

FORWARD

This example storm water quality management plan provides general guidance for developing a storm water quality management plan for non-structural and structural controls to reduce pollutants in storm water runoff from post development activities in residential, commercial, and light industrial areas, and at public facilities. This sample document provides information to assist owners, engineers, architects, and other citizens to prepare a storm water quality management plan. The document is intended only as an example to assist in the development of a storm water quality management plan. Storm water quality management plans that do not follow this example may still be accepted; conversely, use of this example does not guarantee that a proposed plan will be accepted.

NPDES STORM WATER WEBSITE

The Storm Water Management Joint Task Force (JTF) maintains an NPDES Storm Water website at the following address:

<https://www.cleanwaterways.org/Resources/Professionals>

Information on updates to the *Example Storm Water Quality Management Plan* will be posted at the above site.

Submit this document as a pdf when submitting for site plan review and approval.

Have the City of Seabrook's permit form as the first page of the electronic document. Make sure it is filled out.

The forms in this example document are not the City's; make sure you use the City's forms and make sure the appropriate ones are filled out.

STORM WATER QUALITY MANAGEMENT PLAN

FOR

(Site Name)
(City), Texas

Storm Water Quality Management Plan
Prepared for:

(Name)
(Address)

Storm Water Quality Management Plan
Prepared by:

(Printed Name)
(License Number)
(Address)
(Phone Number)

Engineer's Seal and Signature

(NOTE: Plans submitted to the City of Houston as part of a storm water quality permit application must be sealed by a Professional Engineer, licensed to practice engineering in Texas, in accordance with Section 47-651 of City of Houston Ordinance No. 2001-800.)

(Date)

STORM WATER QUALITY MANAGEMENT PLAN

Site Name
(*City or County*), Texas

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STORM WATER QUALITY MANAGEMENT PLAN

Site Name
(*City or County*), Texas

Project Information:

Site Name

Location

Permittee Information:

Name

Contact

Address

Phone number

Prepared by:

Name

Address

Phone number

1. Site Description

A. Site Location

Provide a description of the site location. (Jurisdiction (e.g., in the City of Houston, in unincorporated Harris County), name of the MUD if applicable, street address, latitude/longitude, subdivision name if applicable, direction from intersections or landmarks, etc.)

B. Owner Information

The owner of the property is:

Company Name

Person to Contact

Address

Phone Number

The property is leased to: (if applicable)

Company Name

Person to Contact

Address

Phone Number

C. New Development or Redevelopment Description

Describe the intent and scope of the project. Include as many details as needed to completely describe the development. This may include type of structures that will be built, types of infrastructure, types of existing development, acreage of the new development and existing development, ... etc.

Example:

This project consists of the construction of a 20-acre new development of single-family residential homes. This will include the construction of underground utilities, streets, paving, 36 one or two story houses, landscaping, and a dry detention basin.

D. Activities

Describe all of the activities at the developed site. The description should delineate the use of the land, buildings, and/or structures and the general tasks or services performed by the occupant. If applicable, include the Standard Industrial Classification Codes. Possible activities may include but are not limited to the following.

- *Bulk liquid storage*
- *Bulk materials storage*
- *Landscaping activities*
- *Fertilizer storage and/or use*
- *Chemical storage and/or use*
(Herbicides, Pesticides, Cleaners, Solvents, ... etc.)
- *Loading and unloading of liquids and materials*
- *Vehicle / equipment / machinery repair and/or maintenance*
- *Metal work*
- *Chemical production*
- *Water and/or wastewater treatment*
- *Wood / lumber storage and/or product fabrication*
- *Building and structural maintenance*
- *Parking lots*
- *Vehicle / equipment / machinery storage*
- *Vehicle / equipment washing*

Example:

The development is a 20-acre single-family residential development consisting of 36 houses. All activities associated with this development are typical to residential households. These activities generally include landscaping maintenance, house maintenance, and residential waste disposal. Sanitary waste is transferred via sanitary sewer lines to an offsite wastewater treatment plant, which is operated by (*Name*). There is a master drainage plan for the development that includes a dry detention basin. The dry detention basin will be regularly maintained. The maintenance activities for the dry detention basin generally include vegetative management and sediment removal. There is no Standard Industrial Classification Code for single-family residential homes.

E. NPDES or TPDES Permit for Storm Water Discharges from Construction Activities

Describe how the site will have a permit for water discharges from construction activities.

Example:

A Notice of Intent (NOI) to obtain coverage under an (**NPDES or TPDES**) storm water general permit for construction activities has been submitted and a permit number received. The NOI has been included into this document in *Appendix A*.

F. Total Site Area and Affected Area

Provide the acreage of the property and the acreage that will be affected by the project.

Example:

The total site area of the proposed development is 20 acres. The entire 20 acres will be affected by the development.

or

The acreage of the property is 20 acres, of which 10 will be affected by the development.

G. Site and Vicinity Maps and Associated Information

1) Vicinity Map

Reference an exhibit for general location of the project site. Include a description of the location based on the map.

Example:

The site location is in the northwestern part of Harris County. Specifically, the site is at the corner of W. Main Road and Addicks Drive on the northern side of W. IH 10 and Addicks Reservoir (**Provide street address if applicable.**). The site location is identified in *Exhibit 1, Vicinity Map*.

2) Areas of Development

Reference an exhibit identifying areas of development. Include a description of the areas to be developed.

Example:

The current project will develop a 20-acre single-family residential area with a dry detention basin as a storm water quality and flood control feature. The 20-acre tract is located in the western section of the (**subdivision name**) subdivision. The areas of development are identified in *Exhibit 2, Site Drainage Map*.

3) Areas Not to be Developed

Reference an exhibit identifying any areas that are not to be developed. Describe any pertinent structures or land that are not to be developed. Note structures that are to remain as they exist at the present time.

Example:

The current project will preserve a portion of the site on the southeastern boundary as undeveloped. The area not to be developed is identified as Reserve "A" in *Exhibit 2, Site Drainage Map*.

4) Drainage Areas

Reference an exhibit identifying drainage areas for the project site. Identify the acreage, patterns, and approximate slopes anticipated after development.

Example:

The residential lots are graded to drain into the street gutters, which discharge into various storm sewer inlets. The storm sewer discharges into the proposed dry detention basin, which drains east through a 60-inch CSP to West Creek (HCFCD Channel K100-00). West Creek is a tributary of Spring Creek (HCFCD Channel J100-00), which is a tributary of the West Fork San Jacinto River (HCFCD Channel G103-00). A site drainage map is depicted in *Exhibit 2*.

