

Cypress Creek Flood Control Coalition



2015 ANNUAL REPORT

...community organizations united for collaboration in regional government watershed management...

Spring, Texas • Houston, Texas • Cypress, Texas • Waller, Texas

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Preface

"Today's Choices Avoid or Create Tomorrow's Disasters

If we continue to encourage at-risk development and ignore the impact to others, can we accept the consequences and . . . are you willing to pay for it?"¹

The Cypress Creek Watershed community is the place we call home and all deeply care about. It is continuing to grow and with it we want to attract the families and business organizations that will care for our neighborhoods. Not just in a few subdivisions but throughout the watershed's 320 square mile area.

Many of our residents are 3rd generation inhabitants. Others have moved out from the Houston metropolitan area to enjoy the forested urban subdivisions with tree shaded stream banks, rich with fish, birds, animals and a quality-of-life environment conducive to raising children with an appreciation for nature - - - a less hectic living style than in the crowded city - - - - an environment which helps bring friends and neighbors together.

As the watershed inhabitants increased, so did bulldozer's clearing of trees and piling dirt higher for new developments. The result? Increased stormwater flooding into both neighboring and down stream communities. While this was a concrete truck driver's dream, it was and continues to evolve into an environmental politically-driven challenge. Flood waters rose higher into previously unflooded neighborhood homes while subdivision street drains fed directly into Cypress Creek worsening the increasing out-of-bank runoff consequences.

A watershed master plan prepared by Turner, Collie and Braden (TC&B) fifteen years earlier (in 1984) had been approved and officially adopted by Harris County Commissioners Court but essentially none of the recommended regional flood risk reduction recommendations had been implemented. Thousands of acres of prairies earmarked in the plan for regional flood mitigation basins had been and were continuing to be purchased by developers and converted into ever-increasing new subdivision communities. With rare exceptions, the regional basins did not become a reality and the new community's stormwater runoff exceeded the capacity of the stream channels to carry the water into the receiving downstream San Jacinto River and Lake Houston.

Now, 15 years later after the TC&B master plan was adopted, unabated flooding of their neighborhoods was worsening. Flood mitigation which they expected and wanted to be

¹ Association of State Floodplain Managers, website http://ccap.org/assets/2_Samantha-Medlock_ASFPM-NAI-Overview_Nov-15-2013.pdf

done by local county government was not being done. Forty-eight (48) square miles of fertile rice farming was no longer holding back storm water because the land was converted into the urban countryside of impervious soils slated for new communities.

In 1999 the flooded residents banded together creating an alliance of their home owner association and water district organizations under the name "*Cypress Creek Flood Control Coalition*". Their course of action to function as a proactive "hands-on" force collaborating with both the government and private sectors. was implemented. A charter enumerating the issues and declaring the mission goals to halt and hopefully reverse the adverse stormwater flooding impact to their communities was drafted and signed on December 9, 1999. [Available for viewing on website]

The Cypress Creek Flood Control Coalition (CCFCC) mission goals encompass the entire Cypress Creek Watershed in Harris and Waller Counties, Texas. Created as a non-profit organization, it is governed by a 9-member board of volunteer, unpaid directors elected by residents of this largest of 22 watersheds in Harris County. It's declared purposes seeking safety for residents and property was approved by the U.S. government allowing it to operate as a tax-exempt 501(c) (3) organization. It is continuing today to (1) undertake engineering analysis/evaluation, educational and informational activities covering governmental design/ development / construction and regulation of flood mitigation plans for the purpose of protecting areas likely to be inundated by storm-water and flood-waters within the Cypress Creek Watershed, and (2) provide leadership in community conservation/preservation activities undertaken by both the government, private, and NGO sectors in planning, building and maintaining trails and parks throughout the watershed's riparian corridors.

Today their mission remains unchanged from the 3 goals set forth in their charter 16 years ago: namely *to develop awareness, analyze risks to life and property, and plan/implement regional storm water flood reduction and positive environmental preservation of forested floodplain corridors throughout the Cypress Creek Watershed*".

President's Letter

July 31, 2016

Shortly after being created in 1999, CCFCC was requested by the Harris County Flood Control District (HCFCD) to participate as a member of a Citizens Advisory Committee formed to bring the watershed resident community participation into their new planning process named the "*Cypress Creek Stormwater Management Program*". Formed by the Harris County Flood Control District (HCFCD) and the Texas Water Development Board (TWDB) sponsors, this project, the committee was told, would create a new master plan for the growing watershed; the Turner, Collie & Braden 1984 master plan being declared as "outdated" and this would provide a new plan for going forward with flood control in our rapidly urbanizing watershed.

. This new program plan was scheduled to be completed in the next 4-5 years in a 6-part series of progressive steps culminating in Commissioners Court adoption as a replacement for the TC&B master plan. Although updated watershed computer modeling identifying and mapping the watershed's floodplain and flood hazard zones remapping was completed and officially adopted, the overall watershed planning activities stalled before completion and was never resumed. And the floodplains / hazard zone areas were based on land development as of late December 2001. The result is (1) this remapping was outdated years before it was officially adopted by FEMA, and (2) there is no current master watershed plan today.

Other watershed engineering studies and flood mitigation plans (by the county) which would be critical as building blocks in this process to determine what must be done to establish the drainage management criteria requirements regulating new land development were started by HCFCD but abandoned/uncompleted during the last decade. An example is the "Future Conditions" flood hazard identification and mapping study which was undertaken at CCFCC request and would identify where the floodplains would spread, and their depth, and volume under the watershed's full development conditions.

At the beginning of 2015, there were only 2 "active work-in-progress." watershed flood mitigation/land development programs. These were:

- The Cypress Creek Overflow Management Plan study which encompassed the upper Cypress Creek (and adjoining Addicks/Barker Watersheds),
- The Little Cypress Creek -Frontier Master Plan for Drainage
<https://www.hcfcd.org/projects-studies/little-cypress-creek>

What happened In 2015 in achieving our flood mitigation and environmental conservation mission goals?

- Parks and trail development / conservation achievements were excellent and met with accolades throughout the watershed community. A detailed description of these activities and accomplishments prepared by Jim Robertson, Chairman is contained in the "Cypress Creek Greenway Project" section of this annual report.
- Conversely, flood mitigation planning / implementation activities by local government were, in summary, a disappointing failure.
- *Cypress Creek Overflow Management Plan* study. Touted highly by Harris County Flood Control as the salvation for bringing solutions to land development / floodplain management

drainage issues in the Upper Cypress watershed above and to the west of U.S. 290, this project study phase was implemented in 2011, completed in 2015 and the recommended plan accepted by the Texas Water Development Board. However it floundered and stalled when the land developer community's decision was made to not participate in deference to continuing development on their own accord. This short-circuited HCFCD submittal of the plan to and approval by Harris County Commissioners Court. Moving forward from this "conceptual" phase to the next phase has therefore stalled. Left uncorrected, these circumstances will result in the existing **rising flood waters** dilemma continuing thereby worsening and further endangering the safety of both persons and property in downstream Cypress Creek communities. A special section in this report prepared with the guidance of Pete Smullen, Technical Management Committee Chair provides descriptions of the alternate management plans, schematic diagrams, cost and technical detail.

- The "*Little Cypress Creek Master Plan For Drainage*" information prepared by Jack Sakolosky, the CCFCC Director / Officer is also provided as a separate sections of this report. Jack is the CCFCC representative interface with the HCFCD representative responsible for this extremely important section of the watershed's regional drainage process. This and the Cypress Creek Overflow Management Plan are the backbone for the 2015 and ongoing watershed's floodplain management activities.
- A bulleted synopsis containing more facts describing ongoing urban growth and other facts of interest for obtaining a better understanding of the elements related to the watershed flood mitigation goals

•
The consequence as things now stand is increased flood risk to the inhabitants. Left uncorrected and lacking consensus solutions between the bureaucracy and private enterprise, the flooding problem will intensify as a threat for many years into the future as the upper watershed area continues its transition from rice farming, forests and prairie pastures flat topography to concrete covered urban centers.

In summary it is now my strong belief a compelling need exists for change along several fronts in order for the CCFCC community alliance to achieve its formative goals. I will encourage and hope the Board of Directors and our elected officials and public servant agencies will move forward in 2016 to devise a pragmatic, positive plan for achieving this goal.

Respectfully,



Richard D. Smith President

Synopsis of Growth and Flood Risk Facts
Cypress Creek Watershed
CCFCC Year 2015 Annual Report

- The growth rate of new land development - - - and the volume and speed of stormwater runoff - - - in the upper and middle of this 62 mile length drainage basin has now accelerated this year fueled by completion of the Grand Parkway sections constructed going north from the Katy Freeway I-10 to the North Freeway I-45. It is the main artery of growth through the heart of the Big and Little Cypress Watersheds. Touted highly by Harris County Flood Control as the salvation for bringing solutions to this dilemma, The “*Cypress Creek Overflow Management Plan*” study (CCOMP) completed and accepted by the Texas Water Development Board this year floundered with the land developer community’s decision to not participate and would continue on its own accord. This short-circuited submittal to and approval by Harris County Commissioners Court for moving forward to the next phase. n. Left uncorrected, these circumstances will result in the existing rising waters” dilemma continuing thereby worsening and further endangering the safety of both persons and property in downstream Cypress Creek communities.
- A comparison illustrating the tremendous “*rising waters*” *increase* by a factor of 5X in stormwater flood elevation which occurs when the land use changes from undeveloped to fully developed conditions is provided in Exhibit #3.
- Daikin Industries Comfortflex plant. Exhibit #4, Currently scheduled for completion in 2016 - - a 5-million square-square-foot (largest tilt wall construction building in the entire United States) located next to U.S 290 in the Hempstead area of the watershed. The 4,500 person work force will require additional residential development in the watershed.
- Existing regulations of Harris County for floodplain management in the unincorporated area of Harris County include a fundamental requirement specifying

"no permit will be issued if the County Engineer determines that the development will increase flood hazards". Ref: Section 2.35 (k), Pg 26.

