
2. Monitor conditions at Addicks and Barker Dams 24 hours.
3. Maintain liaison with District elements at the site and Geotechnical and Structures Section through Emergency Operation Center.
4. Collect piezometer readings daily.

**3. Phase II - Emergency.**

1. Monitor conditions at Addicks and Barker Dams on a 24-hour basis.
2. Collect piezometer readings twice daily or as directed by the Dam Safety Engineer.
3. Advise Dam Safety Engineer of need to initiate sandbag and/or riprap and filter cloth operations.

APPENDIX G TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

4. Notify Emergency Operation Center and maintain coordination with them.
5. Supervise and direct in sandbag and/or riprap and filter cloth operations by the contractor.

**4. Phase III - Evacuation.**

1. Assist Dam Safety Engineer to the extent practicable.
2. Evacuate to relocated Addicks/Barker Incident Command Post in accordance with instructions of Dam Safety Engineer.

**5. Personnel.**

Foundations observers are listed as follows. The Dam Safety Engineer, as required by project conditions, may adjust the number of foundation observer team members.

**FOUNDATIONS OBSERVERS**

Chief Foundations Observer

1 - Geotechnical and Structures Section

Foundation Observers Addicks Dam Team Members

3 - Geotechnical and Structures Section

1 – General Engineering Section

Foundation Observers Barker Dam Team Members

1 - Geotechnical and Structures Section

1 – General Engineering Section

Emergency Placement of Filter Cloth and Stone

1 - Geotechnical and Structures Section

1 – General Engineering Section

APPENDIX G TO ANNEX I (ADDICKS & BARKER EMERGENCY OPERATIONS PLAN) TO EMERGENCY OPERATIONS PLAN

**List of equipment needed for Foundation Observers**

Assuming 3 teams of 2 persons for the foundation observer teams and one kit for the Chief Hydrologic Observer, this is what needs to be stored at the Addicks Field Project Office:

- 4 piezometer water level measuring device
- 5 field notebooks
- 4 100 foot measuring tape
- 5 rolls of plastic flagging
- 25 wooden stakes
- 4 set of half size plan drawings
- 4 set of cross sections at piezometer locations
- 4 supply of rags
- 4 forms for recording piezometer readings
- 4 flashlights with spare batteries
- 4 small water canteens
- 3 cans of insect repellent
- 3 cans of wasp spray
- 3 shovels
- 7 raincoats/raingear
- 4 first aid kits
- 4 snake bit kits

The following is to be supplied before departure from Galveston District:

- 4 radios or cell phones with instructions
- 1 4-wheel drive vehicle
- 4 ATV vehicles (these will be delivered to the project office by the Area Office or rental)

APPENDIX H TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
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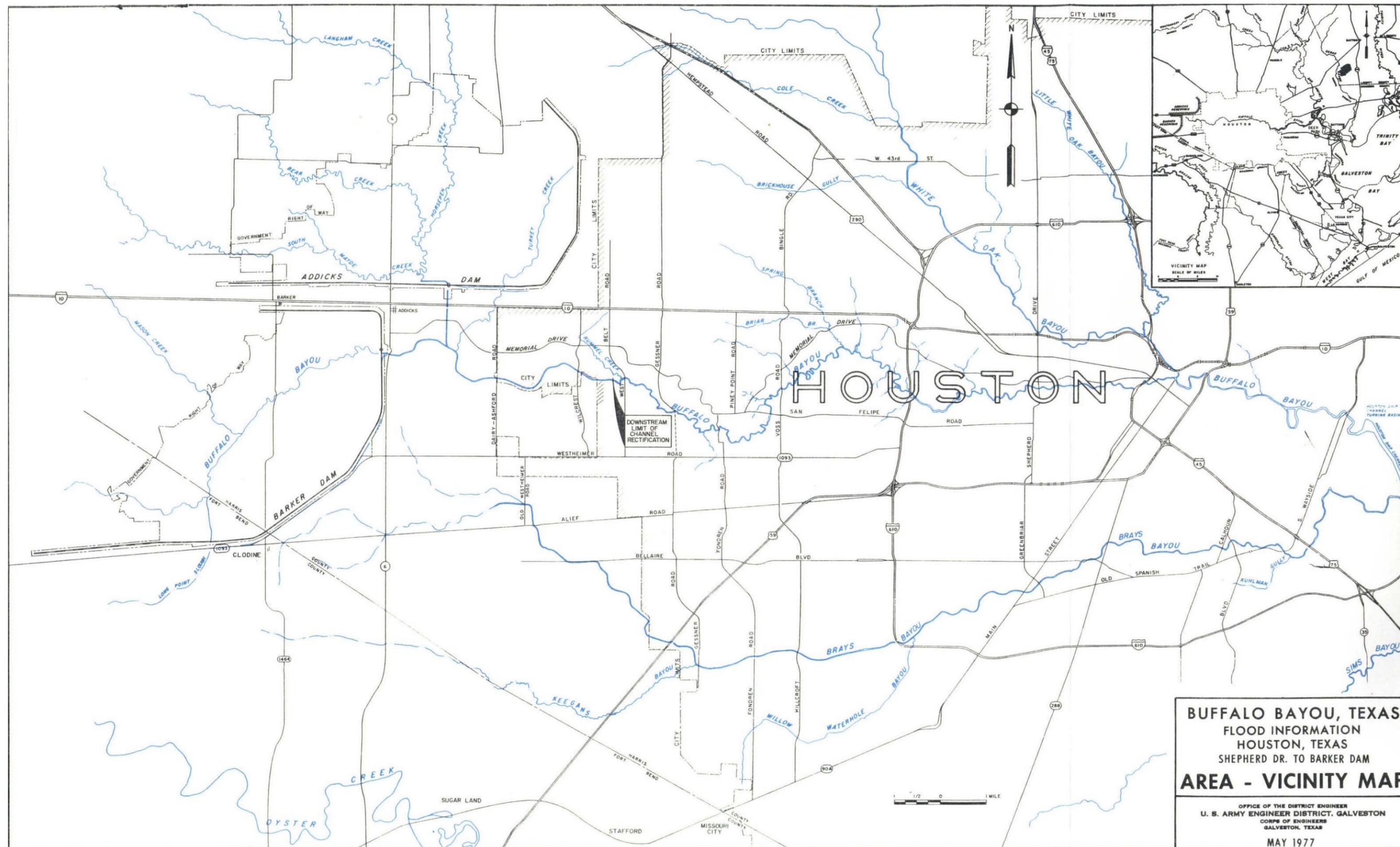
Appendix H  
Maps