5) Wetlands and Surface Waters

Reference an exhibit identifying the location of any known jurisdictional areas, such as waters of the United States, including wetlands. Include a description of the jurisdictional area, including wetlands and surface waters on site.

Example:

West Creek (HCFCD Channel K100-00) is located along the eastern boundary of the property. No jurisdictional areas, including wetlands have been identified at this project site. These water features are identified in *Exhibit 2, Site Drainage Map*.

6) Potential Pollutant Activities

Reference an exhibit identifying the location of any activities that may generate pollutants and potential discharges to the storm drainage system. These locations may include but are not limited to hazardous materials treatment, storage, or disposal facilities, parking areas, and loading and unloading areas. The activities identified on the exhibit should identify any polluting activities that may be related to those activities described in Section 1-D. Include a list of activities and a description of the location of the activities based on the map.

Example:

All activities associated with this development are typical to residential living. These activities include landscaping maintenance, house maintenance, and residential waste disposal. These activities will be located in the vicinity of each house. Other activities will be located in and around the dry detention basin, which include vegetative maintenance and occasionally, sediment removal. Potential pollutant activities are identified in *Exhibit 3, Potential Pollutant Activities and Minimum Control Measures Map*.

7) Non-Structural Controls and Structural Controls

Reference an exhibit identifying the location of any structural controls that are identified in the plan (Section 2). If applicable, identify any specific areas where non-structural controls will be implemented. Include a description of the control and its location based on the map.

Example:

Non-structural controls for storm water quality in this development will include proper waste disposal and proper landscaping practices by the homeowners and inlet stenciling (inlet marker).

The storm water quality structural control for this development is comprised of the dry detention basin, which is separated into two sections by a concrete wall. The basin is designed to store the first 0.5 inch of storm water runoff in the 0.83 ac. ft detention/sedimentation basin constructed in the northern half of the dry detention basin. Additional storm water runoff that flows into the basin will bypass the detention/sedimentation basin through a weir that discharges into the detention basin on the northern half of the dry detention basin.

Non-structural controls and structural controls are depicted in *Exhibit 3, Potential Pollutant Activities and Minimum Control Measures Map*.

8) Storm Water Discharge Locations

Reference an exhibit identifying the storm water discharge locations to the MS4 and the name of the MS4 operator. Include a description of the locations based on the map and the MS4 operator information.

Example:

Storm water discharges into various storm sewer inlets in the residential area of the development. The storm sewer outfalls through a 72-inch pipe into the dry detention basin. The basin discharges through a 60-inch CSP to West Creek (HCFCD Channel K100-00) on the southeastern corner of the 20-acre tract. The MS4 operator is (*the City of Houston, Harris County, etc.*). All storm sewer inlets and outfalls are identified in *Exhibit 2, Site Drainage Map*.

2. Controls

A. Non-Structural Controls

In this section, identify and describe every non-structural control that is to be implemented at the site and how it will be used. These controls may be subcategorized into controls for waste materials, hazardous waste, sanitary waste, landscaping practices / fertilizer and pesticide practices, and others. Refer to the Storm Water Quality Management Guidance Manual and Storm Water Management Handbook for Construction Activities for additional information on non-structural controls. Possible non-structural controls may include but are not limited to the following:

- *Public Education*
- *Reporting Hotline*
- *Household Hazardous Materials Storage/Disposal*
- *Pet Waste Management*
- *Litter Control*
- *Landscaping Practices*
- *Fertilizer and Pesticide Use*
- *Fueling Station Practices*
- *Vehicle/Equipment Washing and Steam Cleaning Practices*
- *Liquid Materials Loading and Unloading Practices*
- *Liquid Storage in Aboveground Tanks Practices*
- *Container Storage of Liquids, Food Wastes, Hazardous Wastes*
- *Spill Prevention and Response Plan*
- *Outdoor Storage Practices*
- *Recycling*
- *Inlet Stenciling (Inlet Marker)*
- *Routine Maintenance of Septic or Sanitary System*
- *Buffer Zone*
- *Urban Forestry*
- *Narrower Residential Streets*
- *Eliminating Curbs and Gutters*
- *Green Parking*
- *Alternative Turnarounds*
- *Alternative Pavers*
- *Plug Floor Drains*
- *Use Dry Cleanup Methods*
- *Stockpile Protection*
- *Spill Kits*
- *Secondary Containment*
- *Dispose/Remove Exposed Materials That Are Not Intended For Use*
- *Volunteer Programs (Stream Cleanup and Monitoring)*

1) Waste Materials

Address any non-structural controls for waste materials that are being implemented as a BMP for the project. These may include but are not limited to litter control and proper solid waste disposal practices.

Example:

Homeowners will be given information on proper handling of household solid waste. Solid waste materials should be stored in a trashcan with a functional lid or kept under cover. The trashcans are placed on the curbside twice a week (***or insert applicable pickup frequency***) for pickup by a licensed waste management provider where it will be taken to an approved landfill for disposal.

2) Hazardous Waste

Address any non-structural controls for hazardous waste that are being implemented as a BMP for the project. These controls may include but are not limited to household hazardous materials storage/disposal, fueling station practices, and materials loading, unloading, and storage practices.

Example:

Homeowners will be given information on proper storage and disposal of household hazardous materials.

3) Sanitary Waste

Address any non-structural controls for sanitary materials that are being implemented as a BMP for the project. These controls may include but are not limited to connection to sanitary sewer or septic system.

Example:

All residential homes in the subdivision are connected to a sanitary sewer that drains to (***name of MUD***) treatment facilities. The (***name of facility***) is located offsite at (***address***).

4) Landscaping Practices / Fertilizer and Pesticide Practices

Address any non-structural controls for landscaping practices. These controls may include but are not limited to use of native or low maintenance vegetation, mowing practices, and proper application of fertilizers and pesticides.

Example:

Homeowners will be responsible for maintaining their private property; however, good management practices for lawn and garden will be provided to educate residence on pollutant reducing practices and alternatives.

The dry detention basin is vegetated with native species of plants. Fertilizers and herbicides will be applied only when necessary and in accordance with manufactures specifications. The basin is mowed once every six months (*or insert applicable frequency*) or as needed.

5) Other

Address any non-structural controls not elsewhere classified that are being implemented as a BMP for the project. These controls may include but are not limited to vehicle/equipment cleaning practices, spill prevention and response plan, and inlet stenciling (inlet marker).

Example:

Inlets in the residential area are stenciled to identify the inlet as a storm drain that drains to West Creek (HCFCD Channel K100-00) and to discourage dumping of waste into the inlet.

