OCT 0 8 2014

Harris County
Flood Control District

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COURIER

October 8, 2014

Mr. Casey Cutler, Chief
Policy Analysis Section
Galveston District
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

ATTN: Dwayne Johnson

RE: Response to Comments for Harris County Flood Control District
USACE File Number SWG-2012-01007
HCFCD Project ID W100-00-00-X043

Dear Mr. Johnson:

Please accept the attached documents including the response to comments received during the public notice for USACE file number SWG-2012-01007 and associated Monitoring Plan. The Harris County Flood Control District (HCFCD) received the electronic comments from your office as an attachment to your letter dated August 6, 2014, and was given a 60 day response period. The District requested a one week extension to this response period and the extension was granted by the USACE. Some comments have been paraphrased for brevity and have been consolidated in table format. For full comments, please refer to the original comment letters.

HCFCD appreciates your coordination while processing this permit application. If you have any questions you may contact Ms. Katie Wanka of my staff at 713-684-4137. **Please reference HCFCD Project ID W100-00-00-X043 on any correspondence regarding this project.**

Sincerely,

Ingrid M. Fairchild
Regulatory Compliance Dept. Manager

IMF:KMW:rso

Attachments: Response to Comments
MPDP Monitoring Plan
Comment Response Evaluation & Monitoring Plan (CD)

cc: Kevin Burkes, Atkins
Katie Wanka, HCFCD
Jason Krahn, HCFCD
Project File

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Response to Comments Prepared by Atkins for
Harris County Flood Control District Project ID W100-00-00-X043
Memorial Park Demonstration Project, Harris County, Texas

Commenting Entity	Item	Comment	Response
Texas Commission on Environmental Quality (TCEQ)			
TCEQ	1.	Please have the applicant explain why this section of Buffalo Bayou was the primary site selected to conduct a demonstration project. Practicable alternatives are preliminarily assumed to exist, but the applicant does have the opportunity to clearly demonstrate that no practicable alternatives exist.	An initial assessment of the entire length of Buffalo Bayou was completed from the Barker Reservoir located on the west side of Harris County, starting at Texas State Hwy. 6, downstream to the Houston Ship Channel. This includes the upper and lower reaches of Buffalo Bayou that were originally rectified by the United States Army Corps of Engineers (USACE) (widened, deepened, and realigned for Flood Damage Reduction and navigation purposes in the mid-20th Century), and the portion of Buffalo Bayou in between that was left in its current state at the time. Through a planning-level analysis, based on field assessments and a review of existing conditions, the Harris County Flood Control District (HCFCD) developed a summary assessment of the Buffalo Bayou system that could be utilized in identifying potential streambank stabilization projects along Buffalo Bayou that would yield the greatest measureable results for water quality, sediment reduction and overall bayou stability. Several criteria were selected to help differentiate the sites based on obtaining the greatest cost/benefit from any streambank stabilization efforts. Criteria were ranked and rated based on importance and include: ● bank erosion entrainment rates (based on Bank Erosion Hazard Index – BEHI analysis); ● threats to existing infrastructure; ● right-of-way access; ● construction access; ● visibility to the public; ● planning level construction costs; ● cultural resources protection; ● constraints such as infrastructure; ● habitat improvement opportunities; and ● project length. Through this analysis, it was recognized that the most

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			beneficial/cost-effective stabilization efforts may be achieved by combining multiple priority sites into a reach-scale project. Based on this assessment, it was apparent that the highest priority sites for streambank stabilization were located within the reach of Buffalo Bayou from Woodway Drive to downtown Houston. An on-site review of the stream conditions along this reach of the bayou was conducted in November 2010 with fluvial geomorphologists, local public agencies, and environmental advocacy groups to determine an area where a possible stream restoration project could be implemented along the bayou to demonstrate to area public agencies, advocacy groups and the local community a holistic approach to restoring a degraded stream system in a manner that is beneficial to multiple interest groups and the environment. Upon completion of the field assessments and on-site review with stakeholders, the current proposed project reach was chosen for several reasons as outlined below: 1. The initial assessment showed that the proposed project reach holds the highest rate of bank instability (extreme) and has severe amounts of erosion taking place along its banks. 2. The proposed project reach is one of the only substantial lengths of Buffalo Bayou where streambank armoring has not been widely implemented by landowners and that demonstrates extreme erosion entrainment rates as compared to other reaches. 3. HCFCD currently has easement rights along portions of this area of the bayou, whereas the majority of Buffalo Bayou is privately owned. 4. There are limited property owners who own large properties along the majority of this portion of the bayou (both public property and private property), whereas the majority of Buffalo Bayou upstream and downstream of the project reach is owned in small segments by private owners. 5. The River Oaks Country Club (ROCC), on the south

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			side of the channel, was planning to conduct a project to install gabion walls and was asked to partner with public agencies to accomplish a more holistic restoration approach to stopping their loss of private property. Upon coordinating with all identified property owners (public and private) and stakeholders on the proposed project limits and coming to a final agreement, HCFCD entered the preliminary design stage for the identified project area. The preliminary design stage included: ● additional geomorphic assessments of the proposed project reach, including a Bank Assessment for Non-point source Consequences of Sediment (BANCS) assessment (comprised of additional Near Bank Stress [NBS] and BEHI assessments; ● wood load mapping; ● sediment load assessment; ● review of United States Geological Survey (USGS) historical aerial maps; ● review of USGS historical stream water level gauges ● valley type assessment and classification; ● assessment of impervious cover within the watershed; ● stream assessment checklist review; ● hydraulic model analysis; ● comparison with other stable stream reference reaches; and ● comparison with Buffalo Bayou stable stream reference reaches. These design input parameters were used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included: leave the reach alone (no restoration activities), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation). When each possible restoration activity was considered for the proposed project reach, four areas of no-work were identified. The remainder of the proposed project area was

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			found to need active restoration, which includes: ● reestablishment of a pool and riffle system to the bayou's stream bed, or profile; ● reestablishment of connectivity (where none currently exists) to the stream's inner geomorphic floodplain, or dimension; ● realignment of the bayou's stream bed to allow for a more stable stream geometry, or pattern; and ● installation of natural in-stream structures to relieve shear stress on the outer banks in areas of meanders. Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, the incorporation of dissipation measures (bankfull benches, or geomorphic floodplain connectivity to the stream's dimension, pool, and riffle reestablishment in the stream's profile, geometry changes in the stream's pattern, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou banks (dimension) would result in less direct, short-term impacts to the aquatic ecosystem within the bayou; however, it would not yield the desired outcome of stabilizing the streambanks within the entire project reach, since it only targets the stream's dimension and would not provide the dissipation effects necessary to stabilize the streambanks within the proposed project reach. Thus, it was not a feasible option for conducting a successful, holistic restoration project that would provide long-term stability to the banks of the bayou that would allow for the restoration of natural stream functions to the bayou. The root cause of the degradation of the bayou needs to be addressed by restoring the stream's natural geomorphological functions in a manner that would allow for the hydraulic transport of stormwater through the project reach while stabilizing the streambanks for overall revegetation of the system based on a stable geomorphology.
TCEQ	2.	Please provide more detailed information on what options were considered to minimize impacts and why they were	Once the decision was made to utilize Natural Channel Design (NCD) methods based on the principles of fluvial

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		eliminated. Please have the applicant detail why the oxbow area in Transect 6 cannot be used as a mitigation area or potential overflow channel for Buffalo Bayou, and why wetland areas cannot be avoided. Also, please have the applicant explain how the overall footprint can be reduced for the demonstration project, considering that the project is experimental and success has not been proven. If these or other options are not feasible, please explain why.	geomorphology to restore the proposed project reach, assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included: leave the reach alone (no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation). The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile was required to reestablish the stable geomorphological function to the stream and provide for overall increased stream functions. Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller-scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. Lessening the footprint of this project would not achieve the project goals of fully restoring the hydrologic, hydraulic, and geomorphic stream functions. Furthermore, stream condition assessments identified the proposed project footprint as having some of the highest instability ratings along Buffalo Bayou. Lessening the project footprint would subsequently leave some of these highly unstable sections of Buffalo Bayou vulnerable to

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			continued failure and potentially threaten the stability and integrity of the restored areas in the reduced project footprint. HCFCD has consulted with experts in the field of fluvial geomorphology and NCD who have been successfully conducting stream restoration projects since the 1960s. The NCD approach used for this project is not experimental, and a goal of this project is to demonstrate to local, state, and federal public agencies, private property owners, environmental advocacy groups, and the local community that this science-based methodology is a viable alternative for conducting channel restoration projects in Harris County, Texas. NCD has been successfully implemented and proven across the United States and other parts of the world. Furthermore, HCFCD has already successfully applied various NCD principles to projects on Cypress Creek, Mason Creek, Vogel Creek, Buffalo Bayou, and Rummel Creek in Harris County, Texas. The original design included the installation of a deep water oxbow in the area currently proposed to be graded to a bankfull bench elevation. The original deep water oxbow design was abandoned when adjacent private property owners, and other stakeholders with whom HCFCD coordinated, opposed the proposed plan to include a deep water oxbow in the area. Their concerns were based on fears of trash accumulating in the area, and their opposition to the perceived side effects (such as mosquitoes and snakes) that could result by having stagnant water in the area. HCFCD modified the plan again in consideration of agency comments. The current proposed plan includes grading this area to the bankfull bench elevation, which will allow streambed forming discharges to flow across this area. The bankfull benches will still have a direct hydrologic connection that will allow wetland vegetation to become reestablished in these areas. The post-project planting plan for this area will include bald cypress, water tupelo, and other tree and herbaceous species well suited for this

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			hydrologic zone that historically existed along this portion of the bayou.
TCEQ	3.	Please provide a list of Best Management Practices (BMP) that will be used to protect and maintain water quality during the construction phase of the project.	HCFCD will utilize the Joint Task Force (JTF) Storm Water Management Handbook for Construction Activities (2006 Edition) and Storm Water Management JTF Storm Water Management Program: Minimization Design Criteria for Implementation of Certain Best Management Practices for Storm Water Runoff Treatment Options (2001 Edition). From these guidelines, best management practices (BMP) and a storm water pollution prevention plan (SWPPP) has been developed to reduce turbidity and total suspended solids during construction. The SWPPP, including specific BMPs to be utilized, will be finalized during the final design of the proposed project.
TCEQ	4.	In the Galveston District stream assessment tool, several metrics suggest a tree is determined to be functional at 3 inches diameter breast height (DBH) or greater. The tree survey conducted on Buffalo Bayou examined trees equal to or greater than 8 inches DBH. Please have the applicant explain how this size threshold was selected.	The vegetation inventory cataloged all trees 8 inches in diameter and greater and noted species type, condition index, coordinates, community types, and any notable features of the tree. HCFCD places a high value on native mature trees, and wants to locate them early on in the project to preserve as many of them as possible (with proper regard to existing and historical community type). HCFCD collected a large amount of detail while conducting the vegetation inventory so that HCFCD could make informed decisions on tree removal and preservation during construction of the project and work around as much desirable vegetation as possible where the project plans allow for it. The selection of 8-inch or greater for the tree inventory was based primarily on two factors: 1. The objective of the tree inventory was to estimate the age of the tree stands within the area of the MPDP to determine whether there were "Old Growth" or "Ancient" forests that might be disturbed, knowing that smaller diameters indicate young or immature trees, and 2. HCFCD places great importance on locating mature trees for preservation. Trees of a diameter smaller than 8" are commercially available, and HCFCD has

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			access to such replacement inventory with a variety of diameters sized up to 7 inches, either through its in-house tree nursery or existing contracts. However, trees 8 inches in diameter and greater are harder to find for replacement and logistically cumbersome to deliver and transport to the proposed project site, especially since all work will be taking place from the bottom of the streambed. This effort was completed independently of the USACE Galveston District Stream Condition Assessment (SCA). The Riparian Buffer Parameter was evaluated using the methodology outlined in the USACE Galveston District SCA (2013) and guidance provided by USACE Galveston staff.
TCEQ	5.	From the public notice, one of the objectives of the proposed project is to improve water quality within the Buffalo Bayou watershed. However, the project as proposed may degrade water quality over the long term due to the removal of significant amounts of riparian vegetation. Riparian function supports stream integrity, especially in the area of bank stabilization.	The project proposes to restore the existing riparian buffer that is currently being eroded by channel instability and colonized by an increasing number of invasive plants. Restoring the natural riparian buffer to an improved condition and stabilizing the streambanks will enhance long-term water quality through a reduction in sediment loading. HCFCD recognizes the importance of a native riparian zone along the banks of the project area and will take all measures necessary to preserve the existing native vegetation where possible within the proposed project reach. The proposed project will be conducted in a manner with proper regard to reestablishment of native vegetation and will place the proper type of native vegetation in the proper hydrologic zone so that trees such as bald cypress, black willows, and water tupelo can be reestablished along the toe of the bayou's slopes where no vegetation currently exists. Certain tree species such as bald cypress were historically removed from the bayou through logging practices. The general lack of vegetation at the toe of the slopes is caused by streambank instability and prolonged saturation resulting from the USACE's release procedures from the Addicks and Barker reservoirs. Please refer to the MPDP Monitoring Plan that includes measures to ensure a minimum survivability rate of

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			80 percent for containerized native trees and shrubs, a 50 percent survival rate for live stake native trees and shrubs, and a minimum coverage of 70 percent for wetland plantings at the end of the second full growing season following planting. The monitoring plan also includes management plans to control the proliferation of noxious invasive plant species.
TCEQ	6.	Please have the applicant reconsider the amount of riparian vegetation to be preserved, removed, and reestablished within the Buffalo Bayou corridor. TCEQ suggests preserving as many existing native trees as possible and recommends consultation with Texas Parks and Wildlife Department regarding proposed plantings. Please have the applicant submit a clear and concise plan outlining what requirements must be met to remove riparian vegetation. Also, please have the applicant submit any plans to control invasive species until the riparian corridor is reestablished. Lastly, please also have the applicant submit a monitoring plan associated with the plantings to ensure survivability of planted species.	HCFCD recognizes the importance of a native riparian zone along the banks of the project area and will take all measures necessary to preserve the existing native vegetation where possible within the proposed project reach. The proposed project will be conducted in a manner with proper regard to reestablishment of native vegetation and will place the proper type of native vegetation in the proper hydrologic zone so that trees such as bald cypress, black willows, and water tupelo can be reestablished along the toe of the bayou's slopes where no vegetation currently exists. Certain tree species such as bald cypress were historically removed from the bayou through logging practices. The general lack of vegetation at the toe of the slopes is caused by streambank instability and prolonged saturation resulting from the USACE's release procedures from the Addicks and Barker reservoirs. Please refer to the MPDP Monitoring Plan that includes measures to ensure a minimum survivability rate of 80 percent for containerized native trees and shrubs, a 50 percent survival rate for live stake native trees and shrubs, and a minimum coverage of 70 percent for wetland plantings at the end of the second full growing season following planting. The monitoring plan also includes management plans to control the proliferation of noxious invasive plant species.
TCEQ	7.	The public notice and additional information provided do not provide any baseline ecological data for current stream conditions. Please have the applicant perform a baseline ecological assessment prior to construction of the demonstration project. To better ensure the replacement of existing stream functions and values, a functional assessment of the stream before and after the proposed modifications should be performed. It is recommended that	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan

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		TCEQ stream assessment methods be utilized (Surface Water Quality Monitoring Procedures Volumes 1 and 2, TCEQ publication numbers RG-415 and RG-416). Please have the applicant provide performance standards and a monitoring plan to show the success of the stream restoration. The applicant should consider permanent stations along the restored stretch for monitoring purposes. Please also have the applicant provide an Adaptive Management Plan for contingency purposes.	to address identified deficiencies is also included in the monitoring plan.
TCEQ	8.	Additional information provided by the applicant at site visits and in the application suggests that heavy equipment access points will need to be established prior to construction. Please have the applicant submit planned locations for access points and detail any proposed impacts that will occur in these areas.	Under the current plan, the project site will have one access point leading from Memorial Drive down to the bayou. If any changes are made to the proposed access, it will be coordinated with the USACE as appropriate. This access point will be located on City of Houston (COH) property and has been coordinated with the COH Parks and Recreation Department (HPARD) who is responsible for managing Memorial Park. An access road will be created from the backside of the HPARD maintenance facility down the north bank of Buffalo Bayou to the stream bed of the bayou. This construction access road will require the clearing of trees and vegetation to gain access to the channel. The exact location of the road will be determined in the field prior to beginning construction so that the most direct and least damaging route can be established and any notable trees located by the project vegetation inventory can be avoided. Upon completion of all work associated with the project, the construction access road will be left in place and turned over to HPARD for their use. Due to the operation of the Addicks and Barker reservoirs, little vegetation currently exists below an elevation of approximately 14 feet. The majority of heavy equipment access along the proposed project reach will take place along this currently denuded streambed and bank that is proposed for restoration. Access across the bayou will be made by sinking temporary wooden matting across the bottom of the bayou, and temporary haul roads will be created along areas of proposed no work by utilizing

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			temporary road beds within the bayou comprised of mulch so that no critical root zones are impacted by the operations.
TCEQ	9.	Project plans depict areas that will be channelized throughout the project reach. The applicant suggests that stormwater conveyance needs, stream profile improvement, and sedimentation issues may be resolved through the proposed project. Please have the applicant demonstrate how the overarching purpose of water quality enhancement is served through these proposed stream pattern and profile improvements.	Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium, which will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The reestablishment of a stable dimension, pattern and profile within the bayou will reduce sediment loading to the bayou system from currently eroding and unstable streambanks. A reduced total sediment load should also reduce bacteria, such as *Escherichia coli* (*E. coli)*, which attach to sediment particles and can be transported through the bayou system. This is a water quality benefit HCFCD foresees soon after completion of the project. The "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" has been developed to assist in quantifying the level of water quality enhancement. This report was provided to TCEQ and other agencies as requested during the public notice period. Additional water quality benefits may be realized through the proposed revegetation of streambanks and the riparian buffer once a closed canopy of native woody and herbaceous species is established. Mature trees along stabilized streambanks will provide shade that reduces in-stream water temperature thereby allowing a corresponding increase in dissolved oxygen. A restored riparian buffer may also filter runoff flowing into Buffalo Bayou from adjacent land uses. Lastly, reestablishing geomorphic floodplain connectivity through the construction of bankfull benches may enhance water quality through reduced flow velocity, filtration, and promoting normal sediment transport processes.
TCEQ	10.	The applicant also proposes to dredge and regrade the channel profile to create stream sequences that may not be supported by a stream of this magnitude. Please have the applicant demonstrate that the proposed project incorporates a design that appropriately supports stream	The proposed project was designed based on geomorphic assessments conducted within the entire Buffalo Bayou watershed and additional geomorphic assessments conducted through the specific proposed project reach. The assessments included:

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		mechanics in this area. Wherever possible, fluvial geomorphological principles should be adhered to in the project design such that the stream can most closely mirror natural stream functions. Channel modification should be designed to achieve a stable, naturally vegetated floodplain-meander channel with consideration of appropriate stream bed features such as riffle-pool sequences. The channel, bank slopes, and floodplain shelves should be vegetated with suitable woody and herbaceous species to provide for stability, pollutant filtration, in-stream shading and cover, and enhanced wildlife and fisheries habitat.	● Review of HCFCD's published regional general curves for stable streams in the region ● Sediment load assessments and mapping ● Wood load mapping ● NBS assessment ● BEHI assessment ● BANCS assessment ● Stable channel reference reaches within the Buffalo Bayou watershed ● Review of historical USGS gage data/peak flows and USGS aerial photography ● Review of the Federal Emergency Management Agency (FEMA) hydraulic model for the channel system ● Topographical survey of the proposed project site ● Vegetation inventory of the project site ● Valley type classification based on Rosgen's method All of these assessments, along with supporting data collection activities, were conducted in an effort to create a proposed restoration project with proper regard for the bayou system based on geographic location, stream valley classification, and stream bed type. The proposed project will include an extensive planting and long-term vegetation monitoring plan to ensure the long-term goal of reestablishing a closed-canopy riparian forest along the project reach to restore as much historical function to the bayou system as possible. HCFCD's geomorphic assessments, hydrologic and hydraulic analyses, vegetation studies, and overall design are based on proven fluvial geomorphological principles. The proposed NCD elements include: ● reestablishment of a natural pool and riffle system with a stable meander pattern; ● reconnection of the stream to its geomorphic floodplain with bankfull benches; ● restoration of bankfull channel dimensions based on existing watershed hydrology influences and regional

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			hydraulic geometry curves (regional curves) to mimic the natural channel forming flow and improve natural sediment transport processes; ● installation of woody debris toe protection (toe wood) to stabilize sensitive streambank areas with a less hardened and more natural material to the region that also improves aquatic habitat; ● planting appropriate native vegetation in the proper hydrologic zones along the proposed areas of active restoration to promote streambank stability, pollutant filtration, in-stream shading and cover, and habitat enhancement; and ● preservation of existing native vegetation and stable channel conditions where natural stream functions are not impaired.
TCEQ	11.	Considering that the proposed project is situated between Addicks and Barker Reservoirs upstream and a channelized portion of the bayou downstream, please have the applicant explain how the integrity of the project site will be maintained in the midst of these modified sections of Buffalo Bayou.	The effects to hydrology and hydraulics produced by the upstream reservoirs and channelized portion of the bayou were accounted for in the initial project assessment and subsequent design. The proposed project design is based on an assessment of the entire Buffalo Bayou watershed, which includes the influence of the two upstream reservoirs, Addicks and Barker, and the previously rectified portions of the bayou upstream and downstream of the proposed project reach. HCFCD's design proposes to address the current problems with channel stability identified in this reach of Buffalo Bayou that are, in part, a result of these watershed and channel modifications. The integrity of the project site will be maintained from the effects of the stormwater releases from the Addicks and Barker reservoirs and upstream channelized portions of the bayou by the reestablishment of a proper dimension, pattern and profile within the proposed project reach, as well as the establishment of a proposed maintenance easement. This will allow HCFCD to implement a sensitive habitat and vegetation maintenance program and an active monitoring plan to document stream response to the proposed restoration.

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U.S. Environmental Protection Agency (EPA)			
EPA	12.	HCFCD would establish several bankfull and lower benches where new in stream wetlands are expected to develop. The EPA recommends that HCFCD plant these bench areas in appropriate hydrophytic vegetation and maintain a dense stand of vegetation for water quality improvements and habitat for semiaquatic and aquatic species.	HCFCD's planting plan will include the installation of native grass mix that may include a portion of Bermuda grass for initial site stabilization and native trees and shrubs for the long-term reestablishment of a healthy, sustainable riparian forest along the proposed project reach. HCFCD is conducting field research, along with other interested local agencies, to formulate a viable seed mix for initial site stabilization along the project reach. If HCFCD is not able to identify a viable seed mixture to use on-site, Bermuda grass may be used for at least a portion of the proposed seed mix for initial site stabilization. If Bermuda grass is used in the seed mix, HCFCD will minimize its existence by not actively mowing the site (which will limit its spread) and establishing a closed canopy to eradicate it (because it is shade intolerant). The current planting plan calls for native tree and shrub species to be planted from the toe of the bank to the top of the bank with regard to proper hydrological zone placement. Native tree species such as bald cypress, water tupelo, sand willow, and black willow will be planted close to the water's edge, both for long-term streambank stabilization purposes and the reestablishment of native species that were historically present along Buffalo Bayou but are no longer there (either removed historically because of the timber industry or more recently as a result of the erosion). The overall long-term revegetation plan for the project area is to reestablish a closed-canopy system along the proposed project reach with proper regard to hydrological zone and community type. HCFCD does foresee the establishment of in-stream wetlands in some areas where the geomorphic floodplain connectivity is reestablished along the project reach, and HCFCD does plan on planting wetlands in some areas where hydrologic water connectivity will allow for it.
EPA	13.	The EPA is concerned with the wholesale reconstruction of the channel bed and banks without a good ecological baseline or action plan. Implementation of the project without an accurate baseline survey could threaten the	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and

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		ecological integrity of this important stream reach. Allowing contractors to decide when and how access and reconstruction of the channel bed and banks would be staged is inappropriate. The applicant should provide an appropriate sampling protocol to the USACE and subsequently to the resource agencies for review and comment. The applicant should provide a construction staging and access plan to the USACE and subsequently to the resource agencies for review and comment to determine the least damaging practicable on-site alternative for in-channel construction to minimize temporary and permanent damage to this stream reach.	protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan. HCFCD selected a Construction Manager at Risk (CMAR) to oversee the construction activity, and the CMAR selected a subcontractor with extensive experience in constructing stream restoration projects. HCFCD purposely selected the CMAR method for this project so that veteran practitioners in the field of stream restoration could aid in demonstrating least damaging methods to HCFCD and the other contractors in the region for possible future projects similar in nature. HCFCD will work with the contractor to develop the final plan. Initial equipment and material staging will occur at the contractor's laydown yard on COH property located at the back of the existing HPARD maintenance facility.
EPA	14.	According to the plans, Sheet 22 of 41, an impervious stream channel plug would be installed in a wide meander to cut off flow to the existing meander, and dredge material from excavation of the new channel would be used to backfill the cut off meander to a grade that would support wetlands but not a permanent waterbody. The EPA recommends that HCFCD maintain an open-water oxbow and wetlands behind the new meander with an uncontrolled spillway in the plug to maintain a hydrologic connection between the oxbow and Buffalo Bayou at a designed stage. Otherwise, the USACE should require in-kind compensatory mitigation for the loss of open water and the fisheries that currently exist in the wide meander depicted on Sheet 22 of 41.	HCFCD previously proposed to adjacent property owners both a deep water oxbow and a connected wetland as alternative recommended design options for this area of the project, but each of these options were met with strong opposition by the property owners. HCFCD is working to balance achieving a stable channel with the support of the surrounding community. Based on these comments, HCFCD will allow connectivity for wetland establishment in this area and will insure its success. HCFCD's current proposed plan includes grading this area to the bankfull bench elevation, which will allow streambed forming discharges to flow across this area. The bankfull benches will still have a direct hydrologic connection that will be conducive to wetland vegetation becoming reestablished in these areas. The post-project planting plan for this area will include bald cypress, water tupelo, and other tree and herbaceous species well suited for this hydrologic zone that historically existed along this portion of the bayou.

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EPA	15.	No deflector structures have been planned for this NCD. The EPA recommends that HCFCD reconsider installing log vanes immediately upstream of each bank stabilization section to deflect sustained high flows from upstream dam releases away from new bank stabilization sections until these sections are well established in high tensile strength native vegetation, such as switchgrass (*Panicum virgatum*) or willow species. The deflector structures would also create small pools that would reduce the overall slope of the channel to somewhat offset the reduced length of the channel.	Log vanes were considered early in the design phase of the project, but were not selected as the preferred streambank stabilization alternative due to the wide width of the channel system. Log vanes on streams with bottom widths found in the project reach can be hard to install properly due to the length of trees necessary to span the width of the stream bed. Alternatively, woody debris toe wood provides the same level of streambank protection from near bank shear stress on the outside of meander bends as log vane deflector structures while also promoting establishment of native vegetation for long-term stabilization. Furthermore, the local community of boating enthusiasts also objected to the use of log vanes within the project reach because they view their use as an impediment and safety hazard to watercraft travel along the bayou. HCFCD appreciates the EPA's advice on appropriate planting species in these locations and will review the final proposed planting plan to ensure high tensile strength vegetation is included in the planting plan for these areas of the project.
EPA	16.	According to design sheets, HCFCD is proposing to install flank protection at the end of each rootwad (toewood) revetment section. The EPA recommends that HCFCD install flank protection at the beginning and end of each rootwad (toewood) revetment section. For all rootwad (toewood) construction, the EPA recommends using all live cuttings of species that are known to vigorously sprout from cuttings such as sandbar willow (*Salix exigua*), black willow (*Salix nigra*), and buttonbush (*Cephalanthus occidentalis*).	HCFCD will include log revetments, or flank protection, on the upstream side of areas proposed to receive toe wood treatments on the outside of meander bends. HCFCD appreciates the EPA's advice on appropriate planting species in these locations and will review the final proposed planting plan to ensure high tensile strength vegetation is included in the planting plan for these areas of the project.
EPA	17.	The EPA recommends and supports a robust monitoring plan for this NCD project and publication of the results. Permanent cross-sections should be established that can be surveyed before, during, and after construction to document the dynamic stability of the channel bed and banks and the ecological recovery of the bayou. Sampling of the ecological baseline should continue until the wetland and riparian vegetation matures and water temperatures are protected from solar energy by shading. We recommend that HCFCD and the COH consider establishing ordinances for upland detention and minimum	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding impacts to waters of the U.S., including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.

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		erosion hazard zones along streams and rivers in Harris County, Texas.	Harris County, HCFCD, and the COH have requirements for developers to include detention within the design of their new development/construction efforts to ensure no adverse impacts from new development/redevelopment.

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U.S. Fish and Wildlife Service (USFWS)			
USFWS	18.	USFWS is concerned with the site selection for this "demonstration project." Given the number and extent of highly impaired (structurally and functionally) bayous and streams in Harris County, the USFWS believes any number of other sites could have been evaluated and selected for this type of stream restoration without potentially risking the biological integrity (e.g., local fish and wildlife populations and habitat) of more than a mile of the City's signature bayou. The USFWS recommends the applicant gain a better understanding of the ecological baseline prior to implementing this project.	In 2010, HCFCD was invited by the Bayou Preservation Association (BPA) to collaborate on a proposal to help stabilize this portion of Buffalo Bayou. The MPDP will restore Buffalo Bayou's equilibrium and will ultimately protect the upper banks along this reach of Buffalo Bayou. The term "demonstration" refers to providing an example of successful urban stream restoration on a portion of Buffalo Bayou using techniques that have been used successfully to restore streams in other areas of the United States. The project is meant to demonstrate to property owners along Buffalo Bayou, and other bayous and creeks in urban areas, the long-term benefits of looking at both banks of the bayou and restoring a significant stretch (holistic project reach approach) of a bayou system rather than repairing isolated sections (spot repairs) to only one bank of a bayou system. Spot repairs to one side of the streambank ultimately create impacts to the opposite bank of the bayou, downstream due to the inability to dissipate erosive flows in a manner that concentrates them to the thalweg (centerline) of the bayou, and have had little effect on the bayou's growing erosion problem over the years. An initial assessment of the entire length of Buffalo Bayou was completed from the Barker Reservoir located on the west side of Harris County, starting at Texas State Hwy. 6, downstream to the Houston Ship Channel. This includes the upper and lower reaches of Buffalo Bayou that were originally rectified by the USACE (widened, deepened, and realigned for Flood Damage Reduction and navigation purposes in the mid-20th Century), and the portion of Buffalo Bayou in between that was left in its current state at the time. Through a planning-level analysis, based on field assessments and a review of existing conditions, HCFCD developed a summary assessment of the Buffalo Bayou system that could be utilized in identifying potential streambank stabilization projects along Buffalo Bayou that

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			would yield the greatest measureable results for water quality, sediment reduction, and overall bayou stability. Several criteria were selected to help differentiate the sites based on obtaining the greatest cost/benefit from any streambank stabilization efforts. Criteria were ranked and rated based on importance and include: ● bank erosion entrainment rates (based on the BEHI analysis); ● threats to existing infrastructure; ● right-of-way access; ● construction access; ● visibility to the public; ● planning level construction costs; ● cultural resources protection; ● constraints such as infrastructure; ● habitat improvement opportunities; and ● project length. Through this analysis, it was recognized that the most beneficial/cost-effective stabilization efforts may be achieved by combining multiple priority sites into a reach-scale project. Based on this assessment, it was apparent that the highest priority sites for streambank stabilization were located within the reach of Buffalo Bayou from Woodway Drive to downtown Houston. An on-site review of the stream conditions along this reach of the bayou was conducted in November 2010 with fluvial geomorphologists, local public agencies, and environmental advocacy groups to determine an area where a possible stream restoration project could be implemented along the bayou to demonstrate to area public agencies, advocacy groups and the local community a holistic approach to restoring a degraded stream system in a manner that is beneficial to multiple interest groups and the environment. Upon completion of the field assessments and on-site review with stakeholders, the current proposed project reach was chosen for several reasons as outlined below:

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			1. The initial assessment showed that the proposed project reach holds the highest rate of bank instability (extreme) and has severe amounts of erosion taking place along its banks. 2. The proposed project reach is one of the only substantial lengths of Buffalo Bayou where streambank armoring has not been widely implemented by landowners and that demonstrates extreme erosion entrainment rates as compared to other reaches. 3. HCFCD currently has easement rights along portions of this area of the bayou, whereas the majority of Buffalo Bayou is privately owned. 4. There are limited property owners who own large properties along the majority of this portion of the bayou (both public property and private property), whereas the majority of Buffalo Bayou upstream and downstream of the project reach is owned in small segments by private owners. 5. The ROCC, on the south side of the channel, was planning to conduct a project to install gabion walls and were asked to partner with public agencies to accomplish a more holistic restoration approach to stopping their loss of private property. Upon coordinating with all identified property owners (public and private) and stakeholders on the proposed project limits and coming to a final agreement, HCFCD entered the preliminary design stage for the identified project area. The preliminary design stage included: ● additional geomorphic assessments of the proposed project reach, including a BANCS assessment (comprised of additional NBS) and BEHI assessments; ● wood load mapping; ● sediment load assessment; ● review of USGS historical aerial maps; ● review of USGS historical stream water level gauges ● valley type assessment and classification; ● assessment of impervious cover within the watershed; ● stream assessment checklist review;

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			● hydraulic model analysis; ● comparison with other stable stream reference reaches; and ● comparison with Buffalo Bayou stable stream reference reaches. These design input parameters were used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included: leave the reach alone (no restoration activities), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation). When each possible restoration activity was considered for the proposed project reach, four areas of no-work were identified. The remainder of the proposed project area was found to need active restoration, which includes: ● reestablishment of a pool and riffle system to the bayou's stream bed, or profile; ● reestablishment of connectivity (where none currently exists) to the stream's inner geomorphic floodplain, or dimension; ● realignment of the bayou's stream bed to allow for a more stable stream geometry, or pattern; and ● installation of in-stream structures to relieve shear stress on the outer banks in areas of meanders. Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, the incorporation of dissipation measures (bankfull benches, or geomorphic floodplain connectivity to the stream's dimension, pool and riffle reestablishment in the stream's profile, geometry changes in the stream's pattern, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou banks (dimension) would result in less direct, short-term impacts to the aquatic ecosystem within the bayou; however, it would not yield the desired outcome of stabilizing the streambanks within the entire project reach,

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			since it only targets the stream's dimension and would not provide the dissipation effects necessary to stabilize the streambanks within the proposed project reach. Thus, it was not a feasible option for conducting a successful, holistic restoration project that would provide long-term stability to the banks of the bayou that would allow for the restoration of natural stream functions to the bayou. The root cause of the degradation of the bayou needs to be addressed by restoring the stream's natural geomorphological functions in a manner that would allow for the hydraulic transport of stormwater through the project reach while stabilizing the streambanks for overall revegetation of the system based on a stable geomorphology.
USFWS	19.	The USFWS believes the applicant is well aware of the issues with impervious cover in this watershed. Given the extent of urbanization in the watershed and the upstream impoundments (i.e., Addicks and Barker Reservoirs) the USFWS questions whether the scale of this project can have any measurable effect on downstream sediment loads, water quality, and habitat improvement.	HCFCD has developed erosion rating curves from measurements of tree root exposure (using methods of dendrogeomorphology) to predict sediment loads discharged to the bayou. This rating curve correlates average erosion rates with a range of Bank Erosion Hazard Indices observed along Buffalo Bayou from the reservoirs to downtown Houston. The natural portion (unrectified) of Buffalo Bayou between Beltway 8 and Shepherd Drive contributes the majority of the total sediment load annually: 15,700 tons/year, for that reach, from a total estimated load of 17,000 tons/year. The project reach in its current unstable state produces an estimated sediment load of 5,491 tons/year. Therefore, despite the short length of the proposed project reach relative to the total length of Buffalo Bayou, the potential reduction in sediment load from this degrading reach is significant.
USFWS	20.	We are concerned that the restored channel dimension of Buffalo Bayou depicted includes a flat-bottomed low-flow channel. Such a channel has too large a surface area relative to the low-flow discharge rate of the stream and will itself be hydraulically inefficient and unstable.	The profile for the proposed project takes numerous factors into consideration, including the existing hydraulic model of the stream, as well as the operational procedures of the Addicks and Barker reservoir systems that discharge stormwater at a rate of 2,000 cubic feet per second (cfs) for prolonged periods of time after a large rain event occurs over the region. HCFCD believes that the profile of the proposed project is proper for the known conditions affecting the bayou and is in line with the project's intent of reestablishing the bayou to

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			a type C valley, transforming in time to a type E valley based on Rosgen's method of channel classification.
USFWS	21.	The work schedule is not addressed in the public notice or the 700+ pages of the IP application. In the absence of such, the USFWS recommends the applicant adhere to the attached "Suggested Priority of Migratory Bird Conservation Actions for Projects USFWS, Migratory Bird Management" dated March 9, 2010. With a better understanding of the project schedule, the USFWS is pleased to work with the applicant to refine these recommendations.	Activities that disturb bird habitat, such as clearing and grubbing, should take place between September 15 and March 1 to avoid nesting of migratory birds. If clearing is necessary outside of the recommended period, a migratory bird nest survey will be conducted to verify active migratory bird nests are not present before clearing begins. The migratory bird nest survey will be performed by a professional with ornithological experience no more than 10 days prior to clearing work. If active nests are discovered during the survey, the nests will be avoided and a non-disturbance buffer will be implemented. If avoidance of the nests is not possible, a professional with ornithological experience will monitor the nests during construction and/or the relocation of the birds. Any necessary monitoring and/or relocation activities will be coordinated with the USFWS.
USFWS	22.	The USFWS raised the question of site access during our May site visit and are still unclear how portions of the project area will be accessed with heavy equipment, trucks, and materials. Are there additional impacts to be disclosed when these access areas are finally identified?	Under the current plan, the project site will have one access point leading from Memorial Drive down to the bayou. If any changes are made to the proposed access, it will be coordinated with the USACE as appropriate. This access point will be located on COH property and has been coordinated with the HPARD who is responsible for managing Memorial Park. An access road will be created from the backside of the HPARD maintenance facility down the north bank of Buffalo Bayou to the stream bed of the bayou. This construction access road will require the clearing of trees and vegetation to gain access to the channel. The exact location of the road will be determined in the field prior to beginning construction so that the most direct and least damaging route can be established and any notable trees located by the project vegetation inventory can be avoided. Upon completion of all work associated with the project, the construction access road will be left in place and turned over to HPARD for their use. Due to the operation of the Addicks and Barker reservoirs,

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			little vegetation currently exists below an elevation of approximately 14 feet. The majority of heavy equipment access along the proposed project reach will take place along this currently denuded streambed and bank that is proposed for restoration. Access across the bayou will be made by sinking temporary wooden matting across the bottom of the bayou, and temporary haul roads will be created along areas of proposed no work by utilizing temporary road beds within the bayou comprised of mulch so that no critical root zones are impacted by the operations.
USFWS	23.	The USFWS recommends that the applicant work to ensure that all of the plant materials used in this project come from local native genetic stock. The USFWS also recommends that no sod-forming turf grasses (e.g., Bermuda grass) be planted within the permit area as temporary or permanent herbaceous cover. Likewise, we request a copy of the herbaceous planting list for review and comment prior to permit issuance. The USFWS reviewed the presentation materials on the applicant's project website and has numerous and significant concerns but is unclear if this represents the current plan or was provided as informational. The USFWS would appreciate additional collaboration with the applicant on this topic.	HCFCD's planting plan will include the installation of grasses for initial site stabilization and native trees and shrubs for the long-term reestablishment of a healthy, sustainable riparian forest along the proposed project reach. The current planting plan calls for native tree and shrub species to be planted from the toe of the bank to the top of the bank with regard to proper hydrological zone placement. Native tree species such as bald cypress, water tupelo, sand willow, and black willow will be planted close to the water's edge, both for long-term bank stabilization purposes and the reestablishment of native species that were historically present along Buffalo Bayou but are no longer there (either removed historically because of the timber industry or more recently as a result of the erosion). The overall long-term revegetation plan for the project area is to reestablish a closed-canopy system along the proposed project reach with proper regard to hydrological zone and community type. HCFCD's plan for initial site stabilization has not yet been finalized. HCFCD strives to use all native vegetation and is working to do so in the proposed project; however, limited commercially available seed sources for native ground vegetation and the low germination rates of native seeds make it difficult to solely use native species to achieve initial site stabilization. HCFCD is conducting field research, along with other interested local agencies, to formulate a viable seed mix for initial site stabilization along the project reach. If HCFCD is

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			not able to identify a viable seed mixture to use on-site, Bermuda grass may be used for at least a portion of the proposed seed mix for initial site stabilization. If Bermuda grass is used in the seed mix, HCFCD will minimize its existence by not actively mowing the site (which will limit its spread) and establishing a closed canopy to eradicate it (because it is shade intolerant).
USFWS	24.	The USFWS recommends that the applicant and their partners commit to a maintenance program that includes no mowing and no pruning of the vegetation in the project area. Likewise, the USFWS recommends that the applicant develop a plan to replant trees or to conduct a thinning cut, as necessary. Lastly, the USFWS recommends that the applicant and their partners commit to controlling invasive species (e.g., Chinese tallow, but not limited to) in the project area until maturity of the restored forest (i.e., canopy closure). With fast-growing species like black willow and cottonwood, this may be 10-15 years.	Please refer to the MPDP Monitoring Plan that includes measures to ensure a minimum survivability rate of 80 percent for containerized native trees and shrubs, a 50 percent survival rate for live stake native trees and shrubs, and a minimum coverage of 70 percent for wetland plantings at the end of the second full growing season following planting. The monitoring plan also includes management plans to control the proliferation of noxious invasive plant species and an adaptive management plan, should a need arise for selective clearing due to overcrowding of the tree canopy.
USFWS	25.	The USFWS has a copy of the HCFCD "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan." While the USFWS is supportive of such monitoring, we question, for example, whether three water samples per monitoring station pre- and post- construction will be sufficient to draw any meaningful conclusions about the effects of the project. The USFWS contends that a clear statement of project goals and measurable objectives related to reduction of erosion rates and sediment load, reduction of bacteria load, improvement of water quality, and increased wildlife utilization is required to establish whether or not the project is determined to be successful.	One of the primary goals of the proposed project, as described in the permit application, is "to create a stable stream that will neither aggrade nor degrade," thereby reducing or eliminating its sediment loading. The project reach will still transport upstream sediment loads effectively through the system, but it will not be a source or sink for sediment loading. Given the established relationships between sediment, bacteria, and water quality, it is presumed that reducing sediment loading to Buffalo Bayou can only have a positive impact on reducing bacteria levels, improving water quality through reduced suspended sediment, and increasing the potential utilization of the aquatic resource by wildlife. However, HCFCD cannot be certain as to what quantifiable level the reduction in sediment loading will improve bacteria levels, water quality, and wildlife. HCFCD developed the "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" to assist in quantifying those impacts to bacteria and water quality. Subsequently, HCFCD has developed the MPDP Monitoring Plan that proposes to sample macroinvertebrate and fish abundance and diversity as an indicator of wildlife utilization. HCFCD will quantify the level of improvements in sediment load

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			reduction, bacteria load reduction, water quality improvement, and wildlife utilization through the proposed monitoring plans.
USFWS	26.	The USACE application for this project states repeatedly that the project is intended to restore and improve aquatic resource functions. The USFWS respectfully asks the applicant, "what functions specifically and how will success be measured?" While the USFWS agrees that reducing "severe erosion" is a reasonable goal of this project, it should not and cannot be the only one. Restoration of the dimension, pattern and profile of the bayou does not address the project's potential impacts to existing chemical and biological functions of the stream.	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
USFWS	27.	In addition to the sediment and bacteria load monitoring plans, the USFWS recommends monitoring plans be developed and made available for review and comments prior to permit issuance for aquatic macro invertebrates, fish, and avian species within the project area. These plans should include quantitative baseline assessments and post-project monitoring with enough monitoring events to be statistically powerful. Thus, as this project is to demonstrate a practice or collection of practices, the USFWS recommends that a rigorous monitoring protocol for aquatic and riparian organisms be developed and carried out as part of this project. In the absence of such, the partners in this project and the public we serve lose a valuable opportunity to build upon what we know and what we need to improve.	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan. Activities that disturb bird habitat, such as clearing and grubbing, should take place between September 15 and March 1 to avoid nesting of migratory birds. If clearing is necessary outside of the recommended period, a migratory bird nest survey will be conducted to verify active migratory bird nests are not present before clearing begins. The migratory bird nest survey will be performed by a professional with ornithological experience no more than 10 days prior to clearing work. If active nests are discovered during the survey, the nests will be avoided and a non-disturbance buffer will be implemented. If avoidance of the nests is not possible, a professional with ornithological experience will monitor the nests during construction and/or the relocation of the birds. Any necessary monitoring and/or relocation activities will be coordinated with the USFWS.

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			In addition to the migratory bird nesting surveys that will be completed by HCFCD as appropriate, the Houston Audubon Society also conducts monthly bird surveys at the Hogg Bird Sanctuary located adjacent to the project area.

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Texas Parks and Wildlife Department (TPWD)			
TPWD	28.	The applicant states in the [public notice] PN on page 6 that it is "likely" wetlands will be permanently established and there is a "potential" for 2 to 8 acres of emergent in-stream wetlands to develop naturally post-project. Even though the post-construction stream assessment score values are forecasted to be equal or higher than the pre-construction scores, this does not ensure post-construction, on-the-ground results will be the same. The applicant also states that approximately 0.8 acre of wetland plantings will be conducted within Transect 6, where the existing channel will be abandoned. However, it is not clear in the PN or in additional information provided whether wetland habitat will exist or be created during construction in the abandoned channel. It is unclear whether the 0.61 acre of wetland impacts are truly mitigated within the current design and captured within the post-construction stream assessment (Table 2, Stream Tool Results Comparison, page 450 of IP application).	The proposed project was designed to be self-compensating; that is, the project will result in an overall ecological lift. The proposed project will impact 0.61 acre of wetlands and HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. In addition, due to the creation of bankfull benches and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
TPWD	29.	TPWD recommends that the GDSAT be reassessed two years after the completion of the project to ensure that actual wetland and stream compensation is achieved. The GDSCA for this project needs to include appropriate guidelines to ensure post-construction assessments are indeed accurate. If the existing channel will contain a 0.8-acre wetland and will act as in-stream mitigation for wetland impacts, this information needs to be clearly defined within the permit. Also, if the GDSAT scores after two years post-construction are not assessed at an equal or higher value than the original GDAST results, then TPWD recommends that the applicant include all of the required components identified under 33 CFR 33.2(c)(2) through (c)(14) in Compensatory Mitigation for Losses of Aquatic Resources. TPWD recommends that the applicant develop an Adaptive Management Plan as well that	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.

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		incorporates strategies to compensate for any impacts that were not initially assessed and provide plans for compensatory mitigation if needed.	
TPWD	30.	A wetland and riparian buffer zone monitoring plan, including monitoring for invasive species, was not included in the PN or the additional information provided to TPWD. TPWD recommends that invasive plant species control be included as a performance standard within a monitoring plan. TPWD recommends annual riparian buffer and wetland monitoring be conducted for at least 5 years post-project in order to ensure success of the proposed plantings (both riparian and wetland) as well as to ensure that stream and wetland impacts are accurately compensated.	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.

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Houston Sierra Club (HSC)			
HSC - 06.30.14 letter	31.	HCFCD states that this is a restoration project and claims that because of this no mitigation is needed. Additional claims by HCFCD (both verbally and in writing) are that the bayou will neither aggrade nor degrade and that water quality will improve if the project is implemented. The HSC disputes that this is a restoration project. It is a channel improvement project that will allow improved conveyance of stormwater and sediment, with attention to erosion control and bank stabilization.	The proposed project was designed to be self-compensating; that is, the project will result in an overall ecological lift. The proposed project will impact 0.61 acre of wetlands and HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches and low flow benches, there is the potential for an additional 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
HSC - 06.30.14 letter	32.	HSC believes that a No Action Alternative is not feasible, but also believes that the NCD technique proposed by HCFCD is needlessly destructive. We define needless destruction as overly aggressive vegetation removal from about 80% of the project length, realignment of the meanders, cutting a new meander through a riparian forest, and reducing the length of the main stem of Buffalo Bayou and of the Hogg Bird Sanctuary Tributary. A preferred demonstration project design would incorporate a reduction in the amount of linear feet of vegetation removal, a lesser degree of bank disturbance, a greater focus on areas of documented bank failure, and monitored revegetation of disturbed areas. The effect of large COH outfall pipes would be evaluated and any warranted modifications would be a part	HCFCD will remove some vegetation and trees to accomplish the project's goal of stabilizing the channel. It is expected that less than 80 percent of the trees and vegetation in the project area will be removed. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14-foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will

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		of the project.	include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Unfortunately, much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature trees that used to line Buffalo Bayou's streambanks have already been lost to streambank failure and mass wasting of slopes. Where vegetation has managed to reestablish on failed streambanks, it is predominantly immature non-native species, creating monoculture community types or herbaceous vegetation which does not have adequate height to provide shading of the water. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. HCFCD has conducted assessments of the channel banks along the entire reach of Buffalo Bayou, as well as extensive assessments of the channel banks along the proposed project reach to determine the conditions of the bayou, and the appropriate repair methods for the proposed project reach. These assessments include a hydraulic model review, visual assessment, BEHI assessment, NBS assessment, BANCS assessment, woody debris load mapping, sediment transport assessment, stable channel reach review, and regional channel curve review. The overall compilation of data indicated that in order to stabilize the banks of the bayou, energy dissipating

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			measures (i.e., bank full benches, a pool and riffle system) and the use of in-stream structures (i.e., toe wood) must be used to work in conjunction with one another to reduce shear stress from the banks of the bayou and allow for long-term, sustainable stability of the banks through the reestablishment of vegetation along the bayou banks and the reestablishment of ecological functions where possible. Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion eats away at the banks, public and private property along the bayou is threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the destruction of habitat and vegetation along portions of the bayou, and threats to public and private property. The MPDP will restore Buffalo Bayou's equilibrium, and will ultimately protect the upper banks along this reach of Buffalo Bayou. The term "demonstration" refers to providing an example of successful urban stream restoration on a portion of Buffalo Bayou using techniques that have been used successfully to restore streams in other areas of the United States. The project is meant to demonstrate to property owners along Buffalo Bayou, and other bayous and creeks in urban areas, the long-term benefits of looking at both banks of the bayou, and restoring a significant stretch (holistic project reach approach) of a bayou system rather than repairing isolated sections (spot repairs) to only one bank of a bayou system. Spot repairs to one side of the streambank ultimately create impacts to the opposite bank of the bayou, downstream due to the inability to dissipate erosive flows in a manner that concentrates them to the thalweg (centerline) of the bayou, and have

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			had little effect on the bayou's growing erosion problem over the years.
HSC - 06.30.14 letter	33.	HCFCD has chosen the NCD technique developed by Dave Rosgen, which the HSC finds inappropriate to be applied to the designated project reach of Buffalo Bayou. HSC believes that an alternative method known as Vegetated Reinforced Soil Slope (VRSS) method targeted to areas of slope failure would be a more balanced approach. It would be less destructive to habitat because it would reduce the amount of linear feet and depth feet of bank disturbance/vegetation and would provide more robust protection at the base of areas of slope failure. The VRSS method will be discussed in more detail later in our comments.	The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems in a stressed condition. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the Natural Resources Conservation Service (NRCS), a branch of the United States Department of Agriculture (USDA), lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.
HSC - 06.30.14 letter	34.	Precipitation patterns over the Buffalo Bayou, Addicks Reservoir, and Cypress Creek watersheds can necessitate sustained upstream water releases from behind the Barker and Addicks dams. Buffalo Bayou is now subject to artificially managed stream flows, instead of exhibiting a natural hydrograph. Yet the riparian vegetation is quite natural with only a small percentage of invasive exotic incursion. There is a shaded canopy over the bayou, although it is not solid and continuous. Buffalo Bayou is still natural in its most important function - that of providing a source of water and diverse vegetation - both wetland and upland - to support a diverse assemblage of wildlife. That one can today find such a natural asset within the urban core of Houston is rarer still. It provides these ecological benefits, even though the flow regime is	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary

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		unnatural and with known areas of bank erosion. For this reason alone, the permit application merits tough scrutiny with an eye to remedying areas of known erosion while maximizing the preservation of areas already providing habitat.	high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, and HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature trees that used to line Buffalo Bayou's banks have already been lost to streambank failure and mass wasting of slopes. Where vegetation has managed to reestablish on failed streambanks, it is predominantly immature non-native species or herbaceous vegetation which does not have adequate height to provide shading of the water. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks.
HSC - 06.30.14 letter	35.	The HCFCD has counted the number of public participation meetings since the inception of the project to the time the permit was filed as being either 33 (per the public notice) or 41 (per Attachment E - Public Coordination, Permit Application). This tally is disingenuous and totally misleading. The reason that there is so much disagreement over the design of the MPDP is because most of the design was completed before the public was allowed to know about it. The public was systematically excluded from any participation in the design process and was only able to obtain the 60% plans two and a	Much of Buffalo Bayou has remained natural, but changes in stormwater flow caused by urbanization and operation of the Addicks and Barker reservoirs are causing the bayou to adapt in some areas through excessive erosion. That erosion has devastating environmental consequences, increases flood potential, and threatens public and private property. Because of these threats to the bayou, interested stakeholder groups came together in recent years to collaborate on proposals to help restore Buffalo Bayou's natural beauty,

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		half years after the planning process began.	water quality, and flood functions. This collaboration resulted in HCFCD taking the lead on the design of the MPDP along Buffalo Bayou from the Hogg Bird Sanctuary/Bayou Bend parking lot to just south of Memorial Park's Picnic Loop. From the outset of this proposal, the stakeholders have used a step-wise approach to measure support and develop understanding for what the proposal might be. With each step in the gradual process of devising a plan, the breadth of information and participants expanded. Initially, communications about the proposed project included the direct landowners who would be affected by the project, or who owned property in direct contact with the proposed project area. This group included the City of Houston, River Oaks Country Club, Memorial Park Conservancy, and private citizens along the proposed project reach. As the proposed project progressed and interest in the project grew, the District held several meetings with interested organizations and the public. Approximately 41 meetings have been held, including: ● Steering committee meetings with project partners and affected property owners – these meetings have been ongoing since 2010. ● A public presentation by Dr. Dave Rosgen in June 2013. ● A meeting with the Sierra Club (Houston Chapter) in August 2013. ● Presentations were made to the Flood Control Task Force in 2012, 2013 and 2014. ● A public meeting (organized and hosted by the Flood Control District) was held on Dec. 17, 2013. Additional public meeting(s) will be scheduled as needed in various project phases, e.g., in advance of construction.