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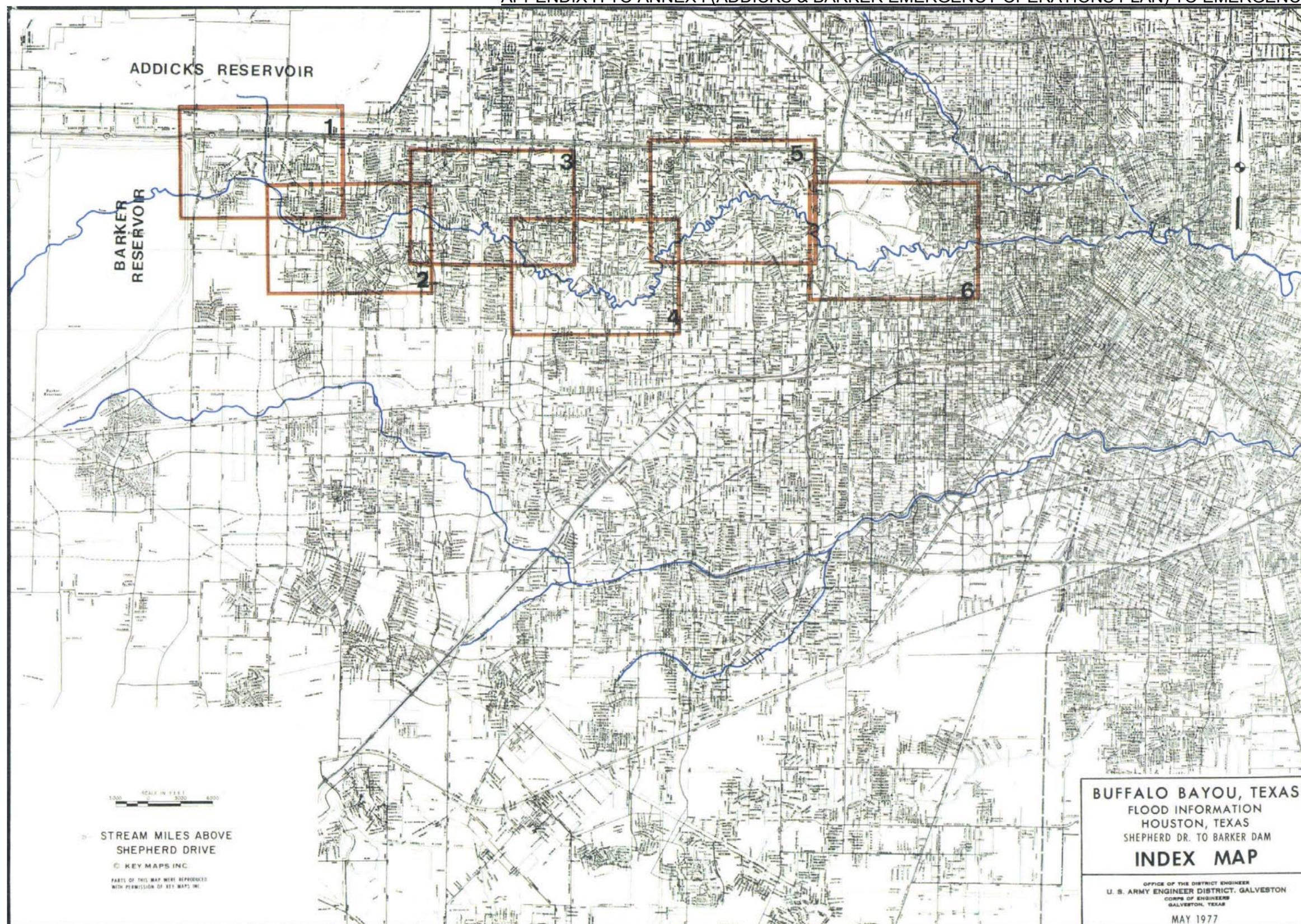
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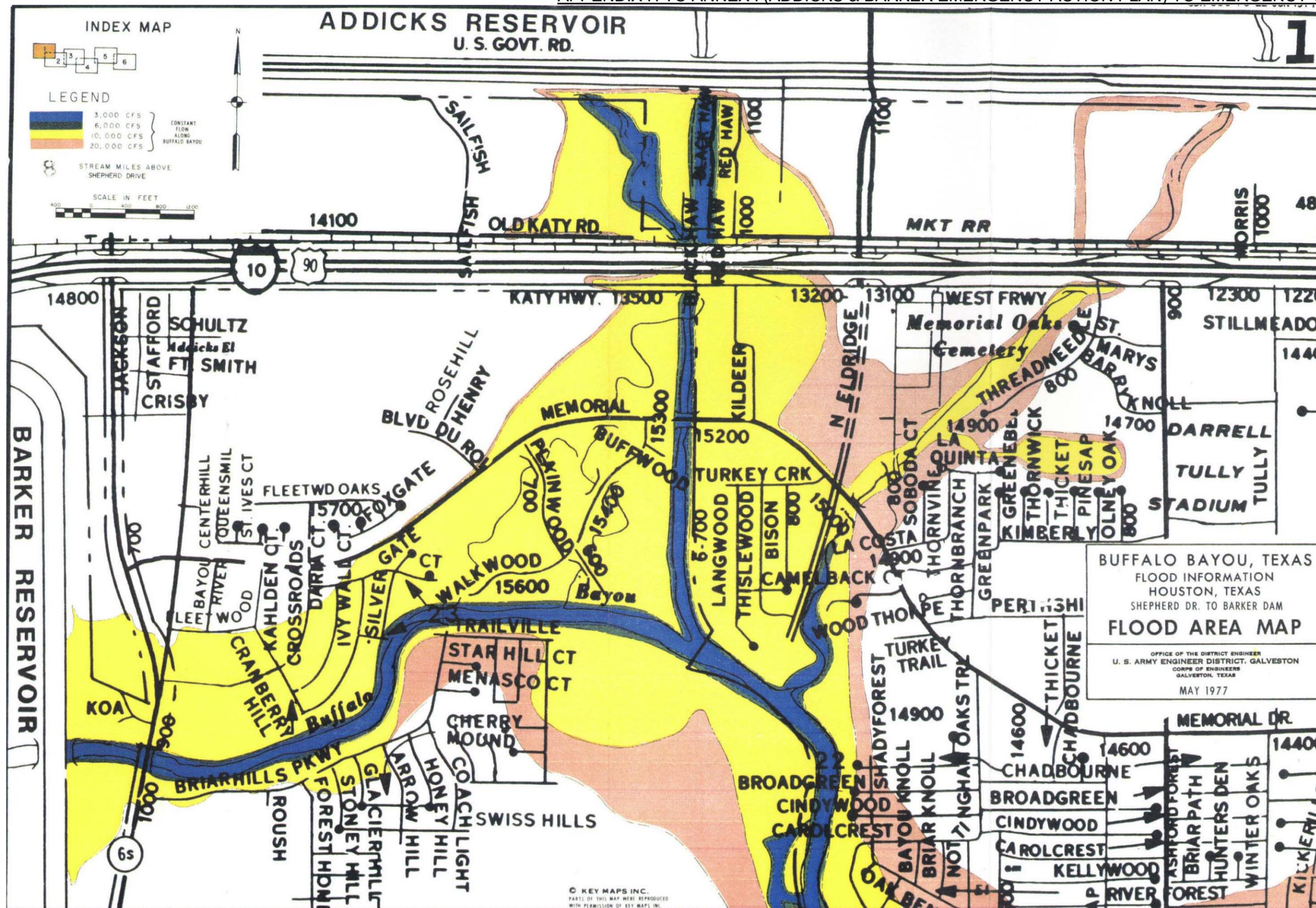
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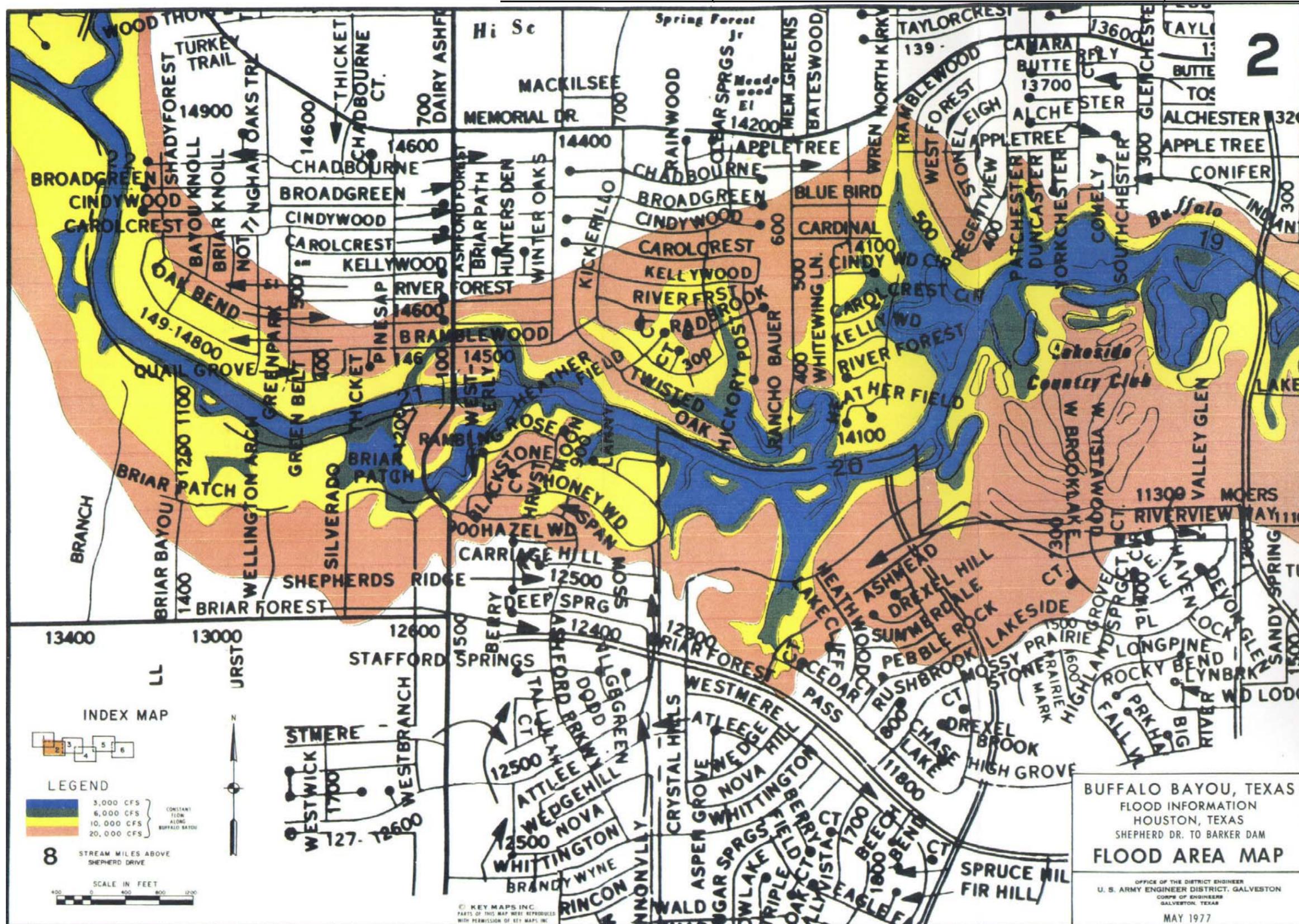
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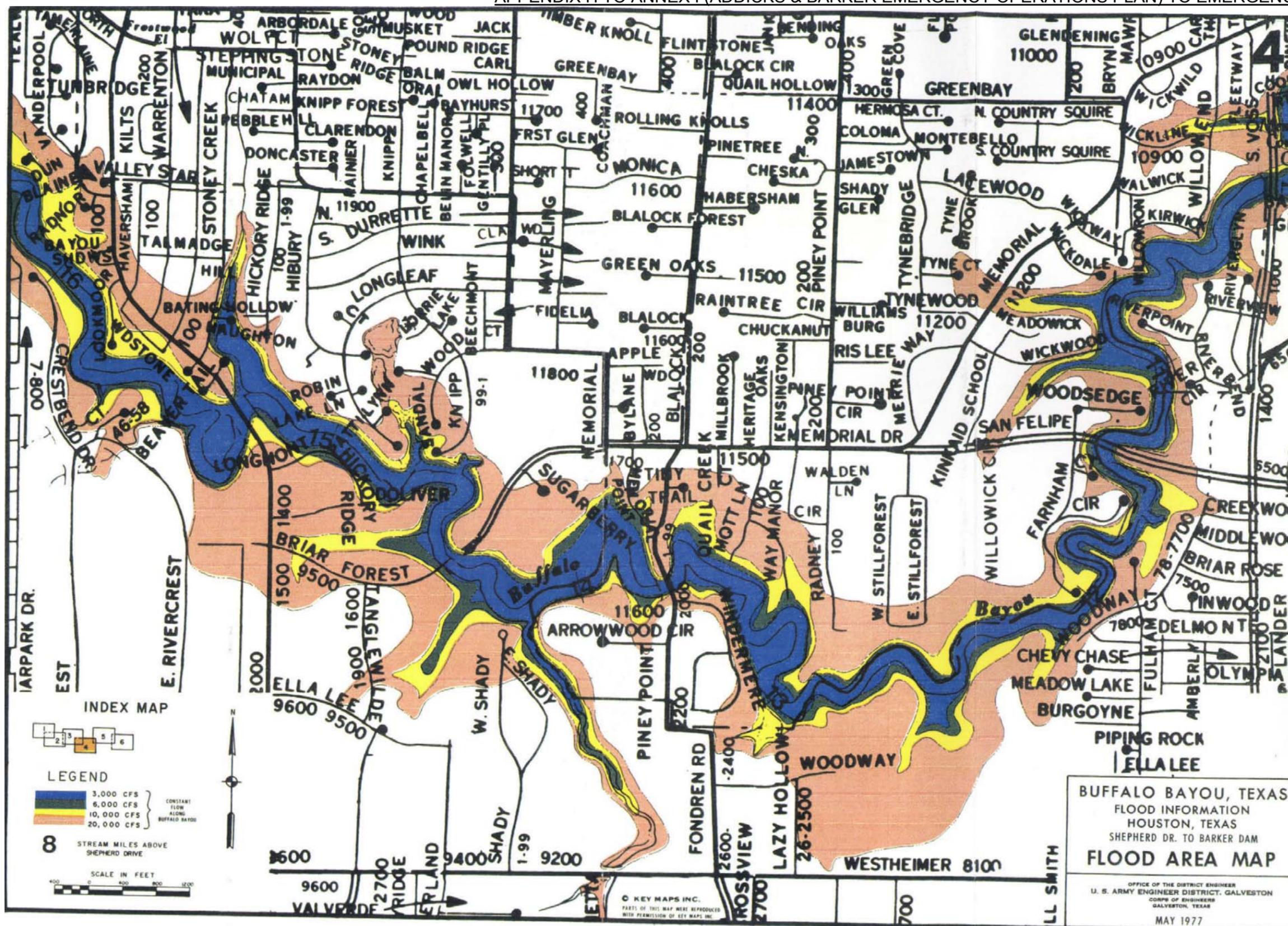