- A fact sheet "No Adverse Impact" published by the Association of Floodplain Managers. Exhibit #8,
- CCFCC "**Rising Waters**" letter dated September 4, 2015 to Commissioner Jack Cagle requesting he, "*initiate appropriate arrangements for the [proposed] development criteria be provided to our [CCFCC] technical representatives for review and comment prior to being processed by Commissioners Court . .*" Note: This was written after HCFCD refused, in defiance of Commissioner Cagle's direction to Mike Talbott to provide such information to CCFCC. Exhibit #1.
- "*Perspectives*", Exhibit #7 summary area comparison of watershed master planned communities. Work force of 4,500 people will require accessible housing in this area.
- Diagram "Circulatory System" illustrating the flow of stormwater and treated waste water from subdivisions/MUDs into the watershed system and overflow into Addicks / Addicks Reservoir, Buffalo Bayou and down town Houston. Illustrates the need for all watershed MUDs and Harris County Flood Control District engineering of such drainage to be done on a watershed-wide systems basis. Exhibit #5.
- Funding:
 - The Harris County Flood Control District Task Force approved a resolution submitted to Harris County seeking agreement to provide a "*consistent, reliable source of funding*" for the HCFCD capital improvement funding and designated a requested amount of \$200 million per year for this purpose. This was done in 2014 after discussion led by Chairman Melvin Spinks concerning what was announced to be \$12 billion - \$25 billion "unmet flood problems" in Harris County and a shortfall of funding for the HCFCD. The County Budget Officer concluded this undertaking with a

decision for such annual funding to be \$60 million and this is the budget allowance for the last 2 years.

o Funding for actual construction of regional stormwater detention basins / channels to be located within the Cypress Creek Watershed is further limited by a HCFCD policy of prioritizing capital improvement funding for watersheds which qualify for projects in which the USACE can participate - - - a requirement which we believe can only be resolved by federal resolution.

- Conservation: Katy Prairie Wetlands Construction. Exhibit #6.
- Home Buyouts in the Cypress Creek Watershed. Acquisitions to date plus information on eligibility and the process. Exhibit #2

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Cypress Creek Overflow Management Study

Annual Report 2015

Summary: Authorities responsible for Addicks-Barker reservoir have a growing concern over its volumetric capacity as development continues in the watershed (southeast of the Cypress Creek watershed). The volume of water flowing into the reservoir continues to increase; one day the incoming storm water volume may exceed the capacity of the reservoir. Cypress Creek is involved in the issue because during periods of heavy rain in the upper (northwest) part of the Cypress Creek watershed, the storm water runoff exceeds the Cypress Creek stream channel capacity resulting in overflow into the Addicks-Barker watershed ending up in the Addicks-Barker reservoirs

The enhanced Cypress Creek Watershed TSARP computer modeling in 2001 provided an improved understanding of the Cypress Creek overflow phenomena; the frequency, depth, width, volume and rate of flow. This led to Harris County Flood Control authorities then undertaking an in-depth review of the Addicks-Barker issue in a project named *"The Cypress Creek Overflow Management Plan study"*. This (1) identified two alternative regional management concept plans to mitigate the threat to exceeding the reservoir capacity, and, (2) additionally resulted in Harris County Flood Control District developing "Supplemental Guidelines and Criteria" which revise existing development permit requirements that call for an increase in the amount of storm water held back in development retention/detention ponds

In order to be implemented, the "Supplemental Guidelines and Criteria" and the regional development management plans require Harris County Commissioners Court approval. We have been and are continuing to monitor and evaluate progress in regard to these 2 aspects with the interests of the Cypress Creek Watershed residents in mind. At year end the status of these 2 elements was:

- The "Supplemental Guidelines and Criteria" have been determined by CCFCC that although being an improvement will be inadequate / allow storm water flooding to continue to increase in the Cypress Creek Watershed. **Note:** CCFCC during a period going back to 2003 has repeatedly encountered Harris County Flood Control District opposition to CCFCC recommended changes which would tighten flood mitigation requirements for new development. This continued in our efforts to review and comment on these proposed criteria before being submitted to Commissioner Court for approval. (See Exhibit #1 copy of CCFCC September 4, 2015 letter to Commissioner Jack Cagle,) However these were adopted after Commissioners Court approval on March 29, 2016.
- Development of the alternative "regional management plans" had stalled for the reason the land developers did not agree to participate and, we (CCFCC) understands in deference would continue

- development on their own accord. Consequently this backbone of the entire project has been suspended without being submitted to Harris County Commissioners Court. CCFCC has not determined at the time of this report, if the county government and/or the developers will regroup to resolve this impasse.

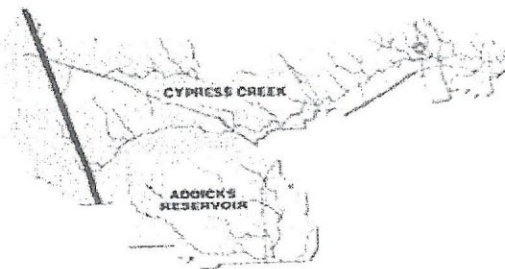
Description of Plan:

Cypress Creek Overflow Management Planⁱ

Study Area

The study area includes the Cypress Creek watershed upstream of US 290, the watersheds draining into Addicks Reservoir, and that portion of the drainage area (including the Cypress overflow) draining into Barker Reservoir that flows through Harris County. Approximately 60 square miles of the upper Cypress Creek watershed originate in Waller County and drain into Harris County.

Addicks and Barker reservoirs were constructed in the 1940's to protect downtown Houston from severe rainfalls that occur on the Buffalo Bayou watershed. The capacity of the reservoirs anticipated an overflow from Cypress Creek. However, no defined drainage systems were planned other than the natural tributary systems. These natural tributary systems include Langham Creek, Bear Creek, and South Mayde Creek.



Note: The portion of Cypress Creek downstream of US 290 is not in the study area.

Background

Western and northwestern Harris County is anticipated to experience a surge of land development activities in the near future. According to Region H Regional Water Planning studies, the population

of the study area, currently about 340,000, is anticipated to nearly double in the next 50 years.

This area drains into the two major reservoirs on the west side of Harris County, Addicks and Barker, which are designed to mitigate flooding in the downtown Houston area. The trend in land development will convert many acres of prairie land and rice farms into a suburban environment. Drainage is complicated by the fact that when storm events exceeding a 10-year event occur in the upper northwest areas of the county, runoff overflows from the Cypress Creek watershed into the tributary watersheds draining into the Addicks and Barker reservoirs.

The expanse of area includes almost 400 square miles, or 1/6 of the entire Harris County. To maintain orderly development of the area, and to avoid future drainage problems caused by lack of overall planning, it is necessary to take a comprehensive look at how a drainage plan and appropriate public policy can be implemented to minimize flood risk. This planning effort must balance the competing types of land use interests: preservation, business interests, and environmental mitigation needs. The planning effort also must examine the applicability of existing drainage criteria and make appropriate changes in light of the constraints; develop a sound implementation strategy that recognizes and protects the interested parties; and is economically viable to implement.

In September of 2011, HCFCD organized a steering committee of key stakeholders to identify the array of issues associated with the competing land interests and drainage issues in the study area. The steering committee includes representatives from Bayou Preservation Association, City of Houston, Harris County, Katy Prairie Conservancy, US Army Corps of Engineers, Waller County, West Houston Association, and HCFCD.

The objective of this effort was to establish a set of policies, technical criteria and guidelines that will allow the Flood Control District and Harris County to plan for and implement programs that reduce flood risks that are reflective of the unique hydrologic conditions in upper Cypress Creek and the drainage areas upstream of Addicks and Barker reservoirs. The principal product of this effort will be a series of design guidelines and an implementation plan for moving forward.

Study Goals

1. Gain consensus among key stakeholder groups representing business, environment, regulatory and other quality-of-life interests of the facts relating to flooding, flood volumes, flood peaks and flood risk.
2. Gain an understanding of the needs and objectives of the interested parties as it relates to land preservation, environmental mitigation, and land development.
3. Develop a consensus plan to reduce flood risks that incorporates the needs and objectives of all of the key stakeholder groups based on the collective interests involved and that is supported by all parties.
4. Establish interim criteria while adoption of the final consensus plan is ongoing.
5. Design a business plan to implement the strategies defined including the roles and responsibilities of all of the parties involved.
6. Gain adoption of the consensus and business plans by Commissioners Court.

Study Scope

The study took a comprehensive look at the aspects of the flooding problem and its solution(s). Aspects of the study were categorized into engineering, environmental, business/financial and communication disciplines. Scope of Work elements included the following.

- **Task 1:** Quantifying and Delineating Flood Risk to define the quantity, areal extent and depth of flooding associated with the Cypress Creek overflow and the locally generated runoff.
- **Task 2:** Identifying Mitigation Strategies
 - To estimate the size of storage/conveyance facilities necessary to respond to changing land uses from undeveloped (prairie) to suburban use.
 - To evaluate the sizing and practicality of implementing alternative strategies to manage the volume and peak rate of runoff in the study area, including runoff in Cypress Creek and the Addicks watershed, in both Waller County and Harris County.
- **Task 3:** Benefits of Prairie Restoration for Flood Control to determine the flood retardation benefits associated with prairie grasslands, in terms of both infiltration and time of concentration.
- **Task 4:** Identifying critical conservation areas to define those tracts of land that, for reasons of unique flood management potential or environmental habitat or wetland characteristics, would be preferred to remain as open space for environmental restoration.

- **Task 5:** Cost/Benefit Analysis to determine the value in establishing a regional drainage plan for the watershed(s), and to quantify that value in terms of avoided costs and benefits to the community.
- **Task 6:** Project Financing and cost Pro Forma to develop alternative strategies for financing a regional plan and identifying what roles and responsibilities public, private, and non-profit interests would commit to work together to implement any strategy.
- **Task 7:** Public Outreach Program to communicate to the public the scope of activities being considered by this planning effort and to solicit suggestions that may be incorporated into the planning study.
- **Task 8:** Final Report to summarize the findings of all investigations into a final report for adoption by Harris County Commissioners Court and potentially Waller County Commissioners Court.

The study effort was completed in October 2014, and the HCFCD submitted the draft Cypress Creek Overflow Management Plan study report to the Texas Water Development Board (TWBD) at that time. After a review period, the TWBD accepted the report in September 2015.

