

STORM WATER POLLUTION PREVENTION PLAN "SWPPP"



For Construction of:

JOHNSON COUNTY PRECINCT 3 SUB-COURTHOUSE
206 NORTH BAUGH STREET
ALVARADO, TEXAS 76009

PERMITTEES:

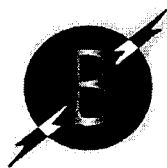
JOHNSON COUNTY
2 NORTH MAIN STREET
CLEBURNE, TEXAS 76033

AND

PETE DURANT & ASSOCIATES, INC.
2040 GOLDEN TRIANGLE
FORT WORTH, TEXAS 76177

Owner - Copy

Prepared by:



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Environmental
Services, LLC.**

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September 2013

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Table of Contents

I. INTRODUCTION.....	1
A. Responsibility of Secondary and Primary Operators	3
II. PROJECT DESCRIPTION.....	5
A. Nature of Construction Activity.....	5
B. Sequence of Construction Activities.....	5
C. Discharges Associated with Construction Support Activity.....	6
D. Estimate of Total Site Area and Disturbed Area.....	8
E. Soil Data / Quality of Discharge from Site.....	8
F. Storm Water Management.....	8
G. Surface Water and Wetlands.....	8
H. Standard Industrial Classification Codes.....	8
I. Endangered Species Information.....	8
J. Impaired Receiving Water and TMDL Requirements Information.....	8
K. Common Plan Development.....	8
L. Notice of Intent / Notice of Termination / Notice of Change.....	8
III. STORM WATER POLLUTION MEASURES AND CONTROLS.....	9
A. Erosion and Sediment Controls.....	9
1. Soil Stabilization.....	9
2. Structural Controls-Temporary/Permanent	10
3. Sediment Control Practices.....	11
1) Sediment Basins.....	11
2) Perimeter Controls and Controls for sites less than 10 acres.....	11
4. Storm Water Management Controls.....	11
B. Other Controls.....	11
1. Dust Control / Offsite Vehicle Tracking.....	11
2. Waste Disposal.....	12
3. Sanitary/Septic.....	12
4. Water Source.....	12
5. Construction Phase "Best Management Practices".....	12
6. Hazardous Material Storage.....	13
7. Spill Prevention and Response.....	13
8. Concrete Saw Cutting.....	14

Table of Contents Continued...

9.	Concrete Truck Washout Requirement.....	14
10.	Storm Water Runoff from Concrete Batch Plants.....	15
IV.	STATE AND LOCAL PROGRAMS.....	15
V.	INSPECTION AND MAINTENANCE.....	16
A.	Material Storage Inspections.....	17
B.	Soil Stabilization Inspections.....	17
C.	Erosion and Sediment Control Inspections.....	17
VI.	MODIFICATIONS / REVISIONS TO SWPPP.....	19
VII.	PROCEDURAL REQUIREMENTS.....	20
VIII.	PREPARER'S CERTIFICATION	

IX. APPENDICES

- A. *CONTRACTOR CERTIFICATION / SUBCONTRACTOR CERTIFICATIONS*
- B. *DELEGATION LETTERS*
- C. *TPDES CONSTRUCTION SITE NOTICES (TO BE POSTED AT SITE)*
SMALL CONSTRUCTION SITE NOTICE / SECONDARY SITE NOTICE / LARGE SITE NOTICE / LOW POTENTIAL FOR EROSION SMALL SITE NOTICE
- D. *NOI / NOT / NOC FORM*
- E. *ENDANGERED SPECIES CERTIFICATION / IMPAIRED RECEIVING WATER BODIES LISTING*
- F. *LIST OF POTENTIAL POLLUTANTS*
- G. *SWPPP UPDATE FORM / RECORD OF MAJOR GRADING ACTIVITIES / CHANGES IN SITE CONDITIONS*
- H. *RECORD TEMPORARY OR PERMANENT CEASED CONSTRUCTION ACTIVITIES / RECORD OF STABILIZATION MEASURES*
- I. *PROJECT DESCRIPTION, SURFACE WATER MAP, VICINITY MAP, EROSION AND SEDIMENT CONTROL PLAN WITH DRAINAGE CHARACTERISTICS, DETAILS AND SPECIFICATIONS*
- J. *INSPECTOR QUALIFICATIONS / INSPECTION REPORTS / RAIN EVENT LOG*
- K. *ISWM TECHNICAL MANUAL BEST MANAGEMENT PRACTICE'S / EFFLUENT LIMITATIONS AND GUIDELINES*
- L. *TPDES GENERAL PERMIT NUMBER TXR150000 FOR CONSTRUCTION ACTIVITIES*
- M. *CONCRETE BATCH PLANTS REQUIREMENTS / MATERIAL MANAGEMENT SHEET / POLLUTION PREVENTION TEAM / EMPLOYEE TRAINING FORM / QUARTERLY VISUAL MONITORING FORM / ANNUAL COMPREHENSIVE COMPLIANCE FORM / NON-STORM WATER DISCHARGES / DMR REPORT / RAIN GAUGE LOG*
- N. *SPILL PREVENTION AND RESPONSE PROCEDURES, CONTACT NUMBERS AND SPILL RESPONSE FORMS*
- O. *DEFINITIONS*

I. INTRODUCTION

This Storm Water Pollution Prevention Plan (SWP3) has been prepared for the proposed construction for; Johnson County Precinct 3 Sub-Courthouse located at 206 N. Baugh Street, in the City of Alvarado, Johnson County Texas. This plan has been prepared as a shared plan covering activities of the General Contractor/ Primary Operator: Pete Durant & Associates, Inc. and the Owner / Secondary Operator Johnson County.

The purpose of this SWPPP is to provide guidelines for preventing or minimizing soil and pollutants that originate on the construction site from flowing into surface water bodies during the construction period. It addresses the principal activities known to disturb significant amounts ground surface during construction.

This SWPPP terminates when areas disturbed for this project reach full stabilization. From a regulatory standpoint, the site has achieved full stabilization once all areas are paved or have at least 100% vegetative coverage with a 70% density.

The Primary Operator referred to in this SWPPP is Pete Durant & Associates, Inc. The Secondary Operator is Johnson County.

The MS4 Operator for this project is: City of Alvarado

Address: City of Alvarado
Attn: Public Works
104 West College
Alvarado, TX 76009

The MS4 Operator (City of Alvarado) will need to be notified of this project prior to the start of construction with a Construction Site Notice.

Upon completion of all construction activities and once the site has been stabilized with vegetation, a construction site notice with the dates of completion will need to be submitted to the MS4 Operator as well.

The Construction Site Notices are located in Appendix C.

The Texas general permit for construction activities provides for the following types of non-storm water discharges, which could originate at the site:

1. Discharges from fire fighting activities (fire fighting activities do not include washing of trucks, run-off water from training activities, test water from fire suppression systems, and similar activities);
2. Uncontaminated fire hydrant flushings (excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life), which include flushings from systems that utilize potable water, surface water, or groundwater that does not contain additional pollutants (uncontaminated fire hydrant flushings do not include systems utilizing reclaimed wastewater as a source water);
3. Water from the routine external washing of vehicles, the external portion of buildings or structures, and pavement, where detergents and soaps are not used and where spills or leaks of toxic or hazardous materials have not occurred (unless spilled materials have been removed; and if local state, or federal regulations are applicable, the materials are removed according to those regulations), and where the purpose is to remove mud, dirt, or dust;
4. Uncontaminated water used to control dust;
5. Potable water sources including waterline flushings (excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life);
6. Uncontaminated air conditioning condensate;
7. Uncontaminated ground water or spring water, including foundation or footing drains where flows are not contaminated with industrial materials such as solvents; and
8. Lawn watering and similar irrigation drainage.

Other Permitted Discharges

Any discharge authorized under a separate NPDES, TPDES, or TCEQ permit may be combined with discharges authorized by this general permit, provided those discharges comply with the associated permit.

The storm water management controls included in this SWPPP focus on providing control of pollutant discharges with practical approaches that utilizes readily available techniques, expertise, material and equipment. The necessary forms for implementing the SWPPP are included in the Appendices including the Contractor and Sub-Contractor Certifications, Delegation Letters, Construction Site Notices, Project Description, Surface Water Maps, Erosion Control Plans, Impaired Receiving Waters and TMDL Requirements, Effluent Limitation Guidelines and Best Management Practices, Inspector Qualifications and Reports.

A. Responsibility of Operators

The Primary Operators and Secondary Operators with control over construction plans and specifications must:

- Ensure the project specifications allow or provide that adequate BMPs are developed to meet the requirements of Part III of this general permit;
- Ensure that the SWP3 indicates the areas of the project where they have control over project specifications, including the ability to make modifications in specifications;
- Ensure all other operators affected by modifications in project specifications are notified in a timely manner so that those operators may modify their BMP's as necessary to remain compliant with the conditions of the general permit; and
- Ensure that the SWP3 for portions of the project where they are operators indicates the name and site-specific TPDES authorization numbers for permittees with the day-to-day operational control over those activities necessary to ensure compliance with the SWP3 and other permit conditions. If the party with day-to-day operational control has not been authorized or has abandoned the site, the person with control over project specifications is considered to be the responsible party until the authority is transferred to another party and the SWP3 is updated.

The Primary Operator with day-to-day operational control of those activities at a project that are necessary to ensure compliance with an SWP3 and other permit conditions must ensure that the SWP3 accomplishes the following requirements:

- Meets the requirements of this general permit for those portions of the project where they are operators;
- Identifies the parties responsible for implementation of best management practices (BMPs) described in the SWP3;
- Includes, for areas where they have operational control over day-to-day activities, the name and site-specific TPDES authorization number of the parties with control over project specifications, including the ability to make modifications in specifications

Secondary Operator: Johnson County

Primary Operator with Day to Day Operational Control: Pete Durant & Associates, Inc.

Additional Requirements for the Primary Operator with Day to Day Operational Control

- Post the signed, dated copy of the Construction Site Notices, prior to the start of construction, at the construction site in a location that is readily available for viewing by the general public and all inspectors from local and state agencies
- A copy of the Construction Site Notices must be posted at all times thru out the duration of the project until the site has been stabilized and all erosion controls have been removed.
- A Storm Water Pollution Prevention Plan (this SWPPP) must be completed and implemented for the project prior to Construction.
- A signed copy of the SWPPP should be retained at the project site at all times
- Johnson County, Pete Durant & Associates, Inc. and all subcontractors must sign the appropriate certification statement in Appendix A
- This SWPPP must be updated each time there are significant modifications to major construction activities, contractors or pollutant control practices
- Pete Durant & Associates, Inc. will provide qualified personnel to conduct inspections of the project as described previously to assure compliance with the SWPPP. Based on inspection results, the SWPPP and pollution prevention control techniques must be modified by the contractors if necessary to assure that storm water or the identified non-storm water discharges are the only discharges leaving the project site
- The SWP3 must be retained on-site at the construction site or, if the site is inactive or does not have an on-site location to store the plan, a notice must be posted describing the location of the SWP3
- If the SWP3 is retained off-site, then it shall be made available as soon as reasonably possible. In most instances, it is reasonable that the SWP3 shall be made available within 24 hours of the request
- Discharge of hazardous substances or oil into storm water is subject to reporting requirements. Refer to TPDES general permit for specific guidelines. Each contractor is responsible for complying with these reporting requirements
- Questions about the TPDES program can be directed to the Texas Commission on Environmental Quality. A copy of the TPDES General Permit Number TXR150000 is included for reference

II. PROJECT DESCRIPTION

A. Nature of Construction Activity

This project consists of the construction of a single story Sub-Courthouse structure approximately 12,600 square feet along with all associated appurtenances.

Construction activities included in this project are: demolition of existing structures, grading and clearing, excavation and embankment, utility construction, paving operations, building construction and lastly landscaping and final stabilization.

Pete Durant & Associates, Inc. is responsible for submitting a copy of the Construction Site Notice to the City of Alvarado prior to the start of construction. Once the construction site notice has been submitted, mobilization of equipment may begin with installation of erosion controls, demolition for the first phase of this project.

The second grouping of activities includes grading and clearing, excavation and embankment, stockpiling and removal, utility construction, grading forming and subgrade stabilization, paving operations and building construction.

The last activities will be placement of topsoil, final grading and landscaping. Following the final site cleanup and stabilization, temporary erosion controls will be removed from the site. When all construction is completed and the site stabilized a construction site notice with the completion date will need to be submitted to the City of Alvarado.

Refer to Appendix D.

B. Sequence and Schedule of Construction Activities

The schedule of construction activities is listed below. The anticipated sequences of construction activities, which will disturb significant amounts of soil, are provided on the next page.

Project scheduled start date is: October 1, 2013

Scheduled completion date: August 30, 2014

Erosion Controls will be installed: October 1, 2013

Dates of Final Stabilization anticipated: August 30, 2014

Specific activities include:

- Installation of sediment controls will begin at the time of mobilization for the equipment and materials. These activities will be the first activities at the site and will be completed prior to any dirt work.

- All construction contractors staging will take place at the site and no offsite staging areas will be used.
- Preparation of R.O.W., establish perimeter controls using silt fence as necessary for temporary erosion control
- Demolition of existing structures
- Grading and clearing
- Excavation and embankment
- Stockpiling and removal
- Utility construction
- Grading, forming and subgrade stabilization
- Paving operations
- Building construction
- Final grading
- Seeding or sodding for final stabilization
- When construction is complete, the site is stabilized and approved by the Engineer, remove all temporary sediment controls and reseed any areas disturbed by their removal
- Submit a Construction Site Notice to the City of Alvarado with the dates of completion filled in. (Appendix C)

A detailed site description may be found in Appendix I: Project Description

Primary Operator - Pete Durant & Associates, Inc.

1. Provide stabilized construction entrances and sediment barriers. Clean the existing rock and /or add rock as necessary to prevent mud and dirt from being tracked onto existing public streets.
2. Maintain silt fence and construction entrance throughout the duration of the project. Replace if required. Remove silt and mud, in order to restore sediment containment capacity.
3. Maintain erosion control measures during all phases of construction, landscaping or temporary vegetation.
4. Remove and dispose of the erosion controls once their use is no longer needed.

Locations for structural controls and details are shown on the Erosion Control Plan (Appendix I)

C. Discharges Associated with Construction Support Activity

Examples of construction support activities include, but are not limited to, concrete batch plants, rock crushers, asphalt batch plants, equipment staging areas, material storage yards, material borrow areas, and excavated material disposal areas. Discharges of storm water runoff from construction support activities may be authorized under this general permit, provided that the following conditions are met:

- (a) the activities are located within one (1)-mile from the boundary of the permitted construction site and directly support the construction activity;

- (b) an SWP3 is developed for the permitted construction site according to the provisions of this general permit, and includes appropriate controls and measures to reduce erosion and discharge of pollutants in stormwater runoff from the construction support activities; and
- (c) the construction support activities either do not operate beyond the completion date of the construction activity or, at the time that they do, are authorized under separate Texas Pollutant Discharge Elimination System (TPDES) authorization. Separate TPDES authorization may include the TPDES Multi Sector General Permit (MSGP), TXR050000, or coverage under an alternative general permit if available, or authorization under an individual water quality permit.

Batch Plant

This project will not include a batch plant to be used as part of this project.

Concrete Washout Areas

All projects must have a designated concrete wash out area(s). A concrete washout pit or other containment shall be installed a minimum of 50 feet away from inlets, swales, drainage ways, channels, and other waters, if the site configuration provides sufficient space to do so. In no case shall concrete washout occur closer than 20 feet from inlets, swales, drainage ways, channels and other waters. Designated concrete washout areas must be shown on the erosion control plan.

Stock Piles:

Areas where excavated or additional materials (fill) will be stored will be shown on the erosion plan.

Material Storage Areas:

These areas should be maintained to keep material limited on the site to materials needed the job. Liquid containers must be kept closed when fluids are not being removed, and drip pans must be used under any containers with valves or spigots attached.

Equipment Staging Areas:

Additional erosion controls may be needed to prevent offsite tracking. Any petroleum products stored in the staging area must be in closed containers in good condition to prevent leaking.

Locations for structural controls and details for any of the above areas must be show on the Erosion Control Plan. If the locations of these areas are not known at the time the SWPPP is developed, it is the responsibility of Pete Durant & Associates, Inc. to update the Erosion Control Plans to show the exact location of these areas.

If you need assistance with these updates, or have questions about updating your SWPPP, please contact Brock Environmental Services, so we can assist you with these updates.

D. Estimate of Total Site Area and Disturbed Areas

The total area for this project consists of approximately 2.23 acres of which 2.23 acres will be disturbed by this project.

E. Soil Data / Quality of Discharge from site.

Soils primarily consist of dark gray, brown silty clay. Refer to the geotechnical report prepared for this project by TSIT for additional information regarding soil type. No information on the quality of discharge from the site has been provided.

F. Storm Water Management

Storm water runoff will be provided by inlets and storm sewer system which carry drainage within the parking lots and R.O.W. to the lows within the roadways, which drains to natural facilities maintained by the City of Alvarado.

G. Surface Waters and Wetlands

The potential receiving water bodies are: North Fork Chambers Creek ultimately leading to Chambers Creek. To the best of our knowledge, this project is not located within any known wetland areas.

H. Standard Industrial Classification Codes

The major construction activities will have the Standard Industrial Classification codes listed below:
1542

I. Endangered Species Information

To the best of our knowledge, there are neither endangered or threatened species nor critical habitat found in the proximity of this project.
See Appendix E

J. Impaired Receiving Water and TMDL Requirements

This projects discharges into segment 0814 and is currently not listed on the Texas 303 9(d) list: the current status- Not Assessed.
See Appendix E

K. Common Plan Development

This project is not considered as part of a larger common plan of development.

Any project that has a disturbed area less than one acre, but that is part of a larger plan of development must follow the guidelines for construction of a Large Project.

L. Notice of Intent / Notice of Termination / Notice of Change

This project is considered as a small project with a disturbed area less than 5 acres no NOI is needed for this project.

III. STORM WATER POLLUTION MEASURES AND CONTROLS

A. Erosion and Sediment Controls

Erosion and sediment control practices can be divided into three broad categories: (1) soil stabilization, (2) structural controls, and (3) management practices. Each of these categories has temporary and permanent control measures to be considered. Soil stabilization and structural practices will be installed and maintained in accordance with the Project construction drawings and specifications.

1. Soil Stabilization

Stripping of vegetation will be conducted in a manner that minimizes erosion. Cut and fill operations will follow the grading plans and be kept to a minimum where practicable. Pete Durant & Associates, Inc. is responsible for planting vegetation (and establishing 100% coverage with at least 70% density) on all ground disturbed during construction and is responsible for watering and maintaining the vegetation until final project is accepted by Johnson County.

Erosion control and stabilization measures must be initiated immediately in portions of the site where construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days. Stabilization measures that provide a protective cover must be initiated immediately in portions of the site where construction activities have permanently ceased. The term "immediately" is used to define the deadline for initiating stabilization measures. In the context of this requirement, "immediately" means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased.

Except as provided in (A) through (D) below, these measures must be completed as soon as practicable, but no more than 14 calendar days after the initiation of soil stabilization measure:

- (A) Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable.
- (B) In arid areas, semi-arid areas, or drought-stricken areas where the immediate initiation of stabilization measures after construction activity has temporarily or permanently ceased or is precluded by arid conditions, erosion control and stabilization measures must be initiated as soon as practicable. Where vegetative controls are not feasible due to arid conditions, the operator shall immediately install, and within 14 calendar days of a temporary or permanent cessation of work in any portion of the site complete, non-vegetative erosion controls. If non-vegetative controls are not feasible, the operator shall install temporary sediment controls.

- (C) In areas where temporary stabilization measures are infeasible, the operator may alternatively utilize temporary perimeter controls. The operator must document in the SWP3 the reason why stabilization measures are not feasible, and must demonstrate that the perimeter controls will retain sediment on site to the extent practicable. The operator must continue to inspect the BMPs at the frequency established in Section III.F.7.(a) for unstabilized sites.
- (D) If the initiation or completion of vegetative stabilization is affected by circumstances beyond the control of the permittee, vegetative stabilization must be initiated or completed as soon as conditions or circumstances allow it on the site. The requirement to initiate stabilization is triggered as soon as it is known with reasonable certainty that work will be stopped for 14 or more additional calendar days.

TCEQ does not expect that temporary or permanent stabilization measures to be applied to areas that are intended to be left un-vegetated or unstabilized following construction (e.g., dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, or materials).

Final stabilization must be achieved prior to termination of permit coverage.

Refer to Appendix K "Best Management Practices" for details on stabilization measures.

2. Structural Controls - Temporary / Permanent

Erosion and sediment controls will be constructed and maintained according to the standards in the construction drawings and specifications, and the site map. Listed below are the structural controls to be used at the Project site.

Temporary Controls

- Silt Fence
- Construction Entrance

Permanent Controls

- Seeding and Landscaping

Refer to the Erosion Plan located in Appendix I for details and specifications for the structural controls

3. Sediment Control Practices

1. Sediment Basins

A sedimentation basin is required, where feasible, for a common drainage location that serves an area with ten (10) or more acres disturbed at one time. A sedimentation basin may be temporary or permanent, and must provide sufficient storage to contain a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained.

If a sedimentation basin is not feasible, then the permittee shall provide equivalent control measures until final stabilization of the site. In determining whether installing a sediment basin is feasible, the permittee may consider factors such as site soils, slope, available area, public safety, precipitation patterns, site geometry, site vegetation, infiltration capacity, geotechnical factors, depth to groundwater, and other similar considerations. The permittee shall document the reason that the sediment basins are not feasible, and shall utilize equivalent control measures, which may include a series of smaller sediment basins

Unless infeasible, when discharging from sedimentation basins and impoundments, the permittee shall utilize outlet structures that withdraw water from the surface.

2. Perimeter Controls and Controls for Sites with Disturbed Area Less Than 10 Acres.

At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions

4. Storm Water Management Controls

Storm water management during construction will consist of containing pollutants on the site. Soil is the most significant potential pollutant. It will be contained by the Silt Barriers and Sediment Traps. These controls must be properly installed and maintained by Pete Durant & Associates, Inc. in order to contain soil on the site. Chemicals, fuels and similar potential pollutants will be contained by careful handling and storage and by utilizing portable or plastic covered Earth Containment Berms as needed.

B. Other Controls

1. Dust Control / Off-site Vehicle Tracking

During construction, water trucks will be used by Pete Durant & Associates, Inc. to reduce dust as needed. After construction, the site will be stabilized as described elsewhere in order to reduce dust.

Construction traffic shall enter and exit at the site at a Construction Entrance, which will be stabilized after the completion of the project. Construction traffic will enter and exit the work area at a Construction Entrance with a stabilized rock entrance or equivalent device.

The purpose of the rock entrance is to minimize the amount of soil and mud that is tracked onto existing streets. If sediment escapes the project site, offsite accumulations of sediment will be removed at a frequency sufficient to minimize offsite impacts.

2. Waste Disposal

- a. All solid waste materials, including disposable materials incidental to the major construction activities, will be collected in containers. The containers will be emptied periodically and hauled to a landfill. Each container must be covered to prevent the blowing of debris from the container. Each contractor is responsible for proper disposal of his own trash.
- b. Substances that have the potential for polluting surface and/or groundwater must be controlled by whatever means necessary to ensure that they do not discharge from the site. It is the responsibility of each contractor to make sure pollutant discharge is avoided. As an example, special care shall be exercised during equipment fueling and servicing operations. If a spill occurs, it shall be contained and disposed of so that it will not flow from the site or soak in to the soil. In this regard, potentially polluting substances shall be handled in a manner consistent with the impact they represent.

3. Sanitary / Septic

Contractors shall comply with all Federal, State and local sanitary sewer septic system regulations. Temporary portable sanitary facilities shall be provided at the site by each contractor throughout construction activities.

They shall be utilized by construction personnel and serviced regularly by a commercial operator. All Expenses associated with providing sanitary facilities are the responsibility of the contractors.

4. Water Source

Water used to establish and maintain grass, to control dust, and for other purposes during the construction phase must originate from a public water supply or private well approved by the Texas State Department of Health. Temporary fire hydrants meters shall be used until such time the potable water is available within the site.

5. Construction Phase "Best Management Practices" (BMPs)

During the construction phase, Pete Durant & Associates, Inc. will also implement the following measures listed on the next page:

- a. Equipment fueling, maintenance and cleaning will only be done in protected areas. The areas will be surrounded by a temporary 15" high perimeter Liquid tight Earth Containment Berm with a liner covered by plastic sheeting.
- b. Equipment wash down (except for wheel washes) shall take place within an area surrounded by an Earth Containment Berm. Use of detergents is prohibited.
- c. Chemicals, paints, solvents, fertilizers and other toxic or hazardous materials shall be stored in waterproof containers. Except during application, the containers shall be kept in trucks or within storage facilities. Run-off containing such materials shall be collected, removed from the site and disposed of at an approved solid waste or chemical disposal facility.

6. Hazardous Material Storage

Chemicals, fertilizers and other toxic or hazardous materials should be stored in their original containers (if original container is not resealable, store the products in clearly labeled, waterproof containers). Except during application, the containers should be kept in trucks or in bermed areas within covered storage facilities. Storm water runoff containing such materials shall be collected, removed from the site and disposed of in accordance with the federal, state and local regulations. As may be required by federal, state or local regulations, the Operator should have a Hazardous Materials Management Plan and/or Hazardous Materials Spill and Prevention Program in place.

A foreman or supervisor should be designated in writing to oversee, enforce and instruct construction workers on proper hazardous materials storage and handling procedures. Should hazardous materials be stored on site this erosion and sediment control plan shall be annotated to indicate where the materials will be stored. These additional controls are necessary to minimize or prevent pollutants, such as chemicals, oil and grease, metals, floatables, and sanitary wastes from entering storm water runoff.

7. Spill Prevention and Response

Consistent with the general permit requirements, all potential pollutants other than sediment will be handled and disposed of in a manner that does not cause contamination of storm water. Non-sediment pollutants that may be present during construction activities include:

- Petroleum products including fuel, lubricants, hydraulic fluids, and form oils.
- Polymer used for soil stabilization

- Water treatment chemicals (coagulant, acid, sodium bicarbonate)
- Concrete
- Paints
- Fertilizers

These materials, and other materials used during construction with the potential to impact storm water, will be stored, managed, used, and disposed of in a manner that minimizes the potential for releases to the environment and especially into storm water.

Spill Response Procedures, Contact Numbers and Spill Response Forms are included in Appendix N

8. Concrete Saw Cutting

Concrete waste at construction sites comes in two forms: 1) excess fresh concrete mix including truck and equipment washing, and 2) concrete dust and concrete debris resulting from demolition. Both forms have the potential to impact water quality through storm water runoff contact with the waste.

Slurry Collection & Disposal

During saw cutting operations, the slurry and cuttings shall be continuously vacuumed to control the flow of water from the operations site.

The slurry and cuttings shall not be allowed to drain to the storm drain system, swale, stream or other water body.

The slurry and cuttings shall not be allowed to remain on the pavement to dry out.

Collected slurry and cuttings shall be discharged in an area protected by one or more sediment removal BMPs and shall be done in a manner that does not result in a violation of groundwater or surface water quality standards.

Never dump waste illicitly or without property owner's knowledge and consent.

Slurry may be disposed of in facilities designated for washdown of concrete trucks.

9. Concrete Truck Wash Out Requirements

Direct discharge of concrete truck wash out water to surface water in the state, including discharge to storm sewers, is prohibited by this general permit.

The discharge of wash out water shall not cause or contribute to groundwater contamination.

Wash out of concrete trucks during rainfall events shall be minimized

Concrete truck wash out water shall be discharged to areas at the construction site where structural controls have been established to prevent direct discharge to surface waters, or to areas that have a minimal slope that allow infiltration and filtering of wash out water to prevent direct discharge to surface waters.

Structural controls may consist of temporary berms, temporary shallow pits, temporary storage tanks with slow rate release, or other reasonable measures to prevent runoff from the construction site.

The direct discharge of concrete truck wash out water is prohibited at all times, and the operator shall insure that its BMPs are sufficient to prevent the discharge of concrete truck washout as the result of rain.

The SWP3 shall include concrete wash out areas on the associated maps in Appendix I.

10. Storm Water Runoff from Concrete Batch Plants

Discharges of storm water runoff from concrete batch plants at regulated construction sites may be authorized under the provisions of this general permit provided that the following requirements are met for concrete batch plant(s) authorized under the General Permit.

This permit does not authorize the discharge or land disposal of any wastewater from concrete batch plants at regulated construction sites. Authorization for these wastes must be obtained under an individual permit or an alternative general permit.

See Appendix M for Concrete Batch Plants Requirements

IV. STATE AND LOCAL PROGRAMS

To the best Knowledge of all parties involved with the implementation of this SWP3, all measures and considerations specified in this plan meet the requirements of the TCEQ TPDES General Permit TXR150000, the City of Alvarado and Johnson County.

- A. Permittees must ensure that the SWP3 is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or stormwater management site plans or site permits approved by federal, state, or local officials.
- B. SWP3s must be updated as necessary to remain consistent with any changes applicable to protecting surface water resources in sediment erosion site plans or site permits, or stormwater management site plans or site permits approved by state or local official for whom the permittee receives written notice.

V. INSPECTION AND MAINTENANCE

All disturbed areas, as well as all erosion and sediment controls devices, will be inspected every fourteen (14) calendar days and after a rain event greater than ½ inch or as an alternative the inspection schedule may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is implemented, then the inspection must occur on a specifically defined day, regardless of whether or not there has been a rainfall event. The schedule may be changed a maximum of one (1) time each month, the schedule must be implemented at the beginning of a calendar month, and the reason for the schedule must be documented in this SWPPP. Inspections shall be conducted, and a written report prepared by a qualified personnel familiar with the TPDES general permit, this SWPPP and the project.

Personnel provided by the Pete Durant & Associates, Inc. must inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, discharge locations, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Personnel conducting these inspections must be knowledgeable of the general permit, familiar with the construction site, and knowledgeable of the SWP3 for the site. Sediment and erosion control measures identified in the SWP3 must be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking. The SWP3 must be modified based on the results of inspections, as necessary, to better control pollutants in runoff. Revisions to the SWP3 must be completed within seven (7) calendar days following the inspection. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule must be described in the SWP3 and wherever possible those changes implemented before the next storm event.

In the event of flooding or other uncontrollable situations which prohibit access to the inspection sites, inspections must be conducted as soon as access is practicable. Utility line installation, pipeline construction, and other examples of long, narrow, linear construction activities may provide inspection personnel with limited access to the areas and inspection of these areas could require that vehicles compromise temporarily or even permanently stabilized areas, cause additional disturbance of soils, and increase the potential for erosion. In these circumstances, controls must be still be inspected at least once every 14 days and rain events, but representative inspections may be performed. For representative inspections, personnel must inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas. Pete Durant & Associates, Inc. will keep a current copy of the SWPPP on the project site, post the construction site notice, and insert inspection report forms (Appendix J) (and all other documents relating to storm water pollution prevention) in the Plan. Pete Durant & Associates, Inc. has contracted Brock Environmental Services, LLC to perform the mandatory inspections. Brock Environmental Services, LLC will provide qualified personnel to perform the Inspections.

Refer to Appendix J for Inspector Name, Qualifications and Reports.

A. Material Storage Inspections

Inspectors must evaluate areas used for storage of materials that are exposed to precipitation. The purpose is to ensure that materials are protected and/or impounded so that pollutants cannot discharge from storage areas. Offsite material storage areas used solely by the subject project (none anticipated) are considered to be part of the project by the TCEQ and must be included in the site inspection report.

B. Soil Stabilization Inspections

Seeded areas will be inspected to confirm that a healthy stand of grass is maintained. The site has achieved final stabilization once all areas are covered with pavement, or have a stand of grass with at least 70% uniform density. The density of 70% or greater must be maintained to be considered as stabilized. The contractor is responsible for watering, fertilizing and reseeding disturbed areas as needed to achieve this goal.

C. Erosion and Sediment Control Inspections

All controls will be inspected at least once every fourteen (14) calendar days. It is also recommended that "walk through inspections" be conducted prior to storm events. The following is a list of inspection/maintenance practices that will be used for specific controls:

Silt Fencing: Silt fence should be inspected regularly for buildup of excess sediment, undercutting, sags, and other failures. Sediment should be removed when it reaches approximately one-half the height of the fence. In addition, determine the source of excess sediment and implement appropriate BMPs to control the erosion. If the fabric becomes damaged or clogged, it should be repaired or replaced as necessary.

Inlet Protection: Inlet protections should be inspected regularly, when silt fence is used and the fabric becomes clogged, it should be cleaned or, if necessary, replaced. Also, sediment should be removed when it reaches approximately one-half the height of the inlet protection device.

Construction Entrance: Additional stone/rock will be placed at the construction entrance as needed to prevent tracking of mud onto public roads. All material spilled, dropped, wash, or tracked onto roadways from vehicles leaving the site will be removed immediately.

Vegetation: Protect newly seeded areas from excessive runoff and traffic until vegetation is established. Establish a watering and fertilizing schedule.

Erosion Control Blankets: Should be inspected regularly for bare spots caused by weather related events. Missing or loose blankets must be replaced or re-anchored. Also check for excess sediment deposited from runoff. Remove sediment and/or replace blanket if necessary.

Concrete Waste: Concrete waste at construction sites comes in two forms: 1) excess fresh concrete mix including truck and equipment washing, and 2) concrete dust and concrete debris resulting from demolition, saw cutting and batching. All these forms have the potential to impact water quality through storm water runoff contact with the waste.

Concrete Washout: All concrete truck washouts shall be discharged in an area protected by one or more sediment removal BMPs and shall be done in a manner that does not result in a violation of groundwater or surface water quality standards.

Good Housekeeping: Litter, demolition debris, and equipment chemicals exposed to storm water shall be prevented from becoming a pollutant source for storm water discharges by means of screening of outfalls and daily pickup of litter.

Discharge of Standing Water: Discharge of standing water will not occur unless the discharge will not cause an exceedance of Surface Water Quality Limits.

Rain Fall Log is located in Appendix J

Maintenance Requirements

All protective measures identified in the SWP3 must be maintained in effective operating condition. If, through inspections or other means, the permittee determines that BMPs are not operating effectively, then the permittee shall perform maintenance as necessary to maintain the continued effectiveness of stormwater controls, and prior to the next rain event if feasible. If maintenance prior to the next anticipated storm event is impracticable, the reason shall be documented in the SWP3 and maintenance must be scheduled and accomplished as soon as practicable. Erosion and sediment controls that have been intentionally disabled, run-over, removed, or otherwise rendered ineffective must be replaced or corrected immediately upon discovery.

If periodic inspections or other information indicates a control has been used incorrectly, is performing inadequately, or is damaged, then the operator shall replace or modify the control as soon as practicable after making the discovery.

Sediment must be removed from sediment traps and sedimentation ponds no later than the time that design capacity has been reduced by 50%. For perimeter controls such as silt fences, berms, etc., the trapped sediment must be removed before it reaches 50% of the above-ground height.

If sediment escapes the site, accumulations must be removed at a frequency that minimizes off-site impacts, and prior to the next rain event, if feasible. If the permittee does not own or operate the off-site conveyance, then the permittee shall work with the owner or operator of the property to remove the sediment.

VI. MODIFICATIONS / REVISIONS TO SWPPP

THE SWPPP MUST BE REVISED OR MODIFIED IF ANY OF THE FOLLOWING OCCUR:

A change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants and that has not been previously addressed in the SWP3

Changing site conditions based on updated plans and specifications, new operators, new areas of responsibility, and changes in BMPs; or

Results of inspections or investigations by site operators, operators of a municipal separate storm sewer system receiving the discharge, authorized TCEQ personnel, or federal, state or local agency approving sediment and erosion plans indicate the SWP3 is proving ineffective in eliminating or significantly minimizing pollutants in discharges authorized under the general permit.

Based on inspection results, any necessary modification to this SWPPP shall be implemented within seven (7) calendar days of the inspection. A modification is necessary if a control measure or operational procedure does not provide adequate pollutant control. All revisions shall be recorded on the Update Form (Appendix G) within seven calendar days of the inspection.