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			The District has also created a website for the project where citizens can submit questions and comments and voice support or concerns. Interested residents/property owners are invited to submit comments and sign up for project updates at the Memorial Park Demonstration Project webpage - www.hcfcd.org/mpdp. HCFCD is committed to making information about the project available to all affected individuals and organizations, and the public in general.
HSC - 06.30.14 letter	36.	[In regard to the public being excluded from the planning process], at the same time that the HSC was forced to use a Texas Public Information Act request to obtain any kind of plan for the MPDP, HCFCD had already completed the first set of the 80% plans after repeated consultation with the selected stakeholders of its choosing. HCFCD did not consider the public a stakeholder, despite Memorial Park being the premier public park in Houston and Buffalo Bayou being the most accessible public waterway. The public was deliberately excluded during the time of the planning process when it would have been the most cost-efficient and effective interval to discuss alternatives to NCD. HCFCD consciously chose to include only those stakeholders who initiated the NCD recommendation or who supported it.	See response to Comment 35 above.
HSC - 06.30.14 letter	37.	Neither of the two public meetings claimed by HCFCD allowed public comment or open questions. The first meeting in June 2013 was only a general presentation on NCD technique hosted by the Bayou Preservation Association (BPA). The BPA handled the invitations and described the event as a lecture. The second meeting in December 2013 was hosted by HCFCD. However, the public could only submit written questions and HCFCD chose the ones the panelists would answer. There was no public comment session.	See response to Comment 35 above.
HSC - 06.30.14 letter	38.	Since the HCFCD has never convened a true public meeting during which the public was allowed open comment and questions, the HSC respectfully requests that the USACE hold a public hearing due to the significance of the impacts upon Buffalo Bayou.	The USACE will determine if a public hearing is warranted for the proposed project.
HSC - 06.30.14 letter	39.	Probable impacts, including cumulative impacts, must be compiled to be considered by the USACE. There are several	A cumulative impacts analysis will be evaluated by the USACE prior to the issuance of any IP.

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		projects now, either ongoing or proposed, that will have cumulative impacts upon bank disturbance, sedimentation, vegetation removal, and wildlife habitat. These projects include: ~2.3-mile Sabine to Shepherd 1.25-mile through Memorial Park and 800 feet of the Hogg Bird Sanctuary tributary TIRZ 16 project at Woodway/Loop 610 West ~800 feet Houston Country Club bank repair 42-acre riparian forest converted to detention in Briar Forest area	
HSC - 06.30.14 letter	40.	The proposed design will have major impacts on Memorial Park. The USACE should carefully consider the potential eligibility of Memorial Park for the National Register of Historic Places. We understand that specific comments regarding such eligibility are being submitted by another party.	HCFCD has completed extensive cultural resource surveys within the project area and has coordinated with the Texas Historical Commission (THC) and the USACE to determine if the proposed project will have any impacts on cultural sites. It is the THC's opinion that impacts within the bayou will not have an effect on National Register eligible historic properties or to contributing elements of any designated State Antiquities Landmarks, including Camp Logan. In addition, fieldwork and historic research completed along the banks of the bayou thus far has concluded that there is no indication that archaeological deposits or historic standing structures associated with Camp Logan or other cultural resources will be affected by the proposed project. The THC and USACE are currently reviewing project plans to verify this conclusion.

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HSC - 06.30.14 letter	41.	The USACE should consider the special status of the 17-acre Hogg Bird Sanctuary and the importance of the habitat it provides. A COH ordinance established the Hogg Bird Sanctuary on October 21, 1958. Part of the sanctuary borders Buffalo Bayou and it includes the Hogg Bird Sanctuary Tributary. There are regularly scheduled bird surveys at the sanctuary organized by the Houston Audubon Society. A compilation of the results of 44 bird surveys at Hogg Bird Sanctuary, beginning April 2010, is attached to these HSC comments as Appendix D. The list shows the number of surveys in which each bird appeared. Surveys were compiled by members of the Houston Audubon Society and other bird enthusiasts.	The erosion along the banks of the Hogg Bird Tributary is extremely severe to the point that adjacent property owners were allowed by the COH to emplace stabilization efforts where necessary to protect their endangered properties. The existing habitat is being subjected to severe degradation and land loss through this section of the sanctuary; the implementation of the proposed project will preserve the existing vegetation in place and allow for the reestablishment of appropriate vegetation where none currently exists. There may be a temporary impact on the results of the Houston Audubon Society bird surveys; however, this will be experienced only during construction activities. Post-project, the bird surveys can document changes in bird counts.
HSC - 06.30.14 letter	42.	Implementation of the project plan would reduce the length of the Hogg Bird Sanctuary Tributary by 200 feet through realignment of the meanders. There is a large elevated outfall pipe at the head of the tributary that is a source of high velocity discharge and definitely a contributor to erosion of the tributary. However, the HCFCD plan does not consider the outfall pipe in its plan. A holistic approach to reducing erosion of the tributary would include an alternative(s) to reduce the impacts of the elevated outfall pipe, such as a drop structure for the outfall pipe and velocity attenuating methodologies.	To create a stable dimension, pattern and profile for the Hogg Bird tributary and stabilize its banks the project design will shorten the overall length of the tributary. By creating the proper dimension, pattern, and profile for the tributary, the project will reestablish accessibility to the channel's geomorphic floodplain, reduce shear stress on the toes of the slopes and allow for the reestablishment of riparian vegetation along the slopes. The proposed project calls for a scour (riprap dissipation) pool to be placed in front of the outfall to dissipate erosive discharges located at the upstream limits of the Hogg Bird Tributary. The dimensions (length, width, and depth) of the riprap dissipation pool are based upon the hydraulic flow (q) of the outfall pipe.

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HSC - 06.30.14 letter	43.	Linda Gorski (President) and Louis Aulbach (Vice-President) of the Houston Archaeological Society (HAS) have prepared a letter stating their concerns related to the historic Camp Logan sites in Memorial Park. The letter and accompanying maps are attached as Appendix E. The Texas Historical Commission notified Houston Mayor Annise Parker of the designation of Camp Logan as a State Archaeological Landmark via a letter dated June 13, 2013. The minutes of the Texas Historical Commission from April 25 through 26, 2013, also confirmed Camp Logan as a State Archaeological Landmark. The USACE is required to determine if the proposed project will significantly impact cultural resources and consult with the Texas Historical Commission.	HCFCD has completed extensive cultural resource surveys within the project area and has coordinated with the THC and the USACE to determine if the proposed project will have any impacts on cultural sites. It is the THC's opinion that impacts within the bayou will not have an effect on National Register eligible historic properties or to contributing elements of any designated State Antiquities Landmarks, including Camp Logan. In addition, fieldwork and historic research completed along the banks of the bayou thus far has concluded that there is no indication that archaeological deposits or historic standing structures associated with Camp Logan or other cultural resources will be affected by the proposed project. The THC and USACE are currently reviewing project plans to verify this conclusion.
HSC - 06.30.14 letter	44.	The impact of COH outfall pipes on erosion, which can have a strong localized effect, do not appear to have been considered in the design. Of course, the degree of impact is variable dependent upon timing and amount of precipitation in different parts of the watershed, amount of runoff, upstream releases, etc. However, under the right mix of low rainfall and runoff upstream in combination with high volume from local stormwater, the outfall pipes can produce erosive flows. In particular, there is a 108-inch outfall pipe on the south side of Buffalo Bayou immediately west of the River Oaks Country Club property line. There is a major elevated outfall pipe at the head of the Hogg Bird Sanctuary Tributary, which behaves very much like a fire hose during high flows. A review of the effects of these and other COH outfall pipes and their localized effects should be part of erosion control efforts on the project reach.	The impacts of storm sewer outfall pipes were taken into consideration for the design of the entire project. It is proposed that all outfalls noted within the proposed project reach will have riprap dissipation pools installed in front of them. The dimensions (length, width, and depth) of the riprap dissipation pool are based upon the hydraulic flow (q) of each outfall pipe.
HSC - 06.30.14 letter	45.	At this point, HSC would like to discuss a possible alternative to HCFCD's project design based upon NCD. We advocate a targeted approach to issues of erosion and bank stabilization, balanced with the need to preserve existing habitat. A preferred demonstration project design would incorporate a reduction in the amount of linear feet of vegetation removal, a lesser degree of bank disturbance, a greater focus on areas of documented bank failure, and monitored re-vegetation of disturbed areas. The effect of large COH outfall pipes would be evaluated and any warranted modifications would be a part	Alternatives to the proposed project, such as a "target approach" identified by the HSC, have been attempted all along Buffalo Bayou with some success at stabilizing only the area where work was conducted but provided no dissipation benefits to the existing hydraulic regime found in the stream system. The proposed project was designed in an effort to consider both sides of the bayou along the entire length of the project to determine what needs to be done to stabilize this entire reach of Buffalo Bayou. The proposed project will reestablish a pool and

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		of the project.	riffle system within the bayou's profile, reestablish accessibility to the geomorphic floodplain within the bayou's dimension, and reduce shear stress along the toes of the bayou's slopes within the bayou's pattern. Other alternatives were considered during the geomorphic assessment and design of the project but were determined not to be viable options for achieving sustainable streambank stability throughout the reach. The meander that will be realigned in the streambed will be placed in a location to reestablish a sustainable geometry for the stream system to handle the existing hydraulic regime and to aid in the overall goal of reducing shear stress along the toes of the streambanks. It is necessary to consider both sides of the channel so that the reinforced sections do not transfer erosive energy to the opposite bank of the stream creating additional erosion. While a "target approach" would minimize impacts to waters of the U.S., this technique typically causes the velocity of the stream to increase and does not address the cause of the stream instability and erosion. The use of toe wood along the outside of meander bends will also reduce shear stress on the toes of the bayou's slopes and keep erosive flows concentrated to the centerline, or thalweg, of the bayou. Toe wood is a natural source of material that is consistent with what is naturally found within the Buffalo Bayou stream system. Large quantities of rock are not naturally found within the Buffalo Bayou stream system, and the use of concrete riprap instead of toe wood would not provide a rough surface to aid in dissipating shear stress acting upon the toes of banks. Although concrete riprap individually is angular in shape, once installed and compacted in place it acts as a smooth, hard surface similar to concrete and will increase by transferring erosive flows (shear stress) on the toes of the opposite streambank located downstream of where it is installed. The proposed project design takes into consideration

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			flows entering the channel from outfall pipes and includes riprap dissipation pools that will be installed in front of them. The dimensions (length, width, and depth) of the riprap dissipation pools are based upon the hydraulic flow (q) of each outfall pipe. The proposed project will create a stable channel to minimize loss of vegetation in the future. By creating a stable dimension, pattern and profile the reestablishment of mature, diverse vegetation along the proposed project reach can be achieved (where currently single-community type vegetation has been noted that is juvenile in age). HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
HSC - 06.30.14 letter	46.	The suggested alternative would utilize the Vegetated Reinforced Soil Slope technique to stabilize highly erodible banks. The use of rock rather than toewood/rootwads at the base of the slopes on this reach of Buffalo Bayou is recommended because of the highly erodible sugar sands. The rock provides a more stable base and is not subject to decomposition like wood. Also, the bank would not have to be excavated (disturbed) as far back from the toe, as would be	The suggested Vegetated Reinforced Soil Slope technique is another name for the Vegetated Stabilized Earthen Wall technique that is included in the proposed design. The use of toe wood along the outside of meander bends will also reduce shear stress on the toes of the bayou's slopes and keep erosive flows concentrated to the centerline, or thalweg, of the bayou. Toe wood is a natural source of material that is

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		necessary for placing 20- to 30-foot tree trunks at right angles to the stream flow.	consistent with what is naturally found within the Buffalo Bayou stream system. Large quantities of rock are not naturally found within the Buffalo Bayou stream system, and the use of concrete riprap instead of toe wood would not provide a rough surface to aid in dissipating shear stress acting upon the toes of banks. Although concrete riprap individually is angular in shape, once installed and compacted in place it acts as a smooth, hard surface similar to concrete and will not reduce shear stress on the toes of the stream. It will instead transfer erosive energy to the opposite bank of the stream at a location downstream.
HSC - 06.30.14 letter	47.	HCFCD has noted that rock is not natural on Buffalo Bayou, which is true. HCFCD reasons that because wood is natural on Buffalo Bayou, therefore its selection of toewood is superior to rock. HCFCD also claims that the rootwads extending into the stream will provide fish habitat. In reply, HSC contends that excavating the bank for 20 to 30 feet in order to place tree trunks at right angles to the stream flow is not natural either. Also, the placement of rock will be largely underneath the surface of the stream bed, covered with sediment, and vegetated. The overhanging vegetation will provide habitat.	The use of toe wood along the outside of meander bends will also reduce shear stress on the toes of the bayou's slopes and keep erosive flows concentrated to the centerline, or thalweg, of the bayou. Toe wood is a natural source of material that is consistent with what is naturally found within the Buffalo Bayou stream system. Large quantities of rock are not naturally found within the Buffalo Bayou stream system, and the use of concrete riprap instead of toe wood would not provide a rough surface to aid in dissipating shear stress acting upon the toes of banks. Although concrete riprap individually is angular in shape, once installed and compacted in place it acts as a smooth, hard surface similar to concrete and will not reduce shear stress on the toes of the stream. It will instead transfer erosive energy to the opposite bank of the stream at a location downstream.
HSC - 06.30.14 letter	48.	The HSC and the Endangered Species Media Project co-hosted a public meeting on September 11, 2013, to highlight concerns about the design of the MPDP. One of the guest speakers was Robbin Sotir, who specializes in soil bioengineering and bank stabilization. Ms. Sotir expressed her concerns about the strength of the soil bioengineering techniques proposed for some steeply eroded banks, particularly next to the River Oaks Country Club. She was of the opinion that the techniques proposed by the project would be too weak to withstand erosive forces. She also thought that using rock at the base, instead of the proposed root wads, should be strongly considered. The intent is to bury the root wads underneath the stream bed. On December 16, 2013,	Soil bioengineering techniques are one of the components of Natural Stable Channel Design, and comparable techniques are included in the proposed project design. The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek

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		Ms. Sotir participated via telephone at a meeting with Harris County Precinct 4 Commissioner R. Jack Cagle to discuss concerns with the use of NCD on the project reach of Buffalo Bayou. Ms. Sotir prepared a summary of her concerns, which was presented to Commissioner Cagle at the meeting. A copy is attached to these comments as Appendix G.	extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.
HSC - 06.30.14 letter	49.	Hydrology concerns pertinent to the permit application are noted by Larry G. Dunbar in his review include, but are not limited to (1) need for hydrology and hydraulics modeling, (2) lack of 100% design plans for public review, (3) lack of specific data regarding the use of Buffalo Bayou FEMA hydrologic data, and (4) characterization of the Channel Condition and Channel Alteration components of the Stream Assessment. Details of these concerns and others are contained in the June 30, 2014, letter submitted on behalf of the HSC to the USACE in Appendix A.	(1) For Hydrology and Hydraulics modeling: The FEMA's effective floodplain model (both HEC-HMS and HEC-RAS) for Buffalo Bayou from HCFCD's Model and Map Management (M3) System was used as the base model for this project. Both steady and unsteady flow models were run to compare the current conditions to the proposed conditions. The steady state model is the official model used by the FEMA. Using the steady state model is a requirement to document that the project does not raise the regulatory floodplains anywhere on Buffalo Bayou (headwaters to Houston Ship Channel) before the project can be approved by the COH, FEMA, and HCFCD. The models have been reviewed by HCFCD and the COH acting as the local floodplain administrator. The COH reviewed the hydraulic model used for the project and is prepared to issue a certificate of no rise for the project subsequent to the final submittal of the sealed 100 percent project plans for their approval. (2) The 80% design plans that were submitted to USACE contain the final design. The plans are marked "80% draft" because they are not ready to be bid for construction; this language merely refers to a contract

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			milestone for HCFCD's engineering consultant. The overall design, stated impacts to waters of the U.S, and the proposed vegetated areas will not change. The plans were submitted to obtain an IP, and while the permit application is under review HCFCD has been working with the engineering consultant to finalize the construction notes and specs found on the design plans. (3) As stated above, the project will be required, using the steady state HEC-RAS model, to document that it does not raise the regulatory floodplains anywhere on Buffalo Bayou (headwaters to Houston Ship Channel) before the project can be approved by the COH, FEMA and HCFCD. (4) The Channel Condition and Channel Alteration Parameters were evaluated using the methodology outlined in the USACE Galveston District SCA (2013) and guidance provided by USACE Galveston staff.
HSC - 06.30.14 letter	50.	A review of the biological and ecological aspects of the permit application by George Guillen, PhD., is attached as Appendix B. Immediately below, the major points noted in the Executive Summary are excerpted: No documentation is provided on the BANCS assessment results or methodology used during the KBR study. This is not a trivial problem since the BANCS assessment is a major part of the Rosgen stream assessment process that is used to develop restoration strategies.	Please refer to the attached BANCS Assessment.
HSC - 06.30.14 letter	51.	No documentation is provided on the POWERSED/FLOWSED assessment used during the KBR study in regard to results or methodology. The authors of the KBR report specifically state in Attachment C, Page 3, Item 3.2b, that a "FLOWSED-POWERSED" was conducted. However, I could not find any BANCS assessment attached to this application or summary results to examine. Again, this is a major oversight.	FLOWSED/POWERSED model runs were performed to verify pre-project and post-project sediment transport capacities. The model runs verified that the proposed project reach was sediment transports reach ("Qs in" was similar to "Qs out"), meaning that the hydraulic geometries were similar.
HSC - 06.30.14 letter	52.	The authors of the KBR report explicitly state that they used a Level I assessment protocol despite the fact that this method was developed for smaller projects (<500 linear feet). They indicate the lack of the Level II assessment methodology being	The Interim Level 2 SCA Procedure for Intermittent Streams with Perennial Pools, Perennial Streams and Wadeable Rivers with Impacts Greater than 500 Linear Feet was published on March 26, 2014; HCFCD

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		available. However, in March 2014, the interim guidance was issued by the USACE. This methodology is more evenly weighted toward in-stream biological data collection.	submitted the IP application for this project on April 8, 2014. At the time of the release of the Interim Level 2 Assessment, HCFCD had the Level I assessment already completed and the preparation of the IP application almost completed. Additionally, the project reach of Buffalo Bayou is not considered wadeable and would not the requirements for review under the Level 2 assessment. HCFCD will be completing pre- and post-construction in-stream macroinvertebrate and fish monitoring; please refer to the MPDP Monitoring Plan for more detailed information.
HSC - 06.30.14 letter	53.	The authors of the KBR report state that the aquatic life use in the project area, based on TCEQ data, is "limited." This again reflects their misunderstanding of how the TCEQ standards are applied and interpreted. Again, since they did not use the Level 2 assessment protocol, it is unknown whether a different designation would have occurred based on the more rigorous biological surveys listed in that protocol. The TCEQ aquatic life use designation is by default based on dissolved oxygen levels, which according to the latest HGAC assessment report is improving in this stream segment. Either way, this does not imply that there is limited use by aquatic life in this segment. Past surveys have shown that large populations of fish are found in this reach of Buffalo Bayou.	The Aquatic Life Parameter was evaluated using the methodology outlined in the USACE Galveston District SCA (2013). The Interim Level 2 Assessment was not completed for this project; however, HCFCD will be completing pre- and post-construction in-stream macroinvertebrate and fish monitoring; please refer to the MPDP Monitoring Plan for more detailed information.
HSC - 06.30.14 letter	54.	It is unclear whether the predicted changes in the amount and quality of riparian buffer, channel condition, and degree of channel alteration, which are calculated as the difference between existing conditions estimated by the Level 1 visual assessment and future projected conditions provided in the restoration project plan, are actually environmentally significant to warrant any declaration of improvement. In many cases the scoring criteria are very subjective and would likely only detect major shifts in condition at the site. The use of a rank transformed scale also obscures true quantitative differences both spatially and temporally. Once again, the Level 2 assessment is more appropriate for this size project per USACE guidance.	The Riparian Buffer Parameter was evaluated using the methodology outlined in the USACE Galveston District SCA (2013) and guidance provided by USACE Galveston staff. HCFCD will be completing wetland and riparian corridor monitoring; please refer to the Pre- and Post- Construction Monitoring Plan for more detailed information.
HSC - 06.30.14 letter	55.	Problems at the site are due to regional problems with water quality (sediment loading). Claims to the contrary regarding sediment loading and bacteria are not true. It is expected that	HCFCD has developed erosion rating curves from measurements of tree root exposure (using methods of dendrogeomorphology) to predict sediment loads

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		the project will have minimal effects on the concentration and loading of these pollutants (e.g., suspended solids, indicator bacteria).	discharged to the bayou. This rating curve correlates average erosion rates with a range of Bank Erosion Hazard Indices observed along Buffalo Bayou from the reservoirs to downtown Houston. The natural portion (unrectified) of Buffalo Bayou between Beltway 8 and Shepherd Drive contributes the majority of the total sediment load annually: 15,700 tons/year, for that reach, from a total estimated load of 17,000 tons/year. The project reach in its current unstable state produces an estimated sediment load of 5,491 tons/year. Therefore, despite the short length of the proposed project reach relative to the total length of Buffalo Bayou, the potential reduction in sediment load from this degrading reach is significant. One of the primary goals of the proposed project, as described in the permit application, is "to create a stable stream that will neither aggrade nor degrade," thereby reducing or eliminating its sediment loading. The project reach will still transport upstream sediment loads effectively through the system, but it will not be a source or sink for sediment loading. Given the established relationships between sediment, bacteria, and water quality, it is presumed that reducing sediment loading to Buffalo Bayou can only have a positive impact on reducing bacteria levels, improving water quality through reduced suspended sediment, and increasing the potential utilization of the aquatic resource by wildlife. However, HCFCD cannot be certain as to what quantifiable level the reduction in sediment loading will improve bacteria levels, water quality, and wildlife. Therefore, HCFCD developed the "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" to assist in quantifying those impacts to bacteria and water quality. Subsequently, HCFCD has developed the MPDP Monitoring Plan that proposes to sample macroinvertebrate and fish abundance and diversity as an indicator of wildlife utilization. Therefore, HCFCD will quantify the level of improvements in sediment load reduction, bacteria load reduction, water quality improvement, and wildlife utilization through the

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			proposed monitoring plans.
HSC - 06.30.14 letter	56.	Based on comments of Rosgen and other researchers, there are inherent problems with using the NCD method in urban disturbed streams.	NCD has been successfully implemented and proven across the United States and other parts of the world. Furthermore, HCFCD has already successfully applied various NCD principles to projects on Cypress Creek, Mason Creek, Vogel Creek, Buffalo Bayou, and Rummel Creek in Harris County, Texas.
HSC - 06.30.14 letter	57.	It is unclear what type of validation monitoring will be conducted to evaluate whether the goals of the project as listed are met. This is a critical issue for all restoration projects. For purposes of fiscal responsibility and to hopefully advance the science, it is essential to determine the effectiveness of restoration technologies.	HCFCD developed the "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" to assist in quantifying those impacts to bacteria and water quality. Subsequently, HCFCD has developed the MPDP Monitoring Plan that includes protocol for wetland and riparian corridor monitoring, geomorphic monitoring, and in-stream macroinvertebrate and fish abundance and diversity monitoring as an indicator of wildlife utilization. An adaptive management plan to address identified deficiencies is also included in the monitoring plan. Therefore, HCFCD will quantify the level of improvements in sediment load reduction, bacteria load reduction, water quality improvement, and wildlife utilization through the proposed monitoring plans.
HSC - 06.30.14 letter	58.	There are inconsistencies in the KBR report regarding the current and projected stream type. The existing stream channel and predicted stream channel are provided in Attachment I of the KBR report. It should be noted that in Attachment C, Page 1, 1.5e, KBR indicates that the predicted channel evolution will be E→G→F→Ce. However, later in the report under Attachment I, Page 3, the authors state that the "stream has a low width-depth ratio typical of a Rosgen C5-type stream." Therefore, it is unclear to the reviewer as to what is the current stream type classification of the project area and Buffalo Bayou. If it is C5 currently, how can the evolution listed above occur? KBR should clarify this.	Schumm et al. (1984), Simon and Hupp (1986), and Rosgen (1996) all identified predictable channel evolution (or succession) scenarios to describe the sequence of changes in channel morphology that streams exhibit to establish a new stable equilibrium following a disturbance. As described in the SCA Report (Permit Application Attachment I), the current Rosgen stream classification of the MPDP reach is C5. The letter in the stream classification designation refers to the stream type (i.e., A, G, F, B, E, C, etc.), and the number refers to the streambed material (i.e., 1-bedrock, 2-boulders, 3-cobble, 4-gravel, 5-sand, 6-silt/clay). The predicted channel evolution sequence provided in the NCD Review Checklist (Permit Application Attachment C) only describes the stream type succession and not the channel material because the predicted channel evolution sequence is independent of the channel material. Based on a review of historical photography and channel descriptions, Buffalo Bayou was believed to

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			be an E stream type prior to watershed development and reservoir construction. Following watershed urbanization and construction of the reservoirs, Buffalo Bayou began a channel succession of deepening and widening to accommodate the changes in watershed hydrology and hydraulics. These morphological changes resulted in a stream type transition to G and F, with some sections of Buffalo Bayou still exhibiting the F stream type condition. The new existing stream type condition beginning to exhibit itself on Buffalo Bayou in the project reach is the C stream type. However, Buffalo Bayou is not ever likely to achieve the typical C stream type in the Rosgen stream classification system because the natural slope and topography of the southeast Texas gulf coastal plain is too flat for the typical Rosgen C stream type parameters. Therefore, when a stream channel varies with regards to one parameter (i.e., slope, sinuosity) from the typical parameters of that stream type, it is typically caveated with an additional lowercase letter, such as "c" or "e". The final predicted stream type for the proposed project is Ce, which will have the stable parameters of the C stream type but will have the opportunity to develop a more narrow width to depth ratio similar to an E stream type and the original channel condition prior to disturbance.
HSC - 06.30.14 letter	59.	The authors claim that there is currently 359 tons per year generated from eroding banks and stream bottom at the project site. It is unclear how this compares to existing sediment loads, which are based on most estimates of sediment and bacteria loading. A recent investigation by AECOM of Buffalo Bayou in the vicinity of the project reported loading rates of sediment during wet weather conditions of up to approximately 28,000 kg/hr. This translates into 31 tons/ hour. So during 10 one-hour wet weather events, the total amount of sediment being transported would exceed the reported erosion rate at the site. During base flows, the amount of sediment transport is equivalent to approximately 1,000 kg/hour, or 1.1 tons/hour. This value was taken and multiplied by 24 hours times 365 days to conservatively estimate annual suspended loading flowing into the project site to exceed 9,636 tons/year. Although the scale of the	The reported "loading rates of sediment during wet weather conditions of up to approximately 28,000 kg/hour" is based on suspended sediment concentration (SSC) measurements from a HCFCD assessment of Buffalo Bayou. SSC is a measurement of sediment suspended in the water column and is not a surrogate measurement for total sediment loading. Therefore, HCFCD questions the accuracy of the sediment loading rates estimated from SSC since sediment moves through streams and rivers by other processes in addition to the suspended load. Fortunately, measurement techniques are available to estimate sediment loading rates specifically from streambanks and beds through the process of the Watershed Assessment of River Stability and Sediment Supply (WARSSS). HCFCD contracted with AECOM, Inc. to perform an overall study of the

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		comparative loading can be visualized using these quick estimates, a load reduction assessment based on the restoration of a few thousand feet of shoreline needs to be conducted and compared to the upstream loading to the reach.	Buffalo Bayou watershed, including a WARSSS. For the purposes of this sediment loading assessment, Buffalo Bayou was divided into three separate reaches; the straightened reach from Barker Reservoir to Beltway 8, the natural reach from Beltway 8 to Shepherd Drive, and the downtown reach from Shepherd Drive to the Ship Channel turning basin. Based on measurements from these reaches, the assessment model indicated the natural reach, which includes the MPDP reach, produces significantly more sediment loading at 15,700 tons/year compared to the straightened reach (300 tons/year) and the downtown reach (1,000 tons/year). Additional sediment load modeling by HCFCD design consultants, KBR, Inc. and Stantec, Inc., estimated the sediment yield at 359 tons/year for the MPDP reach, which represents a substantial contribution to the overall total sediment loading to Buffalo Bayou estimated by AECOM, Inc., given the relatively short length of the proposed project in comparison to the overall length of Buffalo Bayou.
HSC - 06.30.14 letter	60.	The authors state that the watershed has a high level of urbanization, i.e., fully developed. This would imply a high degree of imperviousness. Where does this data and conclusion come from?	The percent of impervious cover within the watershed is calculated utilizing the known size of the Buffalo Bayou watershed and the size of the areas within the watershed with known land use values (urbanization).
HSC - 06.30.14 letter	61.	No data is provided on likely future hydrological scenarios. Historically, the operational rules of the Addicks and Barker Reservoirs plus downstream inflows were limited to 2,000 cfs at the Piney Point regulating gage after significant storm events. However, the facility was recently approved to discharge up to 4,000 cfs. Also, there is no documentation provided on how land in watershed may develop in the future and the effect on runoff volumes.	FEMA's effective hydrologic and hydraulic floodplain models (both HEC-HMS and HEC-RAS) for Buffalo Bayou from HCFCD's Model and Map Management (M3) System were used as the base models for this project. Both steady and unsteady flow models were run to compare the current conditions to the proposed conditions. The steady state model is the official model used by FEMA to determine the regulatory floodplain. Using the steady state model is a requirement to document that the project does not raise the regulatory floodplains anywhere on Buffalo Bayou (headwaters to Houston Ship Channel) before the project can be approved by the COH, FEMA and HCFCD. The unsteady model was used in HEC-RAS rather than the steady state models because it is superior in handling the following: ● Friction and other losses

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			● Bridge and other control structure hydraulics and backwater effects ● Numerical solution algorithm ● Computation of cross section properties ● Non-flow areas ● Flow and boundary condition data requirements ● Calibration strategy ● Application strategy (flood inundations) To develop the unsteady model, HCFCD first identified the sub-basin in the FEMA-effective hydrologic model that included the project reach. Boundary flow conditions were then set in the unsteady state hydraulic model at the upstream and downstream ends of this sub-basin based on outputs from the FEMA-effective hydrologic model. The downstream end of the unsteady model is at Waugh Drive, approximately 9,500 feet downstream of the lower limit of the project reach. The upstream end of the unsteady model is approximately 6,310 feet upstream of the upper end of the project reach. The models have been reviewed by the HCFCD and the COH, acting as the local floodplain administrator. The COH has tentatively approved the submitted hydraulic model for the project and is prepared to issue a certificate of no rise for the project, subsequent to the final submittal of the sealed 100-percent construction project plans for their approval. Combined release rates from the reservoirs are limited by flow in Buffalo Bayou measured at Piney Point gage. In 2010, USACE revised their reservoir procedures to allow for the release of stormwater in the event that water surface elevations in the reservoirs are at or are approaching their maximum historical levels. Under these conditions, stormwater release rates may be increased to a level where flow in Buffalo Bayou does not exceed 4,000 cfs, as measured at the Piney Point gage station. Since revising their procedures in 2010, USACE has not released at a rate of over the 2,000 cfs as noted at the Piney Point gage station.

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			The watershed is currently highly developed and Harris County and the City of Houston both have requirements for developers to include detention within the design of their new development/construction efforts, thus future development within the watershed should have no adverse impacts to the current hydraulic conditions along Buffalo Bayou.
HSC - 06.30.14 letter	62.	There are instances in the report where the authors claim that improvements in in-stream bacteria levels will occur due to reductions in sediment loading. There is no analysis or data provided to evaluate this claim. It is highly unlikely that this would occur based on the extensive sources of these pollutants.	One of the primary goals of the proposed project, as described in the permit application, is "to create a stable stream that will neither aggrade nor degrade," thereby reducing or eliminating its sediment loading. The project reach will still transport upstream sediment loads effectively through the system, but it will not be a source or sink for sediment loading. Given the established relationships between sediment, bacteria, and water quality, it is presumed that reducing sediment loading to Buffalo Bayou can only have a positive impact on reducing bacteria levels, improving water quality through reduced suspended sediment, and increasing the potential utilization of the aquatic resource by wildlife. However, HCFCD cannot be certain as to what quantifiable level the reduction in sediment loading will improve bacteria levels, water quality, and wildlife. Therefore, HCFCD developed the "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" to assist in quantifying those impacts to bacteria and water quality.
HSC - 06.30.14 letter	63.	A critical assumption of this Level 1 stream assessment method is the equal weighting of each stream assessment category variable. This assumes each categorical variable (e.g., stream channel, riparian buffer) is equally important in achieving restoration goals. Depending on the goals of the project (e.g., water quality, geomorphology, aquatic life use), this weighting may incorrectly predict the outcome and success of the project and be inappropriate for selecting the best restoration technique.	The proposed project was evaluated using the methodology outlined in the USACE Galveston District wetland and riparian corridor monitoring and in-stream (2013) and guidance provided by USACE Galveston staff.
HSC - 06.30.14 letter	64.	The authors of the KBR report point out a major weakness of other alternative restoration methods, which they claim do not address the root cause of the streambank erosion. However,	The NCD approach will address the degraded geomorphological functions of the stream through this portion of Buffalo Bayou by reestablishing a stable

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		they do not provide compelling evidence that the NCD approach will address the root cause, which is watershed scale urbanization.	dimension, pattern and profile to this portion of the bayou based on the geomorphological stream assessments that have been conducted both on a high level throughout the entire watershed and on a specific level based on the proposed project limits. This approach takes into consideration that the operational procedures of the Addicks and Barker reservoirs provide a vital flood damage reduction purpose to this region of the county and their operations will continue for the foreseeable future. It also takes into consideration the current ordinances in place that require new development in the City of Houston and Harris County to include detention features in their design and construction.
HSC - 06.30.14 letter	65.	It is unclear whether HCFCD has incorporated forecast models to anticipate future changes in land use, wastewater flows, runoff volumes, and/or dam operations that may affect the project site. If these have not been done, slight changes in land use and hydrology could lead to a different energy state in the river that could restart another stage of active channel and bank erosion.	The proposed project design takes into consideration that the operational procedures of the Addicks and Barker reservoirs provide a vital flood damage reduction purpose to this region of the county and their operational procedures may vary slightly in the foreseeable future. It also takes into consideration the current ordinances in place that require new development in the COH and Harris County to include detention features in their design and construction. Wastewater flows are regulated based on total volume of water that may be discharged per day, which has been taken into consideration in the design of the project.
HSC - 06.30.14 letter	66.	Based on a review of the stream restoration literature, there are major concerns regarding the potential effectiveness of the NCD approach for restoring urban streams and rivers. This includes the clearing and use of toe-wood and rechannelization given the uncertain future hydrology and changes in land use. Based on the material examined, it appears that the major goal of this project will be streambank erosion control. Very little improvement in reach scale in-stream habitat or water quality will likely result. This is due to the overwhelming problems affecting Buffalo Bayou, including large flood pulses; wastewater-dominated base flows, large bacteria and sediment loads, growing human population, and increased urbanization of the watershed. As acknowledged by	An initial assessment of the entire length of Buffalo Bayou was completed from the Barker Reservoir located on the west side of Harris County, starting at Texas State Hwy. 6, downstream to the Houston Ship Channel. This includes the upper and lower reaches of Buffalo Bayou that were originally rectified by the USACE (widened, deepened, and realigned for Flood Damage Reduction and navigation purposes in the mid-20th Century), and the portion of Buffalo Bayou in between that was left in its current state at the time. Through a planning-level analysis, based on field assessments and a review of existing conditions, the

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		Dr. Rosgen and other researchers, the analysis and restoration of urban waterways represents the most challenging scenario in stream restoration. The selected restoration tools should be reevaluated given the low likelihood that the current approach will permanently solve the root problem, which is stormwater loading and flows. The reach scale restoration project will at best treat the symptoms, not the cause of stream degradation.	HCFCD developed a summary assessment of the Buffalo Bayou system that could be utilized in identifying potential streambank stabilization projects along Buffalo Bayou that would yield the greatest measureable results for water quality, sediment reduction and overall bayou stability. Several criteria were selected to help differentiate the sites based on obtaining the greatest cost/benefit from any streambank stabilization efforts. Criteria were ranked and rated based on importance and include: ● bank erosion entrainment rates (based on the BEHI analysis); ● threats to existing infrastructure; ● right-of-way access; ● construction access; ● visibility to the public; ● planning level construction costs; ● cultural resources protection; ● constraints such as infrastructure; ● habitat improvement opportunities; and ● project length. Through this analysis, it was recognized that the most beneficial/cost-effective stabilization efforts may be achieved by combining multiple priority sites into a reach-scale project. Based on this assessment, it was apparent that the highest priority sites for streambank stabilization were located within the reach of Buffalo Bayou from Woodway Drive to downtown Houston. An on-site review of the stream conditions along this reach of the bayou was conducted in November 2010 with fluvial geomorphologists, local public agencies, and environmental advocacy groups to determine an area where a possible stream restoration project could be implemented along the bayou to demonstrate to area public agencies, advocacy groups and the local community a holistic approach to restoring a degraded stream system in a manner that is beneficial to multiple interest groups and the environment.

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			Upon completion of the field assessments and on-site review with stakeholders, the current proposed project reach was chosen for several reasons as outlined below: 1. The initial assessment showed that the proposed project reach holds the highest rate of bank instability (extreme) and has severe amounts of erosion taking place along its banks. 2. The proposed project reach is one of the only substantial lengths of Buffalo Bayou where streambank armoring has not been widely implemented by landowners and that demonstrates extreme erosion entrainment rates as compared to other reaches. 3. HCFCD currently has easement rights along portions of this area of the bayou, whereas the majority of Buffalo Bayou is privately owned. 4. There are limited property owners who own large properties along the majority of this portion of the bayou (both public property and private property), whereas the majority of Buffalo Bayou upstream and downstream of the project reach is owned in small segments by private owners. 5. The ROCC, on the south side of the channel, was planning to conduct a project to install gabion walls and they were asked to partner with public agencies to accomplish a more holistic restoration approach to stopping their loss of private property. Upon coordinating with all identified property owners (public and private) and stakeholders on the proposed project limits and coming to a final agreement, HCFCD entered the preliminary design stage for the identified project area. The preliminary design stage included: ● additional geomorphic assessments of the proposed project reach, including a BANCS assessment (comprised of additional NBS) and BEHI assessments; ● wood load mapping;

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			● sediment load assessment; ● review of USGS historical aerial maps; ● review of USGS historical stream water level gauges ● valley type assessment and classification; ● assessment of impervious cover within the watershed; ● stream assessment checklist review; ● hydraulic model analysis; ● comparison with other stable stream reference reaches; and ● comparison with Buffalo Bayou stable stream reference reaches. These design input parameters were used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included: leave the reach alone (no restoration activities), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation). When each possible restoration activity was considered for the proposed project reach, four areas of no-work were identified. The remainder of the proposed project area was found to need active restoration, which includes: ● reestablishment of a pool and riffle system to the bayou's stream bed, or profile; ● reestablishment of connectivity (where none currently exists) to the stream's inner geomorphic floodplain, or dimension,; ● realignment of the bayou's stream bed to allow for a more stable stream geometry, or pattern; and ● installation of in-stream structures to relieve shear stress on the outer banks in areas of meanders. Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, the incorporation of dissipation measures (bankfull benches,

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			or geomorphic floodplain connectivity to the stream's dimension, pool and riffle reestablishment in the stream's profile, geometry changes in the stream's pattern, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou banks (dimension) would result in less direct, short-term impacts to the aquatic ecosystem within the bayou; however, it would not yield the desired outcome of stabilizing the streambanks within the entire project reach, since it only targets the stream's dimension and would not provide the dissipation effects necessary to stabilize the streambanks within the proposed project reach. Thus, it was not a feasible option for conducting a successful, holistic restoration project that would provide long-term stability to the banks of the bayou that would allow for the restoration of natural stream functions to the bayou. The root cause of the degradation of the bayou needs to be addressed by restoring the stream's natural geomorphological functions in a manner that would allow for the hydraulic transport of stormwater through the project reach while stabilizing the streambanks for overall revegetation of the system based on a stable geomorphology.
HSC - 06.30.14 letter	67.	Some criticisms of the NCD Rosgen methods can be validly traced back to inexperienced practitioners attempting to utilize his methods with insufficient training.	HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines. HCFCD has chosen a project delivery method referred to as a Contract Manager at Risk (CMAR), which allows for the selection of a contractor based on prequalification to oversee the construction activity. The CMAR selected for the project has selected a subcontractor with extensive experience in constructing stream restoration projects. HCFCD purposely selected the CMAR method for this project so that veteran practitioners in the field of stream restoration could aid in demonstrating least damaging methods to HCFCD and the other contractors

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			in the region for possible future projects similar in nature.
HSC - 06.30.14 letter	68.	The MPDP Vegetation Survey performed by Burditt Consultants is primarily a tree study. There is a plant inventory that lists the species of trees, shrubs, forbs, vines, grasses, and sedges observed in the study area. However the detailed data is confined to woody vegetation that is 8 inches or more DBH. Dead trees having a DBH of 16 inches or greater were counted. The HSC has several comments regarding the vegetation survey: ● Although the focus of the study was on trees, the shrubs, forbs, vines, and grasses/sedges are vital to providing a diversity of plants for food and shelter for wildlife. Their importance to a functioning ecosystem should not be discounted simply because they were not tallied. The removal of non-woody and shrubby vegetation does affect wildlife. Their root systems retard erosion.	HCFCD will remove some vegetation and trees to accomplish the project's goal of stabilizing the channel. It is expected that less than 80 percent of the trees and vegetation in the project area will be removed. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where extremely little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks.
HSC - 06.30.14 letter	69.	● The survey does not tally woody vegetation that is less than 8 inches DBH. The difficulty of quantifying smaller-diameter woody vegetation is noted. However, it should also be emphasized that the biomass of smaller woody vegetation does provide food and shelter to wildlife. The	The proposed design will actively restore the streambed of the proposed project reach where no vegetation currently exists and any mature vegetation found within the areas of active restoration will be reviewed during construction to minimize the disturbance to existing

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		roots of smaller woody vegetation are especially important in riparian areas and on slopes.	native vegetation. HCFCD's urban foresters and agronomists have committed to preserving as much mature native vegetation as possible. The current planting plan calls for native tree and shrub species to be planted from the toe of the bank to the top of the bank with regard to proper hydrological zone placement. Native tree species such as bald cypress, water tupelo, sand willow, and black willow will be planted close to the water's edge, both for long-term streambank stabilization purposes and the reestablishment of native species that were historically present along Buffalo Bayou but are no longer there (either removed historically because of the timber industry or more recently as a result of the erosion). The overall long-term revegetation plan for the project area is to reestablish a closed canopy system along the proposed project reach with proper regard to hydrological zone and community type.
HSC - 06.30.14 letter	70.	There is no discussion of vegetation clearing to allow access to Buffalo Bayou for project construction. Even though the upland area of Memorial Park is not in an area requiring a permit, the loss of upland trees and vegetation and soil compaction are an integral part of the permitted project. Effects on habitat cannot be ignored.	Under the current plan, the project site will have one access point leading from Memorial Drive down to the bayou, if any changes are made to the proposed access it will be coordinated with the USACE as appropriate. This access point will be located on COH property and has been coordinated with the HPARD who is responsible for managing Memorial Park. An access road will be created from the backside of the HPARD maintenance facility down the north bank of Buffalo Bayou to the stream bed of the bayou. This construction access road will require the clearing of trees and vegetation to gain access to the channel. The exact location of the road will be determined in the field prior to beginning construction so that the most direct and least damaging route can be established and any notable trees can be avoided. Upon completion of all work associated with the project, the construction access road will be left in place and turned over to HPARD for their use.

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			Due to the operation of the Addicks and Barker reservoirs, little vegetation currently exists below an elevation of approximately 14 feet. The majority of heavy equipment access along the proposed project reach will take place along this currently denuded streambed and bank that is proposed for restoration. Access across the bayou will be made by sinking temporary wooden matting across the bottom of the bayou, and temporary haul roads will be created along areas of proposed no work by utilizing temporary road beds within the bayou comprised of mulch so that no critical root zones are impacted by the operations.
HSC - 06.30.14 letter	71.	We disagree with the decision to lump Cherry Laurel with the number of trees that are invasive species. The consultant prepared a graph showing the number of trees counted that were invasive species. Four species were noted: ligustrum, cherry laurel, Chinese tallow, and china berry. The cherry laurel is a native species and provides much more habitat value than the other three species listed, all of which are invasive exotic species. The inclusion of cherry laurel as an invasive with truly invasive exotic species gives the appearance that the existing vegetation on Buffalo Bayou is of lesser quality. A count of the three invasive exotic species yields a total of 74 trees out of the total of 972 trees counted by the consultant, or 7.6% of the total as exotic specimens. If the 78 specimens of cherry laurel are added, that would yield 152 trees, or 15.6% of the total of 972 trees that the consultant has labeled invasive. There is a difference between exotic invasive species and native species that can potentially be invasive.	It is explained in the survey results that cherry laurel, although native to the region, is often considered invasive due to its ability to proliferate successfully and take over as the dominant species. From a wildlife perspective, diversity of native plant species would be desirable and the presence of the cherry laurel may reduce the amount of plant diversity along this stretch of the bayou.
HSC - 06.30.14 letter	72.	Attachment L, TCEQ Water Quality Certification Questionnaire and Alternative Analysis, Tier II Alternatives Analysis Checklist, Pages 3 of 3, states that the MPDP is the "only alternative that met the proposed project purpose and need for long-term stream stability and improved water quality" and is "the least environmentally damaging practicable alternative." This is a false statement. As documented in 17 above, there are other alternatives and elements that can be turned into alternatives that cause less environmental damage and get the job done. The water quality benefit has not been documented.	HCFCD has conducted assessments of the channel banks along the entire reach of Buffalo Bayou, as well as extensive assessments of the channel banks along the proposed project reach to determine the conditions of the bayou, and the appropriate repair methods for the proposed project reach. These assessments include a hydraulic model review, visual assessment, BEHI assessment, NBS assessment, BANCS assessment, woody debris load mapping, sediment transport assessment, stable channel reach review, and regional channel curve review.