Next Steps

Currently, the study team is working on the following efforts that were borne out of the Cypress Creek Overflow Management Plan study:

Supplemental Guidelines and Criteria

Between December 2014 and December 2015, the Flood Control District hosted seven stakeholder workshops about the draft Supplemental Guidelines and Criteria to provide background information about why the criteria are needed, and to determine areas of concern and suggested revisions to the document. The workshops were well attended by several stakeholders, including the West Houston Association (WHA), Greater Houston Builders Association (GHBA), the American Council of Engineering Companies (ACEC), and the Harris County Public Infrastructure Department (HCPID). The goal was to work toward consensus on the guidelines and criteria, and we feel that we achieved that, as well as developing a deeper understanding of landowner and development concerns regarding real-world implementation of the requirements outlined in the guidelines.

Once the Supplemental Guidelines and Criteria are finalized, HCFCD will submit them to Harris County Commissioners Court for consideration of adoption.

Regional Overflow Management Concept Plan

HCFCD has determined that there is interest in moving forward with a Regional Overflow Management Concept Plan – whether it means building components of the preferred plan presented during the study process on a smaller scale or the full version – and is considering next steps in that analysis.

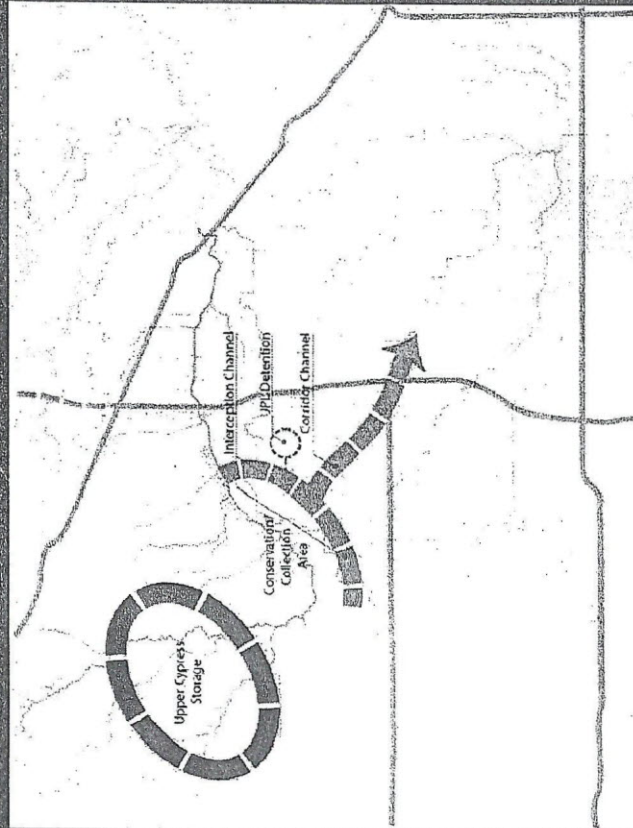
Prairie Vegetation Rainfall/Runoff Study

As part of the "Prairie Vegetation Rainfall/Runoff" study that was conducted within the larger Cypress Creek Overflow study, HCFCD continues to gather rainfall and runoff data from three different types of monitoring sites in the study area: developed property, agricultural and range land property, and native prairie. That data will be evaluated and compared with the initial analysis conducted during the study effort, and the results will be posted when the study is complete.

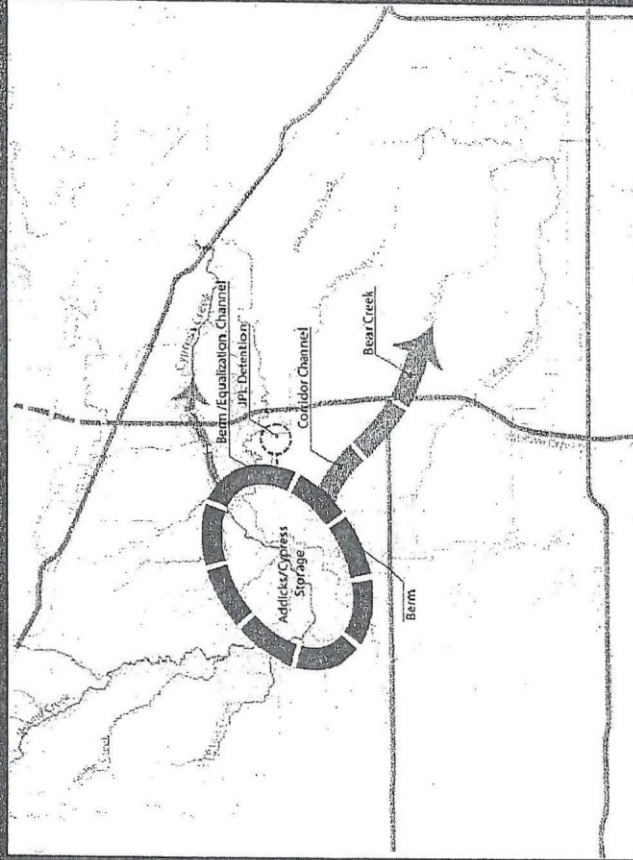
ⁱ Source: Printed from Harris County Flood Control District website, 3/28/16

Regional Management Plans for the Cypress Creek Overflow

Plan 3 Schematic: Mound Creek Reservoir with Overflow Conveyance "B"



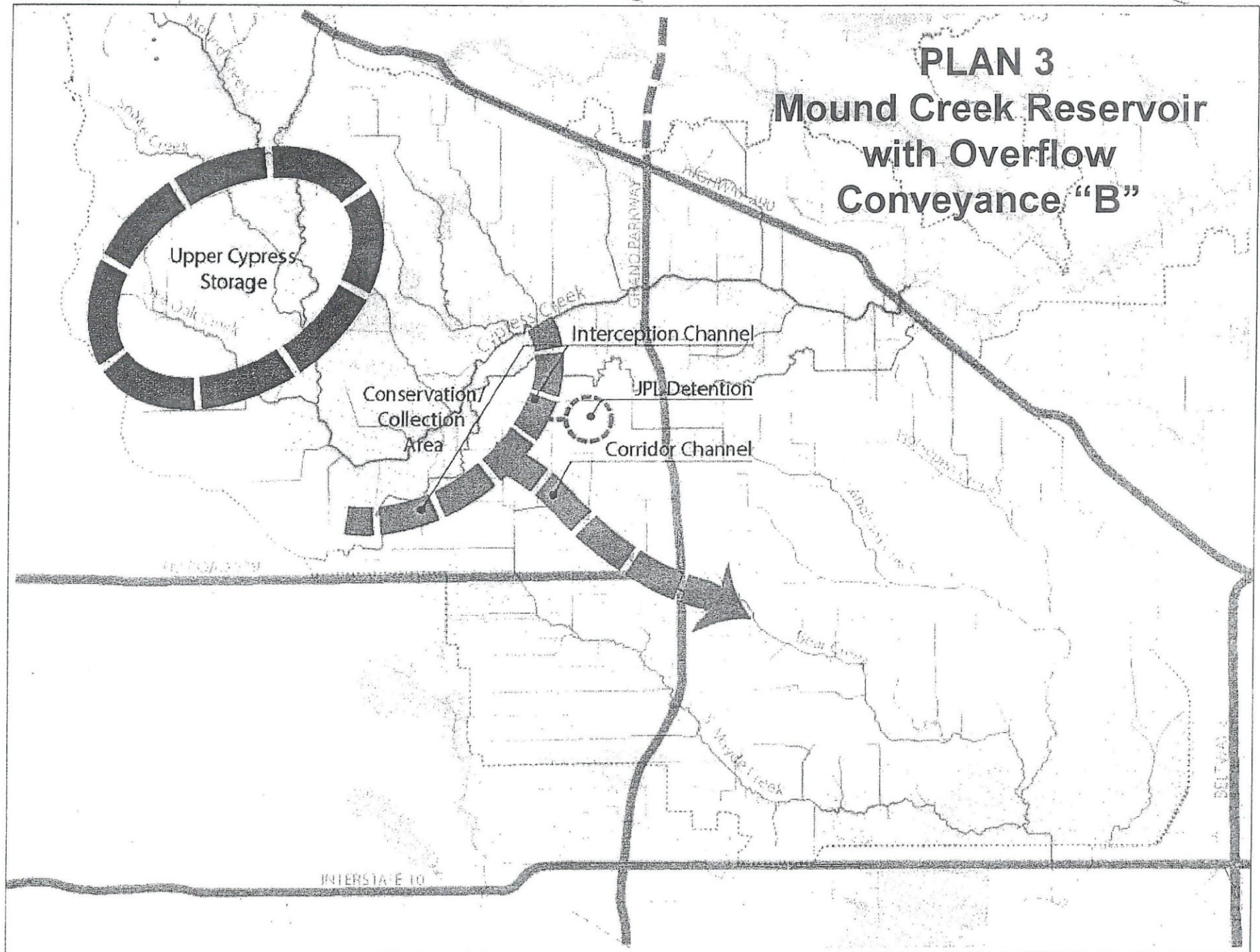
Plan 5 Schematic: Katy-Hockley N - Cypress Reservoir