B. Structural Controls

In this section, identify and describe every structural control that is to be constructed at the site and how it will be used. These controls may be subcategorized into storm water quality basins, infiltration/filtration facility, catchment facility, vegetative practices, low impact development, and others. Refer to the Storm Water Quality Management Guidance Manual, Storm Water Management Handbook for Construction Activities, and Minimum Design Criteria for Implementation of Certain Best Management Practices for Storm Water Runoff Treatment Options for additional information on structural controls. Possible structural controls may include but are not limited to the following:

- *Dry Basins*
- *Wet Ponds*
- *Dual Use Flood Control/Water Quality Basin*
- *Constructed Wetlands*
- *Infiltration / Filtration Facilities*
- *Oil / Grit Separators*
- *Grass Swales*
- *Vegetated Filter Strips*
- *Low Impact Development*
- *Porous Pavement*
- *Bioretention*

1) Storm Water Quality Basin

Address any dry basins, wet ponds, dual use flood control/water quality basins, or constructed wetlands used for storm water quality treatment.

Example:

Dry Detention Basin

This project incorporates a dual use flood control/water quality basin to treat the storm water runoff from the 20-acre residential area. The dry detention basin for water quality enhancements is designed to divert the first 0.5 inches of storm water runoff. The storm water quality basin discharges into the detention basin via a 2-inch PVC pipe in the concrete wall that separates the two. A trash rack is used to prevent the PVC pipe from being clogged with trash and debris. During high frequency events, storm water runoff flows over a weir into the detention basin, which discharges into West Creek (HCFCD Channel K100-00). The bottom and side slopes of the basin will be vegetated to prevent or reduce resuspension of sediment. A pilot channel is included to reduce erosion of the basin.

2) Infiltration/Filtration Facility

Address any infiltration or filtration facilities used for storm water quality treatment.

Example:

Not applicable to this project.

3) Vegetative Practices

Address any grass swales or vegetated filter strips used for storm water quality treatment.

Example:

Not applicable to this project.

4) Low Impact Development

Address any low impact development used for storm water quality treatment.

Example:

Not applicable to this project.

5) Other

Address structural controls not elsewhere classified that are being implemented as a BMP for the project.

Example:

Litter Control

A litter control net will be placed on the inlet pipe of the detention basin to collect trash and debris. The net detaches from the pipe once it is filled and is anchored to the ground until the litter can be removed. Additional trash pickup will be performed as needed. These control measures will help to prevent litter from becoming a source of floatables. The litter control net will be inspected once a month (or insert applicable frequency) for litter removal. Any litter collected is brought to an approved landfill for disposal.

3. Maintenance Plan

Describe procedures and qualified personnel to assure the timely maintenance of the control measures identified in Section 2. Maintenance requirements must be discussed for each control individually. Reference a table that schedules all maintenance activities for all BMPs.

Example:

The following maintenance and inspection requirements will be performed for the identified BMPs used on the property. Table A-1 in Appendix A schedules all maintenance activities on the site and will be used to insure regular and timely maintenance for structural measures.

A. Non-Structural Controls

Example:

Litter Control

1. Homeowners will be responsible for maintaining any trash receptacles or other materials that are needed for proper management of household waste materials. The trash will be picked up twice a week by a licensed waste management provider. Packets of information on proper storage and handling of waste materials will be provided by (*Name*) to homeowners. The packets of information will include:
 - Control litter from becoming floatables

- Secure lids on trash receptacles or place them undercover
- Only dispose of permitted materials in trash receptacles
- Recycling

Household Hazardous Materials Storage/Disposal

1. Homeowners will be given information on proper storage and disposal of household hazardous materials. These packets of information will be provided by (*Name*). The packets of information will include:
 - Keep products in their original containers with original labels
 - Store in a cool, dry place
 - Keep products out of reach of children and pets
 - Regularly check containers; place a leaky container inside another container and label accordingly
 - Store incompatible chemical products separately
 - Secure lids tightly

Routine Maintenance of Septic or Sanitary System

1. All residential homes in the subdivision are connected to a sanitary sewer that drains to (*name of MUD*) treatment facilities. The (*name of facility*) is located offsite at (*address*) and is operated and maintained by (*name*). They will maintain and inspect the wastewater treatment plant regularly to insure that it is functioning properly. The sanitary sewer system is owned and maintained by (*name of MUD*). The sanitary sewer system will be regularly inspected and maintained by (*name*) to insure that it is functioning properly.

Landscaping Practices / Fertilizer and Pesticide Practices

1. Homeowners will be responsible for maintaining their private property; however, literature on good management practices for lawn and garden will be provided to inform residents on pollutant reducing practices and alternatives. The packets of information on proper landscaping and fertilizer and pesticide practices will be provided by (*Name*).

The dry detention basin is vegetated with native species of plants in order to reduce maintenance. Fertilizers and herbicides will be applied by a contract service provider only when necessary and in accordance with manufactures specifications. The basin is mowed by a contract service provider once every 6 months or as needed.

The contract service provider will not cut the grass any lower than 6 inches when mowing the dry detention basin.

Consult the *Storm Water Quality Management Guidance Manual* for addition guidance for landscaping and fertilizer practices.

Inlet Stenciling (Inlet Marker)

1. All inlets in the residential area will be stenciled or marked to identify the inlet as a storm drain that drains to West Creek (HCFCD Channel K100-00) and to discourage dumping of waste into the inlet. The stenciling will be performed and maintained by a contract service provider. Inspection of the stenciled inlets will be performed once a year by (*Name*) to access if restenciling will be necessary. Consult the *Storm Water Quality Management Guidance Manual* for addition guidance on inlet stenciling.

B. Structural Controls

Example:

Dry Detention Basin

1. This project incorporates a dual use flood control/water quality basin to treat the storm water runoff from the 20-acre residential area. The basin will be visually inspected by (*Name*) once a month to assess any additional maintenance or repairs that may be required. Additional planning considerations and guidance are listed below:
 - The trash and debris will be removed from the trash rack to prevent clogging. This will be incorporated into the regular litter pickup performed by the licensed service provider.
 - Sediment will be removed from the basin when accumulations exceed one-third the design depth of the basin.

Consult the *Storm Water Quality Management Guidance Manual* for addition guidance for dry basin maintenance.