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		HCFCD has stated that the MPDP will reduce erosion and that water quality will be improved due to reduced sediment and bacteria levels. This claim is based upon the assertion that bacteria adhere to particulates. In 2012, the TCEQ's Texas Integrated Report, presented a Water Body Assessment by Basin along with Potential Sources of Impairments and Concerns for the San Jacinto River Basin. http://www.tceq.texas.gov/waterquality/assessment/waterquality/assessment/12twqi/twqi12.	The overall compilation of data indicated that in order to stabilize the banks of the bayou, energy dissipating measures (i.e., bank full benches, a pool and riffle system) and the use of in-stream structures (i.e., toe wood) must be used to work in conjunction with one another to reduce shear stress from the banks of the bayou and allow for long-term, sustainable stability of the banks through the reestablishment of vegetation along the bayou banks and the reestablishment of ecological functions where possible. Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion eats away at the banks, public and private property along the bayou is threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the destruction of habitat and vegetation along portions of the bayou, and threats to public and private property. The MPDP will restore Buffalo Bayou's equilibrium within the project reach, and will ultimately protect the upper banks along this reach of Buffalo Bayou. The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to

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			Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.
HSC - 06.30.14 letter	73.	The San Jacinto River Basin includes Buffalo Bayou. All stream segments and upstream tributaries of Buffalo Bayou are listed as exceeding bacteria limits and thus are impaired for human uses. Potential sources of impairments for Buffalo Bayou and its tributaries include non-point sources of urban runoff and storm sewers, and for point sources are sanitary sewer overflows (collection system failures). Reduction of eroded sediments in the 1.3-mile MPDP segment of Buffalo Bayou does nothing to reduce the sources of bacteria in Buffalo Bayou.	While implementation of the proposed project may not dramatically reduce bacteria in Buffalo Bayou due to the overabundance of bacteria entering the bayou from multiple point and non-point sources, the proposed project will decrease the sediment load from the ongoing streambank erosion within the project reach, which should also reduce bacteria. The "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" has been developed to assist in quantifying the level of water quality enhancement.
HSC - 06.30.14 letter	74.	At the same time, it is known that bacteria can adhere to sediment, which can then sink to the bottom of a stream and remain viable. Also, the biologically active layer of soil does contain a greater amount of bacteria and micro-organisms than the subsoil. If topsoil erodes, that biologically active layer of the soil would also go into the stream. However, reducing the amount of eroded material in the 1.25-mile segment of Buffalo Bayou (not all of it topsoil), while it can have some ancillary benefits, does not address the source of bacterial pollution in Buffalo Bayou, as noted by the TCEQ's 2012 Texas Integrated Report. In fact, HCFCD never presents any proof that the project plan will reduce bacterial levels in the project reach of Buffalo Bayou. It should also be noted that IF reducing the degree of erosion would result in reducing bacterial levels in Buffalo Bayou, then an alternative plan that also reduced erosion	HCFCD acknowledges that the TCEQ has identified Buffalo Bayou as being impaired for bacteria, and identified urban runoff and sanitary sewer overflows as potential sources of impairment in the 2012 Texas Integrated Report. However, the 2009 Total Maximum Daily Load (TMDL) study for bacteria in Buffalo and White Bayous by TCEQ notes that "sediments on the beds of bayous exhibit high concentrations of E. coli. These sediments can be resuspended when shear stress exerted on the stream bed exceeds the critical shear stress for incipient motion. This scouring results in stream sediment with associated indicator bacteria being resuspended, and thus contributing to the overlying water concentrations of E. coli." Furthermore, recent research by Dr. Robin Brinkmeyer, Texas A&M University at Galveston, has indicated that E. coli bacteria can survive for extended periods and even

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		would have the same beneficial effect, but only if there were proof.	replicate in the sediments of Buffalo Bayou (Brinkmeyer 2014). Brinkmeyer estimated the E. coli bacteria loading from Buffalo Bayou sediments at 109 most probable number (MPN)/day, and suggests that a significant source of TMDL exceedances of E. coli in Buffalo Bayou is from a naturalized population surviving and replicating in streambed and streambank sediments (Brinkmeyer 2012). Therefore, the sediment from Buffalo Bayou itself is a source of bacteria. Given the relationship between sediment and bacteria in Buffalo Bayou, reducing sediment loading from the eroding streambed and banks, as proposed by the project, does present an opportunity to reduce sources of bacteria in Buffalo Bayou. Passive restoration or other restoration alternatives that do not propose to address the dimension, pattern, and profile instability issues cannot achieve the same levels of reducing sediment erosion of subsequent bacteria loading from the eroded and resuspended sediment. HCFCD has developed a "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" to assist in quantifying the impacts to bacteria and water quality from the proposed project.
HSC - 06.30.14 letter	75.	HCFCD, the permit applicant, failed to truly consider a viable alternative to NCD. The NCD Review Checklist (Attachment C) includes the following question: 2.2b - Were multiple methods used to prepare design criteria? The answer stated that, "NCD was used." The exclusion of all methods other than NCD is confirmed by reviewing Attachment E - Public Coordination of the Permit Application. In July 2010, the Bayou Preservation Association held a discussion to prepare for a November 2010 workshop with selected stakeholders. The November 2010 workshop was with Dave Rosgen, the proponent of NCD. The very first presentation, made in December 2010 to the River Oaks Country Club, was entitled "Buffalo Bayou Channel Restoration at River Oaks Country Club Using NCD Techniques." Thus, from the very beginning, NCD was the only design technique considered by HCFCD.	The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the Natural Resources Conservation Service, a branch of the United States Department of Agriculture (USDA), lists the Rosgen Method as a recommended method of

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			restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.
HSC - 06.30.14 letter	76.	Attachment K - Project Alternatives of the Permit Application, discussed alternatives in less than two pages and only half of the space was devoted to alternatives other than NCD. The first was the "No-build" or "No Action" alternative, which everyone agrees is not feasible. The second was a channelized trapezoidal ditch alternative. Again, everyone, including HCFCD, knows the alternative is not feasible considering the past history of channelization proposals for Buffalo Bayou. The third was "Targeted Erosion Channel Alternative." HCFCD is aware that since 2013 opponents of the current design have favored an approach "targeted" to known areas in need of bank stabilization. HCFCD is aware that HSC has suggested implementing VRSS techniques on the areas requiring bank stabilization. HCFCD also knows that the method suggested emphatically did not include hardening of the bank. The use of rock at the toe would not lead to the loss of aquatic habitat since the rock would be beneath the streambed and any rock above the streambed would be vegetated. There would actually be less loss of aquatic habitat because the suggested alternative would disturb less linear feet of the stream.	The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.
HSC - 06.30.14 letter	77.	HCFCD also opines that a targeted alternative would "require the use of a planting plan to reestablish vegetation." The HSC strongly agrees with this statement because regardless of the technique that is finally adopted to stabilize eroded area, a monitored planting plan will be required. In fact, HCFCD's NCD plan will "require the use of a planting plan to reestablish vegetation," as described in Attachment F of the permit application.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none

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		The concern over the inability of a targeted approach to address root causes is moot, since even NCD does not address the root causes of erosion and bank instability on Buffalo Bayou. A targeted approach would not manipulate Buffalo Bayou like a jigsaw puzzle in the pattern of a sine curve with a single-minded goal of sediment reduction and erosion control. There should be a good faith analysis of an alternative that balances current needs for bank stabilization and erosion control with preservation of habitat with awareness that future hydrology of Buffalo Bayou is not a certain thing.	currently exists. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where no riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, and HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Please refer to the MPDP Monitoring Plan, which includes a management plan to control the proliferation of noxious/invasive plant species. HCFCD has conducted assessments of the channel banks along the entire reach of Buffalo Bayou, as well as extensive assessments of the channel banks along the proposed project reach to determine the conditions of the bayou, and the appropriate repair methods for the proposed project reach. These assessments include a hydraulic model review, visual assessment, BEHI assessment, NBS assessment, BANCS assessment, woody debris load mapping, sediment transport assessment, stable channel reach review, and regional channel curve review. The overall compilation of data indicated that in order to stabilize the banks of the bayou, energy dissipating measures (i.e., bank full benches, a pool and riffle system) and the use of in-stream structures (i.e., toe wood) must be used to work in conjunction with one another to reduce shear stress from the banks of the bayou and allow for long-term, sustainable stability of the banks through the reestablishment of vegetation along

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			the bayou banks and the reestablishment of ecological functions where possible.
HSC - 06.30.14 letter	78.	In part, 40 CRF 230.10 reads: (a) Except as provided under section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. and (2) An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. Comments have shown that there is a practicable alternative to the NCD technique selected by HCFCD. However, HCFCD chose to only consider NCD. Although HSC has recommended VRSS as a technique to be considered and believes it would be appropriate and have less adverse impact on the environment, we do not mean to imply that ours is the only suggestion worth considering.	Alternatives to the proposed project, such as a "target approach" identified by the HSC, have been attempted all along Buffalo Bayou with some success at stabilizing only the area where work was conducted and provided no dissipation benefits to the existing hydraulic regime found in the stream system. The proposed project was designed in an effort to consider both sides of the bayou along the entire length of the project to determine what needs to be done to stabilize this reach of Buffalo Bayou. The proposed project will reestablish a pool and riffle system within the bayou's profile, reestablish accessibility to the geomorphic floodplain within the bayou's dimension, and reduce shear stress along the toes of the bayou's slopes within the bayou's pattern. Other alternatives were considered during the geomorphic assessment and design of the project but were determined not to be viable options for achieving sustainable streambank stability throughout the reach. The meander that will be realigned in the streambed will be placed in a location to reestablish a sustainable geometry for the stream system to handle the existing hydraulic regime and to aid in the overall goal of reducing shear stress along the toes of the streambanks. It is necessary to consider both sides of the channel so that the reinforced sections do not transfer erosive energy to the opposite bank of the stream creating additional erosion. While a "target approach" would minimize impacts to waters of the U.S, this technique would not provide the erosive flow dissipation measures in the stream's dimension, pattern, and profile that are necessary to achieve bank stability within the proposed project reach.
HSC - 06.30.14 letter	79.	Also in part, 40 CRF 230.10 reads: (2) Significantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration, and spread of pollutants or their by-products outside of the	HCFCD will utilize the JTF Storm Water Management Handbook for Construction Activities (2006 Edition) and Storm Water Management JTF Storm Water Management Program: Minimization Design Criteria for Implementation of Certain Best Management Practices for Storm Water Runoff Treatment Options (2001

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		disposal site through biological, physical, and chemical processes. and (3) Significantly adverse effects of the discharge of pollutants on aquatic ecosystem diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy. and (4) Significantly adverse effects of discharge of pollutants on recreational, aesthetic, and economic values. Comments have shown that aquatic life and other wildlife cannot help but be affected by massive amounts of vegetation removal and sedimentation resulting from re-alignment of meanders and cutting through riparian forest to create a new meander. Removal of riparian vegetation will affect water temperature and will for years affect the aquatic ecosystem. There will be a loss of fish and wildlife habitat. The recreational and aesthetic values of Buffalo Bayou and adjacent Memorial Park will diminish.	Edition). From these guidelines, BMP and a SWPPP have been developed to reduce turbidity and total suspended solids during construction. The SWPPP, including specific BMPs to be utilized, will be finalized during the final design of the proposed project. Mature woody riparian vegetation does provide an important function in shading water, thereby limiting in-stream temperature and promoting greater dissolved oxygen to support wildlife. Unfortunately, much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature trees that used to line Buffalo Bayou's banks have already been lost to streambank failure and mass wasting of slopes. Where vegetation has managed to reestablish on failed streambanks, it is predominantly immature non-native species creating a monoculture community type, or herbaceous vegetation that does not have adequate height to provide shading of the water. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities.

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			Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
HSC - 06.30.14 letter	80.	The HSC requests that an Environmental Impact Statement (EIS) be prepared, including discussion of reasonable alternatives to the proposed project. It is well known that the NCD methodology is not the only bank stabilization technique available and that concerns exist about the consequences of utilizing NCD on Buffalo Bayou. The USACE should evaluate the appropriateness of alternatives to NCD or require HCFCD to do so.	The USACE will make determination if this project should be evaluated in an EIS.
HSC - 06.30.14 letter	81.	The HSC requests that USACE set a public hearing on the permit application in Houston due to the significance of the impacts upon Buffalo Bayou. Neither of the two public meetings claimed by HCFCD allowed public comment.	The USACE will determine if a public hearing is warranted for the proposed project.
HSC - 06.30.14 letter	82.	By copy of this letter to TCEQ, the HSC requests that TCEQ hold a public meeting in Houston to consider impacts of the proposed project upon water quality due to massive bank disturbance and increased water temperature due to canopy removal.	The TCEQ will determine if a public meeting is warranted for the proposed project.

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Brandt Mannchen			
Mannchen, Brandt	83.	I request that my December 13, 2013, comments to HCFCD be considered by the USACE as part of the public input on this permit application.	The comments contained in Brandt Mannchen's letter dated December 13, 2013 have been added to this document and responses are provided below.
Mannchen, Brandt	84.	Questions 2.3e and 3.4c - Note that "stakeholder input" is touted but real public input has been missing throughout this process. At a meeting I attended last August, a representative of HCFCD stated that additional public input was not needed. Meetings have been held with the BPA and Memorial Park Conservancy (MPC) on multiple occasions, and these meetings are private and not open to the public. The public, who own Memorial Park and the bed and banks of Buffalo Bayou, have been locked out for most of the time that this proposal was created, and lobbied as opposed to stakeholders and private landowners. This is not fair or right.	In 2010, HCFCD was invited to collaborate on a proposal to help restore Buffalo Bayou's natural beauty, water quality, and flood functions. This collaboration resulted in HCFCD taking the lead on the design of the MPDP along Buffalo Bayou from the Hogg Bird Sanctuary/Bayou Bend parking lot to just south of Memorial Park's Picnic Loop. HCFCD started out by coordinating with initial interest groups that included land owners, financial partners and project sponsors to identify a project that met multiple objectives and needs. Once a preliminary design was completed for a project that addressed the root cause of the channel failure AND had the support of the adjacent property owners, the proposed project was shared with the public at a meeting on December 17, 2013, and HCFCD began receiving comments from the public. Attachment E of the Permit Application includes a list of public coordination meetings held for the proposed project. HCFCD is still taking public comments through the HCFCD project website. Through the USACE IP public notice process, HCFCD also, continues to take comments and believes that the public has had an opportunity to participate in the process.
Mannchen, Brandt	85.	There is no comprehensive explanation about the road system that will be constructed to allow access and haul activities in the Public Notice and Plans and in the permit application. There also is no explanation about how long and wide the roads will be. There is also no explanation about the environmental impacts that the roads will have in the project area and outside the project area (in and outside of wetlands and waters of the U.S.). There is no explanation about what will happen to the roads after the MPDP is complete.	The planned access route is proposed to run through the existing HPARD maintenance facility located on the north side of the proposed project off of Memorial Drive. The proposed construction access road is approximately 550 ft. long, and a 34-foot-wide area will be cleared to accommodate a 30-foot-wide road. The proposed access route will be located from the southernmost portion of the HPARD maintenance facility down the north bank of the bayou to the streambed of the bayou. Upon completion of the proposed project, the access route will be left in place for utilization by HPARD. The proposed access route will not impact any wetlands

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			delineated in the proposed project study area, and will be constructed of 3-inch by 5-inch granular fill. This construction access road will require the clearing of trees and vegetation to gain access to the channel. The exact location of the road will be determined in the field prior to beginning construction so that the most direct and least damaging route can be established and any notable trees can be avoided. The proposed construction access route is shown on the draft project plans on HCFCD's project website (www.hcfcd.org/MPDP). The draft project plans contain details about the proposed length, width, location, and material composition of the proposed access route. The majority of heavy equipment access along the proposed project reach will take place along this currently denuded streambed and bank that is proposed for restoration. Access across the bayou will be made by sinking temporary wooden matting across the bottom of the bayou, and temporary haul roads will be created along areas of proposed no work within the bayou by utilizing temporary road beds comprised of mulch so that no critical root zones are impacted by the operations.
Mannchen, Brandt	86.	This [roads] is a cumulative and associated effect of the MPDP and must be analyzed, assessed, and evaluated under the National Environmental Policy Act (NEPA) via an environmental assessment, environmental impact statement, or a categorical exclusion and finding of no significant impact. The USACE must be open and transparent with the public and reveal all environmental impacts due directly or indirectly to the MPDP regardless of whether these impacts occur in the project area or another area, directly or indirectly, immediately or later in time.	A cumulative impacts analysis is completed by the USACE prior to the issuance of any IP that includes all impacts from the project, including access roads.
Mannchen, Brandt	87.	There are no biological, botanical, ecological, or ecological process and function indicators, standards, or criteria that are presented in the permit application that will be monitored to measure and determine the success or failure of the MPDP. Before, during, and after monitoring of indicators, criteria, and standards is needed to determine the success or failure of the	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of

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		MPDP.	wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	88.	HCFCD states that it will "improve aquatic resource functions." However, HCFCD never states what "aquatic resource functions" currently exist, which ones will be improved, how it will monitor and measure these improved "aquatic resource functions," and how it will compare the aquatic resource functions that exist now with the aquatic resource functions that are improved via the MPDP. If we do not know where we are today, how can we know how far and where we have gone in the future?	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	89.	The failure of the tree inventory to adequately survey all tree species and numbers of species, because trees 1/2 inch in diameter through 7.99 inches in diameter were not counted, ensures that we diminish and hide what the current tree resource is and ensures that we do not know comprehensively the current woody vegetation that will be destroyed. Therefore, we cannot accurately evaluate the tree environmental losses due to the MPDP.	The vegetation inventory cataloged all trees 8 inches in diameter and greater and noted species type, condition index, coordinates, community types, and any notable features of the tree. HCFCD places a high value on native mature trees, and wants to locate them early on in the project to preserve as many of them as possible (with proper regard to existing and historical community type). HCFCD collected a large amount of detail while conducting the vegetation inventory, so that HCFCD could make informed decisions on tree removal and preservation during construction of the project and work around as much desirable vegetation as possible where the project plans allow for it. The selection of 8-inch or greater for the tree inventory was based primarily on two factors: 1. The objective of the tree inventory was to estimate the age of the tree stands within the area of the MPDP to determine whether there were "Old Growth" or "Ancient" forests that might be disturbed, knowing that smaller diameters indicate young or immature trees, and 2. HCFCD places great importance on locating mature trees for preservation. Trees of a diameter smaller than 8 inches are commercially available, and HCFCD has access to such replacement inventory with a

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			variety of diameters sized up to 7 inches, either through its in-house tree nursery or existing contracts. However, trees 8 inches in diameter and greater are harder to find for replacement and logistically cumbersome to deliver and transport to the proposed project site, especially since all work will be taking place from the bottom of the streambed.
Mannchen, Brandt	90.	Attachment A, Item 20 - Reasons for Discharge, Waters of the U.S. Impacts, and Wetland Impacts, Additional Pages 3 and 4 - HCFCD states that the MPDP will result in an "improvement of the stream conditions, riparian buffer." However, HCFCD never states what "stream conditions" and "riparian buffer" currently exist, which ones will be improved, how it will monitor and measure these improved "stream conditions" and "riparian buffer," and how it will compare what exists now with what is improved via the MPDP. If we do not know where we are today how can we know how far and where we have gone in the future?	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	91.	The fact is, the "riparian buffer" will be destroyed by at least 80% and very large trees, which take 4 to 6 decades or more to reach the size they are today, will be lost. The additional mitigation for the loss of old, large, structurally complex trees and "riparian forest," which shade and cool Buffalo Bayou and protect dissolved oxygen levels in the river, is never calculated or presented in this permit application. There will be no "overall ecological up-lift" because the proposed project, with no mitigation, will not be able to compensate and mitigate for the loss of old, large, structurally complex trees, "riparian forest," the shade and cool water created by these old, large, structurally complex trees, dissolved oxygen stability, wildlife food and shelter (cavities and dens), and for dead trees that provide erosion control and habitat that the current "riparian buffer" provides.	HCFCD will remove some vegetation and trees to accomplish the project's goal of stabilizing the channel. It is expected that less than 80 percent of the trees and vegetation in the project area will be removed. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14-foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Mature woody riparian vegetation does provide an important function in shading water, thereby limiting in-stream temperature and promoting greater dissolved oxygen to support wildlife. Unfortunately, much of the proposed project reach has already lost the mature woody

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			vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature trees that used to line Buffalo Bayou's banks have already been lost to streambank failure and mass wasting of slopes. Where vegetation has managed to reestablish on failed streambanks, it is predominantly immature, non-native species of monoculture community type or herbaceous vegetation that does not have adequate height to provide shading of the water. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. The existing banks of the bayou (and all vegetation on those banks) are actively eroding due to the increased erosive flows introduced to the stream by the modifications made to its watershed. HCFCD currently conducts field operations twice a year in an effort to remove downed trees from the stream to allow for the conveyance of stormwater and the movement of recreational watercraft within the bayou. The proposed project will stabilize the banks of the bayou and recreate the proper dimension, pattern and profile for the current hydraulic model within the stream system and allow for the reestablishment of the proper native vegetation along the bayou, with regard to the correct hydrological planting zone. Within the proposed project area, there will be areas of active restoration and areas where no work is planned because the bayou currently has an appropriate dimension pattern and profile. In the no work areas, unless there are invasive or undesirable species that need to be removed, the current vegetation

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			will not be impacted. In an effort to preserve as many mature native trees as possible within the proposed project area, HCFCD has conducted a vegetation inventory of all grasses, shrubs, and trees 8 inches in diameter and greater, located within the proposed project area. The number of trees surveyed within the proposed project area totaled 972, of which 899 were alive and 73 of the trees surveyed were found to be dead. The majority of the trees surveyed were found to be juvenile in age; 400 trees were 8–11 inches in diameter, 260 trees were 12–16 inches in diameter. All surveyed trees greater than 31 inches in diameter were located on the upper banks of the bayou, where there will be no active restoration work, so they should not be impacted by the proposed project. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone, condition index and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exist.
Mannchen, Brandt	92.	The river meander that HCFCD will cut off and plug will result in the degradation of wetlands. This is an avoidable action since the river meander can be left open. There is no mitigation provided, period. Meanwhile, about 14 acres of riparian woodlands or bottomland hardwood forested wetlands will be destroyed but not mitigated, avoided, or minimized. This cannot be allowed.	The meander that will be realigned in the streambed will be placed in a location to reestablish a sustainable geometry for the stream system to handle the existing hydraulic regime and to aid in the overall goal of reducing shear stress along the toes of the streambanks. The meander that will be realigned has over time been slowly migrating towards the location the project proposes to place it. Doing so will help preserve further land and vegetation loss within this reach of the bayou system. A wetland delineation that was completed and verified by the USACE (SWG-2011-00628 and SWG-2012-01007) found a total of 0.78 acre of wetlands in addition to Buffalo Bayou and the Hogg Bird Tributary. The proposed project was designed to be self-compensating; that is, the project

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			will result in an overall ecological lift. The proposed project will impact 0.61 acre of wetlands and HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6 where the existing channel will be abandoned. Due to the creation of bankfull benches and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	93.	Attachment C - Natural Stream Design Checklist, Pages A1-A4, Question 1.1c - Is not answered. There is no percent impervious cover for the watershed calculated by HCFCD and provided.	The project design takes into consideration that the watershed is fully developed and that there will be no changes to impervious cover. A thorough watershed assessment was conducted using the latest existing FEMA hydrologic data and accounting for the influence of the Addicks and Barker reservoirs on project hydrology. The proposed MPDP itself proposes no change in impervious cover, and existing stormwater management regulations by the COH and Harris County limit impacts to watershed hydrology from any future development or redevelopment through detention requirements.
Mannchen, Brandt	94.	Question 1.5h - States that Buffalo Bayou is recovering and that the MPDP will decrease time needed for natural recovery. The time needed for natural recovery is not estimated, nor the time needed for the proposed "stream restoration" to match the existing stream values ecologically, biologically, botanically, and via ecosystem processes and functions.	Rates of channel migration and evolution are difficult to predict due to the influence of variable weather patterns and subsequent stream flows that drive these processes. An assessment of historical aerial photographs indicates that Buffalo Bayou has been changing over multiple decades and continues to change its channel dimension, pattern and profile. If natural recovery were allowed to proceed with continued gradual channel migration,

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			reconnection to a new geomorphic floodplain, and natural revegetation, then it may be assumed that the natural recovery process will take many years based on observed historical trends. However, a natural recovery would result in the loss of private property that adjacent landowners are not willing to accept. Spot streambank erosion repairs constructed by individual landowners to protect their property have caused impacts to other portions of the bayou downstream and have had little effect on providing dissipation benefits for the stream system as a whole, and the bayou's growing erosion problem over the years. The active construction period of the proposed restoration project is expected to last for approximately one (1) year. The proposed project is designed to improve stream functions beyond existing ecological, biological, botanical, and geomorphic conditions. A monitoring plan is being implemented to document the time frame for restoration of stream functions. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	95.	Question 2.1a - HCFCD states that the MPDP will "reduce sediment load." Nowhere in the application does HCFCD state how much the sediment load will be reduced, how long it will take for the sediment load to be reduced to a certain level, or what indictor, standard, or criteria will be used to monitor and measure the success or failure of the stated sediment load reduction.	The Memorial Park Demonstration Project reach, in its current unstable state, produces an estimated sediment load of 5,491 tons/year. One of the primary goals of the Memorial Park Demonstration Project, as described in the permit application, is "to create a stable stream that will neither aggrade nor degrade" the center, or thalweg, thereby reducing or eliminating sediment loading. The project reach will still transport upstream sediment loads effectively through the system, but it will not be a source or sink for sediment loading. Please refer to the attached MPDP Monitoring Plan which includes the "Memorial Park

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			Demonstration Project Sediment Load and Bacteria Monitoring Plan" that will quantify the rates of sediment and bacteria loading before and after construction.
Mannchen, Brandt	96.	Questions 4.2a, 4.2b, 4.2c, and 4.2d - Neither a monitoring program, performance standards based upon design goals, standards, what will be measured, and criteria to determine the success or failure of the MPDP have been...provided to the public for review and comment. HCFCD must state clearly how it will "continually monitor" the project. Where are the ecological, botanical, biological, and ecosystem process and function elements that will be monitored and measured to determine success or failure of the MPDP?	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	97.	February 25, 2014, Bayou Preservation Association letter, states, "We particularly look forward to the water quality improvements that are expected through this project, namely reduction in indicator bacteria (*E. coli*), total suspended solids, and nutrients." There is no monitoring program presented in the permit application to monitor for and measure any of these water pollutants. There is no commitment to monitoring before, during, or after for these water pollutants at the upstream and downstream and middle stream locations to determine whether the MPDP is responsible for any reductions in these water pollutants.	Please refer to the attached MPDP Monitoring Plan which includes the "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" to assist in quantifying the impacts to bacteria and water quality from the proposed project.
Mannchen, Brandt	98.	Delineation Report, 1.0 Summary, Page 1 - The delineation was conducted in 2011. During that year, Houston had one of the lowest rainfalls in its history. I am concerned that the wetlands delineation was affected by the 2011 drought. I have enclosed 10 Wetland Determination Data Forms from Appendix B USACE Wetland Data Forms (Appendix II) that document that hydrophytic vegetation and hydric soils were present at these 10 locations but wetland hydrology was not present. It is very possible that the lack of wetland hydrology is due to the 2011 drought. The USACE should re-verify all wetland delineation locations where wetland vegetation and soils were present, but not hydrology, to ensure that the hydrological element was not missed.	The wetland delineation was conducted following the USACE's *Wetlands Delineation Manual* (Environmental Laboratory, 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)* (USACE, 2010) and was verified by the USACE on February 16, 2012.
Mannchen, Brandt	99.	I have enclosed two Wetland Determination Data Forms from Appendix B USACE Wetland Data Forms (Appendix III) that	Although *Platanus occidentalis* and *Celtis laevigata* were given wetland indicator statuses of FAC on these wetland

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		state that there is no hydrophytic vegetation present. However, both of these forms have *Platanus occidentalis* (American Sycamore) and *Celtis laevigata* (Sugar-Berry) listed as Facultative (FAC) on the forms. The July 2012 National Wetland Plant List Indicator Rating Definitions (Appendix III) has these two tree species listed as Facultative Wet (FACW). In fact, hydrophytic vegetation does exist at these two locations and the Wetland Determination Data Form is incorrect and must be changed. The USACE should check all Wetland Determination Data Forms to ensure that similar mistakes did not occur.	data forms, the results of the Dominance Test are still valid because dominant species that are OBL, FACW, or FAC are counted as hydrophytic species in the Dominance Test. Therefore a rating of FACW for these two species would not have changed the outcome of the Dominance Test. The wetland delineation was verified by the USACE on February 16, 2012.
Mannchen, Brandt	100.	Delineation Report, 2.0 Introduction, 3.1 General Site Characteristics, Page 1 - This section refers to a 2,000 cfs release as operational policy. It should also be stated here that there is an emergency operational policy that allows 4,000 cfs to be released from Addicks and Barker Reservoirs.	In 2010, USACE revised their reservoir procedures to allow for the release of stormwater in the event that water surface elevations in the reservoirs are at or are approaching their maximum historical levels. Under these conditions, stormwater release rates may be increased to a level where flow in Buffalo Bayou does not exceed 4,000 cfs, as measured at the Piney Point gage station. Since revising their procedures in 2010, USACE has not released at a rate of over the 2,000 cfs as noted at the Piney Point gage station. The watershed is currently highly developed and Harris County, HCFCD and the COH have requirements for developers to include detention within the design of their new development/construction efforts, thus future development within the watershed should have no adverse impacts to the current hydraulic conditions along Buffalo Bayou.
Mannchen, Brandt	101.	Delineation Report, 4.0 Results, 4.3.1 Wetlands, Page 3 - The report starts with Wetland 2. Where is Wetland 1?	The wetlands addressed in the wetland delineation report were determined to be the only jurisdictional waters of the U.S. within the project area. The wetland delineation was verified by the USACE on February 16, 2012.
Mannchen, Brandt	102.	Attachment J, Other Environmental Considerations (Endangered Species and Cultural Resources), Page 1 -It is important to note that clearing and grubbing are not prohibited. The report states that these activities "should" take place between September 15 and March 1 to avoid nesting of migratory birds. There should be additional mitigation measures required to avoid bird nests. This is	Activities that disturb bird habitat, such as clearing and grubbing, should take place between September 15 and March 1 to avoid nesting of migratory birds. If clearing is necessary outside of the recommended period, a migratory bird nest survey will be conducted to verify active migratory bird nests are not present before clearing begins. The migratory bird nest survey will be performed by a

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		particularly relevant since climate change has moved nesting season forward from traditional nesting times.	professional with ornithological experience no more than 10 days prior to clearing work. If active nests are discovered during the survey, the nests will be avoided and a non-disturbance buffer will be implemented. If avoidance of the nests is not possible, a professional with ornithological experience will monitor the nests during construction and/or the relocation of the birds. Any necessary monitoring and/or relocation activities will be coordinated with the USFWS.
Mannchen, Brandt	103.	The three archeological surveys conducted by HRA Gray and Pape fail to address the importance of an 18,000-year-old sandstone formation that is found along Buffalo Bayou about 20-40 feet below the surface of the top of its banks. There is no acknowledgement of the existence of this sandstone formation in the permit application, Public Notice, and Plans, and no assessment, analysis, and evaluation of how this formation will be affected by the proposed dredge/fill activities. There is no mitigation proposed to protect this sandstone formation.	The archaeological investigations completed by HRA Gray and Pape focused on the presence, absence, and potential for archaeological sites. While geomorphology is an important part of archaeological site analysis and discovery, it is the presence of an actual archaeological site as evidenced by artifacts, ecofacts, or cultural deposits that indicate the potential for archaeological sites. An archaeological study would not address an 18,000 year old sandstone formation (or any other geologic feature) unless direct evidence of human occupation or modification were found to be associated with it.
Mannchen, Brandt	104.	Under 1.0 Introduction and 1.1 Project Description, it is stated that "The goal of the work is not to facilitate drainage... The plan is to restore the natural flow of the stream rather than modify it to allow for faster drainage." The fact that a new river meander curve will be cut and the old river meander curve will be plugged, that realignment or straightening will occur wherever possible along the 1.3-mile project area, and that the channel will be deepened and narrowed so that water will flow through it faster so sediment will not fall out, means that indeed this is a flood control project that causes water to flow faster through this segment of Buffalo Bayou to other downstream segments. Further, the applicant proposes to reduce the length of the 1.3-mile stretch of Buffalo Bayou by 800 feet...and reduce the length of the Hogg Bird Sanctuary Tributary by 200 linear feet. This flood control aspect (faster speed of water and sediment load that it carries through a shorter river reach) will have impacts on sedimentation and flood levels downstream that should be but are not discussed in the permit application, Public Notice, and Plans. The applicant should be required to	One component of the project will be the reestablishment of geomorphic floodplain connectivity through the construction of bankfull benches. One of the benefits of this action will be reduced flow velocity. An initial assessment of the entire length of Buffalo Bayou was completed from the Barker Reservoir located on the west side of Harris County, starting at Texas State Hwy. 6, downstream to the Houston Ship Channel. This includes the upper and lower reaches of Buffalo Bayou that were originally rectified by the USACE (widened, deepened, and realigned for Flood Damage Reduction and navigation purposes in the mid-20th Century), and the portion of Buffalo Bayou in between that was left in its current state at the time. Through a planning-level analysis, based on field assessments and a review of existing conditions, HCFCD developed a summary assessment of the Buffalo Bayou system to utilize in identifying potential streambank stabilization projects along Buffalo Bayou that would yield

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		address the flood control aspects of this proposal and their impacts downstream.	the greatest measureable results for water quality, sediment reduction and overall bayou stability. streambank Based on this assessment, it was apparent that the highest priority sites for streambank stabilization are located within the reach of Buffalo Bayou from Woodway Drive to downtown Houston.
Mannchen, Brandt	105.	Under 3.1 Prehistory, the oldest prehistoric sites in Harris County no longer are about 6,000 years old. The prehistoric site found next to Cypress Creek, on the Katy Prairie, and under the Grand Parkway, Segment E, was reported to be between 8,000 and 10,000 years old.	The draft report was written prior to the completion of investigations at Dimond Knoll archaeological site (41HR796). With the exception of preliminary discussion of results found in Texas Archeological Society newsletters and a few lectures by the investigators, to date a report of investigations has not been completed for review or citation.
Mannchen, Brandt	106.	Under 7.0 Conclusions and Recommendations, it is of great concern that the archeological survey for the MPDP was only done on one side of Buffalo Bayou, the public or Memorial Park side. This survey should have been conducted on both sides of Buffalo Bayou so that the ROCC side would also be surveyed for archeological sites.	Archaeological fieldwork was completed on both sides of the bayou. Maps in the report of the investigation clearly show the location of shovel tests and survey areas. Per Texas state standards, sections of the bayou that exhibited sloped topography, were inundated, or showed evidence of prior disturbances (including the golf course) were visually inspected and current conditions documented. Landforms retaining a good potential to yield intact cultural resources were surveyed by shovel test excavation.
Mannchen, Brandt	107.	The statement is made that "No new channelization is planned" for the Hogg Bird Sanctuary Tributary. This statement does not appear to be accurate. The entire length of the present channel will be worked on, straightened, shortened, and a wider and deeper channel will result from the work.	The proposed project plans for the Hogg Bird Sanctuary tributary, which serves as an outfall tributary for an existing storm sewer outfall, will include the installation of a concrete riprap dissipation pool sized to dissipate erosive flows from the existing storm sewer outfall pipes' known discharge volume, and the reestablishment of a stable dimension, pattern and profile necessary to stabilize the existing banks of the tributary. The erosion occurring within the Hogg Bird Sanctuary is having a devastating effect on the already degraded habitat; and the project plans propose to stabilize the banks so that mature native vegetation can be reestablished. The proposed project design for the Hogg Bird tributary will not require any dredging of the tributary, and the thalweg (centerline) of the tributary will not be excavated any deeper. The confluence of the Hogg Bird tributary with

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			Buffalo Bayou (shown in plan view on sheet # 36, station 0+00) will be excavated approximately 6 inches deeper to transition into Buffalo Bayou at that location only. The proposed design calls for the Hogg Bird tributary to be approximately 12 linear feet in width, which is consistent with the width of the existing tributary and in some locations narrower than the existing tributary.
Mannchen, Brandt	108.	Under 1.1 Project Description, it is incorrect to limit the width of the archeological project area survey to 15 feet since the equipment that will work on this reach will cause impacts beyond this width. Why the archeological survey insists that "limited subsurface impacts are expected and no deep impacts are anticipated" is not clear since heavy equipment will have to get down into this sensitive riparian forest area and will cause considerable damage.	The archaeological survey was designed based on the plans that were available at the time. Archaeologists, HCFCD, USACE, and the THC are developing an inadvertent discoveries plan as well as an archaeological monitoring plan for the project construction that will be refined as project construction plans are finalized.
Mannchen, Brandt	109.	Under 5.2 Results of Field Investigations, there is no indication that road access or haul areas were tested. The applicant should explain why this is so.	HCFCD selected a CMAR to oversee the construction activity, and the CMAR selected a subcontractor with extensive experience constructing stream restoration projects. HCFCD purposely selected the CMAR method for this project so that veteran practitioners in the field of stream restoration could aid in demonstrating least damaging methods to HCFCD and the other contractors in the region for possible future projects similar in nature. The exact location of the road will be determined in the field by the CMAR prior to beginning construction so that the most direct and least damaging route can be established. Once the exact location is identified an archaeologist will review the location of the access route and monitor construction activities. Archaeologists, HCFCD, USACE, and the THC are developing an inadvertent discoveries plan as well as an archaeological monitoring plan for the project construction that will be refined as project construction plans are finalized.
Mannchen, Brandt	110.	Phosphorus is mentioned as a pollutant associated with sediments but there is no information provided to document that phosphorus is a problem in Buffalo Bayou. If phosphorus is a problem there are no indicators, standards, or criteria	It is well documented in the scientific literature that sorption of phosphorus, in the inorganic form of phosphate, to sediment particles is a frequent loading and transport mechanism within aquatic ecosystems. Furthermore,

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		proposed for monitoring to measure whether the MPDP is a success or failure in the reduction of phosphorus levels.	inorganic phosphorus is frequently a limiting nutrient in freshwater ecosystems. Excess loading of limiting nutrients, such as phosphorus, may lead to eutrophic conditions and further water quality problems in freshwater ecosystems. The Texas Commission on Environmental Quality (TCEQ) has not set water quality standards for phosphorus levels in freshwater streams and rivers, however, nutrient criteria are being developed for these water bodies and screening levels exist in the interim condition. Given the established relationship between sediment and phosphorus, HCFCD developed a monitoring plan to quantify loading of sediment, phosphorus, and other pollutants from the streambanks and bed prior, during, and after construction of the proposed project. Details on the proposed monitoring plan are provided in the "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan."
Mannchen, Brandt	111.	Under 3.1.1 Buffalo Bayou Stream Condition, Page 5, the riparian buffer is rated as being "high suboptimal," which is the second best category of riparian vegetation. The document states that the aquatic life score is based on an assessment of dissolved oxygen, but does not provide any data about what the dissolved oxygen levels are in the 1.3 miles of Buffalo Bayou in the MPDP stretch.	The Riparian Buffer and Aquatic Life Parameters were evaluated using the methodology outlined in the USACE Galveston District SCA (2013) and guidance provided by USACE Galveston staff.
Mannchen, Brandt	112.	Under 3.2 Post-Project SCA, Pages 5 and 6, the document states that the MPDP will "improve aquatic resource functions." However, a list of aquatic resource functions in the MPDP stretch of Buffalo Bayou is not given along with which of the aquatic resource functions on the list will be monitored and measured to determine the success or failure of the MPDP. On page 6, the document admits that "Stream conditions are anticipated to improve," but provides no monitoring program that measures indicators, standards, or criteria to determine the success or failure of the MPDP.	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	113.	On page 7, Table 2, Stream Tool Results Comparison, the "Proposed Riparian Buffer" is assumed to be 5.00 for some transects, yet there is no monitoring program that measures and determines whether this is true.	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of

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			wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	114.	On page 8, the assumption is made that if sediment levels are reduced, bacteria levels will be reduced. However, the sources of bacteria will not be affected by the MPDP and the sediment levels will be minimally affected, if at all, because of the shadow that impervious surface, watershed sedimentation, and non-point source water pollutants has on all of Buffalo Bayou including the MPDP segment.	The MPDP reach, in its current unstable state, produces an estimated sediment load of 5,491 tons/year. One of the primary goals of the MPDP, as described in the permit application, is "to create a stable stream that will neither aggrade nor degrade" the center, or thalweg, thereby reducing or eliminating sediment loading. The project reach will still transport upstream sediment loads effectively through the system, but it will not be a source or sink for sediment loading. Please refer to the attached MPDP Monitoring Plan which includes the "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" that will quantify the rates of sediment and bacteria loading before and after construction. The proposed MPDP itself proposes no change in impervious cover, and existing stormwater management regulations by the COH and Harris County limit impacts to watershed hydrology from any future development or redevelopment through detention requirements.
Mannchen, Brandt	115.	On page 10, 4.0 Conclusion, Summary of Ecological Lift, the document states that the MPDP will "provide an improvement to the riparian buffer." This is not the case. A riparian forest that has many old trees and dead trees (key biological legacies) will be destroyed and an amalgam of different tree species will be planted, which will take 40-60 years to mature enough to provide the same ecological structure and functions that the current riparian forest provides. The riparian forest will be worse off with the MPDP and the sediment that will be placed into Buffalo Bayou due to the so-called "restoration project" and its use of heavy earth-moving equipment will potentially add more sediment than is reduced by the MPDP.	The dynamic nature of Buffalo Bayou along this stretch most likely does not allow long-lived hardwood species and pine trees to take root and establish over a period of many decades. The vegetation within the project area, especially along the slopes and toe line of the bayou is characterized by "pioneer" species, including American sycamore, black willow, green ash, boxelder and eastern cottonwood, that take root fast and grow fast. Some large fallen sycamores and cottonwoods may be seen on the slopes of the bayou because these particular species are composed of denser wood cells. These dense wood cells result in larger growth before the tree can no longer support its biomass and starts to fall apart. Other trees that have less dense wood, such as willow, ash, and boxelder, fall apart at a relatively young age. HCFCD's tree survey focused on identifying desirable species within the project area that were in reasonable condition, which would have included any older or mature trees.

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			In an effort to preserve as many mature native trees as possible within the proposed project area, HCFCD has conducted a vegetation inventory of all grasses, shrubs, and trees 8 inches in diameter and greater, located within the proposed project area. The number of trees surveyed within the proposed project area totaled 972, of which 899 were alive and 73 of the trees surveyed were found to be dead. The majority of the trees surveyed were found to be juvenile in age; 400 trees were 8–11 inches in diameter, 260 trees were 12–16 inches in diameter. All surveyed trees greater than 31 inches in diameter were located on the upper banks of the bayou, where there will be no active restoration work, so they should not be impacted by the proposed project. HCFCD will utilize the JTF Storm Water Management Handbook for Construction Activities (2006 Edition) and Storm Water Management JTF Storm Water Management Program: Minimization Design Criteria for Implementation of Certain Best Management Practices for Storm Water Runoff Treatment Options (2001 Edition). From these guidelines, BMP and a SWPPP have been developed to reduce turbidity and total suspended solids during construction. The SWPPP, including specific BMPs to be utilized, will be finalized during the final design of the proposed project.

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Mannchen, Brandt	116.	Attachment K, Project Alternatives, Page 2 - The document states that, "The utilization of this alternative will minimize impacts to waters of the U.S., including wetlands, and will result in an overall improvement in aquatic resource functions." This statement is false. First, HCFCD does not even acknowledge that it has proposed that 14 acres of riparian woodland or bottomland hardwood forested wetlands will be destroyed by the MPDP. Second, there is no mitigation for the loss of this riparian forest. Third, HCFCD could protect additional wetlands if it did not plug the river meander curve that will be cut off and dewatered by the MPDP. Please read all the comments from this letter, my May 23, 2014, previous letter, and my December 13, 2014, letter to HCFCD for understanding how avoidance, minimization, and mitigation could be used.	The proposed project was designed to be self-compensating; that is, the project will result in an overall ecological lift. The proposed project will impact 0.61 acre of wetlands and HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	117.	Attachment L, TCEQ Water Quality Certification Questionnaire and Alternative Analysis, Page 1 of 3 - The document states that the MPDP will "Temporarily impact" 6,600 linear feet. This is not true. About 800 feet of Buffalo Bayou will be cut out of active use by the river (shortened) which is a permanent environmental impact.	The proposed project was designed to be self-compensating and will reestablish a pool and riffle system within the bayou's profile, reestablish accessibility to the geomorphic floodplain within the bayou's dimension, and reduce shear stress along the toes of the bayou's slopes within the bayou's pattern. The meander that will be realigned in the streambed will be placed in a location to reestablish a sustainable geometry for the stream system to handle the existing hydraulic regime and to aid in the overall goal of reducing shear stress along the toes of the streambanks. While the physical length of the stream will be shortened, the proposed project will create a stable dimension, pattern and profile of the bayou, which will create stability along the banks for the bayou for long term sustainable vegetation to be reestablished. HCFCD believes that the proposed project will improve the

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			overall aquatic function of the system. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	118.	Attachment L, TCEQ Water Quality Certification Questionnaire and Alternative Analysis, Page 2 of 3 - BMPs alone will not keep all sediment out of Buffalo Bayou during the construction of the MPDP. The amount of sediment that goes into Buffalo Bayou from earth-moving construction must be monitored and measured and then mitigated by the MPDP.	HCFCD will utilize the JTF Storm Water Management Handbook for Construction Activities (2006 Edition) and Storm Water Management JTF Storm Water Management Program: Minimization Design Criteria for Implementation of Certain Best Management Practices for Storm Water Runoff Treatment Options (2001 Edition). From these guidelines, BMP and a SWPPP have been developed to reduce turbidity and total suspended solids during construction. The SWPPP, including specific BMPs to be utilized, will be finalized during the final design of the proposed project. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	119.	Attachment L, TCEQ Water Quality Certification Questionnaire and Alternative Analysis, Tier II Alternatives Analysis Checklist, Page 1 of 3 - The document states that there will be water quality benefits. However, there is no monitoring program that measures via indicators, standards, or criteria specific water pollutants before, during, and after the construction of the MPDP. There are no concentration	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious

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		limits or standards that will be used to determine the success or failure of the MPDP with regard to water quality benefits.	and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	120.	Attachment L, TCEQ Water Quality Certification Questionnaire and Alternative Analysis, Tier II Alternatives Analysis Checklist, Page 3 of 3 - The document states that the MPDP is the "only alternative that met the proposed project purpose and need for long-term stream stability and improved water quality" and is "the least environmentally damaging practicable alternative." The water quality benefit has not been documented. HCFCD has stated that the MPDP will reduce erosion and that water quality will be improved due to reduced sediment and bacteria levels. This claim is based upon the assertion that bacteria adhere to particulates. In 2012, TCEQ's Texas Integrated Report, presented a Water Body Assessment by Basin along with Potential Sources of Impairments and Concerns for the San Jacinto River Basin. http://www.tceq.texas.gov/waterquality/assessment/ waterquality/assessment/12twqi/twqi12.	The proposed project is designed to significantly reduce or eliminate the sediment loading from this reach of Buffalo Bayou by restoring a stable dimension, pattern, and profile that neither aggrades nor degrades the thalweg (centerline) of the bayou. The EPA lists sediment as the most common pollutant in rivers, streams, lakes and reservoirs. Sediment is a significant pollutant of concern because it also transports other co-pollutants, such as bacteria, which attach to sediment particles. TCEQ has identified Buffalo Bayou as being impaired for bacteria, and the 2009 TMDL study for bacteria in Buffalo and White Oak Bayous notes that "sediments on the beds of bayous exhibit high concentrations of *E. coli*. These sediments can resuspend when shear stress exerted on the stream bed exceeds the critical shear stress for incipient motion. This scouring results in stream sediment with associated indicator bacteria being resuspended, and thus contributing to the overlying water concentrations of *E. coli*." Based on this fundamental relationship between sediment and bacteria HCFCD believes the water quality benefit from this proposed stream restoration project exceeds the no-action alternative and passive restoration alternative as they will not reduce the sediment loading and subsequent bacteria loading from the project reach. Please refer to the attached MPDP Monitoring Plan which includes the "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" to assist in quantifying the impacts to bacteria and water quality from the proposed project.
Mannchen, Brandt	121.	The San Jacinto River Basin includes Buffalo Bayou. All stream segments and upstream tributaries of Buffalo Bayou are listed as exceeding bacteria limits and thus are impaired for human uses. Potential sources of impairments for Buffalo Bayou and its tributaries include non-point sources of urban runoff and storm sewers, and for point sources are sanitary sewer overflows (collection system failures). Reduction of eroded sediments in the 1.3-mile MPDP segment of Buffalo Bayou does nothing to reduce the sources of bacteria in	Recent research by Dr. Robin Brinkmeyer, Texas A&M University at Galveston, has indicated that *E. coli* bacteria can survive for extended periods of time and even replicate in the sediments of Buffalo Bayou (Brinkmeyer 2014). Brinkmeyer estimated the *E. coli* bacteria loading from Buffalo Bayou sediments at 109 most probable number (MPN)/day, and suggests that a significant source of TMDL exceedances of *E. coli* in Buffalo Bayou is from a naturalized population surviving and replicating in

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		Buffalo Bayou.	streambed and streambank sediments (Brinkmeyer 2014). Given the relationship between sediment and bacteria in Buffalo Bayou, reducing sediment loading from the eroding bed and banks as proposed by the project does present an opportunity to reduce sources of bacteria in Buffalo Bayou. Please refer to the attached MPDP Monitoring Plan which includes the "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" to assist in quantifying the impacts to bacteria and water quality from the proposed project.
Mannchen, Brandt	122.	Attachment L, TCEQ Water Quality Certification Questionnaire and Alternative Analysis, Tier II Alternatives Analysis Checklist, Page 3 of 3 claims "bankfull benches with flat surfaces where wetland plants will be established." However, in other parts of the permit application the applicant states that wetland establishment in these areas is not guaranteed but is "anticipated," "may be established," and "will likely be of higher quality" (page 1 of 3). So the applicant claims in one place that wetlands may not be established and in another that they will be established. The applicant has not provided reliable information for the MPDP with regard to environmental impacts and mitigation.	The proposed project was designed to be self-compensating; that is, the project will result in an overall ecological lift. The proposed project will impact 0.61 acre of wetlands and HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches and low flow benches there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mannchen, Brandt	123.	I request that once the Section 404 and NEPA environmental analysis, assessment, and evaluation and decision notice is complete for the MPDP, I be sent a copy of these documents.	Following its review process, the USACE will issue a permit decision on the proposed project. The applicant will follow any requirements/recommendations given in the USACE's permit decision document in order to perpetuate the permitting process. These may include adjustments to the project design. The USACE will make any new/revised documents available to the public.

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Mannchen, Brandt Dec. 13, 2013 letter	124.	HCFCD has reduced the length of the proposal from 7,800 feet to 6,800 feet. HCFCD must state what the location is that is no longer included in this proposal. HCFCD must state why the location that was dropped from the proposal was excluded.	The proposed project location hasn't been altered and nothing was removed from the proposal. The IP submittal was revised based on the suggestion of USACE to clarify the difference between the initial study area that preceded the selection of a project location, and the ultimate project location that was selected within the initial study area. HCFCD also revised the IP submittal to differentiate between the areas of proposed active restoration within the proposed project reach and the areas where no active restoration will occur within the proposed project reach.
Mannchen, Brandt Dec. 13, 2013 letter	125.	HCFCD must state clearly why $4 million in public money, or 2/3 of the cost of the total MPDP, should be spent for what we are told is an erosion problem at the private River Oaks Country Club. HCFCD must state the justification for this level of public subsidy and funding for what is arguably a private project.	The proposed project was initiated by the Bayou Preservation Association (BPA), who held a series of workshops to evaluate and identify potential locations for a project that would demonstrate the benefits and effectiveness of NCD techniques. The BPA workshops identified a section of Buffalo Bayou bordered by Memorial Park and the ROCC as a possible project location. A combination of factors led to the selection of this reach of Buffalo Bayou for a demonstration project: ● Field reconnaissance identified the physical degradation of the bayou through Memorial Park ● The COH owns Memorial Park and was concerned about the erosion ● The ROCC was planning to repair eroding areas on the south side of Buffalo Bayou through their property ● The COH has an interest in improving water quality and the relationship of bacteria levels in the bayou to sediment ● HCFCD owns substantial right-of-way along this reach, but it was acquired along an alignment for an abandoned federal project. The right-of-way could be adjusted to be in the appropriate location for the project. Working together in a public-private partnership enables all entities to leverage funds to address both actively eroding streambanks as well as improve water quality by reducing sediment deposition, maintain flood carrying capacity, achieve long-term stream stability, and restore the

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			ecosystem to more natural and desirable conditions. The specific interests of project partners include: ● HCFCD is developing natural stable stream design (fluvial geomorphology) techniques for manmade channels and to address eroding banks and sediment deposition in area bayous. Erosion has devastating environmental consequences, increases flood potential, and threatens public and private property. It is expected that aquatic habitat and water quality throughout this reach of Buffalo Bayou will be improved, thus setting a precedent for future maintenance repair and restoration projects in order to preserve existing stormwater conveyance capacity. ● The River Oaks Country Club, which owns property on the south side of the bayou, wants to control land loss due to the effects of erosion and the resulting effects on its golf course operations. The project will include restoration to the south bayou slopes that will help create sustainable stable banks to control ongoing land loss. ● The COH is interested in improving water quality by reducing the bacteria load (which is related to the amount of sediment) in the stream and maintaining the integrity of the parkland on the north side of the bayou. Erosion repair to the north sideslopes will benefit Memorial Park in this area.
Mannchen, Brandt Dec. 13, 2013 letter	126.	HCFCD must state how much bacteria reduction it expects from the proposal, how it will monitor for this reduction, how long it will measure for this reduction, which flows will be measured, what percentage of total bacteria load is represented by the flows that will be measured, and similar information so that actual success and magnitude of that success will be measured over the short and long terms. HCFCD must present Buffalo Bayou specific water quality information that it has that directly links erosion of the banks of Buffalo Bayou to levels of bacteria that exceed the TCEQ water quality standards. In addition, HCFCD must present other water quality information that it has that links erosion of the banks of Buffalo Bayou to levels of bacteria that exceed	HCFCD has developed the "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" to assist in quantifying the impacts to bacteria and water quality from the proposed project. Baseline monitoring prior to project construction has already occurred and additional monitoring is proposed during and following construction in both low flow and high flow conditions. Research by Dr. Robin Brinkmeyer (2014), Texas A&M University at Galveston, illustrates the relationship between streambed and streambank sediment as a significant source of bacteria in Buffalo Bayou.