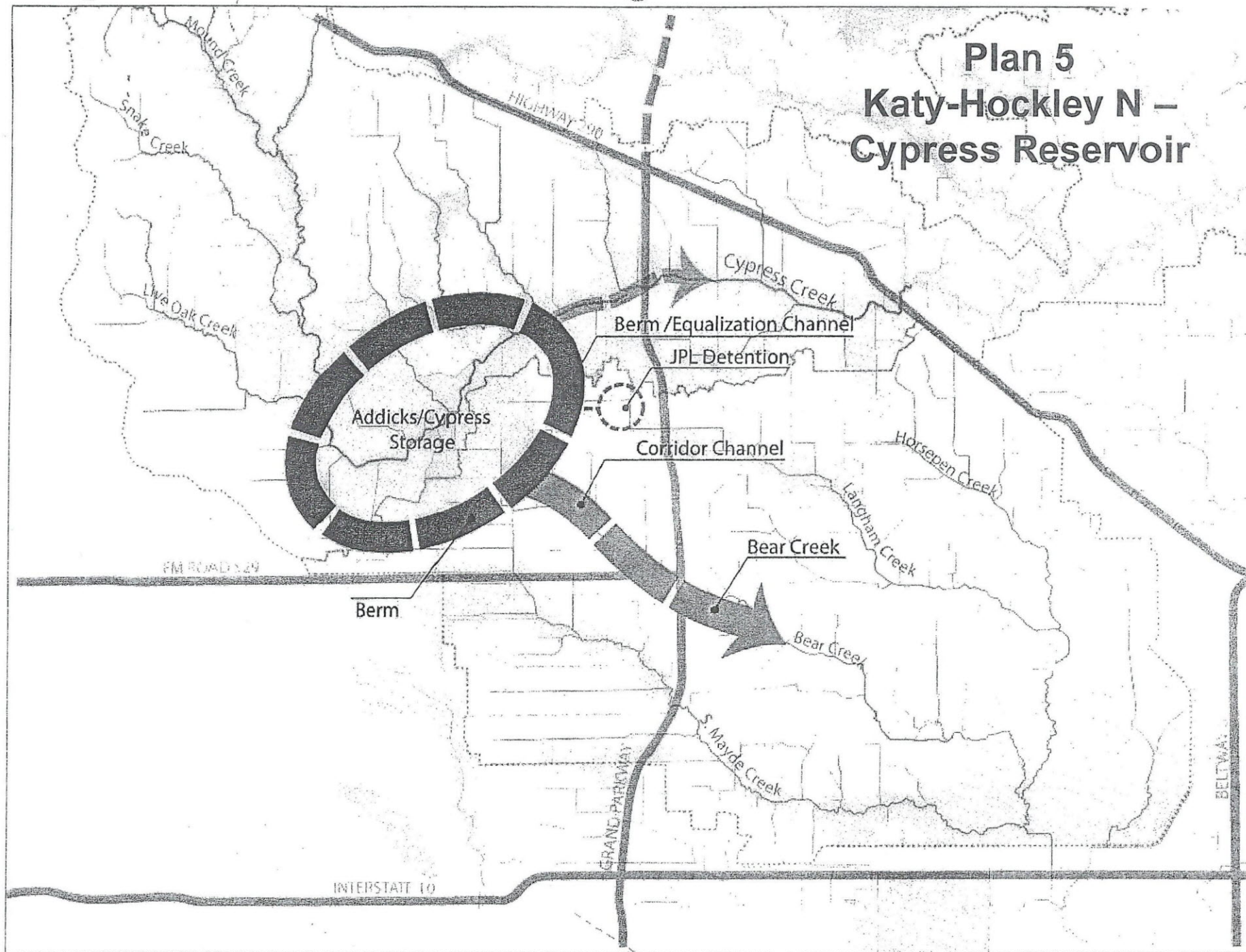
**Texas Water
Development Board**



PLAN 3 Mound Creek Reservoir with Overflow Conveyance "B"



Plan 5 Katy-Hockley N – Cypress Reservoir



Plan Comparisons

	Plan 3	Plan 5
Land Area	5,400 ac	11,300 ac
Managed Storage Volume (Addicks Reservoir Manages 200,800 ac-ft over 16,400 ac)	15,700 ac-ft	26,500 ac-ft
<i>100-yr Event</i>		
Inundation Depth	13' Max	8' Max
Drain Time	3 days	7 days
Land Protected From Overflow	18,500 ac	18,000 ac
Potential to Increase Conservation Footprint	3,100 ac	5,000 ac

Texas Water
Development Board



Plan Costs

Item	Full Cost	With Partner	
		Partner Contribution	Project Contribution
Plan 3			
Land	\$117 M	\$38 M	\$79 M
Construction	\$126 M	\$47 M	\$79 M
Professional	\$28 M	\$8 M	\$20 M
TOTAL	\$271 M	\$93 M	\$178 M
Plan 5			
Land	\$206 M	\$82 M	\$124 M
Construction	\$134 M	\$36 M	\$98 M
Professional	\$29 M	\$8 M	\$21 M
TOTAL	\$369 M	\$126 M	\$243 M



Development Board

Implementation Sequencing

- Each phase helps manage the path of the overflow and reduces its footprint.
- Potential for Development to help pay for implementation of a regional plan rather than smaller, disconnected management facilities that would occur without a regional plan.
- There is a shortfall of funding upfront – regardless of strategy employed.



**Texas Water
Development Board**



LITTLE CYPRESS CREEK MASTER PLAN FOR DRAINAGE

The Little Cypress Creek watershed is expected to experience significant growth as Harris County doubles in population over the next 50 years. Currently Little Cypress Creek (Harris County Channel L100-00-00) and its tributaries have neither the depth nor conveyance capacity to accommodate the increased runoff rates that will result from the projected development. To address this development, the HARRIS COUNTY FLOOD CONTROL DISTRICT (HCFCD, the District) is preparing a final Regional Drainage Plan for the Little Cypress Creek watershed.

The District has designated inclusion of the Little Cypress Creek watershed in the district's Frontier Program. Goals for the Frontier Program include planning for and implementation of the construction of orderly drainage infrastructure (primarily right of way acquisition and construction of channel depth) in advance of future land development. To accomplish this, the District works in partnership with landowners, developers, and public entities to adopt strategies to effectively mitigate increased stormwater runoff while offering opportunities to provide community amenities and to enhance or preserve the area's natural resources. The Frontier Program was adopted by the District to develop watershed drainage plans which include regional or sub-regional detention basins and a master planned channel corridor. The channel corridor may include aesthetic and functional features such as wide flood benches, gentle side-slopes, and linear storage volume

Preliminary findings from the Little Cypress Creek drainage study resulted in the preparation of interim guidelines for new development in the Little Cypress Creek service area.

Recommendations resulted in adoption of the "Interim Guidelines for New Development in the Little Cypress Creek Service Area", dated January 31, 2014, by Harris County Commissioners Court. The interim new development standards will be effective until the final "Regional Drainage Plan for the Little Cypress Creek" is adopted. The scheduled date for adoption of the final plan has not been determined. The interim guidelines include the following elements:

Interim Drainage Plan

The proposed channel right of way ranges from 220 feet to 240 feet. Five (5) regional detention basins are proposed. The proposed acreage and detention volume for each of the regional basins has not been determined. Proposed locations for the basins are shown in Exhibit A. Design and construction of conveyance channels will provide a bankfull channel section capable of conveying a 1-year design flow coupled with a benched section capable of conveying a 100-year flow. HCFCD will allow the use of temporary in-line detention concepts to meet the objectives of the INTERIM DRAINAGE PLAN. Design and preparation of construction drawings shall comply with the current Policy, Criteria, and Procedures manual (PCPM) of HCFCD.

Impact Fees

HCFCD will collect Impact Fees for all new development in the service area. The District intends to limit its financial obligations for the interim drainage plan to funds collected through impact fees.

Detention Volume and Total Required Excavation

The minimum detention volume shall be 0.89 ac-ft/acre of new development. Detention volume is comprised of 0.55 ac-ft/ac for detention volume plus 0.34 ac-ft/ac for channel conveyance volume. "Total Required Excavation" is defined as the volume within HCFCD ROW that a new development will be required to excavate. HCFCD will coordinate with the new development applicant to identify locations for performing "Total Required Excavation" as well as additional excavation for mitigation if required.

Permit Application for New Development

HCFCD will enter into an agreement with the New Development Applicant that allocates System Capacity to the Applicant's New Development. The Applicant's dedication of ROW to the program may be used as a credit to the Impact Fee. The Applicant's costs associated with environmental permitting and environmental mitigation within HCFCD ROW are eligible for credit against Impact Fees.

Cypress Creek Greenway Project – CCFCC Annual Report for 2015

During 2015 the Cypress Creek Greenway Project (CCGP) continued its efforts toward the creation of a linear greenway along Cypress Creek from west of US 290 to the east where Cypress Creek joins Spring Creek. The greenway will connect existing and future anchor parks along Cypress Creek with a multi-use trail. In addition to our efforts many partners in the Greenway are doing things to make the vision for the Greenway a reality. Below are some highlights from 2015.

- **Cypress Creek/SH 249 Area Trail Master Plan** - Lake Forest UD working with the Cypress Creek Greenway Project and several partners provided funding for the development of a trail master plan for the Cypress Creek/SH 249 area. The approximately 14 square mile area is bisected by Cypress Creek and contains three anchor parks, a preserved natural corridor along the creek, several parks and unconnected trail segments, and a large residential area with a central core including offices, retail, educational facilities and mixed use development. EHRA, the firm selected by the coordinating board to develop the master plan, completed the plan in January 2015. A public meeting to present the master plan was held at Lone Star College-University Park on Wednesday, 1/28/25, with approximately 130 attendees. Throughout the remainder of the year the plan was used as a basis of discussion with potential partners who could implement various aspects of the plan. The plan can be viewed online at <http://www.ccfcc.org/CCreekTMP/index.html>.
- **Trash Bash at Collins Park on Cypress Creek** – Trash Bash was held at Collins Park on Saturday, 3/28/15. This was the sixth year for the Bayou Preservation Association, the Cypress Creek Greenway Project, and Precinct 4 Parks Department to hold the event at Collins Park. A total of 661 volunteers participated in the event. Approximately 40 cubic yards of trash were gathered up from several locations along Cypress Creek and its tributaries between Kuykendahl and SH 249.
- **Cypress Creek Paddling Trail** – The Bayou Preservation Association in partnership with the Cypress Creek Greenway Project continued the work to develop the 35 mile long Cypress Creek Paddling Trail. TPWD personnel have examined portions of the paddling trail and launch locations during a driving tour. Bayou Preservation continues to work with the TPWD to schedule times for paddling a selected section of the paddling trail. A scheduled in early June trip was canceled as a result of the high water following the Memorial Day weekend heavy rains.