2. Trash pickup will be performed as needed. This control measure will help to prevent litter from becoming a source of floatables. The litter pickup will be performed as needed but at least once a month (*or insert applicable frequency*). Any litter collected will be brought to an approved landfill for disposal. Additional planning considerations and guidance are listed below:

- Additional visits for litter removal may be needed if trash accumulation becomes excessive.
- Litter will be removed from the dry detention basin and the litter control nets will be inspected before rain events to prevent floatables from continuing downstream of the basin.

Consult the *Storm Water Quality Management Guidance Manual* for addition guidance for litter control.

4. **Inspection Plan**

Describe procedures and qualified personnel to assure the timely inspection of the control measures identified in Section 2. Inspection requirements must be discussed for each control individually.

Example:

The following inspection requirements will be performed for the identified control measures used on the property.

A. Non-Structural Controls

Example:

Visual inspections of the residential area will be performed by (**Name**) every (**frequency**). An inspection form will be filled out by the person(s) performing the inspection and filed at (**Location**). The form will include the inspector's name, address, and qualifications. The residential area will be inspected for the following:

- Proper litter control (e.g., trash receptacles have secure lids or under cover)
- Proper landscaping, fertilizer, and pesticide practices
- Inlet stenciling (inlet marker) repair

The inspector will note the date that any maintenance or repairs have been performed since the last inspection. Blank inspection checklists can be found in *Appendix B*. (**Name**) will also be responsible for following up on residents' complaints, which are pertinent to the SWQMP. Public education will continue to be provided to residents on proper waste and household hazardous materials storage and disposal, landscaping practices, and fertilizer and pesticide practices. Public outreach performed specifically for the (**subdivision name**) subdivision will be properly documented by (**Name**) and filed at (**Location**).

B. Structural Controls

Example:

Monthly Inspections

Visual inspections of the dry detention basin and litter control net will be performed by (*Name*) once a month and after rainfall events of 1 inch or more in a 24-hour period. An inspection form will be filled out by the person(s) performing the inspection and filed at (*Location*). The form will include the following information:

- Inspector's name, address, and qualifications.
- Description of any litter and/or debris present in the basin.
- Description of any vegetative and/or erosion maintenance needed in the basin.
- Description of any structural failures and/or maintenance needed
- The date, any maintenance or repairs that have been performed since the last inspection, whether there is any standing water in the basin, the amount of rain produced in the last rainfall event, and the period of time since that event.

C. Annual Inspection Report

Example:

1. Annual inspections of the residential area and dry detention basin will be performed by (*Name*). An inspection report will be written and filed at (*Location*). The report will be written to assess the effectiveness of all current control measures, non-structural and structural, and identify any changes that need to be made to the SWQMP to better control pollutants. The report will include the following information:

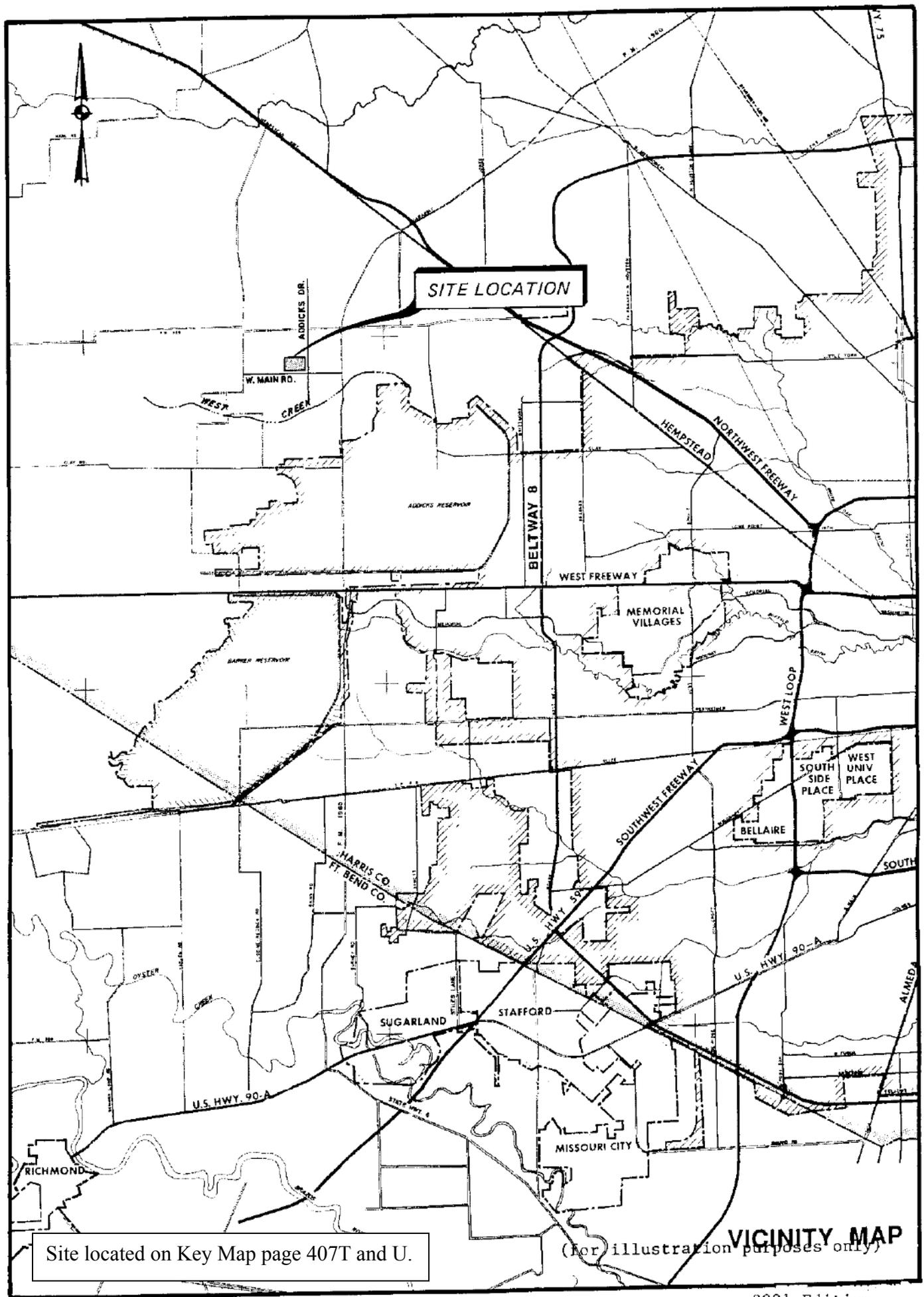
- Inspector's name, address, and qualifications.
- Status of proper litter control (trash receptacles have secure lids or under cover)
- Status of proper landscaping, fertilizer, and pesticide practices
- Status of inlet stenciling (inlet marker) repair
- Status of public education practices based on documentation and attached materials (e.g., brochures, flyers, etc.)