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		the TCEQ water quality standards. HCFCD must state the specific water quality monitoring methods and protocols that will be used to monitor bacteria and sediment levels before, during, and after, and in dry and wet periods for the MPDP.	
Mannchen, Brandt Dec. 13, 2013 letter	127.	HCFCD must determine due to its proposal how much large wood it will remove from Buffalo Bayou versus how much large wood it will install in the proposal. There should be "no net loss" of wood from Buffalo Bayou due to this proposal. Sheet 21 of 62 documents that almost the entire length (both sides of Buffalo Bayou) of this proposal will be either filled or cut. This means that 13,600 feet of possible riparian fringe wetland forest will be destroyed or degraded due to this proposal.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks, and over the bayou where none currently exists. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker reservoirs. Areas with active restoration work planned that are located higher than the 14-foot elevation will require the removal of some riparian vegetation, and HCFCD plans to preserve as many native, mature trees and shrubs as possible and planting of native tree and shrub species.
Mannchen, Brandt Dec. 13, 2013 letter	128.	HCFCD should commit to the preparation of an Environmental Impact Statement (EIS) during the USACE Section 404 IP process so that all cumulative, connected, direct, and indirect impacts of the MPDP are completely analyzed, assessed, and evaluated on Buffalo Bayou, Memorial Park, and Hogg Bird Sanctuary.	The USACE will make determination if this project should be evaluated in an EIS.
Mannchen, Brandt Dec. 13, 2013 letter	129.	These watershed problems include increased impervious surface, which speeds up and increases contaminated runoff into Buffalo Bayou; unregulated sprawl development, which endangers Addicks/Barker Dams; the operation and maintenance of Addicks/Barker Dams, which is the source	The proposed project is a NCD project that utilizes a project reach approach to address noted changes that have occurred within the project reach as a result of modifications within the watershed and to the bayou's hydraulic model resulting from the development of the

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		and exacerbates most of the erosion in Buffalo Bayou due to the vulnerability of Addicks/Barker Dams to additional flood flows in the Buffalo Bayou Watershed from inadequate development regulations; the creation of artificial flood flows that wet, gouge out, and degrade (to the point of collapse) the banks of Buffalo Bayou and create sediment loads that further degrade the stability of the banks of Buffalo Bayou. A comprehensive study of these conditions and their relation to soil erosion and bacteria elevation is needed.	watershed and USACE's operations of the Addicks and Barker reservoirs. The proposed project design will allow for the stabilization of the banks of the bayou within the proposed project reach by focusing on stabilizing the fluvial geomorphological functions of the bayou, which will allow for the reestablishment of a closed canopy riparian forest along the proposed project reach where none currently exists. The creation of stable fluvial geomorphological functions will also increase aquatic function by reestablishing a pool and riffle system to the bayou's profile, and geomorphic floodplain connectivity to the bayou's dimension within the proposed project reach where none currently exists.
Mannchen, Brandt Dec. 13, 2013 letter	130.	It is evident to me that the MPDP has, as its primary purpose, flood control and not erosion control, water quality, or restoration.	The primary purpose of MPDP is to reestablish a stable, sustainable Buffalo Bayou through the proposed project reach. The proposed project will neither increase nor decrease the stormwater carrying capacity of the bayou; rather, it is meant to stabilize the banks of the bayou, and reestablish mature vegetation for the long-term, sustainable preservation of the current stormwater conveyance capacity, as demonstrated in the modeling HCFCD completed and submitted to the COH Floodplain Administrator.
Mannchen, Brandt Dec. 13, 2013 letter	131.	HCFCD must present information on flood control projects that have been completed in the Houston area, Texas, and the Nation that document via water quality monitoring that significant reductions of bacteria have occurred due to erosion control. HCFCD must state the significant contributing factors, projects, or events that lead to erosion of the banks of Buffalo Bayou. HCFCD must tease out the effects that the MPDP will have on bacteria levels during flood events due to the operation of the Addicks and Barker Dams.	Buffalo Bayou is experiencing significant bank erosion as the project reach goes through the natural channel evolution process of incision and widening to accommodate increased flow rates caused by watershed urbanization and operation of the Addicks and Barker reservoirs. Without any action, the channel will continue a natural channel evolution process to adjust its dimension, pattern, and profile to achieve a new dynamic equilibrium with access to a new geomorphic floodplain. This channel evolution process will result in continued channel erosion and sediment loading to Buffalo Bayou in addition to property loss. The proposed stream restoration project will construct a stable dimension, pattern, and profile to which the natural channel evolution process is working to create. The proposed project was designed with a channel dimension (cross-section) that would convey extended high flows based on operational processes of Addicks and

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			Barker reservoirs. The proposed stable channel restoration, which neither aggrades nor degrades the center, or thalweg, will limit bacteria loading associated with the erosion of sediment. Please refer to the attached MPDP Monitoring Plan which includes the "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" to assist in quantifying the impacts to bacteria and sediment loading from the proposed project.
Mannchen, Brandt Dec. 13, 2013 letter	132.	HCFCD must state how the MPDP will "stabilize the bayou" and what this means with regard to the normal functioning of Buffalo Bayou as a river. HCFCD must state how much sediment will be produced during construction and operation of the MPDP.	HCFCD plans to stabilize the banks of the bayou by reestablishing a stable dimension, pattern and profile to the proposed project reach's currently degraded geomorphological conditions. By reestablishing a pool and riffle system to the bayou's profile, geomorphic floodplain connectivity to the bayou's dimension, and a stable geometry to the bayou's pattern, the proposed project will reestablish elements found in stable streams in our region. By creating sustainable stable banks that will allow for the reestablishment of mature native vegetation through the proposed project reach, the shear stress placed on the banks by erosive flows within the bayou will be reduced. The reestablishment of a closed canopy riparian forest along the proposed project reach with connectivity to the bayou will allow for increased aquatic function within the project reach. The project will provide water quality benefits by reducing the amount of sediment within the bayou for bacteria to attach to, and over time through the emergence of in-stream wetlands along banks where reestablished hydrological connectivity will allow for it. BMPs required by TCEQ for stormwater pollution prevention will be utilized on the project until groundcover vegetation is established per TCEQ's requirements. BMPs will include construction access points consisting of a rock access base, reinforced silt fencing, strip sodding, rock filter dams where applicable, and other erosion controls in line with industry standards for sediment pollution prevention.
Mannchen, Brandt Dec. 13, 2013 letter	133.	HCFCD must document that actual percentage of existing riparian vegetation that will be saved and destroyed due to	The geomorphological assessments conducted along the proposed project reach along with the assessment of the

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		the MPDP. HCFCD must state whether additional existing riparian vegetation can be saved, and if so, how much via the MPDP.	current hydraulic model within the bayou demonstrate that the reestablishment of stable geomorphological conditions within the proposed project reach can only be obtained by implementing a reach approach project to reduce shear stress along the toe of the banks of the bayou. Such a project can only be undertaken by creating the proper dimension, pattern, and profile to the proposed project reach, which will necessitate the removal of some vegetation within the project reach where the bayou does not have the proper geometry. The goal is to reestablish the proper geomorphological conditions to create a sustainable system in the future. The proposed design will actively restore the streambed of the proposed project reach where no vegetation currently exists and any mature vegetation found within the areas of active restoration will be reviewed during construction to minimize the disturbance to existing native vegetation. HCFCD's urban foresters and agronomists have committed to preserving as much mature native vegetation as possible.
Mannchen, Brandt Dec. 13, 2013 letter	134.	HCFCD must explore and learn from the research that has been done on the effects and the effectiveness of stream restoration projects that have already been implemented across the United States. I am submitting with these comments an article, "Compensatory Mitigation for Streams Under the Clean Water Act: Reassessing Science and Redirecting Policy," by Martin W. Doyle and F. Douglas Shields, from the Journal of the American Water Resources Association.	HCFCD appreciates the article that has been provided and has reviewed this article in addition to other research articles provided to the USACE Galveston District regarding stream restoration. The authors of the attached article observe that many stream restoration projects built for compensatory stream mitigation, both mitigation banking and in lieu fee programs, fail to achieve the Clean Water Act policy of no net loss of stream function. HCFCD acknowledges that using stream restoration to mitigate for lost stream functions is a challenging endeavor based on the limited research to date and measurement techniques available to quantify "success." However, HCFCD reiterates that the MPDP is not a stream restoration project for compensatory mitigation. The MPDP will restore or reestablish lost and degraded stream functions within the project reach solely for the purpose of restoration; not compensating lost stream functions in other stream systems. Therefore, HCFCD has set clear project goals that seek to address the existing hydrology, hydraulics, and geomorphic stream functions as described in the Stream Functions Pyramid of "A Function-Based Framework for

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			Stream Assessment & Restoration Projects" by Harman et al. (2012). HCFCD has drawn upon the research and experience of many other stream restoration projects and practitioners from across the United States in addition to relying upon HCFCD's local knowledge and experts to design a restoration project with achievable and measurable goals. The "Memorial Park Demonstration Project Sediment Load and Bacteria Monitoring Plan" has been developed to assist in quantifying the level of water quality enhancement and the attached MPDP Monitoring Plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species.
Mannchen, Brandt Dec. 13, 2013 letter	135.	Sheet 3 of 62 - HCFCD should provide the number, locations, and areal extent of sites where reused material will be stockpiled before use and where unacceptable material that will be excavated and disposed of will be temporarily stockpiled before removal from the site.	The proposed project does not include the removal and disposal of material offsite. HCFCD selected a CMAR to oversee the construction activity, and the CMAR selected a subcontractor with extensive experience constructing stream restoration projects. HCFCD purposely selected the CMAR method for this project so that veteran practitioners in the field of stream restoration could aid in demonstrating least damaging methods to HCFCD and the other contractors in the region for possible future projects similar in nature.
Mannchen, Brandt Dec. 13, 2013 letter	136.	Sheet 3 of 62 - HCFCD states it will remove trees with the root ball intact. HCFCD should state clearly if these trees will be replanted and if so where in the project area or elsewhere. Sheet 13 of 62, and in many other places in these plans - HCFCD states, "Existing vegetation disturbance shall be kept to a minimum." HCFCD should state specifically where vegetation will not be "disturbed" and how "disturbed" is defined.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work

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			have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. HCFCD intends to impact the least amount of native mature vegetation within the proposed project reach as possible. HCFCD has conducted a vegetation inventory within the proposed project reach to collect data so that preservation and removal (with proper regard to community type, species and location within the project design) can be made in the field during construction. Where impact to trees is unavoidable, and the trees that will be impacted are of the proper size, and type to be utilized for toewood, those trees will be removed with the root wad intact, so that it can be utilized as toe wood within the project reach. HCFCD will also abide by all relevant COH tree mitigation ordinances (replacement per caliper inch).
Mannchen, Brandt Dec. 13, 2013 letter	137.	Sheets 3-62 of 62 - There are many phrases, terms, and acronyms that need to be defined and spelled out. A glossary would be helpful in educating the public about the terms used. Some of these terms include: 1. yard drains 2. WEC# 3. wing wall 4. retaining wall 5. c.m.p. 6. headwall 7. mse wall 8. step pool channel 9. bagwall 10. upland aesthetics 11. scour pool 12. bayou exit 13. hdpe pipe	1. yard drains – a general term used in all general notes for HCFCD Contracts. The replacement of yard drains will not be necessary for the MPDP. Existing yard drains within the Hogg Bird Sanctuary will be replaced by the homeowners as necessary. 2. WEC – refers to "Well Established Control" point number, with a corresponding number which follows the "WEC#" phrase. This describes the metal rods the surveyor placed on site to establish control points for surveying activities. 3. wing wall – describes an existing concrete structure noted on site during surveying activities. 4. retaining wall – describes an existing structure noted on site during surveying activities. 5. c.m.p. – acronym for corrugated metal pipe 6. headwall – describes an existing concrete structure noted on site during surveying activities. 7. mse wall – acronym for mechanically stabilized earthen wall.

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			8. step pool channel – description of an overflow tributary feature to be installed within the project reach. 9. bagwall – describes an existing concrete structure made of concrete sacks piled up that was noted on site during surveying activities. 10. upland aesthetics – describes a planting zone within the proposed project reach. A review of the planting zone will provide a list of native vegetation to be planted within this zone. 11. scour pool – note describing the concrete riprap dissipation pools to be installed in front of existing storm sewer outfall structures within the proposed project reach. 12. bayou exit – refers to the proposed traffic control plan signage to be implemented during construction. Certain work activities may require boating traffic to exit the bayou, and re-enter at another location downstream. 13. hdpe pipe – (High-density polyethylene) describes an existing pipe outfall noted on site during surveying activities.
Mannchen, Brandt Dec. 13, 2013 letter	138.	Sheets 4 and 5 of 62 - The word wetland is used; however, HCFCD does not provide any information about wetlands, what type they are, how large they are, and whether they will be impacted by the proposal. HCFCD should state plainly how many acres of wetlands will be destroyed or degraded due to this proposal.	The proposed project was designed to be self-compensating; that is, the project will result in an overall ecological lift. The proposed project will impact 0.61 acre of wetlands and HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present.
Mannchen, Brandt Dec. 13, 2013 letter	139.	Sheet 14 of 62, and in many other places in these plans - HCFCD states, "All access for grading outside proposed easement is through temporary right of entry." HCFCD should state clearly how large its present easement is (width), how much of this easement will be used in each 1,500-foot section referred to on Sheet 3 of 62, 13., how many temporary rights of entry there will be, where these	There will need to be a total of four temporary rights of entry along the private home owners section of the proposed project (north bank) which will run along approximately 550 LF of the bayou. These will be in two locations and will include 4 homeowners. The purpose of the temporary rights of entry are to allow HCFCD access onto private property, either for temporary construction

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		temporary rights of entry will be, and how large (length and width) these temporary rights of entry will be.	access, or to repair erosion along the banks of the bayou which has migrated onto private property over time.
Mannchen, Brandt Dec. 13, 2013 letter	140.	Sheet 15 of 62, and in many other places in these plans- The profile of existing banks are shown as well as the proposed bankfull benches. It appears that 4, 8, or even 12-plus feet of soil will be removed from some banks to create bankfull benches and to fill in the channel of Buffalo Bayou. This is a tremendous amount of soil that would be moved. I want to express my concern about this massive earth-moving proposal. This will result in the destruction of most of the protective vegetative tree and other cover along Buffalo Bayou. Higher temperatures for the water and lower dissolved oxygen can be expected due to this proposal. This could worsen water quality.	In order to construct a viable project that addresses the existing hydraulic model and stresses acting upon the proposed project reach, some areas of bank will be excavated in a manner that removes existing vegetation so that a stable dimension, pattern and profile can be reestablished along the proposed project reach. The impacts in such areas are considered to be short in duration, when one considers that the stabilization of the bayou's banks will provide for the long-term sustainable reestablishment of a closed canopy riparian forest along the proposed project reach, where none currently exists, and ultimately provide for aquatic functional lift.
Mannchen, Brandt Dec. 13, 2013 letter	141.	Sheets 14, 15, and 18 of 62 - Impervious stream channel plugs are shown as being installed. There is no indication about where the water that used to flow into or in Buffalo Bayou at these locations will now go. HCFCD must state what this flow consists of, how it affects seepages and flows during low flow periods, like the summer, and what the biological and ecological effects will be if flows are prevented from entering Buffalo Bayou at these points. HCFCD must discuss the sandstone bedrock of Buffalo Bayou, how it will be affected by the proposal, how many seepages, which are associated with the sandstone bedrock, will be affected by the proposal, and what their locations are.	Impervious stream plugs will be used in locations where the streambed of the bayou will be realigned as necessary to reestablish a sustainable pattern to the bayou. These impervious plugs will consist of a soil material composition that includes clay so that the old streambed area does not erode back to the pre-existing pattern. No drainage areas connecting to the bayou will be affected by the installation of impervious stream plugs within the proposed project reach.
Mannchen, Brandt Dec. 13, 2013 letter	142.	Sheets 18 and 21 of 62 - Filling in the meander that HCFCD proposes to cut on Buffalo Bayou. This is a wetland and the proposed filling of this wetland is not necessary for this proposal and does not serve a water-dependent purpose.	The design is based on NCD principles and is a sound fluvial geomorphological design. The meander is not a "wetland." It is an example of the distressed stream seeking equilibrium and carving out a new path. The proposed project adjusts the pattern of the meander and aligns it so that it can sustain itself based on the geomorphological assessments and channel migration noted in historical aerial reviews. The question of what to do with the current meander was explored with adjacent property owners and the current proposed project reflects the consideration of several design proposals (that all work hydraulically with the new design of the meander).
Mannchen, Brandt	143.	Sheet 27 of 62 - HCFCD states, "Grading of proposed	No retaining walls or hard structures will be constructed

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Dec. 13, 2013 letter		channel will tie into the toe of the retaining wall." In past discussions with HCFCD, there was no mention that retaining walls and hard structures would be built as part of this proposal. HCFCD should state plainly how many feet of retaining or other walls will be constructed or repaired and maintained due to this proposal.	within the proposed project reach as part of the proposed project. Retaining walls and hard structures do currently exist within the proposed project reach, on the upper banks of the bayou, and the proposed project will work around and tie into the existing structures when necessary.
Mannchen, Brandt Dec. 13, 2013 letter	144.	[Sheet 27 of 62] I am concerned that HCFCD states clearly here that the channel for Buffalo Bayou will be bulldozed. This will result in the destruction and degradation of the natural stream channel profile, which will reduce niches and natural hiding places (roughness) for fish and aquatic life. Mitigation for these losses is necessary.	Sheet 27 of 62 does not clearly state that Buffalo Bayou will be bulldozed. This sheet does; however, call for the high bank of the bayou to be graded in a manner that transitions into existing hardened retaining walls located on the high bank of the bayou in the proposed project reach. The proposed project plans call for grading around these existing hardened retaining walls to transition into them.
Mannchen, Brandt Dec. 13, 2013 letter	145.	Sheet 36 of 62 - HCFCD does not specifically state how much wider and deeper it will dredge the Hogg Bird Sanctuary Tributary. I have walked this stream. Forested and herbaceous wetlands will be destroyed along this stream. HCFCD should state plainly where and the areal extent of wetlands that will be destroyed. The profile of the existing bank tops show that from 15 to 20 feet of soil will be moved. These dredge and fill actions will completely destroy this area as wildlife habitat (natural ravines will be filled). HCFCD's proposal flattens the extremes in topography, which normalizes and reduces their use for a diversity of vegetation and wildlife habitat features. The hydrological flow regime in the area will be totally changed. HCFCD must state what this change means to vegetation, wetlands, and wildlife in this area.	The proposed project plans for the Hogg Bird Sanctuary tributary, which serves as an outfall tributary for an existing storm sewer outfall, will include the installation of a concrete riprap dissipation pool sized to dissipate erosive flows from the existing storm sewer outfall pipes' known discharge volume, and the reestablishment of a stable dimension, pattern and profile necessary to stabilize the existing banks of the tributary. The erosion occurring within the Hogg Bird Sanctuary is having a devastating effect on the already degraded habitat; the project plans propose to stabilize the banks so that mature native vegetation can be reestablished. The proposed project design for the Hogg Bird tributary will not require any dredging of the tributary, and the thalweg (centerline) of the tributary will not be excavated any deeper. The confluence of the Hogg Bird tributary with Buffalo Bayou (shown in plan view on sheet # 36, station 0+00) will be excavated approximately 6 inches deeper to transition into Buffalo Bayou at that location only. The proposed design calls for the Hogg Bird tributary to be approximately 12 linear feet in width, which is consistent with the width of the existing tributary and in some locations narrower than the existing tributary. Some vegetation will be impacted by the active restoration plans in this area, but is necessary for the long-term sustainable stabilization of this area.

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			Information about wetland locations and proposed impacts are provided in the IP application.
Mannchen, Brandt Dec. 13, 2013 letter	146.	Sheet 48 of 62 - I am concerned about the planting tables that HCFCD proposes. The live oak tree is not a species that originally existed in the upland forests next to Buffalo Bayou in Memorial Park. Live oak does live in Fort Bend, Brazoria, Wharton, and Matagorda Counties in the Columbia Bottomlands, but it does not exist in the uplands of Memorial Park. Therefore, it is an exotic native tree species that should not be planted in or along Buffalo Bayou in Memorial Park. In addition, American sycamore is not an upland species. It is a floodplain species. HCFCD needs to determine what species to plant on what location on the landscape. Another floodplain species that should be utilized and is native to our area is willow oak. My experience is that American elm is more a floodplain species than an upland species. Planting a monoculture of American crinum lilies does not provide for diversity of herbaceous species along Buffalo Bayou. I do not know if these lilies originally grew along Buffalo Bayou. I recommend that HCFCD consult with Dr. John Jacob and his staff (Texas A&M, Agri-Life) and refer to the book, "Aquatic and Wetland Plants of the Western Gulf Coast," by Charles D. Stutzenbaker, for suggestions about diversification of herbaceous plantings.	The draft planting plan in the IP for both initial site stabilization and long-term revegetation of the proposed project reach will be reviewed and refined by urban foresters, certified arborists, and agronomists throughout the project lifecycle, with proper regard to the project location and desired native plant community in order to reestablish a closed canopy riparian forest.
Mannchen, Brandt Dec. 13, 2013 letter	147.	Sheet 56 of 62 - HCFCD refers in Pavement Notice, 5, hotmix asphalt concrete pavement. HCFCD should state where this pavement will be used and how long the road will be that uses this pavement. HCFCD refers in Pavement Notes, 7, to contractor's laydown yard areas and the use of stabilized fly ash. HCFCD should state how many laydown yards will be used and the total area for each laydown yard.	There is one proposed laydown yard for the project, which is located in an existing maintenance yard facility. The hotmix asphalt concrete pavement shown on Sheet 56 of 62 will be used to replace existing pavement within the HPARD Maintenance Facility. The stabilized fly ash is proposed to be mixed in with existing bare ground and road base located at the back of the HPARD Maintenance Facility.
Mannchen, Brandt Dec. 13, 2013 letter	148.	HCFCD refers in Access Notes, 2., that the "Contractor should stay within limits of proposed access routes and within limits of construction." First, the word "must" and not "should" must be used so that contractors understand there is no flexibility in their use of areas other than those HCFCD has	The utilization of only one access route to the streambed of the bayou will provide for the least amount of impact to the surrounding area. Please see the previous response to Item 135 regarding the prequalification of an established restoration contractor for this project to provide for

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		delineated. HCFCD should state what the limits are of proposed access routes, how many access routes will there be, and what the limits are of construction for this proposal. HCFCD refers in Access Notes, 11., that "It is the contractor's responsibility to stockpile necessary material on-site or secured off-site at no additional expense to HCFCD." HCFCD should state how many stockpile sites will be used on-site, where they will be located, and how large each one will be (area). HCFCD refers in Access Notes, 13., that "Staging areas and any additional access roads must be placed above elevation 15.00'." HCFCD should state how many staging areas will be used, where they will be located, and how large each one will be (area).	appropriate oversight of care along the proposed project reach.

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Christian Conner			
Conner, Christian	149.	I have several concerns and request this permit not be granted for the following reasons, most notably a high potential for restoration failure, extreme disruption to the delicate aquatic and riparian ecosystem that is present with the plan as proposed, and the flooding and other hydrologic uncertainties over a 9-10 year period of time. I do understand the restoration process, stressed condition of urban waterways like Buffalo Bayou, and in some cases the need for erosion control and bank stabilization. However, as with many stream and river systems, they can stabilize themselves over time. It appears evident from residential properties on the north, this is actually an erosion control project instead, with public funds being expended to protect private property. Nonetheless, the plan proposed does not consider a full range of alternatives if the proposal is really to demonstrate ("NCD") and result in "restoration" of this segment of Buffalo Bayou.	Natural Channel Design methods are based on the principles of fluvial geomorphology and will restore the proposed project reach. Assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included, leave the reach alone (no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation).The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile was required to reestablish the stable geomorphological function to the stream and provide for overall increased stream functions. Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. Lessening the footprint of this project would not achieve the project goals of fully restoring the hydrologic, hydraulic, and geomorphic stream functions. Furthermore, stream condition assessments identified the proposed project footprint as having some of the highest instability ratings along Buffalo Bayou. Lessening the

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			project footprint would subsequently leave some of these highly unstable sections of Buffalo Bayou vulnerable to continued failure and potentially threaten the stability and integrity of the restored areas in the reduced project footprint. HCFCD has consulted with experts in the field of fluvial geomorphology and Natural Channel Design (NCD) who have been successfully conducting stream restoration projects since the 1960s. HCFCD believes that the NCD approach used for this project is not experimental and a goal of this project is to demonstrate to local, state, and federal public agencies, private property owners, environmental advocacy groups, and the local community that this science-based methodology is a viable alternative for conducting channel restoration projects in Harris County, Texas. NCD has been successfully implemented and proven across the United States and other parts of the world. Furthermore, HCFCD has already successfully applied various NCD principles to projects on Cypress Creek, Mason Creek, Vogel Creek, Buffalo Bayou, and Rummel Creek in Harris County, Texas.
Conner, Christian	150.	If this proposed plan is allowed to proceed as is, there will be significant short-term and long-term direct impacts on this segment's aquatic ecosystem. There will, be significant short-term and long-term indirect impacts as well on the adjacent habitats of Memorial Park and the unnamed drainage pathways from the Park and the Golf Course due to changes in Buffalo Bayou channel alignment, cross-section, and profile from this proposal. Additionally, there will be significant changes the bayou will make upstream and downstream due to the hydrologic changes made within this segment. Those would consist of added indirect impacts.	A cumulative impacts analysis will be evaluated by the USACE prior to the issuance of any IP.
Conner, Christian	151.	There is already an ongoing erosion control project...between Sabine Street and Shepherd Drive, currently causing direct impacts as the existing riparian vegetation and habitat was removed, and 100% of the banks on both sides have been altered, resulting in stress on the aquatic organisms as well as any wading birds or animals that would mitigate along this corridor. Through downtown Houston, approximately 7,410 linear feet have already been	A cumulative impacts analysis will be evaluated by the USACE prior to the issuance of any IP.

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		rectified, i.e., altered natural channel condition to a widened and deepened condition for increased flood water conveyance. Therefore, only a 6,816-linear foot segment would be available for the existing resident and migratory species between the segment being disturbed and this segment being proposed for disturbance, which taken cumulatively does not provide sufficient undisturbed aquatic and riparian habitat, particularly when this remaining segment in between the ongoing Sabine to Shepherd project is predominantly lined with residential development, not the open spaces of Memorial Park and the golf course.	
Conner, Christian	152.	The proposed project location and limits correspond with the golf course. What other site selection criteria determined this segment was the best location for a demonstration project? It is not clear what is being demonstrated. For successful stream restoration in such an urbanized watershed as Houston, a watershed approach should be integrated into any true restoration plan.	An initial assessment of the entire length of Buffalo Bayou was completed from the Barker Reservoir located on the west side of Harris County, starting at Texas State Hwy. 6, downstream to the Houston Ship Channel. This includes the upper and lower reaches of Buffalo Bayou that were originally rectified by the USACE (widened, deepened, and realigned for Flood Damage Reduction and navigation purposes in the mid-20th Century), and the portion of Buffalo Bayou in between that was left in its current state at the time. Through a planning-level analysis, based on field assessments and a review of existing conditions, the HCFCD developed a summary assessment of the Buffalo Bayou system that could be utilized in identifying potential streambank stabilization projects along Buffalo Bayou that would yield the greatest measureable results for water quality, sediment reduction and overall bayou stability. Several criteria were selected to help differentiate the sites based on obtaining the greatest cost/benefit from any streambank stabilization efforts. Criteria were ranked and rated based on importance and include: ● bank erosion entrainment rates (based on the BEHI analysis); ● threats to existing infrastructure; ● right-of-way access; ● construction access; ● visibility to the public; ● planning level construction costs;

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			● cultural resources protection; ● constraints such as infrastructure; ● habitat improvement opportunities; and ● project length. Through this analysis, it was recognized that the most beneficial/cost-effective stabilization efforts may be achieved by combining multiple priority sites into a reach-scale project. Based on this assessment, it was apparent that the highest priority sites for streambank stabilization were located within the reach of Buffalo Bayou from Woodway Drive to downtown Houston. An on-site review of the stream conditions along this reach of the bayou was conducted in November 2010 with fluvial geomorphologists, local public agencies, and environmental advocacy groups to determine an area where a possible stream restoration project could be implemented along the bayou to demonstrate to area public agencies, advocacy groups and the local community a holistic approach to restoring a degraded stream system in a manner that is beneficial to multiple interest groups and the environment. Upon completion of the field assessments and on-site review with stakeholders, the current proposed project reach was chosen for several reasons as outlined below: 1. The initial assessment showed that the proposed project reach holds the highest rate of bank instability (extreme) and has severe amounts of erosion taking place along its banks. 2. The proposed project reach is one of the only substantial lengths of Buffalo Bayou where streambank armoring has not been widely implemented by landowners and that demonstrates extreme erosion entrainment rates as compared to other reaches. 3. HCFCD currently has easement rights along portions of this area of the bayou, whereas the majority of Buffalo Bayou is privately owned. 4. There are limited property owners who own large

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			properties along the majority of this portion of the bayou (both public property and private property), whereas the majority of Buffalo Bayou upstream and downstream of the project reach is owned in small segments by private owners. 5. The ROCC, on the south side of the channel, was planning to conduct a project to install gabion walls and they were asked to partner with public agencies to accomplish a more holistic restoration approach to stopping their loss of private property.
Conner, Christian	153.	The applicant proposes to demonstrate "NCD" (NCD), however NCD has several restoration priorities that are not being utilized because this seems like a flood conveyance project instead. A vital component of stream restoration is reconnecting the stream with the floodplain. This is not being done In this project as proposed. The applicant states that NCD is that the bayou will neither aggrade or degrade and minimize shear stress on the banks that are causing extensive areas of erosion. However, according to Harman and Starr (2011), NCD is defined as the application of fluvial geomorphology to create stable channels that do not aggrade or degrade over time and that maximize stream functions given site conditions.	HCFCD's geomorphic assessments, hydrologic and hydraulic analyses, vegetation studies, and overall design are based on proven fluvial geomorphological principles. The proposed NCD method includes the following design elements to restore the proposed project reach to a stable dimension, pattern and profile, based on the bayou's altered hydraulic model: ● reestablishment of a natural pool and riffle system within the bayou's profile; ● reconnection of the stream to its geomorphic floodplain by creating bankfull benches in the bayou's dimension; ● restoration of bankfull channel dimensions based on existing watershed hydrology influences and regional hydraulic geometry curves (regional curves) to mimic the natural channel forming flow and improve natural sediment transport processes; ● installation of woody debris toe protection (toe wood) to stabilize sensitive bank areas with a less hardened and more natural material to the region that also improves aquatic habitat, and reduces shear stress from the toes of the banks; ● planting appropriate native vegetation in the proper hydrologic zones along the proposed areas of active restoration to promote streambank stability through root mass, pollutant filtration, in-stream shading and cover, and habitat enhancement; and ● preservation of existing native vegetation and stable channel conditions where possible.

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Conner, Christian	154.	Stream restoration should evaluate the causes of existing channel instability and the potential to return to a dynamic equilibrium. This proposed plan only addresses the symptoms of bank instability. Urban streams, including Buffalo Bayou, that are widened and deepened for flood conveyance will lead to continued long-term instability. Another concern, that as existing meander length is actually shortened and the channel is widened and deepened with this proposed plan, will result in instability and a high degree of restoration failure.	The proposed project design is based on an assessment of the entire Buffalo Bayou watershed which includes the influence of the two upstream reservoirs, Addicks and Barker, and the previously rectified portions of the bayou upstream and downstream of the proposed project reach. HCFCD's design proposes to restore elements of the stream's geomorphological function in order to stabilize the banks of the bayou, address the current problems with channel stability identified in this reach of Buffalo Bayou which are in part a result of these watershed and channel modifications.
Conner, Christian	155.	There are "sugar" sands along the bayou that will continue to erode. The proposed 2:1 sideslopes are not a natural angle of repose and would also continue to erode.	Areas proposed in the project plans to have a 2:1 sideslope are limited to one of two types of applications. The first type of application is within portions of the stream bed that are proposed to be constructed with on-site excavated material that is compacted to specific densities, in 10-inch to 12-inch lifts that are benched back into the existing bank, wrapped and pinned in place with biodegradable coir fabric (coconut fiber material), and densely planted with flow-resistant native vegetation along the streambed of the bayou. The coir fabric is designed to provide additional short-term stability until the root system of the native vegetation has a chance to become established and provide long-term stability to the slopes. The second type of application is within portions of the bank's upper slopes where grades gentler than 2:1 cannot be achieved. These areas are referred to in the proposed project design plans as vegetated stabilized earthen slopes and are proposed to be constructed of select imported fill that contains stable mechanical properties that will provide pore pressure relief during times of rapid drawdown. The vegetated stabilized earthen slopes will be constructed of select fill material compacted to specific densities in 10-inch to 12-inch lifts that are benched back into the existing bank. These will be wrapped and pinned in place with biodegradable coir fabric and Big-D coir fabric geogrid blocks and constructed with high tensile strength geogrid placed in every third lift and then densely planted with native vegetation along the high banks. The stabilized vegetated earthen wall system is designed to create a

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			stable area along the high bank of the bayou until the native vegetation has a chance to establish a root system to provide long-term stability to the upper banks.
Conner, Christian	156.	The project limits on Exhibit 3 are not consistent with channel alignment shown on the USGS topographic quad map.	Exhibit 3 has been updated to reflect project limits consistent with the channel alignment.
Conner, Christian	157.	At the upstream project limit, there is a large culvert bringing flow into the channel from the south bank (29 45'27.03" N, 95 26'1.00" W). This added flow contributes to north bank instability on the opposite side and downstream, yet only riprap to protect the outlet is proposed.	The purpose of the riprap dissipation pool proposed to be placed in front of the storm sewer outfall is to dissipate initial discharges coming from the existing storm sewer outfall. This riprap dissipation pool was designed with a length, width and depth ratio to handle the known flow (q) coming from the storm sewer outfall structure. Once the initial discharge of the existing storm sewer outfall is dissipated, the flow of the outfall discharge will match the existing flow of the bayou system, which is proposed to be constructed in a manner that relieves shear stress from the toe or base of the banks and allows the bayou to create sustainable long-term stability.
Conner, Christian	158.	There is a tributary from the north (29 45"35.50" N, 95 25'55.01" W) entering that is in both the 100-year and 500-year floodplains of the main channel. Why is this not part of a stream restoration project using NCD? The limits of private property and applicant ROW/easement limits should not negate the opportunity for partnerships with adjacent land owners and golf course to do a demonstration project for this applicant that would be more successful; without inclusion of an adequate floodplain, restoration has a high degree of failure.	For this demonstration project, two tributaries were included within the project reach to demonstrate how tributaries could be transitioned into, so that NCD principals can be used to achieve stable banks. These techniques could be replicated throughout the eroding gullies in Memorial Park. One tributary proposed to be repaired is the Picnic Loop tributary, which will demonstrate techniques for repairing a non-USACE jurisdictional, ephemeral tributary with a steep grade. The second tributary proposed to be repaired is an intermittent tributary with a low, flat grade. Both tributaries proposed to be repaired will demonstrate options for others wanting to address additional tributaries in the project vicinity.
Conner, Christian	159.	A south bank tributary area near the upstream project limit (29 45'29.89" N, 95 25'51.01"' W) provides an opportunity to incorporate overflow area into existing ponds in the golf course. This is a missed opportunity to spread water out, thereby decreasing hydraulic energy for increased restoration success.	The objective of this project is to stabilize the eroding banks of the bayou and to preserve the existing stormwater carrying capacity of the bayou. HCFCD is not trying to create greater stormwater conveyance within Buffalo Bayou. This is confirmed by the hydraulic model that shows the proposed project will have a no rise effect on the bayou.
Conner, Christian	160.	The opportunities for increasing meandering length, i.e.,	Erosive flows or erosive hydraulic energy will be dissipated

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		south of Rains Way there is added opportunity to reduce hydraulic energy, again using/creating overflow area along the north bank (29 45' 26.53" N, 95 25'29.89" W) and allowing some flows to be redirected along the south bank at four locations; floodplain areas are not being incorporated in the proposed project design; i.e., USGS map indicates lower topographic grades at 29 45'37.72"' N, 95 25'45.27" W, which would incrementally contribute to reduction of flow velocities and hydraulic energy to minimize downstream erosion that provides fringe wetlands and increases aquatic habitat and diversity.	within the project reach and concentrated to the thalweg, or centerline, of the bayou's profile by the inclusion of bankfull benches with the stream dimension, which will allow increasing stormwater levels to spread out upon the reestablished geomorphic floodplain and dissipate erosive hydraulic energy. Other design features such as the reestablishment of a pool and riffle system within the project's profile and a gentler geometry in the stream's pattern will also allow for the dissipation of erosive flows within the bayou.
Conner, Christian	161.	Including clearing a drainage outfall on the north bank (29 45'39.41" N, 95 25'42.52" W) will bring more water more quickly to the bayou in contrast to NCD principals and techniques. This provides indication of flood conveyance project, not restoration. Immediately east of this location is a tributary that also is in the 100-year and 500-year floodplains, but this opportunity to include into stream restoration design has been overlooked.	The proposed project plans do not include the installation of any new storm sewer outfall structures to be added into the proposed project reach. The proposed project does include the installation of riprap dissipation pools in front of existing outfall structures to dissipate initial storm sewer outfall discharges when they enter the bayou. These riprap dissipation pools are designed with a specific width, length and depth ratio to handle the known q, or flow, of the existing storm sewer outfall pipes. The purpose of this project is to preserve the existing stormwater carrying capacity of the bayou and create sustainable, stable streambanks along the proposed project reach.
Conner, Christian	162.	On sheet 3 of 41, the transect 1 does not extend to the project downstream limit; transects 3, 4, 6, 8, and 12 do not follow the channel alignment.	The transects shown on the exhibits follow the post-construction centerline of the channel, which does not directly correspond to the current channel centerline. The transects assessed as part of the pre-construction stream assessment were located along the existing channel as close as possible to the corresponding post-construction transects.
Conner, Christian	163.	On sheet 4 of 41, wetlands appear to overlap on the OHWM; therefore, are they accounted for properly or not counted? How many areas of wetlands are being affected? How many acres of wetlands are being incorporated Into the restoration?	Wetlands that overlapped with the OHWM were accounted for in the wetland acreages. As stated in the IP application submitted to the USACE, the proposed project will impact 18 in-stream wetlands (below the OHWM) and six depressional wetlands, totaling 0.61 acre. Several areas within the stream enhancement project are anticipated to form wetland areas. A bankfull bench typically ranging from 10 and 40 feet in width, and a low flow bench typically ranging from 3 to 10 feet in width will

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			provide flat surfaces where wetland plants may be established. The planting plan included with the IP application includes seeding and/or planting these areas and it is likely that wetlands will be permanently established there creating the potential for 2 to 8 acres of emergent in-stream wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, these wetlands will likely be of higher quality than the existing wetlands. In addition, approximately 0.8 acre of specific wetlands plantings will be included within Transect 6 where the existing channel will be abandoned.
Conner, Christian	164.	If there are tributaries and areas within the 100-year floodplain, why are they not shown as intermittent or ephemeral channels and temporary/seasonal wetlands under jurisdiction since they are adjacent/contributing features?	Based upon the USACE Approved Delineation Verifications SWG-2011-00628 and SWG-2012-01007, approved on February 16, 2012 and January 25, 2013, the study area, which is a larger delineated area than the project area, contains 7,200 linear feet of Buffalo Bayou covering 13.97 acres and 800 linear feet of an unnamed tributary, referred to as Hogg Bird Tributary in the project plans, covering 0.50 acre. Based upon the USACE Approved Delineation Verifications, twenty-eight wetland sites with an areal extent of 0.78 acre are present within the study area. No other wetlands or waterbodies were determined to be USACE-jurisdictional.
Conner, Christian	165.	The large tributary and floodplain area at the project downstream limit (29 45' 33.04" N, 95 25' 24.39" W), how/ why not incorporated into project restoration?	The tributary indicated is the Hogg Bird Tributary, which is included in the proposed project.
Conner, Christian	166.	On sheet 15 of 41, straightening and channelizing is not NCD. The proposed meander length would be less than existing. The meander belt width would also be reduced. The proposed plan reduces sinuosity of the flow path (see sheet 29 of 41), thereby increasing velocities. Removing the irregularities in channel alignment and in cross-section, especially the thalweg, will not "restore" the bayou and provide ecological lift (see sheet 18 of 41). Looking at the existing stream bed profiles over time, the bayou is stabilizing itself with point bars, meandering thalweg, and flattening sideslopes. The proposed plan with a consistent trapezoidal cross-section being proposed does not reflect the flow patterns. Trapezoidal cross-sections are	The project design does not propose the installation of trapezoidal cross sections. The proposed project dimensions include lines and grades found on stable slopes within our region of the state. The proposed profile dimensions include the reestablishment of stable pool and riffle systems, and the proposed pattern for the project includes geometry found in stable streams, all with proper regard to soil type, terrain and topography. The current active erosion and deposition seen within the proposed project reach are items that are noted in the geomorphic assessment that are occurring due to the widening and incising of the bayou as it reacts to the altered hydraulic model that has been introduced to the

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		not reflective of natural channels.	watershed over time. The proposed project design will reestablish geomorphic conditions that will lead to the sustainable long-term stabilization of the stream system.
Conner, Christian	167.	There are no grades/spot elevations shown on the plans and filter dams, and detention basins are not located on the plans.	The proposed project does not include the installation of stormwater detention basins. Topographical elevations are included on the draft plans for the community to review on HCFCD's website (www.hcfcd.org/MPDP). BMPs for stormwater pollution prevention, such as reinforced silt fencing, grass sodding, and rock filter dams will be used on the project.
Conner, Christian	168.	There is no indication of the spacing between the riffle and pools. This should be shown on the plans, not just as one "typical" in order to assess adequate in-stream habitat and document ecological lift being claimed.	The spacing between pool and riffle systems is shown on the profile of the draft plans located on HCFCD's website at www.hcfcd.org/MPDP. The exhibits in the IP application are included in the application to show the Corps the limits of impacts to jurisdictional waters of the U.S.
Conner, Christian	169.	On sheet 20 of 41, for 80% plans, note "existing vegetation disturbance shall be kept to a 'minimum'" is vague. Limits of the work area should be shown, quantified, and related to pounds of seed per acre, numbers of trees, shrubs, etc., per acre being restored for short-term and long-term revegetation.	HCFCD will remove some vegetation and trees to accomplish the project's goal of stabilizing the channel. It is expected that less than 80 percent of the trees and vegetation in the project area will be removed. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately

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			reestablish a closed canopy on stable streambanks. The proposed project will stabilize the banks of the bayou and recreate the proper dimension, pattern and profile for the current hydraulic model within the stream system and allow for the reestablishment of the proper native vegetation along the bayou, with regard to the correct hydrological planting zone. Within the proposed project area, there will be areas of active restoration and areas where no work is planned because the bayou currently has an appropriate dimension pattern and profile. In the no work areas, unless there are invasive or undesirable species that need to be removed, the current vegetation will not be impacted. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exist
Conner, Christian	170.	On sheet 21 of 41, there is no indication of work area transition into "proposed no work area." The clearing and work areas should be phased to limit ecological loss of cover/shelter to the species that currently use the bayou.	Some wildlife habitat will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work

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			have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy along the banks of the stabilized streambank. Construction activities required for the MPDP would occur in phases. . The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Conner, Christian	171.	On sheet 25 of 41, the conveyance volume appears to be reduced in the cross-section at 15+00.03. The channel is becoming deeper in the proposed section, thereby increasing the entrenchment. There is no indication of cut and fill volumes and whether there is a balance.	The dimension of the bayou through the project reach will be made slightly narrower as banks are reestablished and slightly incised in areas where pool systems are proposed to be reestablished. The altering of the dimensions of the bayou will work in unison with the alterations to the bayous pattern and profile to reduce shear stress on the toes of the banks of the bayou and concentrate erosive flows to the thalweg, or centerline, of the profile of the stream. The overall cut and fill quantities of the project come to an approximate balance and the overall floodplain will not be affected by the project.
Conner, Christian	172.	The bayou has been allowed to become incised due to excessive urban runoff directed to the bayou as opposed to infiltrating in the watershed and spreading it out over a floodplain. Therefore, NCD within an urban context like Houston should seek to demonstrate all the incremental opportunities to infiltrate and spread out with as many fringe wetlands as practicable. This would increase stream function, biological conditions, habitat, and water quality	The proposed project will reestablish many more levels of hydrological connectivity to the stream system through initial planting efforts, planned long-term cooperative efforts from other interested groups such as the Bayou Preservation Association, Memorial Park Conservancy, and Houston Parks and Recreation Department; a much more diverse plant community will be reestablished along the proposed project reach. HCFCD foresees the

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		improvements. The more wetlands with native wetland plants, species like dragonflies would be increased and existing mosquitoes decreased.	emergence of in-stream wetlands along the project reach and will monitor the proposed project reach post construction to document the establishment of such in-stream wetlands. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Conner, Christian	173.	On sheet 34 of 41, planting plan calls for only lilies at the waterline. This does not respond to multiple water levels, nor provide erosion control. One plant species does not constitute vegetative diversity in the herbaceous layer or ecological lift. Restoration requires diversity, and diversity in the herbaceous layer should include 12 native species, such as iris, pickerelweed, arrowheads, Emory sedge, flat sedge, spikerush, scouring rush, Juncus, bulrush, many that have erosion control benefits as they have a stability rating provided by the Texas Riparian Association.	The proposed plan for re-vegetation efforts will include the planting of a much more diverse palate of native plant species than currently exists within the proposed project area. The planting plan is being devised with proper regard to native plant species based on hydrological zone and desired plant community type for a closed canopy riparian forest system.
Conner, Christian	174.	On sheet 35 of 41, it appears from the planting plan that plantings start and stop with no indication of any disturbed areas being planted. This would lead to increased erosion with no bank protection treatment being provided.	All areas within the project limits that are proposed to receive active restoration efforts will be re-vegetated by both initial site stabilization efforts to obtain immediate ground cover and long-term reestablishment of a closed canopy riparian forest.
Conner, Christian	175.	On sheet 39 of 41, existing wetlands are being disconnected from the adjacent hydrology needed to sustain them. This type of indirect impact is not being compensated for.	The existing wetlands that will not be impacted by the proposed project will be temporarily fenced to ensure their protection during construction activities. The proposed project should not have any impacts on the hydrology that sustains these areas.
Conner, Christian	176.	On sheet 41 of 41, it is not clear what rate means on planting table. This is not a standard layout with appropriate information on the plant list, as specified by the National Association of Nurserymen or landscape architecture, see Landscape Architectural Graphic Standards or other sources	Planting rates for trees are based on tree species proposed for specific hydrological zones and densities, which take into account mortality rates. Planting rates for the initial site stabilization efforts for seeding are covered in the specifications located within the project manual.

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		for proper plant lists/tables. Plant quantities should be shown. Rates are typically used for seeding in pounds per acre.	The final planting plan for both initial site stabilization and long-term re-vegetation of the proposed project reach is being developed by urban foresters, certified arborists, and agronomists with proper regard to the project location and desired native plant community for reestablishing a closed canopy riparian forest.
Conner, Christian	177.	Native grasses such as switchgrass should be specified on the sideslopes for short-term erosion control. Sideslopes should not be managed as "park" land for flood conveyance but fully wooded as a riparian corridor. Native grasses incorporated with tree plantings would maximize bank stabilization and reduce mowing costs.	Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks.
Conner, Christian	178.	The native nut-and berry-producing tree species, including pecan, sugarberry, should be increased for improved ecological lift.	HCFCD appreciates the feedback on planting species to consider for the proposed project and will review the final proposed planting plan to evaluate if native nut- and berry-producing species can be incorporated.
Conner, Christian	179.	There is no indication of survival rates; monitoring or remedial activities are not provided in the information provided for public comment.	Please refer to the Pre- and Post- Construction Monitoring Plan that includes measures to ensure a minimum survivability rate of 80 percent for containerized native trees and shrubs, a 50 percent survival rate for live stake native trees and shrubs, and a minimum coverage of 70 percent for wetland plantings at the end of the second full growing season following planting. The monitoring plan also includes management plans to control the proliferation of noxious invasive plant species.
Conner, Christian	180.	According to Galveston District SCA for evaluating avoidance, minimization, stream restoration projects, and compensatory mitigation, the USACE District engineer must conclude that discharges comply with the requirements under 40 CFR part 230, and for those projects whose purpose is stream restoration or rehabilitation, they must also demonstrate that their end result will heighten, intensify, or improve specific stream function(s) or return natural/ historic functions so that these projects will result In a net gain in aquatic resource function. This proposed restoration project does not seem to focus on creating landforms and water flows so that the bayou can naturally maintain and	A Stream Assessment of the proposed project reach was conducted by KBR on behalf of HCFCD in order to document existing stream conditions, and is included as Attachment I of the Permit Application. The Stream Assessment was conducted following the USACE Galveston District, SWG SCA Standard Operating Procedure. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium that will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent

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		restore the chemical, physical, and biological functions. Further, because of the urban context and limited easement, the proposed restoration plan would not have the ability to reconnect the bayou with the floodplain and would therefore not reduce flooding downstream, raise the water table, lower water temperature, or enhance in-stream habitat for fish and other wildlife. For these reasons and others identified in this letter, the proposed project is not focused on restoration, as proposed would have a high degree of restoration failure, and should not be permitted as a restoration project.	naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou. The proposed restoration project was developed with proper regard for the bayou system based on geographic location and stream bed type and utilizes the science of fluvial geomorphology. HCFCD's geomorphic assessments, hydrologic and hydraulic analyses, vegetation studies, and overall design are based on proven fluvial geomorphological principles. The proposed NCD method includes the following design elements to restore the proposed project reach to a stable dimension pattern and profile, based on the bayou's altered hydraulic model: ● reestablishment of a natural pool and riffle system within the bayou's profile; ● reconnection of the stream to its geomorphic floodplain by creating bankfull benches in the bayou's dimension; ● restoration of bankfull channel dimensions based on existing watershed hydrology influences and regional hydraulic geometry curves (regional curves) to mimic the natural channel forming flow and improve natural sediment transport processes; ● installation of woody debris toe protection (toe wood) to stabilize sensitive bank areas with a less hardened and more natural material to this region that also improves aquatic habitat, and reduces shear stress from the toes of the banks; ● planting appropriate native vegetation in the proper hydrologic zones along the proposed areas of active restoration to promote streambank stability through root mass, pollutant filtration, in-stream shading and cover, and habitat enhancement; and ● preservation of existing native vegetation and stable channel conditions where possible. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding

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			waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.