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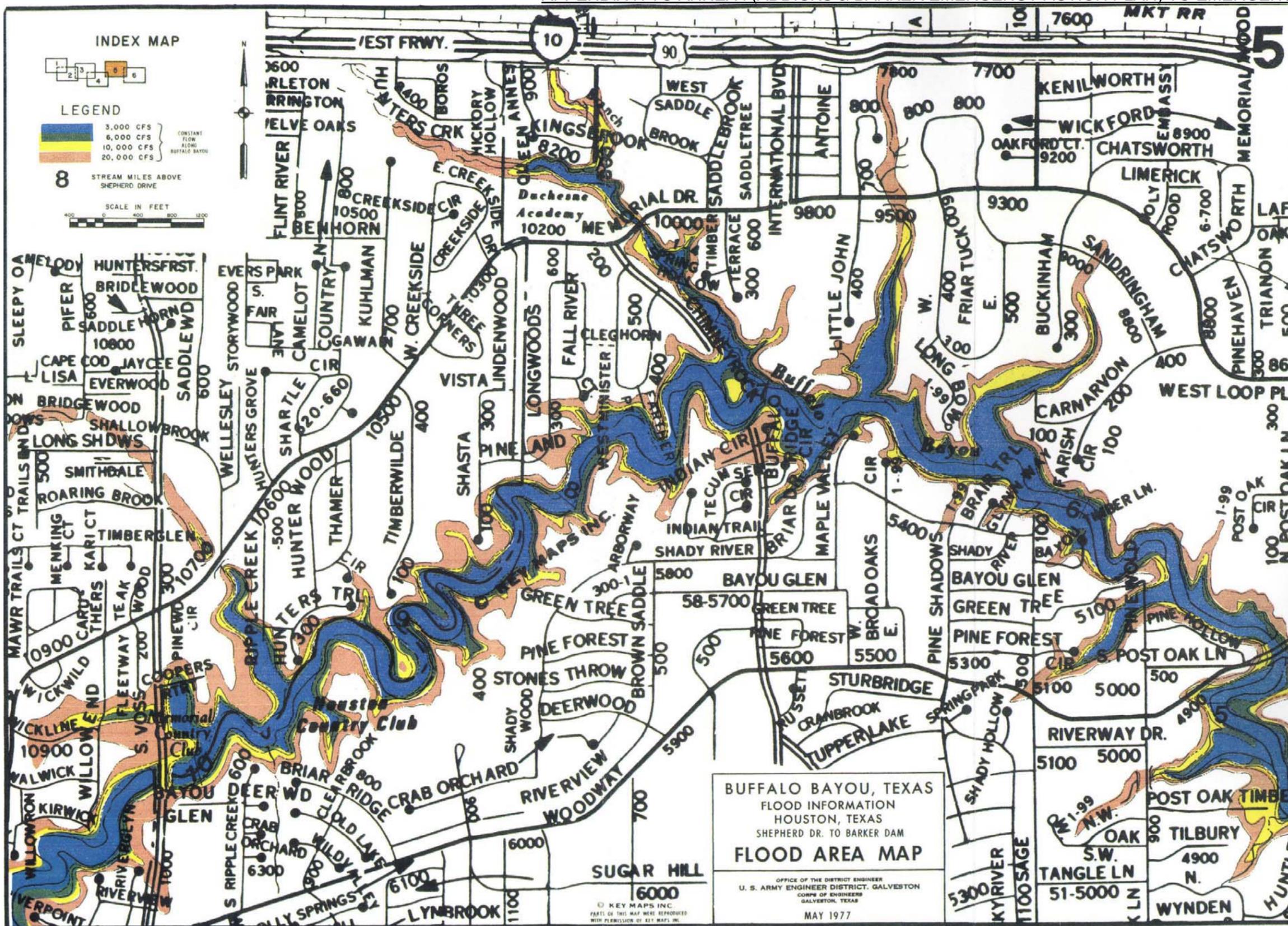