It is the responsibility of each operator or subcontractor to maintain effective pollutant discharge controls. Physical site conditions or contractor/subcontractor practices could make it necessary to install more controls than were originally planned. For example, localized concentrations of surface runoff or unusually steep areas could require additional silt barrier, or other structural controls.

Assessing the need for, and installing additional controls will be a continuing Primary Operator responsibility until final stabilization is achieved.

Johnson County and Pete Durant & Associates, Inc., who will be implementing this SWPPP, must remain alert to the need to periodically refine and update this SWPPP in order to accomplish the intended goals.

UPDATE FORMS LISTED BELOW ARE LOCATED IN APPENDICES F, G AND H

LIST OF POTENTIAL POLLUTANTS

SWPPP UPDATE FORM

CHANGES IN SITE CONDITIONS

RECORD STABILIZATION MEASURES

RECORD OF TEMPORARY OR PERMANENT CEASED CONSTRUCTION ACTIVITIES

VII. PROCEDURAL REQUIREMENTS

During construction, Johnson County and Pete Durant & Associates, Inc. as well as all subcontractors must comply with the following requirements of the TCEQ TPDES Storm Water General Permit:

This SWPPP must be certified by Johnson County and Pete Durant & Associates, Inc. for the Project prior to ground disturbance.

It is the Responsibility of Johnson County and Pete Durant & Associates, Inc. to submit a copy of the Construction Site Notice to the City of Springtown prior to the start of Construction.

Pete Durant & Associates, Inc. is required to keep a signed copy of this SWPPP and supporting documents on-site. In maintaining plans, all records and supporting documents should be compiled together in an orderly fashion. Federal and State regulations require permittee(s) to keep the SWPPP and all reports and documents for at least three years after the project is complete. This provision ensures that all records are available in the event the documents need to be reviewed.

All subcontractors involved in any earth disturbing activities, must sign the appropriate certification statement located in Appendix A. At a minimum, this includes the excavation and grading contractors.

Pete Durant & Associates, Inc. will conduct inspections of the project as described previously to assure compliance with this SWPPP. Based on inspection results, this SWPPP and BMPs may require modification by Johnson County to assure the quality of storm water or the identified non-storm water discharges are leaving the site in compliance with the TCEQ TPDES Storm Water General Permit. All modifications must be implemented within seven calendar days after the inspection.

Johnson County must approve modifications specific to construction projects prior to implementation by Pete Durant & Associates, Inc. and/or subcontractors as required under the TCEQ TPDES Storm Water General Permit. This SWPPP may be amended at any time if it is found to inadequately address conditions of the TCEQ TPDES Storm Water General Permit or any amendments to the permit.

This SWPPP along with supporting documentation must be retained for a period of three (3) years after the completion of the Project. It is recommended that each of the operator(s) maintain a copy of the SWPPP for the three-year period

The SWPPP is not submitted to the TCEQ unless the Executive Director specifically requests a copy for review. However, when the Executive Director requests the SWPPP, the permittee(s) should submit it in a timely manner. In addition, when requested, permittee(s) should also submit the SWPPP to state or local sediment and erosion or storm water management agencies or to the municipal operator of the TCEQ TPDES storm water permitted municipal separate storm sewer system to which the site discharges.

VIII. Preparers Certification

Name of Preparer:

BROCK ENVIRONMENTAL SERVICES, LLC.
5332 Rochelle Road
Rockwall, Texas 75032
214-771-3900 *office*
214-771-3913 *fax*

I, Jennie D. Brock, owner of Brock Environmental Services, do hereby certify that the foregoing Storm Water Pollution Prevention Plan was prepared by me, under the Terms and Conditions of the TPDES General Permit No. TXR 150000. This certification does not cover any maintenance or inspection reporting required under the permit.

The information and materials which were not generated by me have been furnished to me by my clients, their employees and / or engineers in the compilation of this Plan and the attached documents. Preparer has prepared the erosion/sediment control plan in accordance with guidelines set forth by local and state authorities.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designated to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are specific penalties for submitting false information, including the possibilities of fine and imprisonment for knowing violations."

Signature: 

Printed Name: Jennie D. Brock, President

Company Name: Brock Environmental Services, LLC.

Date: 10-2-13

Appendix A

Contractor Certification Sub Contractor Certifications

SWPPP Certification:

The Owner and the General Contractor(s) will need to sign this certification

"This is stating that both the Owner and General Contractor agree to abide by the Storm Water Pollution Prevention Plan and the Guidelines set forth by the TCEQ and General Permit No. TXR15000"

Sub Contractor Certifications:

Each subcontractor that will be disturbing soils as a part of their scope of work for this project will need to fill out and sign a subcontractor certification, *ex: erosion control installer, utilities, trenching or boring company, dirt contractor, concrete, electrical, landscaping etc.*

It is the Responsibility of the General Contractor to ensure that the Subcontractors complete and sign the Subcontractors certifications.

All signed certifications are to remain in the SWPPP throughout the duration of the project.

Signatory Requirements:

A duly authorized representative of each of the Operators (Primary or Secondary) must be identified and sign the following certification statement. (*Separate documents may be signed if desired*).

305.128(a) All reports requested by permits and other information requested by the executive director shall be signed by a person described in §305.44(a) of this title (relating to Signatories to Applications) or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) the authorization is made in writing by a person described in §305.44(a) of this title (relating to Signatories to Applications);

(2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity or for environmental matters for the applicant, such as the position of plant manager, operator of a well or well field, environmental manager, or a position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

(3) the written authorization is submitted to the executive director.

(b) If an authorization under this section is no longer accurate because of a change in individuals or position, a new authorization satisfying the requirements of this section must be submitted to the executive director prior to or together with any reports, information, or applications to be signed by an authorized representative.

(c) Any person signing a report required by a permit shall make the certification set forth in §305.44(b) of this title (relating to Signatories to Applications).

305.44(a) All applications shall be signed as follows.

(1) For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

(2) For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

(b) A person signing an application shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

OPERATOR CERTIFICATION STORMWATER POLLUTION PREVENTION PLAN

Project Name: Johnson County Precinct 3 Sub-Courthouse

Project Location: 206 North Baugh Street, Alvarado Texas 76009

As an Operator, you are required to comply with the Storm Water Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designated to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are specific penalties for submitting false information, including the possibilities of fine and imprisonment for knowing violations."

This certification is hereby signed in reference to the above named project:

SECONDARY OPERATOR: JOHNSON COUNTY

By: Roger Harman Title: County Judge

Date: 10/28/13

Printed Name: Roger Harman

PRIMARY OPERATOR: PETE DURANT & ASSOCIATES, INC.

By: Rodney Durant Title: Vice President

Date: 10-08-2013

Printed Name: Rodney Durant

***This certification is to be kept on file with the SWPPP for this project.
Do not send to the TCEQ.***

Brock Environmental Services, LLC.

**SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN**

Project Name: Johnson County Precinct 3 Sub-Courthouse

Project Location: 206 North Baugh Street, Alvarado Texas 76009

Operator(s): Johnson County / Pete Durant & Associates, Inc.

As a subcontractor, you are required to comply with the Storm Water Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review either at the office trailer or from the Project Superintendent.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the BMPs and practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

Signature: _____

Title: _____

Date: _____

Appendix B

Delegation Letter

Owner's responsibility;

The Owner will need to delegate the Contractor who will have day to day operational control of the construction project to ensure compliance with the SWPPP that has been developed for this site by signing the Delegation letter.

Once the owner has signed the Delegation letter, make a copy of the Delegation letter on your Company Letterhead and mail to the Executive Director of the TCEQ in the envelope that has been provided. Then put a copy back in the SWPPP behind Appendix B.

Contractor's responsibility;

The Contractor will need to delegate the person or specifically described position as an authorized person for signing Inspection reports, storm water pollution prevention plans, certifications or other information as required. This person or position is authorized to sign reports, plans or certifications other than an NOI application.

Once the Contractor has signed the Delegation letter, make a copy of the Delegation letter on your Company Letterhead and mail to the Executive Director of the TCEQ in the envelope that has been provided. Then put a copy back in the SWPPP behind Appendix B.

September 25, 2013

"Executive Director"
Texas Commission on Environmental Quality
Storm Water and Pretreatment Team
P.O. Box 13087, MC-148
Austin, Texas 78711-3087

Dear Executive Director,

This letter serves to designate a Company who will have day-to-day operational controls of those activities at a construction site which are necessary to ensure compliance with the storm water pollution prevention plan that has been developed for this site.

Name: Pete Durant & Associates, Inc.

Title: Primary Operator / Daily Operational Controls

Project Name: Johnson County Precinct 3 Sub-Courthouse

Project Location: 206 North Baugh Street, Alvarado Texas 76009

By signing this authorization, I confirm that I meet the following requirements to make such a designation as set forth in the Texas Administrative Code Title 30 Part 1 Chapter 305 Subchapter C Rule 305.44 and Title 30 Part 1 Chapter 305 Subchapter F Rule 305.128.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designated to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are specific penalties for submitting false information, including the possibilities of fine and imprisonment for knowing violations."

Signature: 

Date: 10/28/13

Printed Name: Roger Harmon

Title: County Judge

Secondary Operator: Johnson County

September 25, 2013

"Executive Director"
Texas Commission on Environmental Quality
Storm Water and Pretreatment Team
P.O. Box 13087, MC-148
Austin, Texas 78711-3087

Dear Executive Director,

This letter serves to designate either a person or specifically described position as an authorized person for signing reports, storm water pollution prevention plans, certifications or other information as required. The following person or position is hereby authorized to sign reports, plans or certifications other than an NOI application.

A qualified Storm Water Inspector Employed by: Brock Environmental Services, LLC

Project Name: Johnson County Precinct 3 Sub-Courthouse

Project Location: 206 North Baugh Street, Alvarado Texas 76009

By signing this authorization, I confirm that I meet the following requirements to make such a designation as set forth in the Texas Administrative Code Title 30 Part 1 Chapter 305 Subchapter C Rule 305.44 and Title 30 Part 1 Chapter 305 Subchapter F Rule 305.128.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designated to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are specific penalties for submitting false information, including the possibilities of fine and imprisonment for knowing violations".

Signature: *Pete Durant*

Date: 10-08-2013

Printed Name: *Pete Durant*

Title: *Vice President*

Primary Operator: Pete Durant & Associates, Inc.

Appendix C

TPDES Construction Site Notices

Large Site Notice (Primary Operator) / Secondary Operator Site Notice

Small Construction Site Notice / Small Construction Site for Low Erosion Potential

Primary Operator(s) responsibility;

Large Construction Site Notice - Primary Operator Notice

This notice is for construction sites that are greater than 5 acres including the larger common plan of development. This notice is posted at the site along with a copy of the NOI (as applicable) by the Contractor in a readily accessible place viewable by the public. Please review the information and make sure it is correct then mail a copy to the MS4 operator in the envelope that has been provided.

Secondary Operator;

Secondary Operator Site Notice

This notice is for Secondary Operators of construction sites equal to or greater than 5 acres. This notice must be signed by the Secondary Operator and posted at the site in a readily accessible place viewable by the public. A copy of the signed Secondary Operator Notice must be sent to the MS4 operator in the envelope that has been provided.

Owner and Contractor's responsibility;

Small Construction Site Notice

This notice is used for Construction projects that disturb less than 5 acres.

Both the Owner and Contractor must sign the notices and mail a copy to the MS4 Operator in the envelope that has been provided. These notices must be posted at the site in a readily accessible place viewable by the public.

Upon completion of all construction activities and once the site has been stabilized with vegetation, a construction site notice with the dates of completion will need to be submitted to the MS4 Operator as well.



SMALL CONSTRUCTION SITE NOTICE

FOR THE
Texas Commission on Environmental Quality (TCEQ)
Stormwater Program
TPDES GENERAL PERMIT TXR150000

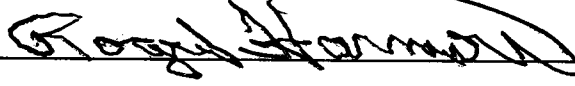
The following information is posted in compliance with Part II.E.2. of the TCEQ General Permit Number TXR150000 for discharges of stormwater runoff from small construction sites. Additional information regarding the TCEQ stormwater permit program may be found on the internet at:

http://www.tceq.state.tx.us/nav/permits/wq_construction.html

Operator Name:	Johnson County
Contact Name and Phone Number:	Judge Harmon 817-556-6360
Project Description: <i>Physical address or description of the site's location, estimated start date and projected end date, or date that disturbed soils will be stabilized</i>	Johnson County Precinct 3 Sub-Courthouse 206 North Baugh Street Alvarado, Texas 76009 Start Date: October 1, 2013 End Date: August 30, 2014
Location of Stormwater Pollution Prevention Plan:	On Site With Project Manager

For Small Construction Activities Authorized Under Part II.E.2. (Obtaining Authorization to Discharge) the following certification must be completed:

I Roger Harmon (Typed or Printed Name Person Completing This Certification) certify under penalty of law that I have read and understand the eligibility requirements for claiming an authorization under Part II.E.2. of TPDES General Permit TXR150000 and agree to comply with the terms of this permit. A stormwater pollution prevention plan has been developed and will be implemented prior to construction, according to permit requirements. A copy of this signed notice is supplied to the operator of the MS4 if discharges enter an MS4. I am aware there are significant penalties for providing false information or for conducting unauthorized discharges, including the possibility of fine and imprisonment for knowing violations.

Signature and Title  Date 10/28/13

_____ Date Notice Removed

_____ MS4 operator notified per Part II.F.3.



SMALL CONSTRUCTION SITE NOTICE

FOR THE
Texas Commission on Environmental Quality (TCEQ)
Stormwater Program
TPDES GENERAL PERMIT TXR150000

The following information is posted in compliance with **Part II.E.2.** of the TCEQ General Permit Number TXR150000 for discharges of stormwater runoff from small construction sites. Additional information regarding the TCEQ stormwater permit program may be found on the internet at:

http://www.tceq.state.tx.us/nav/permits/wq_construction.html

Operator Name:	Pete Durant & Associates, Inc.
Contact Name and Phone Number:	Rodney Durant Cell # 817-614-2631 Office # 817-439-3213
Project Description: <i>Physical address or description of the site's location, estimated start date and projected end date, or date that disturbed soils will be stabilized</i>	Johnson County Precinct 3 Sub-Courthouse 206 North Baugh Street Alvarado, Texas 76009 Start Date: October 1, 2013 End Date: August 30, 2014
Location of Stormwater Pollution Prevention Plan:	On Site With Project Manager

For Small Construction Activities Authorized Under Part II.E.2. (Obtaining Authorization to Discharge) the following certification must be completed:

I Rodney Durant (Typed or Printed Name Person Completing This Certification) certify under penalty of law that I have read and understand the eligibility requirements for claiming an authorization under Part II.E.2. of TPDES General Permit TXR150000 and agree to comply with the terms of this permit. A stormwater pollution prevention plan has been developed and will be implemented prior to construction, according to permit requirements. A copy of this signed notice is supplied to the operator of the MS4 if discharges enter an MS4. I am aware there are significant penalties for providing false information or for conducting unauthorized discharges, including the possibility of fine and imprisonment for knowing violations.

Signature and Title Rodney Durant Vice President Date 10-8-2013

_____ Date Notice Removed

_____ MS4 operator notified per Part II.F.3.

Appendix D

NOI - Notice of Intent

NOT - Notice of Termination

NOC - Notice of Change

These Forms are only used for projects that have 5 acres or more of disturbed area of construction - or - are part of a common plan of development;

Notice of Intent Form - This form is for projects that disturb more than 5 acres or are part of a common plan of development. This form is to be signed by a ***Company Officer*** and mailed to the TCEQ and a copy mailed to the MS4 Operator that receives storm water discharge from the construction site. There is also a fee that must be paid to the TCEQ with the submission of an NOI.

Notice of Termination - This form is to be filled out and sent to the TCEQ and a copy mailed to the MS4 Operator that receives storm water discharge from the construction site once the site has reached final stabilization.

Notice of Change Form - This form is to be used if it is found out to be that relevant information provided in the original NOI changes. An NOC must be submitted at least 14 days before the change occurs, if possible. Where 14 day advance notice is not possible the operator must submit an NOC within 14 days of the discovery.

Appendix E

Endangered Species Impaired Receiving Water Bodies Listing

Endangered Species

This Appendix contains information on any Endangered Species and Impaired Receiving Water Bodies that may be adversely impacted by the construction project. Both the Owner (Secondary Operator) and Contractor (Primary Operator) must sign the certification statement prepared for this project.

Impaired Receiving Water Bodies

Impaired Receiving Waters and Total Maximum Daily Load (TMDL) Requirements to address discharges to impaired water bodies listed in accordance with Section 303(d) of the federal Clean Water Act (CWA)

Endangered Species Certification

Impact on Endangered Species The list of possible threatened and endangered species is attached. A review of the site found no evidence that this project will have an adverse impact on any listed threatened or endangered plant or animal species.

Project Name: Johnson County Precinct 3 Sub-Courthouse

Project Location: 206 North Baugh Street, Alvarado Texas 76009

Signature: _____

Ronnie D. Brock

Printed Name: Ronnie D. Brock, Vice President

Company Name: Brock Environmental Services, LLC.

Date: _____

10-2-13

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designated to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are specific penalties for submitting false information, including the possibilities of fine and imprisonment for knowing violations."

Operator Certification

Owner: JOHNSON COUNTY

By: _____

Roger Harman Title: County Judge

Date: 10/28/13

Printed Name: _____

Roger Harman

Contractor: PETE DURANT & ASSOCIATES, INC.

By: _____

Rodney Durant

Title: Vice President

Date: 10-08-2013

Printed Name: _____

Rodney Durant

JOHNSON COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	DL	T
year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.			
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	DL	
migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	T
found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds			
Black-capped Vireo	<i>Vireo atricapilla</i>	LE	E
oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer			
Golden-cheeked Warbler	<i>Setophaga chrysoparia</i>	LE	E
juniper-oak woodlands; dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer			
Henslow's Sparrow	<i>Ammodramus henslowii</i>		
wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking			
Interior Least Tern	<i>Sterna antillarum athalassos</i>	LE	E
subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony			
Peregrine Falcon	<i>Falco peregrinus</i>	DL	T

JOHNSON COUNTY**BIRDS**

Federal Status State Status

both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (*F. p. anatum*) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, *F.p. tundrius* is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.

Sprague's Pipit *Anthus spragueii* C

only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.

Western Burrowing Owl *Athene cunicularia hypugaea*

open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

White-faced Ibis *Plegadis chihi* T

prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats

Whooping Crane *Grus americana* LE E

potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties

FISHES

Federal Status State Status

Sharpnose shiner *Notropis oxyrhynchus* C

endemic to Brazos River drainage; also, apparently introduced into adjacent Colorado River drainage; large turbid river, with bottom a combination of sand, gravel, and clay-mud

Smalleye shiner *Notropis buccula* C

endemic to upper Brazos River system and its tributaries (Clear Fork and Bosque); apparently introduced into adjacent Colorado River drainage; medium to large prairie streams with sandy substrate and turbid to clear warm water; presumably eats small aquatic invertebrates

MAMMALS

Federal Status State Status

Gray wolf *Canis lupus* LE E

extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands

Plains spotted skunk *Spilogale putorius interrupta*

catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

Red wolf *Canis rufus* LE E

JOHNSON COUNTY

MAMMALS

Federal Status State Status

extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies

MOLLUSKS

Federal Status State Status

Texas fawnsfoot

Truncilla macrodon

C

T

little known; possibly rivers and larger streams, and intolerant of impoundment; flowing rice irrigation canals, possibly sand, gravel, and perhaps sandy-mud bottoms in moderate flows; Brazos and Colorado River basins

REPTILES

Federal Status State Status

Brazos water snake

Nerodia harteri

T

upper Brazos River drainage; in shallow water with rocky bottom and on rocky portions of banks

Texas garter snake

Thamnophis sirtalis annectens

wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August

Texas horned lizard

Phrynosoma cornutum

T

open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September

**Timber/Canebrake
rattlesnake**

Crotalus horridus

T

swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto



Watershed Assessment, Tracking & Environmental Results

You are here: [EPA Home](#) | [Water](#) | [WATERS](#) | [Water Quality Assessment and IMDL Information](#) | [Waterbody Search](#)

Waterbodies matching search criteria: Area equals "TX" and waterbody name contains "Chambers Creek"

Description of this table

NOTE: Click on the underlined "Waterbody Name" to view the waterbody report.									
<u>Waterbody Name</u>	<u>Waterbody ID</u>	<u>Most Current Data Available</u>	<u>Location</u>	<u>Map</u>	<u>Waterbody Type</u>	<u>Size</u>	<u>Unit</u>	<u>Status</u>	<u>State IMDL Development Status</u>
Chambers Creek Above Richland-Chambers Reservoir	TX-0814_01	2010	From The Lower End Of The Segment Up To Just Above The Confluence With Cummins Creek.	Waterbody Map	Stream	9.0	Miles	Good	
Chambers Creek Above Richland-Chambers Reservoir	TX-0814_02	2010	From Just Above The Confluence With Cummins Creek Up To Just Above The Confluence With Waxahachie Creek.	Waterbody Map	Stream	9.0	Miles	Good	
Chambers Creek Above Richland-Chambers Reservoir	TX-0814_03	2010	From Just Above The Confluence With Waxahachie Creek Up To Just Above The Confluence With Mill Branch.	Waterbody Map	Stream	22.9	Miles	Good	
Chambers Creek Above Richland-Chambers Reservoir	TX-0814_04	2010	From Just Above The Confluence With Mill Branch To The Upper	Waterbody Map	Stream	10.7	Miles	Good	

		End Of The Segment.		http://ofmpub.epa.gov/waters10/attains_index.control
South Fork Chambers Creek (Unclassified Water Body)	TX-0814B_01	2010	Entire Water Body. Data Unavailable	Stream 29.2 Miles Not Assessed

Appendix F

List of Potential Pollutants

This Appendix contains your List of Potential Pollutants Form

List of Potential Pollutants

This form is to be used to show all construction materials that will be used and activities that will be performed that have potential to contribute pollutants, including sediments, to storm water run off.

This list must be filled out and kept updated as part of your SWPPP

Appendix G

SWPPP Update Form Record of Major Grading Activities Changes in Site Conditions

SWPPP Update Form;

This form is to be used when there is a change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants that has not been previously addressed in the SWPPP. (Examples would be if there were additions of extra Erosion Control Devices or the deletion of unnecessary Erosion Control Devices.) Also note that the form asks you if the Erosion Map was updated, it is necessary to update your Erosion Map when there are changes in design or maintenance to the controls used on site.

Record of Major Grading;

This Form is to be used to log the dates when any grading activities take place on the project. You log the date and location of the activity as well as describe the grading activity on site. (Example; Started grading parking area 1, Started grading for west bound roadway section, clearing brush to begin grading for new ground storage tank.)

Changes in Site Conditions;

This Form is to be used when there is an update to the plans and specifications, the addition of new operators, new areas of responsibility, and changes in BMPs.

S.W.P.P UPDATE FORM

DATE: _____

WAS EROSION MAP UPDATED: Y/N

REASON FOR UPDATE: _____

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designated to assure that qualified personal property gathered and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are specific penalties for submitting false information, including the possibilities of fine and imprisonment for knowing violations."

NAME: _____

TITLE: _____

DATE: _____

WAS EROSION MAP UPDATED: Y/N

REASON FOR UPDATE: _____

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designated to assure that qualified personal property gathered and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are specific penalties for submitting false information, including the possibilities of fine and imprisonment for knowing violations."

NAME: _____

TITLE: _____

DATE: _____

WAS EROSION MAP UPDATED: Y/N

REASON FOR UPDATE: _____

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designated to assure that qualified personal property gathered and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are specific penalties for submitting false information, including the possibilities of fine and imprisonment for knowing violations."

NAME: _____

TITLE: _____

DATE: _____

WAS EROSION MAP UPDATED: Y/N

REASON FOR UPDATE: _____

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designated to assure that qualified personal property gathered and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are specific penalties for submitting false information, including the possibilities of fine and imprisonment for knowing violations."

NAME: _____

TITLE: _____

CHANGES IN EXISTING SITE CONDITIONS:

Date(s) When Changes Occur (mm-dd-yy)	Describe Changes in Existing Site Conditions

Appendix H

Record Temporary or Permanent Ceased Construction Activities Record of Stabilization Measures

Record of Temporary or Permanent Ceased Construction Activities;

This form is to be used to log the dates when Construction Activity either temporarily or permanently ceases at the site. You log the Project Activity area, the date Activities ceased, whether it is temporary or permanent and the date that Activities resume at the site.

Record of Stabilization Measures;

This form is used to log the dates that each area of your project is stabilized. You log the date, describe the Stabilization measures used and log the area of the project that has been stabilized.

Appendix I

Project Description

Surface Water Map

Vicinity Map

Erosion and Sediment Control Plan with Drainage Characteristics, Details and Specifications

This Appendix contains the following;

Project description - This is a narrative that basically describes what type of construction activity is involved with the construction project.

Surface Water Map - Aerial Map showing nearby surface water

Vicinity Map - This is an area map showing the location of the project.

Erosion and Sediment Control Plan with Drainage Characteristics, Details and specifications - The ECP shows the location of structural controls used to prevent sediment run-off from the project as well as the flow of storm water, details and specifications for the types of controls selected.

Project Description

This Storm Water Pollution Prevention Plan (SWP3) has been prepared for the proposed construction for; Johnson County Precinct 3 Sub-Courthouse located at 206 N. Baugh Street, in the City of Alvarado, Johnson County Texas.

This project consists of the construction of a single story Sub-Courthouse structure approximately 12,600 square feet along with all associated appurtenances.

Construction activities included in this project are: demolition of existing structures, grading and clearing, excavation and embankment, utility construction, paving operations, building construction and lastly landscaping and final stabilization

Pete Durant & Associates, Inc. is responsible for: Updating the SWP3 Plan and Erosion Map as the project proceeds to show; contractors staging areas including all equipment and material storage areas, any offsite materials, waste, borrow or equipment storage areas and all areas of final stabilization once each section has been completed.

Erosion Control Phasing

Phase 1

- A. Install erosion controls (as shown on erosion control map) and mobilize staging area.
- B. Demolition
- C. Grading and clearing
- D. Excavation and embankment
- E. Stockpiling and removal

Phase II

- A. Keep all erosion control measures in place
- B. Utility construction
- C. Grading, forming and paving operations
- D. Building construction and all related appurtenances

Phase III

- A. Keep all erosion control measures in place
- B. Final grading
- C. Landscaping / Site stabilization
- D. Remove all Equipment and Materials
- E. Once project has reached 100% stabilization, remove all erosion control devices.



RECEIVING WATER IS
NORTH FORK CHAMBERS CREEK

Project Name:
Johnson County Precinct 3
Sub-Courthouse
Project Location:
Alvarado, Texas

**BROCK ENVIRONMENTAL
SERVICES, LLC.**
5332 Rochelle Road
ROCKWALL, TEXAS 75032
214-771-3900

Surface Waters	
Project #	Date
	9/27/2013
Page #	1

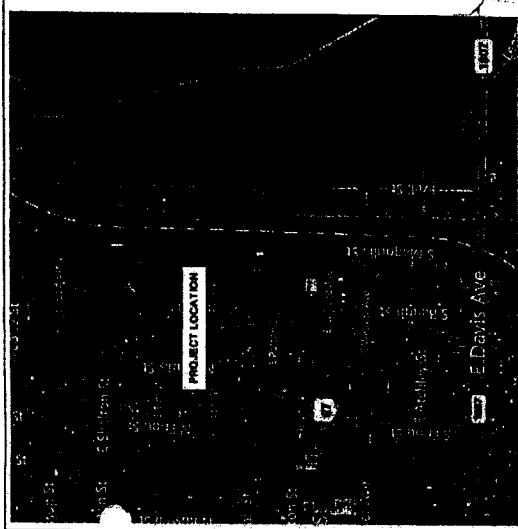
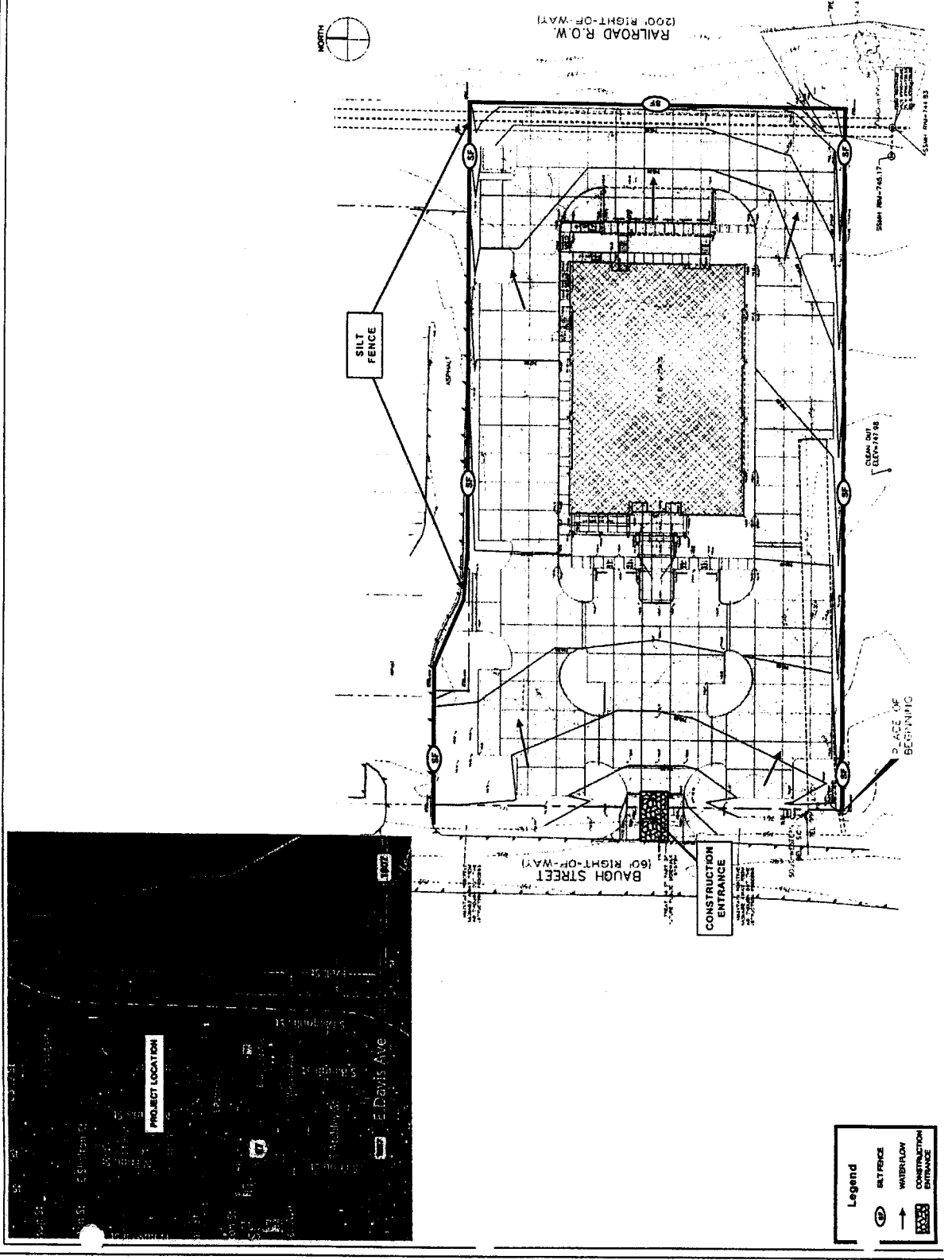
PROJECT LOCATION:
Alvarado, Texas

PRECINCT 3 SUB-COURTHOUSE

**BROCK ENVIRONMENTAL
SERVICES, LLC**
5332 ROCHELLE ROAD
ROCKWALL, TEXAS 75082
214-771-3900

Erosion Control Plan

Project #	Date
	9-27-2013
Page #	1



Legend

	SILT FENCE
	WATERFLOW
	CONSTRUCTION ENTRANCE

PROJECT LOCATION:
Alvarado, Texas

PRECINCT 3 SUB-COURTHOUSE

**BROCK ENVIRONMENTAL
SERVICES, LLC**
5332 ROCHELLE ROAD
ROCKWALL, TEXAS 75087
214-771-3900

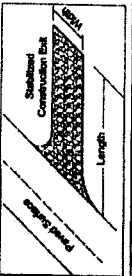
Erosion Control Plan Details

Project # _____ Date _____

9-27-2013

Page # 2

3.11 Stabilized Construction Exit



Description: A stabilized construction exit is a part of a paved surface that is designed to prevent erosion and sediment transport. It is typically constructed using a combination of gravel, sand, and other materials to create a porous surface that allows water to infiltrate the ground. The exit is designed to be self-cleaning and to provide a smooth transition between the paved surface and the natural ground.

Installation: The exit should be installed in a location that is easily accessible to construction equipment and materials. The exit should be constructed in a way that allows for easy maintenance and repair. The exit should be designed to handle the expected traffic and loads.

Materials: The materials used for the exit should be of high quality and should be suitable for the local climate and soil conditions. The materials should be able to withstand the wear and tear of construction equipment and materials.

Construction: The exit should be constructed in a way that allows for easy installation and removal. The exit should be designed to be self-cleaning and to provide a smooth transition between the paved surface and the natural ground.

Maintaining: The exit should be maintained in a way that ensures its effectiveness. This includes regular cleaning and inspection. The exit should be replaced if it becomes damaged or ineffective.

Benefits: The exit provides a number of benefits, including:


- Prevention of erosion and sediment transport
- Reduction of water runoff
- Improvement of water infiltration
- Reduction of noise and dust
- Improvement of site safety

References:

- Soil Conservation Service
- National Engineering Council
- Other Construction Methods

CC-118
Revised 04/10

3.10 Silt Fence



Description: A silt fence is a type of erosion control structure that is used to prevent sediment from being carried away by water runoff. It is typically constructed using a fabric or mesh material that is placed in a trench. The fabric or mesh material acts as a filter, trapping sediment and allowing water to pass through. Silt fences are commonly used on construction sites to prevent sediment from being carried away by runoff.

Installation: Silt fences should be installed in a way that allows them to effectively trap sediment. This includes ensuring that the fabric or mesh material is properly secured in the trench and that there are no gaps or tears in the material. Silt fences should be installed in a way that allows them to be easily removed and replaced if they become damaged or ineffective.

Maintaining: Silt fences should be maintained in a way that ensures their effectiveness. This includes regular cleaning and inspection. Silt fences should be replaced if they become damaged or ineffective.

Benefits: Silt fences provide a number of benefits, including:

- Prevention of sediment transport
- Reduction of water runoff
- Improvement of water infiltration
- Reduction of noise and dust
- Improvement of site safety

References:

- Soil Conservation Service
- National Engineering Council
- Other Construction Methods

CC-119
Revised 04/10

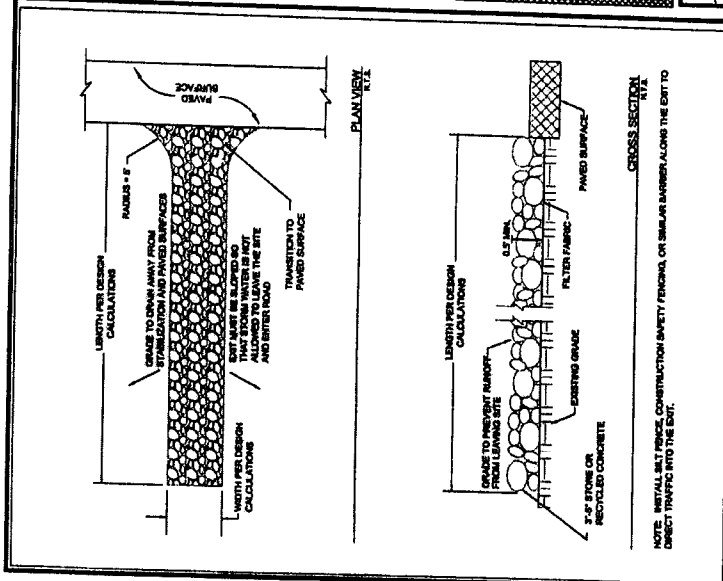
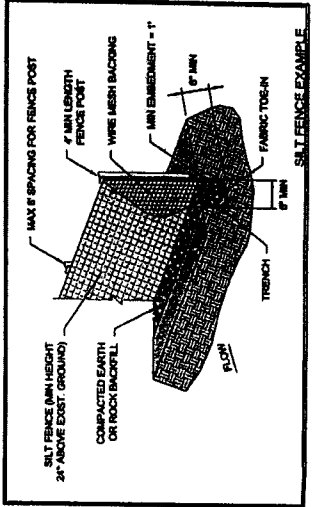


Figure 1.29 Schematics of Stabilized Construction Exit

Stabilized Construction Exit
Revised 04/10

CC-121



Appendix J

Inspector Qualifications and Inspection Reports Rain Event Log

This Appendix contains information about the qualifications of the persons delegated to perform the mandatory Inspections for this project and copies of the site specific Inspection Report forms to be used for this project.