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General Public			
Drummond, Jessica Drummond, Mark Landon, Jerrold E.	181.	The report cites "ecological uplift" that will be gained by performing this "restoration" project. This claim is made by computing a "riparian index" before and after the restoration for various sections of the bayou. These numbers are of dubious value and don't stand up to scientific scrutiny. This seems to be a metric that was computed out of thin air and applied to Buffalo Bayou to justify the ecological benefit to be gained.	The Riparian Buffer Parameter was evaluated using the methodology outlined in the USACE Galveston District SCA (2013) and guidance provided by USACE Galveston staff. HCFCD will be completing wetland and riparian corridor monitoring; please refer to the Pre- and Post-Construction Monitoring Plan for more detailed information.
Drummond, Jessica Drummond, Mark Landon, Jerrold E.	182.	Localized erosion is mentioned in the report as a consequence of this work. With 80 percent of the trees being removed along the banks, how can one possibly classify this as "localized erosion"? Erosion will take place along the entire section where the trees have been removed. Sedimentation runoff will accelerate and the downstream impact from this sedimentation has not been studied. This is a fact. The consequences of massive amounts of sedimentation being carried downstream following tree removal along the banks needs to be evaluated. This is not even considered or mentioned in the report.	HCFCD will utilize the JTF Storm Water Management Handbook for Construction Activities (2006 Edition) and Storm Water Management JTF Storm Water Management Program: Minimization Design Criteria for Implementation of Certain Best Management Practices for Storm Water Runoff Treatment Options (2001 Edition). From these guidelines, BMP and a SWPPP have been developed to reduce turbidity and total suspended solids during construction. The SWPPP, including specific BMPs to be utilized, will be finalized during the final design of the proposed project. HCFCD's overall plan is to preserve as many of the native mature trees and shrubs located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy over the bayou where none currently exists. HCFCD's planting plan will include the installation of native grass mix that may include a portion of Bermuda grass for initial site stabilization and native trees and shrubs for the long-term reestablishment of a healthy, sustainable riparian forest along the proposed project reach.
Drummond, Jessica Drummond, Mark Landon, Jerrold E.	183.	The hydrology is not addressed at all in this report. How can a project of this magnitude be approved when no consideration is given to the hydrology?	The preliminary design stage included many studies including hydraulic model analysis. The proposed design elements will restore hydrology to the project area through:

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			● reestablishment of a natural pool and riffle system in the bayou's profile with a stable geometry in the bayou's meander pattern; ● reconnection of the stream to its geomorphic floodplain with bankfull benches in the bayou's dimension; and ● restoration of bankfull channel dimensions based on existing watershed hydrology influences and regional hydraulic geometry curves (regional curves) to mimic the natural channel forming flow and improve natural sediment transport processes.
Adams, Ellen Blaine	184.	I am strongly opposed to the proposed Buffalo Bayou project. I am a homeowner on Crestwood Drive and my property abuts Buffalo Bayou within the boundaries of the project you propose. However, my property boundary is "outside the scope of work" of the proposed project. To date, I have received no good answer as to why my property would be outside the scope of work. Furthermore, I am extremely concerned about how the scope of work proposed will affect my property. I am also concerned that I have received only one notice of this proposed project, but months and months of meetings have been held with the homeowners on Rainsway at the end of Crestwood Drive. Yet, the homeowners on Crestwood Drive have been excluded from gaining information related to these meetings with the USACE and others. I believe this project was instigated more to protect the private properties of homeowners and River Oaks Country Club more than Buffalo Bayou, and in the end the bayou will suffer.	Much of Buffalo Bayou has remained natural, but changes in stormwater flow caused by urbanization and operation of the Addicks and Barker reservoirs are causing the bayou to adapt in some areas through excessive erosion. That erosion has devastating environmental consequences, increases flood potential, and threatens public and private property. Because of these threats to the bayou, interested stakeholder groups came together in recent years to collaborate on proposals to help restore Buffalo Bayou's natural beauty, water quality, and flood functions. This collaboration resulted in HCFCD taking the lead on the design of the MPDP along Buffalo Bayou from the Hogg Bird Sanctuary/Bayou Bend parking lot to just south of Memorial Park's Picnic Loop. From the outset of this proposal, the stakeholders have used a step-wise approach to measure support and develop understanding for what the proposal might be. With each step in the gradual process of devising a plan, the breadth of information and participants expanded. Initially, communications about the proposed project included the direct landowners who would be affected by the project, or who owned property in direct contact with the proposed project area. This group included the City of Houston, River Oaks Country Club, Harris County Flood Control Task Force, Bayou Preservation Association, Memorial Park Conservancy, and private citizens along the proposed project reach. As the proposed project progressed and interest in the

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			project grew, the District held several meetings with interested organizations and the public. Approximately 41 meetings have been held, including: ● Steering committee meetings with project partners and affected property owners – these meetings have been ongoing since 2010. ● A public presentation by Dr. Dave Rosgen in June 2013. ● A meeting with the Sierra Club (Houston Chapter) in August 2013. ● Presentations were made to the Flood Control Task Force in 2012, 2013 and 2014. ● A public meeting (organized and hosted by the Flood Control District) was held on Dec. 17, 2013. Additional public meeting(s) will be scheduled as needed in various project phases, e.g., in advance of construction. The District has also created a website for the project, where citizens can submit questions and comments and voice support or concerns. Interested residents/property owners are invited to submit comments and sign up for project updates at the Memorial Park Demonstration Project webpage - www.hcfcd.org/mpdp. The Flood Control District is committed to making information about the project available to all affected individuals and organizations, and the public in general.
Batten, Jr., George W.	185.	I am disturbed by the fact that the NCD Review Checklist in the permit application is incomplete. In particular, at the beginning of that checklist there is a note that says, "A design report containing all of the information requested below will be prepared upon completion of the Final Design." Shouldn't all of the requested information be included in the permit application? Will the public be able to review and comment on the report before construction is approved? (Some specific comments regarding the checklist were included in the letter.)	HCFCD completed the NCD Review Checklist based on the information provided in the 80% Design Plans and other supporting documentation in the IP application. A complete design report will not be available until the CMAR process and the IP application review have completed final design review and input. Section 5.0 of the NCD Review Checklist was left blank for the USACE to complete with their comments on Overall Design Review.
Batten, Jr., George W.	186.	In the application much is made of the sedimentation, and on page 4 it is stated that there is "about 359 tons of soil	Measurement techniques are available to estimate sediment loading rates specifically from streambanks and

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		erosion per year." Within the application there is no justification for that statement. Moreover, my observations over the years indicate that much of the sedimentation comes from upstream of the project reach. A look at the 2004 and 2011 aerial photographs on page 7 of the "Intensive Archaeological Survey" by HRA Gray & Pipe (page 588 of the permit application as published on the website of HCFCD) reveals high water that is brown from the sedimentation. This supports my observation. Thus, it seems unlikely that modification of the project reach will significantly reduce sediment deposition downstream, which is one point made in the justification for the project.	beds through the process of the WARSSS. HCFCD contracted with AECOM, Inc. to perform an overall study of the Buffalo Bayou watershed including a WARSSS. For the purposes of this sediment loading assessment, Buffalo Bayou was divided into three separate reaches; the straightened reach from Barker Reservoir to Beltway 8, the natural reach from Beltway 8 to Shepherd Drive, and the downtown reach from Shepherd Drive to the Ship Channel turning basin. Based on measurements from these reaches, the assessment model indicated the natural reach, which includes the MPDP reach, produces significantly more sediment loading at 15,700 tons/year compared to the straightened reach (300 tons/year) and the downtown reach (1,000 tons/year). Additional sediment load modeling by HCFCD design consultants, KBR, Inc. and Stantec, Inc., estimated the sediment yield at 359 tons/year for the MPDP reach, which represents a substantial contribution to the overall total sediment loading to Buffalo Bayou estimated by AECOM, Inc., given the relatively short length of the proposed project in comparison to the overall length of Buffalo Bayou. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium which will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou.
Batten, Jr., George W.	187.	The letter from the Bayou Preservation Association (page 61) mentions "... water quality improvements...reduction in indicator bacteria (*E. coli*), total suspended sediments and nutrients." The SCA Report by HCFCD has statements suggesting the same. While the level of *E. coli* is an appropriate indicator for the quality of water for human contact, it seems unlikely that it is a good indicator for overall ecological quality. Many species live and thrive in waters that are highly contaminated according to this measure, and it seems likely that the bayou is home to many of those. As I indicated in 5 above, the main source	Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium that will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou. Buffalo Bayou is listed as impaired for bacteria by the TCEQ with levels far exceeding the water quality standard

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		of sedimentation is upstream from the project reach; this is also true of indicator bacteria and nutrients. Thus, I believe that the reduction in bacteria, sediment, and nutrient levels will be insignificant compared with the load brought down from upstream point sources (e.g., sewage plants) and non-point sources.	of 126 MPN/100ml for *E. coli* bacteria. Bacteria are found within the water column but also associate with sediment. Buffalo Bayou sediments harbor active bacteria and then, when eroded, suspend the bacteria back into the water based on research completed by Dr. Robin Brinkmeyer in 2014 This project, by stabilizing the streambanks and reducing sediment erosion rates, will positively impact water quality. Bacteria loading in the stream sediments and water column are being monitored throughout the project to determine the effectiveness of streambank stabilization methods. Without the project, there is no plan to reduce erosion and improve the water quality on this reach of Buffalo Bayou. Additional water quality benefits may be realized through the proposed revegetation of streambanks and the riparian buffer with a closed canopy of native woody and herbaceous species. Mature trees along stabilized streambanks will provide shade that reduces in-stream water temperature thereby allowing a corresponding increase in dissolved oxygen. A restored riparian buffer may also filter runoff flowing into Buffalo Bayou from adjacent land uses. Lastly, reestablishing geomorphic floodplain connectivity through the construction of bankfull benches may enhance water quality through reduced flow velocity, filtration, and promoting normal sediment transport processes. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Chadwick, Susan	188.	The permit application clearly states (p. 453) that the project will not achieve the stated goal (p. 13) of "improving water quality," nor is there any evidence that the project will	Buffalo Bayou is listed as impaired for bacteria by the TCEQ with levels far exceeding the water quality standard of 126 MPN/100ml for *E. coli* bacteria. Bacteria are found

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		achieve the stated goal (p. 13) of "reducing erosion and sedimentation." Despite this conclusion, the permit application falsely implies (p. 453) that reduced sediment from within the project area "should" reduce bacteria levels in the waters of Buffalo Bayou, contrary to accepted science. The permit application offers no evidence of the type or source of bacteria in the water that would be reduced by reducing sediment from within the project area, how, or why. The permit application states explicitly that the project area receives a "high sediment supply from upstream portions of the stream" (p. 446) and contributes only 359 tons of soil erosion per year, an infinitesimal annual amount, equivalent to 9 inches of soil spread between the 20- and 40-yard lines of a football field. The permit application offers no evidence that any of this eroded soil from within the project area is contaminated with bacteria.	within the water column but also associate with sediment. Buffalo Bayou sediments harbor active bacteria and then, when eroded, suspend the bacteria back into the water based on research completed by Dr. Robin Brinkmeyer in 2014. This project, by stabilizing the streambanks and reducing sediment erosion rates, will positively impact water quality. Bacteria loading in the stream sediments and water column are being monitored throughout the project to determine the effectiveness of streambank stabilization methods. Without the project, there is no plan to reduce erosion and improve the water quality on this reach of Buffalo Bayou. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium which will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou. Additional water quality benefits may be realized through the proposed revegetation of streambanks and the riparian buffer with a closed canopy of native woody and herbaceous species. Mature trees along stabilized streambanks will provide shade that reduces in-stream water temperature thereby allowing a corresponding increase in dissolved oxygen. A restored riparian buffer may also filter runoff flowing into Buffalo Bayou from adjacent land uses. Lastly, reestablishing geomorphic floodplain connectivity through the construction of bankfull benches may enhance water quality through reduced flow velocity, filtration, and promoting normal sediment transport processes.
Chadwick, Susan	189.	The permit application repeatedly refers to undocumented bank failures and proposes to obliterate valuable geologic features such as high Pleistocene bluffs (p. 597) that have little changed in more than a hundred years, as well as ancient sandstone ledges and beautiful red and ochre clay banks that are the historic heritage of all the people of	The objective of this project is to stabilize the eroding banks of the bayou and to preserve the existing stormwater carrying capacity of the bayou. Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying

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		Houston. The 2004 Conservation Master Plan for Memorial Park found in an extensive hydrological study "of the bayou's dynamics and stability... that, after adjusting to increased urban runoff and water management structures upstream, the bayou is vertically and horizontally stable, i.e., it is not deepening its channel nor is it dramatically widening its path" (p. 16, MPC Master Plan).	unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion severely erodes the banks, public and private property along the bayou is threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the destruction of habitat and vegetation along portions of the bayou, and threats to public and private property. HCFCD recognizes that several sandstone rock outcrops exist within the proposed project reach. Many of the exposed rock outcrops have already begun falling into the channel streambed from ongoing streambank erosion and instability within the reach. Without the proposed restoration, these rock outcrops will continue to be eroded away from the streambanks and bed. HCFCD will attempt to avoid impacts to the naturally occurring rock outcrops where possible if overall channel stability is not compromised. The proposed design for restoring stable banks in areas where severe erosion has occurred on the outside of meanders calls for the installation of toe wood along the base of these eroded areas to a location extending out from the existing eroded banks into the bayou. The installation of earthen coir lifts will occur above the placed toewood, and will continue in a "stairstep" pattern up to the existing eroded high bank location, essentially preserving the existing eroded high bank in place. No mature vegetation located along the high banks of the project will be impacted by the reestablishment of stable banks from the existing high banks out into the bayou. Restoring these existing degraded locations will instead allow for the reestablishment of vegetation along the banks of the bayou where none currently exists, and allow for the preservation of the existing high bank bluffs in their current location.
Chadwick, Susan	190.	The permit falsely claims (p. 13) that since the project will provide "an overall aquatic benefit as demonstrated through the use of the USACE Galveston District's Level 1 SCA	The Interim Level 2 SCA Procedure for Intermittent Streams with Perennial Pools, Perennial Streams and Wadeable Rivers with Impacts Greater than 500 Linear

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		Methodology," compensatory mitigation is not necessary." However, there is no Overall Aquatic Benefit (p. 453). HCFCD uses the USACE Level 1 SCA Methodology when the USACE SCA Guidelines for June 2013 require that "projects proposing impacts to...perennial streams, and wadeable rivers with proposed impacts of 500 linear feet or greater shall use the Level 2 SCA Procedure" (p. 7). The impact of the proposed project is some 5,920 to 5,008 linear feet, far greater than 500 linear feet. Level 2 SCA Methodology should have been applied.	Feet was published on March 26, 2014, HCFCD submitted the IP application for this project on April 8, 2014. At the time of the release of the Interim Level 2 Assessment, HCFCD had the Level I assessment already completed and the preparation of the IP application almost completed. Additionally, the project reach of Buffalo Bayou is not considered wadeable and would not the requirements for review under the Level 2 assessment. HCFCD will be completing pre- and post- construction geomorphic monitoring and in-stream macroinvertebrate and fish monitoring; please refer to the MPDP Monitoring Plan for more detailed information.
Chadwick, Susan	191.	For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." By this definition, in part due to the frequent high flows of water released from upstream dams, much of the riparian forest along Buffalo Bayou in the project area should be considered a type of wetland, along with the 28 wetlands in the area identified by the HCFCD in its permit application.	Per USACE wetland delineation procedures, specific criteria must be met for an area to qualify as wetland. As stated in the wetland delineation report, the project area was investigated and delineated pursuant to the 1987 Corps of Engineers Wetlands Delineation Manual and the 2010 USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0. The wetland delineation findings were verified by the USACE on February 16, 2012.
Crocker, Jonathan Alan	192.	Proponents claim that the water downstream is degraded by sediment and bacteria coming from the park area. That is simply laughable, considering the erosion and deposition that occurs uninterrupted for 20 miles upstream from the park to Addicks Dam and downstream all the way to the bay.	An initial assessment of the entire length of Buffalo Bayou was completed from the Barker Reservoir located on the west side of Harris County, starting at Texas State Hwy. 6, downstream to the Houston Ship Channel. This includes the upper and lower reaches of Buffalo Bayou that were originally rectified by the USACE (widened, deepened, and realigned for Flood Damage Reduction and navigation purposes in the mid-20th Century), and the portion of Buffalo Bayou in between that was left in its current state at the time. Sediment load assessment was conducted as part of the preliminary project design. Sediment load modeling by HCFCD design consultants determined that the sediment loading from this reach of the bayou represents a substantial contribution to the overall total sediment loading to Buffalo Bayou given the relatively short length of the proposed project in comparison to the overall length of

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			Buffalo Bayou. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium that will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou.
Dishberger, Michael and Debra	193.	We request the USACE not grant the permit based upon the current HCFCD design. Living on the bayou, we have seen and continue to see erosion taking place. But that is the nature of rivers, they move around on their own to reach a natural state. The work done here will produce tons of new silt flooding our waters as the tractors rip into the current banks.	Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks. Sediment load assessments were conducted as part of the preliminary project design. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium that will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou.
Duson, Avon S.	194.	I would also like to ask for a statement that would say exactly any impact the MPDP would have on Buffalo Bayou.	Please refer to the overall design, stated impacts to waters of the U.S, and the proposed vegetated areas that were included in the IP for impacts to this stretch of Buffalo Bayou. Improvements to the bayou's dimension, pattern, and profile within this stretch will allow the streambed to establish a dynamic equilibrium that will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou overall.
Heins, William	195.	The access of earth-moving equipment to the bayou will require some kind of access road, presumably paved, and	Under the current plan, the project site will have one access point leading from Memorial Drive down to the

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		presumably from the COH facility on the south side of Memorial Dr., west of Crestwood St. This access road would fundamentally alter the character of the multi-use trails between the facility and the bayou. In addition, the proposed north bank modification outlined in Sheet 14 of the preliminary design would dam off the outlet of a significant tributary drainage (labeled as "gully" on the plan). This dam would flood several acres of park land that is traversed by strands of the train network, effectively Balkanizing the territory and prohibiting transit from one part of the park to another. The resulting swamp would probably also serve as a prolific breeding ground for mosquitoes. The net effect would be to eliminate mountain biking, trail running, and hiking from the part of Memorial Park bordering on the project.	bayou, if any changes are made to the proposed access it will be coordinated with the USACE as appropriate. This access point will be located on COH property and has been coordinated with the HPARD who is responsible for managing Memorial Park. An access road will be created from the backside of the HPARD maintenance facility down the north bank of Buffalo Bayou to the stream bed of the bayou. This construction access road will require the clearing of trees and vegetation to gain access to the channel. The exact location of the road will be determined in the field prior to beginning construction so that the most direct and least damaging route can be established and any notable trees located by the project vegetation inventory can be avoided. Upon completion of all work associated with the project, the construction access road will be left in place and turned over to HPARD for their use. The proposed project does not include the installation of any features that will restrict the normal flow of any tributaries or drainage swales that outfall into the proposed project area. The location mentioned specifically by the commenter will be graded to transition into the adjacent drainage tributary and provide for a more stable confluence area between the two drainage areas.
Heins, William	196.	Cutting the access roads will create significant adverse effects on the recreation and aesthetic value of Memorial Park (40 CFR §230.10 c 4). The proposed access roads will cut across the Green Trail, which is the most heavily travelled and highly regarded off-road bicycle route in all of Memorial Park. Building roads that can be transited by the heavy excavation equipment necessary for the channel reconstruction will completely destroy the riding experience in this part of the park. Further, the more westerly of the access roads is intended to cut through the deepest, most dense part of the Memorial riparian forest. The deeply incised meandering topography of the tributary gullies to Buffalo Bayou in this part of the forest is a remarkable geomorphic feature that is not observed elsewhere. It is	Access to the project reach for recreational purposes will be limited during construction; however, there would be no long-term impacts. Only one officially recognized park trail will be crossed, which will remain open with a traffic control flagman in place for the duration of the project, and there will be only one access point to the streambed of the bayou.

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		difficult to quantify the recreation and aesthetic value of a landscape, but the Code of Federal Regulations clearly says you have to take that into account. I am here to tell you from long, daily, personal experience on this landscape that the proposed project will be all pain and no gain from a recreational and aesthetic point of view.	
Heins, William	197.	I am concerned that the headline problems the project are supposed to address, namely sediment yield from the project area and sediment deposition in downstream recreation areas, will not be affected by the project. It won't solve the problem it is designed for.	Sediment load assessment was conducted as part of the preliminary project design. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium that will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks in addition to decreasing sediment load from the ongoing mass wasting and streambank erosion within the project reach.
Heins, William	198.	According to the BANCS assessment of the target stream segment (presented by HCFCD at a public meeting on December 17, 2013), the 6,925 feet of shoreline along the project reach can be expected to erode ~276 yd3 per year. This amount is probably not much different than the amount of sediment deposited on the Sabine St. canoe launch in one high water event as documented in the same presentation. This simple attempt at mass balance points to the obvious fact that the Memorial Park-River Oaks Country Club area is only a tiny fraction of the story in the sediment budget of Buffalo Bayou. The fact that Buffalo Bayou would be shortened by about 20% by the project suggests that higher velocity flows down the steepened gradient might actually mobilize more sediment from the bayou bed downstream from the project than is currently the case. If the project were allowed to continue, there should be a more holistic assessment of sediment budgets to determine if there is even a problem to be solved within the area of the proposed work.	Sediment load assessment was conducted as part of the preliminary project design. Sediment load modeling by HCFCD design consultants determined that the sediment loading from this reach of the bayou represents a substantial contribution to the overall total sediment loading to Buffalo Bayou given the relatively short length of the proposed project in comparison to the overall length of Buffalo Bayou. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium that will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou.
Heins, William	199.	Based on 30 years as a professional geologist, and as a daily user of the forest in Memorial Park adjoining the bayou, I conclude that the project will cause or contribute to significant degradation of the waters of the United States in two specific ways:	Under the current plan, the project site will have one access point leading from Memorial Drive down to the bayou, if any changes are made to the proposed access it will be coordinated with the USACE as appropriate. This access point will be located on COH property and has been coordinated with the HPARD who is responsible for

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		First, cutting access roads to the demonstration project from the COH Memorial Field Operations site will deliver sediment pollution downslope to Buffalo Bayou, affecting in-stream aquatic habitat (40 CFR §230.10 c2). The "NCD" is intended to "efficiently transport" the water and sedimentation delivered to the treated stretch of bayou; it does not consider an extra contribution of sediment from upslope, which currently does not exist because the area is effectively mantled with riparian forest. The 276 cubic yards of sediment documented by the HCFCD to be produced from the ~10 acres of bayou banks under current conditions will likely be eclipsed by the sediment generated when a greater area is stripped of trees and driven across by heavy machinery accessing the construction site. There is no mention in the plan how access to the bayou will be accomplished, nor how the damage will be mitigated. There is only a map of what area will be razed.	managing Memorial Park. An access road will be created from the backside of the HPARD maintenance facility down the north bank of Buffalo Bayou to the stream bed of the bayou. This construction access road will require the clearing of trees and vegetation to gain access to the channel. The exact location of the road will be determined in the field prior to beginning construction so that the most direct and least damaging route can be established and any notable trees can be avoided. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. HCFCD will utilize the JTF Storm Water Management Handbook for Construction Activities (2006 Edition) and Storm Water Management JTF Storm Water Management Program: Minimization Design Criteria for Implementation of Certain Best Management Practices for Storm Water Runoff Treatment Options (2001 Edition). From these guidelines, BMP and a SWPPP have been developed to reduce turbidity and total suspended solids during construction. The SWPPP, including specific BMPs to be utilized, will be finalized during the final design of the proposed project. HCFCD's planting plan will include the installation of native grass mix that may include a portion of Bermuda grass for

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			initial site stabilization and native trees and shrubs for the long-term reestablishment of a healthy, sustainable riparian forest along the proposed project reach. The current planting plan calls for native tree and shrub species to be planted from the toe of the bank to the top of the bank with regard to proper hydrological zone placement.
Janzer, Mark	200.	The submittal provides riparian zone scores for the existing condition along the project alignment (beginning page 532). I do not see that the proposed plans tally (by total disturbed area) riparian zone scores for the proposed condition.	The Riparian Buffer Parameter was evaluated using the methodology outlined in the USACE Galveston District SCA (2013) and guidance provided by USACE Galveston staff.
Kondolf, G. Mathias	201.	The HCFCD proposal does not justify the need for the proposed intervention, with its multiple impacts. For example, on p. 37 (of 658) the permit application states, "Overall geomorphic assessment comment(s): The stream is recovering; the restoration project will decrease the time needed for natural recovery and allow protection of surrounding property." The permit application does not specify what the stream is recovering from, how it is recovering, and how the disturbance created by the proposed project would "decrease the time needed for natural recovery." Just the opposite would seem to be the case, assuming the stream is in fact recovering from something. A nuanced reading of the statement suggests that the real goal is "protection of surrounding property," i.e., preventing the banks from moving.	HCFCD has conducted assessments of the channel banks along the entire reach of Buffalo Bayou, as well as extensive assessments of the channel banks along the proposed project reach to determine the conditions of the bayou, and the appropriate repair methods for the proposed project reach. These assessments include a hydraulic model review, visual assessment, BEHI assessment, NBS assessment, BANCS assessment, woody debris load mapping, sediment transport assessment, stable channel reach review, and regional channel curve review. The overall compilation of data indicated that in order to stabilize the banks of the bayou, energy dissipating measures (i.e., bank full benches, a pool and riffle system) and the use of in-stream structures (i.e., toe wood) must be used to work in conjunction with one another to reduce shear stress from the banks of the bayou and allow for long-term, sustainable stability of the banks through the reestablishment of vegetation along the bayou banks and the reestablishment of ecological functions where possible. Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion severely erodes at the banks, public and private property along the bayou is

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			threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the destruction of habitat and vegetation along portions of the bayou, and threats to public and private property.
Landon, Helen J.	202.	The implication that this project would slow or stop the flow of silt down the bayou is ridiculous. Silt flow will happen, and in disturbing the banks will only add to the problem as the destruction of vegetation will cause more runoff and thus more silt.	Sediment load assessment was conducted as part of the preliminary project design. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium which will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks in addition to decreasing sediment load from the ongoing mass wasting and streambank erosion within the project reach. HCFCD will utilize the JTF Storm Water Management Handbook for Construction Activities (2006 Edition) and Storm Water Management JTF Storm Water Management Program: Minimization Design Criteria for Implementation of Certain Best Management Practices for Storm Water Runoff Treatment Options (2001 Edition). From these guidelines, BMP and a SWPPP have been developed to reduce turbidity and total suspended solids during construction. The SWPPP, including specific BMPs to be utilized, will be finalized during the final design of the proposed project.

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Martinez, Aramis	203.	Another goal of the project is to control the rate of erosion along the banks of the bayou. Again, this goal cannot be achieved by the project because it is fundamentally controlled by factors outside the scope of the project. The increased rate of erosion in recent years is not caused by the shape of the river, either in cross-sectional profile or in the shape of the bayou over the length of the demonstration project. The increased rate of erosion is the result of increased amounts of water being released from reservoirs upstream of the demonstration project. This increased rate of erosion will continue just as long as water is released at a greater rate. The shifting of the banks of the bayou is a natural process and will continue even if the project is carried out because it is how rivers adjust to changes in their environment.	The proposed project design is based on an assessment of the entire Buffalo Bayou watershed which includes the influence of the two upstream reservoirs, Addicks and Barker, and the previously rectified portions of the bayou upstream and downstream of the proposed project reach. HCFCD's design proposes to address the current problems with channel stability identified in this reach of Buffalo Bayou by focusing on the geomorphological functions of the bayou, which have lost function as a result of these watershed and channel modifications. Sediment load assessment was conducted as part of the preliminary project design. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium that will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks in addition to decreasing sediment load from the ongoing mass wasting and streambank erosion within the project reach.
Martinez, Aramis	204.	HCFCD has not released any results of hydraulic or hydrologic modeling of the impact the demonstration project would have. As far as the public can tell, this modeling was not even attempted by either the contractor that was hired to design the project or HCFCD. HCFCD has no idea whether they could expect the demonstration project to achieve its goals. This fundamental lack of due diligence on the part of HCFCD is sufficient grounds to deny the permit until such time as this modeling is done.	The preliminary design stage included many studies such as the hydraulic model analysis. For Hydrology and Hydraulics modeling: FEMA's effective floodplain model (both HEC-HMS and HEC-RAS) for Buffalo Bayou from HCFCD's Model and Map Management (M3) System was used as the base model for this project. Both steady and unsteady flow models were run to compare the current conditions to the proposed conditions. The steady state model is the official model used by the FEMA. Using the steady state model is a requirement to document that the project does not raise the regulatory floodplains anywhere on Buffalo Bayou (headwaters to Houston Ship Channel) before the project can be approved by the COH, FEMA and HCFCD. The models have been reviewed by HCFCD and the COH, acting as the local floodplain administrator. The COH reviewed the hydraulic model used for the project and is prepared to issue a certificate of no rise for the project subsequent to the final submittal of the sealed 100-percent project plans for their approval.

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Martinez, Aramis	205.	The general public will not benefit from the demonstration project. There are many recreational users of Buffalo Bayou in the area affected by the demonstration project. The destruction of habitat will reduce the amount of eco-tourism to the Houston area. Runners and cyclists will lose one of the main trails in Memorial Park. People recreationally kayaking and canoeing through the area will lose much of the beautiful environment we now enjoy.	Access to the project reach for recreational purposes will be limited during construction; however, there would be no long-term impacts. Only one officially recognized park trail will be crossed, and it will be left open for the duration of the project with a traffic control flagman on-site and there will be only one access point down to the streambed of the bayou. . The overall goal of the project is to improve the stability of Buffalo Bayou, so that it will not erode so severely and can be enjoyed more fully by the public. Field reconnaissance identified the physical degradation of the bayou through Memorial Park. The COH owns Memorial Park and is concerned about the erosion threatening the integrity of the parkland on the north side of the bayou. Erosion repair to the north sideslopes will benefit Memorial Park in this area. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, and HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Overhanging riparian vegetation will be preserved in areas

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			where the streambanks remain stable and mature woody vegetation still exists. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks.
Martinez, Aramis	206.	The demonstration project cannot achieve its stated goals using the proposed plan. One of the goals of the project is to improve water quality levels and control bacteria levels in bayou water. However, this goal cannot be achieved by the demonstration project because these issues result from runoff from the surrounding watershed area. The project cannot address the surrounding watershed and thus cannot improve this water quality issue.	Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium that will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou. Additional water quality benefits may be realized through the proposed revegetation of streambanks and the riparian buffer with a closed canopy of native woody and herbaceous species. Mature trees along stabilized streambanks will provide shade that reduces in-stream water temperature thereby allowing a corresponding increase in dissolved oxygen. A restored riparian buffer may also filter runoff flowing into Buffalo Bayou from adjacent land uses. Lastly, reestablishing geomorphic floodplain connectivity through the construction of bankfull benches may enhance water quality through reduced flow velocity, filtration, and promoting normal sediment transport processes. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mobley, Diana	207.	My primary point on water quality is regarding the bacteria levels in the bayou. Currently, there is *E. coli* present in the water, which is supposedly for recreational use. The	Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium that will keep erosive flows concentrated in the

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		source of these bacteria is from dumping upstream. This project will not improve upon that issue whatsoever.	center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou. Buffalo Bayou is listed as impaired for bacteria by the TCEQ with levels far exceeding the water quality standard of 126 MPN/100ml for *E. coli* bacteria. Bacteria are found within the water column but also associate with sediment. Buffalo Bayou sediments harbor active bacteria and then, when eroded, suspend the bacteria back into the water based on research completed by Dr. Robin Brinkmeyer in 2014. This project, by stabilizing the streambanks and reducing sediment erosion rates, will positively impact water quality. Bacteria loading in the stream sediments and water column are being monitored throughout the project to determine the effectiveness of streambank stabilization methods. Without the project, there is no plan to reduce erosion and improve the water quality on this reach of Buffalo Bayou. Additional water quality benefits may be realized through the proposed revegetation of streambanks and the riparian buffer with a closed canopy of native woody and herbaceous species. Mature trees along stabilized streambanks will provide shade that reduces in-stream water temperature thereby allowing a corresponding increase in dissolved oxygen. A restored riparian buffer may also filter runoff flowing into Buffalo Bayou from adjacent land uses. Lastly, reestablishing geomorphic floodplain connectivity through the construction of bankfull benches may enhance water quality through reduced flow velocity, filtration, and promoting normal sediment transport processes. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream

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			macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mobley, Diana	208.	The permit request submitted is quite lengthy; however, the plans do not appear to be complete. I noticed on the drawings that it is stated "80% PLANS, NOT FOR CONSTRUCTION." I know minute details can be left out of plans in early stages, but for a project such as this, I do not believe 80% plan completion during permitting is enough. My interpretation is that this leaves a large portion of the plans undefined. In order to be able to comment on a project of this magnitude and fully understand it, it must include complete plans and become a static document for a fixed duration of time, which has not occurred. Furthermore, I have concern that appropriate hydrology studies haven't been completed to understand the full impact of the remediation project. On page 37 of the application, on the NCD Review Checklist, question 1.4d inquires about hydrology and hydraulic models. The response provided "NA". The project instead states Harris County Regional Curves were used in 1.4b. I am not familiar with the curves, which makes it difficult for me to understand the basis of the conclusions reached by KBR.	The 80% design plans that were submitted to USACE contain the final design. The plans are marked "80% draft" because they are not ready to be bid for construction; this language merely refers to a contract milestone for HCFCD's engineering consultant. The overall design, stated impacts to waters of the U.S, and the proposed vegetated areas will not change. The plans were submitted to obtain an IP, and while the permit application is under review, HCFCD has been working with the engineering consultant to finalize the construction notes and specs found on the design plans. HCFCD has conducted assessments of the channel banks along the entire reach of Buffalo Bayou, as well as extensive assessments of the channel banks along the proposed project reach to determine the conditions of the bayou, and the appropriate repair methods for the proposed project reach. These assessments include a hydraulic model review, visual assessment, BEHI assessment, NBS assessment, BANCS assessment, woody debris load mapping, sediment transport assessment, stable channel reach review, and regional channel curve review.
Preservation Texas	209.	The cultural resource report included in the applicant's submittal is flawed in that it is premised on a project that will involve "minimal changes in the channel and stream flow [that] will not significantly alter the landscape, appearance or feel of the surrounding area." To the contrary, this project will radically alter the landscape, appearance, and feel of the surrounding area to take on the character of a landscaped drainage ditch. Scattered shovel tests along the water's edge are completely insufficient to demonstrate that the complete removal of the banks will not have a permanent, negative impact on historic and cultural resources.	HCFCD has completed extensive cultural resource surveys within the project area and has coordinated with the THC and the USACE to determine if the proposed project will have any impacts on cultural sites. It is the THC's opinion that impacts within the bayou will not have an effect on National Register eligible historic properties or to contributing elements of any designated State Antiquities Landmarks, including Camp Logan. In addition, fieldwork and historic research completed along the banks of the bayou thus far has concluded that there is no indication that archaeological deposits or historic standing structures associated with Camp Logan or other cultural resources will be affected by the proposed project. The THC and

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			USACE are currently reviewing project plans to verify this conclusion. The archaeological survey was designed based on the plans that were available at the time. Archaeologists, HCFCD, USACE, and the THC are developing an inadvertent discoveries plan as well as an archaeological monitoring plan for the project construction that will be refined as project construction plans are finalized.
Salzhandler, Frank	210.	Generally speaking, there are major problems regarding compliance with the 404(b)(1) guidelines that are binding on permits such as these, as well as issues regarding compliance with the National Environmental Policy Act and the National Historic Preservation Act. Attached is the original application, including letters of support from the Harris County Historical Commission and the Houston Archeological Society, in the PDF file. This application was selected by Preservation Texas as one of Texas' most endangered places. An article and comments on that designation were provided.	HCFCD has completed extensive cultural resource surveys within the project area and has coordinated with the THC and the USACE to determine if the proposed project will have any impacts on cultural sites. It is the THC's opinion that impacts within the bayou will not have an effect on National Register eligible historic properties or to contributing elements of any designated State Antiquities Landmarks, including Camp Logan. In addition, fieldwork and historic research completed along the banks of the bayou thus far has concluded that there is no indication that archaeological deposits or historic standing structures associated with Camp Logan or other cultural resources will be affected by the proposed project. The THC and USACE are currently reviewing project plans to verify this conclusion. The archaeological survey was designed based on the plans that were available at the time. Archaeologists, HCFCD, USACE, and the THC are developing an inadvertent discoveries plan as well as an archaeological monitoring plan for the project construction that will be refined as project construction plans are finalized.

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Smith, Griffin	211.	Decisions about such projects should consider not only erosion and water quality but wider effects. The proposed project doesn't even explain how it would reduce erosion. Also, the HCFCD's application states it will not improve water quality (page 452).	Sediment load assessment was conducted as part of the preliminary project design. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium that will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou. Buffalo Bayou is listed as impaired for bacteria by the TCEQ with levels far exceeding the water quality standard of 126 MPN/100ml for *E. coli* bacteria. Bacteria are found within the water column but also associate with sediment. Buffalo Bayou sediments harbor active bacteria and then, when eroded, suspend the bacteria back into the water based on research completed by Dr. Robin Brinkmeyer in 2014. This project, by stabilizing the streambanks and reducing sediment erosion rates, will positively impact water quality. Bacteria loading in the stream sediments and water column are being monitored throughout the project to determine the effectiveness of streambank stabilization methods. Without the project, there is no plan to reduce erosion and improve the water quality on this reach of Buffalo Bayou. Additional water quality benefits will be realized through the proposed revegetation of streambanks and the riparian buffer with a closed canopy of native woody and herbaceous species. Mature trees along stabilized streambanks will provide shade that reduces in-stream water temperature thereby allowing a corresponding increase in dissolved oxygen. A restored riparian buffer may also filter runoff flowing into Buffalo Bayou from adjacent land uses. Lastly, reestablishing geomorphic floodplain connectivity through the construction of bankfull benches may enhance water quality through reduced flow velocity, filtration, and promoting normal sediment transport processes.
Wilson, A. K.	212.	The wording of the notice indicates that the proposed "NCD" techniques create a stable stream reach that will	The proposed project was designed based on geomorphic assessments conducted within the entire Buffalo Bayou

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		neither aggrade nor degrade, will minimize shear stress, and WILL improve aquatic resource function. This is fortune-telling and therefore misleading. This should be clarified and a structural assessment should be included as part of the permit record for review. I believe the project sponsors have a heavy burden of proof to bear in demonstrating that these techniques are effective in order for probable impacts (e.g., upon failure) to be adequately considered.	watershed and additional geomorphic assessments conducted through the specific proposed project reach. The assessments included: ● Review of HCFCD's published regional general curves for stable streams in the region ● Sediment load assessments and mapping ● Wood load mapping ● NBS assessment ● BEHI assessment ● BANCS ● Stable channel reference reaches within the Buffalo Bayou watershed ● Review of historical USGS gauge data/peak flows and USGS aerial photography ● Review of the FEMA hydraulic model for the channel system ● Topographical survey of the proposed project site ● Vegetation inventory of the project site ● Valley type classification based on Rosgen's method All of these assessments, along with supporting data collection activities, were conducted in an effort to create a proposed restoration project with proper regard for the bayou system based on geographic location and stream bed type. The proposed project will include an extensive planting and long-term vegetation monitoring plan to ensure the long-term goal of reestablishing a closed canopy riparian forest along the project reach to restore as much historical function to the bayou system as possible. HCFCD's geomorphic assessments, hydrologic and hydraulic analyses, vegetation studies, and overall design are based on proven fluvial geomorphological principles. The proposed NCD methods includes the following design elements to restore the proposed project reach to a stable dimension, pattern, and profile, based on the bayou's altered hydraulic model: ● reestablishment of a natural pool and riffle system within the bayou's profile;

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			● reconnection of the stream to its geomorphic floodplain by creating bankfull benches in the bayou's dimension; ● restoration of bankfull channel dimensions based on existing watershed hydrology influences and regional hydraulic geometry curves (regional curves) to mimic the natural channel forming flow and improve natural sediment transport processes; ● installation of woody debris toe protection (toe wood) to stabilize sensitive bank areas with a less hardened and more natural material to this region that also improves aquatic habitat, and reduces shear stress from the toes of the banks; ● planting appropriate native vegetation in the proper hydrologic zones along the proposed areas of active restoration to promote streambank stability through root mass, pollutant filtration, in-stream shading and cover, and habitat enhancement; and ● preservation of existing native vegetation and stable channel conditions where possible.
Wilson, A. K.	213.	It is my understanding that should Memorial Park lose even a sliver of its property, the whole (1,466 acres) reverts to the Hogg family successors. I imagine this has been considered, as the City has had input, but there is no mention of the issue and no reassurance to that effect in the published notice. Memorial Park would lose land in the area of Transect 6, for example, if the property line were to be the bayou centerline.	No physical property ownership will be exchanged in the easement swap, only the abandonment of current HCFCD easement and the conveyance of new easements from the COH to HCFCD. Coordination with the COH includes discussions with the reverter interests.
Wilson, A. K.	214.	I didn't notice any mention of a study that demonstrates the project wouldn't inadvertently worsen flood conditions. A study should be made and referenced, or discussion explaining why this is not relevant should be provided.	The objective of this project is to stabilize the eroding banks of the bayou and to preserve the existing stormwater carrying capacity of the bayou. The hydraulic model shows the proposed project will have a no rise effect on the bayou. The models have been reviewed by HCFCD and the COH, acting as the local floodplain administrator. The COH reviewed the hydraulic model used for the project and is prepared to issue a certificate of no rise for the project subsequent to the final submittal of the sealed 100-percent project plans for their approval.

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Alternatives			
Battey, James M. Beishir, Olga Eckenfis, Michael Emde, William Evans, Bruce Evans, Richard H. Gederberg, Silvia Hannan, Nancy Hatcher, Eileen Lowiclu, Becky Manley, James Parker, Ray C. Rose-Molina, Peter Shen, Lan Spolyar, Mary Thomas, Judy Walker, Kelly Whittlesey, Karin	215.	CWA Section 404 (b) (1) states that the applicant must present alternative plans if there are alternative plans that would provide less adverse impacts on the aquatic ecosystem. In its 719-page permit application, HCFCD spent two pages discussing alternative plans, and two of those plans were slight and not being considered by almost anyone. Alternative methods for addressing slope failure have been suggested, but HCFCD has not evaluated them with an open mind. In accordance with Section 404 (b)(1), 40 CFR 230.10 (a), HCFCD should have this permit denied due to the lack of discussion of alternative, less harmful plans that exist, as required.	Assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included, leave the reach alone (no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation). Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful, holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. HCFCD has consulted with experts in the field of fluvial geomorphology and NCD who have been successfully conducting stream restoration projects since the 1960s. NCD has been successfully implemented and proven across the United States and other parts of the world. Furthermore, HCFCD has already successfully applied various NCD principles to projects on Cypress Creek, Mason Creek, Vogel Creek, Buffalo Bayou, and Rummel Creek in Harris County, Texas.
Harris, Carol M. and	216.	We are worried about the destruction of natural habitat	Due to the erosive nature of high flows in the bayou

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Almroth, Arne		along Buffalo Bayou, and the loss of the ecosystem that will occur because of this brutal carving up of the bayou's edges. We understand there are less destructive and better solutions for erosion control according to river experts, which the Clean Air Act requires. These need to be looked into. Houston needs all the trees it can get, and this plan will wreck magnificent decades-old trees that will take a lifetime to replace.	caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. HCFCD has consulted with experts in the field of fluvial geomorphology and NCD who have been successfully conducting stream restoration projects since the 1960s. NCD has been successfully implemented and proven across the United States and other parts of the world. Furthermore, HCFCD has already successfully applied various NCD principles to projects on Cypress Creek, Mason Creek, Vogel Creek, Buffalo Bayou, and Rummel Creek in Harris County, Texas.
Batten, Jr., George W.	217.	The application has a section on alternative methods, but it, and presumably the investigation of alternatives, is very superficial. There are a number of good alternatives; Appendix A of this document has some related ideas. The public should be presented with good alternatives and be allowed to submit comments about them. Evidence of such degradation appears in the streambank modifications done at Houston Country Club, which modifications were done without appropriate permits, as I understand it. The project design team must be called on	Natural Channel Design methods are based on the principles of fluvial geomorphology and will restore the proposed project reach. Assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included, leave the reach alone (no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation). Due to the erosive nature of high flows in the bayou

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		to make significant modifications to the project. My information is that Section 404(b)(1) guidelines require the USACE to consider the least damaging practical alternatives for such a project. Although a detailed design is not available at this time, it appears that such alternatives are available. I request that the USACE require HCFCD to present such alternatives in a form that can be compared with the current proposal and make it available for public evaluation.	caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. HCFCD has consulted with experts in the field of fluvial geomorphology and NCD who have been successfully conducting stream restoration projects since the 1960s. NCD has been successfully implemented and proven across the United States and other parts of the world. Furthermore, HCFCD has already successfully applied various NCD principles to projects on Cypress Creek, Mason Creek, Vogel Creek, Buffalo Bayou, and Rummel Creek in Harris County, Texas.
Blackburn, Jr., James B.	218.	The 404(b)(1) guidelines require the adoption of the least environmentally damaging practicable alternative (LEDPA). Here, the applicant has not developed this least-damaging alternative. In fact, what has been proposed causes unnecessary environmental damage to achieve the project purpose, although confusion exists as to exactly what the purpose of this project is. Recommendation: Based on hydrologic and hydraulic analysis of Buffalo Bayou and the Park Vision, the recommended course of action for the bayou is simply to	Natural Channel Design methods are based on the principles of fluvial geomorphology and will restore the proposed project reach. Assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included, leave the reach alone (no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation). Changes in stormwater flow caused by urbanization, and

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		leave it alone and consider it as a symbol of a dynamic natural process. Memorial Park Conservation Master Plan, p. 56. [Plan provided as attachment; alternative plan prepared by Asakura Robinson and Associates also included as Attachment.]	the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion washes away the banks, public and private property along the bayou is threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the destruction of habitat and vegetation along portions of the bayou, and threats to public and private property. The assessments conducted by HCFCD's design team indicated that active restoration of the stream dimension, pattern, and profile were all required to restore the impaired geomorphic function of the stream. Lessening the footprint of this project would not achieve the project goals of fully restoring the hydrologic, hydraulic, and geomorphic stream functions.
Blake, Frank	219.	Critics of the HCFCD design have recommended that a design incorporating a reduction in the amount of linear feet of vegetation removal, and a lesser amount of bank disturbance be developed. I believe it is vitally important to investigate such an alternative.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. Lessening the footprint of this

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			project would not achieve the project goals of fully restoring the hydrologic, hydraulic, and geomorphic stream functions. Furthermore, stream condition assessments identified the proposed project footprint as having some of the highest instability ratings along Buffalo Bayou. Lessening the project footprint would subsequently leave some of these highly unstable sections of Buffalo Bayou vulnerable to continued failure and potentially threaten the stability and integrity of the restored areas in the reduced project footprint.
Botell, Mariella	220.	I agree that something has to happen to lower the rate of erosion taking place along the shores of the Buffalo Bayou. There has to be a win-win solution for all parties involved. The proposed plan by HCFCD seems heavy-handed, and the certainty of success has not been verified. There has to be a less invasive option to this dilemma. Why can't we deal with only the highly affected banks and leave the others at peace? Buffalo Bayou is a sanctuary for wildlife and people...I wish more people were aware of the gem we have along the shores of the bayou, and the only way to do this is to preserve what we have.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. Lessening the footprint of this project would not achieve the project goals of fully restoring the hydrologic, hydraulic, and geomorphic stream functions. Furthermore, stream condition assessments identified the proposed project footprint as having some of the highest instability ratings along Buffalo Bayou. Lessening the project footprint would subsequently leave some of these highly unstable sections of Buffalo Bayou vulnerable to continued failure and potentially threaten the stability and integrity of the restored areas in the reduced project footprint.

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Chadwick, Susan	221.	Section 484(b)(1) of the federal Clean Water Act requires that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem." A better and more practicable alternative that would have less adverse impact on the aquatic ecosystem would be to: ● Leave this beautiful, naturally functioning stretch of the bayou alone and let it do its work. ● Target those few areas with low riparian buffer scores with appropriate plantings and better land use practices, as recommended by virtually every academic paper and public agency in Texas and the nation. ● Address the destructive outfall problem in the Hogg Bird Sanctuary tributary as a sewer system runoff problem rather than destroying our scenic, wild tributary. ● Develop better and more uniform urban land-use management practices for runoff, stormwater management, and riparian buffer on private and public property on urban waterways.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. Lessening the footprint of this project would not achieve the project goals of fully restoring the hydrologic, hydraulic, and geomorphic stream functions. Furthermore, stream condition assessments identified the proposed project footprint as having some of the highest instability ratings along Buffalo Bayou. Lessening the project footprint would subsequently leave some of these highly unstable sections of Buffalo Bayou vulnerable to continued failure and potentially threaten the stability and integrity of the restored areas in the reduced project footprint. To create a stable dimension, pattern and profile for the Hogg Bird tributary and stabilize its banks the project design will shorten the overall length of the tributary. By creating the proper dimension, pattern and profile for the tributary, the project will reestablish accessibility to the channel's geomorphic floodplain, reduce shear stress on the toes of the slopes and allow for the reestablishment of riparian vegetation along the slopes.

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			The proposed project calls for a scour (riprap dissipation) pool to be placed in front of the outfall to dissipate erosive discharges located at the upstream limits of the Hogg Bird Tributary. The dimensions (length, width and depth) of the riprap dissipation pool are based upon the hydraulic flow (q) of the outfall pipe.	

