City of Houston
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 & 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 of Houston, 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 _____

Or

The property is leased to: *(if applicable)*

Company Name _____

Person to Contact _____

Address _____

Phone Number _____

This plan is for the proposed □ *New Development* or □ *Substantial Re-development (check one)* are of _____ acres as part of the _____ acres total tract located at (your facility location), Houston, Texas. All management of storm water runoff and quality control should follow the BMP as outlined below:

1.1 Storm Water Quality Management Plan

The SWQMP functions as a mitigation plan for the potential impacts of pollution in storm water discharge from the normal operating activities of a site for the life of the development. This plan will contain a site description, planned controls and procedures for maintenance and inspection.

1.2 Site Description

A. Site Location

B. Names, addresses and phone numbers of owner and contact person

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 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 street gutters, which discharge into various 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). Exibit 2 shows site drainage map.

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.

1.3 Controls

A. Non-Structural Controls (Describe non-structural BMPs and how they will be used at the site if applicable)

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:

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 (Describe structural BMPs like retention or detention ponds, etc. in addition to the CDS example below).

The Contech CDS is the structural control to be installed in the storm water lateral connection pipe, approximately XX' deep with XX" inlet pipe and XX" outlet pipe to main storm drainage MS4 (see site map for locations).

1.4 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. A lawn maintenance company will perform regular lawn and detention pond maintenance, including removal of clippings and parking lot debris. Typically, this will be every week in warmer months and every two to three weeks in cooler months.
B. The perimeter of the site will be inspected at least once weekly for wind blown debris.
C. Dumpster trash will be picked up on a weekly schedule including cleaning of dumpster area.
D.Any oil or chemical related spills will be cleaned up immediately and disposed of per local, county and TCEQ regulations.

1.5 Inspection Plan

A. A qualified employee or manager will perform recorded inspections twice per year (e.g. spring and fall) or after any major storm event, following the CDS Inspection Guidelines. Inspection reports will be kept in a secure location available for review by local inspectors.
B. Management will contract a professional engineer registered by the State of Texas to perform an annual inspection and complete the Annual Structural Control Certification for SWQP Renewal Form. This will be submitted along with renewal fees and any pumping truck manifests.

1.6 Sizing CDS based on City of Houston guidelines

City of Houston requires the system to be designed to treat the first ½ inch of runoff. Determining the treatment stormwater flow rate requirement can use the "First Flush Principle". The initial runoff flow contains the highest pollutant load and it will be treated with the **CDS** device. Studies have found that significant concentration pollutant loads are retained when at least 90% of the storm events are treated.[1]

To determine the flow rate of the **CDS** stormwater system, the flow rate of the first flush is estimated. An accepted practice is to calculate the drainage using the Rational Method for estimating design peak discharge from a small watershed.[1]

[1] *Storm Water Quality Management Guidance Manual 2001, City of Houston/Harris County Flood Control District/Texas Dept of Transportation Stormwater Management Joint Task force*

Example:
Commercial site of 2 acres, with a common stormwater application. The stormwater runoff consists of TSS, trash/debris, and free oil and grease. Using a Runoff Coefficient of C = 0.9, the treatment flow rate requirement is calculated as follows:

Formula:

Use the following equation to obtain the treated flow rate:

Q = A x C x I

Where:

Q = treated flow rate (cfs)
A = drainage area (acres)
C = runoff coefficient
I = treated rainfall intensity (0.27 in/hr, per City of Houston)

Example:

Commercial site of 3 acres, typical stormwater runoff consisting of trash, TSS, oil and grease. Use a C coefficient of 0.95 to calculate the required flow to be treated.

Solution:

Q = 3 x 0.95 x 0.27 = 0.77 cfs

In this example, the CDS2015-4 model is the recommended solution, rated to treat up to 1 cfs.

A. Actual sizing calculations for the site located at *(Property Address)*

Q = A x C x I

Q = _____ x _____x 0.27 = _____

B. **Table 1**: CDS Sizing Table for Typical Stormwater Treatment Flow Rates

CDS Model	Max. Treatment flow rate (cfs)
CDS1515-3	0.7
CDS2015-4	1
CDS2015-5	1
CDS2020-5	1.5
CDS2025-5	2.2
CDS3020-6	2.8
CDS3025-6	3.5
CDS3030-6	4.2
CDS3035-6	5.3
CDS4030-8	6.3
CDS4040-8	8.4
CDS4045-8	10.5
CDS5640-10	12.6
CDS5653-10	19.6
CDS5668-10	26.6
CDS5678-10	35

Notes:

1. Calculations are based on an intensity of 0.27 in/hr, per City of Houston requirements.
2. Calculations assume a runoff coefficient of 1.
3. Treatment flow rates are scaled from the CDS2015-4 model tested, which achieved > 80% removal of a sediment distribution with a D_{50} of 240 µm.
4. Additional models available upon request. Contact your local Contech representative if treatment flows are higher than listed in the table.