- Timber Lane Utility District** – Timber Lane Utility District hosted a meeting on 12/8/14 at which students of the Texas A&M Graduate Landscape Architecture Class presented the results of a project titled *Cypress Creek Greenway- East Section (Spring Creek to West of I-45) Hike and Bike Master Plan*. The work was sponsored by Timber Lane UD under the direction of Professor John Rodick at A&M. Timber Lane UD continued construction of a bridge which will cross Cypress Creek and connect Timber Lane's extensive network of parks and trails on the north side of Cypress creek to Mercer Arboretum on the south side of Cypress Creek. The bridge will accommodate pedestrian and bicycle traffic as well as maintenance and emergency vehicles. The project also includes an additional trail and a bridge over a Cypress Creek tributary on the south side of the creek.
- Bayou Land Conservancy Land Ownership along Cypress Creek** – Bayou Land Conservancy, which holds 57 conservation easements on lands across Texas, became a landowner in early 2015. In assuming ownership of an approximately 12 acre donated tract it now also owns acreage in fee. The Ashton Gardens Preserve is adjacent to the south bank of Cypress Creek just to the west of the Hardy Toll Road.
- Trail across the 100 Acre Wood** – Precinct 4 Parks Department awarded the contract for and the construction began on a 4,200' asphalt trail across the 100 Acre Wood Preserve adjacent to Cypress Creek west of SH 249. On Saturday, 9/26/15, Bayou Land Conservancy (BLC) hosted a National Trails Day event at the 100 Acre Wood Preserve. In addition to the work events completed on the tract, Harris County Precinct 4 Commissioner Jack Cagle participated in a "vine cutting" (aka ribbon cutting) commemorating the beginning of construction by Precinct 4 of the 4,200' paved trail which will cross the 100 Acre Wood. The trail will connect from an existing trail at Jones Road and will provide trail connectivity for thousands of area residents to the Cypress Creek YMCA to the east. Harris County owns, and the Bayou Land Conservancy holds a conservation easement on, the 100 Acre Wood Preserve. The Preserve also has about 2 miles of natural surface hiking and biking trails.
- Development of the Kickerillo-Mischer Preserve (KMP)** – Harris County Precinct 4 Parks Department was able to commit \$3.7 million to the initial development of this park beginning in 2016. The 85 acre KMP is a key anchor park and is located adjacent to Cypress Creek immediately east of SH 249. The KMP includes a 40 acre lake. Development of this park should serve as a catalyst for further trail development and connectivity to occur in this area. The acreage was donated to Harris County by V&W partners following discussions among several partners/participants including HP, V&W Partners (Kickerillo and Mischer), Harris County, Harris County Precinct 4, HCFCD, and Friends of the Kickerillo-Mischer Preserve.

- **Cypress Creek Regatta** – The second annual Cypress Creek Regatta was held on Saturday, 9/19/15. The event was very successful with at least 28 water craft and 41 paddlers participating. The 7.4 mile route extended from Mercer Arboretum east to Jones Park. Water conditions and the weather were both great. A clean up scheduled on Saturday, 9/12/15, along the regatta course was cancelled due to high water levels. The course was floated two days before the event to ensure safe conditions existed on the course. Special thanks go to Steve Hupp, Rico Torres, Tom Douglass, Erick Ruckstuhl and his crew, Harris County Precinct 4 Parks Department, and to the sponsors for their significant roles in making this a great event.
- **Cypress Creek Greenway Update Meeting** – The Cypress Creek Greenway Project Update Meeting was held on Friday, 10/2/15, in the Big Stone Lodge at Dennis Johnston Park in Spring, TX. There were approximately 50 attendees at the meeting. Presentations were made by representatives from Harris County Precinct 4 Parks Department (including Precinct 4 Commissioner Jack Cagle), the Cypress Creek Flood Control Coalition/Cypress Creek Greenway Project, Bridgeland, Malcomson Road UD, Timber Lane UD, EHRA, CDS Market Research, Texas A&M, and HCFCD. Information was shared about several projects completed, underway, and planned for the Cypress Creek Greenway.
- **Harris County Flood Control District Purchase of Flood Plain Preservation Acreage** – HCFCD purchased an approximately 75-acre forested tract adjoining the north bank of Cypress Creek immediately east of TC Jester. This tract was purchased for flood plain preservation and lies between previously owned HCFCD tracts immediately to its east and west. With this acquisition there is publically owned acreage bordering the north side of Cypress Creek from Strack Road upstream to the upper end of Meyer Park, a distance of almost 3 miles. This acquisition “fills in a hole” in the HCFCD owned floodway through this area and has been a tract of interest for several years. It is a key piece in the connectivity of the Cypress Creek Greenway along this section of Cypress Creek.
- **Harris County Flood Control District Construction of Zube Park Stormwater Detention Basin** - HCFCD has begun construction on the first phase of a new stormwater detention basin adjacent to Little Cypress Creek. It is part of a regional drainage infrastructure plan for this area. This new basin will ultimately hold 195.5 million gallons or more than 600 acre feet of stormwater in a rapidly developing area of northwestern Harris County. The basin is located on a tract to the east of Precinct 3’s existing 141-acre Zube Park which is bisected by Little Cypress Creek.

04/18/16

Cypress Creek Flood Control Coalition
Profit and Loss Standard
January through December 2015

	<u>Jan - Dec '...</u>
Ordinary Income/Expense	
Income	
I - 2 — Resident Voluntary Contribu...	20,547.40
I - 4 — Interest Earnings	5.73
Total Income	<u>20,553.13</u>
Expense	
10 — Office Supplies, Print, Postage	1,496.84
13 — Contributions & Membership ...	100.00
18 — Engineering/Technical Consu...	10,650.00
23 — Cypress Creek Greenway Pr...	3,524.79
7 — Administration Expense	1,457.33
11 — Computer ops and maintenanc...	1,411.56
12 — D&O L Liability Insurance	940.00
9 — Earthlink, SBC,DSL,Symantec	1,362.69
Total Expense	<u>20,943.21</u>
Net Ordinary Income	<u>-390.08</u>
Net Income	<u><u>-390.08</u></u>

Cypress Creek Flood Control Coalition Balance Sheet Standard

04/18/16

As of December 31, 2015

	<u>Dec 31, '15</u>
ASSETS	
Current Assets	
Checking/Savings	
1.1110 — Checking - Amegy Bank 365...	40,453.72
1.1130 — Investments - Amegy	16,094.10
Total Checking/Savings	<u>56,547.82</u>
Total Current Assets	56,547.82
Fixed Assets	
1.1300 — Computer & Office Equipment	2,334.30
Total Fixed Assets	<u>2,334.30</u>
TOTAL ASSETS	<u><u>58,882.12</u></u>
LIABILITIES & EQUITY	
Liabilities	
Current Liabilities	
Accounts Payable	
1.2110 — Trade Accounts Payable	177.42
Total Accounts Payable	<u>177.42</u>
Total Current Liabilities	<u>177.42</u>
Total Liabilities	177.42
Equity	
3000 — Opening Bal Equity	24,870.64
3900 — Retained Earnings	34,224.14
Net Income	-390.08
Total Equity	<u>58,704.70</u>
TOTAL LIABILITIES & EQUITY	<u><u>58,882.12</u></u>

CCFCC
Proposed 2016 Budget

Funds/Expense			2015 Budget	Total 2015	Proposed 2016 Budget	Current 1/16/16	Total 2016
Funds							
	Bank balance						
1-1	MUD/HOA Contributions						
1-2	Resident Vountary Contribution		\$24,000	20,422.50	\$21,000	1778.15	1778.15
1-3	Grant Applications						
	3a.- Houston Endowment						
	3b. - Other Sources (See Treasurer's Report)						
Total	1-3 Grant Applications						
	Misc						
1-4	Interest Earnings (Includes cking & savings)		\$5	5.75	\$6	0.49	0.49
Total			\$24,005	20,553.25	\$21,006	1778.64	1778.64
Expense							
1	Membership Bus. & Community Outreach						
2	Annual Meeting						
3	Preservation Committee						
4	IT Mgt-Evaluation Comm.						
5	AWBD Committee						
6	Legal & Accounting Fees & Banking fees						
7	Administration Expense	RD Smith	\$1,500	1,278.76	\$1,500		
8	Fed Income Tax Preparation						
9	Earthlink, SBC,DSL,Symantec		\$1,500	1,362.69	\$1,500		
10	Office Supplies,Print Postage		\$1,400	1,694.98	\$1,400	25.36	25.36
11	Computer ops & maint.		\$1,500	855.77	\$1,500		
12	D&O Liability Insurance		\$1,000	940.00	\$1,000		
13	Contributions & membership Dues		\$1,000	1,150.00	\$1,000		
14	Houston-Galveston Area Council						
15	Publications						
16	Environmental Affairs Committee						
17	Seminar/Conference Expense		\$100	65.00	\$100		
		Total 1->17	\$8,000.00	7,347.20	\$8,000.00	25.36	25.36
18	Engr / Tech Consultation			10,650.00			
	18-1 PY Work to be Paid in '2015						
	Rice Univ. NAI Project						
	LG Dunbar-FEMA Comp/LOMAR (Encumbered)						
	Total 18-1 PY Work to be Paid in '15		\$12,000	10,650.00	\$12,000		
	18-ii CY 2010 Work						
	Rice Univ. NAI Project						
	Future Conditions-begin 4/1/10 (L Dunbar)						
	Houston Endowment for Future Conditions)(Encumbered Grant)						
	Aerial Photo's						
	Total 18-ii-CY 2015 Work						
Total 18	Engr / Tech Consultation		\$14,000		\$10,000		
19	Reserve for Future Requirements						
20	Grant Proposal Expense						
21	Operator Fee - Customer Billing						
22	Bookkeeping						
23	Cypress Creek Greenway Project-J Robertson		\$2,000	2,699.79	\$2,000		
	23a Meyer Park / REI (Encumbered Grant)						
	23b Memorial Lady Bug (Encumbered Grant)						
	23d Cypress Creek Greenway Project-other						
Total 23	Cypress Creek Greenway project		\$2,000	2,699.79	\$2,000		
24	Detention Pond Committee						
25	Contingencies						
26	Misc. office Equipment		\$250		\$250		
	Total 18>26						
			\$250		\$250		
total expense			\$24,250.00	20,696.99	\$20,250.00	\$25.36	25.36
Total Income			\$24,005.00	20,553.25	\$21,006.00	\$1,778.64	1778.64

Cypress Creek Flood Control Coalition
Board and Committee Members
 January 01, 2016

Board of Directors

3-year term ending

John Porea, Treasurer	2018	
James H. Robertson	2017	
John J. Sakoloski, Secretary	2018	
Autumn L. Selman	2017	
John E. Sherman	2019	
Richard D. Smith, President	2019	
Peter R. Smullen, Vice President	2019	
Joe Velasco	2017	
Carl Zeitler	2018	8

Committees

- Communications and Public Outreach Committee
 Dick Smith, Acting Chair
- Public Relations Committee
 John Porea, Chair
- Civic Association / MUD Membership Committee
(A voluntee is required to fill vacancy)
- Technical Management Committee
 Pete Smullen, Chair
 Autumn Selman
 Jack Sakolosky
- Preservation Committee
 Patsy Gillham, Chair
- IT Management
 Joe Velasco, Chair
- Cypress Creek Greenway Committee
 Jim Robertson, Chair



CYPRESS CREEK FLOOD CONTROL COALITION

12526 Texas Army Trail
Cypress, Texas 77429
Tel: 281-469-5161
Fax: 281-469-5468

e-mail: floodalliance@ccfcc.org
www.ccfcc.org

COPY

Commissioner Jack Cagle
1001 Preston, 9th Floor
Houston, Texas 77002

September 4, 2015

Subject: Rising Waters

Ref: a) Cagle/CCFCC February 5, 2015 meeting
b) Harris County "No Adverse Impact" Floodplain Management Regulations

Dear Commissioner Cagle,

This is the letter I mentioned to you would be forthcoming when we recently met at with the Government Affairs Committee, Cy-Fair Houston Chamber of Commerce. The purpose is to confirm the work-in-progress meeting with Gary Bezemek the prior week went well and to request your assistance on one of the matters which came to our attention.