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Hershey, Olive	222.	There are proven alternatives that must be considered, and the United States Clean Water Act requires the least damaging solution.	The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile were required to restore the impaired geomorphic stream function.
Landon, Helen J.	223.	In the early 1990's, the condo association noted that there was an erosion problem along the bayou that directly affected the bank in front of the building. We hired Robbin B. Sotir and Associates to execute a plan to save the bank with natural plantings. Nearly 15 years later, that bank still holds, even after the major flooding created by Tropical Storm Allison when the bank was completely submerged. It would seem that an unproven method of saving the banks of the bayou at taxpayer expense, with no consideration or exploration of an alternative, is created by those with ulterior motivations that are in their interests rather than the interests of the taxpayers and the community members who actually use Memorial Park.	The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile were required to restore the impaired geomorphic stream functions. Lessening the footprint of this project would not achieve the project goals of fully restoring the hydrologic, hydraulic, and geomorphic stream functions. Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. HCFCD has consulted with experts in the field of fluvial geomorphology and NCD who have been successfully conducting stream restoration projects since the 1960s. NCD has been successfully implemented and proven across the United States and other parts of the world. Furthermore, HCFCD has already successfully applied various NCD principles to projects on Cypress Creek,

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			Mason Creek, Vogel Creek, Buffalo Bayou, and Rummel Creek in Harris County, Texas.
Martinez, Aramis	224.	Given that the project cannot achieve its water quality or erosion control goals, the main beneficiaries of the demonstration project seem to be the group of people who own private land along the impacted stretch of Buffalo Bayou and the River Oaks Country Club. Their concerns about erosion are valid and should be addressed. However, the NCD methodology underlying the demonstration project's design has a controversial history of little scientific support and has resulted in few successes and many failures so far. The interests of the private landowners along Buffalo Bayou would be better served by more effective erosion control approaches.	The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile were required to restore the impaired geomorphic stream functions. Lessening the footprint of this project would not achieve the project goals of fully restoring the hydrologic, hydraulic, and geomorphic stream functions. HCFCD has consulted with experts in the field of fluvial geomorphology and NCD who have been successfully conducting stream restoration projects since the 1960s. HCFCD believes that the NCD approach used for this project is not experimental and will demonstrate to local, state, and federal public agencies, private property owners, environmental advocacy groups, and the local community that this science-based methodology is a viable alternative for conducting channel restoration projects. NCD has been successfully implemented and proven across the United States and other parts of the world. Furthermore, HCFCD has already successfully applied various NCD principles to projects on Cypress Creek, Mason Creek, Buffalo Bayou, Vogel Creek, and Rummel Creek in Harris County, Texas.
McFarland, Shawn	225.	I know you are receiving other options to get this same work accomplished and I hope that you will look closely at a less intrusive method to what I consider minor problems on this majestic waterway.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter

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			the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. Lessening the footprint of this project would not achieve the project goals of fully restoring the hydrologic, hydraulic, and geomorphic stream functions. Furthermore, stream condition assessments identified the proposed project footprint as having some of the highest instability ratings along Buffalo Bayou. Lessening the project footprint would subsequently leave some of these highly unstable sections of Buffalo Bayou vulnerable to continued failure and potentially threaten the stability and integrity of the restored areas in the reduced project footprint. HCFCD has consulted with experts in the field of fluvial geomorphology and NCD who have been successfully conducting stream restoration projects since the 1960s. HCFCD believes that the NCD approach used for this project is not experimental and will demonstrate to local, state, and federal public agencies, private property owners, environmental advocacy groups, and the local community that this science-based methodology is a viable alternative for conducting channel restoration projects. NCD has been successfully implemented and proven across the United States and other parts of the world. Furthermore, HCFCD has already successfully applied various NCD principles to projects on Cypress Creek, Mason Creek, Vogel Creek, Buffalo Bayou, and Rummel Creek in Harris County, Texas.
Mobley, Diana	226.	The permit application offers a proposed solution to the problem of erosion for the River Oaks Country Club. The solution, however, is quite drastic and negatively impacts a large amount of the bayou. Under Section 404(b)(1) guidelines, the USACE is required to consider the least damaging alternatives. A more localized approach, focusing on the areas of greatest erosion, would be more cost effective and have less negative impact on the environment and downstream. This would require less bank disturbance and vegetation removal, benefitting the wildlife.	The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile were required to restore the impaired geomorphic stream function. Lessening the footprint of this project would not achieve the project goals of fully restoring the hydrologic, hydraulic, and geomorphic stream functions. While the stream system seeks equilibrium, it continues to migrate. This proposed project will speed up what natural processes would many years to achieve by applying NCD

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		Additionally, from a tax payer's perspective, the application notes that, "The stream is recovering; the restoration project will decrease the time needed for natural recovery." While I am not convinced this is an accurate statement, nevertheless, this type of information needs to be quantified so we can fully evaluate the cost-benefit.	principles to determine the stable pattern, profile and dimension.
Smith, Griffin	227.	The proposed method is not consistently successful. It is not worth risking our natural and financial resources on this method. I request a true evaluation of viable alternative designs; for example, targeted (not wholesale) vegetated reinforced soil slope.	HCFCD has consulted with experts in the field of fluvial geomorphology and NCD who have been successfully conducting stream restoration projects since the 1960s. HCFCD believes that the NCD approach used for this project is not experimental and will demonstrate to local, state, and federal public agencies, private property owners, environmental advocacy groups, and the local community that this science-based methodology is a viable alternative for conducting channel restoration projects. NCD has been successfully implemented and proven across the United States and other parts of the world. Furthermore, HCFCD has already successfully applied various NCD principles to projects on Cypress Creek, Mason Creek, Vogel Creek, Buffalo Bayou, and Rummel Creek in Harris County, Texas. Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's

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			geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology.

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Costs/Access			
Drummond, Jessica Drummond, Mark Landon, Jerrold E.	228.	Construction costs and access to the bayou for this "restoration" work have not been addressed in the permit. This is clearly part of that 20% that is missing in the application. This must be included in the permit application. How are the bulldozers and other construction equipment going to get back into the bayou? Logically, this will require access roads to be constructed, which will require further tree removal and damage to Memorial Park. This will also impact the bike trails that currently exist in this area. Where will construction access to the bayou occur? How many access roads will be required? How wide will they be? How much vegetation will need to be cleared? How many trees will be removed? Maybe River Oaks Country Club should be considered as an access point.	Under the current plan, the project site will have one access point leading from Memorial Drive down to the bayou, if any changes are made to the proposed access it will be coordinated with the USACE as appropriate. This access point will be located on COH property and has been coordinated with the HPARD who is responsible for managing Memorial Park. An access road will be created from the backside of the HPARD maintenance facility down the north bank of Buffalo Bayou to the stream bed of the bayou. This construction access road will require the clearing of trees and vegetation to gain access to the channel. The exact location of the road will be determined in the field prior to beginning construction so that the most direct and least damaging route can be established and any notable trees can be avoided. Due to the operation of the Addicks and Barker reservoirs, little vegetation currently exists below an elevation of approximately 14 feet. The majority of heavy equipment access along the proposed project reach will take place along this currently denuded streambed and bank that is proposed for restoration. Access across the bayou will be made by sinking temporary wooden matting across the bottom of the bayou, and temporary haul roads will be created along areas of proposed no work within the bayou by utilizing temporary road beds comprised of mulch so that no critical root zones are impacted by the operations.
McFarland, Shawn	229.	If the River Oaks Country Club is the initiating client, why is the access to the bayou coming through Memorial Park?	The ROCC did not initiate the proposed project. ROCC was invited to participate in the project to demonstrate a holistic approach to stabilizing the banks of the bayou along a project reach, instead of implementing their proposed project plans to install mass gabion walls along the south bank of the bayou. In developing the proposed project plans for MPDP, ROCC offered access to the bayou from the ROCC property, however entering the bayou from the south banks created greater impacts to existing vegetation than entering the bayou from the north bank.
Wilson, A. K.	230.	If this project is intended to demonstrate a structurally	The purpose of this project is to restore a stable dimension,

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		stable, ecologically friendly design, with the end-game being to reproduce this technique along the entire "forgotten" middle reach of the bayou, this future goal should likewise be demonstrated to be plausible (e.g., would the fair market value costs of land or easements through the existing residential communities, either acquired voluntarily or through eminent domain, be prohibitive?	pattern, and profile to the proposed project reach, and it lends itself to improved ecological function to the system. The term "demonstration" refers to an example of successful urban stream restoration on a portion of Buffalo Bayou using techniques that have been used successfully to restore streams in other areas of the United States and the world. The project demonstrates to property owners along Buffalo Bayou, and other bayous and creeks in urban areas, the long-term benefits of looking at both banks of the bayou, and restoring a significant stretch (holistic approach) by utilizing a project reach approach to stabilizing the bayou rather than repairing isolated sections (spot repairs). Spot streambank erosion repairs create impacts to other portions of the bayou downstream and have had little effect on providing dissipation benefits for the stream system as a whole, and the bayou's growing erosion problem over the years. This project is not intended to be a precursor for multiple similar projects along Buffalo Bayou. Instead, it is meant to demonstrate what might be achieved by multiple property owners working together on a reach of a bayou. Wherever there is community interest in similar projects in the future, HCFCD would assess the possibility of a future project in the same manner.

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Cumulative Impacts			
Arnett, Carrie Curcio, Ken Drummond, Jessica Drummond, Mark Falloure, David Hollifield, Hannah Jane Hyde, Richard JWW "McP" Kirschke, Theresa Myers, Jean Roll Model Rudez, Michael G. Smith, Karis Sutton, Andrew Tilbury, Gillian A. Villaescusa, Julie Westbrook, Lydia Yglesias, Jerry	231.	There must be an assessment of all the impacts on Buffalo Bayou starting with releases from Addicks and Barker dams, HCFCD's proposed project at Briar Forest, habitat eradication by the unpermitted Houston Country Club project, the TIRZ 16 project at Woodway/Loop 610 West, and Buffalo Bayou Park from Shepherd to Sabine.	A cumulative impacts analysis will be evaluated by the USACE prior to the issuance of any IP.
Baumann, Marsha J. Beishir, Olga Benton, Janet Blake, Frank Brenner, Margaret Emde, Katy Emde, William Foss, Linda Funghe, Brenda Handley, Bruce Hannan, Nancy Harrison, Elizabeth Y. James, Helen Knowles, Linda Marquez, Sheryl Mead, Celeste Montague, David R. Rascoe, Cathy Redden, Joe W., Jr. Salinas, Al Spolyar, Mary Terry, Janis	232.	Probable impacts, including cumulative impacts, must be compiled to be considered by the USACE. Cumulative impacts to bayou habitat will result from multiple projects, including the ongoing Sabine to Shepherd segment, this proposed 1.25-mile segment through Memorial Park and 800 feet of the Hogg Bird Sanctuary tributary, the TIRZ 16 project at Woodway/Loop 610 West, habitat eradication by the unpermitted Houston Country Club project, and HCFCD's proposed project at Briargrove (tree survey in progress).	A cumulative impacts analysis will be evaluated by the USACE prior to the issuance of any IP.

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Ward, John R. Wilson, Jeanie Kilroy			
Abbassi, Armin Jani, Sima	233.	From early-on, HCFCD presented the demonstration project as the only feasible savior of the doomsday path that the nature had decided for our adjacent segment of the bayou, and most of our questions were answered authoritatively rather than objectively. The following are a few of many points that would justify further and less biased evaluation of the perceived problems and possible solutions around buffalo bayou: About 20 years ago, our condo community installed local barriers against erosion and planted willow trees that are still in good condition and are controlling erosion. HCFCD and KBR repeatedly rejected a similar method of localized but widespread mitigation of erosion areas as a method that just moves the problem to a different location of the bayou. But isn't the demonstration project doing the same in a larger span?	Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion washes away the banks, public and private property along the bayou is threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the destruction of habitat and vegetation along portions of the bayou, and threats to public and private property. The MPDP will restore Buffalo Bayou's equilibrium, and will ultimately protect the upper banks along this reach of Buffalo Bayou. The term "demonstration" refers to an example of successful urban stream restoration on a portion of Buffalo Bayou using techniques that have been used successfully to restore streams in other areas of the United States and the world. The project demonstrate to property owners along Buffalo Bayou, and other bayous and creeks in urban areas, the long-term benefits of looking at both banks of the bayou, and restoring a significant stretch (holistic approach) by utilizing a project reach approach to stabilizing the bayou rather than repairing isolated sections (spot repairs). Spot streambank erosion repairs create impacts to other portions of the bayou downstream and have had little effect on providing dissipation benefits for the stream system as a whole, and the bayou's growing erosion problem over the years.
Abbassi, Armin Jani, Sima	234.	They never provided a response to this question: currently a portion of the kinetic energy of the stream is lost to the erosive work. By reducing the curvature in the channel, the shear stress around the sharp turn is reduced; therefore, the stream saves its kinetic energy instead of doing erosive work. Will this kinetic energy not reveal itself downstream? But where? Since this energy is carried to outside the scope of the project: out of site out of mind. This is evidence that the project never considered the cumulative impact of the project on areas	One component of the project will be the reestablishment of geomorphic floodplain connectivity through the construction of bankfull benches. One of the benefits of this action will be reduced flow velocity. An initial assessment of the entire length of Buffalo Bayou was completed from the Barker Reservoir located on the west side of Harris County, starting at Texas State Hwy. 6, downstream to the Houston Ship Channel. This includes the upper and lower reaches of Buffalo Bayou that were originally rectified by

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		outside their scope.	the USACE (widened, deepened, and realigned for Flood Damage Reduction and navigation purposes in the mid-20th Century), and the portion of Buffalo Bayou in between that was left in its current state at the time. Through a planning-level analysis, based on field assessments and a review of existing conditions, HCFCD developed a summary assessment of the Buffalo Bayou system to utilize in identifying potential streambank stabilization projects along Buffalo Bayou that would yield the greatest measureable results for water quality, sediment reduction and overall bayou stability. Based on this assessment, it was apparent that the highest priority sites for streambank stabilization are located within the reach of Buffalo Bayou from Woodway Drive to downtown Houston. A cumulative impacts analysis will be evaluated by the USACE prior to the issuance of any IP.
Blackburn, Jr., James B.	235.	Cumulative and secondary impacts, as well as direct impacts, are required to be addressed under 40 CFR §230.11 (g) and (h)...It must be quantitatively analyzed...Before this can be permitted by the USACE, a full and comprehensive consideration of these impacts must occur, not only under 404(b)(1) but also under the National Environmental Policy Act.	A cumulative impacts analysis will be evaluated by the USACE prior to the issuance of any IP.
Gish, Sarah	236.	I have many concerns about the appropriateness of HCFCD's design for this segment of Buffalo Bayou and the major impacts it will have on water quality and wildlife. I ask that USACE deny or modify the permit on the following basis: The COH, HCFCD, USACE, and others need to look at the bayou as a whole—all 53 miles and not just this section—and to find a solution to erosion problems that is less damaging. The effect of the Addicks-Barker dam on flooding needs to be included in all evaluations of the future of the bayou. The ACE has deemed it "extremely high risk" (see write up at http://www.swg.usace.army.mil/Missions/DamSafetyProgram.aspx) and stated that the outflow of	A cumulative impacts analysis will be evaluated by the USACE prior to the issuance of any IP.

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		its water to Buffalo Bayou is cause for concern. This needs to addressed first before an invasive and expensive band-aid solution is applied.	
Wise, Landrum & Lynnea	237.	Not only should alternative techniques and approaches be fully considered for use in the area, but a broader look at out-of-channel approaches to reduce stormwater flow of Buffalo Bayou should be considered as well. (Piecemeal approval of individual proposed projects, without looking at other existing or potential projects along Buffalo Bayou, can result in very significant, negative, environmental impacts on a cumulative basis.) We therefore request that your review of this proposed project should take into account the existence of such other projects (or proposed projects). We think it should also include an examination of the potential for an upstream regional detention project in the Clodine area of Fort Bend County, which would serve to significantly decrease the flow of water into the Buffalo Bayou channel during major storm events, but without damaging the bayou's riparian environment. This approach would, in our opinion, significantly assist in flood control, and also, we expect, in a reduction of erosion in the area targeted by the proposed project.	A cumulative impacts analysis will be evaluated by the USACE prior to the issuance of any IP. Any new construction, development, or redevelopment within the watershed is subject to COH, Fort Bend County, HCFCD and Harris County requirements for detention to be included in the proposed construction project's design. The purpose of the MPDP is not to increase capacity within the proposed project reach, but to reestablish a sustainable bayou system which will preserve the existing storm water conveyance capacity through the proposed project reach.

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Design			
Arnett, Carrie Curcio, Ken Drummond, Jessica Drummond, Mark Falloure, David Gish, Sarah Hollifield, Hannah Jane Hyde, Richard James, Terrell JWW "McP" Kirschke, Theresa Knight, Susan Myers, Jean Roll Model Rudez, Michael G. Smith, Karis Sutton, Andrew Tilbury, Gillian A. Villaescusa, Julie Westbrook, Lydia Yglesias, Jerry	238.	There are solutions for erosion problems that are much less destructive, and the federal Clean Water Act requires the least damaging solution. A least-damaging solution would be to leave the bayou alone, as recommended in the 2004 Memorial Park Conservation Master Plan. But a less damaging solution is a plan reducing the amount of linear feet of vegetation removal, a lesser amount of bank disturbance, and a greater focus on areas of documented bank failure be adopted. HCFCD must document the areas of bank failure that are the supposed basis for this project. The NCD methodology being proposed is controversial, expensive, has a high failure rate, and is not appropriate for Buffalo Bayou.	HCFCD has conducted assessments of the channel banks along the entire reach of Buffalo Bayou, as well as extensive assessments of the channel banks along the proposed project reach to determine the conditions of the bayou, and the appropriate repair methods for the proposed project reach. These assessments include a hydraulic model review, visual assessment, BEHI assessment, NBS assessment, BANCS assessment, woody debris load mapping, sediment transport assessment, stable channel reach review, and regional channel curve review. The overall compilation of data indicated that in order to stabilize the banks of the bayou, energy dissipating measures (i.e., bank full benches in the bayou's dimension, a pool and riffle system in the bayou's profile, and a stable geometry in the bayou's pattern) and the use of in-stream structures (i.e., toe wood) must be used to work in conjunction with one another to reduce shear stress from the banks of the bayou and allow for long-term, sustainable stability of the banks through the reestablishment of vegetation along the bayou banks and the reestablishment of ecological functions where possible. Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion washes away the banks, public and private property along the bayou is threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the destruction of habitat and vegetation along portions of the bayou, and threats to public and private property. The MPDP will restore Buffalo Bayou's equilibrium, and will ultimately protect the upper banks along this reach of Buffalo Bayou. The term "demonstration" refers to an example of successful urban stream restoration on a portion of Buffalo

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			Bayou using techniques that have been used successfully to restore streams in other areas of the United States and the world. The project demonstrate to property owners along Buffalo Bayou, and other bayous and creeks in urban areas, the long-term benefits of looking at both banks of the bayou, and restoring a significant stretch (holistic approach) by utilizing a project reach approach to stabilizing the bayou rather than repairing isolated sections (spot repairs). Spot streambank erosion repairs create impacts to other portions of the bayou downstream and have had little effect on providing dissipation benefits for the stream system as a whole, and the bayou's growing erosion problem over the years. The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.
Baumann, Marsha J. Beishir, Olga Benton, Janet Brenner, Margaret Emde, Katy Emde, William	239.	Critics of the HCFCD design have recommended that a design incorporating a reduction in the amount of linear feet of vegetation removal, a lesser amount of bank disturbance, and a greater focus on areas of documented bank failure be adopted. Documentation is being developed.	The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and

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Foss, Linda Funghe, Brenda Goode, Debra Handley, Bruce Hannan, Nancy Harrison, Elizabeth Y. James, Helen Knowles, Linda Marquez, Sheryl Mead, Celeste Rascoe, Cathy Redden, Joe W., Jr. Salinas, Al Spolyar, Mary Terry, Janis Ward, John R. Wilson, Jeanie Kilroy			climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.
Drummond, Jessica Drummond, Mark Landon, Jerrold E.	240.	The Rosgen method that this permit is proposing is not without its critics. There have been several papers presented that indicate this is a controversial technique, especially for urban streams. Even Rosgen himself acknowledges the risks. He quotes," the hardest place to apply is in urban streams where massive disturbance has made it impossible to make key measurements."	The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.
Hollifield, Hannah Jane Korleski Richardson, Lori	241.	The NCD methodology being proposed is controversial, expensive, has a high failure rate, and is not appropriate	The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-

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Myers, Jean		for Buffalo Bayou.	1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.
McKann, Michael Thobae, Anne Thobae, Julie	242.	It is of utmost importance that the plan that is chosen be sensitive to the delicate balance of the bayou, and that it be one that which would target the eroded areas only and allow the vital forest and the habitat to remain for the Hogg Bird Sanctuary and the native wildlife.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. The erosion along the banks of the Hogg Bird Tributary is

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			extremely severe to the point that adjacent property owners were allowed by the COH to emplace stabilization efforts where necessary to protect their endangered properties. The existing habitat is being subjected to severe degradation and land loss through this section of the sanctuary; the implementation of the proposed project will preserve the existing vegetation in place and allow for the reestablishment of appropriate vegetation where none currently exists. HCFCD selected a CMAR to oversee the construction activity, and the CMAR selected a subcontractor with extensive experience constructing stream restoration projects. HCFCD purposely selected the CMAR method for this project so that veteran practitioners in the field of stream restoration could aid in demonstrating least damaging methods to HCFCD and the other contractors in the region for possible future projects similar in nature.
Abbassi, Armin Jani, Sima	243.	Another evidence that HCFCD has not considered the cumulative impact of the project is their exclusion of major ravines that feed the bayou over the sections of the current channel that will be filled after the project. A question was posed at a meeting of how would the runoff from these ravines impact the integrity of the new banks and will it wash out the filled areas especially to the north of the bayou at the middle curvature (Transect 6 per HCFCD area map) that is being reduced. Their response was that these ravines are the responsibility of COH or Memorial Park and they should initiate future projects to ensure those runoffs do not negatively impact the new banks.	For this demonstration project two tributaries were included so that NCD principals can be used to achieve stable banks. One tributary proposed to be repaired is the Picnic Loop tributary, which will demonstrate techniques for repairing a non-USACE jurisdictional, ephemeral tributary with a steep grade. The second tributary proposed to be repaired is an intermittent tributary with a low, flat grade. Both tributaries proposed to be repaired will demonstrate options for others wanting to address additional tributaries in the project vicinity. Other drainage swales that enter Buffalo Bayou within the proposed project reach will be transitioned into at their confluence to allow for positive drainage into the bayou. The objective of this project is to stabilize the eroding banks of the bayou and to preserve the existing stormwater carrying capacity of the bayou. The hydraulic model shows the proposed project will have a no rise effect on the bayou.
Abbassi, Armin Jani, Sima	244.	HCFCD never presented any alternatives to the demonstration project in their public meetings. Any other option that was brought up at the meetings was explained away without proper engineering or financial evaluation. Based on recent objections by the public, there appears to be other, less destructive, solutions to	Once the decision was made to utilize Natural Channel Design methods based on the principles of fluvial geomorphology to restore the proposed project reach, assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included, :leave the reach alone

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		the water quality and erosion problems that deserve proper consideration before aggressive removal of current wildlife. HCFCD considers the demonstration project to be the only valid mitigation based on statements made by the developers of the methodology and engineering firms whose income is directly tied to the progress of the project. HCFCD should feel responsible to deliver the right protection of public and environment by funding a cross-examination of different methodologies rather than promoting a one-sided approach.	(no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation).The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile was required to reestablish the stable geomorphological function to the stream and provide for overall increased stream functions.
Batten, Jr., George W.	245.	When I first heard of this project, I went and looked at some of the project area. At that time, it appeared to me that the riparian forest provided strong support for the bank structure. Thus, I believed, and I continue to believe, that the project's proposed cut-and-fill program, especially the cutting part, will greatly damage the bank structure and may in fact increase the possibility of bank failure. Later I found that this view is supported by Robbin B. Sotir in her review, which is in Appendix A of this document. There are places on this reach of the bayou where the banks need stabilization, but I agree with Sotir that this can be done by stabilizing one side of the channel where needed. Properly done, and with a proper inspection and maintenance plan, this would accomplish the major goals with minimal disruption of the channel and riparian forest.	Once the decision was made to utilize Natural Channel Design methods based on the principles of fluvial geomorphology to restore the proposed project reach, assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included, :leave the reach alone (no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation).The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile was required to reestablish the stable geomorphological function to the stream and provide for overall increased stream functions.
Batten, Jr., George W.	246.	My observation of Buffalo Bayou over the last 65 years leads me to agree with Sotir that this reach appears to be highly unstable, but that the channel has not moved much in 70 years. Thus, I do not see the need for the rechanneling that the current project design proposes.	Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion washes away the banks, public and private property along the bayou is threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the

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			destruction of habitat and vegetation along portions of the bayou, and threats to public and private property. The movement of the bayou can be observed by comparing historical imagery to recent aerial photographs.
Batten, Jr., George W.	247.	I do not believe that rechanneling of the tributary as proposed in the application is needed or appropriate. Upstream, the outfall from the storm sewer delivers water directly to a Pool 1, behind Dam 2. On Sheet 51 (page 33 of the application document) of the HCFCD plans as submitted in the application, there is a design for a scour pool. It is my impression that this is intended as new construction to replace Pool 1. I do not believe that this is needed, or even a good idea. Pool 1 seems quite adequate in mollifying flow from the sewer outfall.	There are no known existing dams within the proposed project area along the Hogg Bird tributary or within any of the proposed project areas. The proposed project design includes the installation of a scour pool intended to dissipate the initial discharge of erosive storm water flows from the COH storm sewer outfall located at the upstream limit of the Hogg Bird tributary. The dimensions of each proposed scour pool are designed to effectively handle the hydraulic flow (q) of their corresponding outfall pipe. Additional project features included in the proposed project design for the Hogg Bird tributary include the reestablishment of a pool and riffle system in the stream profile, bankfull benches in the stream dimension, and a stable geometry in the stream pattern, all intended to work in unison along with the proposed in-stream structures through this area (which includes the installation of wood cross vanes, and toewood) to dissipate erosive flows that cause shear stress along the toe of the banks and concentrate them to the thalweg (centerline) of the tributary.
Boyd, Jim	248.	Less-damaging and proven alternatives are available to the requested permitted action. The downstream community used tree and vegetation planting decades ago to stop erosion on their part of Buffalo Bayou. Significant degradation to the bayou will occur during the construction and dredging, and the wildlife will be harmed, the only question being how much harm will occur.	Once the decision was made to utilize Natural Channel Design methods based on the principles of fluvial geomorphology to restore the proposed project reach, assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included, leave the reach alone (no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation).The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile was required to reestablish the stable geomorphological function to the stream and provide for overall increased stream functions. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and

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			various other disciplines. The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.
Boyd, Jim	249.	Why are so many cuts to Buffalo Bayou needed?	The proposed project design is based on an assessment of the entire Buffalo Bayou watershed which includes the influence of the two upstream reservoirs, Addicks and Barker, and the previously rectified portions of the bayou upstream and downstream of the proposed project reach. HCFCD's design proposes to address the current problems with channel stability identified in this reach of Buffalo Bayou which are in part a result of these watershed and channel modifications. Sediment load assessment was conducted as part of the preliminary project design. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium that will keep erosive flows concentrated in the center of the stream, or thalweg, and

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			protect the adjacent naturally vegetated streambanks in addition to decreasing sediment load from the ongoing mass wasting and streambank erosion within the project reach.
Chadwick, Susan	250.	Also the NCD method proposed is phony, lacking in scientific support, often failing, and leaves us with the real prospect of razing and bulldozing our wild bayou only to have the "restored" banks fail and wash out, leaving us with an ecological disaster, a wasteland.	The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.

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Chojnacki, Kimberly	251.	Under federal law, the least damaging solution is the credited solution. Addressing erosion at the bayou is possible through less damaging solutions than this proposal. As such, this permit application must be denied. Address erosion by reducing the amount of linear feet of vegetation removed, the amount of bank disturbance, and by increasing focus on areas of documented bank failure. Indeed, what are the specific areas of bank failure supporting this proposal? This proposal is, at best, controversial. At worst, and more likely, it is incredibly expensive, with a high failure rate and lasting negative impacts on the environment, setting a dangerous precedent for the few remaining green spaces in Houston.	Once the decision was made to utilize Natural Channel Design methods based on the principles of fluvial geomorphology to restore the proposed project reach, assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included, leave the reach alone (no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation).The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile was required to reestablish the stable geomorphological function to the stream and provide for overall increased stream functions. The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines. Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes,

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			and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology
Daniel, Martha (Marty)	252.	This project appears totally unnecessary and will create worse problems downstream. This project will adversely impact vegetation, animal life and water quality of the bayou as well as the Hogg Bird Sanctuary. Our city is turning into concrete at an unprecedented rate, and we need the bayou as a respite for people, birds, wildlife, and flora. A review of the application needs to be done. There is better river science than what is being proposed. Removal of the canopy due to tree loss will raise the temperature of the bayou and adversely affect fish, etc. The USACE should reevaluate alternatives to the NCD for a more natural setting at much lower cost. We do NOT want Buffalo Bayou to look like the bayou near the University of Houston.	Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion eats away at the banks, public and private property along the bayou is threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the destruction of habitat and vegetation along portions of the bayou, and threats to public and private property. Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be

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			addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology
Ereli, Ruth and Eliezer	253.	The federal Clean Water Act requires a least-damaging solution to the erosion problems alleged by HCFCD. A less damaging solution would be to target only those specific areas in urgent need of stabilization with plantings and methods that work in harmony with the bayou ecosystem.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology
Ereli, Ruth and Eliezer	254.	The question is not whether we should spend City money on a project to reduce erosion; the question is how should it be done. Many people believe it can be done less aggressively with less impact on our environment and on Crestwood on the Park. We are writing to ACE to request that they do not permit the project until HCFCD extensively and officially considers less aggressive but more sustainable alternatives.	Once the decision was made to utilize Natural Channel Design methods based on the principles of fluvial geomorphology to restore the proposed project reach, assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included: leave the reach alone (no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation). The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile was required to reestablish the stable geomorphological function to the stream and provide for overall increased stream functions.
Galveston Bay Foundation	255.	We recommend that HCFCD and USACE take a closer look at the need to fill the meander that is located just to	The original design included the installation of a deep water oxbow in the area currently proposed to be graded to a

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		the south of the COH Memorial Park Maintenance Facility. Perhaps the current meander could be preserved as an oxbow feature, thus providing important habitat, water quality, and flood control functions.	bankfull bench elevation. The original deep water oxbow design was abandoned when adjacent private property owners, and other stakeholders with whom HCFCD coordinated, opposed the proposed plan to include a deep water oxbow in the area. Their concerns were based on fears of trash accumulating in the area, and their opposition to the perceived side effects (such as mosquitoes and snakes) that could result by having stagnant water in the area. HCFCD modified the plan again in consideration of agency comments. The current proposed plan includes grading this area to the bankfull bench elevation, which will allow streambed forming discharges to flow across this area. The bankfull benches will still have a direct hydrologic connection that will allow wetland vegetation to become reestablished in these areas. The post-project planting plan for this area will include bald cypress, water tupelo, and other tree and herbaceous species well suited for this hydrologic zone that historically existed along this portion of the bayou.
Hamilton, Ann T.	256.	I am writing in opposition to the permit application by HCFCD on the MPDP on Buffalo Bayou. While I agree that several areas within the reach of this project need remediation, the design technique proposed by HCFCD is overly-destructive to the sensitive riparian corridor that exists along this stretch of the bayou today...The stretch of Buffalo Bayou behind Memorial Park is one of the few remaining areas of wilderness left within this city...It would indeed be a shame to allow this portion of the bayou to be environmentally degraded and damaged under HCFCD's current proposed plan.	Once the decision was made to utilize Natural Channel Design methods based on the principles of fluvial geomorphology to restore the proposed project reach, assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included, :leave the reach alone (no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation).The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile was required to reestablish the stable geomorphological function to the stream and provide for overall increased stream functions.
James, Helen	257.	There is increasing awareness of and appreciation of the native plants and animals of this area, and this project should be designed to enhance our specific SE Texas native landscape.	HCFCD's overall plan is to preserve as many of the native mature trees and shrubs located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. HCFCD's planting plan will

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			include the installation of native grass mix that may include a portion of Bermuda grass for initial site stabilization and native trees and shrubs for the long-term reestablishment of a healthy, sustainable riparian forest along the proposed project reach.
Kondolf, G. Mathias	258.	I am a fluvial geomorphologist and hydrologist...In my opinion, the proposed project would be misguided and not a wise investment of public funds. First, it is notable that many projects constructed using the techniques proposed have failed by washing out within a few years or months of construction. Examples include Deep Run, Maryland (Smith and Prestegaard, 2005), and Cuneo and Uvas Creeks, California (Kondolf, 2006). However, even if these projects do not wash out, there is a fundamental problem in that they seek to stabilize stream channels by hardening the banks with root wads and/or boulders, preventing the natural migration of stream channels that is demonstrated to provide the best habitat values in natural rivers (Beechie, et al., 2010; Florsheim, et al., 2008; Stanford, et al., 2005).	The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.
Kondolf, G. Mathias	259.	Interestingly, the bank erosion is estimated in the permit application (p. 10 of 658) to have an annual volume of 359 tons per year. Yet the projected cut-and-fill volumes (p. 12 of 658) show a net "cut" of 1,078 tons, or nearly three times the claimed current bank erosion rate. In reading the permit application, I did not see where this excess material would be disposed of, but if it is to be washed away by the river, that means the amount of sediment produced by project construction would exceed the ongoing erosion rate. It is not clear that an ongoing erosion rate of 359 tons per year for this reach would really be problematic, but if it were, it seems that the proposed project would create nearly three times this amount from its cutting and filling.	The proposed project will not require offsite sediment disposal for "cut" material during constriction. HCFCD has engaged a Construction Manager at Risk (CMAR) process to oversee construction planning and on-site activity that includes sub-contractors with extensive experience managing stream restoration projects. Excavated material from the proposed project will be stabilized on site in upland areas away from the channel. The estimated erosion rates are annual rates of soil loss per year that are anticipated to continue if the proposed project is not implemented to address instability with the existing stream dimension, pattern, and profile. The ongoing soil loss from the proposed project area makes up a significant portion of the total sediment loading to Buffalo Bayou based on a WARSSS assessment for the entire reach from Barker

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			Reservoir to the Houston Ship Channel turning basin. Sediment loading is a significant problem for Buffalo Bayou due to the related pollutants associated with the eroded sediment, most notably bacteria. The reestablishment of a stable dimension, pattern and profile within the bayou will reduce sediment loading to the bayou system from currently eroding and unstable streambanks.
Kondolf, G. Mathias	260.	Clearly, the process of ripping out the existing riparian forest and channel and imposition of the new "ideal" form on this reach of Buffalo Bayou would create disturbances, and the permit application fails to demonstrate that these disturbances would not contribute to significant degradation of waters of the United States.	HCFCD will utilize the JTF Storm Water Management Handbook for Construction Activities (2006 Edition) and Storm Water Management JTF Storm Water Management Program: Minimization Design Criteria for Implementation of Certain Best Management Practices for Storm Water Runoff Treatment Options (2001 Edition). From these guidelines, BMP and a SWPPP have been developed to reduce turbidity and total suspended solids during construction. The SWPPP, including specific BMPs to be utilized, will be finalized during the final design of the proposed project. A Stream Assessment of the proposed project reach was conducted by KBR on behalf of HCFCD in order to document existing stream conditions, and is included as Attachment I of the Permit Application. The Stream Assessment was conducted following the USACE Galveston District, SWG SCA Standard Operating Procedure. Baseline and subsequent post-construction benthic macroinvertebrate and fish monitoring will utilize TCEQ (2006) methods for collecting, analyzing data, and assigning Indexes of Biotic Integrity (IBI). Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.

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Landon, Jerrold E.	261.	Less invasive methods should be evaluated and applied first before performing a radical step like this one. Why perform bypass heart surgery on the patient when all that may be required is a stent?	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and

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			various other disciplines.
McFarland, Shawn	262.	HCFCD has repeatedly ignored requests from bayou supporters to maximize the amount of undisturbed area and focus repair efforts on just the eroded areas.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology
McFarland, Shawn	263.	They [HCFCD] have hired a designer who is not peer reviewed and whose work has not always held up in other similar locations. Surely, you are getting documentation to verify this.	The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and

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			various other disciplines.
McKann, Michael	264.	Buffalo Bayou and the bayou system in their natural state are precious to Houston, the wildlife they support, and their human inhabitants. The damage already affecting Buffalo Bayou and its natural ecosystem with the systematic stripping of all vegetation and the leveling of the banks of the bayou for the creation of Buffalo Bayou Park east of Shepherd Drive has ignored and challenged the progress Terry Hershey, a conservationist who campaigned to keep the banks of Buffalo Bayou from being paved in the 1960s, has contributed to preserve our natural bayou system. We have seen the results there, and strongly object to the over-engineering approach to mitigating the runoff and erosion problems caused by urban development. We should expect a better job by the City and County to regulate development to prevent the excess water runoff that threatens our natural bayou system.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape

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			architects, urban foresters, agronomists, hydrologists and various other disciplines.
Mobley, Diana	265.	I believe more research needs to be done by additional third parties before HCFCD should be allowed to move forward with this project. It does not appear that the full ramifications of the proposed project have been taken into account. I don't believe the project adequately evaluates the downstream impact, which has been a major problem with previous historical bayou "restoration" projects in Houston. Other alternatives should be considered before moving forward. I have many other concerns with the project, as presented in the permit application.	The FEMA's effective floodplain model (both HEC-HMS and HEC-RAS) for Buffalo Bayou from HCFCD's Model and Map Management (M3) System was used as the base model for this project. Both steady and unsteady flow models were run to compare the current conditions to the proposed conditions. The steady state model is the official model used by the FEMA. Using the steady state model is a requirement to document that the project does not raise the regulatory floodplains anywhere on Buffalo Bayou (headwaters to Houston Ship Channel) before the project can be approved by the COH, FEMA and HCFCD. The models have been reviewed by HCFCD and the COH, acting as the local floodplain administrator. The COH reviewed the hydraulic model used for the project and is prepared to issue a certificate of no rise for the project subsequent to the final submittal of the sealed 100-percent project plans for their approval.
Nolen, Evelyn	266.	While I agree that several areas within the boundaries of this project need remediation, the design technique proposed by HCFCD is unnecessarily destructive to the corridor along this stretch of the bayou.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology The Rosgen Method of NCD has been used successfully on

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			various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.
Smith, Jr., Frank C.	267.	I am opposed to HCFCD's proposed design for the MPDP, which is based upon the NCD technique. There are readily identifiable areas of bank erosion within the project reach that would benefit from a thoughtful bank stabilization project. However, the current proposal is over-reaching and fails to balance the desire to retard erosion with the necessity to preserve the riparian vegetation, which in turn supports important urban wildlife habitat.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology.

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Smith, Karis	268.	Memorial Park is already struggling. The trees are suffering due to drought. By channelizing and destroying wetlands, more water will run off into the bayou, removing vital water from this area. There is nothing "natural" about the NCD. This design was not meant for this area and is meant only to enforce our will on a natural entity.	A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects

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Thobae, Julie	269.	Buffalo Bayou and the bayou system in their natural state are precious to Houston, the wildlife it supports, and its human inhabitants. The damage already affecting Buffalo Bayou with the systematic stripping of all vegetation and the leveling of the banks of the bayou for the creation of Buffalo Bayou Park on the stretch to the east of Shepherd Drive has been done. We have seen the results there and we strongly object to the over-engineering aspects that we see in the proposed Demonstration Project to the west of it.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches in the bayou's dimension,, pool and riffle reestablishment, geometry changes in the bayou's pattern, and in-stream structures such as the use of toe wood) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration

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			of a closed tree canopy along the banks and over the bayou where none currently exists. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Brown, Carlton Vikrum, Raghu	270.	I just signed a petition addressed to you titled Stop the Bulldozers on the Wild Banks of Buffalo Bayou in Houston's Memorial Park (http://petitions.moveon.org/ sign/stop- the-bulldozers-on-1). So far, 146 people have signed the petition. You can post a response for MoveOn.org to pass along to all petition signers by clicking here: http://petitions.moveon.org/target talkback.html?tt=tt-74558-custom-43239-20240526-NQdNL The petition states: "Regarding Permit Application No. SWG-2012-01007: We respectfully request that the Army Corps of Engineers deny a permit to the Harris County Flood Control District, which proposes to destroy nearly 1.5 miles of riparian forest and wildlife habitat and one of our last remaining links to nature in the middle of Houston. The federal Clean Water Act requires a least damaging solution to the erosion problems alleged by the H.C.F.C.D. A less damaging solution would be to target only those specific areas in urgent need of stabilization with plantings and methods that work in harmony with the bayou ecosystem..."	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches in the bayou's dimension, pool and riffle reestablishment in the bayou's profile, geometry changes in the bayou's pattern, and in-stream structures such as the use of toe wood reestablish were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek

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			extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate. HCFCD has consulted with several experts in the field of NCD – Dave Rosgen is one of them – and has developed this project with a multidisciplinary team of civil engineers, fluvial geomorphologists, environmental scientists, landscape architects, urban foresters, agronomists, hydrologists and various other disciplines.
Wise, Landrum & Lynnea	271.	It appears to us that the primary driver of this project is to address erosion along this stretch of the bayou, including erosion affecting the golf course of the River Oaks Country Club. Another driver of this project appears to be flood control. This proposed project should not, in our opinion, be viewed in a vacuum, but rather in the context of all the current or proposed activities that will negatively impact the existing riparian environment along Buffalo Bayou, including those upstream from this stretch of the bayou. We certainly understand that erosion along rivers and bayous is real and may need to be addressed from time to time, but we ask the USACE to give careful and studied consideration of alternative approaches that would be much less damaging to the environment and would be targeted to address the more limited areas of land that are currently impacted by erosion. In a nutshell, we are seeking consideration of a much "lighter hand" to address the erosion issue since massive removal of the existing vegetation in an area in order to "restore" it just doesn't make common sense to us.	Once the decision was made to utilize Natural Channel Design methods based on the principles of fluvial geomorphology to restore the proposed project reach, assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included, :leave the reach alone (no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation).The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile was required to reestablish the stable geomorphological function to the stream and provide for overall increased stream functions. Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches in the bayou's dimension, pool and riffle reestablishment in the bayou's profile, geometry changes in the bayou's pattern, and in-stream structures such as the use of toe wood reestablish) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-

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			term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayou's geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology..

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Extension of Public Comment Period			
Baumann, Marsha J. Beishir, Olga Daniel, Martha (Marty) Emde, Katy Emde, William Foss, Linda Funghe, Brenda Garland, Colleen Robinson Goode, Debra Handley, Bruce Hannan, Nancy Harrison, Elizabeth Y. James, Helen Knowles, Linda Marquez, Sheryl McKann, Michael Mead, Celeste Montague, David R. Rascoe, Cathy Redden, Joe W., Jr. Singleton, Pauline Spolyar, Mary Terry, Janis Thobae, Anne Thobae, Julie Topek, Toby Van Dame, Lesly Ward, John R.	272.	I request a 60-day extension beyond May 30, 2014, to receive public comment. This request for additional time is based upon the need to prepare an adequate response to the permit application on several points that should be considered by the USACE in making a decision on the application.	The USACE extended the public comment period an additional 30 days to June 30, 2014, to allow the public additional time to comment on the proposed project.
Battey, James M. Beishir, Olga Eckenfis, Michael Emde, William Evans, Bruce Evans, Richard H. Gederberg, Silvia Hannan, Nancy Hatcher, Eileen Lowiclu, Becky Manley, James	273.	HCFCD has only presented its 80% plan to the public, so how can I comment intelligently on a plan about which I am only shown 80%? I ask that the comment period be extended to 30 days after the 100% plans are made available to the public so that we can see what the "cut and fill" plan actually is.	The 80% design plans that were submitted to USACE contain the final design. The plans are marked "80% draft" because they are not ready to be bid for construction; this language merely refers to a contract milestone for HCFCD's engineering consultant. The overall design, stated impacts to waters of the U.S, and the proposed vegetated areas will not change. The plans were submitted to obtain an IP, and while the permit application is under review, HCFCD has been working with the engineering consultant to finalize the construction notes and specs found on the design plans.

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Parker, Ray C. Rose-Molina, Peter Shen, Lan Spolyar, Mary Thomas, Judy Walker, Kelly Whittlesey, Karin			The USACE extended the public comment period an additional 30 days to June 30, 2014, to allow the public additional time to comment on the proposed project.
Benton, Janet Wilson, Jeanie Kilroy	274.	I request a 30-day extension beyond June 30, 2014, to receive public comment. This request for additional time is based on the need to prepare an adequate response to the permit application on several points that should be considered by the USACE in making a decision on the application.	The USACE extended the public comment period an additional 30 days to June 30, 2014, to allow the public additional time to comment on the proposed project.
Almoney, Stanley R., PhD	275.	I request a 60-day extension beyond May 30, 2014, to receive public comment.	The USACE extended the public comment period an additional 30 days to June 30, 2014, to allow the public additional time to comment on the proposed project.
Barnstone, Gertrude	276.	As a Houstonian, I strongly urge a 60-day extension of comment period for permit application #SWG-2012-01007 to evaluate alternatives that do not strip down vegetation, cut down trees, and do not ravage whole sections Buffalo Bayou.	The USACE extended the public comment period an additional 30 days to June 30, 2014, to allow the public additional time to comment on the proposed project.
Cohen, Ronald	277.	This is to request an extension of time to permit further comments to be submitted regarding the Memorial Drive Demonstration Project. Turning native bayous into barren concrete ditches has long been a part of efforts to control Houston's flooding. It is my understanding that other projects using methods similar to those proposed for this demonstration project have failed in other states. It would be better not to denude a critical part of Houston's ecosystem before confirming that the proposed methods are the only practical approach to the problem sought to be remedied. I submit my comment and request to you to delay the decision to go forward by 60 days to permit other knowledgeable comments to be filed.	The USACE extended the public comment period an additional 30 days to June 30, 2014, to allow the public additional time to comment on the proposed project.
Myers, Jean	278.	I am not opposed to spending money to preserve the area; however, this plan must be presented to the people	The USACE extended the public comment period an additional 30 days to June 30, 2014, to allow the public additional time to

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		of Harris County and we must be allowed to speak. Please allow the folks who live around Houston an opportunity to enjoy what small pockets of nature that we have left.	comment on the proposed project.

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General			
Arnett, Carrie Curcio, Ken Falloure, David Gish, Sarah Hollifield, Hannah Jane Hyde, Richard James, Terrell JWW "McP" Kirschke, Theresa Knight, Susan Myers, Jean Korleski Richardson, Lori Roll Model Rudez, Michael G. Smith, Karis Sutton, Andrew Tilbury, Gillian A. Villaescusa, Julie Westbrook, Lydia Yglesias, Jerry	279.	The plan will damage critical wetlands, vital wildlife habitat, and destroy the bayou's ecosystem.	HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan. Some wildlife habitat will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require

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			the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities.
Baumann, Marsha J. Brenner, Margaret Rascoe, Cathy Redden, Joe W., Jr. Wilson, Jeanie Kilroy Goode, Debra	280.	HCFCD's claims regarding improvement of stream conditions, wetland impacts, the amount of vegetation impacted, and additional claims require a review of the complete permit application.	As part of the permitting process, the USACE reviews the application, consults with other applicable agencies to determine if the application is "complete", and obtains additional information as necessary for a complete review of the permit application.
Beishir, Olga Emde, Katy Emde, William Foss, Linda Funghe, Brenda Handley, Bruce Hannan, Nancy Harrison, Elizabeth Y. James, Helen Knowles, Linda Marquez, Sheryl Mead, Celeste Spolyar, Mary Terry, Janis Ward, John R.	281.	HCFCD's claims regarding improvement of stream conditions, wetland impacts, the amount of vegetation impacted, and additional claims require a review of the complete permit application. Probable impacts, including cumulative impacts, must be compiled to be considered by the USACE.	As part of the permitting process, the USACE reviews the application, consults with other applicable agencies to determine if the application is "complete", and obtains additional information as necessary for a complete review of the permit application. A cumulative impacts analysis will be evaluated by the USACE prior to the issuance of any IP.
Drummond, Jessica Drummond, Mark Landon, Jerrold E.	282.	In the report, it is acknowledged that natural stream restoration is already occurring. So why not let nature continue the job? Has anyone considered how long this process will take if we let this process continue naturally?	While the stream system seeks equilibrium, it continues to migrate. This proposed project will speed up what natural processes would many years to achieve by applying NCD principles to determine the stable pattern, profile and dimension. Rates of channel migration and evolution are difficult to predict due to the influence of variable weather patterns and subsequent stream flows that drive these processes. An assessment of historical aerial photographs indicates that Buffalo Bayou has been changing over multiple decades and continues to change its channel dimension,

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			pattern and profile. If natural recovery were allowed to proceed with continued gradual channel migration, reconnection to a new geomorphic floodplain, and natural revegetation, then it may be assumed that the natural recovery process will take many years.
Korman, Betty A. Owens, William C. Salinas, Al	283.	HCFCD's claims regarding improvement of stream conditions, wetland impacts, benefits to the riparian buffer, and water quality lack proof.	As part of the permitting process, the USACE reviews the application, consults with other applicable agencies to determine if the application is "complete", and obtains additional information as necessary for a complete review of the permit application.
Drummond, Jessica Drummond, Mark Landon, Jerrold E.	284.	Only 80% of the plan has been provided in the permit application. Since this plan is now in the public comment phase, how can anyone reasonably comment on this permit with 20% of the plan missing? This is a major project that will have a permanent and lasting effect on Memorial Park. The consequences of this project cannot be evaluated with an incomplete plan.	The 80% design plans that were submitted to USACE contain the final design. The plans are marked "80% draft" because they are not ready to be bid for construction; this language merely refers to a contract milestone for HCFCD's engineering consultant. The overall design, stated impacts to waters of the U.S, and the proposed vegetated areas will not change. The plans were submitted to obtain an IP, and while the permit application is under review, HCFCD has been working with the engineering consultant to finalize the construction notes and specs found on the design plans.
Bertagne, Bob	285.	I can only imagine the expense of carrying out the proposed "improvements"... and at what environmental cost? Seems to me the River Oaks Country Club could use some of the methods already put in place by homeowners along the bayou's banks to shore up the areas of concern, leaving the rest alone. Taxpayers should not have to pay for this drastic plan that would have catastrophic and permanent effects on the aesthetics and environmental integrity of Buffalo Bayou along this stretch.	A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology.
Boyd, Jim	286.	The application for the permit by the HCFCD will cause radical change to the flow and the banks of Buffalo Bayou. The wonderful and varied wildlife that calls Buffalo Bayou home will be disturbed, especially during the construction phase of the project. The application is based on the use of unproven science that uses Buffalo Bayou as a laboratory for techniques that are not within	A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern

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		the norms of river science and are not accepted by professionals in the field. Substantial damage to Buffalo Bayou will occur if the permit is granted in its present form. How can a plan that destroys wetlands be called good?	and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities. The Rosgen Method of NCD has been used successfully on various projects throughout the United States since the mid-1960s. It is widely recognized as a method that takes a holistic approach to assessing and addressing the functional needs of natural stream systems. Examples of NCD technique projects that have been successfully completed in areas with soil and climatic conditions similar to Houston include the Mason Creek extension (T101-00-00-E003), Cypress Creek restoration at Meyer Park Phase 1&2 (K100-00-00-X026/X028), Buffalo Bayou conveyance restoration from Sabine to Shepherd (W100-00-00-X036), Flewellen Creek at Cross Creek Ranch in Fort Bend County, and Warren Creek at the Katy Prairie Stream Mitigation Bank. In addition, the NRCS, a branch of the USDA, lists the Rosgen Method as a recommended method of restoration when appropriate.
Caul, Carol	287.	Nationwide Permits Are Not Appropriate for These Buffalo Bayou Segments Because There Are Significant Impacts Which Are Not Analyzed or Mitigated In The NWP Rulemaking.	This project is not being permitted under a Nationwide Permit. An IP was submitted to the USACE for the proposed project which triggered this public comment period.
Chadwick, Susan	288.	Section 404(b)(1) of the federal Clean Water Act requires that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem..." The adverse impact on the aquatic ecosystem in this project area includes but is not limited to the destruction of more than a mile...of riparian forest buffer along both banks of the bayou in swathes extending as wide as 100 feet in places. In addition, the project would dredge and fill and alter the	The proposed project design is based on an assessment of the entire Buffalo Bayou watershed which includes the influence of the two upstream reservoirs, Addicks and Barker, and the previously rectified portions of the bayou upstream and downstream of the proposed project reach. HCFCD's design proposes to address the current problems with channel stability identified in this reach of Buffalo Bayou which are in part a result of these watershed and channel modifications. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic

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		channel of the bayou itself. The impact would be the destruction of the natural and heretofore largely untouched bayou ecosystem in this area, much of it public land containing significant geologic features, such as ancient rock formations and rare, ages-old bluffs treasured by Houstonians.	ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. The proposed design for restoring stable banks in areas where severe erosion has occurred on the outside of meanders calls for the installation of toe wood along the base of these eroded areas to a location extending out from the existing eroded banks into the bayou. The installation of earthen coir lifts will occur above the placed toewood, and will continue in a "stairstep" pattern up to the existing eroded high bank location, essentially preserving the existing eroded high bank in place. No mature vegetation located along the high banks of the project will be impacted by the reestablishment of stable banks from the existing high banks out into the bayou. Restoring these existing degraded locations will instead allow for the reestablishment of vegetation along the banks of the bayou where none currently exists, and allow for the preservation of the existing high bank bluffs in their current location.
Chadwick, Susan	289.	The permit application is incomplete, vague,	The 80% design plans that were submitted to USACE contain

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		contradictory in its description of the project length and limits, is misleading, is lacking in scientific data and support for its claims and the need for the project, and uses engineering drawings clearly marked "Not for Permit Purposes."	the final design. The plans are marked "80% draft" because they are not ready to be bid for construction; this language merely refers to a contract milestone for HCFCD's engineering consultant. The overall design, stated impacts to waters of the U.S, and the proposed vegetated areas will not change. The plans were submitted to obtain an IP, and while the permit application is under review, HCFCD has been working with the engineering consultant to finalize the construction notes and specs found on the design plans. The proposed project location hasn't been altered and nothing was removed from the proposal. The IP submittal was revised based on the suggestion of USACE to clarify the difference between the initial study area that preceded the selection of a project location, and the ultimate project location that was selected within the initial study area. HCFCD also revised the IP submittal to differentiate between the areas of proposed active restoration within the proposed project reach and the areas where no active restoration will occur within the proposed project reach. The proposed project design is based on an assessment of the entire Buffalo Bayou watershed which includes the influence of the two upstream reservoirs, Addicks and Barker, and the previously rectified portions of the bayou upstream and downstream of the proposed project reach. HCFCD's design proposes to address the current problems with channel stability identified in this reach of Buffalo Bayou which are in part a result of these watershed and channel modifications. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic

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			function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. The preliminary design stage included: ● additional geomorphic assessments of the proposed project reach including a BANCS assessment (comprised of additional NBS and BEHI assessments); ● wood load mapping; ● sediment load assessment; ● review of USGS historical aerial maps; ● review of USGS historical stream water level gauges ● valley type assessment and classification; ● assessment of impervious cover within the watershed; ● stream assessment checklist review; ● hydraulic model analysis; ● comparison with other stable stream reference reaches; and ● comparison with Buffalo Bayou stable stream reference reaches.