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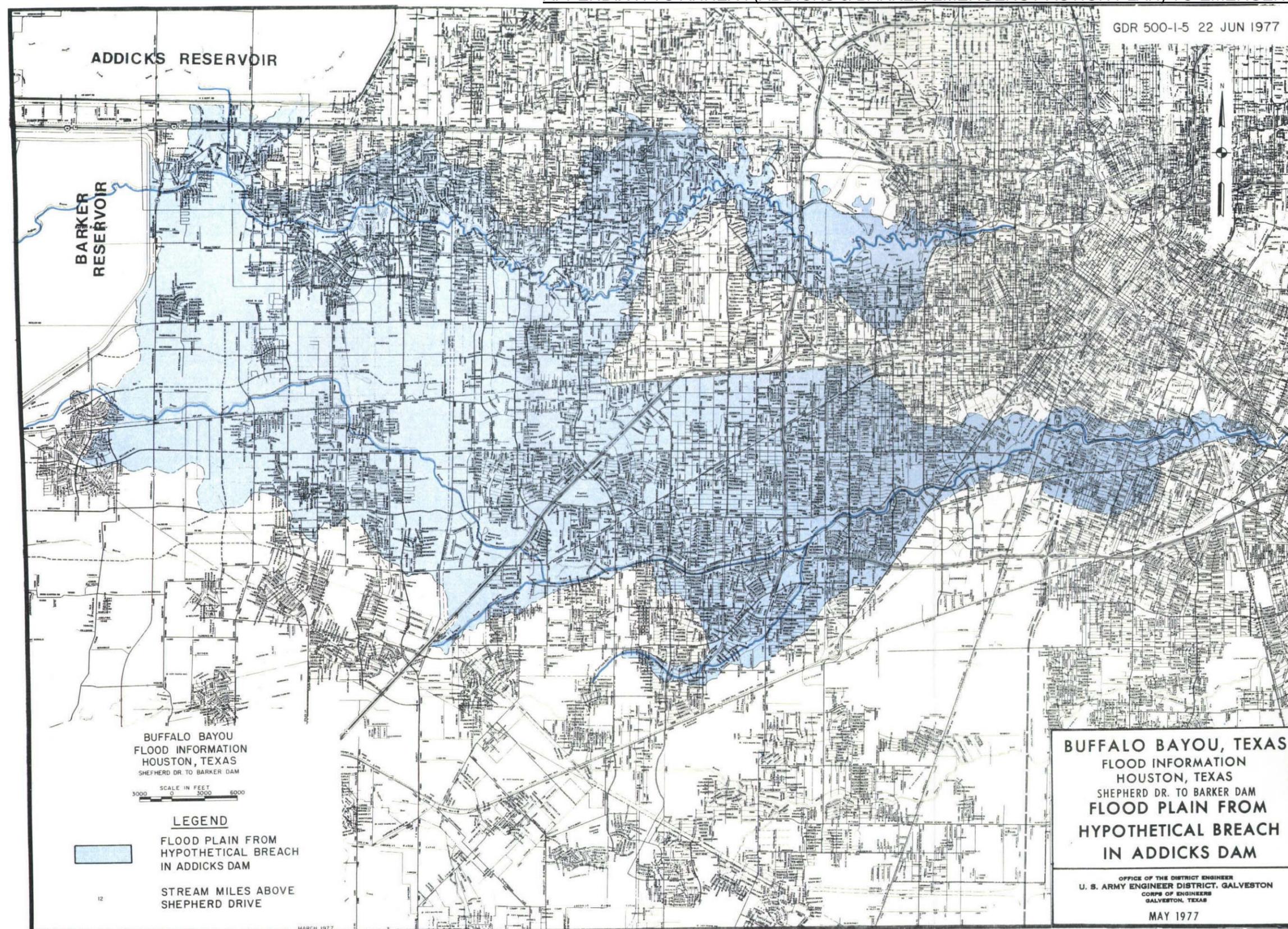


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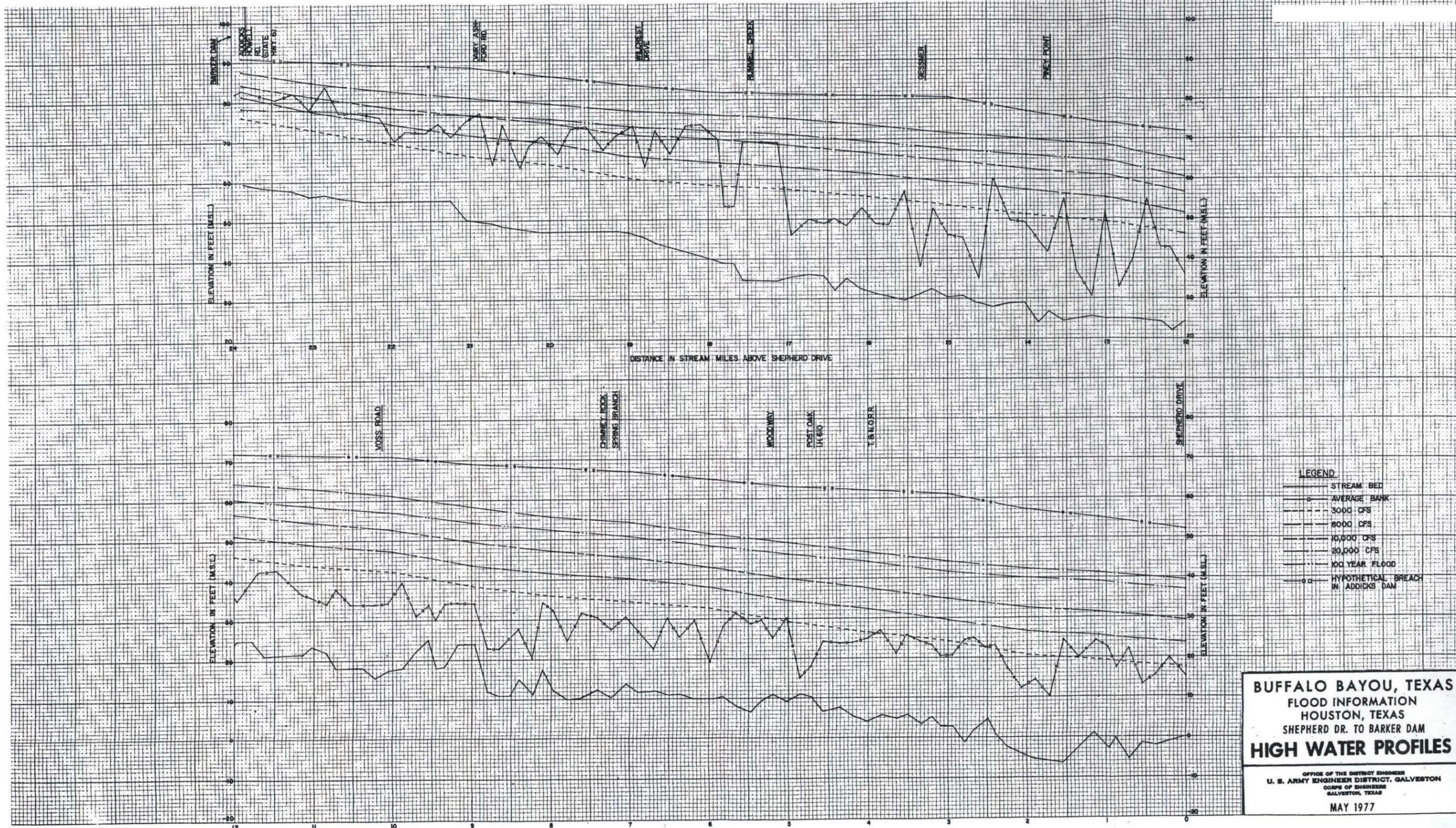




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APPENDIX H TO ANNEX I (ADDICKS & BARKER EMERGENCY OPERATIONS PLAN) TO EMERGENCY OPERATIONS PLAN



**LEGEND**  
 — STREAM BED  
 - - - AVERAGE BANK  
 - - - 3000 CFS  
 — 8000 CFS  
 - - - 10,000 CFS  
 — 20,000 CFS  
 - - - 100 YEAR FLOOD  
 - - - ○ - - - HYPOTHETICAL BREACH IN ADDICKS DAM

**BUFFALO BAYOU, TEXAS  
 FLOOD INFORMATION  
 HOUSTON, TEXAS  
 SHEPHERD DR. TO BARKER DAM  
 HIGH WATER PROFILES**  
 OFFICE OF THE DISTRICT ENGINEER  
 U. S. ARMY ENGINEER DISTRICT, GALVESTON  
 CORPS OF ENGINEERS  
 GALVESTON, TEXAS  
 MAY 1977

APPENDIX I TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
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Standard Operating Procedure Hydrologic Observers

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APPENDIX I TO ANNEX I (ADDICKS & BARKER EMERGENCY OPERATIONS PLAN)  
TO EMERGENCY OPERATIONS PLAN

**Appendix I  
Standard Operating Procedure Hydrologic Observers**

**1. General.**

Chief, Hydrology and Hydraulics Section is responsible for alerting the Chief Hydrologic Observer and hydrologic observer teams of beginning of Phase I operation. The Chief Hydrologic Observer and hydrologic observer teams will report to the Addicks/Barker Incident Command Post, Addicks Field Project Office.