If you are performing your own Inspections, you will need to fill out the Inspector Qualifications form.

Storm Water Pollution Prevention Plan Inspector Qualifications

Storm Water Pollution Prevention Plan Inspector Qualifications	
Inspectors Name	Ronnie Brock Inspector: Brock Environmental Services, LLC. office - 214-771-3900 cell - 214-394-6757
Title	Project Inspector
Training Received	Region 6 NPDES Construction General Permit Compliance, Best Management Practices and Inspection Training February 2000- 2002 By: International Erosion Control Association Storm Water Permitting March, 2004 By: Texas Commission on Environmental Quality, San Antonio TX City of Dallas Storm Water Management Training Sessions - 2004
Training Covered	How to Select, Install and Inspect Construction Site BMP's for NPDES Storm Water Permit Compliance How to Write and Implement a Storm Water Pollution Prevention Plan Practical Approaches for Effective Erosion & Sediment Control Simple Tools for NPDES Compliance on Construction Sites City of Dallas, Storm Water Training and Partnering Sessions
Construction Experience	19 Years in Construction Industry Positions Held: Project Manager / Safety and Environmental Manager / Safety and Competent Persons Certified Instructor
Storm Water Construction Inspection Experience	Storm Water Construction Inspections since February, 2002

International Erosion Control Association
P.O. Box 774904, Steamboat Springs, CO 80477-4904

Certificate of Completion

May it be known by all who read this that

Ronnie Brock

has successfully completed the

Simple Tools for NPDES Compliance on Construction Sites

and has been awarded 0.6 Continuing Education Units.

Presented this 22nd day of February, 20 00



President

International Erosion Control Association
P.O. Box 774904, Steamboat Springs, CO 80477-4904

Certificate of Completion

May it be known by all who read this that

Ronnie Brock

has successfully completed the

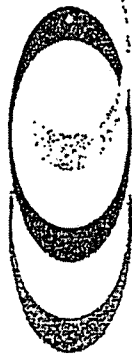
Practical Approaches for Effective Erosion & Sediment Control

and has been awarded 0.6 Continuing Education Units.

Presented this 21st *day of* February, 20 00.



President



International Erosion Control Association

P.O. Box 774904, Steamboat Springs, Colorado 80477-4904 ~ 970-879-3010 ~ www.ieca.org

CERTIFICATE OF COMPLETION

May it be known by all who read this that:

Ronnie Brock

has successfully completed

*How to Select, Install and Inspect Construction Site
BMPs for NPDES Stormwater Permit Compliance*

and has earned 0.6 Continuing Education Units.

Presented this 25th day of February, 2002.

Dr. N. J. ...

Executive Director

John R. ...

President



International Erosion Control Association

P.O. Box 774904, Steamboat Springs, Colorado 80477-4904 - 970 879 3010 www.ierc.org

CERTIFICATE OF COMPLETION

May it be known by all who read this that:

Ronnie Brock

has successfully completed

How to Write and Implement a Stormwater Pollution Prevention Plan

and has earned 0.6 Continuing Education Units.

Presented this 26th day of February, 2002.

D. Nittel
Executive Director

James R. F.
President

Storm Water Pollution Prevention Plan Inspector Qualifications

Storm Water Pollution Prevention Plan Inspector Qualifications	
Inspectors Name	Ray Bailey Inspector: Brock Environmental Services, LLC. office - 214-771-3900
Title	Project Inspector
Training Received	TPDES Construction General Permit Compliance, Best Management Practices and Inspection Training October 24, 2004 By: Brock Environmental Services, LLC
Training Covered	History of the TPDES Permitting Process TPDES Compliance and Regulations, Including Operator Responsibilities Erosion and Sedimentation Processes Selecting and installing proper controls Good Housekeeping and non-structural BMP's, including proper storage techniques Inspection Process, reports, record-keeping, compliance and maintenance of controls
Storm Water Construction Inspection Experience	Storm Water Project Inspections since October 24, 2004



BROCK ENVIRONMENTAL SERVICES, LLC.

Storm Water Pollution Prevention Certificate

Ray Bailey

Has successfully completed Storm Water Pollution
Prevention Training for Construction Activities:

*Items covered: TPDES Construction General Permit Compliance / Best Management Practices and
Inspection Training Permitting Process, Compliance and Regulations, Including Operator Responsibilities
Erosion and Sedimentation Processes / Good Housekeeping and non-structural BMP's, Inspection Process-
Reports- Record-keeping / Compliance and maintenance of controls*

Ronnie Brock

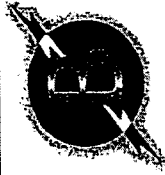
Ronnie Brock / Vice-President

Brock Environmental Services, LLC.

October 24, 2004

Storm Water Pollution Prevention Plan Inspector Qualifications

Storm Water Pollution Prevention Plan Inspector Qualifications	
Inspectors Name	Ryan Thompson Inspector: Brock Environmental Services, LLC. office: 214-771-3900 cell: 214-854-7863
Title	Project Inspector
Training Received	TPDES Construction General Permit Compliance, Best Management Practices and Inspection Training January 26, 2009 By: Brock Environmental Services, LLC.
Training Covered	History of the TPDES Permitting Process TPDES Compliance and Regulations, Including Operator Responsibilities Erosion and Sedimentation Processes Selecting and installing proper controls Good Housekeeping and non-structural BMP's, including proper storage techniques Inspection Process, reports, record-keeping, compliance and maintenance of controls
Storm Water Construction Inspection Experience	Storm Water Project Inspections since January 26, 2009



BROCK ENVIRONMENTAL SERVICES, LLC.

Storm Water Pollution Prevention Certificate

Ryan Thompson

Has successfully completed Storm Water Pollution
Prevention Training for Construction Activities:

*Items covered: TPDES Construction General Permit Compliance / Best Management Practices
and Inspection Training Permitting Process, Compliance and Regulations, Including Operator
Responsibilities Erosion and Sedimentation Processes / Good Housekeeping and non-structural
BMP's, Inspection Process- Reports- Record-keeping / Compliance and maintenance of controls*

Ronnie Brock | Vice-President

Brock Environmental Services, LLC.

January 26, 2009



**Brock
Environmental
Services, LLC.**

SWP3 Compliance Inspection Report

General Information

Project Name Johnson County Precinct 3 Sub-Courthouse
TPDES Permit No. _____ **Location** 206 North Baugh Street
Date of Inspection _____ **Alvarado, Texas 76009**
Inspector's Name(s) Ryan Thompson **Contractor** Pete Durant & Associates, Inc.
Inspector's Title(s) Inspector
Inspector's Contact Information Cell # 214-854-7863 Office # 214-771-3900
Time of Inspection _____
Type of Inspection: 14 Day

Weather Information

Has there been a storm event since the last inspection? Yes No

If yes, provide:

Approximate Amount of Precipitation (in):

Weather at time of this inspection?

Clear Cloudy Rain Sleet Fog Snowing High Winds
 Other: _____

BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1	Silt Fence	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
2	Inlet Protection	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
3	Construction Entrance	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
4	Rock Berm	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
5	Erosion Control Log	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
6	Erosion Control Blanket	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
7	Hay Bale	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
8	Solid Waste Disposal	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
9	Sanitary/Septic	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
10	Equipment Fueling/Storage	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
11	Designated Concrete Washout Area	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No

BMP/Activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1 Are all TPDES Construction Site Notices posted at the site for each permittee?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2 Are all slopes and disturbed areas not actively being worked properly stabilized?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3 Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4 Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5 Are there any signs of discharge leaving the site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6 Are storm drain inlets properly protected?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7 Is the construction exit preventing sediment from being tracked into the street?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8 Is trash/litter from work areas collected and placed in covered dumpsters?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9 Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10 Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
11 Are materials that are potential stormwater contaminants stored inside or under cover?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
12 Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
13 Was a copy of the Inspection Report left at project site w/ Superintendent or in the back of the SWPPP sign?	<input type="checkbox"/> Yes <input type="checkbox"/> No		

Non-Compliance

Describe any incidents of non-compliance listed above:

NOTE: All items of non compliance shall be repaired/installed within (7) days of inspection. Repairs/Installation shall be completed immediately, if storm conditions are imminent.

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed name and title: Ryan Thompson

Signature: _____

Date:

Appendix K

Best Management Practices Effluent Limitations and Guidelines

Best Management Practices

This Appendix contains a copy of the 2010 ISWM Technical Manual. In this Appendix you will find information on how to properly install and maintain the various controls selected for this project.

Effluent Limitations and Guidelines

Effluent Limitations guidelines for regulated construction sites based on the federal Effluent Limitation Guidelines (ELGs) at 40 CFR 450.21, 450.23, and 450.24, which consists of a series of Best Management Practices.

Construction Controls:

- 1.0 Overview of Construction Controls
- 2.0 Erosion Controls
- 3.0 Sediment Controls
- 4.0 Material Waste Controls

Table of Contents

1.0 Overview of Construction Controls	CC-1
1.1 Introduction	CC-1
1.2 Control Selection Guide	CC-1
1.2.1 Erosion Controls	CC-2
1.2.2 Sediment Controls	CC-2
1.2.3 Material and Waste Controls	CC-4
1.3 Site Rating Calculation	CC-5
1.3.1 Introduction	CC-5
1.3.2 Background	CC-5
1.3.3 Methodology	CC-5
1.3.4 Summary	CC-10
2.0 Erosion Controls	CC-12
2.1 Check Dam	CC-12
2.1.1 Primary Use	CC-13
2.1.2 Applications	CC-13
2.1.3 Design Criteria	CC-13
2.1.4 Design Guidance and Specifications	CC-15
2.1.5 Inspection and Maintenance Requirements	CC-15
2.1.6 Example Schematics	CC-15
2.2 Diversion Dike	CC-20
2.2.1 Primary Use	CC-21
2.2.2 Applications	CC-21
2.2.3 Design Criteria	CC-21
2.2.4 Design Guidance and Specifications	CC-22
2.2.5 Inspection and Maintenance Requirements	CC-22
2.2.6 Example Schematics	CC-22
2.3 Erosion Control Blankets	CC-26
2.3.1 Primary Use	CC-26
2.3.2 Applications	CC-26
2.3.3 Design Criteria	CC-26
2.3.4 Design Guidance and Specifications	CC-27
2.3.5 Inspection and Maintenance Requirements	CC-27
2.3.6 Example Schematics	CC-27
2.4 Interceptor Swale	CC-30

2.4.1	Primary Use.....	CC-31
2.4.2	Applications.....	CC-31
2.4.3	Design Criteria.....	CC-31
2.4.4	Design Guidance and Specifications.....	CC-32
2.4.5	Inspection and Maintenance Requirements.....	CC-32
2.4.6	Example Schematics.....	CC-32
2.5	Mulching.....	CC-34
2.5.1	Primary Use.....	CC-35
2.5.2	Applications.....	CC-35
2.5.3	Design Criteria.....	CC-35
2.5.4	Design Guidance and Specifications.....	CC-37
2.5.5	Inspection and Maintenance Requirements.....	CC-38
2.6	Pipe Slope Drain.....	CC-39
2.6.1	Primary Use.....	CC-40
2.6.2	Applications.....	CC-40
2.6.3	Design Criteria.....	CC-40
2.6.4	Design Guidance and Specifications.....	CC-41
2.6.5	Inspection and Maintenance Requirements.....	CC-41
2.6.6	Example Schematics.....	CC-41
2.7	Soil Surface Treatments.....	CC-43
2.7.1	Primary Use.....	CC-44
2.7.2	Applications.....	CC-44
2.7.3	Design Criteria.....	CC-44
2.7.4	Design Guidance and Specifications.....	CC-47
2.7.5	Inspection and Maintenance Requirements.....	CC-47
2.8	Turf Reinforcement Mats.....	CC-48
2.8.1	Primary Use.....	CC-49
2.8.2	Applications.....	CC-49
2.8.3	Design Criteria.....	CC-49
2.8.4	Design Guidance and Specifications.....	CC-50
2.8.5	Inspection and Maintenance Requirements.....	CC-50
2.8.6	Example Schematics.....	CC-50
2.9	Vegetation.....	CC-53
2.9.1	Primary Use.....	CC-54
2.9.2	Applications.....	CC-54
2.9.3	Design Criteria.....	CC-54
Construction Controls CC-61		
Revised 04/10		

2.9.4	Design Guidance and Specifications.....	CC-58
2.9.5	Inspection and Maintenance Requirements.....	CC-58
2.10	Velocity Dispersion Devices.....	CC-60
2.10.1	Primary Use.....	CC-61
2.10.2	Applications.....	CC-61
2.10.3	Design Criteria.....	CC-61
2.10.4	Design Guidance and Specifications.....	CC-62
2.10.5	Inspection and Maintenance Requirements.....	CC-62
2.10.6	Example Schematics.....	CC-62
3.0 Sediment ControlsCC-64		
3.1	Active Treatment System (ATS).....	CC-64
3.1.1	Primary Use.....	CC-65
3.1.2	Applications.....	CC-65
3.1.3	Design Criteria.....	CC-65
3.1.4	Design Guidance and Specifications.....	CC-68
3.1.5	Inspection and Maintenance Requirements.....	CC-68
3.1.6	Example Schematics.....	CC-68
3.2	Depressed Grade (Curb Cut/Bed) Sediment Trap.....	CC-70
3.2.1	Primary Use.....	CC-71
3.2.2	Applications.....	CC-71
3.2.3	Design Criteria.....	CC-71
3.2.4	Design Guidance and Specifications.....	CC-71
3.2.5	Inspection and Maintenance Requirements.....	CC-71
3.2.6	Example Schematics.....	CC-71
3.3	Dewatering Controls.....	CC-75
3.3.1	Primary Use.....	CC-76
3.3.2	Applications.....	CC-76
3.3.3	Design Criteria.....	CC-78
3.3.4	Design Guidance and Specifications.....	CC-78
3.3.5	Inspection and Maintenance Requirements.....	CC-78
3.3.6	Example Schematics.....	CC-78
3.4	Inlet Protection.....	CC-81
3.4.1	Primary Use.....	CC-82
3.4.2	Applications.....	CC-82
3.4.3	Design Criteria.....	CC-82
3.4.4	Design Guidance and Specifications.....	CC-86
Construction Controls CC-86		
Revised 04/10		

3.4.5	Inspection and Maintenance Requirements	CC-86
3.4.6	Example Schematics	CC-86
3.5	Organic Filter Berm	CC-86
3.5.1	Primary Use	CC-87
3.5.2	Applications	CC-87
3.5.3	Design Criteria	CC-87
3.5.4	Design Guidance and Specifications	CC-87
3.5.5	Inspection and Maintenance Requirements	CC-87
3.5.6	Example Schematics	CC-88
3.6	Organic Filter Tubes	CC-100
3.6.1	Primary Use	CC-100
3.6.2	Applications	CC-101
3.6.3	Design Criteria	CC-101
3.6.4	Design Guidance and Specifications	CC-103
3.6.5	Inspection and Maintenance Requirements	CC-103
3.6.6	Example Schematics	CC-103
3.7	Passive Treatment System (PTS)	CC-106
3.7.1	Primary Use	CC-107
3.7.2	Applications	CC-107
3.7.3	Design Criteria	CC-107
3.7.4	Design Guidance and Specifications	CC-109
3.7.5	Inspection and Maintenance Requirements	CC-109
3.8	Pipe Inlet Sediment Trap	CC-110
3.8.1	Primary Use	CC-111
3.8.2	Applications	CC-111
3.8.3	Design Criteria	CC-111
3.8.4	Design Guidance and Specifications	CC-112
3.8.5	Inspection and Maintenance Requirements	CC-112
3.8.6	Example Schematics	CC-112
3.9	Sediment Basin	CC-115
3.9.1	Primary Use	CC-116
3.9.2	Applications	CC-116
3.9.3	Design Criteria	CC-116
3.9.4	Design Guidance and Specifications	CC-119
3.9.5	Inspection and Maintenance Requirements	CC-120
3.9.6	Example Schematics	CC-120

3.9.7	Design Procedures	CC-125
3.9.8	Design Form	CC-140
3.10	SR Fence	CC-143
3.10.1	Primary Use	CC-144
3.10.2	Applications	CC-144
3.10.3	Design Criteria	CC-144
3.10.4	Design Guidance and Specifications	CC-145
3.10.5	Inspection and Maintenance Requirements	CC-145
3.10.6	Example Schematics	CC-146
3.11	Stabilized Construction Exit	CC-148
3.11.1	Primary Use	CC-149
3.11.2	Applications	CC-149
3.11.3	Design Criteria	CC-149
3.11.4	Design Guidance and Specifications	CC-150
3.11.5	Inspection and Maintenance Requirements	CC-150
3.11.6	Example Schematics	CC-150
3.12	Stone Outlet Sediment Trap	CC-152
3.12.1	Primary Use	CC-153
3.12.2	Applications	CC-153
3.12.3	Design Criteria	CC-153
3.12.4	Design Guidance and Specifications	CC-154
3.12.5	Inspection and Maintenance Requirements	CC-154
3.12.6	Example Schematics	CC-154
3.13	Triangular Sediment Filter Dike	CC-157
3.13.1	Primary Use	CC-158
3.13.2	Applications	CC-158
3.13.3	Design Criteria	CC-158
3.13.4	Design Guidance and Specifications	CC-159
3.13.5	Inspection and Maintenance Requirements	CC-159
3.13.6	Example Schematics	CC-159
3.14	Turbidity Barrier	CC-161
3.14.1	Primary Use	CC-162
3.14.2	Applications	CC-162
3.14.3	Design Criteria	CC-162
3.14.4	Design Guidance and Specifications	CC-163
3.14.5	Inspection and Maintenance Requirements	CC-163

3.14.6	Example Schematics.....	CC-163
3.15	Vegetated Filter Strips and Buffers.....	CC-168
3.15.1	Primary Use.....	CC-167
3.15.2	Applications.....	CC-167
3.15.3	Design Criteria.....	CC-167
3.15.4	Design Guidance and Specifications.....	CC-189
3.15.5	Inspection and Maintenance Requirements.....	CC-189
3.15.6	Example Schematics.....	CC-189
3.16	Wheel Cleaning Systems.....	CC-171
3.16.1	Primary Use.....	CC-172
3.16.2	Applications.....	CC-172
3.16.3	Design Criteria.....	CC-172
3.16.4	Design Guidance and Specifications.....	CC-173
3.16.5	Inspection and Maintenance Requirements.....	CC-174
3.16.6	Example Schematics.....	CC-174
4.0 Material and Waste Controls.....CC-178		
4.1	Chemical Management.....	CC-178
4.1.1	Primary Use.....	CC-179
4.1.2	Applications.....	CC-179
4.1.3	Design Criteria.....	CC-179
4.1.4	Design Guidance and Specifications.....	CC-181
4.1.5	Inspection and Maintenance Requirements.....	CC-182
4.2	Concrete Sawcutting Waste Management.....	CC-183
4.2.1	Primary Use.....	CC-184
4.2.2	Applications.....	CC-184
4.2.3	Design Criteria.....	CC-184
4.2.4	Design Guidance and Specifications.....	CC-185
4.2.5	Inspection and Maintenance Requirements.....	CC-185
4.3	Concrete Waste Management.....	CC-185
4.3.1	Primary Use.....	CC-187
4.3.2	Applications.....	CC-187
4.3.3	Design Criteria.....	CC-187
4.3.4	Design Guidance and Specifications.....	CC-189
4.3.5	Inspection and Maintenance Requirements.....	CC-189
4.3.6	Example Schematics.....	CC-189
4.4	Debris and Trash Management.....	CC-191

Construction Controls
Revised 04/10

CC-4

4.4.1	Primary Use.....	CC-192
4.4.2	Applications.....	CC-192
4.4.3	Design Criteria.....	CC-192
4.4.4	Design Guidance and Specifications.....	CC-194
4.4.5	Inspection and Maintenance Requirements.....	CC-194
4.5	Hyper-Chlorinated Water Management.....	CC-195
4.5.1	Primary Use.....	CC-196
4.5.2	Applications.....	CC-196
4.5.3	Design Criteria.....	CC-196
4.5.4	Design Guidance and Specifications.....	CC-198
4.5.5	Inspection and Maintenance Requirements.....	CC-198
4.6	Sandblasting Waste Management.....	CC-199
4.6.1	Primary Use.....	CC-200
4.6.2	Applications.....	CC-200
4.6.3	Design Criteria.....	CC-200
4.6.4	Design Guidance and Specifications.....	CC-201
4.6.5	Inspection and Maintenance Requirements.....	CC-201
4.7	Sanitary Waste Management.....	CC-202
4.7.1	Primary Use.....	CC-203
4.7.2	Applications.....	CC-203
4.7.3	Design Criteria.....	CC-203
4.7.4	Design Guidance and Specifications.....	CC-203
4.7.5	Inspection and Maintenance Requirements.....	CC-203
4.8	Spill and Leak Response Procedures.....	CC-204
4.8.1	Primary Use.....	CC-205
4.8.2	Applications.....	CC-205
4.8.3	Design Criteria.....	CC-205
4.8.4	Design Guidance and Specifications.....	CC-206
4.8.5	Inspection and Maintenance Requirements.....	CC-206
4.9	Subgrade Stabilization Management.....	CC-207
4.9.1	Primary Use.....	CC-208
4.9.2	Applications.....	CC-208
4.9.3	Design Criteria.....	CC-208
4.9.4	Design Guidance and Specifications.....	CC-208
4.9.5	Inspection and Maintenance Requirements.....	CC-209
4.9.6	Example Schematic.....	CC-209

Construction Controls
Revised 04/10

CC-4

4.10	Vehicle and Equipment Management.....	CC-210
4.10.1	Primary Use.....	CC-211
4.10.2	Applications.....	CC-211
4.10.3	Design Criteria.....	CC-211
4.10.4	Design Guidance and Specifications.....	CC-212
4.10.5	Inspection and Maintenance Requirements.....	CC-213

List of Tables

Table 1.1	Erosion Controls.....	CC-2
Table 1.2	Sediment Controls.....	CC-3
Table 1.3	Material and Waste Controls.....	CC-4
Table 1.4	Soil Erodibility Factors (K) Length/Slope Factor (LS).....	CC-7
Table 1.5	Cropping Factors.....	CC-8
Table 1.6	Mulch Standards and Guidelines.....	CC-9
Table 2.1	Pipe Slope Drain Minimum Diameters.....	CC-36
Table 2.2	NRCS Wind Erodibility Groups.....	CC-44
Table 2.3	Recommended Grass Mixture for Temporary Erosion Control.....	CC-56
Table 2.4	Recommended Grass Mixture for Final Stabilization of Upland in Rural Areas.....	CC-57
Table 2.5	Recommended Grass Mixture for Final Stabilization of Upland in Urban Areas.....	CC-57
Table 2.6	Perimeter Control Applications.....	CC-102
Table 3.1	Maximum Spacing for Slope Protection.....	CC-102
Table 3.2	Sediment Basin Effectiveness for Different Soil Types.....	CC-116
Table 3.3	Number and Spacing of Anti-Seep Collars.....	CC-119
Table 3.4	Pipe Flow Chart, $n=0.013$	CC-130
Table 3.5	Pipe Flow Chart, $n=0.025$	CC-131
Table 3.6	Design Data for Earth Spillways.....	CC-133
Table 3.7	Trash Rack and Anti-Vortex Device Design Table.....	CC-138
Table 3.8	Minimum Exit Dimensions.....	CC-150
Table 3.9	Sizing of Vegetated Buffers and Strips.....	CC-168
Table 3.10	Chemical Dechlorination Agents and Approximate Dosages.....	CC-197

List of Figures

Figure 2.1	Schematics of Rock Check Dams.....	CC-16
Figure 2.2	Schematics of Rock Bag Check Dams.....	CC-17
Figure 2.3	Schematics of Sack Gabion Check Dams.....	CC-18

Figure 2.4	Schematics of Organic Filter Tube Check Dams.....	CC-19
Figure 2.5	Schematics of Diversion Dike.....	CC-23
Figure 2.6	Schematics of Diversion Dike with Swale.....	CC-24
Figure 2.7	Schematics of Erosion Control Blankets.....	CC-28
Figure 2.8	Anchor Examples for Erosion Control Blankets.....	CC-29
Figure 2.9	Schematics of Interceptor Swale.....	CC-33
Figure 2.10	Schematics of Pipe Slope Drain.....	CC-42
Figure 2.11	Schematics of Turf Reinforcement Mats.....	CC-51
Figure 2.12	Examples of Turf Reinforcement Mat Anchoring.....	CC-52
Figure 2.13	Schematics of Velocity Dissipation Device.....	CC-63
Figure 3.1	Schematics of Active Treatment System.....	CC-69
Figure 3.2	Schematics of Depressed Grade (Curb Cut-Back) Sediment Trap.....	CC-73
Figure 3.3	Schematics of Depressed Pavement Replacement Sediment Trap.....	CC-74
Figure 3.4	Schematics of Dewatering Controls.....	CC-80
Figure 3.5	Schematics of 2'x4" Weir Curb Inlet Protection.....	CC-87
Figure 3.6	Schematics of Organic Filter Tube Curb Inlet Protection.....	CC-88
Figure 3.7	Schematics of Hog Wire Weir Curb Inlet Protection.....	CC-89
Figure 3.8	Schematics of Block and Gravel Filter Curb Inlet Protection.....	CC-90
Figure 3.9	Schematic of Organic Filter Tube On-Grade Curb Inlet Protection.....	CC-91
Figure 3.10	Schematics of Filter Fabric Area Inlet Protection.....	CC-92
Figure 3.11	Schematics of Excavated Impoundment Area Inlet Protection.....	CC-93
Figure 3.12	Schematics of Block and Gravel Area Inlet Protection.....	CC-94
Figure 3.13	Schematics of Organic Filter Tube Area Inlet Protection.....	CC-95
Figure 3.14	Schematics of Organic Filter Berm.....	CC-99
Figure 3.15	Schematics of Organic Filter Tubes.....	CC-104
Figure 3.16	Examples of Organic Filter Tube Installation Methods.....	CC-105
Figure 3.17	Schematics of Type A Pipe Inlet Sediment Trap.....	CC-113
Figure 3.18	Schematics of Type B Pipe Inlet Sediment Trap.....	CC-114
Figure 3.19	Schematics of Sediment Basin with Surface Skimmer.....	CC-121
Figure 3.20	Schematics of Sediment Basin with Overflow Riser.....	CC-122
Figure 3.21	Schematics of Basin Embankment with Flashboard Riser.....	CC-123
Figure 3.22	Schematic of Basin Embankment with Perforated Riser.....	CC-124
Figure 3.23	Example of Basin Outlet Design.....	CC-128
Figure 3.24	Riser Inflow Curves for Basin Outlet Design.....	CC-129
Figure 3.25	Example of Excavated Earth Spillway Design.....	CC-132
Figure 3.26	Example of Anti-Vortex Design for Corrugated Metal Pipe Riser.....	CC-137
Figure 3.27	Riser Pipe Base Design for Embankment Less Than 10 Feet High.....	CC-139
Figure 3.28	Schematics of Silt Fence.....	CC-147
Figure 3.29	Schematics of Stabilized Construction Exit.....	CC-151

Figure 3.30	Schematics of Excavated Stone Outlet Sediment Trap	CC-155
Figure 3.31	Schematics of Berned Stone Outlet Sediment Trap	CC-156
Figure 3.32	Schematics of Triangular Sediment Filter Dike	CC-160
Figure 3.33	Example Application of Turbidity Barrier	CC-164
Figure 3.34	Schematics of Turbidity Barrier	CC-165
Figure 3.35	Schematics of Vegetated Filter Strip	CC-170
Figure 3.36	Schematics of Rumble Rack Wheel Cleaning	CC-175
Figure 3.37	Schematics of Corrugated Metal Wheel Wash	CC-176
Figure 3.38	Schematics of Flooded Basin Wheel Wash	CC-177
Figure 4.1	Schematics of Concrete Washout Containment	CC-190
Figure 4.2	Schematic of Controls for Subgrade Stabilization	CC-209

1.0 Overview of Construction Controls

1.1 Introduction

In order to address the requirements of pollution reduction at construction sites, a variety of controls should be employed to reduce soil erosion, reduce sediment loss from the site, and manage construction-generated waste and construction related toxic materials. Controls consist of both temporary and permanent methods to reduce pollution from a construction site.

The majority of controls address loss of soil from the site. Soil loss in the form of erosion and sediment due to storm events and wind constitute the majority of pollution generated from construction sites. Controls that address erosion and sediment are typically more site specific than waste and toxics management. Erosion and sediment controls are dependent on site slopes, drainage patterns and drainage quantities along with other site-specific conditions. Materials and waste management controls primarily of "good housekeeping" practices which are dependent on the type of construction and the quantity and type of building materials.

1.2 Control Selection Guide

The designer preparing the ISWM Construction Plan can first use the control selection guide on the following pages to determine the controls that are most appropriate for the site. Chapters 2.0, 3.0 and 4.0 contain the descriptions, design requirements, maintenance requirements, and limitations of the controls. These provide the tools for the designer to select the appropriate controls and properly locate them on the site to effectively reduce erosion and sediment loss.

The Efficiency Ratings listed for the controls are the range of average efficiencies in reducing erosion or trapping sediment for the control, assuming the controls are properly designed, installed, and maintained for the flow and volumes from the design storm. The removal efficiency varies within in the range based on soil type.

The Efficiency Ratings are useful in comparing the effectiveness of the controls. The ratings are also used in calculating the Site Rating, which is used by some municipalities to ensure adequate design of erosion and sediment controls. Refer to Section 1.3 Site Rating Calculations for additional details concerning the Efficiency Ratings and the methodology for calculating the Site Rating.

The following legend applies to the Targeted Pollutants and Implementation Considerations presented for each of the controls:

Legend	
●	Significant Impact
◐	Medium Impact
○	Low Impact
?	Unknown or Questionable Impact

1.2.1 Erosion Controls

These controls are the measures and techniques used to retain soil in place. They are installed on the perimeter of the site to limit flow across disturbed areas and within the site to provide protective covering of disturbed areas that are not actively being worked. Erosion controls reduce the amount of soil removed and transported by stormwater runoff and reduce the need for sediment controls.

Table 1.1 Erosion Controls

Control	Primary Purpose	Efficiency Rating (%)
Check Dam	Slow flow to prevent erosion of swales and drainage ditches while also providing minor detention and sediment removal	0.30 - 0.50 (Depends on soil type)
Diversion Dike	Route flows around slopes and disturbed areas	0.95
Erosion Control Blankets	Protect disturbed soil and slopes from erosion using a degradable, rolled erosion control product; also provides limited protection as a perimeter control	0.90 (Ground cover) 0.65 (Perimeter w/o vegetation)
Interceptor Swale	Route flows around slopes and disturbed areas	0.95
Mulching	Protect disturbed soil with a layer of straw, wood chips, compost or other organic material	0.75 - 0.90 (Depends on coverage)
Pipe Slope Drain	Route overland flow on a slope into a pipe to protect the slope	0.95
Soil Surface Treatments	Protect disturbed soil from wind erosion (dust control) while also providing some protection from water erosion, depending on the treatment method	0.10 - 0.90 (Depends on type of treatment)
Turf Reinforcement Mats	Protect disturbed soil on steep slopes and in channels from erosion using a non-degradable, rolled erosion control product	0.90
Vegetation	Prevent erosion by providing a natural cover through hydro-mulching, seeding or sod placement	0.90 (When fully established; lower while vegetation is first growing)
Velocity Dissipation Devices	Protect soil from erosion at points where concentrated flows are discharged	N/A

The Efficiency Ratings listed for the erosion controls are the assumed average efficiencies in reducing erosion, based on the controls being designed for the flow and volume from the temporary control design storm and installed in accordance with the criteria in this manual.

1.2.2 Sediment Controls

These controls are temporary structures or devices that capture soil transported by stormwater through sedimentation, filtration or chemical treatment of the runoff. They are used to trap sediment before it leaves the construction site. The effectiveness of controls that form a barrier or filter for trapping soil is highly dependent on the size of soil particles. The efficiencies presented are ranges based on soil types. The removal efficiency will be at the high end of the range for sand and coarse silt or loam and at the low end for fine silt or loam and clay. Controls with a single number for the efficiency rating do not vary in performance based on soil type.

Table 1.2 Sediment Controls

Control	Primary Purpose	Efficiency Rating (%)
Active Treatment System	Remove pollutants and suspended soil, including fine clay particles, through filtration and/or chemical-aided flocculation	0.99
Depressed Grade Sediment Trap	Detain and settle suspended soil from small areas within rights-of-way	0.50 - 0.75
Dewatering Controls	Remove suspended soil from water that is pumped out of low points on-site	0.50 - 0.75
Inlet Protection	Intercept sediment at curb and area inlets as a secondary defense in sequence with other controls	0.35 - 0.65
Organic Filter Berms	Slow and filter runoff to retain sediment	0.50 - 0.75
Organic Filter Tubes	Slow and filter runoff to retain sediment	0.50 - 0.75
Passive Treatment System	Improve performance of other controls by adding flocculation agents to stormwater	0.85
Pipe Inlet Protection	Detain stormwater for sedimentation and filtration before it enters a closed conveyance system	0.50 - 0.75
Sediment Basin	Detain stormwater in a pond with a controlled outflow to allow for sedimentation	0.50 - 0.90
Silt Fence	Slow and filter runoff to retain sediment	0.50 - 0.75
Stabilized Construction Exit	Reduce offsite sediment tracking from trucks and construction equipment	N/A
Stone Outlet Sediment Trap	Intercept and filter small, concentrated flows in swales and other defined waterways	0.50 - 0.85
Triangular Sediment Filter Dike	Slow and filter runoff to retain sediment	0.50 - 0.75
Turbidity Barrier	Detain and settle suspended soil where work is occurring in or adjacent to a water body	0.50 - 0.90
Vegetated Filter Strips and Buffers	Slow sheet flow from small areas to allow for sedimentation	0.35 - 0.85 (Depends on many conditions in addition to soil type)
Wheel Cleaning Systems	Reduce offsite sediment tracking from trucks and construction equipment	N/A

The Efficiency Ratings listed for the sediment controls are the assumed average efficiencies in capturing sediment for a range of soil types, based on the controls being designed for the flow and volume from the temporary control design storm and installed in accordance with the criteria in this manual.

1.2.3 Material and Waste Controls

Material and waste control techniques are applicable on the majority of construction projects due to their general purpose of reducing the discharge of pollutants from construction activities. They form the basis of good housekeeping procedures that should be followed during construction and in many cases are mandated by stormwater discharge permits. The techniques are essential to preventing the discharge of pollutants other than sediment from a construction site.

A numeric efficiency rating is not provided for material and waste controls, since the controls are not for erosion and sediment and are not a factor in the Site Rating calculation. All of these techniques are highly effective in minimizing discharges of the targeted pollutants when properly applied.