- Status of the basin for litter, debris, vegetation needs, integrity of any structural components, erosion problems, and sediment accumulation.
 - Whether the current BMPs, non-structural and structural, are effectively controlling floatables, suspended solids, and other pollutants.
 - The date that any maintenance or repairs were performed since the last annual inspection, whether there is any standing water in the basin, the amount of rain produced in the last rainfall event, and the period of time since that event.
2. As a pre-requisite for the permittee's annual renewal of the Storm Water Quality Permit, the structural storm water quality control(s)/feature(s) will be inspected by a Professional Engineer, licensed in the state of Texas, who will certify that the controls conform to the plans and technical specifications contained in the approved civil engineering drawings and the Storm Water Quality Management Plan on file with the (**Harris County Public Infrastructure Department, Engineering Division**). The Annual Professional Engineer Inspection Certification form can be found in Appendix B.
 3. As a pre-requisite for the permittee's annual renewal of the Storm Water Quality Permit, the permittee/operator will complete the Annual Permittee Certification of Proper Maintenance for Permit Renewal form. The Annual Permittee Certification of Proper Maintenance for Permit Renewal form can be found in Appendix B.

Example

EXHIBITS

Exhibit 1 – Vicinity Map
(Insert an exhibit showing the general location of the project site.)



Site located on Key Map page 407T and U.

(For illustration purposes only)

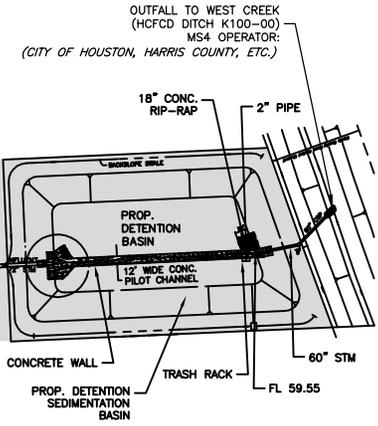
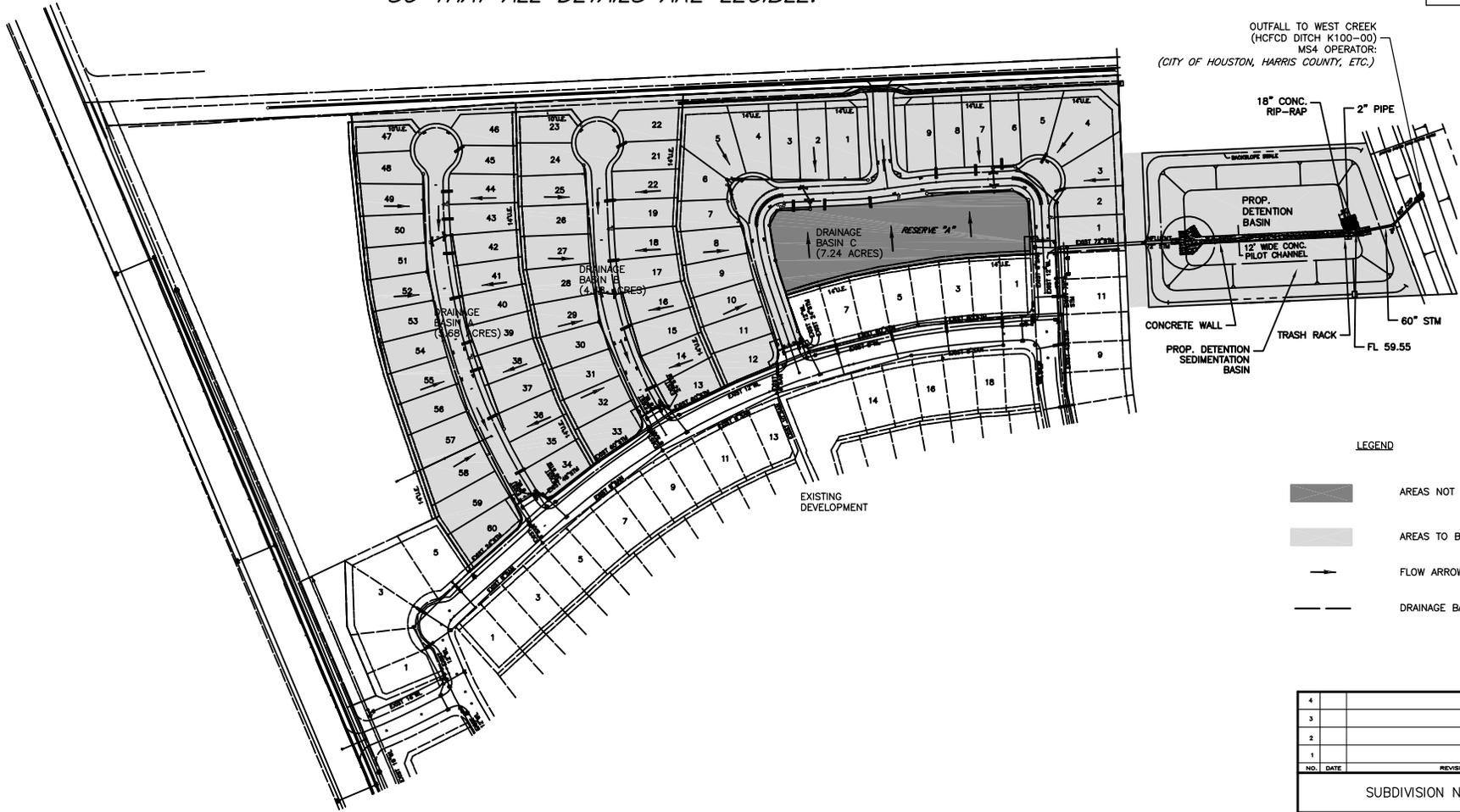
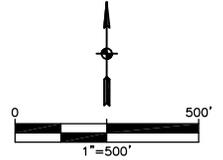
VICINITY MAP

Exhibit 2 – Site Drainage Map

(Insert an exhibit identifying areas of development and areas that are not to be developed.)

(Insert an exhibit identifying drainage basins, the location of any wetlands or surface waters, and the storm water discharge locations to the MS4 and the name of the MS4 operator.)

NOTE: THIS EXHIBIT HAS BEEN REDUCED FOR THE SAKE OF THE EXAMPLE SWQMP. EXHIBITS THAT ARE SUBMITTED MUST BE LARGE ENOUGH SO THAT ALL DETAILS ARE LEGIBLE.