**2. Phase I.**

1. Chief Hydrologic Observer will report to the Dam Safety Engineer and Water Control Personnel to brief them on the mission of the hydrologic observers.
2. Assist in the monitoring of the inflow into Addicks and Barker Reservoirs.
3. At the request of Water Control personnel, hydrologic observers will supplement missing rainfall data with field observations at predetermined locations.
4. Chief Hydrologic Observer will tabulate supplement rainfall data collected by Hydrologic Observer Teams throughout Addicks, Barker and Cypress Creek watersheds and report data to Water Control Personnel.
5. If needed, hydrologic observer teams can estimate elevation or width at predetermined locations using mapping for the Chief Hydrologic Observer to calculate inflow of volume.

**3. Phase II.**

1. Chief Hydrologic Observer will report to the Dam Safety Engineer and Water Control Personnel to brief them on the mission of the hydrologic observers.

APPENDIX I TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN

2. Assist in the monitoring of the inflow into Addicks and Barker Reservoirs.
3. At the request of Water Control personnel, hydrologic observers will supplement missing rainfall data with field observations at predetermined locations.
4. Chief Hydrologic Observer will tabulate supplement rainfall data collected by hydrologic observer teams throughout Addicks, Barker and Cypress Creek watersheds and report data to Water Control Personnel.
5. If needed, hydrologic observer teams can estimate elevation or width at predetermined locations using mapping for the Chief Hydrologic Observer to calculate inflow of volume.
6. At the request of the Dam Safety Engineer, Chief Hydrologic Observer will predict area of downstream flooding.

**4. Phase III.**

1. Continue to assist Dam Safety Engineer as in Phase II.
2. Evacuate to relocated Addicks/Barker Incident Command Post in accordance with instructions of the Dam Safety Engineer.

**5. Personnel.**

Hydrologic Observers are listed as follows. The Dam Safety Engineer, as required by project conditions, may adjust the number of hydrologic observers team members.

**HYDROLOGIC OBSERVERS**

Chief, Hydrologic Observer

1 - Hydrology and Hydraulics Section

Hydrologic Observer Team Members

3 - Hydrology and Hydraulics Section

3 – Engineering-Construction Division

APPENDIX I TO ANNEX I (ADDICKS & BARKER EMERGENCY OPERATIONS PLAN)  
TO EMERGENCY OPERATIONS PLAN

**List of equipment needed for Hydrologic Observers**

Assuming 3 teams of 2 persons each for hydrologic observers teams, this is what needs to be stored at the Addicks/Barker Project Office:

- 20 rain gauges with mounting brackets and screws
- 20 rain gauge mounting wooden stakes
- 4 sledgehammers
- 50 1 inch nails
- 3 nail hammers
- 4 screw drivers
- 3 writing tablets with pens or pencils to record data/notes
- 3 rolls of toilet paper
- 6 hard hats with chin straps
- 6 flashlights with spare batteries
- 6 small water canteens
- 6 life vests
- 4 cans of insect repellent
- 3 cans of wasp spray
- 3 shovels
- 6 raincoats/raingear
- 3 first aid kits
- 3 snake bit kits

The following is to be supplied before departure from Galveston District:

- 4 radios or cell phones with instructions
- 4 4-wheel drive vehicles
- 4 maps of Addicks, Barker, and Cypress watershed Hydrologic Observer routes, including elevations such as 5 foot USGS contour maps

**APPENDIX I TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
EMERGENCY OPERATIONS PLAN**

**Pertinent Water Elevations Addicks Reservoir**

Drainage Area: 136 sq. mi.

Length: 61,166 ft.

Height: 48.5 ft.

Elevation <sup>1</sup> (ft)	Flood Frequency <sup>2</sup> (years)	Surface Area <sup>3</sup> (acres)	Capacity <sup>3</sup> (acre-feet)	Capacity <sup>4</sup> (percent)	Description	Source <sup>5</sup>
122.7					High point of dam	P
118.1	SDF				Spillway design flood	H
116.0~					Spillway elevation	H
112.0~		16432	200840	100	Natural ground at end of dam	H
110.6	SPF	15402	178556	89	Standard project flood	H
107.0	450					H
106.9		12898	126406	63	Low point Barker Cypress	H
106.1	250	12460	116263	58	Limits of government-owned land	H
104.1	100	11213	92572	46		H
103.0					Phase I – Alert	
102.4	50	9874	74591	37		H
101.49		9133	65954	33	Low point Elderidge Road	P
100.58		8446	57956	29	Maximum pool to Date 09 March 92	H
100.5	25	8386	57283	29		H
99.71					Hwy 6 closed	O
99.15		7456	46608	23	First impacts on Hwy 6 traffic	O
98.87					Water on shoulder of Hwy 6	O
97.7	10	6535	36473	18		H
96.0		5465	26256	13	Shelter elevations Bear Creek Park	C
95.0	5	4818	21118	11		H
92.0-94.0					Adverse effects begin on golf course	C
91.93		2653	9739	5	Low point Bear Creek Drive	C
90.68		1921	6903	3	Low point Patterson Road	C
90.0		1602	5707	3	Extended watch begins	H
89.8	2	1522	5395			H
71.1		0	0	0	Invert of conduit outlet structures	

Foot Notes:

- Elevations in feet, NGVD, 1973 adjustment.
- Flood frequency was provided by CESWG-EC-EH.
- The surface area in acres and the capacity in acre-feet were obtained from the Buffalo Bayou and Tributaries, Texas, Hydrology Report for Addicks and Barker Reservoirs, dated August 1977.
- The percent capacity is determined by using the natural ground elevation at the end of the dam as 100% capacity.
- Source identification is as follows:  
P = Construction plans H = Hydrology & Hydraulics A = Addicks/Barker Project Office records  
T = Texas Dept. of Highways C = Harris County Pct. 3 O = Field observation
- All roads are subject to stream flooding. Inundation may also be caused by the reservoir pool in conjunction with stream flooding.

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**Pertinent Water Elevations Barker Reservoir**

Drainage Area: 130 sq. mi.

Length: 71,900 ft.

Height: 36.5 ft.

Elevation <sup>1</sup> (ft)	Flood Frequency <sup>2</sup> (years)	Surface Area <sup>3</sup> (acres)	Capacity <sup>3</sup> (acre-feet)	Capacity <sup>4</sup> (percent)	Description	Source <sup>5</sup>
114.7					High point of dam	P
110.3	SDF				Spillway design flood	H
108.0~					Spillway elevation	H
106.0~		16740	209013	100	Natural ground at end of dam	H
100.4	SPF	13889	123653	59	Standard project flood	H
97.8	100	12293	89498	43		H
97.3		12060	83410	40	Limits of government-owned land	H
97.0					Phase I – Alert	H
96.6	50	11706	75087	36		H
95.89		11338	66910	32	Maximum pool on 7 March 1992	H
95.7		11257	64763	31	Low point Beeler Road	P
95.2	25	11043	59189	28		H
93.1	10	9800	37176	18		H
93.0		9729	36200	17	Adverse effects to Model Airport	C
91.5		6772	23622	11	Adverse impacts on baseball fields & gun range	C
91.1	5	5830	21104	10		H
87.2	2	2396	6472	3		H
87.0		2280	6005	3	Extended Watch begins	H
85.0		1322	2433	1	Low point at Barker-Clodine	P
73.2		0	0	0	Invert of conduit outlet structures	

Foot Notes:

- Elevations in feet, NGVD, 1973 adjustment.
- Flood frequency was provided by CESWG-EC-EH.
- The surface area in acres and the capacity in acre-feet were obtained from the Buffalo Bayou and Tributaries, Texas, Hydrology Report for Addicks and Barker Reservoirs, dated August 1977.
- The percent capacity is determined by using the natural ground elevation at the end of the dam as 100% capacity.
- Source identification is as follows:  
 P = Construction plans H = Hydraulics A = Addicks/Barker Project Office records  
 T = Texas Dept. of Highways C = Harris County Pct. 3 O = Field observation
- All roads are subject to stream flooding. Inundation may also be caused by the reservoir pool in conjunction with stream flooding.