Specifically your highly regarded stewardship is requested to establish a process within the Harris County government for resolving what, in our assessment, constitutes the primary impasse between our community and HCFCD in overcoming impediments preventing resolution to long standing and increasing rising water risks in the Cypress Creek Watershed's rapidly evolving transition from a rural to highly developed landscape. As previously brought to Art Storey's and later your attention, it is an issue with inherent safety and what could be very significant but avoidable tax payer cost implications to the residential and business communities throughout this watershed.

The primary unresolved issue concerns the existing stormwater drainage detention regulatory requirements applicable in order to obtain Harris County PID approval of permit applications for new land development in this watershed. These are not sufficient to prevent the identified adverse impact to watershed inhabitants resulting from the increasing stormwater runoff. Technical analysis using state-of-the-art computer modeling carried out by local engineering experts contracted by CCFCC for this purpose have quantified and determined the regulatory adjustment(s) required to be made by Harris County in order to restrain these flood water elements to their level which exists while the topography is in the undeveloped state.

The technical data reports covering these evaluations were submitted to HCFCD but rejected without comment or corrective action. This and related engineering studies by HCFCD which were approved by Commissioners Court and implemented but abandoned were taken up with Mr. Art Storey. As you may recall, these were addressed in his letter of February 9, 2012 on which you and Commissioner Steve Radack were copied. We understood from this letter that

... continued next page ...


the Cypress Creek Overflow Management Plan study would include *"an analysis that confirms the validity of the existing criteria"*.

We now understand from the review at last week's meeting with Gary Bezemek, that HCFCD will shortly be requesting Commissioners Court to approve changes to these existing development criteria independent from and not part of their report to Commissioners Court covering the Cypress Creek Overflow Management Plan study. This is an unexpected surprise to us and is especially so inasmuch as there has been no communications received that CCFCC will be given the opportunity to review and comment consistent with your directions to do so during the June 14, 2012 meeting in your office with Messrs Talbott and Garcia). A copy of the confirming letter on this point is enclosed.

In conclusion, it is therefore requested that you initiate appropriate arrangements for the aforesaid development criteria to be provided to our technical representatives for review and comment prior to being processed by Commissioners Court. Please confirm this meets with your approval/will be undertaken and what additional action, if any, you wish be done by our organization or others in the Cypress Creek Watershed's Precinct 3 and Precinct 4 community.

Thank you again on behalf of our board of directors and membership for your much appreciated continuing leadership in overcoming what has clearly been identified as a "Rising Waters" adverse risk impact to our rapidly expanding sector of Harris County's northwestern frontier.

Sincerely,



R.D. Smith
President

Encl:

cc: Commissioner Steve Radack
Judge Ed Emmett, Harris County Commissioners Court
Michael D. Talbott, Executive Director, HCFCD
Gary Bezemek, P.E. HCFCD Watershed Management

Cagle HCFCD Drainage Criteria Review

Home Buyouts in the Cypress Creek Watershed

“Through voluntary home buyouts, the Flood Control District can purchase properties that are hopelessly deep in the floodplain, move the owners to higher ground and prevent future flood damages by removing structures from these properties. The Flood Control District has placed a major focus on voluntary home buyouts within the Cypress Creek watershed. Since 1985, the Flood Control District, acting alone and in various partnerships with the Federal Emergency Management Agency (FEMA), the U.S. Army Corps of Engineers (Corps) and Harris County, has acquired more than 300 flood-prone properties in the Cypress Creek watershed.”¹

Update provided by HCFCD :

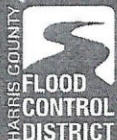
Cypress and Little Cypress Creek Acquisition as of 9/2/16:

- Home Buyout → 283 properties → 223 acres (fee)
 - Basin right of way → 47 properties → 1,013 acres (fee and easement)
 - Channel right of way → 1,058 properties → 3,445 acres (fee and easement)
 - Floodplain preservation → 64 properties → 2,035 acres (fee and easement)
 - Flooding easement → 37 properties → 2,970 acres (easement)
-

Use the following Harris County Flood Control District website links to obtain information concerning the voluntary home buyout program:

- <https://www.hcfcd.org/our-programs/property-acquisition-program/voluntary-acquisition/voluntary-home-buyout/>
- <https://www.hcfcd.org/media/1730/voluntarybuyoutprogramfema.pdf>

¹ Source: Harris County Flood Control District website, 3/30/16



VOLUNTARY BUYOUT PROGRAM

FEMA Home Buyout Grants

ELIGIBILITY FOR VOLUNTARY BUYOUT

In order for a property to meet FEMA's eligibility requirements for a grant-funded voluntary buyout, it must meet the following criteria:

1. The property must be located in a community that participates and is in good standing in the National Flood Insurance Program (NFIP) and has a FEMA-approved Hazard Mitigation Action Plan.
2. The property's purchase must be cost beneficial. A property is considered cost beneficial if the cost of acquiring and demolishing the property is less than the cost of the estimated future flood damages to the property.
3. The property must have a current flood insurance policy to meet the requirements for certain types of FEMA grants, such as Severe Repetitive Loss (SRL) and Flood Mitigation Assistance (FMA).

In order for a property to meet the District's eligibility requirements, it must be beneficial to the District's mission of providing flood damage reduction projects that work with appropriate regard for community and natural values. To that end, the District will consider the following factors in its evaluation of the property:

1. Source of flooding.
2. Location and depth within the floodplain.
3. Cost effectiveness as a solution to the property's flooding problem.
4. Potential for future floodplain preservation and/or flood damage reduction projects.
5. Compatibility with community and natural values.

OVERVIEW

This guide is for property owners who are considering or have agreed to participate in a Voluntary Buyout Program funded by the Federal Emergency Management Agency (FEMA) and sponsored by the Harris County Flood Control District. This guide explains the program and process for the voluntary sale of property to the Flood Control District.

It is important to understand that FEMA-funded buyouts are voluntary. Either party (the property owner or the Flood Control District) may withdraw from the process until an Agreement for Sale contract is signed.

IMPORTANT CONTACTS

Harris County Flood Control District,
Property Acquisition Section
9900 Northwest Freeway
Houston, TX 77092 • 713-684-4000

Buyout Hotlines
713-684-4020 or 713-684-4035

*For questions related to: volunteering,
eligibility, grant status, and demolition.*

Harris County Right of Way Division
10555 Northwest Freeway, Suite 210
Houston, TX 77092 • 713-355-7750

*For questions related to: appraisal,
agreement for sale, relocation, and closing.*

VOLUNTARY BUYOUT PROCESS

This process,
which generally
takes between
13 – 25 months
from the date the
grant application
is submitted, is
carried out through
the following steps:

1. PROPERTY OWNERS VOLUNTEER

2. GRANT APPLICATION SUBMITTED FOR REVIEW

3. FEMA ACCEPTS OR REJECTS APPLICATION

4. PROPERTY OWNER MEETING

5. APPRAISAL

6. AGREEMENT FOR SALE

7. DETERMINE RELOCATION BENEFITS

8. CLOSING

9. DEMOLITION

Start Date

Start Date + 8 to 18 Months

Start Date + 9 To 20 Months

Start Date + 10 To 21 Months

Start Date + 11 To 23 Months

Start Date + 12 To 24 Months

Start Date + 13 To 26 Months

1. PROPERTY OWNERS VOLUNTEER

The property owner voluntarily agrees to be included in a FEMA grant application and completes the Voluntary Participation Agreement form. The Flood Control District will review the completed form and determine if the property meets the eligibility criteria for the voluntary buyout program.

2. GRANT APPLICATION SUBMITTED FOR REVIEW *(Start Date)*

The Flood Control District prepares and submits a grant application to the State, which serves as the grantee for FEMA's grant, for the purchase and demolition of the properties included in the application. Typically, it takes 8 to 18 months for a decision to be reached by FEMA and the State.

3. FEMA ACCEPTS OR REJECTS APPLICATION

(Start Date + 8 to 18 Months)

FEMA and the State review and approve or reject the grant application.

4. PROPERTY OWNER MEETING

(Start Date + 8 to 18 Months)

If the grant application is approved, each property owner will meet (in person or via phone or e-mail) with a Flood Control District Grant Coordinator. The purpose of the meeting is to explain the voluntary buyout process and timeline. At the meeting, the District Grant Coordinator will review this handout and the property owner will sign the three forms described below. The property owner must sign all three forms to continue with the buyout process.

A. A Privacy Act Statement form, which authorizes a public notice that FEMA is considering a voluntary home buyout program in the community (no private contact information is published).

B. A Property Appraisal Permission and Release form, which authorizes the District to conduct a property appraisal and to make an offer to purchase.

C. A Declaration and Release form, which indicates if the property owner is a citizen of the United States. The owner's citizenship can affect eligibility for certain types of relocation assistance.

5. APPRAISAL *(Start Date + 9 To 20 Months)*

The Flood Control District utilizes the services of the Harris County Right of Way Division (HCROW) to acquire property. Once HCROW receives the District's request for a voluntary purchase, a state-certified real estate appraiser is assigned to perform an appraisal of the property. The appraisal process takes approximately 30 days. HCROW will mail the

property owner a letter that identifies the appraiser and their contact information. The property owner then schedules an appointment with the appraiser for a complete inspection of the property. During the appointment, the property owner should be prepared to provide any valuation information, such as documentation of renovations or another recent appraisal, they have regarding the property. The appraiser will assess either the current fair market value or a pre-flood fair market value, as appropriate. Fair market value is the most probable value of a property in a competitive, fair and open market. The pre-flood fair market value takes previous flooding damages into consideration and provides the most probable price a property should bring in a competitive, fair and open market prior to flood damages. The Harris County Appraisal District market value of a property is NOT used in determining the fair market value of a property. The appraiser will prepare an appraisal report that meets FEMA and State requirements and includes the fair market value of a property, and will submit it to HCROW.