LEGEND

- AREAS NOT TO BE DEVELOPED
- AREAS TO BE DEVELOPED
- FLOW ARROW
- DRAINAGE BASIN

4		
3		
2		
1		
NO.	DATE	REVISION

SUBDIVISION NAME SEC. #

SITE DRAINAGE MAP

Unit	PUBLIC WORKS	Scale	1"=200'
Designed	???	Checked	
Drawn	LWD	Approved	
			Date
			AUGUST, 2002
			Job No.
			EXHIBIT 2

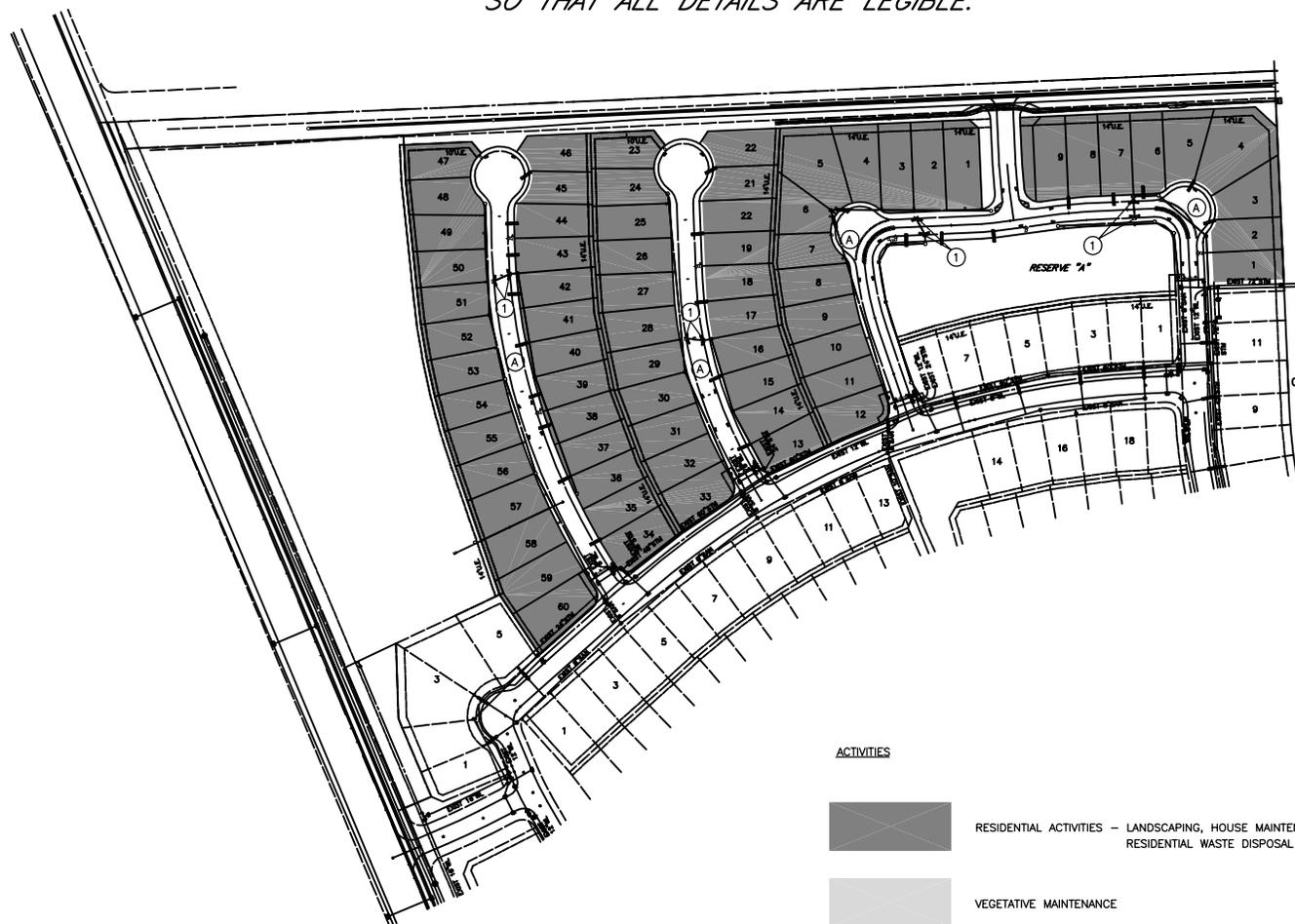
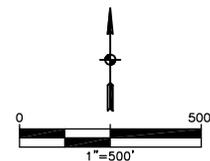
P:\PWP DRAWINGS\37-11165\001 SWQMP Exhibit 2.dwg

**Exhibit 3 – Potential Pollutant Activities & Minimum Control
Measures Map**

(Insert an exhibit identifying the location of any activities that may generate pollutants and potential discharges.)

(Insert an exhibit identifying the location of any non-structural and structural controls that are identified in the plan.)

NOTE: THIS EXHIBIT HAS BEEN REDUCED FOR THE SAKE OF THE EXAMPLE SWQMP. EXHIBITS THAT ARE SUBMITTED MUST BE LARGE ENOUGH SO THAT ALL DETAILS ARE LEGIBLE.



ACTIVITIES



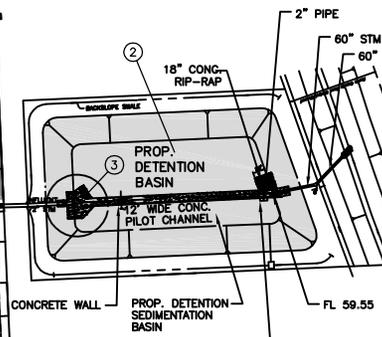
RESIDENTIAL ACTIVITIES - LANDSCAPING, HOUSE MAINTENANCE, RESIDENTIAL WASTE DISPOSAL



VEGETATIVE MAINTENANCE



POLLUTANTS GENERATED IN THE STREET



NON-STRUCTURAL CONTROLS

- ① INLET STENCILING

NOTE: INFORMATION WILL BE PROVIDED TO HOMEOWNERS FOR PROPER HANDLING OF SOLID WASTE, STORAGE AND DISPOSAL OF HOUSEHOLD HAZARDOUS WASTE, AND LANDSCAPING PRACTICES.

STRUCTURAL CONTROLS

- ② DRY DETENTION BASIN
- ③ LITTER CONTROL NET

4			
3			
2			
1			
NO.	DATE	REVISION	APPROV.