Table 1.3 Material and Waste Controls

Control	Primary Purpose
Chemical Management	Techniques to minimize the exposure of paints, solvents, fertilizers, pesticides, herbicides, and other chemicals to precipitation and stormwater; and techniques for managing the wastewater from washout of paint, form release oils, curing compounds, and other construction chemicals
Concrete Sawcutting Waste Management	Techniques for collection and disposal of the slurry of cutting water and concrete cuttings that results from concrete sawing
Concrete Waste Management	Techniques for disposal of concrete washout, demolded concrete, etc.
Debris and Trash Management	Techniques for storage and disposal of packaging, scrap building materials, personal trash, and other wastes generated by construction activities and personnel
Hyper-Chlorinated Water Management	Techniques to prevent water with high concentrations of chlorine from being discharged
Sandblasting Waste Management	Techniques for disposal of sandblasting waste and containment of wastes during operations
Sanitary Waste Management	Techniques to control and prevent the exposure of sanitary waste to precipitation and stormwater
Spill and Leak Response Procedures	Techniques to minimize the discharge of pollutants from spills and leaks
Subgrade Stabilization Management	Techniques to control runoff from soil being chemically stabilized in preparation for construction
Vehicle and Equipment Management	Techniques to prevent discharges of fluids used in vehicle and equipment operation and maintenance and the discharge of wash waters that contain soaps or solvents

1.3 Site Rating Calculation

1.3.1 Introduction

The site rating calculation is a useful tool for evaluating the potential effectiveness of proposed erosion and sediment controls on a construction site. It is used to compare the potential soil loss from a site without controls to the soil loss from the site with proposed controls. The site rating may also be used to compare the effectiveness of two different controls on a site.

The site rating calculation is an optional element for an ISWM Construction Plan but may be required by some municipalities in North Central Texas. When required, a numeric site rating is established as the criteria for the design of erosion and sediment controls for a construction site. Municipalities that use the site rating will typically require a minimum site rating of 0.70, which reflects a realistic, attainable reduction in sediment loss from a construction site of 70 percent using controls compared to the same site without the use of controls.

The user of this manual is advised to confirm local requirements with the municipality where the project is located. When required to provide the site rating by the local government, the ISWM Construction Plan should be prepared as described in Chapter 4 of the ISWM Criteria Manual, followed by calculation of the site rating. Controls shall then be modified and added as needed to achieve the minimum required site rating.

1.3.2 Background

The design and implementation of erosion and sediment controls is highly dependent on project site conditions and construction methods. The amount of potential soil loss from a site is based on the physical features and location of the site: soil type(s), slope, length of stormwater flow across the site, the rainfall intensity and overall runoff quantity of a particular storm, and the groundcover of the site. Of these factors, construction activity at a site can affect the groundcover, the slope of the site and the length of stormwater flow across the site. These effects are mitigated by minimizing onsite disturbance of the soil and groundcover and providing structural measures to retain sediment onsite after erosion occurs.

The most effective method to reduce sediment loss from a tract of land is to prevent the occurrence of erosion. While structural barriers, such as those shown in this manual, have a theoretical 70 to 90 percent effectiveness rating for removal of sediment from runoff, natural groundcover and mulching can provide up to 98 percent reduction in erosion and soil loss. Therefore, the primary goals of the erosion control plan for a construction site is to prevent the soil from eroding and to minimize the area of disturbance through the phasing of construction activities, mulching of disturbed but inactive areas, and providing larps, seeding or hydroseeding of stockpiles. These techniques are not only the most effective at reducing soil loss; they are normally the most cost effective due to low initial cost and reduced maintenance requirements.

Sediment removal controls provide the second line of defense by treating sediment-laden stormwater before it is discharged from the site. All construction activities will require areas in which soil is disturbed. Stormwater runoff that crosses areas of exposed soil will require treatment by adequate Best Management Practices in accordance with the guidelines presented in this manual. Sediment removal controls include diversion of stormwater around areas of construction, and filtration and sedimentation (detention) of sediment-laden runoff that crosses disturbed areas.

1.3.3 Methodology

Site Rating Description

The runoff across both disturbed and non-disturbed areas of a drainage basin produces a quantity of soil loss due to erosion. This quantity is estimated through the use of the Universal Soil Loss Equation as a

mass per time period. Erosion and sediment controls are used to reduce the sediment transported offsite.

The site rating is defined as the theoretical amount of soil that remains uneroded and/or is captured on a site through the use of erosion and sediment controls (soil retained) divided by the theoretical amount of soil that would leave the site if no controls were used (uncontrolled). A minimum site rating of 0.70 is typically used as a guideline for the adequate design of erosion and sediment control systems.

This site rating is calculated as follows:

$$SR = Z A_{uncontrolled} / Z A_{controlled} \quad (1-1)$$

where:

SR = Site Rating

$Z A_{uncontrolled}$ = Soil uneroded and/or retained onsite by erosion prevention and sediment trapping practices (pounds/year)

$Z A_{controlled}$ = Soil loss from site if no controls used (pounds/year)

Note that the site rating calculation methodology assumes that the erosion and sediment control measures are correctly designed, installed, and maintained in accordance with the criteria in this manual to treat the volume of runoff from the 2-year, 24-hour storm event, which is the regionally defined design storm frequency for temporary control design.

Universal Soil Loss Equation

Several elements are involved in evaluating the potential for erosion of a site. Soil type, length of flow across the ground, slope of ground, rainfall intensity and groundcover play important roles in determining if a site will produce excessive siltation downstream. The Universal Soil Loss Equation is used to determine the potential erodibility of a site. The Universal Soil Loss Equation (USLE) is expressed as:

$$Z = R \cdot K \cdot LS \cdot C_p \cdot P \quad (1-2)$$

where:

Z = Rate of soil loss (tons per acre per year)

R = Rainfall erosion factor (300 for North Texas)

K = Soil erodibility factor

LS = Length/slope factor

C_p = Cropping/management factor

P = Erosion control practice

Calculate the anticipated yearly soil loss (ZA)

$$ZA = Z \cdot A \quad (1-3)$$

where

ZA = Soil loss per year (tons per year)

Z = Rate of soil loss for a drainage basin (tons per acre per year)

A = Area of drainage basin (acres)

Some of the factors above (R and K) remain consistent throughout the construction of the project. Both the LS and C_p factors are altered during construction through clearing, grading and drainage operations on the site. The P factor represents the implementation of erosion and sediment controls to reduce the potential for sediment to be transported offsite. These factors are discussed in the following sections.

Rainfall Erosion Factor

The average annual rainfall erosion factor, R, varies for different regions throughout the country and during the year. This value accounts for the volume and intensity of rainfall for a one year time period in a region. A value of 300 is used for R in the North Central Texas area.

Soil Erodibility Factor

The soil erodibility factor, K, indicates the potential for water erosion of the soil. It is strongly suggested that soil erodibility be determined as part of the geotechnical investigation of the site in order to determine the most effective means to reduce site erosion. If a site has not been previously disturbed, the native soil type(s) most likely to be present at the site can be identified on the NRCS Web Soil Survey at: <http://websoilsurvey.nrcs.usda.gov>. The website also contains the soil erodibility factors for native soils.

Consider the depth of grading activities when determining the soil erodibility factor. Soil type varies with depth. The surface soil may have a low erodibility factor, but the soil at a lower depth may have a high erodibility factor when it is exposed by grading operations.

Table 1.4 provides approximate values of K for various soil types and can be used in calculations if detailed data are not available.

Soil Type	K
Sand	0.03
Fine Sand	0.14
Loamy Sand	0.10
Sandy Loam	0.24
Loam	0.34
Silt Loam	0.42
Silt	0.52
Sandy Clay Loam	0.25
Clay Loam	0.25
Silty Clay Loam	0.32
Sandy Clay	0.13
Silty Clay	0.23
Clay	0.13 - 0.28

(Source: Standard Handbook of Environmental Engineering edited by Robert A. Corbett)

*Assuming 2% organic matter content.

Length/Slope Factor

The length-slope factor, LS, of the drainage basin may be changed through construction operations. A reduction in slope or drainage length can significantly reduce the erosion potential of the drainage basin. The length-slope factor considers the topographic features of the drainage basin. The LS factor is defined by the length and slope that a drop of water will travel through the drainage basin from the farthest reach to the point of analysis. The slope value is the average slope of this path. Table 1.5 lists values of LS for a wide variety of slope and drainage length. LS can also be calculated as follows:

$$LS = [L/72.6]^{0.5} [85.41 \sin^2(S) + 4.56 \sin(S) + 0.065] \quad (1-4)$$

where:

L = Length of flow path of contributing area (feet)

M = $0.6 \cdot [1 - \exp(-35.835 \cdot S)]$ where S=slope (feet/feet)

S = Average slope of contributing area (degrees)

Table 1.5 Length/Slope Factor (LS)

Length (ft.)	Slope (ft./ft.)												
	0.005	0.01	0.015	0.02	0.025	0.03	0.04	0.05	0.06	0.1	0.15	0.2	0.3
10	0.07	0.08	0.09	0.10	0.11	0.12	0.14	0.17	0.20	0.37	0.87	1.06	2.06
20	0.08	0.09	0.11	0.12	0.14	0.16	0.20	0.24	0.29	0.55	1.01	1.60	3.13
30	0.08	0.10	0.12	0.14	0.16	0.18	0.23	0.29	0.36	0.70	1.29	2.05	3.98
40	0.08	0.11	0.13	0.15	0.18	0.21	0.27	0.34	0.42	0.82	1.53	2.43	4.74
50	0.08	0.11	0.13	0.16	0.19	0.22	0.30	0.38	0.47	0.94	1.75	2.78	5.42
60	0.09	0.11	0.14	0.17	0.21	0.24	0.32	0.41	0.52	1.04	1.95	3.10	6.04
70	0.09	0.12	0.15	0.18	0.22	0.26	0.35	0.45	0.56	1.14	2.13	3.40	6.63
80	0.09	0.12	0.15	0.19	0.23	0.27	0.37	0.48	0.60	1.23	2.31	3.68	7.18
90	0.09	0.12	0.16	0.19	0.24	0.28	0.39	0.51	0.64	1.32	2.48	3.95	7.71
100	0.09	0.12	0.16	0.20	0.25	0.30	0.41	0.53	0.68	1.41	2.64	4.21	8.21
125	0.09	0.13	0.17	0.22	0.27	0.32	0.45	0.60	0.76	1.60	3.02	4.81	9.39
150	0.10	0.13	0.18	0.23	0.28	0.35	0.49	0.66	0.84	1.78	3.38	5.37	10.47
175	0.10	0.14	0.18	0.24	0.30	0.37	0.53	0.71	0.91	1.95	3.69	5.89	11.49
200	0.10	0.14	0.19	0.25	0.32	0.39	0.56	0.78	0.98	2.11	3.99	6.38	12.45
250	0.10	0.15	0.20	0.27	0.34	0.42	0.62	0.85	1.10	2.40	4.56	7.29	14.23
300	0.10	0.16	0.21	0.28	0.36	0.46	0.67	0.93	1.22	2.67	5.09	8.14	15.67
350	0.10	0.16	0.22	0.30	0.38	0.49	0.72	1.00	1.32	2.92	5.58	8.92	17.41
400	0.11	0.16	0.23	0.31	0.40	0.51	0.77	1.07	1.42	3.16	6.04	9.67	18.86
450	0.11	0.16	0.23	0.32	0.42	0.54	0.81	1.13	1.51	3.38	6.48	10.37	20.25
500	0.11	0.17	0.24	0.33	0.44	0.56	0.85	1.20	1.59	3.59	6.90	11.05	21.57
600	0.11	0.17	0.25	0.35	0.47	0.60	0.92	1.31	1.75	4.00	7.70	12.33	24.06
700	0.11	0.18	0.26	0.37	0.49	0.64	0.99	1.42	1.90	4.37	8.44	13.62	26.39
800	0.11	0.18	0.27	0.38	0.52	0.67	1.06	1.51	2.04	4.73	9.14	14.65	28.59
900	0.11	0.18	0.28	0.39	0.54	0.70	1.11	1.60	2.18	5.07	9.81	15.72	30.69
1000	0.12	0.19	0.28	0.41	0.56	0.73	1.17	1.69	2.30	5.39	10.44	16.74	32.69
1500	0.12	0.20	0.32	0.46	0.64	0.86	1.40	2.07	2.65	6.82	13.31	21.35	41.69
2000	0.12	0.21	0.34	0.50	0.71	0.97	1.60	2.39	3.32	8.07	15.80	25.37	49.55
3000	0.13	0.23	0.37	0.57	0.82	1.13	1.93	2.93	4.12	10.22	20.13	32.35	63.19
4000	0.13	0.24	0.40	0.62	0.91	1.27	2.20	3.38	4.80	12.09	23.90	38.44	75.10
5000	0.14	0.25	0.43	0.67	0.99	1.39	2.43	3.78	5.40	13.77	27.31	43.95	85.86

Overview
Revised 04/10

CC-8

Cropping/Management Factor

The cropping factor, C_c , considers the protection of natural ground cover in preventing erosion of the soil. This is dependent on the type of vegetation (grass or trees) and the density of the vegetation on the site. The higher the value for C_c , the less protection from erosion is available; for example, a bare construction site with no groundcover has a C_c value of 1.0, while hay matting applied at 1 ton per acre produces a C_c value of 0.13.

The C_c factor is not intended to account for the reduced erosion provided by temporary or final vegetation established on areas that have been disturbed. The erosion control factor, P_c , described below reflects the erosion protection afforded by use of vegetation in accordance with the Section 2.9 Vegetation.

Table 1.6 provides approximate values for C_c for a variety of conditions. The sensitivity of the C_c value reflects the importance of minimizing the area of disturbance and providing protection to the disturbed soil before erosion occurs. For existing bare areas or areas stripped of natural vegetation by construction, a C_c value of 1.0 shall be used.

Table 1.6 Cropping Factors

Type and Height of Natural Vegetative Canopy	Canopy Cover, %	Ground cover that exceeds the average, %						
		0	20	40	60	80	95-100	
No appreciable canopy / Canopy of tall weeds or short brush (<1' tall)	0	0.450	0.200	0.100	0.042	0.013	0.003	
	25	0.360	0.170	0.090	0.036	0.012	0.003	
	50	0.280	0.130	0.070	0.025	0.012	0.003	
	75	0.170	0.100	0.060	0.031	0.011	0.003	
Appreciable brush or bushes (5' tall height)	25	0.400	0.180	0.090	0.040	0.013	0.003	
	50	0.340	0.160	0.085	0.038	0.012	0.003	
	75	0.280	0.140	0.080	0.036	0.012	0.003	
Trees with appreciable low brush (>10' tall height)	25	0.420	0.190	0.100	0.041	0.013	0.003	
	50	0.390	0.180	0.090	0.040	0.013	0.003	
	75	0.360	0.170	0.090	0.039	0.012	0.003	

(Source: Standard Handbook of Environmental Engineering edited by Robert A. Carney)

For each drainage basin, this C_c value is weighted based on the percentage of disturbed area in the basin:

$$C_{c_{basin}} = [(C_{c_{dist}} \cdot A_{d}) + (C_{c_{undist}} \cdot A_{u})] / A_{tot} \tag{1.5}$$

- where:
- $C_{c_{basin}}$ = C_c for drainage basin
 - $C_{c_{dist}}$ = C_c for undisturbed areas
 - A_{d} = Area of undisturbed areas of drainage basin (acres)
 - $C_{c_{undist}}$ = C_c for disturbed areas
 - A_{u} = Area of disturbed areas of drainage basin (acres)
 - A_{tot} = Total area of drainage basin (acres)

Overview
Revised 04/10

CC-9

Erosion Control Practice Factor

The erosion control practice factor, P , accounts for the erosion control and sediment trapping effectiveness of land treatments such as mulching, erosion control blankets, temporary or final vegetation, sediment basins, filter berms, check dams, and other controls.

For the, A P value of 1 is used in the USLE calculation of the uncontrolled soil loss from the site ($ZA_{uncontrolled}$) because it is assumed that no controls are used.

The Efficiency Rating (F_e) for the calculation of the soil erosion prevented/sediment retained on the site ($ZA_{prevented}$) for the various controls is used in place of the erosion control practice factor. The Efficiency Rating is the complement of the P value ($F_e = 1 - P$) and is used instead of P , because the desired calculation is the soil retained on the site through the use of the practices rather than the soil lost from the site.

When multiple structural controls are used in series to treat runoff from disturbed areas, the design efficiency can be calculated as follows¹:

$$F_{e\text{TOTAL}} = 1 - (1 - F_{e1})(1 - F_{e2}) \quad (1.6)$$

where:

F_{e1} = Removal efficiency of first control

F_{e2} = Removal efficiency of second control

Site Rating Factor Calculation

After erosion potential is calculated for both uncontrolled ($ZA_{uncontrolled}$) and controlled conditions ($ZA_{controlled}$), a site rating (SR) is calculated using Equation 1.1.

A minimum design storm of 2-year intensity and 24-hour duration shall be used for design of structural sediment control techniques. Other design criteria are defined in sections of the manual for specific erosion controls. The 2-year intensity is the rainfall intensity that has a 50 percent probability of occurring in any given year. The 24-hour duration establishes the overall volume of rainfall and runoff of the storm with a peak flow of the referenced intensity. Municipalities can adjust this requirement for particularly sensitive areas or other areas of concern.

1.3.4 Summary

The following outlines the primary steps required to calculate the Site Rating.

- I. Develop design storm flows.
 - Determine drainage sub-basin.
 - Determine C_e values and drainage patterns (LS) based on conditions for design period.
- II. Calculate theoretical soil loss for each sub-basin if no controls are used.
- III. Calculate theoretical soil loss for the Erosion Control Practice factor, P , since no controls are used.
 - Use F_e from Section 2.0 Erosion Controls and Section 3.0 Sediment Controls (or testmanufacturer's data) in place of P in USLE.
 - Calculate soil retained onsite due to use of controls.
- IV. Determine site rating.

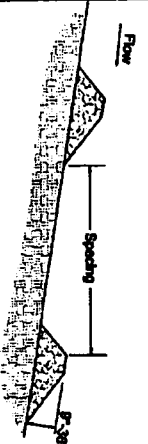
¹Harrigan, P. and K. Whitting. *The Clean Colorado Project and Urban Nonpoint Source Pollution Control: The LCRA Program, Seminar Publication - Nonpoint Source Watershed Workshop, Environmental Protection Agency, Sept. 1991, p. 170.*

Total sediment loss from the site must be reduced by a minimum of 70 percent from uncontrolled conditions (Site Rating > 0.70).

For sites that include phasing of the construction, repeat the steps for each phase.

2.0 Erosion Controls

2.1 Check Dam

	<p>Description: Check dams are small barriers consisting of loose rock, rock bags, or organic filter tubes placed across a drainage swale or ditch. They reduce the velocity of small concentrated flows, provide a limited barrier for sediment and reduce the potential for erosion of the swale or ditch.</p> <p style="text-align: right;"><i>Erosion Control</i></p>
<p>KEY CONSIDERATIONS</p> <p>DESIGN CRITERIA:</p> <ul style="list-style-type: none"> • Heights between 8 inches and 36 inches • Top of the downstream dam should be at the same elevation as the toe of the upstream dam <p>ADVANTAGES / BENEFITS:</p> <ul style="list-style-type: none"> • Reduced velocities in long drainage swales or ditches • May be used with other channel protection measures • Provides some sediment removal <p>DISADVANTAGES / LIMITATIONS:</p> <ul style="list-style-type: none"> • Cannot be used in live stream channels • Minor ponding upstream of the check dams • Extensive maintenance or replacement of the dams required after heavy flows or high velocity flows • Moving hazard from loose rocks if all rock is not removed at end of construction <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> • Inspect regularly • Remove silt when it reaches approximately 1/2 the height of the dam or 12 inches, whichever is less <p>TARGETED POLLUTANTS</p> <ul style="list-style-type: none"> ○ Sediment ○ Nutrients & Toxic Materials ○ Oil & Grease ○ Friable Materials ○ Other Construction Wastes 	<p>APPLICATIONS</p> <ul style="list-style-type: none"> Perimeter Control Slope Protection Sediment Barrier Channel Protection <p>Temporary Stabilization Final Stabilization Waste Management Housekeeping Practices</p> <p>F_g=0.30-0.50 (Depends on soil type)</p> <p>PERFORMANCE CONSIDERATIONS</p> <ul style="list-style-type: none"> ○ Capital Costs ○ Maintenance ○ Training ○ Suitability for Slopes > 5% <p>Other Considerations:</p> <ul style="list-style-type: none"> • None

Check Dam
Revised 04/10

CC-12

2.1.1 Primary Use

Check dams are used in long drainage swales or ditches to reduce erosive velocities. They are typically used in conjunction with other channel protection techniques such as vegetation lining and turf reinforcement mats. Check dams provide limited treatment to sediment-laden flows. They are more useful in reducing flow velocities to acceptable levels for stabilization methods. Check dams may be used in combination with slope outlet sediment traps, when the check dams prevent erosion of the swale while the sediment trap captures sediment at the downstream end of the swale.

2.1.2 Applications

Check dams are typically used in swales and drainage ditches along linear projects such as roadways. They can also be used in short swales down a steep slope, such as swales down a highway embankment, to reduce velocities. Check dams shall not be used in live stream channels.

Check dams should be installed before the contributing drainage area is disturbed, so as to mitigate the effects on the swale from the increase in runoff. If the swale itself is graded as part of the construction activities, check dams are installed immediately upon completion of grading to control velocities in the swale until stabilization is completed.

2.1.3 Design Criteria

General Criteria

- Typically, the dam height should be between 8 inches and 36 inches, depending on the material of which they are made. The height of the check dam shall always be less than one-third the depth of the channel.
- Dams should be spaced such that the top of the downstream dam is at the same elevation as the toe of the upstream dam. On channel grades flatter than 0.4 percent, check dams should be placed at a distance that allows small pools to form between each check dam.
- The top of the side of the check dam shall be a minimum of 12 inches higher than the middle of the dam. In addition, the side of the dams shall be embedded a minimum of 18 inches into the side of the drainage ditch, swale or channel to minimize the potential for flows to erode around the side of the dam.
- Larger flows (greater than 2-year, 24-hour design storm) must pass the check dam without causing excessive upstream flooding.
- Check dams should be used in conjunction with other sediment reduction techniques prior to releasing flow offsite.
- Use geotextile filter fabric under check dams of 12 inches in height or greater. The fabric shall meet the following minimum criteria:
 - Tensile Strength, ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles, 250-lbs.
 - Puncture Rating, ASTM D4633 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products, 135-lbs.
 - Mullen Burst Rating, ASTM D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Disintegrating Bursting Strength Tester Method, 420-psf.
 - Apparent Opening Size, ASTM D4751 Test Method for Determining Apparent Opening Size of a Geotextile, U.S. Sieve No. 20 (max).
- Loose, unconfined soil, wood chips, compost, and other material that can float or be transported by runoff shall not be used to construct check dams.

Check Dam
Revised 04/10

CC-13

Rock Check Dams

- Stone shall be well graded with stone size ranging from 3 to 6 inches in diameter for a check dam height of 24 inches or less. The stone size range for check dams greater than 24 inches is 4 to 8 inches in diameter.

- Rock check dams shall have a minimum top width of 2 feet with side slopes of 2:1 or flatter.

Rock Bag Check Dams

- Rock bag check dams should have a minimum top width of 16 inches.
- Bag length shall be 24 inches to 30 inches, width shall be 18 inches to 18 inches and thickness shall be 6 inches to 8 inches and having a minimum weight of 40 pounds.
- Minimum rock bag dam height of 12 inches would consist of one row of bags stacked on top of two rows of bag. The dam shall always be one more row wide than it is high, stacked pyramid fashion.
- Bags should be filled with pea gravel, filter stone, or aggregate that is clean and free of deleterious material.
- Sand bags shall not be used for check dams, due to their propensity to break and release sand that is transported by the concentrated flow in the drainage swale or ditch.
- Bag material shall be polypropylene, polyethylene, polyamide or cotton burlap woven fabric, minimum unit weight 4-ounces-per-square-yard, Mullen burst strength exceeding 340-psi as determined by ASTM D3786, Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Dispersion Bursting Strength Tester Method, and ultraviolet stability exceeding 70 percent.
- PVC pipes may be installed through the dam to allow for controlled flow through the dam. Pipe should be schedule 40 or heavier polyvinyl chloride (PVC) having a nominal internal diameter of 2 inches.

Sack Gabion Check Dams

- Sack gabion check dams may be used in channels with a contributing drainage area of 5 acres or less.
- Sack gabions shall be wrapped in galvanized steel, woven wire mesh. The wire shall be 20 gauge with 1 inch diameter, hexagonal openings.
- Wire mesh shall be one piece, wrapped around the rock, and secured to itself on the downstream side using wire ties or hog rings.
- Sack gabions shall be staked with ¾ inch rebar at a maximum spacing of three feet. Each wire sack shall have a minimum of two stakes.
- Stone shall be well graded with a minimum size range from 3 to 6 inches in diameter.

Organic Filter Tube Check Dams

- Organic filter tubes may be used as check dams in channels with a contributing drainage area of 5 acres or less.
- Organic filter tubes shall be a minimum of 12 inches in diameter.
- Filter material used within tubes to construct check dams shall be limited to coir, straw, aspen fiber and other organic material with high cellulose content. The material should be slow to decay or leach nutrients in standing water.
- Staking of filter tubes shall be at a maximum of 4 foot spacing and shall alternate through the tube and on the downstream face of the tube.
- Unless superseded by requirements in this section, filter tubes and filter material shall comply with the

criteria in Section 3.6 Organic Filter Tubes.

2.1.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.9 Check Dam (Rock). Specifications are also available in the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TxDOT 2004), Item 508.2.A and Item 508.4.C.1.

2.1.5 Inspection and Maintenance Requirements

Check dams should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Silt must be removed when it reaches approximately 1/3 the height of the dam or 12 inches, whichever is less. Inspectors should monitor the edges of the dam where it meets the sides of the drainage ditch, swale or channel for evidence of erosion due to bypass or high flows. Eroded areas shall be repaired. If erosion continues to be a problem, modifications to the check dam or additional controls are needed.

Care must be used when taking out rock check dams in order to remove as much rock as possible. Loose rock can create an extreme hazard during mowing operations once the area has been stabilized.

2.1.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are not for construction. They may serve as a starting point for creating a construction detail, but they must be adapted for the site by the designer. Dimensions and notes appropriate for the application must also be added by the designer.

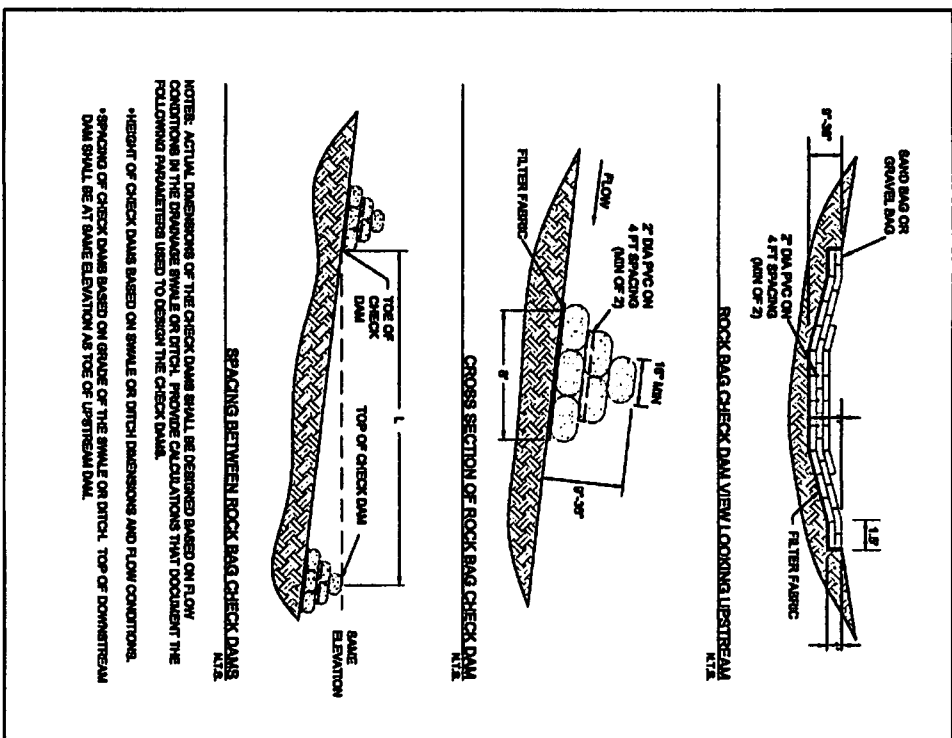
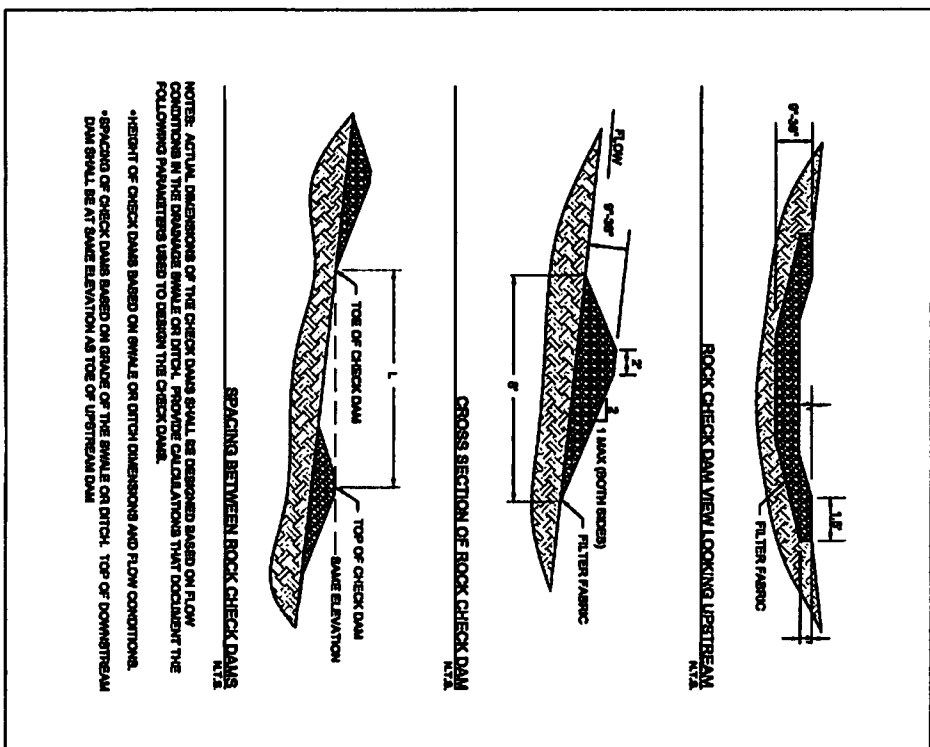


Figure 2.2 Schematics of Rock Bag Check Dams

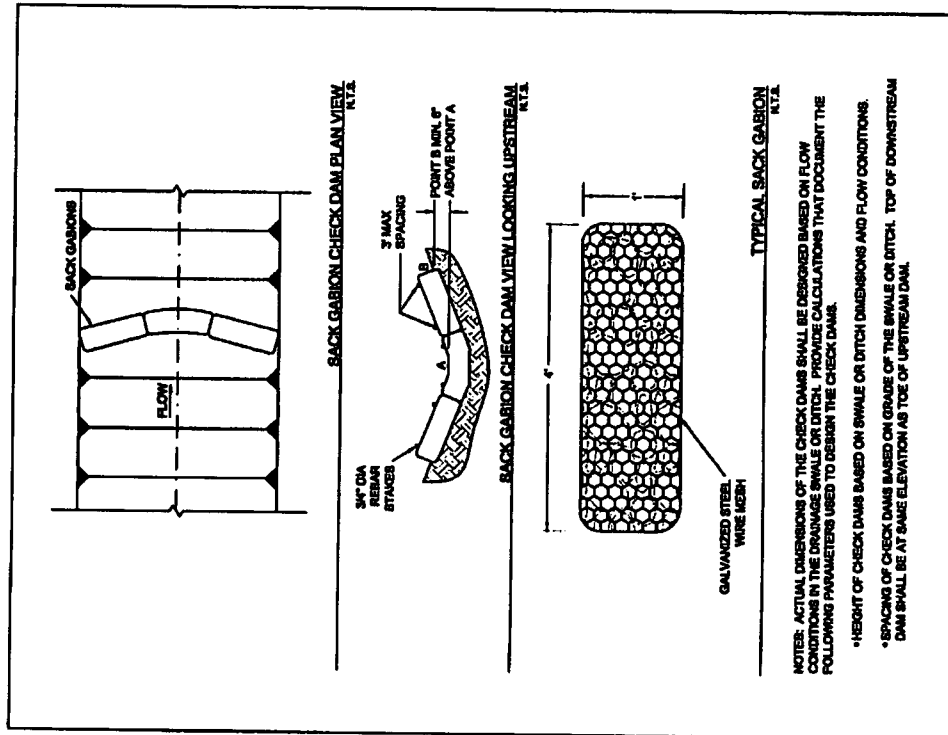


Figure 2.3 Schematics of Sack Gabion Check Dams
(Source: Modified from: Texas Department of Transportation Detail Sheet EC (2)-43)

Check Dam
Revised 04/10

CC-18

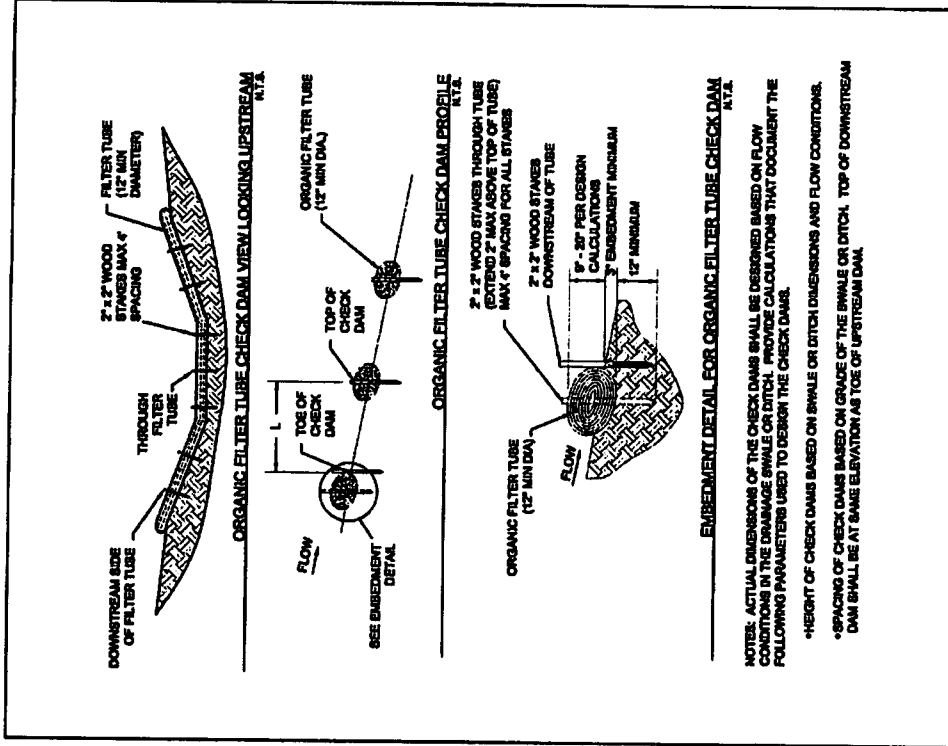
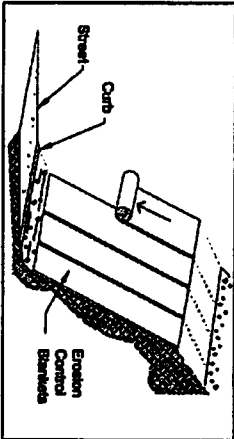


Figure 2.4 Schematics of Organic Filter Tube Check Dams
(Source: Modified from City of Plano BMP 5-7)

Check Dam
Revised 04/10

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2.3 Erosion Control Blankets



Description: An erosion control blanket (ECB) is a temporary, degradable, rolled erosion control product that reduces soil erosion and assists in the establishment and growth of vegetation. ECBS, also known as soil retention blankets, are manufactured by many companies and are composed primarily of processed, natural, organic materials that are woven, glued, or structurally bound together with natural fiber netting or mesh on one or both sides.