SECTION (_____)

STORM WATER TREATMENT DEVICE

1.0 GENERAL

1.1 This item shall govern the furnishing and installation of the CDS® by Contech Engineered Solutions LLC, complete and operable as shown and as specified herein, in accordance with the requirements of the plans and contract documents.

1.2 The Contractor shall furnish all labor, equipment and materials necessary to install the storm water treatment device(s) (SWTD) and appurtenances specified in the Drawings and these specifications.

1.3 The manufacturer of the SWTD shall be one that is regularly engaged in the engineering design and production of systems deployed for the treatment of storm water runoff for at least five (5) years and which have a history of successful production, acceptable to the Engineer. In accordance with the Drawings, the SWTD(s) shall be a CDS® device manufactured by:

Contech Engineered Solutions LLC
9025 Centre Pointe Drive
West Chester, OH, 45069
Tel: 1 800 338 1122

1.4 Related Sections

1.4.1 Section 02240: Dewatering
1.4.2 Section 02260: Excavation Support and Protection
1.4.3 Section 02315: Excavation and Fill
1.4.4 Section 02340: Soil Stabilization

1.5 All components shall be subject to inspection by the engineer at the place of manufacture and/or installation. All components are subject to being rejected or identified for repair if the quality of materials and manufacturing do not comply with the requirements of this specification. Components which have been identified as defective may be subject for repair where final acceptance of the component is contingent on the discretion of the Engineer.

1.6 The manufacturer shall guarantee the SWTD components against all manufacturer originated defects in materials or workmanship for a period of twelve (12) months from the date the components are delivered to the owner for installation. The manufacturer shall upon its determination repair, correct or replace any manufacturer originated defects advised in writing to the manufacturer within the referenced warranty period. The use of SWTD components shall be limited to the application for which it was specifically designed.

1.7 The SWTD manufacturer shall submit to the Engineer of Record a "Manufacturer's Performance Certification" certifying that each SWTD is capable of achieving the specified removal efficiencies listed in these specifications. The certification shall be supported by independent third-party research.

1.8 No product substitutions shall be accepted unless submitted 10 days prior to project bid date, or as directed by the Engineer of Record. Submissions for substitutions require review and approval by the Engineer of Record, for hydraulic performance, impact to project designs, equivalent treatment performance, and any required project plan and report (hydrology/hydraulic, water quality, stormwater pollution) modifications that would be required by the approving jurisdictions/agencies. Contractor to coordinate with the Engineer of Record any applicable modifications to the project estimates of cost, bonding amount determinations, plan check fees for changes to approved documents, and/or any other regulatory requirements resulting from the product substitution.

2.0 MATERIALS

2.1 Housing unit of stormwater treatment device shall be constructed of pre-cast or cast-in-place concrete, no exceptions. Precast concrete components shall conform to applicable sections of ASTM C 478, ASTM C 857 and ASTM C 858 and the following:

- 2.1.1 Concrete shall achieve a minimum 28-day compressive strength of 4,000 pounds per square-inch (psi);
- 2.1.2 Unless otherwise noted, the precast concrete sections shall be designed to withstand lateral earth and AASHTO H-20 traffic loads;
- 2.1.3 Cement shall be Type III Portland Cement conforming to ASTM C 150;
- 2.1.4 Aggregates shall conform to ASTM C 33;
- 2.1.5 Reinforcing steel shall be deformed billet-steel bars, welded steel wire or deformed welded steel wire conforming to ASTM A 615, A 185, or A 497.
- 2.1.6 Joints shall be sealed with preformed joint sealing compound conforming to ASTM C 990.
- 2.1.7 Shipping of components shall not be initiated until a minimum compressive strength of 4,000 psi is attained or five (5) calendar days after fabrication has expired, whichever occurs first.

2.2 Internal Components and appurtenances shall conform to the following:

- 2.2.1 Screen and support structure shall be manufactured of Type 316 and 316L stainless steel conforming to ASTM F 1267-01;
- 2.2.2 Hardware shall be manufactured of Type 316 stainless steel conforming to ASTM A 320;
- 2.2.3 Fiberglass components shall conform to the ASTM D-4097
- 2.2.4 Access system(s) conform to the following:
- 2.2.5 Manhole castings shall be designed to withstand AASHTO H-20 loadings and manufactured of cast-iron conforming to ASTM A 48 Class 30.

3.0 PERFORMANCE

3.1 The SWTD shall be sized to either achieve an 80 percent average annual reduction in the total suspended solid load or treat a flow rate designated by the jurisdiction in which the project is located. Both methods should be sized using a particle size distribution having a mean particle size (d_{50}) of 180 microns unless otherwise stated.