SUBDIVISION NAME SEC. #	
POTENTIAL POLLUTANT ACTIVITIES & MINIMUM CONTROL MEASURES	

Unit	PUBLIC WORKS	Scale:	1"=200'	Date	AUGUST, 2002
Designed	???	Checked		Job No.	
Drawn	LWD	Approved		EXHIBIT 3	

Appendix A

Documentation

NPDES or TPDES Permit or NOI
Maintenance and Inspection Schedule

NPDES or TPDES Permit or NOI

(Insert a NPDES or TPDES permit or NOI.)

Example

**Texas Commission on Environmental Quality
Payment Submittal Form**

The storm water application fee shall be sent under separate cover to the Texas Commission on Environmental Quality.

This form must be used to submit your Storm Water Application Fee. Please complete the following information, staple your check in the space provided at the bottom of this document, and mail it to:

BY REGULAR U.S. MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
P.O. Box 13088
Austin, TX 78711-3088

BY OVERNIGHT/EXPRESS MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
12100 Park 35 Circle
Austin, TX 78753

Fee Code: GPA

Storm Water General Permit: TXR150000

Check / Money Order No:

Amount of Check/Money Order:

Date of Check or Money Order:

Name on Check or Money Order:

Facility / Site Name:

Facility / Site Physical Address:

City:

Zip Code:

Staple Check In This Space

Table A-1: Maintenance and Inspection Schedule for (*Location*)

Maintenance Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Non-Structural Controls												
Information packets*												
Litter Pickup in the Basin	X	X	X	X	X	X	X	X	X	X	X	X
Mowing of the Basin			X						X			
Structural Controls												
Cleaning of the Trash Rack	X	X	X	X	X	X	X	X	X	X	X	X
Sediment Removal**												
Inspections												
Monthly	X	X	X	X	X	X	X	X	X	X	X	X
Annual												X
"X" identifies the months in which the activity will be performed (at a minimum).												
*Provided to residents at move-in and available at community locations.												
**Sediment removed from the basin when accumulations exceed one-third the design depth of the basin.												

Appendix B

Forms

Permittee Certification of Storm Water Quality Management Requirements
Storm Water Quality Management Plan Engineer's Certification
Storm Water Quality Permit As-Built Certificate
Annual Permittee Certification of Proper Maintenance for Permit Renewal
Annual Professional Engineer Inspection Certification
Monthly Inspection Form

PERMITTEE CERTIFICATION OF STORM WATER QUALITY MANAGEMENT REQUIREMENTS

I, (*Name*), acting as (*Position*) for (*Permittee's Name*), Permittee, certify under penalty of law that the proposed development is subject to storm water quality requirements. It is my duty to see that all storm water quality features be placed in accordance with construction drawings approved by (*the City of Houston, Harris County, ... etc.*). Once storm water quality features are in place, it is my responsibility that all features be inspected either yearly or at the frequency outlined in the Storm Water Quality Management Plan For (*Site Name*). Also, all storm water quality features will be maintained in accordance with the above-mentioned report for the property known as (*Site Name*) at (*Address or Location*).

Signature: _____ Date: _____

(*Printed Name*)
(*Permittee's Name*)
(*Address*)
(*Phone Number*)

State of Texas
County of _____

Before me, a notary public, on this day personally appeared _____ known to me (or proved to me on the oath of _____) to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he/she executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this _____ day of _____, _____.

Use City's form.
This one needs to be completely filled out.

Notary Public's Signature

STORM WATER QUALITY MANAGEMENT PLAN
ENGINEER'S CERTIFICATION

(NOTE: Engineer's Certification is required for SWQMPs submitted to Harris County for a Harris County Storm Water Quality Permit.)

I, _____ (*Name*), a registered _____ (*Engineer*) duly licensed to practice in the State of Texas do hereby certify that the information presented in this document was prepared under my direction and supervision and complies with the *Regulations of Harris County, Texas for Storm Water Quality Management* and the *Storm Water Quality Management Guidance Manual*. Any parts of the design/sizing of the permanent storm water quality feature(s) that do not meet current minimum design criteria contained within the Regulations and Manual are noted below.

(Describe any exceptions to the criteria here.)

Signature: _____

Date: _____

(Printed Name)
(License Number)
(Address)
(Phone Number)

Use City's form.
This one needs to be completely filled out.

Engineer's Seal and Signature

Project Name: _____

Project Description: _____

Project Location: _____

STORM WATER QUALITY PERMIT AS-BUILT
CERTIFICATE

I, _____ (*Name*), a registered _____ (*Engineer*)
duly licensed to practice in the State of Texas do hereby certify that the
_____ (*Storm water quality features*) constructed at
_____ under Permit Number _____ were
completed in accordance with the drawings and specifications on file with the Harris
County Public Infrastructure Department Engineering Division.

Signature: _____

Date: _____

(*Printed Name*)
(*License Number*)
(*Address*)
(*Phone Number*)

Engineer's Seal and Signature

Example

**ANNUAL PERMITTEE CERTIFICATION OF PROPER
MAINTENANCE FOR PERMIT RENEWAL**

I, (*Name*), acting as (*Position*) for (*Permittee's Name*), Permittee, certify under penalty of law that the Storm Water Quality Management Plan in effect for _____ (*Development*) under Harris County/City of Houston Storm Water Quality Permit number _____, has been maintained according to the provisions contained therein.

Signature: _____

Date: _____

(*Printed Name*)
(*Permittee's Name*)
(*Address*)
(*Phone Number*)

State of Texas
County of _____

Before me, a notary public, on this day personally appeared _____ known to me (or proved to me on the oath of _____) to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he/she executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this _____ day of _____, _____.

Use City's form.
This one needs to be left blank for each following year's annual recertification.

Notary Public's Signature

ANNUAL PROFESSIONAL ENGINEER INSPECTION CERTIFICATION

I, _____ (*Name*), a professional engineer licensed in the State of Texas, certify that on _____ (*inspection date*) the _____ (*structural control(s)*) designed and constructed as part of Storm Water Quality Permit number _____ conformed to the plans and technical specifications contained in the approved civil engineering drawings and Storm Water Quality Management Plan for that permit on file with the (***Harris County Public Infrastructure Department, Engineering Division/City of Houston***).

Signature: _____

Date: _____

(*Printed Name*)
(*License Number*)
(*Address*)
(*Phone Number*)

Engineer's Seal and Signature

Example

Use City's form.
This one needs to be left blank for each following year's annual recertification.