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Chojnacki, Kimberly	290.	The proposal will damage crucial wetlands and wildlife habitats, decimating the bayou's ecosystem.	HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. Some wildlife habitat will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters

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			of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Detering, Deborah	291.	That pristine section of the bayou and the bird sanctuary's surroundings and the native vegetation can never be replaced. Straightening the canal and terracing will make it look like the sections along Allen Parkway.	The proposed design for restoring stable banks in areas where severe erosion has occurred on the outside of meanders calls for the installation of toe wood along the base of these eroded areas to a location extending out from the existing eroded banks into the bayou. The installation of earthen coir lifts will occur above the placed toewood, and will continue in a "stairstep" pattern up to the existing eroded high bank location, essentially preserving the existing eroded high bank in place. No mature vegetation located along the high banks of the project will be impacted by the reestablishment of stable banks from the existing high banks out into the bayou. Restoring these existing degraded locations will instead allow for the reestablishment of vegetation along the banks of the bayou where none currently exists, and allow for the preservation of the existing high bank bluffs in their current location. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks.
Dishberger, Michael and Debra	292.	River Oaks Country Club is investing $2 million to stabilize 3,000 linear feet of their golf course. The public is footing the bill for the rest, and as seen on the plans, most of the work is there to help River Oaks Country Club. Another country club upstream is investing their own funds to repair their banks. Why should River Oaks Country Club's situation be any different?	ROCC was invited to participate in the project to demonstrate a holistic approach to stabilizing the banks of the bayou along a project reach, instead of implementing their proposed project plans to install mass gabion walls along the south bank of the bayou. The proposed project design is based on an assessment of the entire Buffalo Bayou watershed which includes the influence of the two upstream reservoirs, Addicks and Barker, and the previously rectified portions of the bayou upstream and

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			downstream of the proposed project reach. HCFCD's design proposes to address the current problems with channel stability identified in this reach of Buffalo Bayou which are in part a result of these watershed and channel modifications. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology.
Emde, Katy	293.	At the last moment, a few weeks ago, in a relatively private meeting, it was announced that the Houston Parks Department would install a canoe launch at the end of the MPDP work road, since the road was going to be there. This was done in an underhanded way, there has been no public notice and no announcement, and the information is being shared among a very few people. This is one of those nasty cumulative effects, there was peace in Memorial Park, then there was a plan to bring in heavy equipment to "fix" the erosion, and then because there will have been disturbance to the area, it was decided to go ahead and keep it disturbed. I believe that a canoe launch is unnecessary since they just redid one a short way upstream. I believe that the canoe launch will result in ongoing disturbance for both the aquatic wildlife and the riparian wildlife, and I believe it will result in more pollutants in the water, perhaps leading to a violation of the Clean Water Act. I am asking that the permit be denied for all the reasons I have stated before in other comments and because getting the permit will result in a canoe launch, for which there has been no study, that is apt to lead to violations of the Clean Water Act.	Upon completion of all work associated with the project, the construction access road will be left in place and turned over to HPARD for their use.
Emde, Katy	294.	The permit should not be approved for a number of	Please refer to the Pre- and Post- Construction Monitoring

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		reasons, and one of them is that information is missing from the application, and the lack of that information, including a restoration plan, makes it impossible to rest assured that the Clean Water Act is being properly observed. I ask that the permit application for the MPDP be denied.	Plan that includes measures to ensure a minimum survivability rate of 80 percent for containerized native trees and shrubs, a 50 percent survival rate for live stake native trees and shrubs, and a minimum coverage of 70 percent for wetland plantings at the end of the second full growing season following planting. The monitoring plan also includes management plans to control the proliferation of noxious invasive plant species.
Ereli, Ruth and Eliezer	295.	HCFCD has offered no proof or guarantee that their project can sustainably stop erosion, and they indicated at their last meeting that the ravine next to Crestwood on the Park is not within the scope of their project. They even hinted that the City and the Park are responsible if what they install washes away. If one reads their application to ACE, they have misrepresented the local homeowners as the initiators of the project and never evaluated alternatives to their current approach. Bank stabilization and erosion have been successfully controlled by other methods. About 20 years ago, Robbin Sotir did a bank support project on a section that has held quite well.	The main focus of MPDP is along Buffalo Bayou and not the numerous drainage swales throughout Memorial Park that drain into Buffalo Bayou. The specific drainage swale mentioned by the commenter will be transitioned into at its confluence with Buffalo Bayou.
Farris, Kirk	296.	...the truth is, the Army Corps needs to fix the dams and hold the water and drop out the solids and release the volume more slowly. In short, please save the bayou as a natural stream and repair these dams. The HCFCD project is damaging to habitat, water quality, trees, and real forest that should be saved. The HCFCD project is dangerous to the integrity of found and yet-unfound archeological sites within Camp Logan. This program would be damaging to the 17,000-year-old sandstone step pool, which is intact in much of the natural bayou bottom. Too many damaging features, not enough science, and not a body of people I trust. This is after all a human response to a political game and I take the position that Buffalo Bayou is natural and if saved from this stupid project will remain a cultural and historic asset for future generations to explore and experience.	The proposed project design is based on an assessment of the entire Buffalo Bayou watershed which includes the influence of the two upstream reservoirs, Addicks and Barker, and the previously rectified portions of the bayou upstream and downstream of the proposed project reach. HCFCD's design proposes to address the current problems with channel stability identified in this reach of Buffalo Bayou which are in part a result of these watershed and channel modifications. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology.

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			HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. HCFCD has completed extensive cultural resource surveys within the project area and has coordinated with the THC and the USACE to determine if the proposed project will have any impacts on cultural sites. It is the THC's opinion that impacts within the bayou will not have an effect on National Register eligible historic properties or to contributing elements of any designated State Antiquities Landmarks, including Camp Logan. In addition, fieldwork and historic research completed along the banks of the bayou thus far has concluded that there is no indication that archaeological deposits or historic standing structures associated with Camp Logan or other cultural resources will be affected by the proposed project. The THC and USACE are currently reviewing project plans to verify this conclusion. HCFCD recognizes that several sandstone rock outcrops exist within the proposed project reach. Many of the exposed rock outcrops have already begun falling into the channel streambed from ongoing streambank erosion and instability within the reach. Without the proposed restoration, these rock outcrops will continue to be eroded away from the streambanks and bed. HCFCD will attempt to avoid impacts to

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			the naturally occurring rock outcrops where possible if overall channel stability is not compromised.
Farris, Kirk	297.	I object to the HCFCD permit application for Buffalo Bayou and don't think it meets the level of functionality to be considered a best practice. I feel they have no real water quality solutions and nothing good can come from the damage to the natural features of the downward cutting stream. I don't want to lose the forest or the habitat and run the risk of giving up a good reserve for what amounts to a will to continue the work on the bayou in progress downstream from Shepherd Drive Bridge. These are vastly different environments. One has archeological intact deposits both found and yet-to-be-found sites. One has an adjusted body of major trees and understory canopy and a geological sandstone river bottom that is 17,000 years old. One is a facility for public use and has long been channelized, and the other is an area which needs your protection from what would obviously become a real estate promotional bikeway project...widely advertised as an improvement...but I question, what is the big picture value of destruction of what is mostly natural? Not a good idea in its current format and no real evidence has been presented to assure us of an improvement to water quality. No, please fix the dams and hold the water, drop out the solids and release the water in easy, functional ways.	The proposed project design is based on an assessment of the entire Buffalo Bayou watershed which includes the influence of the two upstream reservoirs, Addicks and Barker, and the previously rectified portions of the bayou upstream and downstream of the proposed project reach. HCFCD's design proposes to address the current problems with channel stability identified in this reach of Buffalo Bayou which are in part a result of these watershed and channel modifications. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. HCFCD has completed extensive cultural resource surveys within the project area and has coordinated with the THC and the USACE to determine if the proposed project will have any impacts on cultural sites. It is the THC's opinion that impacts within the bayou will not have an effect on National Register eligible historic properties or to contributing elements of any designated State Antiquities Landmarks, including Camp Logan. In addition, fieldwork and historic research completed along the banks of the bayou thus far has concluded that there is no indication that archaeological deposits or historic standing structures associated with Camp Logan or other cultural resources will be affected by the proposed project. The THC and USACE are currently reviewing project plans to verify this conclusion. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as

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			possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. HCFCD recognizes that several sandstone rock outcrops exist within the proposed project reach. Many of the exposed rock outcrops have already begun falling into the channel streambed from ongoing streambank erosion and instability within the reach. Without the proposed restoration, these rock outcrops will continue to be eroded away from the streambanks and bed. HCFCD will attempt to avoid impacts to the naturally occurring rock outcrops where possible if overall channel stability is not compromised.
Fenelon, Mark	298.	I do not support the proposed reconstruction of Buffalo Bayou at Memorial Park. There are better ways of fixing the bayou than clear-cutting the proposed areas around Memorial Park. You know that part of the problem affecting Buffalo Bayou has to do with all the development in Katy, Texas, that creates runoff in Harris County.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. The proposed project design takes into consideration that the operational procedures of the Addicks and Barker reservoirs provide a vital flood damage reduction purpose to this region of the county and their operational procedures may vary slightly in the foreseeable future. It also takes into

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			consideration the current ordinances created by the COH and Harris County that require new development to include detention features in their design and construction.
Fosdick, Helen Winkler	299.	I strongly oppose, with my heart and mind, the USACE plan to bulldoze the natural ecosystem of Houston's Buffalo Bayou running through Memorial Park, causing the destruction of one of the last urban wildernesses in the United States. It is a truly extraordinary presence in Houston that should not be bulldozed and ecologically destroyed, but be preserved and cared for in the best manner possible for future generations.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. The proposed design for restoring stable banks in areas where severe erosion has occurred on the outside of meanders calls for the installation of toe wood along the base of these eroded areas to a location extending out from the existing eroded banks into the bayou. The installation of earthen coir lifts will occur above the placed toewood, and will continue in a "stairstep" pattern up to the existing eroded high bank location, essentially preserving the existing eroded high bank in place. No mature vegetation located along the high banks of the project will be impacted by the reestablishment of stable banks from the existing high banks out into the bayou. Restoring these existing degraded locations will instead allow for the reestablishment of vegetation along the banks of the bayou where none currently exists, and allow for the preservation of the existing high bank bluffs in their current location.

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Fowler, Dick	300.	I have received an email from Move-On.Org asking me to sign a petition against the referenced permit. I am against destroying the forest along Buffalo Bayou in Houston, which the petition claims this permit will allow; however, I do not trust this organization, a political movement funded by George Soros. Can you please tell me if this is a valid permit application and the other side of the issue.	Information regarding the permit application can be found on the HCFCD website: www.hcfcd.org/MPDP or through the USACE.
Garland, Colleen Robinson	301.	I have spent years learning about and educating others about erosion control. I have an environmental science degree, have spent years working for TCEQ and the City of Austin, specifically dealing with erosion control and prevention. From everything I've learned, all based on scientific research, this plan for Buffalo Bayou will accomplish anything but greater erosion control. The greatest lesson we have learned is the best way to control erosion is by leaving nature alone. Not only does nature stabilize banks to control erosion, it functions better as a filter than any engineered product to protect water quality.	Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion washes away the banks, public and private property along the bayou is threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the destruction of habitat and vegetation along portions of the bayou, and threats to public and private property. The overall compilation of data indicated that in order to stabilize the banks of the bayou, energy dissipating measures (i.e., bank full benches in the bayou's dimension, a pool and riffle system in the bayou's profile, stable geometry in the bayou's pattern) and the use of in-stream structures (i.e., toe wood) must be used to work in conjunction with one another to reduce shear stress from the banks of the bayou and allow for long-term, sustainable stability of the banks through the reestablishment of vegetation along the bayou banks and the reestablishment of ecological functions where possible. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium which will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou.
Hinton, Barbara B.	302.	I am vehemently against bulldozing the Hogg Bird	The erosion along the banks of the Hogg Bird Tributary is

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		Sanctuary & Camp Logan remains as part of the MPDP. How does bulldozing hundreds of trees, vines, and native undergrowth restore a natural, stable habitat?	extremely severe to the point that adjacent property owners were allowed by the COH to emplace stabilization efforts where necessary to protect their endangered properties. The existing habitat is being subjected to severe degradation and land loss through this section of the sanctuary; the implementation of the proposed project will preserve the existing vegetation in place and allow for the reestablishment of appropriate vegetation where none currently exists. HCFCD has completed extensive cultural resource surveys within the project area and has coordinated with the THC and the USACE to determine if the proposed project will have any impacts on cultural sites. It is the THC's opinion that impacts within the bayou will not have an effect on National Register eligible historic properties or to contributing elements of any designated State Antiquities Landmarks, including Camp Logan. In addition, fieldwork and historic research completed along the banks of the bayou thus far has concluded that there is no indication that archaeological deposits or historic standing structures associated with Camp Logan or other cultural resources will be affected by the proposed project. The THC and USACE are currently reviewing project plans to verify this conclusion.

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Hollocher, Phillip	303.	I am a local business owner who pays a lot of property taxes for my business property and my house in Houston along with the newly imposed drainage fees. I am very opposed to the bulldozing of the forest along the bayou in Memorial Park and River Oaks golf course.	HCFCD will remove some vegetation and trees to accomplish the project's goal of stabilizing the channel. It is expected that less than 80 percent of the trees and vegetation in the project area will be removed. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.
Hyde, Richard	304.	River Oaks Country Club is being sold a bag of bad goods. The golf course is safe if left alone, as there is a substantial riparian forest buffer zone between the banks and the fairways. As seen from the river at low water, these bluffs have mostly stabilized and vegetation is being reestablished. The bluffs are being stabilized by natural growth of trees and plants growing on the wedges of bank deposited at the base of these bluffs.	Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion washes away the banks, public and private property along the bayou is threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the destruction of habitat and vegetation along portions of the bayou, and threats to public and private property. The current active erosion and deposition seen within the proposed project reach are items that are noted in the

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			geomorphic assessment that are occurring due to the widening and incising of the bayou as it reacts to the altered hydraulic model that has been introduced to the watershed over time. The proposed project design will reestablish geomorphic conditions that will lead to the sustainable long-term stabilization of the stream system.
Knight, Susan	305.	I am writing in protest of the proposed Buffalo Bayou Demonstration Project. I live at 19 Crestwood and own two townhouses in the condominiums. I have lived in this area since 1996. I have been distraught about the Demonstration Project since I first heard about it. When I have expressed my concerns, I've been told that we are "outside the scope of the project," even though I will no longer be able to walk outside the back of my property and watch the birds come down and fish in the river. My concerns have basically been dismissed or ignored or it has even been suggested that if I don't like the results of the project I can always leave. We have never been given a choice or alternatives to resolve the issues; we have merely been told that there is only one solution and less environmentally damaging alternatives are not available.	For this demonstration project two tributaries were included so that NCD principals can be used to achieve stable banks. These techniques could be replicated throughout the eroding gullies in Memorial Park. One tributary proposed to be repaired is the Picnic Loop tributary, which will demonstrate techniques for repairing a non-USACE jurisdictional, ephemeral tributary with a steep grade. The second tributary proposed to be repaired is an intermittent tributary with a low, flat grade. Both tributaries proposed to be repaired will demonstrate options for others wanting to address additional tributaries in the project vicinity. The proposed project design is based on an assessment of the entire Buffalo Bayou watershed which includes the influence of the two upstream reservoirs, Addicks and Barker, and the previously rectified portions of the bayou upstream and downstream of the proposed project reach. HCFCD's design proposes to address the current problems with channel stability identified in this reach of Buffalo Bayou which are in part a result of these watershed and channel modifications. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology.
Knight, Susan	306.	There's no question that this project will scare off all the wildlife that has become so visible to us recently and that	Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to

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		it will destroy the natural beauty of our complex by removing the bayou out of our view and will reduce the canopy and natural life. There is no proof or guarantee that HCFCD's project can sustainably stop erosion. We've also been told that the ravine next to our building is not within the scope of their project. In the application to ACE, misrepresentations have been made that the local homeowners as the initiators of the project (it was River Oaks Country Club) also never evaluated alternatives to their current approach.	similar habitats directly adjacent to the project area or construction zone during the construction activities. The proposed project does include efforts to restore two tributaries, or swales, that outfall into Buffalo Bayou along the proposed project reach. One tributary proposed to be repaired is the Picnic Loop tributary, which will demonstrate techniques for repairing a non-USACE jurisdictional, ephemeral tributary with a steep grade. The second tributary proposed to be repaired is an intermittent tributary with a low, flat grade. Both tributaries proposed to be repaired will demonstrate options for others wanting to address additional tributaries in the project vicinity. These tributaries were included so that NCD principals can be used to achieve stable banks, and these techniques could then be incorporated into stabilizing other eroding drainage swales in Memorial Park.
Knowles, Linda	307.	I object to proposed projects that remove vegetation along the bayou in Memorial Park. I also oppose other projects that remove all natural vegetation along Buffalo Bayou and along other bayous. Please fund and allow projects that address erosion at the most eroded places and leave the rest of the natural areas along bayous alone. Please support projects that raise funds to buy more bayou land to add additional flood capacity.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. The proposed project design is based on an assessment of the entire Buffalo Bayou watershed which includes the influence of the two upstream reservoirs, Addicks and Barker, and the previously rectified portions of the bayou upstream and downstream of the proposed project reach. HCFCD's design proposes to address the current problems with channel

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			stability identified in this reach of Buffalo Bayou which are in part a result of these watershed and channel modifications. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology.
Kondolf, G. Mathias	308.	The project as proposed by HCFCD for Buffalo Bayou is not justified on geomorphic or ecological grounds. It appears to be aimed at stabilizing the river, at a considerable ecological cost, as well as a substantial financial cost to the citizens of Houston. If such sums are to be spent to improve rivers in Houston, an alternative approach of purchasing land and/or easements to increase the width of the river corridor at key points should be considered as a more robust approach that allows the river to heal itself (Smith, 2008; Piegay, et al., 2005), and one that would avoid the environmental damage that would occur with the proposed project.	Development along Buffalo Bayou is extensive and private property ownership extends to the center of the bayou in most areas. Property values along Buffalo Bayou are very high, making it exceedingly cost prohibitive to address Buffalo Bayou's stability issues by purchasing land.
Landon, Helen J.	309.	I am writing about my concern that the present demonstration plan to change Buffalo Bayou is based on unconfirmed information provided by those with personal interests rather than on verifiable and tested information. Beginning with the map that has been used to show the need for this project, but does not even show the 10-unit complex of condominiums, which are adjacent to Memorial Park, six of which will lose their view of the bayou, thus value, I question the plan's facts.	The goal of the project is bank stabilization to reduce erosion. Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion washes away the banks, public and private property along the bayou is threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the destruction of habitat and vegetation along portions of the bayou, and threats to public and private property.

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			NCD has been successfully implemented and proven across the United States and other parts of the world. HCFCD has already successfully applied various NCD principles to projects on Cypress Creek, Mason Creek, Vogel Creek, Buffalo Bayou, and Rummel Creek in Harris County, Texas. The property mentioned by the commenter is adjacent to COH property and not directly adjacent to the project reach, therefore it was not shown on the map referenced.
Light, Diana	310.	I am writing regarding my concerns over the proposed improvements to Buffalo Bayou near Memorial Park. In particular, the south picnic loop is of great concern as it is one of the (very) few remaining areas in the ever-growing COH where wildlife is abundant and people can explore trails and enjoy outdoor recreation. I would like to see where the improvements are proposed as well as what the timeframe is and what the expected outcome will look like.	The Picnic Loop is one of two drainage areas chosen to demonstrate that NCD principals can be used to achieve stable banks. The Picnic Loop will demonstrate techniques for repairing a non-USACE jurisdictional, ephemeral tributary with a steep grade. Access to the project reach for recreational purposes will be limited during construction; however, there would be no long-term impacts. Plans for this area are included in the IP application. Only one recognized park trail will be crossed which will be left open for the duration of the project with a traffic control flagman and there will be only one access point to the streambed of the bayou. No mature vegetation located along the high banks of the project will be impacted by the reestablishment of stable banks from the existing high banks out into the bayou. Restoring these existing degraded locations will instead allow for the reestablishment of vegetation along the banks of the bayou where none currently exists, and allow for the preservation of the existing high bank bluffs in their current location.
Mackin, T. R.	311.	Do not do the mowing and destruction of all plants; it is so nice in a canoe going down Buffalo Bayou!	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou

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			where none currently exists. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks.
Martinez, Aramis	312.	The permit should be denied on the grounds that these are not final design plans. It is very difficult for regulatory agencies to make a reliable assessment about the water quality, environmental impact, or public benefits from a design that could be changed even after a permit was granted. Similarly, it is difficult for the public to provide informed feedback regarding the effectiveness of the proposed design or its impact on the community.	The 80% design plans that were submitted to USACE contain the final design. The plans are marked "80% draft" because they are not ready to be bid for construction; this language merely refers to a contract milestone for HCFCD's engineering consultant. The overall design, stated impacts to waters of the U.S, and the proposed vegetated areas will not change. The plans were submitted to obtain an IP, and while the permit application is under review, HCFCD has been working with the engineering consultant to finalize the construction notes and specs found on the design plans. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mobley, Diana	313.	I am uncertain that this is the appropriate approach for resolution of the issues cited along Buffalo Bayou. It does not appear the impact on the environment has been fully considered, nor have the downstream implications of rerouting the curves of the bayou. While this project is partially funded by taxpayers, I believe it is an inappropriate use of taxpayer funds for an inefficient solution. Other alternatives should be considered to address the issues brought forth by the permit applicant.	An initial assessment of the entire length of Buffalo Bayou was completed from the Barker Reservoir located on the west side of Harris County, starting at Texas State Hwy. 6, downstream to the Houston Ship Channel. This includes the upper and lower reaches of Buffalo Bayou that were originally rectified by the USACE (widened, deepened, and realigned for Flood Damage Reduction and navigation purposes in the mid-20th Century), and the portion of Buffalo Bayou in between that was left in its current state at the time. Due to the erosive nature of high flows in the bayou caused by

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			urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. One component of the project will be the reestablishment of geomorphic floodplain connectivity through the construction of bankfull benches. One of the benefits of this action will be reduced flow velocity.
Morgenstern, Joan	314.	Do not take out the 14 acres as an erosion experiment on Buffalo Bayou. We need the trees badly and there are other places such as the River Oaks Country Club that are willing to experiment and they can spend their own money. Please do not kill the beautiful trees and wildlife that inhabit that area. It is not necessary.	As stated on page 3 of the IP application, the study area is 13.97 acres and 6,260 linear feet; however, not all of this vegetation will be removed for the proposed project. HCFCD will remove some vegetation and trees to accomplish the project's goal of stabilizing the channel. It is expected that less than 80 percent of the trees and vegetation in the project area will be removed. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and

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			planting of native tree and shrub species. The Memorial Park Demonstration Project (MPDP) will restore Buffalo Bayou's equilibrium, and will ultimately protect the upper banks along this reach of Buffalo Bayou. The term "demonstration" refers to providing an example of successful urban stream restoration on a portion of Buffalo Bayou using techniques that have been used successfully to restore streams in other areas of the United States. The project is meant to demonstrate to property owners along Buffalo Bayou, and other bayous and creeks in urban areas, the long-term benefits of looking at both banks of the bayou, and restoring a significant stretch (holistic project reach approach) of a bayou system rather than repairing isolated sections (spot repairs) to only one bank of a bayou system. Spot repairs to one side of the streambank ultimately create impacts to the opposite bank of the bayou, downstream due to the inability to dissipate erosive flows in a manner that concentrates them to the thalweg (centerline) of the bayou and have had little effect on the bayou's growing erosion problem over the years.
Preservation Texas	315.	A recent 14-mile paddle down the bayou reveals that most of the erosion in the project area has been caused by the removal of trees. Coupled with increased water volumes caused by overdevelopment of areas in the bayou's watershed, it becomes clear that the challenges of the bayou extend beyond the waterway itself. A radical grading and replanting project does not address root causes.	The proposed project design is based on an assessment of the entire Buffalo Bayou watershed which includes the influence of the two upstream reservoirs, Addicks and Barker, and the previously rectified portions of the bayou upstream and downstream of the proposed project reach. HCFCD's design proposes to address the current problems with channel stability identified in this reach of Buffalo Bayou which are in part a result of these watershed and channel modifications. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology.

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			Changes in stormwater flow caused by urbanization, and the operation of the Addicks and Barker reservoirs are causing Buffalo Bayou to try to find equilibrium. As a result, the channel is trying unsuccessfully to stabilize itself, and the end result is severe erosion of the bayou's banks, which causes trees, plants and the dirt that makes up those banks to fall into the channel. As erosion washes away the banks, public and private property along the bayou is threatened. That erosion has had devastating environmental consequences, including an increase in flood potential, a decrease in water quality, the destruction of habitat and vegetation along portions of the bayou, and threats to public and private property. The current active erosion and deposition seen within the proposed project reach are items that are noted in the geomorphic assessment that are occurring due to the widening and incising of the bayou as it reacts to the altered hydraulic model that has been introduced to the watershed over time. The proposed project design will reestablish geomorphic conditions that will lead to the sustainable long-term stabilization of the stream system. Improvements to the bayou's dimension, pattern, and profile will allow the streambed to establish a dynamic equilibrium which will keep erosive flows concentrated in the center of the stream, or thalweg, and protect the adjacent naturally vegetated streambanks. The decrease in sediment load from the ongoing mass wasting and streambank erosion within the project reach will have a positive influence on water quality in Buffalo Bayou.
Van Dame, Lesly	316.	The public does not have sufficient information to understand and evaluate the proposed project. I doubt if anyone actively involved in pursuing and reviewing the project specifications has sufficient information to make a truly informed, rational, beneficial to the general public decision. Let's not rush it. There is too much to lose.	Following its review process, the USACE will issue a permit decision on the proposed project. The applicant will follow any requirements/recommendations given in the USACE's permit decision document in order to perpetuate the permitting process. These may include adjustments to the project design. The USACE will make any new/revised documents available to the public.
Watkins, Steve Houston	317.	This "natural" process has failed notably elsewhere. It is nothing more than channelization, minus the concrete, with no guarantee that natural erosion will even be	NCD has been successfully implemented and proven across the United States and other parts of the world. Furthermore, HCFCD has already successfully applied various NCD

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		stopped. But the damage? Irreversible. And, where, exactly, do they propose to create the trails to get their bulldozers in and out to do all this "natural" work? The proposal does not address this - I suppose this is the 20 percent of the proposal that hasn't been completed yet. This certainly needs addressing before anyone should make a decision (in fact, why is the public being given only to June 30 to comment on an incomplete proposal?). You have undoubtedly read the template letter generated by the Save Buffalo Bayou people. I agree with every word of it. I send you this only to add a personal note from one who has been closely connected to this unique place - beloved by so many - and who would be deeply saddened to find it mutilated at the selfish behest of a few.	principles to projects on Cypress Creek, Mason Creek, Vogel Creek, Buffalo Bayou, and Rummel Creek in Harris County, Texas. Under the current plan, the project site will have one access point leading from Memorial Drive down to the bayou, if any changes are made to the proposed access it will be coordinated with the USACE as appropriate. This access point will be located on COH property and has been coordinated with HPARD who is responsible for managing Memorial Park. An access road will be created from the backside of the HPARD maintenance facility down the north bank of Buffalo Bayou to the stream bed of the bayou. This construction access road will require the clearing of trees and vegetation to gain access to the channel. The exact location of the road will be determined in the field prior to beginning construction so that the most direct and least damaging route can be established and any notable trees located by the project vegetation inventory can be avoided. The 80% design plans that were submitted to USACE contain the final design. The plans are marked "80% draft" because they are not ready to be bid for construction; this language merely refers to a contract milestone for HCFCD's engineering consultant. The overall design, stated impacts to waters of the U.S, and the proposed vegetated areas will not change. The plans were submitted to obtain an IP, and while the permit application is under review, HCFCD has been working with the engineering consultant to finalize the construction notes and specs found on the design plans. The USACE extended the public comment period an additional 30 days to June 30, 2014, to allow the public additional time to comment on the proposed project.
Westrich, Anne and Joe	318.	As residents who recently built a home in a neighborhood near Buffalo Bayou, we have been excited about being near the bayou. However, recently while walking on paths beside the newly-graded and planted area along Buffalo Bayou from Shepherd Street to DT...disappointed	Some wildlife habitat will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the

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		that there was no wildlife in evidence. No birds of prey, no river mammals, few insects (butterflies, etc.). The trees were tiny and new, and few old trees remain along the edge of the bayou. We believe that this type of devastation will happen to the part of the bayou scheduled to be changed under HCFCD's plan to redesign the bayou. This plan will destroy the wonderful remaining natural area of the bayou near Memorial Park and the Arboretum. If left intact or minimally contained, this natural part can speed the healing of the devastated stretches of bayou we mentioned above. The wildlife and vegetation will be irreparably damaged if this area is destroyed by the proposed plan. We don't have 90 years to wait for it to come back! In learning more about this issue, we also understand that the plan will destroy critical wetlands and destroy the bayou's ecosystem, with rather untested claims that it will control erosion. We've also heard that the erosion can be controlled in other, less invasive, manners.	ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. These wetlands will provide food and water for birds in the area. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and

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			monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Whittlesey, Karin	319.	Please do a thorough job of conserving the native plants and being mindful of a healthy ecosystem. Please make your project more sustainable.	The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Wise, Landrum & Lynnea	320.	In the July 2014 issue of the magazine, "Texas Parks and Wildlife," there is an article entitled, "Love at Second	Access to the project reach for recreational purposes will be limited during construction; however, there would be no long-

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		Sight - Texas cities are embracing their rivers again." That article states, in part: "Texas cities were built on rivers. But for decades, many cities have abused or ignored their rivers—straightening them, walling them off with levees and using them as dumping grounds. That's starting to change. Cities are realizing what incredible resources their rivers are, and many of them are embracing their rivers once again." A Texas Parks and Wildlife Department paddling trail now covers a 26-mile stretch of Buffalo Bayou. We think that in the consideration of any proposed project that would impact these resources in a manner that would result in very significant destruction of the existing, natural, environment, the highest degree of care should be exercised and all reasonable alternatives should be thoroughly investigated.	term impacts. Upon speaking with several members of the boating community, the design plans were altered to prevent hindrance of boating and recreation in the project area long term. The proposed design for restoring stable banks in areas where severe erosion has occurred on the outside of meanders calls for the installation of toe wood along the base of these eroded areas to a location extending out from the existing eroded banks into the bayou. The installation of earthen coir lifts will occur above the placed toewood, and will continue in a "stairstep" pattern up to the existing eroded high bank location, essentially preserving the existing eroded high bank in place. No mature vegetation located along the high banks of the project will be impacted by the reestablishment of stable banks from the existing high banks out into the bayou. Restoring these existing degraded locations will instead allow for the reestablishment of vegetation along the banks of the bayou where none currently exists, and allow for the preservation of the existing high bank bluffs in their current location.

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National Register of Historic Places			
Arnett, Carrie Curcio, Ken Drummond, Jessica Drummond, Mark Gish, Sarah Hollifield, Hannah Jane Hyde, Richard James, Terrell JWW "McP" Kirschke, Theresa Knight, Susan Myers, Jean Novy, Stanley Roll Model Rudez, Michael G. Smith, Karis Sutton, Andrew Tilbury, Gillian A. Villaescusa, Julie Westbrook, Lydia Yglesias, Jerry	321.	Camp Logan in Memorial Park, which includes banks of the bayou, is a State Antiquities Landmark and eligible for the National Historic Register.	HCFCD has completed extensive cultural resource surveys within the project area and has coordinated with the THC and the USACE to determine if the proposed project will have any impacts on cultural sites. It is the THC's opinion that impacts within the bayou will not have an effect on National Register eligible historic properties or to contributing elements of any designated State Antiquities Landmarks, including Camp Logan. In addition, fieldwork and historic research completed along the banks of the bayou thus far has concluded that there is no indication that archaeological deposits or historic standing structures associated with Camp Logan or other cultural resources will be affected by the proposed project. The THC and USACE are currently reviewing project plans to verify this conclusion. The archaeological survey was designed based on the plans that were available at the time. Archaeologists, HCFCD, USACE, and the THC are developing an inadvertent discoveries plan as well as an archaeological monitoring plan for the project construction that will be refined as project construction plans are finalized.
Baumann, Marsha J. Benton, Janet Brenner, Margaret Goode, Debra Rascoe, Cathy Redden, Joe W., Jr. Salinas, Al Wilson, Jeanie Kilroy	322.	The proposed design will have major impacts on Memorial Park. Comments are being developed regarding the potential eligibility of Memorial Park for the National Register of Historic Places.	HCFCD has completed extensive cultural resource surveys within the project area and has coordinated with the THC and the USACE to determine if the proposed project will have any impacts on cultural sites. It is the THC's opinion that impacts within the bayou will not have an effect on National Register eligible historic properties or to contributing elements of any designated State Antiquities Landmarks, including Camp Logan. In addition, fieldwork and historic research completed along the banks of the bayou thus far has concluded that there is no indication that archaeological deposits or historic standing structures associated with Camp Logan or other cultural resources will be affected by the proposed project. The THC and USACE are currently reviewing project plans to verify this conclusion. The archaeological survey was designed based on the plans that were available at the time. Archaeologists, HCFCD, USACE, and the THC are developing an inadvertent discoveries plan as well as an archaeological monitoring plan

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			for the project construction that will be refined as project construction plans are finalized.
Blackburn, Jr., James B.	323.	Although not currently listed on the National Register, Memorial Park meets all of the criteria for eligibility and should be treated as eligible for purposes of the USACE analysis of compliance. Due to the fact that Memorial Park is eligible for listing, a full effects determination of the project on Memorial Park must be undertaken. The best way to comply with the National Historic Preservation Act is to leave the banks of Buffalo Bayou within Memorial Park alone. Attachment C, a letter regarding "Eligibility of Memorial Park, Houston, Harris County, Texas, for listing in National Register of Historic Places," written by Stephen Fox, an architectural historian based in Houston, was included for reference.	HCFCD has completed extensive cultural resource surveys within the project area and has coordinated with the THC and the USACE to determine if the proposed project will have any impacts on cultural sites. It is the THC's opinion that impacts within the bayou will not have an effect on National Register eligible historic properties or to contributing elements of any designated State Antiquities Landmarks, including Camp Logan. In addition, fieldwork and historic research completed along the banks of the bayou thus far has concluded that there is no indication that archaeological deposits or historic standing structures associated with Camp Logan or other cultural resources will be affected by the proposed project. The THC and USACE are currently reviewing project plans to verify this conclusion. The archaeological survey was designed based on the plans that were available at the time. Archaeologists, HCFCD, USACE, and the THC are developing an inadvertent discoveries plan as well as an archaeological monitoring plan for the project construction that will be refined as project construction plans are finalized.
Chadwick, Susan	324.	The application permit is out of date regarding the landmark status of the project area (p. 595). The project area is now a State Antiquities Landmark.	HCFCD has completed extensive cultural resource surveys within the project area and has coordinated with the THC and the USACE to determine if the proposed project will have any impacts on cultural sites. It is the THC's opinion that impacts within the bayou will not have an effect on National Register eligible historic properties or to contributing elements of any designated State Antiquities Landmarks, including Camp Logan. In addition, fieldwork and historic research completed along the banks of the bayou thus far has concluded that there is no indication that archaeological deposits or historic standing structures associated with Camp Logan or other cultural resources will be affected by the proposed project. The THC and USACE are currently reviewing project plans to verify this conclusion. The archaeological survey was designed based on the plans that were available at the time. Archaeologists, HCFCD, USACE, and the THC are developing an inadvertent

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			discoveries plan as well as an archaeological monitoring plan for the project construction that will be refined as project construction plans are finalized.

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Wildlife			
Battey, James M. Beishir, Olga Eckenfis, Michael Emde, William Evans, Bruce Evans, Richard H. Gederberg, Silvia Hannan, Nancy Hatcher, Eileen Lowiclu, Becky Manley, James Parker, Ray C. Rose-Molina, Peter Shen, Lan Spolyar, Mary Thomas, Judy Walker, Kelly Whittlesey, Karin	325.	The project will result in significant degradation of the waters of the United States. During the construction period, the equipment, the process of cutting and filling, and the clearing of the low vegetation and trees will significantly increase the discharge of pollutants in the project area. The fish habitat will be adversely affected because the water will be greatly disturbed by the activity and more pollutants will be flowing into the water, the trees will be removed from the bank... so the water will have little or no shade and the water temperature will rise; once the trees that hang over the water are removed, fewer insects will fall into the water so there will be less food for the fish. Aquatic birds will be adversely affected because they will have less fish to eat when the fish are adversely affected, and will have fewer seeds and less vegetation to eat when the vegetation is scraped from most of the project area, as well as fewer insects to eat for the same reason. The wetlands along the reach of the project will also be affected because many of the original wetlands lie in cut or fill areas of the project. Many valuable plants that lie in those areas, plants such as aquatic milkweed and smartweed, a plant that serves both waterfowl and insects, will be destroyed when the banks are scraped.	HCFCD will utilize the JTF Storm Water Management Handbook for Construction Activities (2006 Edition) and Storm Water Management JTF Storm Water Management Program: Minimization Design Criteria for Implementation of Certain Best Management Practices for Storm Water Runoff Treatment Options (2001 Edition). From these guidelines, BMP and a SWPPP have been developed to reduce turbidity and total suspended solids during construction. The SWPPP, including specific BMPs to be utilized, will be finalized during the final design of the proposed project. Mature woody riparian vegetation does provide an important function in shading water, thereby limiting in-stream temperature and promoting greater dissolved oxygen to support wildlife. Unfortunately, much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature trees that used to line Buffalo Bayou's banks have already been lost to streambank failure and mass wasting of slopes. Where vegetation has managed to reestablish on failed streambanks it is predominantly immature non-native species creating monoculture community types or herbaceous vegetation which does not have adequate height to provide shading of the water. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches

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			and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Bertagne, Bob	326.	"The cliffs, which would be eliminated in the proposed reconfiguration, are important habitat for nesting kingfishers (which we saw only in this stretch of the bayou). Furthermore, the stretch that borders Memorial Park is the only part of the bayou where natural habitat (and all the animals it contains) borders the watercourse."	The proposed design for restoring stable banks in areas where severe erosion has occurred on the outside of meanders calls for the installation of toe wood along the base of these eroded areas to a location extending out from the existing eroded banks into the bayou. The installation of earthen coir lifts will occur above the placed toewood, and will continue in a "stairstep" pattern up to the existing eroded high bank location, essentially preserving the existing eroded high bank in place. No mature vegetation located along the high banks of the project will be impacted by the reestablishment of stable banks from the existing high banks out into the bayou. Restoring these existing degraded locations will instead allow for the reestablishment of vegetation along the banks of the bayou where none currently exists, and allow for the preservation of the existing high bank bluffs in their current location.
Caul, Carol	327.	The project needs to let the citizens know how many of our few birds, frogs, and other animals will have to give their lives for this project and what efforts will be undertaken to provide an interim habitat for animals who have the mobility to relocate.	Some wildlife habitat will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will

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			require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities. An MPDP Monitoring Plan has been developed that includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Dishberger, Michael and Debra	328.	We are also very concerned that this work will ruin a unique habitat for wildlife in the area. What about the beavers that live directly across the bayou from us, not to mention the egrets, herons, hawks, armadillos, and coyotes that call this place home. We have a truly natural area in a city of millions and this project will do nothing to improve it. We are most opposed to the work being done in the Ima Hogg Bird Sanctuary. What good is a bird sanctuary without trees? Take note of the plans that call for the work to go all the way up the ravines to help stabilize individual property owners' properties.	Some wildlife habitat will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities. The erosion along the banks of the Hogg Bird Tributary is extremely severe to the point that adjacent property owners

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			were allowed by the COH to emplace stabilization efforts where necessary to protect their endangered properties. The existing habitat is being subjected to severe degradation and land loss through this section of the sanctuary; the implementation of the proposed project will preserve the existing vegetation in place and allow for the reestablishment of appropriate vegetation where none currently exists. There may be a temporary impact on the results of the Houston Audubon Society bird surveys; however, this will be experienced only during construction activities. Post project, the bird surveys can document changes in bird counts. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Heins, William	329.	I am concerned that proposed modifications to the bayou will cause problems we don't have now, specifically: rendering portions of Memorial Park unsuitable for recreation, and removing mature riparian forest with associated wildlife habitat.	Some trees and vegetation will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Access to the project reach for recreational purposes will be limited during construction; however, there would be no long-term impacts. Upon speaking with several members of the boating

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			community, the design plans were altered to prevent hindrance of boating and recreation in the project area long term. Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities. An MPDP Monitoring Plan has been developed that includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Hershey, Olive	330.	Earlier this month I attended a meeting where a professional hydrologist and a biology professor refuted Harris County's claim that the bayou will get an "ecological lift." Instead of experiencing a lift, the bayou's water will be hotter because the trees will be gone from its banks, which will certainly reduce the stream's ability to sustain aquatic life. Most birds in the Hogg Bird Sanctuary will lose their habitat entirely, as well as water and food.	Some wildlife habitat will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have

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			been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. These wetlands will provide food and water for birds in the area. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Landon, Helen J.	331.	The destruction of the natural habitat of the birds (belted kingfisher for one), and the animals (possums, raccoons, coyotes) will move these animals into residential areas where they will ultimately be destroyed (coyotes), or leave them without an area in which they may survive (kingfishers).	The proposed design for restoring stable banks in areas where severe erosion has occurred on the outside of meanders calls for the installation of toe wood along the base of these eroded areas to a location extending out from the existing eroded banks into the bayou. The installation of earthen coir lifts will occur above the placed toewood, and will continue in a "stairstep" pattern up to the existing eroded high bank location, essentially preserving the existing eroded high bank in place. No mature vegetation located along the high banks of the project will be impacted by the reestablishment of stable banks from the existing high banks out into the bayou. Restoring these existing degraded locations will instead allow for the reestablishment of vegetation along the banks of the bayou where none currently exists, and allow for the preservation of the existing high bank bluffs in their current

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			location which these animals can continue using. HCFCD's planting plan will include the installation of grasses for initial site stabilization and native trees and shrubs for the long-term reestablishment of a healthy, sustainable riparian forest along the proposed project reach. The current planting plan calls for native tree and shrub species to be planted from the toe of the bank to the top of the bank with regard to proper hydrological zone placement. Native tree species such as bald cypress, water tupelo, sand willow, and black willow will be planted close to the water's edge, both for long-term bank stabilization purposes and the reestablishment of native species that were historically present along Buffalo Bayou but are no longer there (either removed historically because of the timber industry or more recently as a result of the erosion). The overall long-term revegetation plan for the project area is to reestablish a closed canopy system along the proposed project reach with proper regard to proper hydrological zone placement.

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Martinez, Aramis	332.	The demonstration project would have a strong negative environmental impact. The project would remove many trees along the banks of Buffalo Bayou, leading to a significant increase in water temperatures. The increase in water temperature is a degradation of habitat for a variety of fish species that currently live and spawn in these waters. The channel shape would be changed at many points, and debris like dead trees cleaned out of the bayou, both of which would completely eliminate much of the habitat of the fish species currently there. The loss of wetlands along the length of the bayou is the removal of habitat for bird species that live in the area permanently and for species that migrate through the area. These birds also serve as a lure for eco-tourists, bringing commerce to the Houston area. The Hogg Bird sanctuary would lose a notable amount of its currently-existing wetlands due to one of the main transects in the plan. The natural, normal cross-sectional shape of bayou includes near-vertical cliff faces that provide habitat for bird species such as the kingfisher species observed nesting on the banks; the plan would obliterate this habitat by artificially smoothing out the bayou's cross-section.	Some wildlife habitat will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. HCFCD's planting plan will include the installation of grasses for initial site stabilization and native trees and shrubs for the long-term reestablishment of a healthy, sustainable riparian forest along the proposed project reach. The current planting plan calls for native tree and shrub species to be planted from the toe of the bank to the top of the bank with regard to proper hydrological zone placement. Native tree species such as bald cypress, water tupelo, sand willow, and black willow will be planted close to the water's edge, both for long-term bank stabilization purposes and the reestablishment of native species that were historically present along Buffalo Bayou but are no longer there (either removed historically because of the timber industry or more recently as a result of the erosion). The overall long-term revegetation plan for the project area is to reestablish a closed canopy system along the proposed project reach with proper regard to proper hydrological zone placement. HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the

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			existing wetlands present. Mature woody riparian vegetation does provide an important function in shading water, thereby limiting in-stream temperature and promoting greater dissolved oxygen to support wildlife. Unfortunately, much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Mobley, Diana	333.	The application states that the project will provide an "ecological lift" and "improve aquatic habitat." Rerouting the bayou and removing large amounts of the natural canopy will devastate the wildlife living in and near the bayou. It seems counterintuitive that destroying an environment that has formed over hundreds/thousands of years will be beneficial to it. Mature trees play a huge part in regulating water temperature and make life for many species sustainable. Debris and vegetation, from an ecological perspective, offer great sanctuary for wildlife. It is unclear how disrupting existing habitat and	Some trees and vegetation will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian

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		removing trees/vegetation will "improve aquatic habitat." The bayou will not just "bounce back" post-construction, and certainly will not reform to the bayou that it is now. It is currently a heterogeneous, diverse ecosystem. As it regrows, many of the inhabitants will not be able to sustain life in the new environment, and it will become a typical urban waterway with less diverse wildlife.	vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Smith, Karis	334.	Please reject this plan. The area that is under scrutiny has wetlands that are rare, just by virtue of being in an urban setting. These wetlands are critical habitat for wildlife, including fish, who use the slow-moving water as spawning and nursery areas. The Clean Water Act requires the least damaging solution—which this is not—because the waters are meant to support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."	HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.