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Appendix J  
Reports

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**Appendix J  
Reports**

**1. General.**

Receipt of prompt and accurate information is of utmost importance to the District Engineer in rendering decisions on actions to execute his statutory responsibilities during flood emergencies and other natural disasters. Dam Safety Engineer, Hydrologic Observers, and Foundations Observers are expected to proceed immediately (within 6 hours of notification of Phase 1 implementation) to the Addicks/Barker Incident Command Post and to submit factual situation reports based on personal observations and locally available official information.

So called "unofficial" information will be verified to the extent possible under the circumstances and, when submitted, will be accompanied by an opinion of the reliability of the source.

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**Summary of Flood Emergency Reports**

<b>Name of Report</b>	<b>Prepared By</b>	<b>Submitted To</b>	<b>Due</b>	<b>Method of Transmission</b>
<b>Pre Emergency</b>				
Flood Emergency Test Exercise Report	Operations Division		After each Exercise	Mail/E-mail
<b>Phase I</b>				
Area Flood Situation	Dam Safety Engineer	EOC, Project Operations Branch, Galveston District	9:00 am and when conditions warrant by 2:00 pm	Telephone/E-mail
<b>Phase II</b>				
Area Flood Situation (Daily follow up)	Dam Safety Engineer	EOC, Project Operations Branch, Galveston District	9:00 am & 2:00 pm	Telephone/E-mail
<b>Phase III</b>				
Area Flood Situation (Daily follow up)	Dam Safety Engineer	EOC, Project Operations Branch, Galveston District	9:00 am & 2:00 pm	Telephone/E-mail

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Appendix K  
General Instruction for High-Water Maintenance of Levees or Dams

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**Appendix K  
General Instruction for High-Water Maintenance of Levees or Dams**

**1. General.**

The following general statements of standard practice, heretofore followed with good results on high-water maintenance work, are not intended to restrict the Dam Safety Engineer, or others concerned, to a rigid set of rules for every condition that might develop. In case of problems, not covered by these instructions, where the assistant in charge is in doubt as to the procedure to be taken, he will be expected to consult his immediate superior and follow standard engineering practices in meeting the situation.

**2. Earthen levee or dams.**

An earthen levee or dam is in danger whenever there is water against it. This danger is directly proportional to the height of the water, the duration of the flood stage, and the intensity of either the current or wave action, or both. The danger is inversely proportional to the cross-sectioned area of the levee or dam, and the degree of maintenance. A well-constructed levee or dam of proper section should, if maintained and not overtopped, hold throughout any major flood. However, faulty construction, bad foundation conditions, action of rodents, unauthorized alterations, or a serious accident may result in a break. Foundation failures result in sand boils and a sinking levee or dam. Poor construction methods and the use of unsatisfactory materials cause slides and sloughs. However, such threatened failure can be overcome if prompt action is taken and proper methods of treatment are used. Wave wash is to be expected whenever the levee or dam is exposed to a wide stretch of open water, and if permitted to continue over a considerable length of time will develop into a serious threat.

**3. Preliminary work of local levee or dam districts.**

- a. Immediately upon receipt of information that high water is imminent, local levee or dam districts or other agencies should form a skeleton organization, capable of quick expansion, and assign individuals (Sector Commanders) to have charge of definite sections of levees.

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- b. As his initial activity, each Sector Commander should go over his entire Section and parts of adjacent Sectors, making a detailed inspection, particularly with reference to the following matters:
  1. Sector limits; ascertain that the dividing line between Sectors is plainly determined and, if necessary, marked.
  2. New levees or dams; check for settlement, possible erosion, etc.
  3. Drainage facilities; close, if necessary, culverts, flap gates, and sluice gates.
  4. Transportation facilities; determine status of roads, rail, water, and communications.
  5. Materials; determine supply, quantity, location, and condition.
  6. Communications; locate and check all necessary telephones in the Sector.
  7. Quarters; locate for laborers.
- c. After the initial inspection, each Levee or Dam District Sector Commander should recruit a labor gang, and if necessary employ any equipment needed, and perform the following work immediately:
  1. Fill up bad holes or washes in the levee crown, slopes, and landside berms. Where new construction has been completed during the year, rain washes and deep gullies may have developed. Tractors with blades or pans can be used in repairing these deficiencies. If the new levee or enlargement is along an exposed reach, preparations should be made in advance to combat wave wash.
  2. Repair gaps where road crossings have been worn down and the levee or dam is below grade. In filling road crossings, it may be necessary to obtain material from landside borrow pits, in which case excavation for the material should be kept at least 50 feet from the toe

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of levee. Any filling done in this connection should be tamped in place and, if in an exposed reach subject to wave wash, the new section should be faced with bags of sand.

3. Resod, if time permits, all localities seriously deficient in sod. Such resodding will be of permanent value but of little value in face of high water.
4. Repair and close all flap and sluice gates on culverts and see that they are seated properly before they are covered with floodwaters.
5. Poison or trap rodents if they appear on levees in sufficient numbers to endanger its safety.
6. Ascertain that all roads to and along the levee or dam are in a good state of repair. If time permits, Sector Commanders should obtain assistance from the county road forces to have all roads put in first-class condition.
7. Locate necessary tools and materials (sacks, brush, lumber, lights, etc.) and distribute and store them at points where active maintenance is anticipated.
8. Locate all radios and telephones in the Sector, obtain list of all tractors, motorboats, and trucks that can be made available.
9. Make thorough arrangements with reliable citizens of the community for the supply, transportation, subsistence, and shelter for the necessary labor.
10. Communicate directly with owners of all stock pastured on the levee or dam and direct that all stock be removed from the levee rights-of-way. Cut all fences crossing the levee where gates are not provided.
11. Investigate all drainage ditches on the land-side of the levee and open these drains where obstructions exist. Prepare to cut the necessary seep drainage ditches; however, no attempt should be made to drain the levee slope until actual seepage takes place.

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12. Determine the condition of all sub-levees in the sector and make repairs where needed. Examine especially the spillways and clear away any drift that may have accumulated.
13. Remove all dynamite and explosives of any kind from the vicinity of the levee or dam.

**4. Standard methods for various defects.**

**a. General.**

The methods of treatment outlined in the following paragraphs have been used by the Department of Army for many years and have proven to be effective.

**b. Drainage of slopes.**

This work can be done economically while awaiting developments and will serve to make the levees more efficient. Crews should be organized to cut seep drains at all places on the levee and berm where seepage appears. The drains should be V-shaped, no deeper than necessary, and never more than 6-inches deep. Care must be taken not to cut the sod unnecessarily. In all instances, drains should be cut straight down the levee slope or nearly so. Near the toe of the slope the small drains shall be Y'd together and lead into larger drains, which, in general, should lead straight across the landside berm into the landside pits or main lateral ditch.

**c. Filling sub-levees.**

Sub-levees are smaller levees built to the landside of the main levee for formation of pools to reduce the effective water pressure on the landside and consequently inhibit the formation of boils and movement of foundation material. There are no sub-levees in the District at present. However, if sub-levees later prove advisable, the following procedure is recommended. Immediately upon mobilization, the siphons provided for filling all sub-levees should be put in commission and kept running until each sub-levee basin is filled. The sub-levee spillways should be kept free of obstructions so that when the basin is filled the surplus water can escape. The siphon, of course, need not be run if the basin

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fills of its own accord from normal seepage. If the spillways constructed in the sub-levees do not have capacity sufficient to drain off the water to the level of the spillway crest, additional temporary spillways should be constructed. The crest of the sub-levee spillways should not be raised, unless active sand boils begin to appear above the sub-levee water level. If active sand boils should become evident, the grade and crest of spillway of the sub-levee should be raised at once to a height sufficient to stop the active sand boil flow.

**d. Sand Boils.**

If discharging material, these danger spots are serious, especially if within a distance of 100 feet from the toe of the levee. The common method of handling sand boils is by walling up a watertight sack ring around the boil until the water within the ring has attained sufficient head to counteract the effective head causing the boil, as indicated graphically on page K-7. Where a single boil is noted that shows signs of displacing excessive material, a small sack hoop should be built around it, taking care to make the hoop sufficiently large to avoid the defective area immediately surrounding the boil. In the event that several boils of sufficient force to displace sand are observed at points where sublevees have not been provided, and if any considerable number of them are within 100 feet of the levee, a sack sublevee should be built around the entire nest of boils, rising to such a height that none of the boils will discharge with enough force to displace sand. If, at any time, sand boils either inside or outside of protection levees shows signs of discharging with increasing force, indicating that considerable sand is being displaced, preparations must be made to raise the counter water level.

**e. Slough.**

In some reaches in this Engineer District, the material in the levee section may be of such a nature that prolonged high stages of the river may cause sloughing conditions on the back slopes. All soft areas should be thoroughly drained as provided in subparagraph b, above, after which a single layer of willow brush, if obtainable, or any small trees or limbs should be laid up and down the slope, laying the butts up and tops down, and weighted with sacks as shown on page K-8. If the slope begins to slough down, a buttress of sacks should be built on the toe and extending up the slope. The buttress on the toe should be built in the

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shape of a small banquette. No sacks or weight should be placed more than two-thirds of the way from the toe of the slope to the fault of the slough.