6. AGREEMENT FOR SALE *(Start Date + 10 To 21 Months)*

Once funding is established, HCROW will assign a purchase agent to the property owner. The purchase agent will contact the property owner to arrange a meeting to present the property owner with an offer to purchase the property. At that meeting, the property owner will be provided a copy of the appraisal report and a proposed agreement for sale contract. If the property owner accepts the appraisal, they would continue to the next step in the process. The property owner may appeal the appraisal by obtaining, at the property owner's expense, another appraisal prepared by a state-certified real estate appraiser. HCROW will review both appraisals to determine the final fair market value of the property.

7. DETERMINE RELOCATION BENEFITS

(Start Date + 11 To 23 Months)

HCROW will assign a relocation agent who will determine the property owner's relocation assistance eligibility and estimate the amount of relocation benefits to be paid to the property owner. Upon request, the relocation agent will also assist the property owner in locating a replacement home.

8. CLOSING *(Start Date + 12 To 24 Months)*

Closing will take place upon receipt of title work and funding. The property must be vacant at the time of closing.

9. DEMOLITION *(Start Date + 13 To 26 Months)*

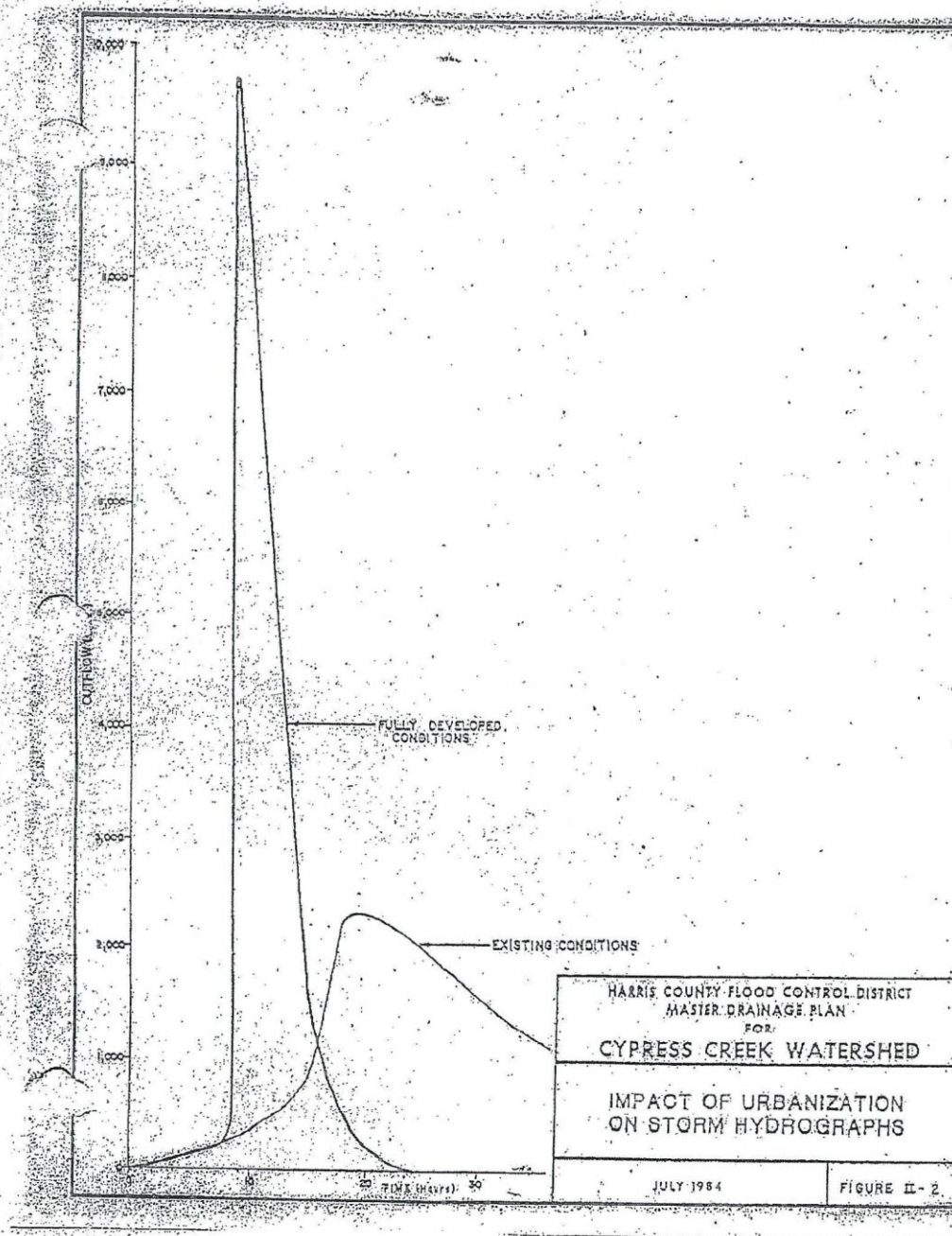
The Flood Control District will demolish the improvements located on the property. Per FEMA's deed restrictions, the property must remain as open space in perpetuity (forever).

VOLUNTARY BUYOUT PROGRAM

FEMA Home Buyout Grants



Impact of Urbanization on Stormwater Runoff Cypress Creek Watershed ¹



This hydrograph illustrates the stormwater runoff peak base flood elevation and runoff duration for (1) undeveloped land in the upper watershed (lower curve) and (2) the 5X increase but shorter duration at this same location under full development conditions (higher curve).

¹ Source: Cypress Creek Watershed Master Plan prepared by Turner, Collie & Braden. Master Plan was adopted by Harris County Commissioners Court in 1986 and remains today as the only official master plan for the watershed.

Partnership Awarded 2015 Economic Deal of the Year



One of the leading national economic development publications, Business Facilities magazine, has awarded the Partnership and our Houston regional allies the 2015 "Economic Development Deal of the Year" Gold Award for Goodman Global Group's (Daikin Industries) 4.1-million-square-foot consolidated campus.

Goodman Global's new facility now joins the ranks of 2014 winner, Tesla, for their 5-million-square-foot lithium battery Giga factory in Western Nevada, and 2013 award winner Apple, for their first Solar facility in Phoenix.

Construction on the \$417 million facility in northwest Harris County is well underway. Goodman Global will begin relocating employees in 2016, and the site is scheduled to be fully operational between 2018 and 2020. The project will support 4,600 jobs and more than 11,000 indirect jobs.

This project spanned several years, and there were many partners that participated in an organized regional effort to secure Goodman/Daikin's investment including: the State of Texas, CenterPoint Energy, Harris County Economic Development, Metro, Katy EDC and Waller County Officials. Thank you all and congratulations.

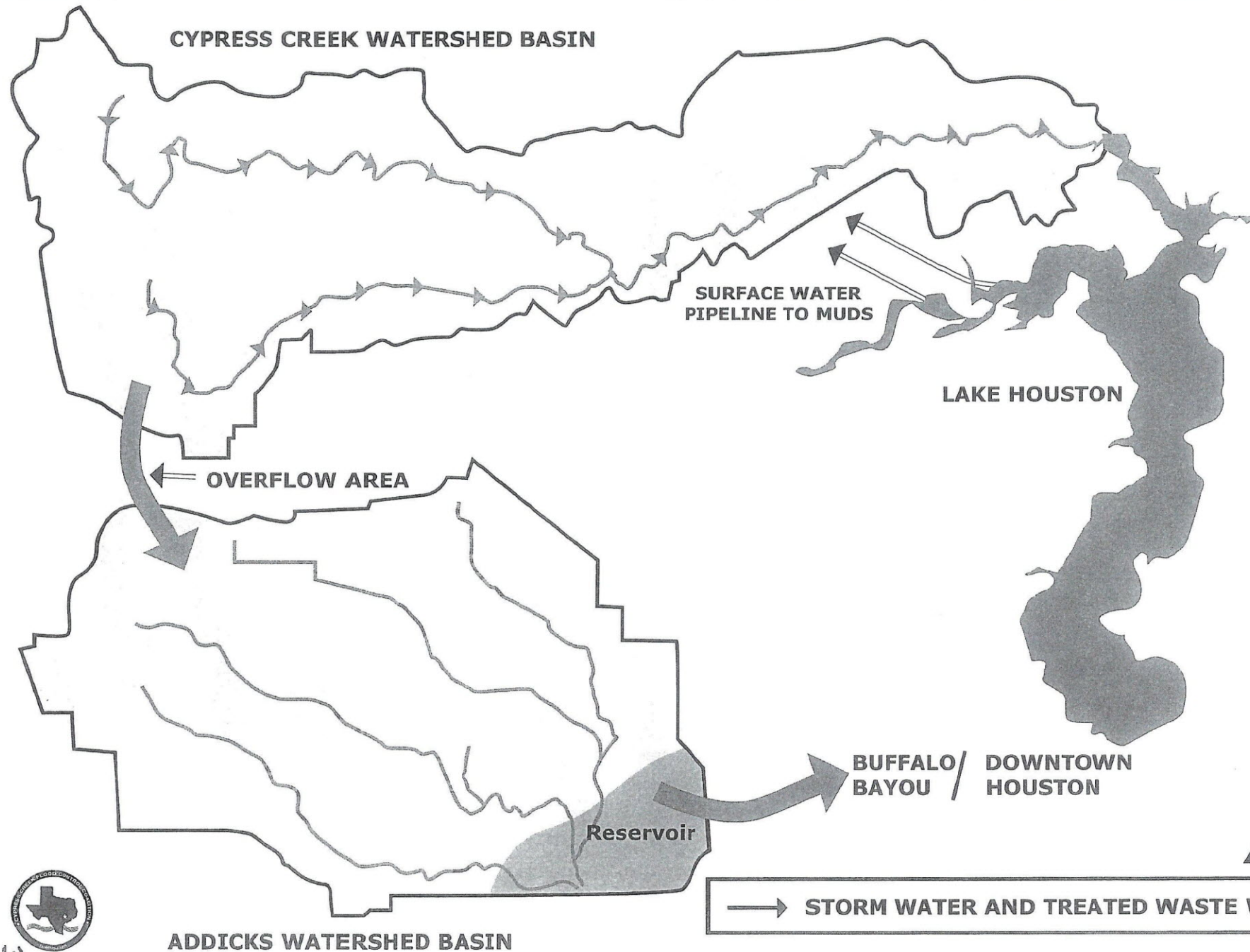
Thanks,
Bill St. Clair
Independent CFO Consultant
281-382-1943