KEY CONSIDERATIONS

- ECB selected based on slope, flow rate and length of service
- Specify preparation of soil surface to ensure uniform contact with blanket
- Installation and anchoring according to manufacturer's recommendations

ADVANTAGES / BENEFITS:

- Holds seed and soil in place until vegetation is established
- Effective for slopes, embankments and small channels

DISADVANTAGES / LIMITATIONS:

- Not for use on slopes greater than 2:1 or in channels with shear stresses greater than 2.0 pounds per square foot

MAINTENANCE REQUIREMENTS:

- Replace or re-anchor bearded blankets
- Remove sediment deposited on blankets

TARGETED POLLUTANTS

- Sediment
- Nutrients & Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier
Channel Protection
Temporary Stabilization
Final Stabilization
Waste Management
Housekeeping Practices

Housekeeping Practices

$F_e=0.90$ (Ground cover)

$F_e=0.65$

(Perimeter w/o vegetation)

PREPARATION CONSIDERATIONS

- Capital Costs:
- Maintenance:
- Training
- Suitability for Slopes > 5%

Other Considerations:

- Life expectancy, partial degradation, and mowing/maintenance issues for ECBS set in place as part of final stabilization

2.3.1 Primary Use

Erosion control blankets (ECBs) are used to hold seed and soil in place until vegetation is established on disturbed areas. They can be used on many types of disturbed areas, but are particularly effective for slopes and embankments and in small drainage swales.

ECBs seeded for vegetation may be used as a perimeter control. When used in combination with other sediment barriers, such as silt fence or organic filter tubes, blankets may be used as a perimeter control with or without vegetation.

2.3.2 Applications

ECBs may be used on many types of disturbed areas but are most applicable on gradual to steep (2:1) cut/fill slopes and in swales and channels with low to moderate flow velocities. In these applications they may provide temporary stabilization by themselves or may be used with seeding to provide final stabilization. ECBS are also used to establish vegetation in channels where velocities are less than 6.0 feet per second.

When seeded for establishment of vegetation, ECBS can be an effective perimeter along the down slope side of linear construction projects (roads and utilities). ECBS with vegetation are also used as perimeter controls for new development, particularly at the front on residential lots in new subdivisions. ECBS are an effective aid in establishing vegetated filter strips.

2.3.3 Design Criteria

- The designer shall specify the manufacturer, type of erosion control blanket to be used, and dimensioned limits of installation based on the site topography and drainage.
- The type and class of erosion control blanket must be specified in accordance with the manufacturer's guidance for the slope of the area to be protected, the flow rate (sheet flow on cut/fill slopes) or velocity (concentrated flow in swales) of stormwater runoff in contact with the ECB, and the anticipated length of service.
- ECBS should meet the applicable "Minimum Performance Standards for TxDOT" as published by TxDOT in its "Erosion Control Report" and/or be listed on the most current annual "Approved Products List for TxDOT" applicable to TxDOT Item 169 Soil Retention Blanket and its Special Provisions.
- ECBS shall be installed vertically down slope (across contours) on cut/fill slopes and embankments and along the contours (parallel to flow) in swales and drainage ditches.
- ECBS designed to remain onsite as part of final stabilization shall have netting or mesh only on one side (the exposed side) of the ECB. The ECB shall be installed with the side that does not have netting or mesh in contact with the soil surface. All materials in the ECB, including anchors, should be 100 percent biodegradable within three years.
- On cut/fill slopes and drainage ditches or swales designed to receive erosion control blankets for temporary or final stabilization, installation of the ECBS shall be initiated immediately after completing grading of the slope or drainage way, and in no case later than 14 days after completion of grading these features. Do not delay installation of ECBS on these highly-erodible areas until completion of construction activities and stabilization of the remainder of the site.
- Unless the ECB is seeded to establish vegetation, perimeter control applications shall be limited to thirty foot wide drainage areas (i.e. linear construction projects) for an 8 foot width of ECB. When seeded for vegetation, use of ECBS for perimeter control shall follow the criteria in the Section 2.15 *Vegetated Filter Strips and Barriers*.
- Prior to the installation of the ECB, all rocks, dirt clods, stumps, roots, trash and any other obstructions that would prevent the ECB from lying in direct contact with the soil shall be removed.

- Anchor trenching shall be located along the top of slope of the installation area, except for small areas with less than 2 percent slope.
- Installation and anchoring shall conform to the recommendations shown within the manufacturer's published literature for the erosion control blanket. Anchors (staples) shall be a minimum of 6 inches in length and 1 inch wide. They shall be made of 11-gauge wire, or equivalent, unless the ECB is intended to remain in place with final stabilization and biodegrade.
- Particular attention must be paid to joints and overlapping material. Overlap along the sides and at the ends of ECBs should be per the manufacturer's recommendations for site conditions and the type of ECB being installed. At a minimum, the end of each roll of ECB shall overlap the next roll by 3 feet and the sides of rolls shall overlap 4 inches.
- After installation, the blankets should be checked for uniform contact with the soil, security of the lap joints, and tightness of the staples with the ground.
- When ECBs are installed to assist with establishing vegetation, seeding shall be completed before installation of the ECB. Criteria for seeding are provided in Section 2.9 Vegetation.
- Turf Reinforcement Mats should be used instead of ECBs for permanent erosion control and for stabilizing slopes greater than 2:1.
- ECBs are limited to use in swales and channels that have shear stresses of less than 2.0 pounds per square foot. Turf reinforcement mats shall be used in open channels with higher shear stresses.

2.3.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.15 Erosion Control Blankets and in Item 169 of the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TXDOT, 2004).

2.3.5 Inspection and Maintenance Requirements

Erosion control blankets should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for bare spots caused by weather or other events. Missing or loosened blankets must be replaced or re-anchored.

Check for excess sediment deposited from runoff. Remove sediment and/or replace blanket as necessary. In addition, determine the source of excess sediment and implement appropriate measures to control the erosion. Also check for rill erosion developing under the blankets. If found, repair the eroded area. Determine the source of water causing the erosion and add controls to prevent its recurrence.

2.3.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are not for construction. The designer is responsible for working with ECB manufacturers to ensure the proper ECB is specified based on the site topography and drainage. Installation measures should be dictated by the ECB manufacturer and are dependent on the type of ECB installed. Manufacturer's recommendations for overlap, anchoring, and stapling shall always be followed. Criteria shown here are applicable only when they are more stringent than those provided by the manufacturer.

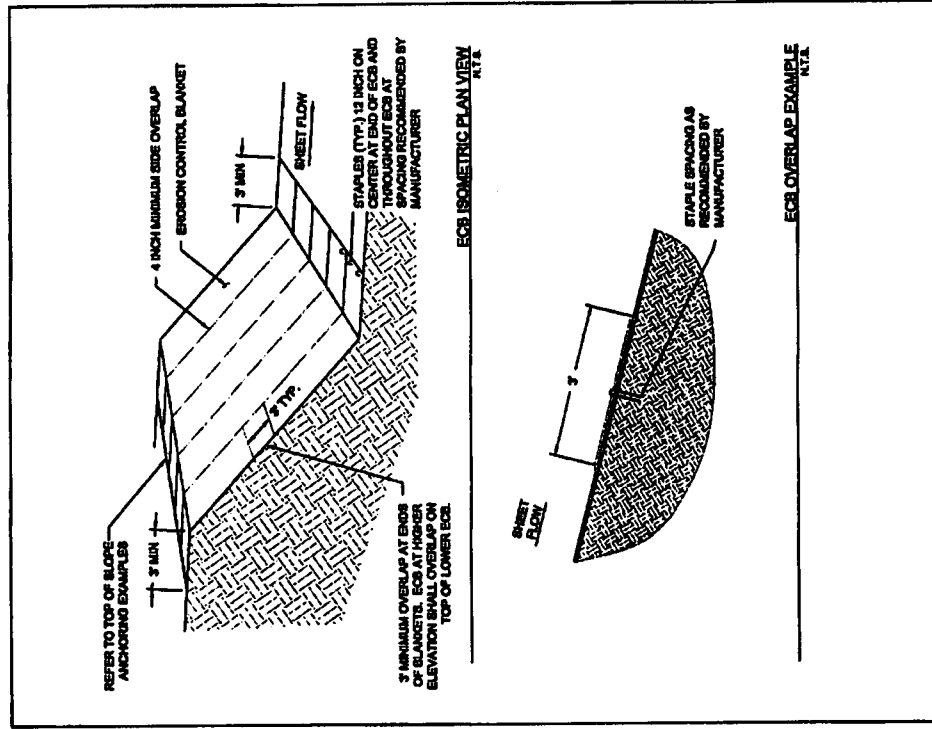


Figure 2.7 Schematics of Erosion Control Blankets

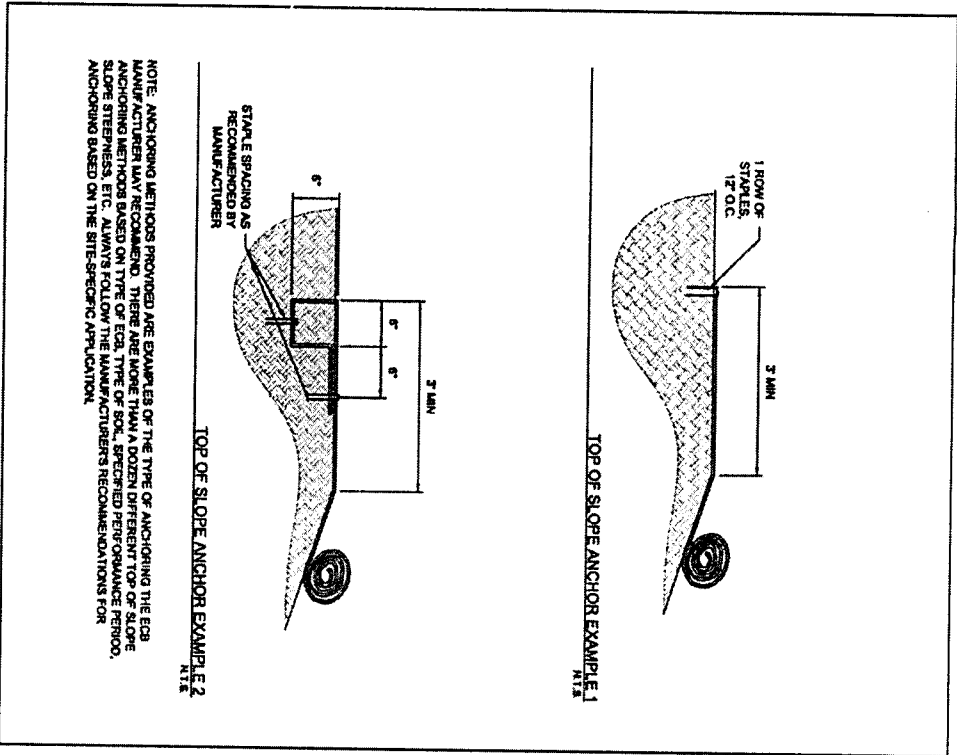


Figure 2.8 Anchor Examples for Erosion Control Blankets
 (Sources: American Excelsior Company and Western Excelsior Corporation)

2.9 Vegetation

<p>KEY CONSIDERATIONS:</p> <ul style="list-style-type: none"> Specify preparation of the soil surface before seeding or sodding Minimum of 4 to 6 inches of top soil required, depending on subsurface conditions Specify soil amendments depending on soil conditions Select seed or sod species appropriate for the climate, season, and soil <p>ADVANTAGES / BENEFITS:</p> <ul style="list-style-type: none"> More effective and easier to maintain than sediment controls during a long construction period May be used for temporary or final stabilization <p>DISADVANTAGES / LIMITATIONS:</p> <ul style="list-style-type: none"> Not appropriate for areas with heavy pedestrian, vehicular traffic, or concentrated, high velocity flow May require days to weeks for adequate establishment Alternate erosion control is needed until vegetation is established <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> Inspect regularly Protect newly seeded areas from excessive runoff, high velocity flow, and traffic until vegetation is established Water and fertilize until vegetation is established Reseed and/or provide mulch or another control for bare spots Rake accumulations of sediment from the vegetation <p>TARGETED POLLUTANTS</p> <ul style="list-style-type: none"> ○ Sediment ○ Nutrients & Toxic Materials ○ Oil & Grease ○ Floatable Materials ○ Other Construction Wastes 	<p>APPLICATIONS</p> <ul style="list-style-type: none"> Perimeter Control Slope Protection Sediment Barrier Channel Protection Temporary Stabilization Final Stabilization Waste Management Housekeeping Practices <p>F_s = 0.90 (When fully established; lower while vegetation is first growing)</p> <p>IMPLEMENTATION CONSIDERATIONS</p> <ul style="list-style-type: none"> ○ Capital Costs ○ Maintenance ○ Training ○ Suitability for Slopes > 5% <p>Other Considerations:</p> <ul style="list-style-type: none"> Design is unique to soil and other conditions at each site Watering and other maintenance required until vegetation is established
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Vegetation
 Revised 04/10

2.9.1 Primary Use

Vegetation is used as a temporary or final stabilization measure for areas disturbed by construction. As a temporary control, vegetation is used to stabilize stockpiles, earthen dikes, and barren areas that are inactive for longer than two weeks. As a final control at the end of construction, grasses and other vegetation provide good protection from erosion along with some filtering for overland runoff. Subjected to acceptable runoff velocities, vegetation can provide a positive method of long-term stormwater management as well as a visual amenity to the site.

Other control measures may be required to assist during the establishment of vegetation. These other controls include erosion control blankets, mulching, swales, and dikes to direct flow around newly seeded areas and proper grading to limit runoff velocities during construction.

2.9.2 Applications

Vegetation effectively reduces erosion in channels and swales and on stockpiles, dikes, and mild to medium slopes. Vegetative strips can provide some protection and sediment trapping when used as a perimeter control for utility and site development construction. Refer to Section 3.15 *Vegetated Filter Strips and Buffers* for more information.

In many cases, the initial cost of temporary seeding may be high compared to tarps or covers for stockpiles or other barren areas subject to erosion. This initial cost should be weighed with the amount of time the area is to remain inactive, since vegetation is more effective and the maintenance cost for vegetated areas is much less than most structural controls.

2.9.3 Design Criteria

General

- Vegetation is a highly effective erosion control when the vegetation is fully established. Until then, additional controls are needed. Sediment controls should not be removed from vegetated areas until the vegetation is established.
- On grades steeper than 20:1 (5 percent), anchored mulch or erosion control blankets are required to protect seeded areas until vegetation is established. Refer to Section 2.5 *Mulching* and Section 2.3 *Erosion Control Blankets* for design criteria.
- Vegetation may be used by itself for channel protection when the channel grade is less than 2 percent and the temporary control design storm (2-year, 24-hour) and the conveyance storm (25-year, 24-hour) flow velocities are less than 6 feet per second.
- If the velocity of the temporary control design storm is greater than 2 feet per second, erosion control blankets shall be used in the channel while vegetation is being established. Tuff reinforcement mats are required when the velocity exceeds 6 feet per second. Refer to Section 2.3 *Erosion Control Blankets* and Section 2.8 *Tuff Reinforcement Mats* for design criteria.
- Stabilization of channels with vegetation is limited to channels that have side slopes of 3:1 or flatter.
- On cutoff slopes and channels designed to receive temporary or final vegetation, establishment of vegetation shall be initiated immediately after completing grading of the cutoff slope or channel, and in no case later than 14 days after completion of grading on these features. It is not acceptable to delay establishing vegetation on these highly-erodible areas until completion of construction activities and stabilization of the remainder of the site.

Surface Preparation

- Unless infeasible, remove and stockpile existing topsoil at the start of grading activities. Store topsoil in a series of small stockpiles instead of one large stockpile to decrease the loss of aerobic soil microorganisms during stockpiling.

- Interim or final grading must be completed prior to seeding or sodding.
- To minimize soil compaction of areas to be vegetated, limit vehicle and equipment traffic in these areas to the minimum necessary to accomplish grading.
- Install all necessary erosion structures such as dikes, swales, diversions, etc. prior to seeding or sodding.
- Spread stockpiled topsoil evenly over the disturbed area to be vegetated.
- Depth of topsoil shall be a minimum of 4 inches, with 6 inches required where the topsoil is over rock, gravel, or otherwise unsuitable material for root growth. After spreading stockpiled topsoil, provide additional top soil as needed to achieve these depths.
- Compost Manufactured Topsoil as specified in TxDOT Special Specification 1001 may be used to achieve the specified depths or when it's infeasible to stockpile topsoil. Topsoil may also be acquired from another construction site if there is no space to stockpile the topsoil at that site.
- Topsoil shall have an organic content of 10 to 20 percent using ASTM D2974 Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Solids.
- Topsoil that does not meet the organic content requirement shall be amended with General Use Compost as specified in TxDOT Special Specification 1001. Amendment should be three parts of topsoil to one part compost by volume thoroughly blended.
- Seed bed should be well pulverized and loosened to a minimum depth of 3 inches and then raked to have a uniform surface.
- When establishing vegetation from seed, groove or furrow slopes steeper than 3:1 on the contour line before seeding.

Plant Selection, Fertilization and Seeding

- Use only high quality, USDA certified seed.
- Use an appropriate species or species mixture adapted to the local climate, onsite soil conditions and the season as shown below, or consult with the local office of the Natural Resources Conservation Service (NRCS) or Texas AgriLife Extension Service for selection of proper species and application technique in this area.
- Seeding rate should be in accordance with the Tables 2.4, 2.5 and 2.6 as follow in this section or as recommended by the Natural Resources Conservation Service (NRCS) or Texas AgriLife Extension Service.
- Chemical fertilization is not recommended at the time of seeding, because it typically stimulates and is consumed by fast growing weeds that out-compete the slower growing grasses and legumes. If the topsoil has not been amended by compost as discussed above, an 0.5 inch layer of General Use Compost (TxDOT Special Specification 1001) is recommended as a surface treatment to protect the seed and provide slow release nutrients
- Evenly apply seed using a seed drill, cultipacker, terra-seeder, or hydro-seeder.
- Hydro-seeding should not be used on slopes of 5:1 or steeper unless Bonded Fiber Matix is used.
- Seeded areas shall be thoroughly watered immediately after planting. Water shall be applied at a rate that moistens the top 6 inches of soil without causing runoff. Provide water daily for the first 14 days after seeding and thereafter as needed to aid in establishment of vegetation.
- Use appropriate mulching techniques (Section 2.5 *Mulching*) where necessary, especially during cold periods of the year. Mulch consisting of clipped site vegetation is discouraged, since the wood content may result in depleting nitrogen from the soil.

Sodding

- Use of sod should be limited to planned landscapes due to the relatively high water use of most types of sod grass.
- When sod is necessary to achieve immediate stabilization, buffalograss (*Buchloe dactyloides*) is recommended. Other types of sod may be used in landscaping when specified by a landscape architect for a commercial property or a homebuyer for a residential lot.
- The sod should be mowed prior to sod cutting so that the height of the grass shall not exceed 3 inches and should not be harvested or planted when its moisture condition is so excessively wet or dry that its survival shall be affected.
- Sod shall have a healthy, white, system of dense, thickly matted roots throughout a minimum soil thickness of 0.75 inch.
- Sod shall be planted within 3 days after it is excavated.
- In areas subject to direct sunlight, pre-moisten prepared sod bed by watering immediately prior to placing sod.
- Sodded areas shall be thoroughly watered immediately after they are planted.

Temporary Vegetation

The following table lists recommended plant species for the North Central Texas region depending on the season for planting.

Season	Common Name	Pure Live Seed Rate (Lb./Ac.)
Sep 1 - Nov 30	Tall Fescue Wheat (Red Winter) Wheat (Red Winter)	4.5 5.6 34.0
May 1 - Aug 31	Foxtail Millet	34.0
Feb 15 - May 31 Sep 1 - Dec 31	Annual Rye	20.0

Areas receiving temporary seeding and vegetation shall be landscaped, re-seeded or sodded with perennial species to establish final vegetation at the end of construction.

Vegetation for Final Stabilization

Sodding or seeding may be used to establish vegetation for final stabilization of areas disturbed by construction activity. The vegetation must achieve a cover that is 70 percent of the native background vegetative cover to be considered final stabilization. Sod will achieve this coverage quicker than seeding; however, sod is usually more expensive than seeding. Sod is most cost-effective for small areas or areas of concentrated flow or heavy pedestrian traffic where it will be difficult to establish vegetation by seeding. Grass seed for establishing final stabilization can be sown at the same time as seeding for temporary (annual) vegetation. Drought tolerant native vegetation is recommended rather than exotics as a long-term water conservation measure. Native grasses can be planted as seed or placed as sod. Buffalo 609, for example, is a hybrid grass that is placed as sod. Fertilizers are not normally used to establish native grasses, but mulching is effective in retaining soil moisture for the native plants.

Table 2.5 Recommended Grass Mixture for Final Stabilization of Upland in Rural Areas

County	Planting Date	City Soils Species and Pure Live Seed Rate (Lb./Ac.)		Sand Soils Species and Pure Live Seed Rate (Lb./Ac.)	
		Species and Pure Live Seed Rate (Lb./Ac.)	Rate	Species and Pure Live Seed Rate (Lb./Ac.)	Rate
Erath	February 1 - May 15	Green Sprangletop Sideoats Gramma (El Reno) Bermudagrass Little Bluestem (Abeak) Blue Gramma (Abeak) Illinois Burdickflower	0.3 2.7 0.9 1.0 0.9 1.0	Green Sprangletop Sand Lovegrass Bermudagrass Weeping Lovegrass (Erath) Sand Droopseed Partridge Pea	0.3 0.5 1.8 0.8 0.4 1.0
Hood Johnson Palo Pinto Parmer Kaufman Navarro Rockwell	February 1 - May 15	Green Sprangletop Sideoats Gramma (El Reno) Little Bluestem (Abeak) Burdickflower Illinois Burdickflower	0.3 1.2 2.7 2.0 1.6 1.0	Green Sprangletop Bermudagrass Weeping Lovegrass (Erath) Sand Lovegrass Sand Droopseed Partridge Pea	0.3 1.8 0.6 0.6 0.4 1.0
Collin Dallas Denton Ellis Kaufman Navarro Rockwell	February 1 - May 15	Green Sprangletop Sideoats Gramma (El Reno) Little Bluestem (Abeak) Burdickflower Illinois Burdickflower	0.3 3.2 1.8 1.7 1.0	Green Sprangletop Bermudagrass Burdickflower Weeping Lovegrass (Erath) Sand Droopseed Partridge Pea	0.3 1.5 6.0 0.6 0.8 1.0
Hunt	February 1 - May 15	Green Sprangletop Sideoats Gramma (Abeak) Sideoats Gramma (Abeak) Sideoats Gramma (Abeak) Sideoats Gramma (Abeak)	0.3 2.4 4.5	Green Sprangletop Bermudagrass	0.3 5.4

(Source: TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, Item 164)

Table 2.6 Recommended Grass Mixture for Final Stabilization of Upland in Urban Areas

County	Planting Date	City Soils Species and Pure Live Seed Rate (Lb./Ac.)		Sand Soils Species and Pure Live Seed Rate (Lb./Ac.)	
		Species and Pure Live Seed Rate (Lb./Ac.)	Rate	Species and Pure Live Seed Rate (Lb./Ac.)	Rate
Erath	February 1 - May 15	Green Sprangletop Sideoats Gramma (El Reno) Bermudagrass Burdickflower (Abeak)	0.3 3.6 2.4 1.8	Green Sprangletop Sideoats Gramma (El Reno) Bermudagrass Sand Droopseed	0.3 3.6 2.1 0.3
Hood Johnson Palo Pinto Parmer Kaufman Navarro Rockwell	February 1 - May 15	Green Sprangletop Sideoats Gramma (El Reno) Bermudagrass Burdickflower (Abeak)	0.3 3.6 1.6 2.4	Green Sprangletop Burdickflower (Abeak) Burdickflower (Abeak) Sand Droopseed	0.3 1.6 3.6 0.4
Collin Dallas Denton Ellis Kaufman Navarro Rockwell	February 1 - May 15	Green Sprangletop Sideoats Gramma (El Reno) Burdickflower (Abeak) Burdickflower (Abeak)	0.3 3.6 1.6 2.4	Green Sprangletop Burdickflower (Abeak) Burdickflower (Abeak) Sand Droopseed	0.3 1.6 3.6 0.4
Hunt	February 1 - May 15	Green Sprangletop Bermudagrass Sideoats Gramma (Abeak) Sideoats Gramma (Abeak)	0.3 2.4 4.5	Green Sprangletop Bermudagrass	0.3 5.4

(Source: TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, Item 164)

Vegetation for final stabilization of channels requires grasses that are tolerant of periodic inundation, such as Bermuda grass, Kentucky bluegrass or a grass-legume mixture.

Additional Considerations

- Conditions for establishing vegetation vary significantly from site to site. Therefore, specifics of the vegetation design should be prepared based on the soil, slopes, drainage patterns, and the purpose of the vegetation at a each site.
- For construction activities that include landscaping in the development plans, the landscape architect should be consulted when specifying vegetation for temporary or final stabilization of disturbed areas.
- Vegetation is easier to establish if equipment and vehicle traffic is managed on-site to minimize soil compaction by traffic in the disturbed area that will be vegetated.
- Establishing a good vegetative cover is dependent on the season of the year. Projects that commence in the fall of the year may not be candidates for using vegetation as an erosion control.
- Where vegetation is used in swales and channels it may be necessary to use sod, rather than seeding, to establish an erosion resistant surface that accommodates rainfall runoff flows.
- Mulch should be used to enhance vegetative growth, in that mulch protects seeds from heat, prevents soil moisture loss, and provides erosion protection until the vegetation is established. Compost mulch has the additional benefit of providing some slow-release nutrients.
- Fertilizers have both beneficial and adverse effects. Fertilizers provide nutrients to the vegetation, but fertilizers are also a source of unwanted nutrients in streams and lakes. In this latter regard, they are a pollutant. The use of native vegetation rather than exotics reduces the need for fertilizers. Organic fertilizers, such as compost mulch, are generally preferred over chemical fertilizers. They provide a slow release of nutrients over a longer period of time and are less likely to cause environmental problems.
- Steep slopes represent a problem for establishing vegetation. Hydraulic mulches are useful for establishing vegetation on slopes. Refer to Section 2.5 *Mulching*.

2.9.4 Design Guidance and Specifications

Additional criteria for the application of vegetation in channels are in Section 3.6.3 of the *ISWM Criteria Manual* and design guidance is in Section 3.2 of the *Hydraulics Technical Manual*.

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Item 202 Landscaping. Additional specifications for the following components of this item are in the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TxDOT 2004):

- Topsoil, Item 160.
- Compost, Item 161.
- Seeding for Erosion Control, Item 162.
- Fertilization, Item 184.
- Vegetative Watering 165.

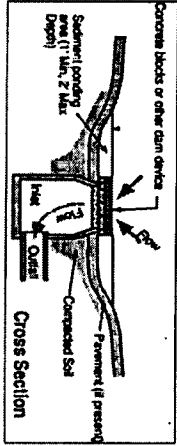
2.9.5 Inspection and Maintenance Requirements

Protect newly seeded areas from excessive runoff and traffic until vegetation is established. Include a watering and fertilizing schedule in the ISWM Construction Plan facilitate the establishment of the vegetation. Vegetation for final stabilization must be maintained until the vegetative cover is 70 percent of the native background vegetative cover.

Vegetation should be inspected regularly (at least as often as required by the TPDES Construction General Permit) to ensure that the plant material is established properly and remains healthy. Bare spots shall be reseeded and/or protected from erosion by mulch or other measures. Accumulated sediment

deposited by runoff should be removed to prevent smothering of the vegetation. In addition, determine the source of excess sediment and implement appropriate measures to control the erosion.

3.4 Inlet Protection



Description: Inlet protection consists of a variety of methods to intercept sediment at low point inlets through the use of depressed grading, filter stone, filter fabric, inlet inserts, organic filter tubes and other materials. The protection devices are placed around or across the inlet openings to provide localized detention or filtration of sediment and floatable materials in stormwater. Protection devices may be assembled onsite or purchased as manufactured assemblies.

Sediment Control

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Evaluate drainage patterns to ensure inlet protection will not cause flooding of roadway, property or structures
- Never block entire inlet opening
- Size according to drainage area and flow rates
- Include flow bypass for clogged controls and large storm events

ADVANTAGES/BENEFITS:

- May be the only feasible sediment control when all construction is located within right-of-way

DISADVANTAGES/LIMITATIONS:

- Limited effectiveness and reliability
- High maintenance requirements
- Has potential to flood roadway's or adjacent properties

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Check for and remove blockage of inlet after every storm event
- Remove sediment before it reaches half the design height or volume of the inlet protection, more frequently for curb inlets
- Repair or replace damaged materials
- Clean or replace filter stone and organic filter tubes is when clogged with sediment

TARGETED POLLUTANTS

- Sediment
- Nutrients & Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Wastes

APPLICATIONS

- Perimeter Control
- Slope Protection
- Sediment Barrier
- Channel Protection
- Temporary Stabilization
- Final Stabilization
- Waste Management
- Housekeeping Practices

Fa=0.35-0.65
(Depends on soil type)

IMPLEMENTATION CONSIDERATIONS

- Capital Costs
 - Maintenance
 - Training
 - Suitability for Slopes > 5%
- Other Considerations:**
- Traffic hazards
 - Passage of larger storm events without causing flooding
 - Flow diversion to other inlets or drainage points

3.4.1 Primary Use

Inlet protection is typically used as a secondary sediment barrier, due to its limited effectiveness and numerous disadvantages. It is used to reduce sediment in storm sewer systems by serving as a back-up system for areas that have newly applied erosion controls or for other sediment controls that cannot achieve adequate sediment removal by themselves.

Inlet protection may be used as a primary sediment control only when all other primary controls are infeasible because of site configuration or the type of construction activity.

3.4.2 Applications

Inlet protection is best applied at low point (sump) inlets where stormwater runoff will pond behind the protection measure, and then either filter through the protection measure or flow over a weir created by it. Most inlet protection measures depend on ponding to be effective. These types of inlet protection are not applicable to on-grade curb inlets, where the inlet protection will cause stormwater runoff to bypass the inlet, and overflow downstream inlets. Only inlet protection measures that allow for use of the inlet opening (e.g. inlet inserts) are applicable as inlet protection for on-grade inlets.

Inlet protection is normally used in new developments with new inlets and roads that are not in public use. It has limited applications in developed areas due to the potential for flooding, traffic safety, pedestrian safety, and maintenance problems. Potential applications in developed areas are on parking lot inlets where water can pond without causing damage and during major repairs to existing roadways where no other controls are viable.

The application of inlet protection is highly variable due to the wide variety of inlet configurations (existing and new) and site conditions. The schematics in Section 5 show example applications; however, applications in most cases must be site adapted. Different methods and materials may be used. It is the responsibility of the designer to ensure that the methods and materials applied for inlet protection are appropriate to the site and flow conditions following the design criteria in Section 3.

3.4.3 Design Criteria

General

- Drainage patterns shall be evaluated to ensure inlet protection will not divert flow or flood the roadway or adjacent properties and structures.
- Inlet protection measures or devices that completely block the inlet are prohibited. They must also include a bypass capability in case the protection measures are clogged.
- Inlet protection must be designed to pass the conveyance storm (25-year, 24-hour) without creating a road hazard or damaging adjacent property. This may be accomplished by any of the following measures:
 - An overflow weir on the protection measure.
 - An existing positive overflow swale on the inlet.
 - Sufficient storage volume around the inlet to hold the ponded water until it can all filter into the inlet.
 - Other engineered method.
- Positive overflow drainage is critical in the design of inlet protection. If overflow is not provided for at the inlet, temporary means shall be provided to route excess flows through established swales, sliests, or other watercourses to minimize damage due to flooding.
- Filter fabric and wire mesh used for inlet protection shall meet the material requirements specified in Section 3.10 SW Fence.

- Block and gravel (crushed stone or recycled concrete) protection is used when flows exceed 0.5 cubic feet per second and it is necessary to allow for overtopping to prevent flooding.
- The tube and filter for organic filter tubes shall be in accordance with the criteria in Section 3.6 Organic Filter Tube.
- Bags used to secure inlet protection devices on pavement shall be filled with aggregate, filter stone, or crushed rock that is less likely than sand to be washed into an inlet if the bag is broken. Filled bags shall be 24 to 30 inches long, 16 to 18 inches wide, and 6 to 8 inches thick. Bags shall be polypropylene, polyethylene, or polyamide woven fabric with a minimum unit weight of 4 ounces per square yard and meet the following criteria:
 - Greater than 300 psi Mullen Burst Strength using ASTM D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method.
 - Greater than 70 percent UV Stability using ASTM D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus.

Curb Inlet Protection

- Municipality approval is required before installing inlet protection on public streets.
- Special caution must be exercised when installing curb inlet protection on publicly traveled streets or in developed areas. Ensure that inlet protection is properly designed, installed and maintained to avoid flooding of the roadway or adjacent properties and structures.
- A two inch overflow gap or weir is required on all curb inlet protection devices.
- Traffic cones, warning signs, or other measures shall be installed to warn motorists when the inlet protection measures extend beyond the gutter line.
- 2 inch X 4 inch Weir Protection:
 - Bend wire mesh around the 2 inch x 4 inch board and staple to the board. Bend wire mesh around the bottom of the board, the curb opening, and along the pavement to form a cage for the rock.
 - Rock bags shall be placed perpendicular to the curb, at both ends of the wooden frame, to disrupt the flow and direct water into the rock filter. Stack the bags two high if needed.
- Organic Filter Tube Protection:
 - The diameter of the tube shall be at least 2 inches less than the height of the inlet opening. The tube should not be allowed to block the entire opening, since it will clog.
 - The tube shall be placed on 4 inch x 4 inch or 2 inch x 4 inch wire mesh to prevent the tube from sagging into the inlet.
 - The tube should be long enough to extend a minimum of 12 inches past the curb opening on each side of the inlet.
- Hog Wire Weir Protection:
 - The filter fabric and wire mesh shall extend a minimum of 12 inches past the curb opening on each side of the inlet.
 - Filter fabric shall be placed on 2 inch x 4 inch wire mesh to prevent the tube from sagging into the inlet.
 - Rock bags are used to hold the wire mesh and filter fabric in contact with the pavement. At least one bag shall be placed on either side of the opening, parallel to and up against the concrete curb. The bags are intended to disrupt and slow the flow and ensure it does not go under the fabric. Add bags if needed.

- If a board is used to anchor the wire mesh and fabric instead of rock bags, the board shall be secured with concrete nails at 3 inches on center. Upon removal clean any dirt or debris from the nailing locations, apply chemical sealing agent, and apply non-shrink grout flush with surface of concrete.
- Block and Gravel Protection:
 - Concrete blocks shall be standard 8 inch x 8 inch x 16 inch concrete masonry units and shall be in accordance with ASTM C139, Concrete Masonry Units for Construction. Filter gravel shall be ¾ inch washed stone containing no fines. Angular shaped stone is preferable to rounded shapes.
 - Concrete blocks are to be placed on their sides in a single row around the perimeter of the inlet, with ends abutting. Openings in the blocks should face outward, not upward. ¾ inch x ¾ inch wire mesh shall then be placed over the outside face of the blocks covering the holes. Filter gravel shall then be piled against the wire mesh to the top of the blocks with the base of the stone being a minimum of 18 inches from the blocks.
 - Alternatively, where loose stone is a concern (streets, etc.), the filter gravel may be placed in appropriately sized filter fabric bags.
 - Periodically, when the gravel filter becomes clogged, the gravel must be removed and cleaned in a proper manner or replaced with new gravel and piled back against the wire mesh.
- Organic Filter Tube On-Grade Protection:
 - Organic filter tubes may be used to provide sediment control at on-grade curb inlets where the tube will not be a traffic hazard, such as on residential streets where the pavement adjacent to the curb is allocated to parked cars. Tubes should not be used in this manner where they will extend into an active travel lane.
 - The filter tube shall be secured in a U-shape by rock bags. Runoff flowing in the gutter will pond within the U until it filters through the tube or overflows around the end.
- Inlet protection shall be phased on curb inlets being constructed. Controls shall be installed on the pipe inlet at the bottom of the catch basin as soon as it is installed and while the inlet box and top are being formed or placed.