**f. Topping.**

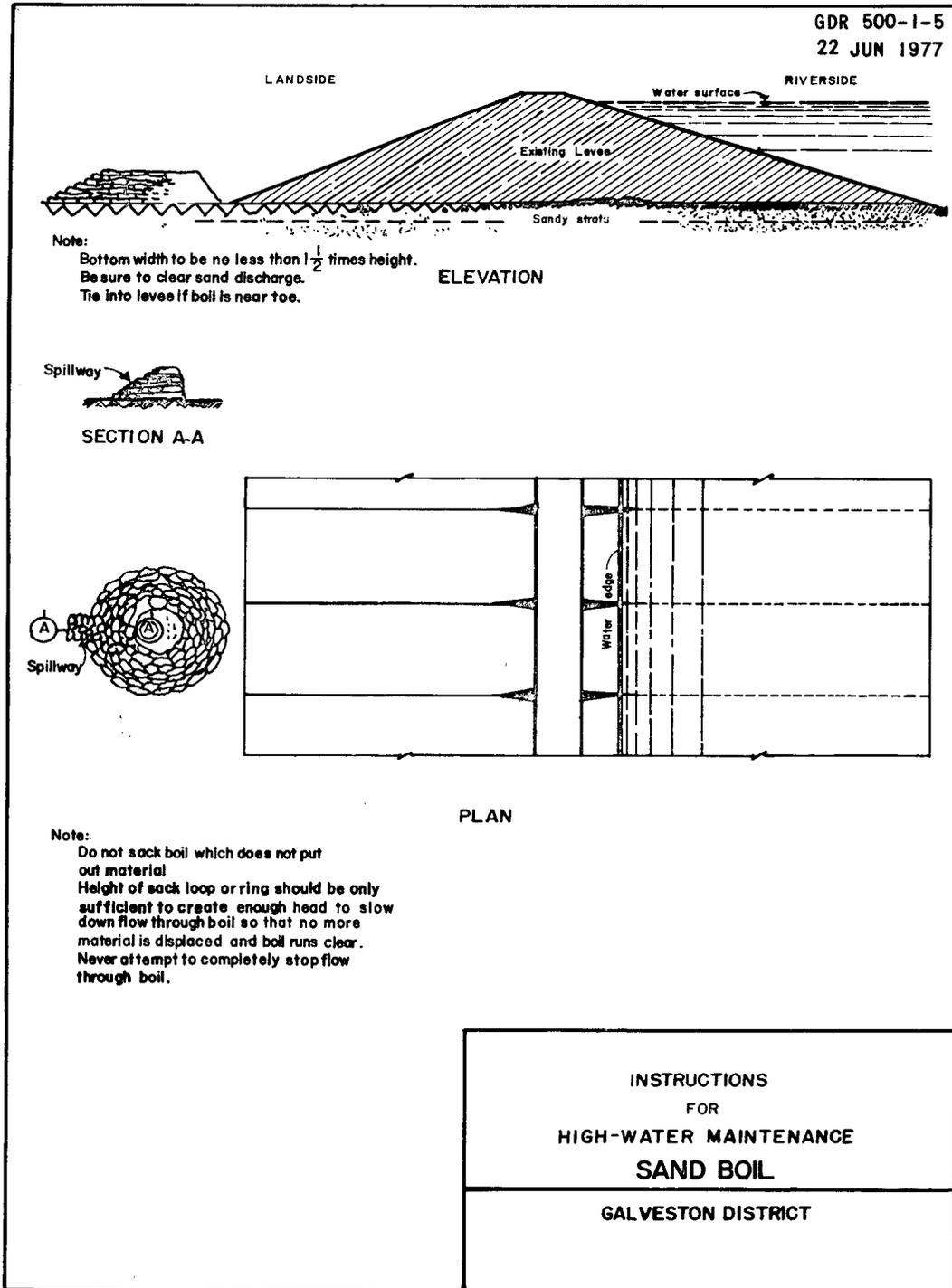
Immediate consideration should be given to grade line of each levee section. A study of high-water profiles and levee grade will show where low places in levees exist. If it is considered desirable to increase grade of levee to expected high-water elevations, emergency topping may be done (1) with sacked earth; (2) with lumber and sacked earth; (3) with mud boxes; (4) by raising crown of levee with borrowed material.

**g. Sack topping.**

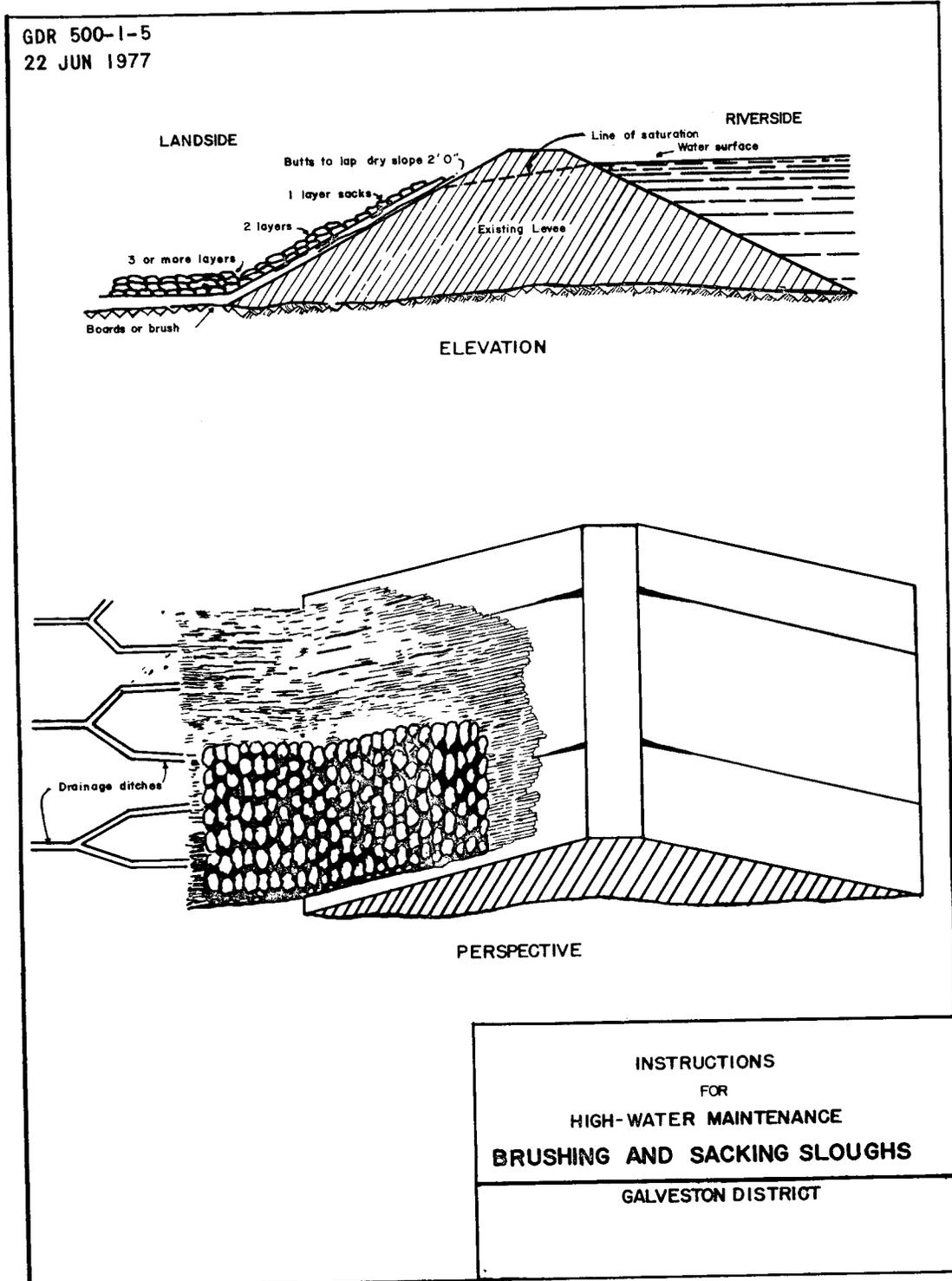
If lumber is not available, a sack topping as shown on page K-9 may be used to raise crown of levees about three feet. The sacks should be laid stretcher-wise or along the levee for the first layer, crosswise for the second layer, and so on. The sacks should be lapped at least 1/3 both ways and well mauled into place. When properly sacked and tamped, one sack will give about three-to-four-inch topping. If gravel is available, it should be used for the front facing to avoid washing out.