STORM DRAIN INLET STENCILING MONTHLY INSPECTION

Inspection Date _____

By: _____

Time _____

Location: _____

ITEM	DESCRIPTION	Yes/No/NA	Correction Action/By	Corrected Date	Notes
1	PRACTICES				
1.1	Signs painted on or adjacent to all storm drain inlets noting receiving waters and warning against dumping.				
1.2	Stenciled message on concrete or metal plates on or adjacent to storm drain inlets noting receiving waters and warning against dumping				
1.3	Other:				
2	REQUIRED MAINTENANCE AND/OR REPAIRS:				

Example

DRY DETENTION BASIN MONTHLY INSPECTION

Inspection Date _____

By: _____

Time _____

Location: _____

ITEM	DESCRIPTION	Yes/No/NA	Correction Action/By	Corrected Date	Notes
1	SEDIMENT REMOVAL				
1.1	Design depth (feet): _____				
1.2	Sediment thickness: _____ (Measure sediment thickness directly, or measure current depth and subtract from design depth to arrive at sediment thickness. Remove sediment if thickness exceeds 1/3 of design depth.)				
2	EMBANKMENT				
2.1	Evidence of subsidence.				
2.2	Presence of erosion.				
2.3	Presence of crack.				
2.4	Presence of tree growth.				
2.5	Presence burrowing animals.				
2.6	Other. Describe below.				
2.7	Explanation:				
3	OUTFALL				
3.1	Emergency spillway.				
3.2	Outlet.				
3.3	Discharge control such as valve, riser/barrel, weir, check dam, and other.				
3.4	Other. Describe below.				
3.5	Explanation:				
4	DRAW DOWN TIME				
	Design volume drains less than 24 hours or remains 72 hours or more after a storm. If answer is yes, outfall or outlet control should be checked, cleaned or adjusted as needed.				
5	CONTRIBUTORY DRAINAGE				
5.1	Inlet condition is satisfactory.				
5.2	Upstream channel conditions are satisfactory.				
5.3	Upstream erosion controls are satisfactory.				
5.4	Upstream sediment controls are satisfactory.				
5.5	Other. Describe below.				
5.6	Explanation:				

DRY DETENTION BASIN MONTHLY INSPECTION (Continued)

Inspection Date _____

By: _____

Time _____

Location: _____

ITEM	DESCRIPTION	Yes/No/NA	Correction Action/By	Corrected Date	Notes
6	DEBRIS / LITTER REMOVAL				
6.1	Date of last litter removal: _____				
6.2	Removal of litter is required. (Required if last litter removal was more than 6 months ago.)				
7	MOWING				
7.1	Date of last mowing performed: _____				
7.2	Mowing required. (Required if last mowing was more than 6 months ago or if trees or woody shrubs are present on embankment.)				
8	NUISANCE CONTROL				
8.1	Presence of insects.				
8.2	Presence of weeds				
8.3	Presence of odors.				
8.4	Other. Describe below.				
8.5	Explanation:				
9	STRUCTURAL REPAIRS/REPLACEMENT				
	Describe any item needing structural repair and replacement below.				
10	OTHER ITEM.				
	Describe item and condition. Explain any problem below.				
	REQUIRED MAINTENANCE AND /OR REPAIRS:				

Example

Appendix C

Calculations

STORM WATER QUALITY MANAGEMENT PLAN CALCULATIONS

Provide detailed design calculations for all structural controls used on the site.

Example:

Dry Detention Basin

1. *Determine the drainage area that contributes storm water runoff to the basin.*
The drainage area served only accounts for the storm water runoff from inlet 1. Inlet 2 drains the backslope swale and is not included in the calculations. The inlets are identified in *Exhibits 5*.

$$A = 20 \text{ acres}$$

2. *Compute the water quality treatment volume.* The water quality treatment volume is 0.5 inches of runoff from the drainage area.

$$V_{wq} = 0.5 \text{ in} \times \frac{1 \text{ ft}}{12 \text{ in}} \times 20 \text{ acres} = 0.83 \text{ acre} - \text{feet}$$

3. *Design the basin layout with approximate length to width ratio of at least 3:1.*
The basin width is 140 ft wide. The length of the basin is 440 ft and the side slopes are 3:1. The storm water quality depth was calculated based on an average storm water quality basin acreage of 0.36 acres.

$$A_b = 0.36 \text{ acre}$$

$$d_{wq} = V_{wq} / A_b = 0.83 \text{ acre} - \text{feet} / 0.36 \text{ acre} = 2.30 \text{ feet}$$

4. *Calculate the orifice area require to drain 50 percent of the water quality volume within 24-hours.* Using Eq. 2 from the *Storm Water Quality Management Guidance Manual*, page 4-38, the orifice area required would be:

$$A_p = \frac{V}{120.3 \Delta t \sqrt{\Delta H}}$$

Where: A_p = perforation area, square inches

V = the design volume, cubic feet

$$V = 50\% V_{wq}$$

Δt = the draw down time, hours

$$\Delta t = 24 \text{ hours}$$

ΔH = the maximum storage depth of the basin, feet

$$\Delta H = d_{wq}$$

$$A_p = \frac{0.5 \times 0.83 \text{ ac} - \text{ft} \times 43560 \frac{\text{ft}^2}{\text{acre}}}{120.3 \times 24 \text{ hr} \sqrt{2.30 \text{ ft}}} = 4.15 \text{ in}^2$$

5. Calculate the maximum diameter of the pipe to be used to have the needed perforated area.

$$D = \sqrt{\frac{4 \times A_p}{\pi}} = \sqrt{\frac{4 \times 4.15 \text{ in}^2}{\pi}} = 2.3 \text{ in}$$

Use a 2-inch PVC pipe to retain the storm water quality volume for the required length of time.

6. Calculate the number of holes required in the riser.

$$0.5 \text{ in. diameter} = 0.19635 \text{ sq. in. area}$$

$$1.0 \text{ in. diameter} = 0.7854 \text{ sq. in. area}$$

A_h = Area of the desired hole size

Choose the desired hole size.

$$N_{0.5} = \text{Number of 0.5 in. holes required} = \frac{A_p}{A_h}$$

$$N_{0.5} = \frac{A_p}{A_h} = \frac{4.15 \text{ in}^2}{0.19635 \text{ in}^2} = 21.11 \text{ holes}$$

$$N_{1.0} = \frac{A_p}{A_h} = \frac{4.15 \text{ in}^2}{0.7854 \text{ in}^2} = 5.28 \text{ holes}$$

Place 21 – 0.5 inch holes or 5 – 1.0 inch holes in the riser.