Area Inlet Protection

- Installation methods for protection on area inlets vary depending on the type of inlet (drop, "Y," or other) and the type and use of the surface surrounding the inlet (parking lot, playground, etc.). It is the responsibility of the designer to appropriately adapt inlet protection measures and their installation methods for each site condition. Several types may be needed on one project.
- Filter Fabric Protection:
 - Filter fabric protection is appropriate where the drainage area is less than one acre and the basin slope is less than five (5) percent. Filter fabric, posts, and wire mesh shall meet the material requirements specified in Section 3.10 Silt Fence.
 - A 6 inch wide trench is to be cut 6 inches deep at the toe of the fence to allow the fabric to be laid below the surface and backfilled with compacted earth or gravel. This entrenchment prevents any bypass of runoff under the fence.
 - Stone overflow structures, according to the criteria in Section 3.10 Silt Fence shall be installed where flow to the inlet is concentrated and more than 1 cubic feet per second.
- Excavated Impoundment Protection:
 - Excavated inlet protection is usually the most effective type of area inlet protection; however, it is only applicable to drop inlets. It should not be applied to Y inlets because it will undermine the concrete pad surrounding the inlet opening. Nor can it be used for inlets on pavement.

- With this protection method, it is necessary to install weep holes to allow the impoundment to drain completely.
 - The impoundment shall be sized such that the volume of excavation is equal to or exceeds the runoff volume from the temporary control design storm (2-year, 24-hour) for the inlet's drainage area.
 - The trap shall have a minimum depth of one foot and a maximum depth of 2 feet as measured from the top of the inlet and shall have side slopes of 2:1 or flatter.
- Block and Gravel Protection:**
- Block and gravel inlet protection is the most stable area inlet protection and can handle more concentrated flows. It may be installed on paved or vegetated surfaces. Loose stone shall be carefully removed from vegetated surfaces at the end of construction to prevent the stone from becoming a mowing hazard.
 - The inlet protection may be one or two blocks high. Single block heights are applicable for drainage areas up to 3 acres in size. The double block height shall be used for larger drainage areas.
 - Concrete blocks shall be standard 8 inch x 8 inch x 16 inch concrete masonry units and shall be in accordance with ASTM C139, Concrete Masonry Units for Construction. Filler gravel shall be ¾ inch washed stone containing no fines. Angular shaped stone is preferable to rounded shapes.
- Organic Filler Tube Protection:**
- Organic filler tubes may be used on paved or unpaved surfaces.
 - On paved surfaces, tubes shall be secured in place by rock bags. On unpaved surfaces, the tubes shall be embedded in the ground a minimum of 3 inches and staked at 4 foot spacing.
 - Designer shall provide calculations and specify the diameter of tube to be used based on the inlet's drainage area and the flow rate of runoff to the inlet. The minimum allowable diameter is 12 inches.
- Proprietary Inlet Protection**
- Numerous proprietary protection devices are available from commercial vendors. The devices often have the advantage of being reusable on several projects if they are maintained in good condition.
 - It is the policy of this manual not to recommend any specific commercial vendors for proprietary controls. However, this subsection is included in order to provide municipalities with a rationale for approving the use of a proprietary inlet protection device within their jurisdiction.
 - The designer shall work with the supplier to provide the municipality with flow calculations or independent third-party tests that document the device's performance for conditions similar to the ones in which it is proposed to be installed. The conditions that should be considered include: type and size of inlet, inlet configuration, size of contributing drainage area, design flow rate, soil particle sizes to be removed, and other pollutants to be removed.
 - The designer or vendor of the proprietary device shall provide a minimum of three references for projects where the device has been installed and maintained in operation at a construction site for at least six months. Local references are preferred; but references from other regions can be accepted if a similarity between the reference project and the proposed application can be demonstrated.
 - Proprietary devices must not completely block the inlet. The device shall have a minimum of a 2 inch wide opening for the length of the inlet when it will be used in areas that water can safely pond to depths deeper than the design depths for the inlet. If ponding is not an option, then the device must have overflow capacity equal to the inlet design flow rate.
 - Some proprietary devices are available with replaceable pads or filters. These pads or filters have the added benefit of removing pollutants such as metals and oils in addition to removing sediment.

- These types of inserts are recommended in applications where prior or current land use in or adjacent to the construction areas may result in the discharge of pollutants.
- Proprietary protection devices shall be in accordance with the General criteria at the beginning of this section and any criteria listed under Curb Inlet Protection and Area Inlet Protection that are not specific to an inlet protection method.

3.4.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.15 Inlet Protection.

3.4.5 Inspection and Maintenance Requirements

Inlet protection should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Inlet controls should also be inspected after every storm event to check for collapse into the inlet or other damages that may block flow in the inlet. In addition to routine inspection, inlet protection devices should be observed and monitored during larger storm events to verify that they are not ponding or diverting water in a manner that floods a roadway or damages property.

Floating debris and other trash caught by the inlet protection should be removed after each storm event. Sediment should also be removed from curb inlet protection after each storm event because of the limited storage area associated with curb inlets.

Sediment collected at area inlet protection should be removed before it reaches half the height of the protection device. Sediment should be removed from inlets with excavated impoundment protection before the volume of the excavation is reduced by 50 percent. In addition, the weep holes should be checked and kept clear of blockage.

Concrete blocks, 2 inch x 4 inch boards, stakes, and other materials used to construct inlet protection should be checked for damaged and repaired or replaced if damaged.

When filter fabric or organic filler tubes are used, they should be cleaned or replaced when the material becomes clogged. For systems using filter stone, when the filter stone becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced.

Because of the potential for inlet protection to divert runoff or cause localized flooding, remove inlet protection as soon as the drainage area contributing runoff to the inlet is stabilized. Ensure that all inlet protection devices are removed at the end of the construction.

3.4.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are not for construction. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

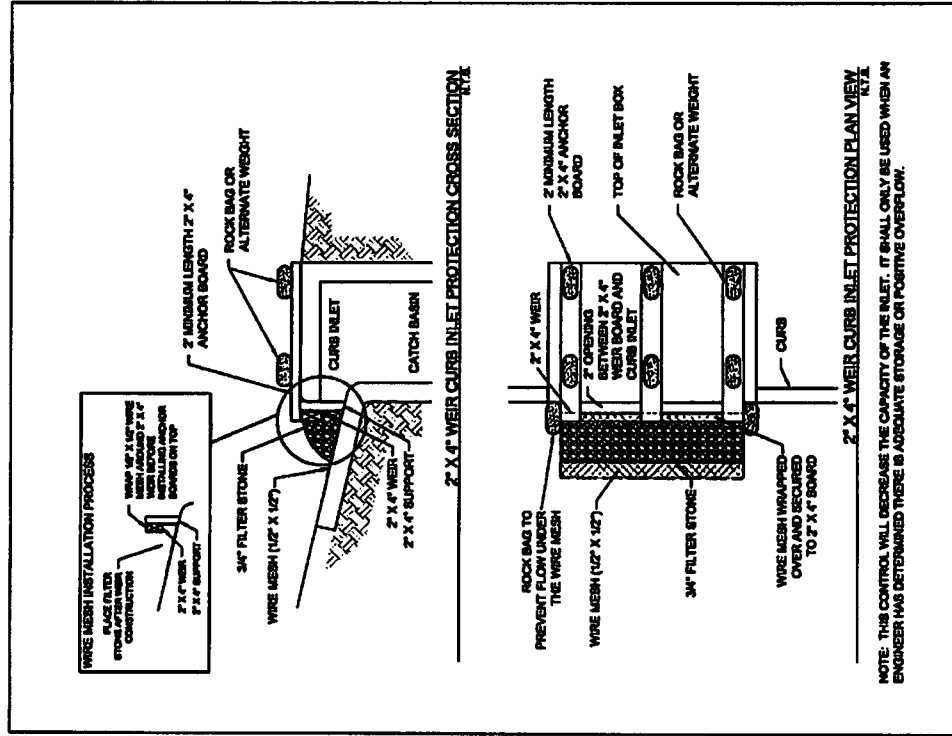


Figure 3.5 Schematics of 2'x4" Weir Curb Inlet Protection
 (Source: Modified from Washington Suburban Sanitary Commission Detail SC-18.9)

Inlet Protection
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CC-87

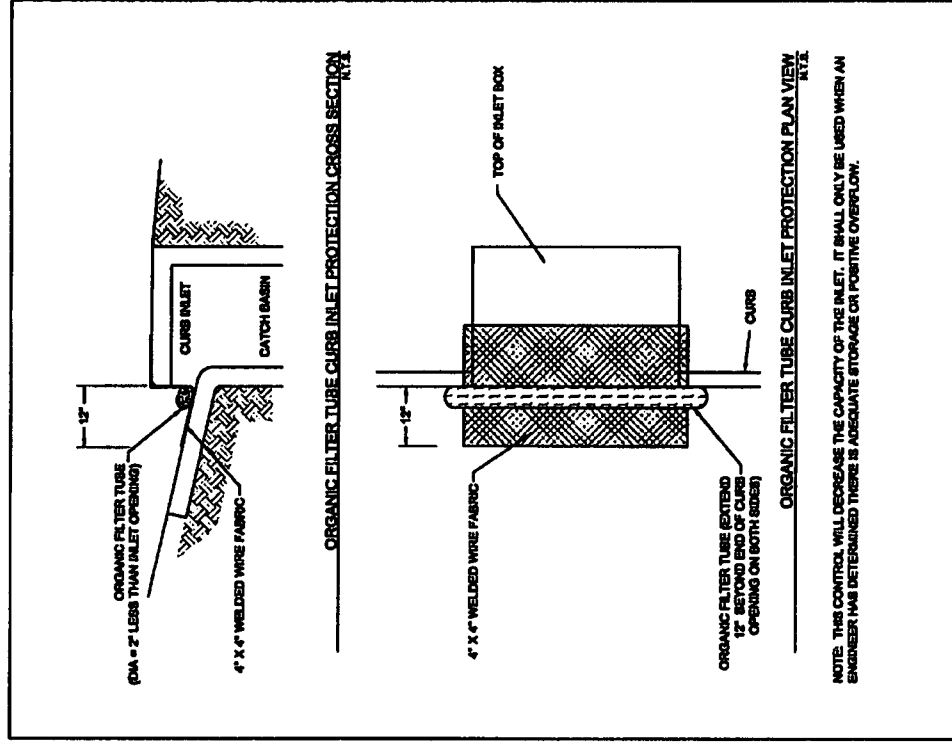


Figure 3.6 Schematics of Organic Filter Tube Curb Inlet Protection
 (Source: Modified from City of Plano BMP BP-4)

Inlet Protection
 Revised 04/10

CC-88

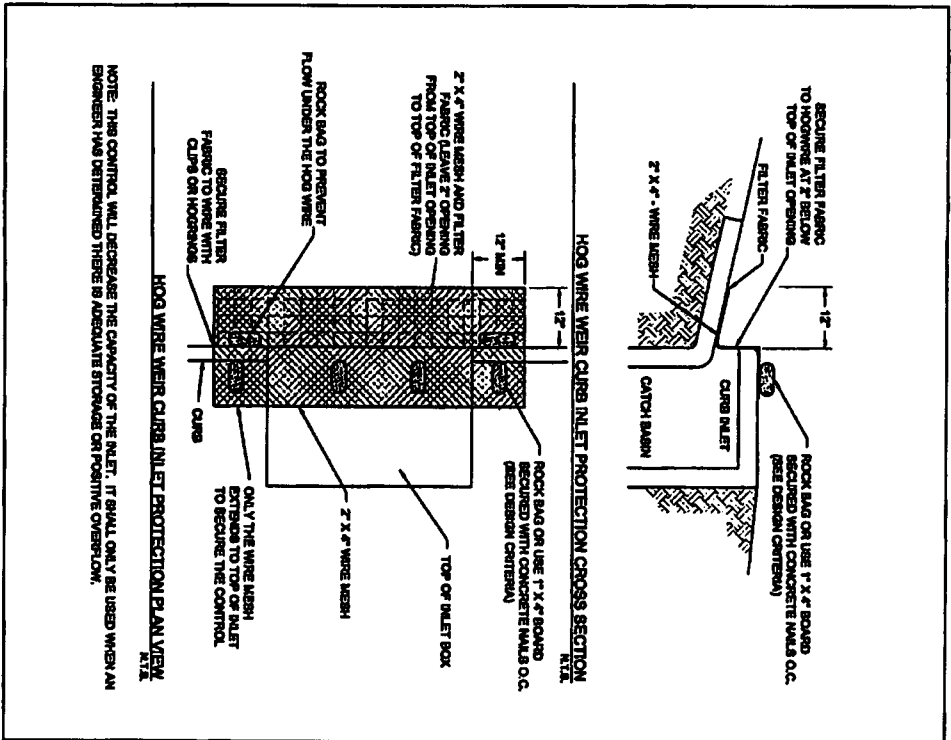


Figure 3.7 Schematics of Hog Wire Weir Curb Inlet Protection
(Source: Modified from City of Round Rock Detail E-40)

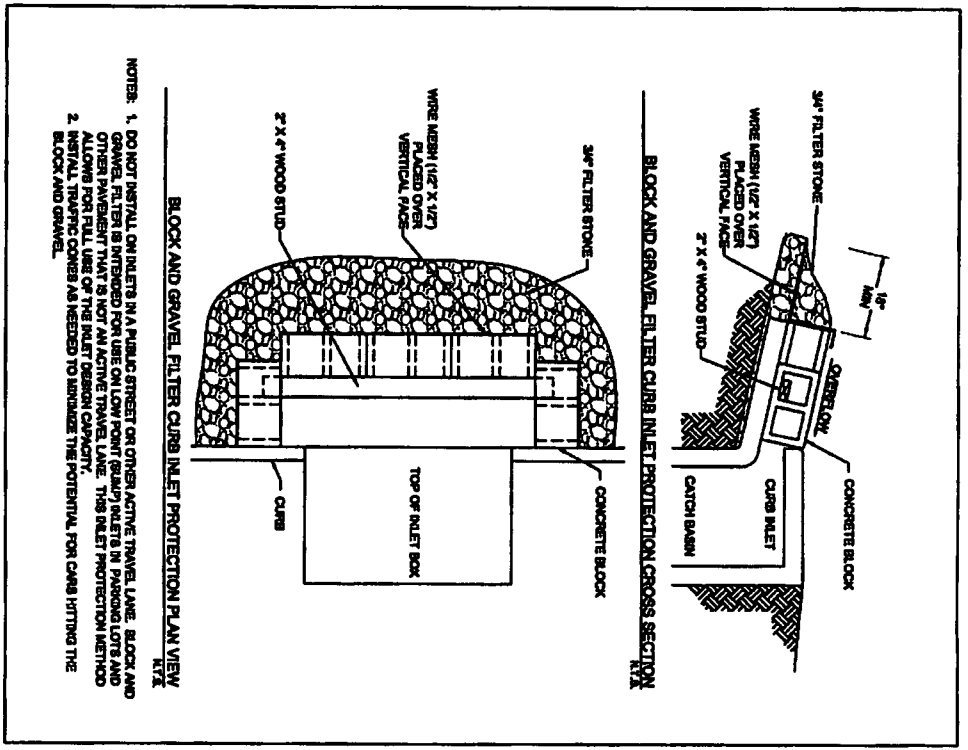


Figure 3.8 Schematics of Block and Gravel Filter Curb Inlet Protection

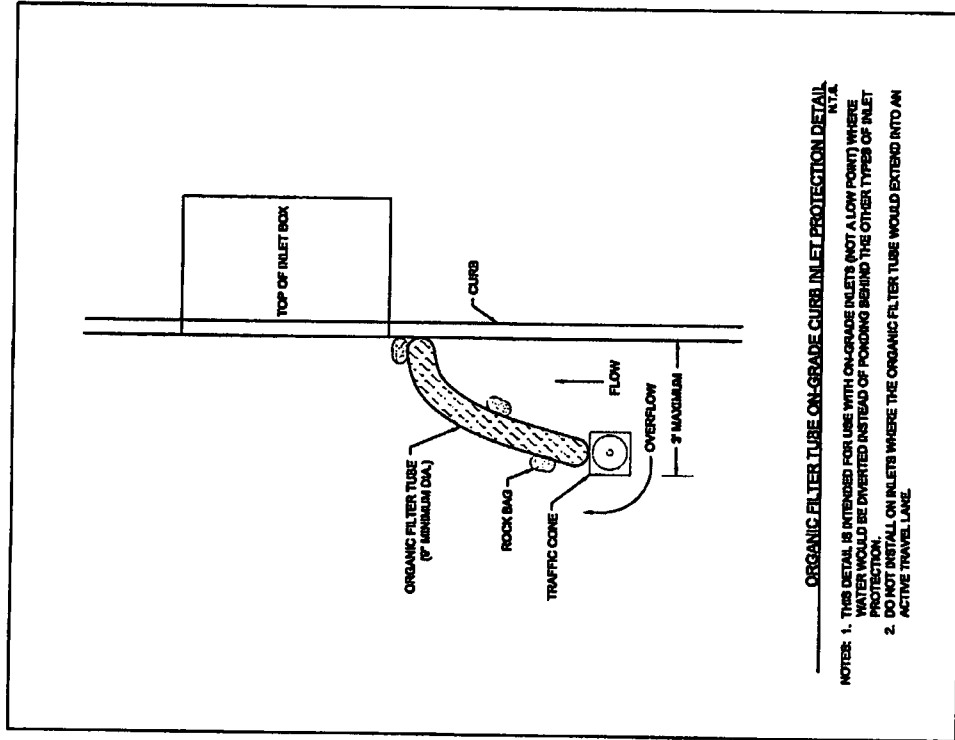


Figure 3.9 Schematic of Organic Filter Tube On-Grade Curb Inlet Protection

Inlet Protection
Revised 04/10

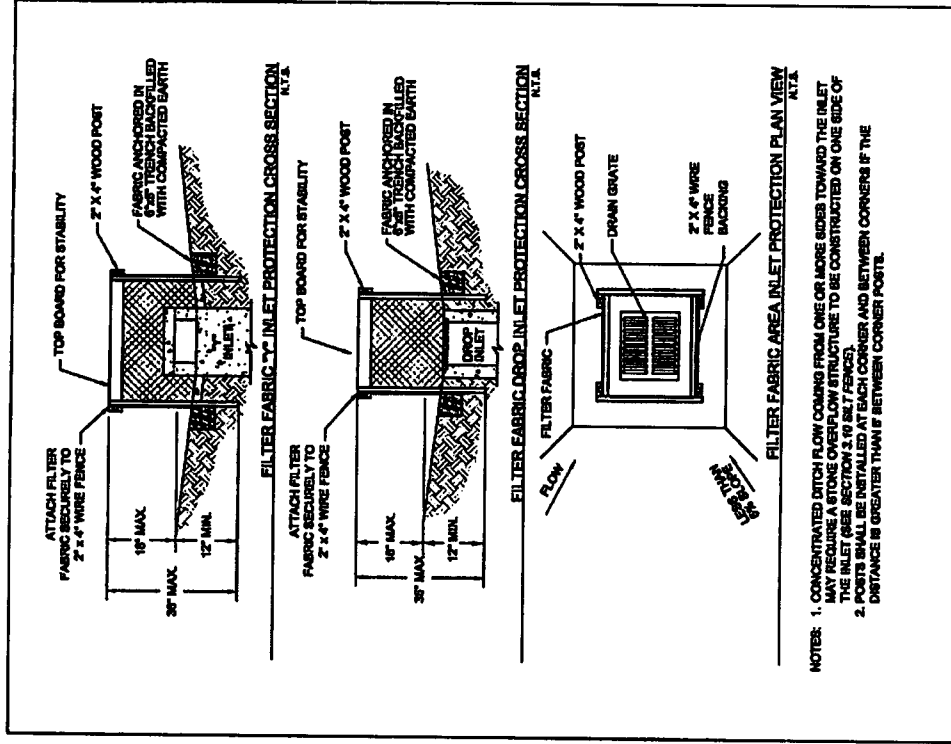


Figure 3.10 Schematics of Filter Fabric Area Inlet Protection
(Source: City of Plano BMP 99-4)

Inlet Protection
Revised 04/10

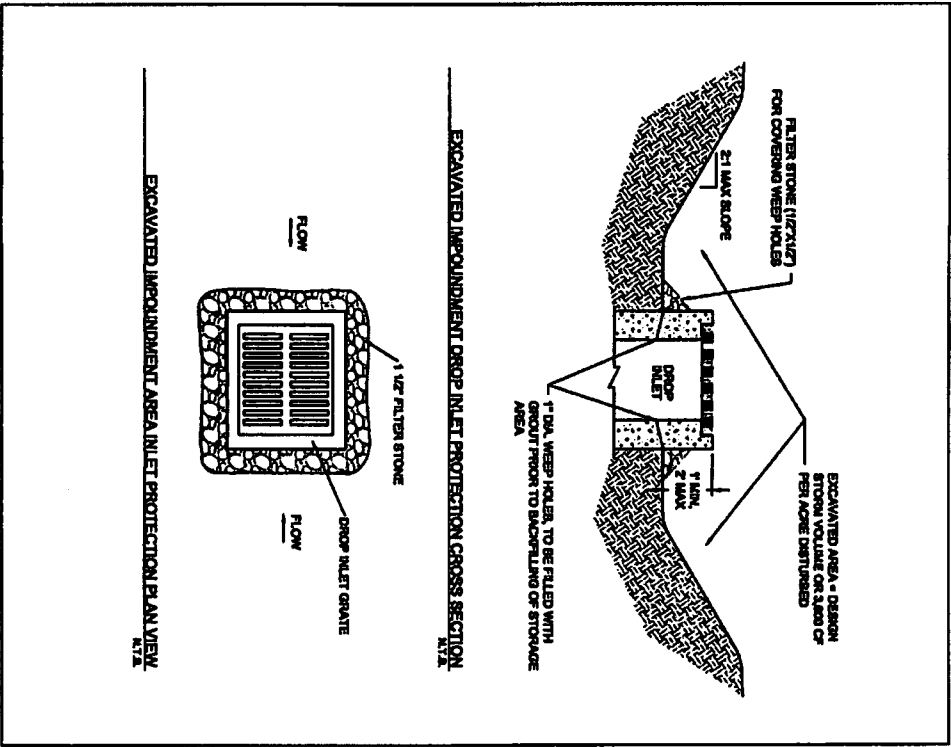


Figure 3.11 Schematics of Excavated Impoundment Area Inlet Protection

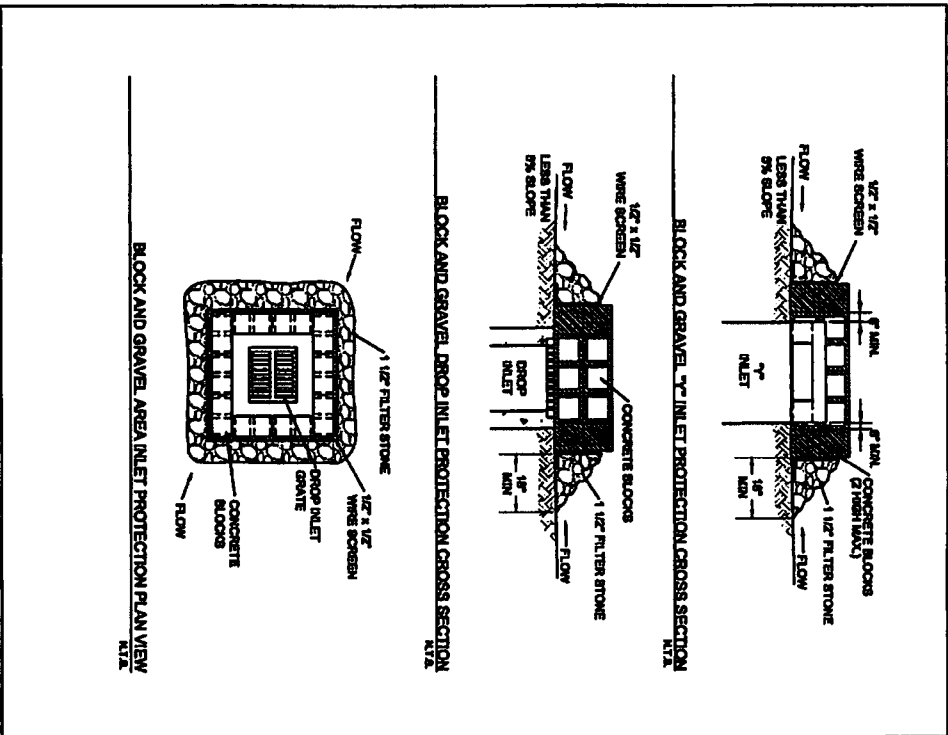


Figure 3.12 Schematics of Block and Gravel Area Inlet Protection
(Source: Modified from City of Plano BMP Sp-4)

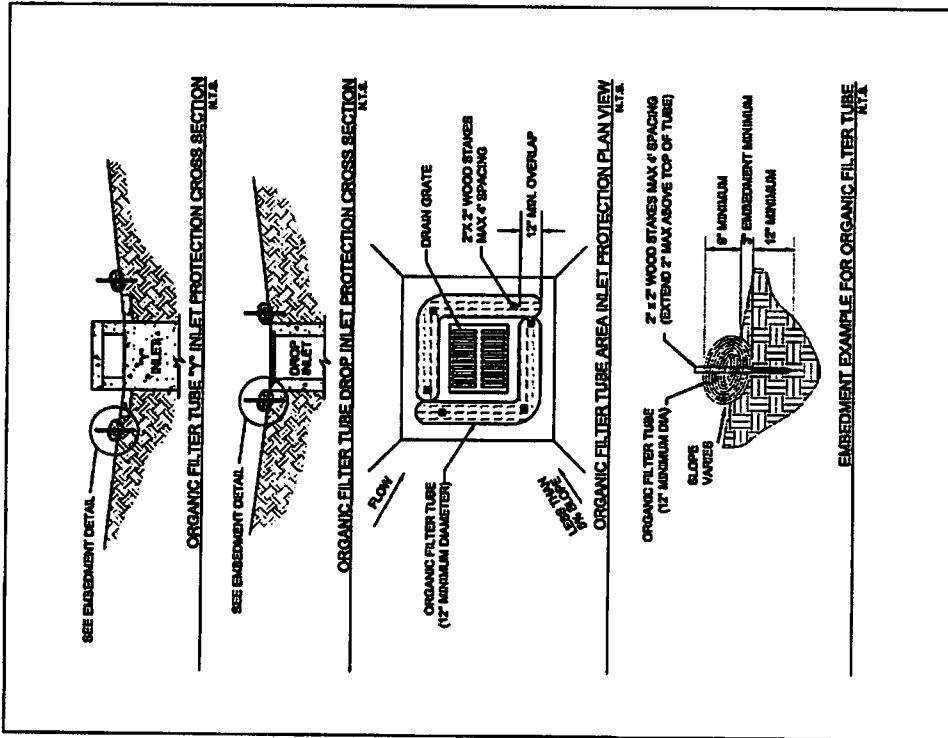


Figure 3.13 Schematics of Organic Filter Tube Area Inlet Protection

3.6 Organic Filter Tubes

<p>DESCRIPTION: Organic filter tubes are comprised of an open weave, mesh tube that is filled with a filter material (compost, wood chips, straw, coir, aspen fiber, or a mixture of materials). The tube may be constructed of geosynthetic material, plastic, or natural materials. Organic filter tubes are also called fiber rolls, fiber logs, wattles, much socks, and/or coir rolls. Filter tubes detain flow and capture sediment as linear controls along the contours of a slope or as a perimeter control down-slope of a disturbed area.</p>	<p>DESIGN CRITERIA:</p> <ul style="list-style-type: none"> • 8 inch minimum tube diameter when filled • 3 inch minimum embedment in soil • 18 inch minimum overlap at ends of tubes • Spacing based on drainage area and slope • Must be staked on soil and secured with rockbags on pavement • Turn ends of tube lines upslope a minimum of 10 feet <p>ADVANTAGES / BENEFITS:</p> <ul style="list-style-type: none"> • Effective means to treat sheet flow over a short distance • Relatively easy to install • May be used on steep slopes • Can provide perimeter control on paved surfaces or where soil type prevents embedment of other controls <p>DISADVANTAGES / LIMITATIONS:</p> <ul style="list-style-type: none"> • Difficult to remove when wet and/or filled with sediment • Relatively small effective areas for sediment capture <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> • Inspect regularly • Repair eroded areas underneath the organic filter tubes • Re-align and stake tubes that are dislodged by flow • Remove sediment before it reaches half the height of the exposed tube 	<p>TARGETED POLLUTANTS</p> <ul style="list-style-type: none"> • Sediment • Nutrients & Toxic Materials • Oil & Grease • Floatable Materials • Other Construction Wastes 								
<p>APPLICATIONS</p> <table border="1"> <tr><td>Perimeter Control</td></tr> <tr><td>Slope Protection</td></tr> <tr><td>Sediment Barrier</td></tr> <tr><td>Channel Protection</td></tr> <tr><td>Temporary Stabilization</td></tr> <tr><td>Final Stabilization</td></tr> <tr><td>Waste Management</td></tr> <tr><td>Housekeeping Practices</td></tr> </table> <p>F₀=0.50-0.75 (Depends on soil type)</p>	Perimeter Control	Slope Protection	Sediment Barrier	Channel Protection	Temporary Stabilization	Final Stabilization	Waste Management	Housekeeping Practices	<p>IMPLEMENTATION CONSIDERATIONS</p> <ul style="list-style-type: none"> • Capital Costs • Maintenance • Training • Suitability for Slopes > 5% <p>Other Considerations:</p> <ul style="list-style-type: none"> • None 	
Perimeter Control										
Slope Protection										
Sediment Barrier										
Channel Protection										
Temporary Stabilization										
Final Stabilization										
Waste Management										
Housekeeping Practices										

3.6.1 Primary Use

Organic filter tubes are long, flexible controls that are used along a line of constant elevation (along a contour) on slopes. They are used as perimeter controls down slope of disturbed areas and on side slopes where stormwater may runoff the area. The tubes maintain sheet flow, slow velocities, and capture sediment. When used on slopes, they also shorten the slope length and protect the slope from erosion.

3.6.2 Applications

Organic filter tubes include a wide variety of tube and filter materials. Organic filter tubes are used as a perimeter sediment barrier, similar to silt fence, for development projects and linear projects, such as roadways and utilities. They work well on individual residential lots and on lots being re-developed, where space may be limited. Organic filter tubes are most effective with coarse to silty soil types. Additional controls may be needed to remove fine silts and clay soils suspended in stormwater.

Organic filter tubes can be used on paved surfaces where it's not possible to stake a silt fence. Applications on paved surfaces include perimeter controls for soil stockpiles, pavement repair areas, utility trenching, and building demolition. When compost filter material is used in tubes on pavement, the material has the added benefit removing some oil and grease from stormwater runoff.

Applications on slopes include temporary sediment control during construction and erosion control of the disturbed soil on the slope. Organic filter tubes may be used to control sheet flow on slopes when final stabilization measures are being applied and established.

Organic filter tubes may also be used for sheet protection and, in limited cases, as check dams in small drainage swales. Refer to Section 3.4 *Sheet Protection* and Section 2.1 *Check Dam* for the design criteria to use organic filter tubes in these applications.

3.6.3 Design Criteria

General Criteria

- Filter tubes should be installed along the contour.
- Tubes shall be staked with 2 inch by 2 inch wooden stakes at a maximum spacing of 4 feet. Rebar or similar metal stakes may be used instead of wooden stakes.
- When placed on pavement, sand or rock bags shall be placed abutting the down-slope side of the tubes to prevent runoff from dislodging the tubes. At a minimum, bags shall be placed one foot from each end of the tube and at the middle of the tube.
- Filter tubes shall be embedded a minimum of three inches when placed on soil. Placement on rock shall be designed as placement on pavement.
- The end of tubes shall overlap a minimum of 18 inches when multiple tubes are connected to form a linear control along a contour or a perimeter.
- The last 10 feet (or more) at the ends of a line of tubes shall be turned upslope to prevent bypass by stormwater. Additional upslope lengths of tubes may be needed every 200 to 400 linear feet, depending on the reverse slope along the line of tubes.
- The most common sizes of tubes are 9 and 12 inch diameter; however, tubes are available in sizes up to 24 inch diameter. The designer shall specify a diameter based on the site application. Tubes less than 9 inches in diameter when filled shall not be used.
- Manufactured organic filter tube products shall have documentation of a minimum 75 percent soil retention using ASTM D7351 Standard Test Method for Determination of Sediment Retention Device Effectiveness in Sheet Flow Applications.

Organic Filter Tubes
Revised 04/10

CC-101

- When using manufactured tubes, the manufacturer's recommendations for diameter and spacing based on slope, flow velocities, and other site conditions shall be followed when they are more stringent than the design criteria in this section.
- When used as a perimeter control on grades of 10:1 or less, criteria in the following table shall be used as a guide for the size and installation rate of the organic filter tube.

Table 3.1 Perimeter Control Applications*

Drainage Area (Acres)	Max Flow Length to the Tube	Tube Diameter (Inch)
1/3 Acres per 100 feet	145 feet	18 inches
1/4 Acres per 100 feet	110 feet	15 inches
1/5 Acres per 100 feet	85 feet	12 inches
1/8 Acres per 100 feet	65 feet	9 inches

(Source: Modified and expanded from City of Plano Fact Sheet SR-13)

- When installing organic filter tubes along contours on slopes, criteria in the following table shall be used as a general guide for size and spacing of the tubes. Actual tube diameter and spacing shall be specified by the designer. The designer shall consider the tube manufacturer's recommendations, the soil type, flow volume on the slope, required performance life, and erosion control measures that may be used in conjunction with the tubes.

Table 3.2 Maximum Spacing for Slope Protection

Slope (H:V)	Tube Diameter (Inch)			
	9 inches	12 inches	18 inches	24 inches
5:1 to 10:1	35 feet	40 feet	55 feet	60 feet
4:1	30 feet	40 feet	50 feet	50 feet
3:1	25 feet	35 feet	40 feet	40 feet
2:1	20 feet	25 feet	30 feet	30 feet
1:1	10 feet	15 feet	20 feet	20 feet

(Source: Modified and expanded from Iowa Standards Urban Design and Specifications Standards for Filter Socks)

Tube Material

- The designer shall specify the type of mesh based on the required life of the tube. At a minimum, the mesh shall have a rated life of one year under field conditions.
- If the tubes will be left onsite as part of the final stabilization, they must be constructed of 100 percent biodegradable jute, cotton, steel or similar natural fiber or 100 percent UV photodegradable plastic, polyester or geosynthetic material.
- Mesh tubes may be oval or round in cross-section.
- Mesh for the tubes shall be open and evenly woven. Size of weave openings shall be specified based on filter material. Openings may range from 1/4 inch for Erosion Control Compost to 2 inches for straw and coir.
- Mesh should not exceed 1/4 inch in diameter.

Filter Material

- Different filter materials have different properties and will affect sheet flow differently. The designer shall specify the type of material to be used (or excluded) on a particular site.
- Straw filter material shall be Certified Weed Free Forage. The straw must be in good condition, air-dried, and not rotten or moldy.

Organic Filter Tubes
Revised 04/10

CC-102

- Compost shall conform to the requirements for Erosion Control Compost in TxDOT Special Specification 1001 Compost (2004). Compost may provide some oil and grease removal; however, the large percentage of fines in compost will result in less filtering and more ponding of stormwater.
- Wood chips shall be 100 percent untreated chips and free of inorganic debris, such as plastic, glass, metal, etc. Wood chip size shall not be smaller than 1 inch and shall not exceed 3 inches in diameter. Shavings shall not be more than 5% of the total mass.