3.2 The SWTD shall be capable of capturing and retaining 100 percent of pollutants greater than or equal to 4.7 millimeters (mm) regardless of the pollutant's specific gravity (i.e.: floatable and neutrally buoyant materials) for flows up to the device's rated-treatment capacity. The SWTD shall be designed to retain all previously captured pollutants addressed by this subsection under all flow conditions. The SWTD shall be capable of capturing and retaining total petroleum hydrocarbons. The SWTD shall be capable of achieving a removal efficiency of 92 and 78 percent when the device is operating at 25 and 50 percent of its rated-treatment capacity. These removal efficiencies shall be based on independent third-party research for influent oil concentrations representative of storm water runoff (20 ± 5 mg/L). The SWTD shall be greater than 99 percent effective in controlling dry-weather accidental oil spills.

3.3 The SWTD shall be designed with a sump chamber for the storage of captured sediments and other negatively buoyant pollutants in between maintenance cycles. The minimum storage capacity provided by the sump chamber shall be in accordance with the volume listed in Table 1. The boundaries of the sump chamber shall be limited to that which do not degrade the SWTD's treatment efficiency as captured pollutants accumulate. The sump chamber shall be separate from the treatment processing portion(s) of the SWTD to minimize the probability of fine particle re-suspension. In order to not restrict the Owner's ability to maintain the SWTD, the minimum dimension providing access from the ground surface to the sump chamber shall be 16 inches in diameter.

3.4 The SWTD shall be designed to capture and retain Total Petroleum Hydrocarbons generated by wet-weather flow and dry-weather gross spills and have a capacity listed in Table 1 of the required unit.

3.5 The SWTD shall convey the flow from the peak storm event of the drainage network, in accordance with required hydraulic upstream conditions as defined by the Engineer. If a substitute SWTD is proposed, supporting documentation shall be submitted that demonstrates equal or better upstream hydraulic conditions compared to that specified herein. This documentation shall be signed and sealed by a Professional Engineer registered in the State of the work. All costs associated with preparing and certifying this documentation shall be born solely by the Contractor.

3.6 The SWTD shall have completed field tested following TARP Tier II protocol requirements

4.0 EXECUTION

4.1 The contractor shall exercise care in the storage and handling of the SWTD components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted and unloading has commenced shall be borne by the contractor.

4.2 The SWTD shall be installed in accordance with the manufacturer's recommendations and related sections of the contract documents. The manufacturer shall provide the contractor installation instructions and offer on-site guidance during the important stages of the installation as identified by the manufacturer at no additional expense. A minimum of 72 hours' notice shall be provided to the manufacturer prior to their performance of the services included under this subsection.

4.3 The contractor shall fill all voids associated with lifting provisions provided by the manufacturer. These voids shall be filled with non-shrinking grout providing a finished surface consistent with adjacent surfaces. The contractor shall trim all protruding lifting provisions flush with the adjacent concrete surface in a manner, which leaves no sharp points or edges.

4.4 The contractor shall removal all loose material and pooling water from the SWTD prior to the transfer of operational responsibility to the Owner.

TABLE 1

Storm Water Treatment Device
Storage Capacities

CDS Model	Minimum Sump Storage Capacity $(yd^3)/(m^3)$	Minimum Oil Storage Capacity (gal)/(L)
CDS2015-4	0.9(0.7)	61(232)
CDS2015-5	1.5(1.1)	83(313)
CDS2020-5	1.5(1.1)	99(376)
CDS2025-5	1.5(1.1)	116(439)
CDS3020-6	2.1 (1.6)	184(696)
CDS3025-6	2.1(1.6)	210(795)
CDS3030-6	2.1 (1.6)	236(895)
CDS3035-6	2.1 (1.6)	263(994)
CDS3535-7	2.9(2.2)	377(1426)
CDS4030-8	5.6(4.3)	426(1612)
CDS4040-8	5.6 (4.3)	520(1970)
CDS4045-8	5.6 (4.3)	568(2149)
CDS5640-10	8.7(6.7)	758(2869)
CDS5653-10	8.7(6.7)	965(3652)
CDS5668-10	8.7(6.7)	1172(4435)
CDS5678-10	8.7(6.7)	1309(4956)

END OF SECTION

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allow both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine whether the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on

a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.

CONTECH ENGINEERED SOLUTIONS

CDS Inspection & Maintenance

CDS Model: _____

Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

Appendix A
Documentation
NPDES** or **TPDES Permit** or **NOI
Maintenance and Inspection Schedule

NPDES or TPDES Permit or NOI

(Insert NPDES or TPDES permit or NOI)