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Restoration/Maintenance/Monitoring			
Battey, James M. Beishir, Olga Eckenfis, Michael Emde, William Evans, Bruce Evans, Richard H. Gederberg, Silvia Hannan, Nancy Hatcher, Eileen Lowiclu, Becky Manley, James Parker, Ray C Rose-Molina, Peter Shen, Lan Spolyar, Mary Thomas, Judy Walker, Kelly Whittlesey, Karin	335.	Thus far, after almost three years, no detailed restoration plan is available. How can they apply for a permit for the project when the restoration plan, a key component, has not been made public for comment? Since there is no planting plan, mitigation should be involved, and they must mitigate for the wetlands being destroyed. Detailed restoration plans on which we can comment on mitigation - the public needs to know that the wetlands will be restored or mitigated.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. HCFCD's planting plan will include the installation of native grass mix that may include a portion of Bermuda grass for initial site stabilization and native trees and shrubs for the long-term reestablishment of a healthy, sustainable riparian forest along the proposed project reach. The current planting plan calls for native tree and shrub species to be planted from the toe of the bank to the top of the bank with regard to proper hydrological zone placement. Native tree species such as bald cypress, water tupelo, sand willow, and black willow will be planted close to the water's edge, both for long-term bank stabilization purposes and the reestablishment of native species that were historically present along Buffalo Bayou but are no longer there (either removed historically because of the timber industry or more recently as a result of the erosion). The overall long-term revegetation plan for the project area is to reestablish a closed canopy system along the proposed project reach with proper regard to hydrological zone and community type. HCFCD does foresee the establishment of in-stream wetlands in some areas where the geomorphic floodplain connectivity is reestablished along the project reach, and HCFCD does plan on planting wetlands in some areas where hydrologic water connectivity will allow for it. Please refer to the Pre- and Post- Construction Monitoring Plan that includes measures to ensure a minimum survivability rate of 80 percent for containerized native trees and shrubs, a 50 percent survival rate for live stake native trees and shrubs, and a minimum coverage of 70 percent for wetland plantings at the end of the second full growing season following planting. The monitoring plan also includes

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			management plans to control the proliferation of noxious invasive plant species.
Batten, Jr., George W.	336.	As presented, the project does not have a maintenance plan. The NCD Review Checklist Item 4.1a indicates that the stream is designed to be "self-maintained." This is inadequate. There needs to be a plan for regular inspection with follow-up maintenance whenever it is needed.	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Blackburn, Jr., James B.	337.	The most absurd aspect of this project is that it does not propose any mitigation. The Galveston District has developed four assessments: Forested Riverine, Herbaceous Riverine, Tidal Fringe, and Lacustrine. Here, the forested riverine tool should be used. Only by the application of this tool can a defensible decision be made on the amount, quality, and acceptability of mitigation. No mitigation for a project such as this simply violates 40 CFR §230.10(d).	The proposed project was designed to be self-compensating; that is, the project will result in an overall ecological lift. The proposed project will impact 0.61 acre of wetlands and HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Boyd, Jim	338.	Why has the permit applicant failed to investigate mitigation of the changes to the Buffalo Bayou it requests?	The proposed project was designed to be self-compensating; that is, the project will result in an overall ecological lift. The proposed project will impact 0.61 acre of wetlands and HCFCD will plant at least 0.80 acre of wetlands to replace what will be disturbed during construction. This wetland area will be located within Transect 6, where the existing channel will be abandoned. Due to the creation of bankfull benches

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			and low flow benches, there is the potential for 2 to 8 acres of emergent wetlands to be established. Due to the improved hydrology and use of native plantings and seed mixes, the created wetlands are expected to be of higher quality than the existing wetlands present. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Dishberger, Michael and Debra	339	After the work is complete, we are told that the area will be replanted, but with what? We've heard that non-native, invasive plants such as Bermuda grass will be included. Also, even if native plants and trees are installed, will they be cared for? We have personally spent considerable time and effort to plant and sustain native trees along the bayou. We can tell you that it is not enough just to plant a few trees and hope for the best. For the first few years, it is necessary to continually remove invasive weeds and vines that will otherwise overwhelm the new trees. Does the MPDP budget include this ongoing work that will be needed for several years?	Some trees and vegetation will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as

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			possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. A monitoring plan has been developed and provided to USACE which includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Elder, Bob and Ann	340.	It is stated in the application that "Aquatic resource functions will be improved by establishing a riffle and pool system, installing in stream structures to protect the banks from erosive flows and provide aquatic habitat…" Many of these NCD design features have been eliminated or reduced in the current design. While we still agree that the current design will increase aquatic resources, we do think that a baseline and post installation aquatic surveys will demonstrate this for future projects. Such surveys should be considered.	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Emde, Katy	341.	At this time I would like to speak to the fact that I do not think the permit should be granted because the public has not had a chance to comment on the restoration part of the project. I have been attending meetings for two years and 11 months and at five different times I asked what the Harris County Flood Control District was going to plant during the restoration part of the project. Five times I was told that they were ONLY going to plant native plants. However, after two years I was finally told by Mike Talbot that HCFCD would be planting Bermuda grass because they always did...I and others were horrified to hear that a non-native, very invasive grass would be planted in the natural riparian habitat along the bayou. For over a year we have been objecting vociferously. Over 50 signatures	HCFCD's planting plan will include the installation of grasses for initial site stabilization and native trees and shrubs for the long-term reestablishment of a healthy, sustainable riparian forest along the proposed project reach. The current planting plan calls for native tree and shrub species to be planted from the toe of the bank to the top of the bank with regard to proper hydrological zone placement. Native tree species such as bald cypress, water tupelo, sand willow, and black willow will be planted close to the water's edge, both for long-term bank stabilization purposes and the reestablishment of native species that were historically present along Buffalo Bayou but are no longer there (either removed historically because of the timber industry or more recently as a result of the erosion). The overall long-term revegetation plan for the project area is

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		protesting the use of Bermuda grass in Memorial Park were sent to the Mayor Anise Parker, Parks Director Joe Turner, County Judge Ed Emmett, HCFCD Director Mike Talbot, and County Commissioner Jack Cagle. I have attached a copy of the petition - I am sending it as one who endorses what it says, consider it signed by me - and am sending a copy of the sources for information on how horrible Bermuda grass actually is.	to reestablish a closed canopy system along the proposed project reach with proper regard to proper hydrological zone placement. HCFCD's plan for initial site stabilization has not yet been finalized. HCFCD strives to use all native vegetation and is working to do so in the proposed project; however, limited commercially available seed sources for native ground vegetation and the low germination rates of native seeds make it difficult to solely use native species to achieve initial site stabilization. HCFCD is conducting field research, along with other interested local agencies, to formulate a viable seed mix for initial site stabilization along the project reach. If HCFCD is not able to identify a viable seed mixture to use on-site, Bermuda grass may be used for at least a portion of the proposed seed mix for initial site stabilization. If Bermuda grass is used in the seed mix, HCFCD will minimize its existence by not actively mowing the site (which will limit its spread) and establishing a closed canopy to eradicate it (because it is shade intolerant).
Galveston Bay Foundation	342.	In the materials provided on the USACE website, we do not see information concerning tree planting and canopy coverage success criteria and monitoring requirements. These items should be part of any granted permit.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.

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Galveston Bay Foundation	343.	As (a) this project is described as a demonstration project and (b) it is aimed at improving water quality and for providing for improved aquatic resource functions, measures of success and a schedule for their monitoring over the coming years should be included in the permit. If the demonstration project does not meet success criteria per item 1, HCFCD should have a contingency plan/adaptive management plan to mitigate for impacts to waters of the U.S.	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Janzer, Mark	344.	I would expect that the impact to the disturbed riparian zone by this project would be mitigated fully by the proposed project. The existing zone scores, included with this submittal, would be a benchmark for this mitigation. To successfully mitigate the impact of the riparian zone, a phase approach may be required. This would permit equivalent mitigated areas of the riparian zone to become established, to minimize impact to habitat within the project limits.	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Wilson, A. K.	345.	Many of our bayous tend to continuously meander through Houston's flat topography. The project description refers to "restoration," but doesn't describe or reference a previous condition or point in time (i.e., what's it restoring the bayou to?). I find it hard to believe, in fact, that the bayou ever did resemble the proposed configuration.	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.
Wilson, A. K.	346.	The plan is presented as a "demonstration" project, yet it's not clear what is hoped to be proven and by what measures it would be evaluated. Goals and actual outcomes should be defined and monitored as part of a long-term plan that is included in the project budget.	Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan.

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Scope			
Batten, Jr., George W.	347.	It is obvious that stabilization of the banks is needed in some places, but the extent of the project as it stands will cause significant degradation of the bayou.	HCFCD has conducted assessments of the channel banks along the entire reach of Buffalo Bayou, as well as extensive assessments of the channel banks along the proposed project reach to determine the conditions of the bayou, and the appropriate repair methods for the proposed project reach. These assessments include a hydraulic model review, visual assessment, BEHI assessment, NBS assessment, BANCS assessment, woody debris load mapping, sediment transport assessment, stable channel reach review, and regional channel curve review. Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches in the streams dimension, pool and riffle reestablishment in the streams profile, geometry changes in the streams pattern, and in-stream structures, such as toe wood) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. HCFCD will utilize the JTF Storm Water Management Handbook for Construction Activities (2006 Edition) and Storm Water Management JTF Storm Water Management Program: Minimization Design Criteria for Implementation of Certain Best Management Practices for Storm Water Runoff Treatment Options (2001 Edition). From these guidelines, BMP and a SWPPP have been developed to reduce turbidity and total

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			suspended solids during construction. The SWPPP, including specific BMPs to be utilized, will be finalized during the final design of the proposed project.
Blackburn, Jr., James B.	348.	This project destroys an important part of a public park. This is important space. This is public space. This park is environmentally and historically and civically significant. The important point here is that these impacts can be avoided. This area does not have to be impacted. There is no need for this project at this location. There may be the need for some work on some areas of the bayou within the project boundaries, but there is no need for work within Memorial Park and the Hogg Bird Sanctuary. Period.	Once the decision was made to utilize Natural Channel Design methods based on the principles of fluvial geomorphology to restore the proposed project reach, assessments were conducted and used to select one of three possible choices for restoration activities associated with the project. The three possible restoration activities included, :leave the reach alone (no restoration activities necessary), passive restoration (install additional vegetation), and active restoration (earthwork and vegetation installation).The assessments conducted by HCFCD's design team indicated that active restoration of stream dimension, pattern, and profile was required to reestablish the stable geomorphological function to the stream and provide for overall increased stream functions. Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches, pool and riffle reestablishment, geometry changes, and in-stream structures) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. Lessening the footprint of this project would not achieve the project goals of fully restoring the hydrologic, hydraulic, and geomorphic stream functions. Furthermore, stream condition assessments identified the proposed project footprint as having some of the highest

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			instability ratings along Buffalo Bayou. Lessening the project footprint would subsequently leave some of these highly unstable sections of Buffalo Bayou vulnerable to continued failure and potentially threaten the stability and integrity of the restored areas in the reduced project footprint. HCFCD has consulted with experts in the field of fluvial geomorphology and Natural Channel Design (NCD) who have been successfully conducting stream restoration projects since the 1960s. HCFCD believes that the NCD approach used for this project is not experimental and a goal of this project is to demonstrate to local, state, and federal public agencies, private property owners, environmental advocacy groups, and the local community that this science-based methodology is a viable alternative for conducting channel restoration projects in Harris County, Texas. NCD has been successfully implemented and proven across the United States and other parts of the world. Furthermore, HCFCD has already successfully applied various NCD principles to projects on Cypress Creek, Mason Creek, Vogel Creek, Buffalo Bayou, and Rummel Creek in Harris County, Texas.
Blake, Frank	349.	I believe that the project as proposed by the HCFCD is more extensive than it needs to be, and will remove more of the existing riparian vegetation than is necessary to address existing erosion problems. The proposed design will have major impacts on Memorial Park.	HCFCD has conducted assessments of the channel banks along the entire reach of Buffalo Bayou, as well as extensive assessments of the channel banks along the proposed project reach to determine the conditions of the bayou, and the appropriate repair methods for the proposed project reach. These assessments include a hydraulic model review, visual assessment, BEHI assessment, NBS assessment, BANCS assessment, woody debris load mapping, sediment transport assessment, stable channel reach review, and regional channel curve review. The overall compilation of data indicated that in order to stabilize the banks of the bayou, energy dissipating measures (i.e., bank full benches in the bayou's dimension, a pool and riffle system in the bayou's profile, stable geometry in the bayou's pattern) and the use of in-stream structures (i.e., toe wood) must be used to work in conjunction with one another to reduce shear stress from the banks of the bayou and allow for long-term, sustainable stability of the banks through the reestablishment of vegetation along the bayou banks and the

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			reestablishment of ecological functions where possible. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Vegetation from the bankfull bench elevation down to the water's edge will be planted by the contractor at the time of construction using coir lifts, live stakes, and native seed mix to facilitate stabilization of soils and establishment of vegetation as quickly as possible following grading activities.
Boyd, Jim	350.	Do we need to destroy a large section of Buffalo Bayou to repair a few small areas of erosion?	HCFCD has conducted assessments of the channel banks along the entire reach of Buffalo Bayou, as well as extensive assessments of the channel banks along the proposed project reach to determine the conditions of the bayou, and the appropriate repair methods for the proposed project reach. These assessments include a hydraulic model review, visual assessment, BEHI assessment, NBS assessment, BANCS assessment, woody debris load mapping, sediment transport assessment, stable channel reach review, and regional channel curve review. The overall compilation of data indicated that in order to stabilize the banks of the bayou, energy dissipating measures (i.e., bank full benches in the bayou's dimension, a pool and riffle system in the bayou's profile, stable geometry in the bayou's pattern) and the use of in-stream structures (i.e., toe wood) must be used to work in conjunction with one another to reduce shear stress from the banks of the bayou and allow for long-term, sustainable stability of the banks through the reestablishment of vegetation along the bayou banks and the reestablishment of ecological functions where possible.

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Korman, Betty A.	351.	More focus needs to be on areas of documented bank failure and not on disturbing the natural habitat.	HCFCD has conducted assessments of the channel banks along the entire reach of Buffalo Bayou, as well as extensive assessments of the channel banks along the proposed project reach to determine the conditions of the bayou, and the appropriate repair methods for the proposed project reach. These assessments include a hydraulic model review, visual assessment, BEHI assessment, NBS assessment, BANCS assessment, woody debris load mapping, sediment transport assessment, stable channel reach review, and regional channel curve review. The overall compilation of data indicated that in order to stabilize the banks of the bayou, energy dissipating measures (i.e., bank full benches in the bayou's dimension, a pool and riffle system in the bayou's profile, stable geometry in the bayou's pattern) and the use of in-stream structures (i.e., toe wood) must be used to work in conjunction with one another to reduce shear stress from the banks of the bayou and allow for long-term, sustainable stability of the banks through the reestablishment of vegetation along the bayou banks and the reestablishment of ecological functions where possible. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species.
Preservation Texas	352.	Preservation Texas included the site of the MPDP on our 2014 Texas' Most Endangered Places list. The scope of the project far exceeds the limited erosion problem this particular stretch of Buffalo Bayou faces. The project should be narrowed to address only portions of the bayou that are actively eroding and in a manner that does not destroy significant vegetation, rock	HCFCD has conducted assessments of the channel banks along the entire reach of Buffalo Bayou, as well as extensive assessments of the channel banks along the proposed project reach to determine the conditions of the bayou, and the appropriate repair methods for the proposed project reach. These assessments include a hydraulic model review, visual assessment, BEHI assessment, NBS assessment, BANCS

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		outcroppings, potential archaeological sites, and otherwise alters the slowly, naturally-evolving course of the historic waterway by cutting and filling.	assessment, woody debris load mapping, sediment transport assessment, stable channel reach review, and regional channel curve review. The overall compilation of data indicated that in order to stabilize the banks of the bayou, energy dissipating measures (i.e., bank full benches in the bayou's dimension, a pool and riffle system in the bayou's profile, stable geometry in the bayou's pattern) and the use of in-stream structures (i.e., toe wood) must be used to work in conjunction with one another to reduce shear stress from the banks of the bayou and allow for long-term, sustainable stability of the banks through the reestablishment of vegetation along the bayou banks and the reestablishment of ecological functions where possible. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species.
Wilson, A. K.	353.	I don't believe there are reasons given in the notice for the shape of the "study area," which doesn't always conform to the existing and proposed footprint (e.g., odd-shaped extensions to the north of Wetlands #12 and #6). This may or may not be significant, but may need to be clarified, regardless, to ensure the project limits and all related impacts are represented.	The IP submittal was revised based on the suggestion of USACE to clarify the difference between the initial study area that preceded the selection of a project location, and the ultimate project location that was selected within the initial study area. HCFCD also revised the IP submittal to differentiate between the areas of proposed active restoration within the proposed project reach and the areas where no active restoration will occur within the proposed project reach.

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Request for EIS			
Arnett, Carrie Abbassi, Armin Jani, Sima Batten, Jr., George Center, Katherine Curcio, Ken Ereli, Ruth and Eliezer Falloure, David Gish, Sarah Hollifield, Hannah Jane Hyde, Richard James, Terrell JWW "McP" Kirschke, Theresa Knight, Susan Korman, Betty A. Martinez, Aramis McKann, Michael Mobley, Diana Montague, David R. Myers, Jean Novy, Stanley Owens, William C. Roll Model Rudez, Michael G. Salinas, Al Singleton, Pauline Smith, Griffin Smith, Karis Sutton, Andrew Thobae, Anne Thobae, Julie Tilbury, Gillian A. Topek, Toby Vikrum, Raghu Villaescusa, Julie Westbrook, Lydia Wise, Landrum & Lynnea Yglesias, Jerry	354.	I request that the USACE do an Environmental Impact Statement on the proposed plan that includes a discussion of reasonable alternatives.	The USACE will make determination if this project should be evaluated in an EIS.

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Baumann, Marsha J. Beishir, Olga Benton, Janet Blake, Frank Brenner, Margaret Chojnacki, Kimberly Emde, Katy Emde, William Foss, Linda Funghe, Brenda Goode, Debra Handley, Bruce Hannan, Nancy Harrison, Elizabeth Y. James, Helen Knowles, Linda Marquez, Sheryl Mead, Celeste Rascoe, Cathy Redden, Joe W., Jr. Spolyar, Mary Terry, Janis Ward, John R. Wilson, Jeanie Kilroy	355.	I request that an Environmental Impact Statement (EIS) be prepared, including discussion of reasonable alternatives to the proposed project. It is well-known that the NCD methodology is not the only bank stabilization technique available and that concerns exist about the consequences of utilizing NCD on Buffalo Bayou. The USACE should evaluate the appropriateness of alternatives to NCD.	The USACE will make determination if this project should be evaluated in an EIS.
Drummond, Jessica Drummond, Mark Landon, Jerrold E.	356.	I request that the ACE do an Environmental Impact Statement on the proposed plan that includes a discussion of reasonable alternatives. An environmental impact statement, even though it may not be mandated, must be performed. A project of this size that will permanently affect the bayou's ecosystem should not be considered without an environmental impact study.	The USACE will make determination if this project should be evaluated in an EIS.
Van Dame, Lesly	357.	Request for an Environmental Impact Statement to specify what will be affected by any major effort to alter Buffalo Bayou as it flows through Memorial Park.	The USACE will make determination if this project should be evaluated in an EIS.
Vega, Richard	358.	I demand an Environmental Impact Statement due to possible damage to critical wetlands, wildlife habitat, and the bayou's ecosystem.	The USACE will make determination if this project should be evaluated in an EIS.

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Request for Public Hearing Held by USACE			
Almoney, Stanley R., PhD Batten, Jr., George W. Baumann, Marsha J. Beishir, Olga Benton, Janet Blake, Frank Brenner, Margaret Emde, Katy Emde, William Foss, Linda Funghe, Brenda Goode, Debra Handley, Bruce Hannan, Nancy Harrison, Elizabeth Y. James, Helen Knowles, Linda Marquez, Sheryl Mead, Celeste Mobley, Diana Owens, William C. Rascoe, Cathy Redden, Joe W., Jr. Salinas, Al Singleton, Pauline Smith, Jr., Frank C. Spolyar, Mary Terry, Janis Ward, John R. Wilson, Jeanie Kilroy	359.	I request that the USACE hold a public hearing on this application due to the significance of the impacts upon Buffalo Bayou. Neither of the two public meetings claimed by HCFCD allowed public comment. The first meeting was only a general presentation on NCD hosted by Bayou Preservation Association. At the second meeting, hosted by HCFCD, the public could only submit written questions. HCFCD chose the ones to answer.	The USACE will determine if a public hearing is warranted for the proposed project.
Arnette, Carrie Caul, Carol Center, Katherine Chadwick, Susan Curcio, Ken Daniel, Martha (Marty) Drummond, Jessica Drummond, Mark Ereli, Ruth and Eliezer Falloure, David	360.	I request that USACE also hold a public hearing on the application.	The USACE will determine if a public hearing is warranted for the proposed project.

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Gish, Sarah Hollifield, Hannah Jane Hyde, Richard James, Terrell JWW "McP" Kirschke, Theresa Knight, Susan Korman, Betty A. Landon, Jerrold E. Martinez, Aramis Novy, Stanley Roll Model Rudez, Michael Smith, Griffin Smith, Karis Sutton, Andrew Thobae, Anne Thobae, Julie Tilbury, Gillian A. Topek, Toby Van Dame, Lesly Vega, Richard Vikrum, Raghu Villaescusa, Julie Westbrook, Lydia Yglesias, Jerry			
Galveston Bay Foundation	361.	We recommend that the USACE conduct a public hearing on the project, allowing the public to obtain the latest information, for the following reasons: ● Potential impacts to waters of the U.S., notably loss of riparian tree canopy and in-stream aquatic habitat. While these impacts will be temporal in nature, due to the regrading, earth moving, tree removal, and stream profile alterations that must take place, the time value loss of habitat and water quality functions could be substantial. ● The project is described as a demonstration project that could be repeated elsewhere along tributaries of Galveston Bay, both within HCFCD jurisdiction and in other drainage/flood control entities' jurisdictions.	The USACE will determine if a public hearing is warranted for the proposed project.

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		Therefore, this project could have far-reaching implications for tributaries to Galveston Bay.	
Houston Audubon Society	362.	Streambank restoration is not Houston Audubon's area of expertise, but we are very interested in ensuring the decision-making process includes a robust analysis of possible options, and is transparent and inclusive of such analysis. As such, we are pleased that the USACE granted additional time for submitting public comments, but would also encourage a public meeting that provided for presentations of alternative methods by third parties.	The USACE will determine if a public hearing is warranted for the proposed project.
Hershey, Olive	363.	We, the citizens of Houston, are being required to comment on a plan that is only 80 percent complete. This seems grossly unfair. I urge you to reject the permit until more public hearings can be held and a complete set of plans are made public.	The USACE will determine if a public hearing is warranted for the proposed project.
Wilson, A. K.	364.	I believe these question are significant and therefore warrant a public hearing, and I hereby request one to solicit additional information, per above, that: clarifies what is meant by "restoration" in this context; confirms no threat to the Memorial Park land grant; explains study area boundaries; provides engineering analyses confirming the structural integrity of the design and no adverse flood impacts; discusses long-term goals and provides a monitoring plan to evaluate longer-term outcomes; and, provides a long-term environmental and financial assessment of any related future projects.	The USACE will determine if a public hearing is warranted for the proposed project.
Wise, Landrum & Lynnea	365.	The primary nickname for Houston is "The Bayou City" and Buffalo Bayou is the "mother bayou" of Houston. Special care should therefore be taken in reviewing any proposed project that would damage the rare riparian environment along its channel. In this regard, we also request that the USACE hold a public hearing on the referenced application due to the significance of the environmental impacts and the public's interest in public parklands and the beauty of Buffalo Bayou.	The USACE will determine if a public hearing is warranted for the proposed project.

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Request for TCEQ to Hold Public Meeting			
Almoney, Stanley R., PhD Arnett, Carrie Baumann, Marsha J. Beishir, Olga Benton, Janet Blake, Frank Brenner, Margaret Center, Katherine Chojnacki, Kimberly Curcio, Ken Daniel, Martha (Marty) Drummond, Jessica Drummond, Mark Emde, Katy Emde, William Falloure, David Foss, Linda Funghe, Brenda Goode, Debra Handley, Bruce Hannan, Nancy Harrison, Elizabeth Y. Hollifield, Hannah Jane Hyde, Richard James, Helen James, Terrell JWW "McP" Knowles, Linda Korman, Betty A. Marquez, Sheryl Martinez, Aramis Mead, Celeste Montague, David R. Myers, Jean Owens, William C. Rascoe, Cathy Redden, Joe W., Jr. Salinas, Al Smith, Griffin	366.	By copy of this letter to TCEQ, I request that TCEQ hold a public meeting in Houston to consider the impacts of the proposed project upon water quality due to massive bank disturbance and increased water temperature due to canopy removal.	The TCEQ will determine if a public meeting is warranted for the proposed project.

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Spolyar, Mary Sutton, Andrew Terry, Janis Tilbury, Gillian A. Ward, John R. Westbrook, Lydia Wilson, Jeanie Kilroy Wise, Landrum & Lynnea Yglesias, Jerry			
Caul, Carol Landon, Jerrold E. Novy, Stanley Vega, Richard	367.	TCEQ should also hold a public hearing.	The TCEQ will determine if a public meeting is warranted for the proposed project.
McKann, Michael Thobae, Anne Thobae, Julie Topek, Toby Van Dame, Lesly	368.	I also would like to see public hearings by TCEQ on the impact the proposed plan would have on water quality.	The TCEQ will determine if a public meeting is warranted for the proposed project.
Harris, Carol M. Almroth, Arne Westrich, Anne and Joe	369.	Schedule a public meeting here in Houston so all residents can comment.	The TCEQ will determine if a public meeting is warranted for the proposed project.
Duson, Avon S.	370.	Please give more time and consideration to any plans to change Buffalo Bayou. I would like to ask for a meeting where the public could ask questions—not written, but oral—and the questions would be answered in a thoughtful, accurate manner. Enough time should be allowed for comments from the public.	The USACE will determine if a public hearing is warranted for the proposed project.
Mobley, Diana	371.	A public hearing has not been held that has allowed effective dialogue with the public comment. Due to the magnitude of this project, a public meeting should be held to address the public's concerns.	The USACE will determine if a public hearing is warranted for the proposed project.

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Tree Removal			
Arnett, Carrie Curcio, Ken Falloure, David Gish, Sarah Hollifield, Hannah Jane Hyde, Richard James, Terrell JWW "McP" Kirschke, Theresa Knight, Susan Korleski Richardson, Lori Myers, Jean Roll Model Rudez, Michael G. Smith, Karis Sutton, Andrew Tilbury, Gillian A. Villaescusa, Julie Westbrook, Lydia Yglesias, Jerry	372.	The proposed plan needlessly kills hundreds of trees. Memorial Park is already losing more than half its trees to the drought. Some of the trees in the area targeted for destruction may be 100-150 years old or more.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches in the streams dimension, pool and riffle reestablishment in the streams profile, geometry changes in the streams pattern, and in-stream structures, such as toe wood) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. It is possible that some trees still exist in Memorial Park that are beyond 100 years old but this would not be the case within the project area. The dynamic nature of Buffalo Bayou along this stretch does not allow long-lived hardwood species and pine trees to take root and establish over a period of many decades. The vegetation within the project area, especially along the slopes and toe line of the bayou is characterized by "pioneer" species, including American sycamore, black willow, green ash, boxelder and eastern cottonwood, that take root fast and grow fast. Some large fallen sycamores and cottonwoods may be seen on the slopes of the bayou because these particular species are composed of denser wood cells. These dense wood cells result in larger growth before the tree can no longer support its biomass and starts to fall apart. Other trees that have less dense wood, such as willow, ash, and boxelder, fall apart at a relatively young age. HCFCD's tree survey focused on identifying desirable species within the project area that were in reasonable condition, which would

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			have included any older or mature trees. In an effort to preserve as many mature native trees as possible within the proposed project area, HCFCD has conducted a vegetation inventory of all grasses, shrubs, and trees 8 inches in diameter and greater, located within the proposed project area. The number of trees surveyed within the proposed project area totaled 972, of which 899 were alive and 73 of the trees surveyed were found to be dead. The majority of the trees surveyed were found to be juvenile in age; 400 trees were 8–11 inches in diameter, 260 trees were 12–16 inches in diameter. All surveyed trees greater than 31 inches in diameter were located on the upper banks of the bayou, where there will be no active restoration work, so they should not be impacted by the proposed project. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.
Batten, Jr., George W.	373.	Removal of large trees along the banks will not only tend to destabilize the banks, but it will remove shading that is important for keeping the stream water cool. Although the project proposal states that a "large majority" of the trees will not be disturbed, even a small reduction (for example, 25%) in the canopy will have a significant effect, especially if the reduction is right at streamside. This will have an adverse effect on the stream habitat.	Due to the erosive nature of high flows in the bayou caused by urbanization of the watershed and releases from the USACE's Barker and Addicks reservoirs, dissipation measures (bankfull benches in the streams dimension, pool and riffle reestablishment in the streams profile, geometry changes in the streams pattern, and in-stream structures, such as toe wood) were necessary in the design to relieve shear stress on the banks of the bayou. A smaller scale repair to just the bayou streambanks would result in less direct short-term impacts to the aquatic ecosystem within the bayou; however, it was not a feasible option for conducting a successful holistic restoration project that would provide long-term stability to the bayou banks and restoration of natural stream functions to the bayou. To reestablish stability to the bayou banks, the dimension, pattern and profile must all be addressed to restore geomorphic function to the bayou. Addressing only the

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			dimension of the bayou would not provide the relief necessary to counter the root cause of the degradation of the bayous geomorphic function and restore the natural stream functions of hydrologic and hydraulic transport and stable geomorphology. In an effort to preserve as many mature native trees as possible within the proposed project area, HCFCD has conducted a vegetation inventory of all grasses, shrubs, and trees 8 inches in diameter and greater, located within the proposed project area. The majority of the trees surveyed were juvenile in age; 400 trees were 8–11 inches in diameter and 260 trees were 12–16 inches in diameter. All surveyed trees greater than 31 inches in diameter were located on the upper banks of the bayou, where there will be no active restoration work, so they should not be impacted by the proposed project. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.
Caul, Carol	374.	This section of the bayou provides a unique and vulnerable habitat for wildlife deserving of great protection in a relatively flat area. While access roads will be necessary, there is no well-explained rationale for the total and permanent denuding of hardwoods and much other vegetation. While much of the segment is not on Memorial Park COH property, some of the land is, and much of the access will be. Houston has a tree ordinance (Tree Protection Ordinance as contained in Sections V and VI of Chapter 33 of the COH Code of Ordinances), which pertains to the protection and preservation of trees and shrubs on City property. At the very least, removal of trees that would otherwise be covered by the protection of the Tree Ordinance must be permitted and justified.	Some trees and vegetation will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species.

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			HCFCD will conduct the project in strict compliance with COH Tree Protection Ordinance contained in section 5 and 6 of Chapter 33 of COH code of ordinances. Under the current plan, the project site will have one access point leading from Memorial Drive down to the bayou, if any changes are made to the proposed access it will be coordinated with the USACE as appropriate. This access point will be located on COH property and has been coordinated with the HPARD who is responsible for managing Memorial Park. An access road will be created from the backside of the HPARD maintenance facility down the north bank of Buffalo Bayou to the stream bed of the bayou. This construction access road will require the clearing of trees and vegetation to gain access to the channel. The exact location of the road will be determined in the field prior to beginning construction so that the most direct and least damaging route can be established and any notable trees located by the project vegetation inventory can be avoided. Construction activities required for the MPDP would occur in phases. The majority of wildlife in the project area will shift to similar habitats directly adjacent to the project area or construction zone during the construction activities. Please refer to the attached MPDP Monitoring Plan. The monitoring plan includes baseline information regarding waters of the U.S. impacts including a description of impacted wetlands, existing stream channel conditions, and protocol for geomorphic monitoring, in-stream macroinvertebrate and fish monitoring, monitoring of wetland and riparian plantings, and monitoring of noxious and invasive plant species. An adaptive management plan to address identified deficiencies is also included in the monitoring plan. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional

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			trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.
Chojnacki, Kimberly	375.	The proposal needlessly kills hundreds of trees, which, when taken with the devastation of the trees at Memorial Park, drastically reduces the green space of Houston. This green space is an asset and treasure to a metropolitan powerhouse such as Houston. The dynamism it brings to a vibrant, fast, and growing city is valuable and indispensable.	The existing banks of the bayou (and all vegetation on those banks) are actively eroding due to the increased erosive flows introduced to the stream by the modifications made to its watershed. HCFCD currently conducts field operations twice a year in an effort to remove downed trees from the stream to allow for the conveyance of stormwater and the movement of recreational watercraft within the bayou. The proposed project will stabilize the banks of the bayou and recreate the proper dimension, pattern and profile for the current hydraulic model within the stream system and allow for the reestablishment of the proper native vegetation along the bayou, with regard to the correct hydrological planting zone. Within the proposed project area, there will be areas of active restoration and areas where no work is planned because the bayou currently has an appropriate dimension pattern and profile. In the no work areas, unless there are invasive or undesirable species that need to be removed, the current vegetation will not be impacted. In an effort to preserve as many mature native trees as possible within the proposed project area, HCFCD has conducted a vegetation inventory of all grasses, shrubs, and trees 8 inches in diameter and greater, located within the proposed project area. The number of trees surveyed within the proposed project area totaled 972, of which 899 were alive and 73 of the trees surveyed were found to be dead. The majority of the trees surveyed were found to be juvenile in age; 400 trees were 8–11 inches in diameter, 260 trees were 12–16 inches in diameter. All surveyed trees greater than 31 inches in diameter were located on the upper banks of the bayou, where there will be no active restoration work, so they should not be impacted by the proposed project. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as

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			possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.
Hershey, Olive	376.	80 percent of the trees larger than 4 inches in diameter will be destroyed, as bulldozers and backhoes peel back the banks of over a mile of the river on both sides. Buffalo Bayou will be deepened, and the water will run faster, causing more erosion downstream. This project was supposed to reduce erosion and sedimentation; instead it will create more of both.	The existing banks of the bayou (and all vegetation on those banks) are actively eroding due to the increased erosive flows introduced to the stream by the modifications made to its watershed. HCFCD currently conducts field operations twice a year in an effort to remove downed trees from the stream to allow for the conveyance of stormwater and the movement of recreational watercraft within the bayou. The proposed project will stabilize the banks of the bayou and recreate the proper dimension, pattern and profile for the current hydraulic model within the stream system and allow for the reestablishment of the proper native vegetation along the bayou, with regard to the correct hydrological planting zone. Within the proposed project area, there will be areas of active restoration and areas where no work is planned because the bayou currently has an appropriate dimension pattern and profile. In the no work areas, unless there are invasive or undesirable species that need to be removed, the current vegetation will not be impacted. In an effort to preserve as many mature native trees as possible within the proposed project area, HCFCD has conducted a vegetation inventory of all grasses, shrubs, and trees 8 inches in diameter and greater, located within the proposed project area. The number of trees surveyed within the proposed project area totaled 972, of which 899 were alive and 73 of the trees surveyed were found to be dead. The majority of the trees surveyed were found to be juvenile in age; 400 trees were 8–11 inches in diameter, 260 trees were 12–16 inches in diameter. All surveyed trees greater than 31 inches in diameter were located on the upper banks of the bayou, where there will be no active restoration work, so they should not be impacted by the proposed project.

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			HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.
Landon, Helen J.	377.	During the past three years we have endured a major drought and Memorial Park has lost many hundreds of trees...and will lose more in the next few years. It is amazing to think that this project would destroy additional trees. Native trees are evident along the banks of the bayou, and possibly a small number of non-native growth has crept in. Most likely the non-native growth is the result of birds and animals carrying seeds in from the areas where the bayou has been "improved" with the addition of trees and lawns for private homes. This project would only add to that problem, and non-native species would become pests to Memorial Park and the nearby Houston Arboretum.	The existing banks of the bayou (and all vegetation on those banks) are actively eroding due to the increased erosive flows introduced to the stream by the modifications made to its watershed. HCFCD currently conducts field operations twice a year in an effort to remove downed trees from the stream to allow for the conveyance of stormwater and the movement of recreational watercraft within the bayou. The proposed project will stabilize the banks of the bayou and recreate the proper dimension, pattern and profile for the current hydraulic model within the stream system and allow for the reestablishment of the proper native vegetation along the bayou, with regard to the correct hydrological planting zone. Within the proposed project area, there will be areas of active restoration and areas where no work is planned because the bayou currently has an appropriate dimension pattern and profile. In the no work areas, unless there are invasive or undesirable species that need to be removed, the current vegetation will not be impacted. In an effort to preserve as many mature native trees as possible within the proposed project area, HCFCD has conducted a vegetation inventory of all grasses, shrubs, and trees 8 inches in diameter and greater, located within the proposed project area. The number of trees surveyed within the proposed project area totaled 972, of which 899 were alive and 73 of the trees surveyed were found to be dead. The majority of the trees surveyed were found to be juvenile in age; 400 trees were 8–11 inches in diameter, 260 trees were 12–16 inches in diameter. All surveyed trees greater than 31 inches in diameter were located on the upper banks of the bayou, where there will be no active restoration work, so they should

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			not be impacted by the proposed project. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.
Martinez, Aramis	378.	The loss of trees should especially be seen as a negative impact due to the deaths of many trees during the drought conditions in recent years.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.
Naumann, Ronald W.	379.	Between TxDOT construction on Hwy 290 and IH 610, the destruction on N. Shepherd of trees planted by Trees For Houston, the unprecedented destruction of trees during the drought, and your project, the total biomass loss is in tens of thousands of tons, which is EPA's primary focus.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.

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Salzhandler, Frank	380.	Planting a new forest is not the same value as an already established riparian forest. A forest like the one on Buffalo Bayou is varied in age of trees and is more valuable because it is already established and not just a bunch of seedlings. [A write-up on the various values of trees is provided—nothing specific to this project.]	In an effort to preserve as many mature native trees as possible within the proposed project area, HCFCD has conducted a vegetation inventory of all grasses, shrubs, and trees 8 inches in diameter and greater, located within the proposed project area. The majority of the trees surveyed were juvenile in age; 400 trees were 8–11 inches in diameter and 260 trees were 12–16 inches in diameter. All surveyed trees greater than 31 inches in diameter were located on the upper banks of the bayou, where there will be no active restoration work, so they should not be impacted by the proposed project. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.

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Arnett, Carrie Baumann, Marsha J. Benton, Janet Brenner, Margaret Chojnacki, Kimberly Curcio, Ken Drummond, Jessica Drummond, Mark Falloure, David Gish, Sarah Goode, Debra Hollifield, Hannah Jane Hyde, Richard James, Terrell JWW "McP" Kirschke, Theresa Knight, Susan Korleski Richardson, Lori Korman, Betty A. Montague, David R. Myers, Jean Owens, William C. Rascoe, Cathy Redden, Joe W., Jr Roll Model Rudez, Michael G. Salinas, Al Smith, Karis Sutton, Andrew Tilbury, Gillian A. Van Dame, Lesly Villaescusa, Julie Westbrook, Lydia Wilson, Jeanie Kilroy Yglesias, Jerry	381.	The proposed design will have major environmental impacts upon riparian habitat because of the physical removal of vegetation from about 80% of the stream length. The removal of shading canopy will raise the stream temperature and impact the ability of the stream to support wildlife.	HCFCD will remove some vegetation and trees to accomplish the project's goal of stabilizing the channel. It is expected that less than 80 percent of the trees and vegetation in the project area will be removed. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Mature woody riparian vegetation does provide an important function in shading water, thereby limiting in-stream temperature and promoting greater dissolved oxygen to support wildlife. Unfortunately, much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature trees that used to line Buffalo Bayou's banks have already been lost to streambank failure and mass wasting of slopes. Where vegetation has managed to reestablish on failed streambanks it is predominantly immature non-native species creating monoculture community types or herbaceous vegetation which does not have adequate height to provide shading of the water. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks.

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Almoney, Stanley R., PhD	382.	I have grave concerns about the appropriateness of the HCFCD design for this segment of Buffalo Bayou and the major impacts it will have upon wildlife and water quality. As a conservationist and bird watcher, I find it both regrettable and unconscionable that this plan to destroy vital riparian habitat is even being considered. It will not significantly reduce flooding. It is simply HCFCD's way of keeping busy. It will however, remove some of the only remaining riparian habitat from the COH. Most of the city's other bayous have been denuded in the name of flood control, and this is the last challenge remaining for HCFCD within the city. The proposed design will have major environmental impacts on the riparian habitat because of the physical removal of vegetation from about 80% of the stream length. The removal of shading canopy will raise the stream temperature and impact the ability of the stream to support wildlife. Many migrating and resident birds need this habitat to remain.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Mature woody riparian vegetation does provide an important function in shading water, thereby limiting in-stream temperature and promoting greater dissolved oxygen to support wildlife. Unfortunately, much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature trees that used to line Buffalo Bayou's banks have already been lost to streambank failure and mass wasting of slopes. Where vegetation has managed to reestablish on failed streambanks it is predominantly immature non-native species creating monoculture community types or herbaceous vegetation which does not have adequate height to provide shading of the water. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. Areas where vegetation

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			has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. HCFCD's planting plan will include the installation of native grass mix that may include a portion of Bermuda grass for initial site stabilization and native trees and shrubs for the long-term reestablishment of a healthy, sustainable riparian forest along the proposed project reach. The current planting plan calls for native tree and shrub species to be planted from the toe of the bank to the top of the bank with regard to proper hydrological zone placement. Native tree species such as bald cypress, water tupelo, sand willow, and black willow will be planted close to the water's edge, both for long-term bank stabilization purposes and the reestablishment of native species that were historically present along Buffalo Bayou but are no longer there (either removed historically because of the timber industry or more recently as a result of the erosion).
Azios, Jr., A. D.	383.	It is now our equal concern that the referenced MPDP will drastically alter and destroy a very large part of the heart of Buffalo Bayou through Memorial Park and the Hogg Bird Sanctuary. We are aware of erosion taking place along Buffalo Bayou, and the need for some mitigation, but the total deforestation and excavation of both banks of Buffalo Bayou, creating a large drainage ditch, is extremely unnecessary, heavy-handed, and not in the best interests of the public. It is our even greater concern that such a demonstration project, if implemented, could set a horrible precedent for HCFCD and the COH to destroy other reaches of Buffalo Bayou just as egregiously and without regard to the desires of the citizens of Houston and Harris County who enjoy the bayou in its natural state. For these and other reasons too numerous to list in this letter, we strongly recommend that you decline the application for the MPDP, now and in the future.	The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.

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			HCFCD's planting plan will include the installation of native grass mix that may include a portion of Bermuda grass for initial site stabilization and native trees and shrubs for the long-term reestablishment of a healthy, sustainable riparian forest along the proposed project reach. The current planting plan calls for native tree and shrub species to be planted from the toe of the bank to the top of the bank with regard to proper hydrological zone placement. Native tree species such as bald cypress, water tupelo, sand willow, and black willow will be planted close to the water's edge, both for long-term bank stabilization purposes and the reestablishment of native species that were historically present along Buffalo Bayou but are no longer there (either removed historically because of the timber industry or more recently as a result of the erosion).
Ereli, Ruth and Eliezer	384.	Harris County's expensive and invasive plan removes 80 percent of the vegetation from the banks of Buffalo Bayou in an area as wide as 100 feet from the water's edge in places. It will artificially channelize and change the course of the bayou, damage two dozen critical wetlands, and kill hundreds of trees, some of them more than 100 years old, on both banks of the bayou, in Memorial Park, and in the Hogg Bird Sanctuary. Many of us have long enjoyed the shady beauty and mystery of the forest using the hiking and biking trails in Memorial Park, which is already losing more than half its trees to the drought. Our serene, slow-moving, distinctly southern Buffalo Bayou is also a Texas Parks and Wildlife paddling trail, and if this "demonstration" plan is implemented, eventually there will be no more bayou wilderness to enjoy. A riparian forest cannot be replaced. The wild banks will be stripped, excavated, graded, landscaped, and planted with Bermuda grass. Harris County has already identified other parts of Buffalo Bayou where it plans to use this destructive and controversial bank "stabilization" method.	It is possible that some trees still exist in Memorial Park that are beyond 100 years old but this would not be the case within the project area. The dynamic nature of Buffalo Bayou along this stretch most likely does not allow long-lived hardwood species and pine trees to take root and establish over a period of many decades. The vegetation within the project area, especially along the slopes and toe line of the bayou is characterized by "pioneer" species, including American sycamore, black willow, green ash, boxelder and eastern cottonwood, that take root fast and grow fast. Some large fallen sycamores and cottonwoods may be seen on the slopes of the bayou because these particular species are composed of denser wood cells. These dense wood cells result in larger growth before the tree can no longer support its biomass and starts to fall apart. Other trees that have less dense wood, such as willow, ash, and boxelder, fall apart at a relatively young age. HCFCD's tree survey focused on identifying desirable species within the project area that were in reasonable condition, which would have included any older or mature trees. HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species

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			along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Mature woody riparian vegetation does provide an important function in shading water, thereby limiting in-stream temperature and promoting greater dissolved oxygen to support wildlife. Unfortunately, much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature trees that used to line Buffalo Bayou's banks have already been lost to streambank failure and mass wasting of slopes. Where vegetation has managed to reestablish on failed streambanks it is predominantly immature non-native species creating monoculture community types or herbaceous vegetation which does not have adequate height to provide shading of the water. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks.
Hamilton, Ann T.	385.	As a novice in hydrology and soil science, I have studied both sides of this debate seriously. There appear to be alternative, less destructive, methods to address the	HCFCD will remove some vegetation and trees to accomplish the project's goal of stabilizing the channel. It is expected that less than 80 percent of the trees and vegetation in the project

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		erosion problems without removing 80% of the vegetation within this reach.	area will be removed. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Mature woody riparian vegetation does provide an important function in shading water, thereby limiting in-stream temperature and promoting greater dissolved oxygen to support wildlife. Unfortunately, much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature trees that used to line Buffalo Bayou's banks have already been lost to streambank failure and mass wasting of slopes. Where vegetation has managed to reestablish on failed streambanks it is predominantly immature non-native species creating monoculture community types or herbaceous vegetation which does not have adequate height to provide shading of the water. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks.
Heins, William	386.	In addition, substantial swaths, ~100 feet wide in most areas, of mature riparian closed-canopy forest would be bulldozed to accommodate channel modification. Although the design is intended to recreate the native	Some wildlife habitat will be disturbed during the project, however the majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high

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		flora, the estimated time to reestablish a closed canopy is at least 12 years. Credible alternative interpretations of the plan suggest it could take much longer. In the interim, the territory that is currently shielded from heavy rains would be vulnerable to much more severe erosion, and the wildlife habitats that currently exist would be slow to reestablish, if they can do so at all.	water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. These proposed areas of no work have been identified in the project plans and tree vegetation survey. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks. HCFCD's planting plan will include the installation of native grass mix that may include a portion of Bermuda grass for initial site stabilization and native trees and shrubs for the long-term reestablishment of a healthy, sustainable riparian forest along the proposed project reach. The current planting plan calls for native tree and shrub species to be planted from the toe of the bank to the top of the bank with regard to proper hydrological zone placement.
Nolen, Evelyn	387.	There are alternative, less destructive, methods of addressing the erosion problem without removing 80% of the vegetation within the reach of this project.	HCFCD will remove some vegetation and trees to accomplish the project's goal of stabilizing the channel. It is expected that less than 80 percent of the trees and vegetation in the project area will be removed. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian

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Overly, Kathy	388.	The mowing of the plant life along Buffalo Bayou here in Houston is really stupid! And the fact that you call it an experiment is galling! In addition to the plants, you should think of all of the creatures that live there! The plants control erosion...have you not noticed??? My husband and I have Ag degrees from A&M and we are appalled that you think this is a good idea!	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.
Pritchett, Mary H.	389.	Prissy, mowed people parks! You will ruin much of the attraction of that wonderful place if you alter the bayou as planned. I agree with the HSC.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be

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			accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists.
Shen, Lan	390.	I oppose spending my tax dollars on the MPDP, a project that needs to remove all vegetation, including many mature native trees to drastically change the nature of the landscape and habitat. I read Nancy Greig's eloquent letter and I totally agree with the sentiments that she expressed. If Memorial Park were to preserve the natural ecological habitats of this area for future generations, as I believed was the original wish of the Hogg family when they donated the property, this project will work directly counter to that goal. Furthermore, as soon as they scrape an area, HCFCD plants the exotic invasive Bermuda grass over the entire area. Almost nothing native will out-compete the Bermuda grass. There goes the natural habitat for eternity. Please do not allow the MPDP to go forward and create a man-made environment out of one of the extremely few natural areas in Harris County.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Mature woody riparian vegetation does provide an important function in shading water, thereby limiting in-stream temperature and promoting greater dissolved oxygen to support wildlife. Unfortunately, much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature trees that used to line Buffalo Bayou's banks have already been lost to streambank failure and mass wasting of slopes. Where vegetation has managed to reestablish on failed streambanks it is predominantly immature non-native species creating monoculture community types or herbaceous

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Thobae, Anne	391.	Buffalo Bayou and the bayou system in their natural state are precious to Houston, the wildlife they support, and their human inhabitants. The damage already affecting Buffalo Bayou and its natural ecosystem with the systematic stripping of all vegetation and the leveling of the banks of the bayou for the creation of Buffalo Bayou Park east of Shepherd Drive has ignored and challenged the progress Terry Hershey, a conservationist who campaigned to keep the banks of Buffalo Bayou from being paved in the 1960s, has contributed to preserve our natural bayou system. We have seen the results there, and strongly object to the over-engineering approach to mitigating the runoff and erosion problems caused by urban development. We should expect a better job by the City and County to regulate development to prevent the excess water runoff that threatens our natural bayou system.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Mature woody riparian vegetation does provide an important function in shading water, thereby limiting in-stream temperature and promoting greater dissolved oxygen to support wildlife. Unfortunately, much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature trees that used to line Buffalo Bayou's banks have already been lost to streambank failure and mass wasting of slopes.

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			Where vegetation has managed to reestablish on failed streambanks it is predominantly immature non-native species creating monoculture community types or herbaceous vegetation which does not have adequate height to provide shading of the water. Overhanging riparian vegetation will be preserved in areas where the streambanks remain stable and mature woody vegetation still exists. Areas where vegetation has already been lost or will be lost during construction will be replaced with native woody riparian vegetation that will ultimately reestablish a closed canopy on stable streambanks.
Topek, Toby	392.	This plan is as bad as it ever was. Harris County has ignored requests from Buffalo Bayou supporters to leave more riparian habitat undisturbed and focus help on eroded areas using less invasive, less expensive methods. Reference Permit Application No. SWG-2012-01007.	HCFCD will remove some vegetation and trees to accomplish the project's goal of stabilizing the channel. It is expected that less than 80 percent of the trees and vegetation in the project area will be removed. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where no riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where little riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, but HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Mature woody riparian vegetation does provide an important function in shading water, thereby limiting in-stream temperature and promoting greater dissolved oxygen to support wildlife. Unfortunately, much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature trees that used to line Buffalo Bayou's banks have already been lost to streambank failure and mass wasting of slopes. Where vegetation has managed to reestablish on failed streambanks it is predominantly immature non-native species creating monoculture community types or herbaceous

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Wise, Landrum & Lynnea	393.	It is our understanding that if the referenced application is approved in its current form, the project would remove approximately 80% of the existing vegetation along both banks of a stretch of Buffalo Bayou over a mile long within the COH. Part of this stretch passes the Hogg Bird Sanctuary. To us, if this project was implemented as submitted, it would result in an extremely high percentage of wildlife habitat and plant and tree loss along this stretch of Houston's primary bayou, a bayou that has already lost so much of its natural characteristics. This potential loss is even more troubling when one considers that a portion of the affected area abuts a bird sanctuary and that much, if not all, of the affected area is park land, part of the storied "crown jewel" of Houston parks, Memorial Park. In the 2011 drought, Memorial Park lost about 50% of its trees; the park and its related Arboretum were devastated. The current longer-term drought cycle appears to be continuing. Each remaining tree and the shade and habitat it provides is therefore more important than ever.	HCFCD's overall plan is to preserve as many of the native mature trees located within the proposed project reach as possible (with proper regard to hydrological zone and community type) and to replant more than 8,000 additional trees and shrubs along the banks of the bayou. This will be accomplished by increasing the diversity of native species along the banks of the bayou and allowing for the re-creation of a closed tree canopy along the banks and over the bayou where none currently exists. The majority of work located within the proposed project area is slated to occur within the streambed of the channel, which means it will occur below the ordinary high water mark where little riparian vegetation exists, or above the ordinary high water mark to the proposed bankfull elevation of approximately 14 feet where no riparian vegetation currently exists due to the operational procedures of the Addicks and Barker Reservoirs. Areas with active restoration work planned that are located higher than the 14 foot elevation will require the removal of some riparian vegetation, HCFCD's plans will include the preservation of as many native mature trees and shrubs as possible and planting of native tree and shrub species. Mature woody riparian vegetation does provide an important function in shading water, thereby limiting in-stream temperature and promoting greater dissolved oxygen to support wildlife. Unfortunately, much of the proposed project reach has already lost the mature woody vegetation that used to overhang the bayou water. Buffalo Bayou's streambanks have experienced significant erosion as the channel has responded to substantial changes in watershed hydrology over the past several decades. As a result, many of the mature

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