3.6.4 Design Guidance and Specifications

Specifications for Erosion Control Compost to be used as filter material may be found in Item 161 of the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TxDOT 2004) and TxDOT Special Specification 1001 Compost (2004).

3.6.5 Inspection and Maintenance Requirements

Organic filter tubes should be inspected regularly (at least as often as required by the TPDES Construction General Permit). The filter tube should be checked to ensure that it is in continuous contact with the soil at the bottom of the embankment trench. Closely check for fill erosion that may develop under the filter tubes. Eroded spots must be repaired and monitored to prevent recurrence. If erosion under the tube continues, additional controls are needed.

Staking shall be checked to ensure that the filter tubes are not moving due to stormwater runoff. Repair and re-stake stumping filter tubes. Tubes that are split, torn or unraveling shall be repaired or replaced.

Check the filter tube material to make sure that it has not become clogged with sediment or debris. Clogged filter tubes usually lead to standing water behind the filter tube after the rain event. Sediment shall be removed from behind the filter tube before it reaches half the height of the exposed portion of the tube.

When sediment control is no longer needed on the site, the tubes may be split open and the filter material may be used for mulching during establishment of vegetation for final stabilization if it meets the criteria in Section 2.5 Matching.

3.6.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are not for construction. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

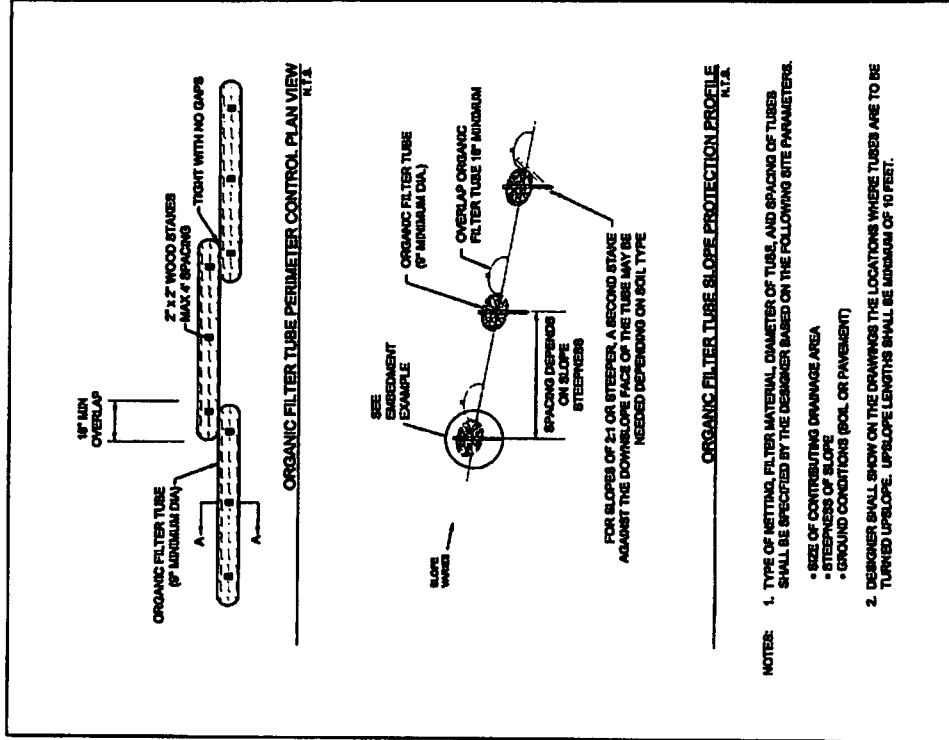


Figure 3.16 Schematics of Organic Filter Tubes

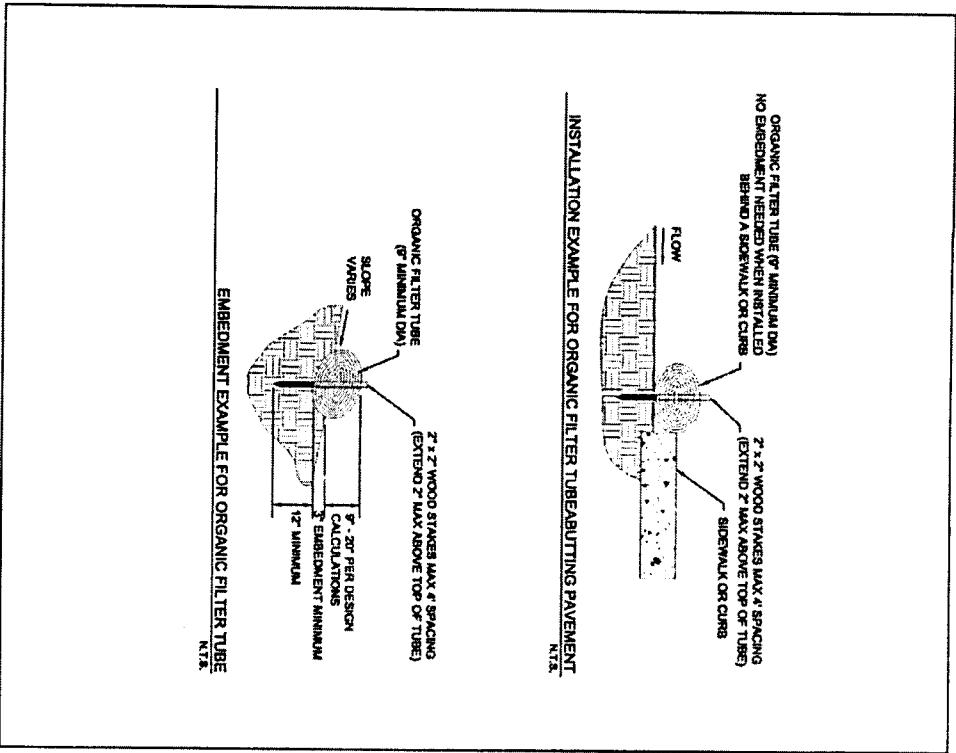
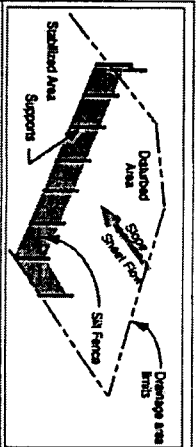


Figure 3.16 Examples of Organic Filter Tube Installation Methods

3.10 Silt Fence



KEY CONSIDERATIONS

- DESIGN CRITERIA:**
- Maximum drainage area of 0.25 acre per 100 linear feet of silt fence
 - Maximum 200 feet distance of flow to silt fence; 50 feet if slope exceeds 10 percent
 - Minimum fabric overlap of 3 feet at abutting ends; join fabric to prevent leakage
 - Turn end of silt fence line upslope a minimum of 10 feet
 - Install stone overflow structure at low points or spaced at approximately 300 feet if no apparent low point

ADVANTAGES / BENEFITS:

- Economical means to treat sheet flow
- Most effective with coarse to silty soil types

DISADVANTAGES / LIMITATIONS:

- Limited effectiveness with clay soils due to clogging
- Localized flooding due to minor ponding at the upslope side of the silt fence
- Not for use as check dams in swales or low areas subject to concentrated flow
- Not for use where soil conditions prevent a minimum toe-in depth of 6 inches or installation of support posts to a depth of 12 inches
- Can fail structurally under heavy storm flows, creating maintenance problems and reducing effectiveness

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Repair undercutting, sags and other fence failures
- Remove sediment before it reaches half the height of the fence
- Repair or replace damaged or clogged filter fabric

TARGETED POLLUTANTS

- Sediment
- Nutrients & Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Wastes

Sediment Control

Description: A silt fence consists of geotextile fabric supported by wire mesh netting or other backing stretched between metal posts with the lower edge of the fabric securely embedded six-inches in the soil. The fence is typically located downstream of disturbed areas to intercept runoff in the form of sheet flow. A silt fence provides both filtration and time for sediment settling by reducing the velocity of the runoff.

APPLICATIONS

- Perimeter Control
- Slope Protection
- Sediment Barrier
- Channel Protection
- Temporary Stabilization
- Final Stabilization
- Waste Management
- Housekeeping Practices

F_g=0.50-0.75
(Depends on soil type)

IMPLEMENTATION CONSIDERATIONS

- Capital Costs
- Maintenance
- Training
- Suitability for Slopes > 5%

Other Considerations:

- Effects of ponding or the redirection of flow onto adjacent areas and property.

3.10.1 Primary Use

Silt fence is normally used as a perimeter control on the down slope side of disturbed areas and on side slopes where stormwater may runoff the area. It is only feasible for non-concentrated, sheet flow conditions. If it becomes necessary to place a silt fence where concentrated flows may occur (e.g. where two silt fences join at an angle, or across minor channels or gullies), it will be necessary to reinforce the silt fence at that area by a rock berm or sand bag berm, or other structural measures that will support the silt fence.

3.10.2 Applications

Silt fence is an economical means to treat overland, non-concentrated flows for all types of projects. Silt fences are used as perimeter control devices for both site developers and linear (roadway) type projects. They are most effective with coarse to silty soil types. Due to the potential of clogging and limited effectiveness, silt fences should be used with caution in areas that have predominantly clay soil types. In this latter instance, a soils engineer or soil scientist should confirm the suitability of silt fence for that application. Additional controls may be needed to remove fine silts and clay soils suspended in stormwater.

3.10.3 Design Criteria

- Fences are to be constructed along a line of constant elevation (along a contour line) where possible.
- Silt fences can interfere with construction operations; therefore, planning of access routes onto the site is critical.
- Maximum drainage area shall be 0.25 acre per 100 linear feet of silt fence.
- Maximum flow to any 20 foot section of silt fence shall be 1 CFS.
- Maximum distance of flow to silt fence shall be 200 feet or less. If the slope exceeds 10 percent the flow distance shall be less than 50 feet.
- Maximum slope adjacent to the fence shall be 2:1.
- Silt fences shall not be used where there is a concentration of water in a channel, drainage ditch or swale, nor should it be used as a control on a pipe outfall.
- If 50 percent or less soil, by weight, passes the U.S. Standard Sieve No. 200; select the apparent opening size (A.O.S.) to retain 85 percent of the soil.
- If 85 percent or more of soil by weight, passes the U.S. Standard Sieve No. 200, silt fences shall not be used unless the soil mass is evaluated and deemed suitable by a soil scientist or geotechnical engineer concerning the erodibility of the soil mass, dispersive characteristics, and the potential grain-size characteristics of the material that is likely to be eroded.
- Stone overflow structures or other outlet control devices shall be installed at all low points along the fence or spaced at approximately 300 feet if there is no apparent low point.
- Filter stone for overflow structure shall be 1 1/2 inches washed stone containing no fines. Angular shaped stone is preferable to rounded shapes.
- Silt fence fabric must meet the following minimum criteria:
 - Tensile Strength, ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles, 90-lbs.
 - Puncture Rating, ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products, 60-lbs.
 - Multiaxial Burst Rating, ASTM D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabric- Diaphragm Bursting Strength Tester Method, 280-psi.

Silt Fence
Revised 04/10

CC-144

- Apparent Opening Size, ASTM D4751 Test Method for Determining Apparent Opening Size of a Geotextile, U.S. Sieve No. 30(max) to No. 100 (min).
- Ultraviolet Resistance, ASTM D4355 Standard Test Method for Determination of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus, Minimum 70 percent.
- Fence posts shall be steel and may be T-section or L-section, 1.3 pounds per linear foot minimum, and 4 feet in length minimum. Wood posts may be used depending on anticipated length of service and provided they are 4 feet in length minimum and have a nominal cross section of 2 inches by 4 inches for pine or 2 inches by 2 inches for hardwoods.
- Silt fence shall be supported by steel wire fence fabric as follows:
 - 4 inch x 4 inch mesh size, W1.4/1.4, minimum 14 gauge wire fence fabric;
 - Hog wire, 12 gauge wire, small openings installed at bottom of silt fence;
 - Standard 2 inch x 2 inch chain link fence fabric; or
 - Other welded or woven steel fabrics consisting of equal or smaller spacing as that listed herein and appropriate gauge wire to provide support.
- Silt Fence shall consist of synthetic fabric supported by wire mesh and steel posts set a minimum of 1-foot depth and spaced not more than 6-feet on center.
- A 6 inch wide trench is to be cut 6 inches deep at the toe of the fence to allow the fabric to be laid below the surface and backfilled with compacted earth or gravel to prevent bypass of runoff under the fence. Fabric shall overlap at abutting ends a minimum of 3 feet and shall be joined such that no leakage or bypass occurs. If soil conditions prevent a minimum toe-in depth of 6 inches or installation of support post to depth of 12 inches, silt fences shall not be used.
- Sufficient room for the operation of sediment removal equipment shall be provided between the silt fence and other obstructions in order to properly maintain the fence.
- The last 10 feet (or more) at the ends of a line of silt fence shall be turned upslope to prevent bypass of stormwater. Additional upslope runs of silt fence may be needed every 200 to 400 linear feet, depending on the traverse slope along the line of silt fence.

3.10.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction - North Central Texas Council of Governments, Section 201.5 Silt Fence and in the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (TxDot 2004) Item 506.2.J and Item 506.4.C.9.

The American Society for Testing and Materials has established standard specifications for silt fence materials (ASTM D6461) and silt fence installation (ASTM D6462).

3.10.5 Inspection and Maintenance Requirements

Silt fence should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for buildup of excess sediment, undercutting, sagging, and other failures. Sediment should be removed before it reaches half the height of the fence. In addition, determine the source of excess sediment and implement appropriate measures to control the erosion. Damaged or clogged fabric must be repaired or replaced as necessary.

Silt Fence
Revised 04/10

CC-145

3.10.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are not for construction. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes applicable for the application must be added by the designer.

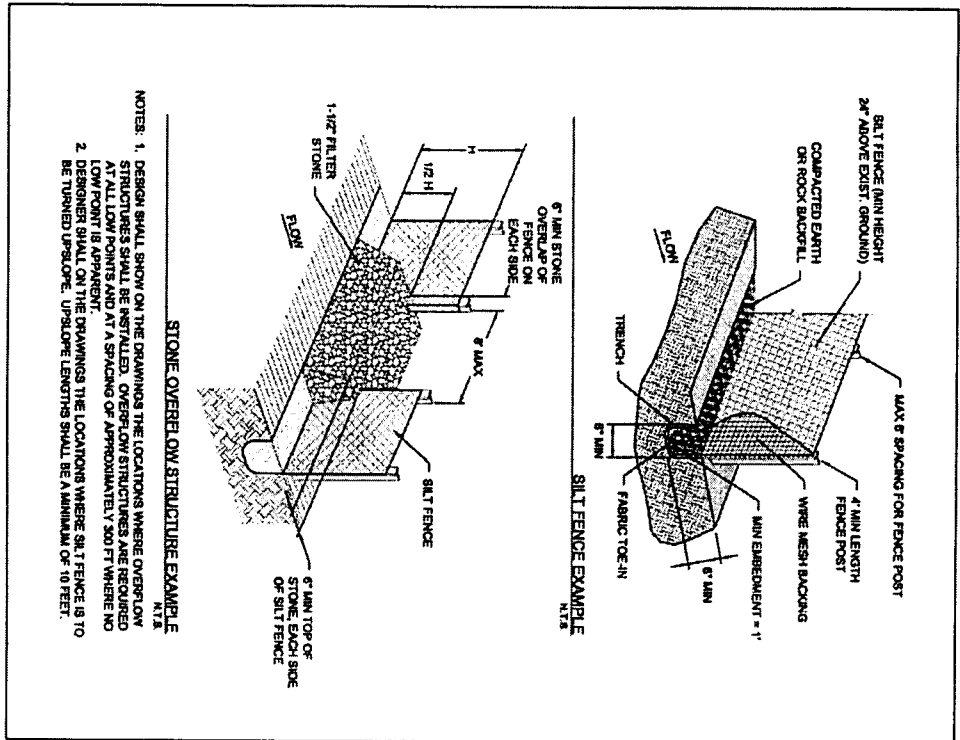


Figure 3.28 Schematics of Silt Fence

3.11 Stabilized Construction Exit

	<p>Description: A stabilized construction exit is a pad of crushed stone, recycled concrete or other rock material placed on geotextile fiber cloth to dislodge soil and other debris from construction equipment and vehicle tires prior to exiting the construction site. The object is to minimize the tracking of soil onto public roadways where it will be suspended by stormwater runoff.</p>
<p>KEY CONSIDERATIONS</p> <p>DESIGN CRITERIA:</p> <ul style="list-style-type: none"> • Slope exit away from offsite paved surface • Minimum width and length dependent on size of disturbed area, which correlates to traffic volume • 6 inches minimum thickness of stone layer • Stone of 3 to 5 inches in size • Add a wheel cleaning system when inspections reveal the stabilized exit does not prevent tracking <p>ADVANTAGES / BENEFITS:</p> <ul style="list-style-type: none"> • Reduces tracking of soil onto public streets • Directs traffic to a controlled access point • Protects other sediment controls by limiting the area disturbed <p>DISADVANTAGES / LIMITATIONS:</p> <ul style="list-style-type: none"> • Effectiveness dependent on limiting ingress and egress to the stabilized exit • A wheel washing system may also be required to remove clay soil from tires, particularly in wet conditions <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> • Inspect regularly • Replace rock when sediment in the void area between the rocks is visible on the surface • Periodically re-grade and top dress with additional stone to maintain efficiency 	<p>APPLICATIONS</p> <ul style="list-style-type: none"> • Perimeter Control • Slope Protection • Sediment Barrier • Channel Protection • Temporary Stabilization • Final Stabilization • Waste Management • Housekeeping Practices <p>F6=N/A</p>
<p>TARGETED POLLUTANTS</p> <ul style="list-style-type: none"> • Sediment • Nutrients & Toxic Materials • Oil & Grease • Flammable Materials • Other Construction Wastes 	<p>IMPLEMENTATION CONSIDERATIONS</p> <ul style="list-style-type: none"> • Capital Costs • Maintenance • Training • Suitability for Slopes > 6% <p>Other Considerations:</p> <ul style="list-style-type: none"> • None

3.11.1 Primary Use

Stabilized construction exits are used to remove soil, mud and other matter from vehicles that drive off of a construction site onto public streets. Stabilized exits reduce the need to remove sediment from streets. When used properly, they also control traffic by directing vehicles a single (or two for larger sites) location. Controlling traffic onto and off of the site reduces the number and quantity of disturbed areas and provides protection for other sediment controls by decreasing the potential for vehicles to drive over the control.

3.11.2 Applications

Stabilized construction exits are used on all construction sites with a disturbed area of one acre or larger and are a recommended practice for smaller construction sites. A stabilized exit is used on individual residential lots until the driveway is paved. Stabilized construction exits may be used in conjunction with wheel cleaning systems as described in Section 3.16 Wheel Cleaning Systems.

3.11.3 Design Criteria

- Limit site access to one route during construction, if possible; two routes for linear and larger projects.
- Prevent traffic from avoiding or shortcutting the full length of the construction exit by installing barriers. Barriers may consist of silt fence, construction safety fencing, or similar barriers.
- Design the access point(s) to be at the upslope side of the construction site. Do not place construction access at the lowest point on the construction site.
- Stabilized construction exits are to be constructed such that drainage across the exit is directed to a controlled, stabilized outlet onsite with provisions for storage, proper filtration, and removal of wash water.
- The exit must be sloped away from the paved surface so that stormwater from the site does not discharge through the exit onto roadways.
- Minimum width of exit shall be 15 feet.
- The construction exit material shall be a minimum thickness of 6 inches. The stone or recycled concrete used shall be 3 to 5 inches in size with little or no fines.
- The geotextile fabric must meet the following minimum criteria:
 - Tensile Strength, ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles, 300 lbs.
 - Puncture Strength, ASTM D4633 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products, 120 lbs.
 - Milken Burst Rating, ASTM D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabric-Diaphragm Bursting Strength Tester Method, 600 psi.
 - Apparent Opening Size, ASTM D4751 Test Method for Determining Apparent Opening Size of a Geotextile, U.S. Sieve No. 40 (max).
- Rock by itself may not be sufficient to remove clay soils from wheels, particularly in wet conditions. When necessary, vehicles must be cleaned to remove sediment prior to entering paved roads, streets, or parking lots. Refer to Section 3.16 Wheel Cleaning Systems for additional controls.
- Using water to wash sediment from streets is prohibited
- Minimum dimensions for the stabilized exit shall be as follows:

Disturbed Area	Mts. Width of Exit	Mts. Length of Exit
< 1 Acre	15 feet	20 feet
≥ 1 Acre but < 5 Acres	25 feet	50 feet
≥ 5 Acres	30 feet	50 feet

- If a wheel cleaning system is used, the width of the stabilized exit may be reduced to funnel traffic into the system. Refer to Section 3.16 Wheel Cleaning.

3.11.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.10 Stabilized Construction Entrance and in the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (TxDOT 2004) Item 506.2.E and Item 506.4.C.5.

3.11.5 Inspection and Maintenance Requirements

Construction exits should be inspected regularly (at least as often as required by the TPOES Construction General Permit). The stabilized construction exit shall be maintained in a condition that prevents tracking or flow of sediment onto paved surfaces. Periodic re-grading and top dressing with additional stone must be done to keep the efficiency of the exit from diminishing. The rock shall be re-graded when ruts appear. Additional rock shall be added when soil is showing through the rock surface.

Additional controls are needed if inspections reveal a properly installed and maintained exit, but tracking of soil outside the construction area is still evident. Additional controls may be daily sweeping of all soil spilled, dropped, or tracked onto public rights-of-way or the installation of a wheel cleaning system.

3.11.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are not for construction. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

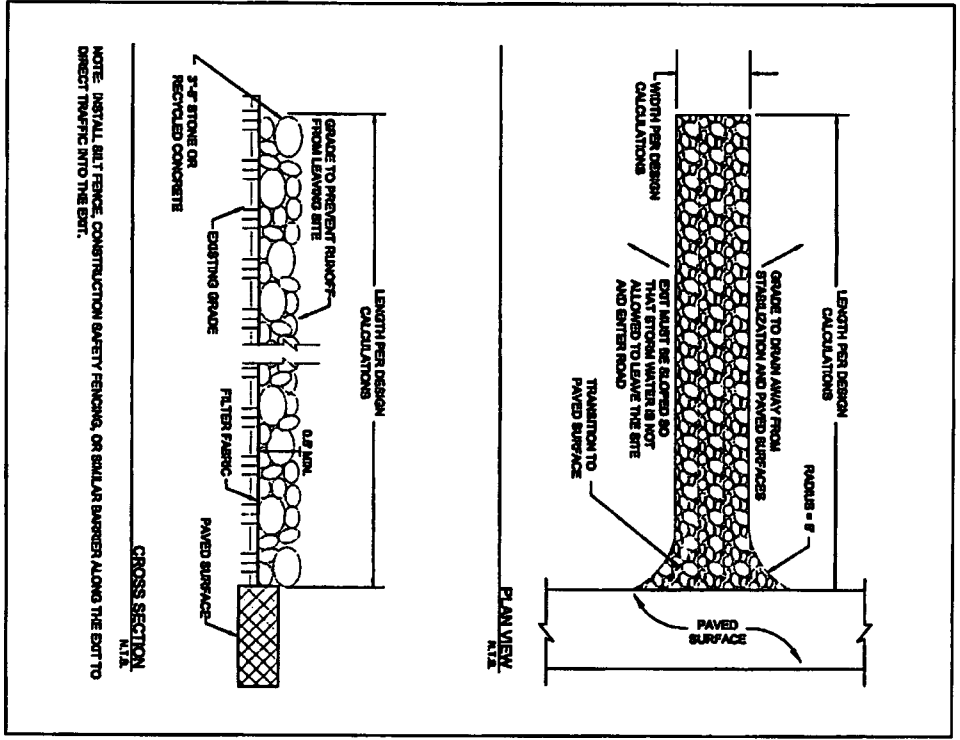


Figure 3.29 Schematics of Stabilized Construction Exit

4.0 Material and Waste Controls

4.1 Chemical Management

Material and Waste Control	
<p>DESCRIPTION: Chemical management addresses the potential for stormwater to be polluted with chemical materials and wastes that are used or stored on a construction site. The objective of chemical management is to minimize the potential of stormwater contamination by construction chemicals through appropriate recognition, handling, storage, and disposal practices.</p>	<p>APPLICATIONS</p> <ul style="list-style-type: none"> Perimeter Control Slope Protection Sediment Barrier Channel Protection Temporary Stabilization Final Stabilization Waste Management Housekeeping Practices
<p>KEY CONSIDERATIONS</p> <p>DESIGN CRITERIA:</p> <ul style="list-style-type: none"> • Designate a person responsible for chemical management • Minimize the amount of chemicals and waste stored onsite • Provide secondary containment that's 110 percent of the largest container in the containment • Label all containers • Prohibit the discharge of washout water • Train workers in proper procedures • Provide timely removal of waste materials <p>LIMITATIONS:</p> <ul style="list-style-type: none"> • Not intended to address site-assessment and pre-existing contamination • Does not address demolition activities and potential pre-existing materials, such as lead and asbestos • Does not address contaminated soils • Does not address spill and leak response procedures • Does not address chemicals associated with vehicle and equipment management <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> • Inspect regularly • Check for proper storage and evidence of leaks and spills • Make sure all containers are labeled • Check waste containers and dispose of the waste when 90 percent full • Verify procedures are being followed • Train new employees and regularly re-train all employees 	<p>IMPLEMENTATION CONSIDERATIONS</p> <ul style="list-style-type: none"> • Capital Costs • Maintenance • Training • Suitability for Slopes > 6% <p>Other Considerations:</p> <ul style="list-style-type: none"> • TCEQ regulations for hazardous waste
<p>TARGETED POLLUTANTS</p> <ul style="list-style-type: none"> ○ Sediment ● Nutrients & Toxic Materials ● Oil & Grease ○ Floatable Materials ● Other Construction Wastes 	

4.1.1 Primary Use

These management practices, along with applicable OSHA, EPA, and TCEQ requirements, are implemented at construction sites to prevent chemicals, hazardous materials, and their wastes from becoming stormwater pollutants.

4.1.2 Applications

Chemical management is applicable on all construction sites where chemicals and hazardous materials are stored or used and could result in pollutants being discharged with stormwater. Many chemicals, such as paints, grease, concrete curing compounds, and pesticides are present at most construction sites. Chemical management is most effective when used in conjunction with controls in Section 4.8 Spill and Leak Response Procedures.

Management of vehicle and equipment maintenance chemicals is applicable to all construction activities. These chemicals are the most common ones on construction sites; plus, there are specific stormwater permit requirements for vehicle and equipment maintenance. For these reasons, the management of chemicals associated with vehicles and equipment are found in Section 4.10 Vehicle and Equipment Maintenance.

Chemical management techniques are based on proper recognition, handling, and disposal practices by construction workers and supervisors. Key elements are education and modification of workers' behavior and provisions for safe storage and disposal. Cooperation and vigilance is required on the part of supervisors and workers to ensure that the procedures are followed.

The following list (not all inclusive) gives examples of targeted chemicals:

- Paints
- Solvents
- Stains
- Wood preservatives
- Cutting oils
- Greases
- Roofing tar
- Pesticides, herbicides, & fertilizers
- Concrete curing compound

It is not the intent of chemical management to supersede or replace normal site assessment and remediation procedures. Significant spills and/or contamination warrant immediate response by trained professionals. Chemical management shall be applied in combination with criteria in Section 4.8 Spill and Leak Response Procedures.

4.1.3 Design Criteria

- Construction plan notes shall require controls for all chemicals, hazardous materials, and their wastes that are potentially exposed to precipitation or stormwater runoff.
- Show the location of chemical and hazardous waste storage and secondary containment on the drawings, or require the contractor to add this information.
- The contractor should be required to designate a site superintendent, foreman, safety officer, or other senior person who is onsite daily to be responsible for implementing chemical management.
- Specify use of the least hazardous chemical to perform a task when alternatives are available. To the extent possible, do not use chemicals that are classified as hazardous materials or that will generate

a hazardous waste. A hazardous material is any compound, mixture, solution, or substance containing a chemical listed on the EPA's *Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA)* and Section 112(d) of the *Clean Air Act* (EPA 650-B-01-003, October 2001), available at:

<http://www.epa.gov/ceppo/public/ceplists3.pdf>

Chemical and Hazardous Material Storage

- As much as possible, minimize the exposure of building materials, building products, landscape materials, fertilizers, pesticides, herbicides, detergents, and other materials to precipitation and stormwater runoff.
- Chemicals and hazardous materials shall be stored in their original, manufacturer's containers, inside a shelter that prevents contact with rainfall and runoff.
- The amount of chemicals and hazardous materials stored onsite shall be minimized and limited to the materials necessary for the current phase of construction.
- Material Safety and Data Sheets (MSDSs) shall be available for all chemicals used or stored onsite.
- Chemical and hazardous materials shall be stored a minimum of 30 feet away from inlets, swales, drainage ways, channels, and other waters, if the site configuration provides sufficient space to do so. In no case shall material and waste sources be closer than 20 feet from inlets, swales, drainage ways, channels, and other waters.
- Use secondary containment controls for all hazardous materials. Containment shall be a minimum size of 110 percent of the largest chemical container stored within the containment.
- If an earthen pit or berm is used for secondary containment, it shall be lined with plastic or other material that is compatible with the chemical being stored.
- Chemical and hazardous material storage shall be in accordance with Federal and State of Texas regulations and with the municipality's fire codes.
- Storage locations shall have appropriate placards for emergency responders.
- Containers shall be kept closed except when materials are added or removed.
- Chemicals shall be dispensed using drip pans or within a lined, bermed area or using other spillover/flow protection measures.

Washout Procedures

- Many chemicals (e.g. slurry, paint, form release oils, curing compounds) used during construction may require washing of applications or containers after use. The discharge of this wash water is prohibited.
- Wash water shall be collected in containers, labeled, and classified for correct waste disposal.
- A licensed waste hauler shall be used for wash water.

Chemical and Hazardous Waste Handling

- Ensure that adequate waste storage volume is available.
- Ensure that waste collection containers are conveniently located and compatible with the waste chemicals.
- Waste containers shall have lids and be emptied or hauled for disposal when they are 90 percent full or more frequently.
- Segregate potentially hazardous waste from non-hazardous construction waste and debris.

- Do not mix different chemical wastes. First, dangerous reactions may result. Second, all of the waste will be classified as the most hazardous waste in the container and will increase disposal costs.
- Clearly label all chemical and hazardous waste containers to identify which wastes are to be placed in each container.
- Based on information in the Material Safety Data Sheet, ensure that proper spill containment material is available onsite and maintained near the storage area.
- Do not allow potentially hazardous waste to be stored on the site for more than 90 days.
- Enforce hazardous waste handling and disposal procedures.

Disposal Procedures

- Regularly schedule waste removal to minimize onsite storage.
- Use only licensed waste haulers.
- For special and hazardous wastes, use licensed hazardous waste transporter that can classify, manifest and transport the special or hazardous wastes for disposal.
- Where possible, send wastes such as used oil to a recycler instead of a disposal facility.
- No chemical waste shall be buried, burned or otherwise disposed of onsite.

Education

- Instruct workers on safe chemical storage and disposal procedures.
- Instruct workers in identification of chemical pollutants and proper methods to contain them during storage and use.
- Educate workers of potential dangers to humans and the environment from chemical pollutants.
- Educate all workers on chemical storage and disposal procedures.
- Have regular meetings to discuss and reinforce identification, handling and disposal procedures (incorporate in regular safety seminars).
- Establish a program to train new employees.

Quality Control

- Designated personnel shall monitor onsite chemical storage, use, and disposal procedures.
- Educate and if necessary, discipline workers who violate procedures.
- Retain trip reports and manifests that document the recycling or disposal location for all chemical, special, and hazardous wastes that are hauled from the site.

4.1.4 Design Guidance and Specifications

National guidance for response procedures are established by the Environmental Protection Agency (EPA) in the Code of Federal Regulations (CFR). Specific sections addressing spills are governed by:

- 40 CFR Part 261 Identification and Listing of Hazardous Waste.
- 40 CFR Part 262 Standards Applicable to Generators of Hazardous Waste.
- 40 CFR Part 263 Standards Applicable to Transporters of Hazardous Waste.
- 49 CFR Parts 171-176 of the Transportation Hazardous Materials Regulations.

Guidance for storing, labeling, and managing hazardous waste in the State of Texas are established by the Texas Commission on Environmental Quality (TCEQ) in the Texas Administrative Code Title 30, Chapter 335, Industrial Solid Waste and Municipal Hazardous Waste.

No specification for chemical management measures is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.1.5 Inspection and Maintenance Requirements

Chemical management measures should be inspected regularly (at least as often as required by the TPOES Construction General Permit) for proper storage and evidence of leaks or spills. Check that all chemicals, hazardous materials, and wastes are properly stored and labeled. If not stored properly, take corrective action, and reinforce procedures through re-education of employees.

If leaks or spills have occurred, check that proper clean up and reporting procedures have been followed. If procedures have not been followed, take corrective action. Check that all employees have been trained in spill and leak procedures as detailed in Section 4.8 Spill and Leak Response Procedure.

4.2 Concrete Sawcutting Waste Management

Waste Control	
<p>Description: Sawcutting of concrete pavement is a routine practice used to control shrinkage cracking immediately following placement of plastic concrete. It is also used to remove curb sections and pavement sections for pavement repairs, utility trenches, and driveways. Sawcutting for joints involves sawing a narrow, shallow groove in the concrete, while sawcutting for renewals is usually done full depth through the slab. Water is used to control saw blade temperature and to flush the dust from the sawed groove. The objective of concrete sawcutting waste management is to prevent the resulting slurry of process water and fine particles with its high pH from becoming a water pollutant.</p>	<p>APPLICATIONS</p> <ul style="list-style-type: none"> Perimeter Control Slope Protection Sediment Barrier Chemical Protection Temporary Stabilization Final Stabilization Waste Management Housekeeping Practices
<p>KEY CONSIDERATIONS</p> <p>DESIGN CRITERIA:</p> <ul style="list-style-type: none"> Prohibit discharge of untreated slurry Educate employees on proper procedures Continuously vacuum slurry and cuttings during sawcutting operation Block inlets to prevent discharges Establish an onsite containment area (minimum 1 ft freeboard) if immediate disposal of the vacuumed slurry is not feasible Water evaporation and concrete recycling are the recommended disposal methods when slurry is not vacuumed <p>LIMITATIONS:</p> <ul style="list-style-type: none"> Only one part of concrete waste management Does not address concrete demolition waste <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> Check for uncollected slurry after all sawcutting operations Inspect collection areas and repair containment as needed Dispose of sediment and cuttings when collection area volume is reduced by 50 percent Train new employees and regularly re-train all employees 	<p>IMPLEMENTATION CONSIDERATIONS</p> <ul style="list-style-type: none"> Capital Costs Maintenance Training Suitability for Slopes > 5% <p>Other Considerations:</p> <ul style="list-style-type: none"> Coordinate with concrete waste management.
<p>TARGETED POLLUTANTS</p> <ul style="list-style-type: none"> Sediment Nutrients & Toxic Materials Oil & Grease Floatable Materials Other Construction Wastes 	

4.2.1 Primary Use

Pavement sawcutting is performed on almost all construction projects that include removal or installation of pavement. Properly managing the slurry and cuttings from sawcutting prevents them from affecting surface and ground water resources.

4.2.2 Applications

Concrete sawcutting waste management is applicable on construction activities where sawcutting is part of the work, regardless of the size of the total area disturbed. It is also applicable on repair and maintenance projects that may not be required to implement erosion and sediment controls.

Concrete sawcutting waste management is based on the proper collection and disposal of the slurry and cuttings. Employee education is critical to ensuring correct procedures are followed.

4.2.3 Design Criteria

- Construction plan notes shall include proper concrete sawcutting waste management procedures.
- The contractor should be required to designate the site superintendent, foreman, or other person who is responsible for concrete sawcutting to also be responsible for concrete sawcutting waste management.