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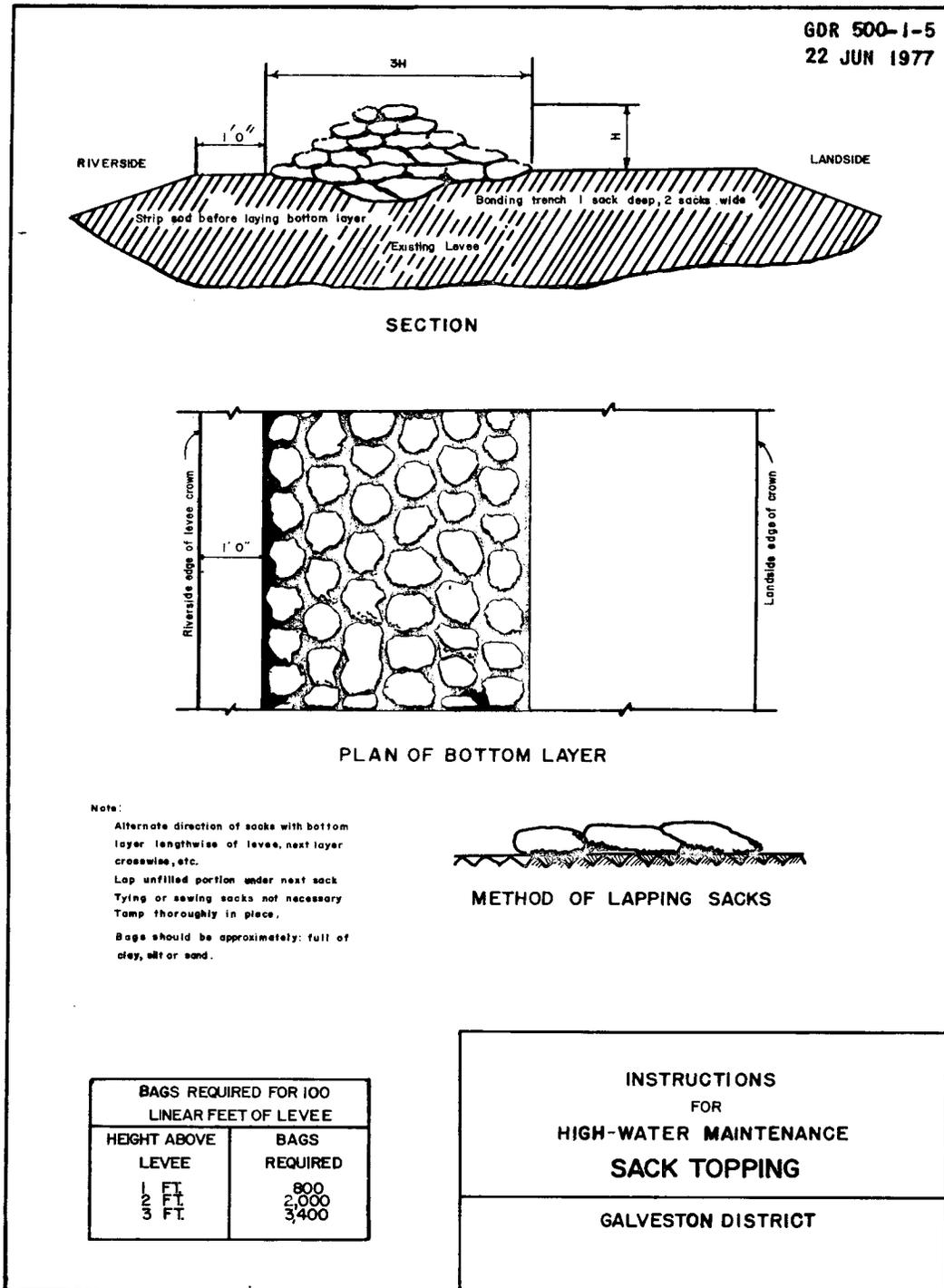
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**APPENDIX L TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
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**Appendix L  
Addicks Water Elevation Impact Table**

<b>Elevation (Feet)</b>	<b>Capacity (Acre-Feet)</b>	<b>Cap %</b>	<b>Impacts</b>
71.1	0	0	Invert of Conduit Outlet Structures
89.8	5,395		2 year flood frequency
90.0	5,707	3	Extended Watch begins
90.68	6,903	3	Low point Patterson Road
91.93	9,739	5	Low point Bear Creek Drive
92.0			Adverse effects begin on golf course
95.0	21,118	11	5 year flood frequency
96.0	26,256	13	Shelter slab elevations Bear Creek Park
97.7	36,473	18	10 year flood frequency
98.87			Water on shoulder of State Hwy 6
99.1	46,608	23	Low point on State Hwy 6
99.5	49,258	25	Low point Eldridge Parkway High point on State Hwy 6
99.71			State Hwy 6 closed
100.0			Water Control notifies Emergency Management that this trigger has been reached. Implement notification of Phase I response personnel to prepare to deploy High point on Eldridge Parkway Logistics to identify Phase 1 response vehicles
100.5		29	25 year flood frequency
100.58	57,956	29	Maximum pool to date, 09 March 1992
101.49	65,954	33	
102.4	74,591	37	50 year flood frequency
103.0	80,676	40	Phase I Alert
104.1	92,572	46	100 year flood frequency
104.13			80% of Government owned land Coordination required see Appendix A.
106.1	116,263	58	Limits of government owned land <u>250 year flood frequency</u>
106.9	126,406	63	Low point Barker-Cypress road
107.0			450 year flood frequency
110.6	178,556	89	Standard Project Flood
112.0	200,840	100	Natural ground at end of dam
116.0			Spillway elevation
118.1			Spillway design flood
122.7			High point of dam

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**Addicks Facts**

	Number	Width (ft)	Height (ft)	Length (ft)	# Gated	Maximum Discharge (cfs)
Outlets	5	8	6	252	5	7852

Stilling Basin 43.5' Convex Spillway; 40' Long x 60' Wide Longitudinal Basin, 150' of Rip-Rap lined outlet channel.

Dam Type – Earth Embankment.

Dam Length - 61,166 ft.

Dam Height – 48.5 ft. above streambed

Drainage Area – 136 Sq mi.

**APPENDIX L TO ANNEX I (ADDICKS & BARKER EMERGENCY ACTION PLAN) TO  
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**Barker Water Elevation Impact Table**

<b>Elevation (Feet)</b>	<b>Capacity (Acre- Feet)</b>	<b>Cap %</b>	<b>Impacts</b>
73.2	0	0	Invert of conduit outlet structures
85.0	2,433	1	Low point Barker-Clodine Road
87.0	6,005	3	Extended Watch begins
87.2	6,472	3	2 year flood frequency
91.1	21,104	10	5 year flood frequency
91.5	23,622	11	Adverse impacts on baseball fields
92.0	23,622	11	Adverse impacts on American Shooting range
93.0	36,200	17	Adverse impacts on Model Airport
93.1	37,176	18	10 year flood frequency
94.0			Water Control notifies Emergency Management that this trigger has been reached. Implement notification of Phase I response personnel to prepare to deploy Logistics to identify Phase 1 response vehicles
95.2	59,189	28	25 year flood frequency
95.7	64,763	31	Low point Beeler road
95.88			80% of Government owned land Coordination required see Appendix A.
95.89	66,910	32	Maximum pool to date, 07 Mar 1992
96.6	75,087	36	50 year flood frequency
97.0			Phase I Alert
97.3	83,410	40	Limits of government owned land
97.8	89,498	43	100 year flood frequency
100.4	123,653	59	Standard Project Flood
106.0	209,013	100	Natural ground at end of dam
108			Spillway elevation
110.3			Spillway design flood
114.7			High point of dam

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**Barker Facts**

	Number	Width (ft)	Height (ft)	Length (ft)	# Gated	Maximum Discharge (cfs)
Outlets	5	9	7	190.5	5	8734

Stilling Basin 55.5' Convex Spillway; 50' Long x 60' Wide Longitudinal Basin, 160' of Rip-Rap lined outlet channel.

Dam Type – Rolled Earth Embankment.

Dam Length - 71,900 ft.

Dam Height – 36.5 ft. above streambed

Drainage Area – 130 Sq mi.

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**Appendix M  
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Reserve	25
<b>TOTAL COPIES</b>	<b>103</b>

CESWG PLAN 500-1-3  
1 June 2005

APPENDIX M TO ANNEX I (ADDICKS & BARKER EMERGENCY OPERATIONS  
PLAN) TO EMERGENCY OPERATIONS PLAN

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