36
~~OVER~~

CREEK & TRIBUTARY | Watershed's Veins & Arteries

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Perspective

Project Area, Master Planned Communities and Overflow Water Volume

Cypress Creek Overflow Management Plan

		Land Area (Acres)
• Project area in Cypress Watershed	(157 sq. miles)	100,480 ¹
• Project area in Waller County	(60 sq. miles)	38,400
• Total area in Overflow project	270 square miles)	172,800

Master Planned Communities

	Land Area (Acres)
• The Woodlands	28,000
• Bridgeland *	11,300
• Fairfield *	3,200
• Towne Lake *	2,400
• Canyon Lakes *	1,800
• Cypress Creek Lakes *	1,600
• Coles Crossing *	1,500
• Elyson **	3,600

* Located in Cypress Creek Watershed

** Located in Cypress Creek Overflow study area

City

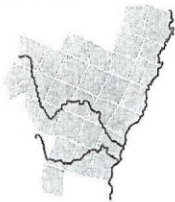
	Land Area (Acres)
• City of Houston (4 th largest city in U.S.)	383,000
• Galveston City	133,000

Volume of Overflow Water: 13,500 cubic feet per second (cfs) ²

¹ Approximate area based on H-GAC map of watershed sections provided to CCFCC

² Volume of overflow water per second at the watershed divide (1 cfs equals 748 gallons). Source: HCFCD public meeting in November 2013. Ref: VG #48

NO ADVERSE IMPACT FLOODPLAIN MANAGEMENT



What is No Adverse Impact?

“No Adverse Impact” (NAI) floodplain management is a managing principle developed by the Association of State Floodplain Managers (ASFPM) to address deficiencies in the typical local floodplain management program. Town leaders may believe that adopting the minimum regulatory standards under the National Flood Insurance Program (NFIP) will protect them from liability from both fronts of

concern: developers threatening takings litigation and landowners at possible risk of damage in the next flood. Unfortunately, they may be wrong on both counts. Rather than depending on minimum requirements of federal or state programs, NAI provides tools for communities to help ensure a higher level of protection for their citizens and to prevent increased flood damage now and in the future.



“No Adverse Impact Floodplain Management” is a managing principle that is easy to communicate and from a policy perspective, tough to challenge. In essence, No Adverse Impact floodplain management is where the action of one property owner does not adversely impact the rights of other property owners, as measured by increased flood peaks, flood stage, flood velocity, and erosion and sedimentation.

NAI floodplain management is an approach that ensures the action of any community or property owner, public or private, does not adversely impact the property and rights of others. An adverse impact can be measured by an increase in flood stages, flood velocity, flows, the potential for erosion and sedimentation, degradation of water quality, or increased cost of public services. No Adverse Impact floodplain management extends beyond the floodplain to include managing development in the watersheds where increased runoff of storm water and floodwaters originate. NAI does not mean no development. It means that any adverse impact caused by a project must be mitigated, preferably as provided for in the community or watershed based plan.

For local governments, No Adverse Impact floodplain management represents a more effective way to tackle their flood problems. The concept offers communities a framework to design programs and standards that meet their true needs, not just the requirements of a federal or state governmental agency. The NAI floodplain management initiative empowers communities (and their citizens) to work with stakeholders and build a program that is effective in reducing and preventing flood problems.

What is No Adverse Impact? (cont'd)

NAI floodplain management is about communities being proactive—identifying potential impacts and implementing strategies to prevent and mitigate those impacts before they occur.

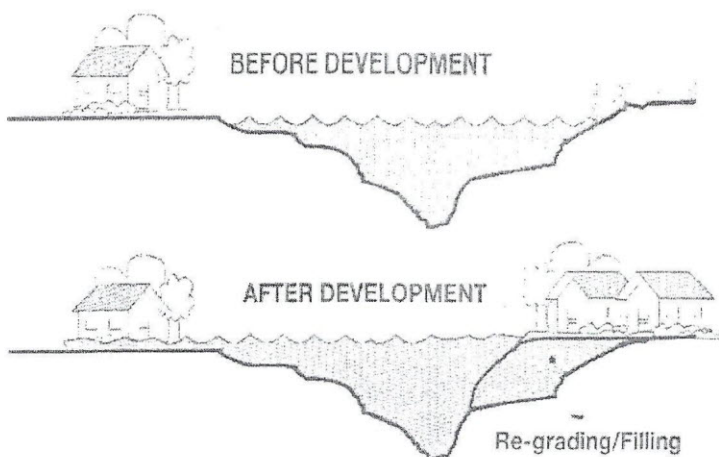
What's Wrong with FEMA/ NFIP Minimum Standards?

The Federal Emergency Management Agency (FEMA) has long supported the adoption of higher regulatory standards through the Community Rating System and state or local programs to offer incentives for safer development practices. Communities that fall back on the minimum federal NFIP standards may allow diversion of floodwaters onto other properties, loss of channel conveyance and storage, and an increase in erosive velocities, ALL of which may make the community liable under the Takings Clause or negligence. Ultimately, any new development that is allowed to adversely impact other properties may make the community liable, even if minimum standards are met.

*44 CFR 60.1(d) "...community officials may have access to information or knowledge of conditions that require, particularly for human safety, higher standards than the minimum criteria set forth...Therefore any flood plain management regulations adopted by a State or a community, which are more restrictive than the criteria set forth in this part are **encouraged** and shall take precedence." - FEMA NFIP Regulations*

It is important to remember that the National Flood Insurance Program was designed with insurance in mind, and was never intended to be the nation's land use program for floodplain management. Relying exclusively on NFIP minimum standards may lead to:

- ◆ Adverse cumulative impacts of allowing small rises in flood elevation here and there, that accumulate into significant and hazardous changes, subjecting families and businesses to greater flood risks;
- ◆ Increased storm water velocities that worsen erosion, sedimentation, streambank failure, and new stream channel formation; and,
- ◆ Increased destructive potential, as what were once manageable storms become major producers of flood damage and associated disruption and misery.



Courtesy of VTDEC River Management Program

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NAI Strategies

No Adverse Impact watershed management relies on a combination of development planning, standards, and review to ensure that proposed and anticipated development will not adversely impact other property interests through increased runoff, velocities, or degradation. Since each community is unique – and no one knows your community better than you, the local official – NAI provides the flexibility for each community to adapt strategies to fit unique community interests, watershed dynamics, political will, vision, and goals.

Your community can adapt the following approaches to meet your unique management needs:

- ☑ Develop hazard mitigation actions in a Pre-Disaster Mitigation Plan to reduce losses from flooding;
- ☑ Create mutual aid agreements to aid in flood warning and response; and,
- ☑ Implement higher standards to achieve no increase in flood damage through the use of restrictions on impervious cover, no net fill, freeboard requirements, and additional setbacks to take erosion into account.

Under the NAI approach, the developer and community work together to:

- ☑ Identify the impacts of proposed development;
- ☑ Notify potentially impacted property owners;
- ☑ Explore design alternatives to avoid adverse impacts; and,
- ☑ Develop appropriate mitigation measures that are acceptable to locals, neighbors, and the community as a whole.

The NAI Legal Framework

“NAI is a PRINCIPLE that leads to a PROCESS that is legally acceptable, non-adversarial, understandable, and palatable to the community as a whole.”

- Edward A. Thomas, Esq.; Floodplain Manager, Disaster Response and Recovery Specialist, and Attorney

NAI does not take away property rights – it protects them by preventing one landowner’s activities from harming others. NAI is not an arbitrary or inflexible denial of development rights, or blanket no-growth strategy. It is a performance-based standard consistently favored by courts when challenged. While no strategy can completely eliminate all possible legal challenges, following the NAI approach to floodplain and watershed management can help to:

- ◆ Reduce the number of lawsuits filed against local governments;
- ◆ Greatly increase the chances that local governments will win legal challenges arising from their floodplain management program;
- ◆ Reduce or eliminate the chances of surprising or alienating developers who want to do business, but find little or no guidance until project design is well underway;
- ◆ Ensure that critical facilities, such as hospitals, schools, police, fire and EMS facilities, are well above current and future flood elevations and fully accessible during flood events;
- ◆ Educate community leaders, families, and businesses regarding the community’s flood risks and how to stay safe in a flood.

(cont'd on page 4)

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The NAI Legal Framework (cont'd)

The legal system has long recognized and supported the local community duty to identify hazards and prevent harm. Courts throughout the nation, including the US Supreme Court, have consistently shown great deference to governments acting to prevent loss of life or property, even when protective measures restrict some uses of private property. Recent decisions confirm that:

- ♦ Communities have the legal authority to manage flood risks and development;
- ♦ Communities have the legal responsibility to do so, and may be liable for any harm resulting from failure to exercise that responsibility; and,
- ♦ Property owners who increase flooding or erosion, or violate reasonable watershed or floodplain standards, are intruding on the property rights of others. The community is seen as the first line of defense against this intrusion.

For more information on this subject, please go to the ASFPM website at www.floods.org and view the many resources under the No Adverse Impact link.



Additional fact sheets include:

- #1 Floodplain Basics
- #2 Protecting Property Rights to Reduce Local Liability
- #3 Living with Inadequate Maps
- #4 Using Freeboard and Setbacks to Reduce Flood Damage
- #6 Protecting Lives & Property Through the NFIP Community Rating System.

For more information, contact:

VTDEC River Management Program

www.vtwaterquality.org/rivers/htm/rv_floodhazard.htm

Vermont Law School's Land Use Institute

<http://www.vermontlaw.edu/elc/landuse/>

Two Rivers-Ottawaquechee Regional Commission

www.trorc.org

Produced by the Two Rivers-Ottawaquechee Regional Commission in cooperation with Vermont Law School's Land Use Institute, and the Vermont Department of Environmental Conservation, with Samantha Riley Medlock, CFM V.L.S. '08, as principal author. This paper is a general discussion of legal issues but is not legal advice, which can only be provided by an attorney licensed to practice in Vermont.