Slurry Collection

- During sawcutting operations, the slurry and cuttings shall be continuously vacuumed or otherwise recovered and not be allowed to discharge from the site.
- If the pavement to be cut is near a storm drain inlet, the inlet shall be blocked by sandbags or equivalent temporary measures to prevent the slurry from entering the inlet. Remove the sandbags immediately after completing sawcutting operations, so they do not cause drainage problems during storm events.
- The slurry and cuttings shall not be allowed to remain on the pavement to dry out.

Slurry Disposal

- Develop pre-determined, safe slurry disposal areas.
- Collected slurry and cuttings should be immediately hauled from the site for disposal at a waste facility. If this is not possible, the slurry and cuttings shall be discharged into onsite containment.
- The onsite containment may be an excavated or bermed pit lined with plastic that is a minimum of 10 millimeters thick. Refer to Section 4.3 *Concrete Waste Management* for additional design criteria and an example schematic. If the project includes placement of new concrete, slurry from sawcutting may be disposed of in facilities designated for the washout of concrete trucks instead of constructing a separate containment.
- The containment shall be located a minimum of 50 feet away from inlets, swales, drainage ways, channels, and other waters. If the site configuration provides sufficient space to do so, in no case shall the collection area be closer than 20 feet from inlets, swales, drainage ways, channels and other waters.
- Several, portable, pre-fabricated, concrete washout, collection basins are commercially available and are an acceptable alternative to an onsite containment pit.
- Remove waste concrete when the containment is half full. Always maintain a minimum of one foot freeboard.

- Onsite evaporation of slurry water and recycling of the concrete waste is the preferred disposal method. When this is not feasible, discharge from the collection area shall only be allowed if a passive treatment system is used to remove the fines. Criteria are in Section 3.7 *Passive Treatment System*. Mechanical mixing is required in the collection area. The pH must be tested, and discharge is allowed only if the pH does not exceed 8.0. The pH may be lowered by adding sulfuric acid to the slurry water. Dewatering of the collection area after treatment shall follow the criteria in Section 3.3 *Dewatering Controls*.
- Care shall be exercised when treating the slurry water for discharge. Monitoring must be implemented to verify that discharges from the collection area do not violate groundwater or surface water quality standards.
- Geotextile fabrics such as those used for fill fences should not be used to control sawcutting waste, since the grain size is significantly smaller than the apparent opening size of the fabric.
- Use waste and recycling haulers and facilities approved by the local municipality.

Education

- Supervisors must be made aware of the potential environmental consequences of improperly handling sawcutting slurry and waste.
- Train all workers performing sawcutting operations on the proper slurry and cuttings collection and disposal procedures.

4.2.4 Design Guidance and Specifications

No specification for concrete sawcutting waste management is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.2.5 Inspection and Maintenance Requirements

Concrete sawcutting waste management measures should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Project personnel should inspect the operators to assure that operators are diligent in controlling the water produced by the sawcutting activities. Pavement should be inspected each day after operations to ensure that waste removal has been adequately performed. Residual waste should be cleaned. Reinforce proper procedures with workers. Inspect the collection area for signs of unauthorized discharges. Repair containment area as needed. Remove sediment and fines when the collection area volume is reduced by 50 percent.

4.3 Concrete Waste Management

Waste Control	
<p>DESCRIPTION: Concrete waste at construction sites comes in two forms: 1) excess fresh concrete mix, including residual mix washed from trucks and equipment, and 2) concrete dust and concrete debris resulting from demolition. Both forms have the potential to impact water quality through stormwater runoff contact with the waste. The objective of concrete waste management is to dispose of these wastes in a manner that protects surface and ground water.</p>	<p>APPLICATIONS:</p> <ul style="list-style-type: none"> Perimeter Control Slope Protection Sediment Barrier Channel Protection Temporary Stabilization Final Stabilization Waste Management Housekeeping Practices
<p>DESIGN CRITERIA:</p> <ul style="list-style-type: none"> Prohibit the discharge of untreated concrete washout water. Prohibit dumping waste concrete anywhere except at pre-determined, regulated, recycling or disposal sites. Provide a washout containment with a minimum of 6 cubic feet of containment volume for every 10 cubic yards of concrete placed. Minimum 1 foot freeboard on containment. Minimum 10 mil plastic lining of containment. Washout water evaporation and concrete recycling are the recommended disposal methods. Educate drivers and operators on proper disposal and equipment cleaning procedures. 	<p>IMPLEMENTATION CONSIDERATIONS:</p> <ul style="list-style-type: none"> Capital Costs Maintenance Training Suitability for Slopes > 5% <p>Other Considerations:</p> <ul style="list-style-type: none"> None
<p>LIMITATIONS:</p> <ul style="list-style-type: none"> Does not address concrete sawcutting waste <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> Inspect regularly Check for and repair any damage to washout containment areas Clean up any overflow of washout pits Regularly remove and properly dispose of concrete waste 	<p>TARGETED POLLUTANTS:</p> <ul style="list-style-type: none"> Sediment Nutrients & Toxic Materials Oil & Grease Flotable Materials Other Construction Wastes

4.3.1 Primary Use

Concrete waste management is used to prevent the discharge of concrete wash water and waste into stormwater runoff. A number of water quality parameters can be affected by the introduction of concrete, especially fresh concrete. Concrete affects the pH of runoff, causing significant chemical changes in water bodies and harming aquatic life. Suspended solids in the form of both cement and aggregated dust are also generated from both fresh and demolded concrete waste.

4.3.2 Applications

Concrete waste management is applicable to all construction sites where existing concrete is being demolished or new concrete is being placed, regardless of the size of the local area disturbed. It is also applicable on repair and maintenance projects that may not be required to implement erosion and sediment controls.

4.3.3 Design Criteria

- The discharge of washout water to an inlet, swale, or any portion of the storm drainage system or a natural drainage system (e.g. channel) shall be prohibited.
- Construction plan notes shall state that the discharge of concrete washout to anything except a designated containment area is prohibited.
- Show the location of the concrete washout containment on the drawings, or require the contractor to provide this information.
- The contractor should be required to designate the site superintendent, foreman, or other person who is responsible for concrete placement to also be responsible for concrete waste management.

Unacceptable Waste Concrete Disposal Practices

- Dumping in vacant areas on the job-site.
- Illicit dumping onto off-site lots or any other placed not permitted to receive construction demolition debris.
- Dumping into ditches, drainage facilities, or natural water ways.
- Using concrete waste as fill material or bank stabilization.

Recommended Disposal Procedures

- Identify pre-determined, regulated, facilities for disposal of solid concrete waste. Whenever possible, haul the concrete waste to a recycling facility. Disposal facilities must have a Class IV (or more stringent) municipal solid waste permit from the TCEQ.
- A concrete washout pit or other containment shall be installed a minimum of 50 feet away from inlets, swales, drainage ways, channels, and other wetters, if the site configuration provides sufficient space to do so. In no case shall concrete washout occur closer than 20 feet from inlets, swales, drainage ways, channels and other wetters.
- Provide a washout area with a minimum of 6 cubic feet of containment volume for every 10 cubic yards of concrete poured. Alternatively, the designer may provide calculations sizing the containment based on the number of concrete trucks and pumps to be washed out.
- The containment shall be lined with plastic (minimum 10 millimeters thick) or an equivalent measure to prevent seepage to groundwater.
- Mosquitoes do not typically breed in the high pH of concrete washout water. However, the concrete washout containment should be managed in a manner that prevents the collection of other water that could be a potential breeding habitat.

- o Do not excavate the washout area until the day before the start of concrete placement to minimize the potential for collecting stormwater.
 - o Do not discharge any water or wastewater into the containment except for concrete washout to prevent dilution of the high pH environment that is hostile to mosquitoes.
 - o Remove the waste concrete and grade the containment closed within a week of completing concrete placement. Do not leave it open to collect stormwater.
 - o If water must be pumped from the containment, it shall be collected in a tank, neutralized to lower the pH, and then hauled to a treatment facility for disposal. Alternatively, it may be hauled to a batch plant that has an onsite collection facility for concrete washout water.
 - o Do not pump water directly from the containment to the Municipal Separate Storm Sewer System or a natural drainage way without treating for removal of fine particles and neutralization of the pH.
- Multiple concrete washout areas may be needed for larger projects to allow for drying time and proper disposal of the washout water and waste concrete.
 - Portable, pre-fabricated, concrete washout containers are commercially available and are an acceptable alternative to excavating a washout area.
 - Evaporation of the washout water and recycling of the concrete waste is the preferred disposal method. After the water has evaporated from the washout containment, the remaining cuttings and fine sediment shall be hauled from the site to a concrete recycling facility or a solid waste disposal facility.
 - Remove waste concrete when the washout containment is half full. Always maintain a minimum of one foot freeboard.
 - Use waste and recycling haulers and facilities approved by the local municipality.
 - When evaporation of the washout water is not feasible, discharge from the collection area shall only be allowed if a passive treatment system is used to remove the iron. Criteria are in Section 3.7 *Passive Treatment System*. Mechanical mixing is required within the containment for passive treatment to be effective. The pH must be tested, and discharge is allowed only if the pH does not exceed 8.0. The pH may be lowered by adding sulfuric acid to the water. Dewatering of the collection area after treatment shall follow the criteria in Section 3.3 *Dewatering Controls*.
 - Care shall be exercised when treating the concrete washout water for discharge. Monitoring must be implemented to verify that discharges do not violate groundwater or surface water quality standards.
 - On large projects that are using a nearby batch plant, a washout facility associated with the plant and under the plant's TPDES Multi-Sector General Permit may be used instead of installing an onsite containment area for truck washout.

Education

- Drivers and equipment operators should be instructed on proper disposal and equipment washing practices (see above).
- Supervisors must be made aware of the potential environmental consequences of improperly handled concrete waste.

Enforcement

- The construction site manager or foreman must ensure that employees and pre-mix companies follow proper procedures for concrete disposal and equipment washing.
- Employees violating disposal or equipment cleaning directives must be re-educated or disciplined if necessary.

Demolition Practices

- Monitor weather and wind direction to ensure concrete dust is not entering drainage structures and surface waters.
- Spray water on structures being demolished to wet them before start of demolition operations. Reapply water whenever dust is observed.
- Construct sediment traps or other types of sediment detention devices downstream of demolition activities to capture and treat runoff from demolition wetting operations.

4.3.4 Design Guidance and Specifications

No specification for concrete waste management is currently available in the Standard Specifications for Public Works – North Central Texas Council of Governments.

4.3.5 Inspection and Maintenance Requirements

Concrete waste management controls should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for proper handling of concrete waste. Check concrete washout pits and make repairs as needed. Washout pits should not be allowed to overflow. Maintain a schedule to regularly remove concrete waste and prevent over-filling.

If illicit dumping of concrete is found, remove the waste and reinforce proper disposal methods through education of employees.

4.3.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are not for construction. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

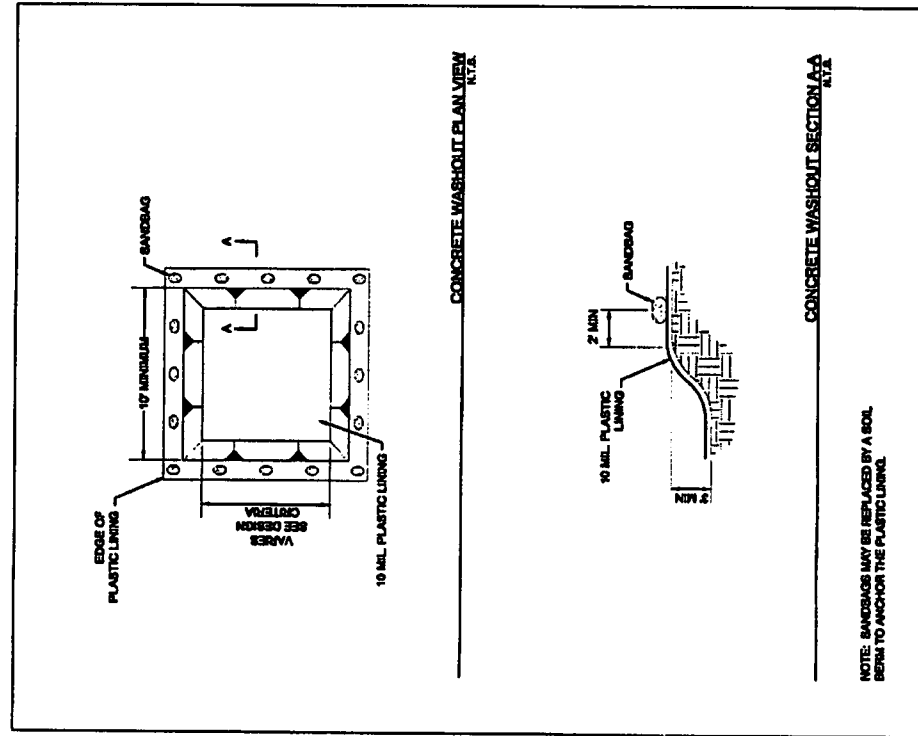


Figure 4.1 Schematics of Concrete Washout Containment

4.4 Debris and Trash Management

<p>Waste Control</p> <p>Description: Large volumes of debris and trash are often generated at construction sites, including packaging, pallets, wood waste, personal trash, scrap material, and a variety of other wastes. The objective of debris and trash management is to minimize the potential of stormwater contamination from solid waste through appropriate storage and disposal practices. Recycling of construction debris is encouraged to reduce the volume of material to be disposed of and associated costs of disposal.</p>	
<p>KEY CONSIDERATIONS</p> <p>DESIGN CRITERIA:</p> <ul style="list-style-type: none"> • Implement a job-site waste handling and disposal education and awareness program • Provide sufficient and appropriate waste storage containers • Provide timely removal of stored solid waste materials • Train workers and monitor compliance <p>LIMITATIONS:</p> <ul style="list-style-type: none"> • Only addresses non-hazardous solid waste • One part of a comprehensive construction site waste management program <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> • Inspect regularly • Empty waste containers regularly • Clean up loose trash and debris daily • Verify procedures are being followed • Train new employees and regularly re-train all employees 	<p>APPLICATIONS</p> <ul style="list-style-type: none"> • Perimeter Control • Slope Protection • Sediment Barrier • Channel Protection • Temporary Stabilization • Final Stabilization • Waste Management • Housekeeping Practices <p>IMPLEMENTATION CONSIDERATIONS</p> <ul style="list-style-type: none"> • Capital Costs • Maintenance • Training • Suitability for Slopes > 5% <p>Other Considerations:</p> <ul style="list-style-type: none"> • None
<p>TARGETED POLLUTANTS</p> <ul style="list-style-type: none"> • Sediment • Nutrients & Toxic Materials • Oil & Grease • Floatable Materials • Other Construction Wastes 	

4.4.1 Primary Use

Debris and trash management is used to minimize floatables and other wastes in stormwater. By controlling the trash and debris onsite, stormwater quality is improved and the need for extensive clean up upon completion of the project is reduced.

4.4.2 Applications

Debris and trash management is applicable on all construction sites where workers are present. Even if the only construction activity is earthwork, workers will still have drink bottles, lunch bags, and other wastes that must be managed.

Solid waste management for construction sites is based on proper storage and disposal practices by construction workers and supervisors. Key elements of the program are education and modification of improper disposal habits. Cooperation and vigilance is required on the part of supervisors and workers to ensure that the procedures are followed.

The following are lists describing the type of targeted materials.

- Construction (and Demolition) Debris:
 - Dimensional lumber
 - Miscellaneous wood (pallets, plywood, etc)
 - Copper (pipe and electrical wiring)
 - Miscellaneous metal (studs, pipe, conduit, sheathing, nails, etc)
 - Insulation
 - Brick and mortar
 - Shingles
 - Roofing materials
 - Gypsum board
- Trash:
 - Paper and cardboard (packaging, containers, wrappers)
 - Plastic (packaging, bottles, containers)
 - Styrofoam (cups, packing, and forms)
 - Food and beverage containers
 - Food waste

4.4.3 Design Criteria

- Construction plan notes shall include proper debris and trash management procedures.
- Show the location of waste storage containers on the drawings, or require the contractor to add this information.
- The contractor should be required to designate a site superintendent, foreman, safety officer, or other senior person who is onsite daily to be responsible for implementing debris and trash management.

Storage Procedures

- All waste sources and storage areas shall be located a minimum of 50 feet away from inlets, swales, drainage ways, channels and other waters, if the site configuration provides sufficient space to do so.

Debris and Trash Management
Revised DW/10

CC-182

In no case shall material and waste sources be closer than 20 feet from inlets, swales, drainage ways, channels, and other waters.

- Construction waste and trash shall be stored in a manner that minimizes its exposure to precipitation and stormwater runoff.
- Whenever possible, minimize production of debris and trash.
- Instruct construction workers in proper debris and trash storage and handling procedures.
- Segregate potentially hazardous waste from non-hazardous construction site debris. Hazardous waste shall be managed according to the criteria in Section 4.1 Chemical Management.
- Segregate recyclable or re-usable construction debris from other waste materials. A goal of re-using or recycling 50 percent of the construction debris and waste is recommended.
- Keep debris and trash under cover in either a closed dumpster or other enclosed trash container that limits contact with rain and runoff and prevents light materials from blowing out.
- Check the municipality's storage requirements. Some municipalities have specific requirements for the size and type of waste containers for construction sites.
- Do not allow trash containers to overflow. Do not allow waste materials to accumulate on the ground.
- Prohibit filtering by workers and visitors.
- Post a site daily for filter and debris.
- Enforce solid waste handling and storage procedures.

Disposal Procedures

- If feasible, recycle construction and demolition debris such as wood, metal, and concrete.
- Trash and debris shall be removed from the site at regular intervals that are scheduled to empty containers when they are 80 percent full or more frequently.
- General construction debris may be hauled to a licensed construction debris landfill (typically less expensive than a sanitary landfill).
- Use waste and recycling handlers/facilities approved by the local municipality.
- No waste, trash, or debris shall be buried, burned or otherwise disposed of onsite.
- Cleared trees and brush may be burned if authorized by the municipality and proper permits are obtained from the county and/or TCEQ. Chipping of trees and brush for use as mulch is the preferred alternative to burning or offsite disposal.

Education

- Educate all workers on solid waste storage and disposal procedures.
- Instruct workers in identification of solid waste and hazardous waste.
- Have regular meetings to discuss and reinforce disposal procedures (incorporate in regular safety seminars).
- Clearly mark on all debris and trash containers which materials are acceptable.

Quality Control

- Foreman and/or construction supervisor shall monitor onsite solid waste storage and disposal procedures.
- Check the site, particularly areas frequented by workers during lunch and breaks, for loose trash and debris at the end of each work day.

Debris and Trash Management
Revised DW/10

CC-183

- Discipline workers who repeatedly violate procedures.

4.4.4 Design Guidance and Specifications

No specification for debris and trash management measures is found currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.4.5 Inspection and Maintenance Requirements

Debris and trash management measures should be inspected regularly (at least as often as required by the TPDES Construction General Permit). If waste containers are overflowing, call the waste hauler immediately for a pick-up. If loose trash and debris are found around the site, reinforce proper waste management procedures through education of workers.

Construction sites must maintain separate waste containers clearly marked for non-hazardous, hazardous and recyclable waste. Check solid waste containers for chemical, special, or hazardous wastes that are improperly placed in them. These wastes shall be removed and handled according to criteria in Section 4.7 Chemical Management.

The site should be checked for loose litter and debris at the end of each working day.

4.5 Hyper-Chlorinated Water Management

Description: Hyper-chlorinated water is routinely used to disinfect new waterlines and appurtenances. Chlorine protects humans from pathogens in water, but it is toxic to aquatic ecosystems. The objective of hyper-chlorinated water management is to discharge the water in a manner that protects surface water and related aquatic ecosystems.

Waste Control

KEY CONSIDERATIONS

- **DESIGN CRITERIA:**
- Educate employees on proper procedures
- Discharge to sanitary sewer if the system operator approves
- Discharge water onsite for natural chlorine attenuation
- Use appropriate dosage for chemical de-chlorination based on chemical used and chlorine concentration
- Chlorine concentration must be less than 4 ppm before leaving the site
- Use velocity dissipation devices for discharges
- Always monitor receiving waters for negative effects

LIMITATIONS:

- Discharge to sanitary sewer limited by sewer capacity
- Discharges limited to areas without vegetation that is to be preserved
- Wet, cool, and overcast days limits chlorine attenuation and removal

MAINTENANCE REQUIREMENTS:

- Monitor continuously during discharge
- Check for and repair any erosion caused by discharge
- Sample and test receiving water hourly for chlorine

TARGETED POLLUTANTS

- Sediment
- Nutrients & Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Wastes

APPLICATIONS

- Perimeter Control
- Slope Protection
- Sediment Barrier
- Channel Protection
- Temporary Stabilization
- Final Stabilization
- Waste Management
- Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

- Capital Costs
 - Maintenance
 - Training
 - Suitability for Slopes > 5%
- Other Considerations:**
- None

4.5.1 Primary Use

Hyper-chlorinated water is used to disinfect new water lines.

4.5.2 Applications

Construction sites that install new water lines or repair or replace existing water lines should use hyper-chlorinated water management measures.

4.5.3 Design Criteria

- Drawing notes shall include procedures for the proper discharge of hyper-chlorinated water from waterline disinfection.
- The contractor should be required to designate the site superintendent, foreman, or other person who is responsible for water line disinfection to also be responsible for hyper-chlorinated water management.
- Educate employees about the environmental hazards of high chlorine concentrations and the proper procedures for handling hyper-chlorinated water.
- Hyper-chlorinated water shall not be discharged to the environment unless the chlorine concentration is reduced to 4 ppm or less by chemically treating to dechlorinate or by onsite retention until natural attenuation occurs.
- Water with a measurable chlorine concentration of less than 4 ppm is considered potable and an authorized discharge; however, large volumes of water with chlorine at this concentration can still be toxic to aquatic ecosystems. Do not discharge water that has been de-chlorinated to 4 ppm directly to surface water. It shall be discharged onto vegetation or through a conveyance system for further attenuation of the chlorine before it reaches surface waters.
- Discharges of high flow rate and velocities shall be directed to velocity dissipation devices.
- Discharge to Sanitary Sewers
 - The preferred method of disposal for hyper-chlorinated water is discharge into a sanitary sewer system.
 - Permission from the sanitary sewer operator **must** be obtained to discharge to the sanitary sewer.
 - Limitations on discharges to the sanitary sewer are the capacity of the sanitary sewer and the availability of a sewer manhole near the construction site.
 - The designer shall verify that the sanitary sewer is capable of receiving the flow rate that will result from dewatering the dewatered line within the required time.
 - Consideration should be given to timing the discharge with the daily low flow period for the sanitary sewer system.
- Onsite Discharge
 - Hyper-chlorinated water may be applied to the construction site if it can be done without causing a discharge. The feasibility of this option is dependent on the volume of water, the size of the construction site, and the conditions of the site. Site application should not be done when the soil moisture content is high due to recent storm events.
 - Chlorine can burn vegetation, so it should not be used to water vegetation that is being used for stabilization, vegetated filters or buffers, or other vegetation to be preserved.
 - Hyper-chlorinated water may be discharged to an onsite retention area until natural attenuation occurs. The area may be a dry stormwater retention basin, or a portion of the site may be graded to form a temporary pit or bermed area.

- Natural attenuation of the chlorine may be aided by aeration. Air can be added to the water by directing the discharge over a rough surface (e.g. forcp) before it enters the temporary retention area or an aeration device (e.g. circulation pump) can be placed in the retention area.
- Onsite discharge may require several hours to a few days before the water is safe to discharge. The rate at which chlorine will attenuate is affected by soil conditions and weather conditions. Attenuation will occur quickest during warm, sunny, dry periods.
- If the hyper-chlorinated water is retained in a pit or basin, and then pumped to discharge, pumping shall follow the criteria in Section 3.3 Dewatering Controls.

Chemical Dechlorination

- If non-chemical means of dechlorination are not feasible, chemical methods may be used to neutralize the chlorine before discharging the hyper-chlorinated water.
- Vitamin C in the form of ascorbic acid or sodium ascorbate is the preferred dechlorination agent.
- Consider the National Fire Protection Association (NFPA) rating when selecting a dechlorination chemical. The NFPA rating is given by a series of three numbers ranging from 0 to 4, with 0 being no risk and 4 the highest risk. The sequence of numbers rank the health hazard, flammability risk, and reactivity risk of the chemical. A NFPA rating of 0,0,0 indicates no risk for all three categories.
- Ensure appropriate personal protective equipment (PPE) is specified for workers depending on the chemical being used to neutralize the chlorine.
- The chemicals listed in Table 4.1 may be used to neutralize chlorine.

Table 4.1 Chemical Dechlorination Agents and Approximate Dosages

Dechlorinating Agent	Dosing Rate (per Acre) (per Chlorine)	Advantages	Disadvantages
Ascorbic Acid (form of Vitamin C)	2.6:1	<ul style="list-style-type: none"> • Not toxic to aquatic species • Quick reaction time • NFPA rating of 0,0,0 	<ul style="list-style-type: none"> • May lower pH in receiving water
Sodium Ascorbate (form of Vitamin C)	2.6:1	<ul style="list-style-type: none"> • Does not affect pH • Not toxic to aquatic species • Quick reaction time • NFPA rating of 0,0,0 	<ul style="list-style-type: none"> • Greater amount needed than Ascorbic Acid • More expensive
Sodium Thiosulfate	2:1 to 7:1 depending on pH	<ul style="list-style-type: none"> • Least expensive • Readily available • Long history of use (fertilizer) 	<ul style="list-style-type: none"> • Must calculate dosage based on pH • Skin, eye, nose and throat irritant • Consumes oxygen in water • May encourage bacterial growth in receiving streams
Calcium Thiosulfate	1:1 to 0.5:1 depending on pH	<ul style="list-style-type: none"> • Less expensive • Not toxic to aquatic species • NFPA rating of 0,0,0 	<ul style="list-style-type: none"> • Must calculate dosage based on pH • Over-dosing produces suspended solids • Over-dosing may increase turbidity in receiving water • May encourage bacterial growth in receiving streams

- The designer shall confirm dosages with the chemical supplier before using the dechlorination agent.

- Chlorine and residual agent concentrations and the pH of the discharged water shall be monitored at least hourly using field tests.
- The treated water should be discharged onto pavement or into a dry conveyance system to allow aeration and reaction time before the dechlorinated water reaches the receiving water. The receiving water should be closely monitored for any signs of negative effects from the discharge.

4.5.4 Design Guidance and Specifications

No specification for hyper-chlorinated water management is currently available in the Standard Specifications for Public Works Construction - North Central Texas Council of Governments.

4.5.5 Inspection and Maintenance Requirements

Hyper-chlorinated water management measures should be monitored continuously while the hyper-chlorinated water is being discharged. Discharges to a sanitary sewer should be monitored for back-ups or overflows that indicate the discharge is exceeding the sewer's capacity. If these occur, the rate of discharge must be decreased or another discharge method is needed.

Onsite or chemically treated discharge should be monitored for chlorine and residual chemical concentrations. Verify that discharges are not causing erosion, and modify the discharge to use velocity dissipation devices if erosion is occurring. Repair any eroded areas. If water is being pumped from a temporary retention area, verify that appropriate dewatering controls are in place.

For all discharges, frequently inspect the receiving water for any evidence of negative effects. Sample and test the receiving water hourly for chlorine. Stop the discharge immediately if chlorine is detected and modify the discharge procedures before resuming.

4.6 Sandblasting Waste Management

Description: The objective of sandblasting waste management is to minimize the potential of stormwater quality degradation from sandblasting activities at construction sites. The key issues in this program are prudent handling and storage of sandblast media, dust suppression, and proper collection and disposal of spent media. It is not the intent of this control to outline all of the worker safety issues pertinent to this practice. Safety issues should be addressed by construction safety programs as well as local, state, and federal regulations.

KEY CONSIDERATIONS

- DESIGN CRITERIA:**
- Prohibit discharge of sandblasting waste
 - Provide site specific fugitive dust control and containment equipment
 - Educate employees on proper procedures
 - Provide proper sandblast equipment for the job
 - Ensure compliance by supervisors and workers
- LIMITATIONS:**
- Does not address hazardous materials that may be present in the waste
 - Does not address spill and leak response procedures

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Contain and dispose of sandblast grit
- Train new employees and regularly re-train all employees

TARGETED POLLUTANTS

- Sediment
- Nutrients & Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Wastes

APPLICATIONS

- Perimeter Control
- Slope Protection
- Sediment Barrier
- Channel Protection
- Temporary Stabilization
- Final Stabilization
- Waste Management
- Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

- Capital Costs
 - Maintenance
 - Training
 - Suitability for Slopes > 5%
- Other Considerations:**
- OSHA requirements
 - Special procedures for sandblasting operations on structures known to contain hazardous materials
 - Possible site assessment or remediation required if hazardous materials present

4.6.1 Primary Use

Sandblasting is typically used to clean a surface or prepare a surface for coatings. Since the sandblasting media consists of fine abrasive granules, it can be easily transported by running water. Sandblasting activities typically create a significant dust problem that must be contained and captured to prevent off-site migration of fines. Particular attention must be paid to sandblasting work on bridges, box culverts, and head walls that span or are immediately adjacent to streams and waterways.

4.6.2 Applications

This control should be implemented when sandblasting operations will occur on a construction site. If a discharge of sandblasting waste occurs, it shall be considered a spill and handled according to the criteria in Section 4.8 Spill and Leak Response Procedures.

4.6.3 Design Criteria

- Construction plan notes shall include proper sandblasting waste management procedures.
- The contractor should be required to designate the site superintendent, foreman, or other person who is responsible for sandblasting to also be responsible for sandblasting waste management.
- Prohibit the discharge of sandblasting waste.

Operational Procedures

- Use only inert, non-degradable sandblast media.
 - Use appropriate equipment for the job; do not over-blast.
 - Whenever possible, blast in a downward direction.
 - Install a windsock or other wind direction instrument.
 - Cease blasting activities in high winds or if wind direction could transport grit to drainage facilities.
 - Install dust shielding around sandblasting areas.
 - Collect and dispose of all spent sandblast grit, use dust containment fabrics and dust collection hoppers and berms.
 - Non-hazardous sandblast grit may be disposed in permitted construction debris landfills or permitted sanitary landfills.
 - If sandblast media cannot be fully contained, construct sediment traps downstream from blasting area where appropriate.
 - Use sand fencing where appropriate in areas where blast media cannot be fully contained.
 - If necessary, install misting equipment to remove sandblast grit from the air prevent runoff from misting operators from entering drainage systems.
 - Use vacuum grit collection systems where possible.
 - Keep records of sandblasting materials, procedures, and weather conditions on a daily basis.
 - Take all reasonable precautions to ensure that sandblasting grit is contained and kept away from drainage structures.
- #### Educational Issues
- Educate all onsite employees of potential dangers to humans and the environment from sandblast grit.

- Instruct all onsite employees of the potential hazardous nature of sandblast grit and the possible symptoms of over-exposure to sandblast grit.
- Instruct operators of sandblasting equipment on safety procedures and personal protection equipment.
- Instruct operators on proper procedures regarding storage, handling and containment of sandblast grit.
- Instruct operators and supervisors on current local, state and federal regulations regarding fugitive dust and hazardous waste from sandblast grit.
- Have weekly meetings with operators to discuss and reinforce proper operational procedures.
- Establish a continuing education program to indoctrinate new employees.

Materials Handling Recommendations

- Sandblast media should always be stored under cover away from drainage structures.
- Ensure that stored media or grit is not subject to transport by wind.
- Ensure that all sandblasting equipment and storage containers comply with current local, state and federal regulations.
- Refer to Section 4.1 Chemical Management if sandblast grit is known or suspected to contain hazardous components.
- Capture and treat runoff, which comes into contact with sandblasting material or waste.

Quality Assurance

- Foreman and/or construction supervisor should monitor all sandblasting activities and safety procedures.
- Educate and if necessary, discipline workers who violate procedures.
- Take all reasonable precautions to ensure that sandblast grit is not transported off-site or into drainage facilities.

4.6.4 Design Guidance and Specifications

No specification for sandblasting waste management is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.6.5 Inspection and Maintenance Requirements

Sandblasting waste management measures should be inspected regularly (at least as often as required by the TPOES Construction General Permit). Verify that sandblasting grit is contained and disposed of properly. Check for downstream locations and the off-site partner for evidence of discharges or off-site transport by wind.

Check that daily records of sandblasting activities are current. Hold weekly meetings with operators to reinforce proper procedures. Regularly re-educate employees on potential dangers and hazards, safety procedures and proper handling.

4.7 Sanitary Waste Management

Waste Control			
<p>DESCRIPTION: The objective of sanitary waste management is to provide for collection and disposal of sanitary waste in a manner that minimizes the exposure to precipitation and stormwater. This is most often accomplished by providing portable facilities for construction site workers.</p> <p>KEY CONSIDERATIONS</p> <ul style="list-style-type: none"> • Provide sanitary facilities at the rate of one toilet per 10 workers for a 40-50 hour work week • Locate portable toilets a minimum of 50 feet away from storm drain inlets, conveyance channels or surface wetters • If unable to meet the 50 foot requirement, locate portable toilets at least 20 feet away and provide secondary containment • Show location of portable toilets on the drawings • Have a plan to clean up spills <p>LIMITATIONS:</p> <ul style="list-style-type: none"> • Multiple facilities and/or facilities in several locations may be needed to adequately serve a construction site • Facilities are subject to vandalism if not within a secured construction site <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> • Inspect regularly • Check for proper servicing, leaks and spills • Service toilets at the frequency recommended by the supplier 	<p>APPLICATIONS</p> <ul style="list-style-type: none"> Perimeter Control Slope Protection Sediment Barrier Channel Protection Temporary Stabilization Final Stabilization <table border="1" style="width: 100%;"> <tr> <td>Waste Management</td> </tr> <tr> <td>Housekeeping Practices</td> </tr> </table> <p>IMPLEMENTATION CONSIDERATIONS</p> <ul style="list-style-type: none"> ○ Capital Costs ○ Maintenance ○ Treating ○ Suitability for Slopes > 5% <p>Other Considerations:</p> <ul style="list-style-type: none"> • None 	Waste Management	Housekeeping Practices
Waste Management			
Housekeeping Practices			
<p>DESIGN CRITERIA:</p> <ul style="list-style-type: none"> • Provide sanitary facilities at the rate of one toilet per 10 workers for a 40-50 hour work week • Locate portable toilets a minimum of 50 feet away from storm drain inlets, conveyance channels or surface wetters • If unable to meet the 50 foot requirement, locate portable toilets at least 20 feet away and provide secondary containment • Show location of portable toilets on the drawings • Have a plan to clean up spills <p>LIMITATIONS:</p> <ul style="list-style-type: none"> • Multiple facilities and/or facilities in several locations may be needed to adequately serve a construction site • Facilities are subject to vandalism if not within a secured construction site <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> • Inspect regularly • Check for proper servicing, leaks and spills • Service toilets at the frequency recommended by the supplier 	<p>TARGETED POLLUTANTS</p> <ul style="list-style-type: none"> ○ Sediment ● Nutrients & Toxic Materials ○ Oil & Grease ○ Floatable Materials ● Other Construction Wastes 		

4.7.1 Primary Use

Sanitary facilities are used to properly store and dispose of sanitary wastes that are generated onsite.

4.7.2 Applications

Sanitary facilities should be available to workers at all construction sites. If permanent facilities are not available, portable toilets are placed at the construction site.

4.7.3 Design Criteria

- Construction plan notes shall include requirements for the contractor to provide an appropriate number of portable toilets based on the number of employees using the toilets and the hours they will work. The typical standard is one portable toilet per 10 workers for a 40-50 hour work week.
- The location of portable toilets shall be shown on the drawings.
- Sanitary facilities shall be placed a minimum of 50 feet away from storm drain inlets, conveyance channels or surface wetters. If unable to meet the 50 foot requirement due to site configuration, portable toilets shall be a minimum of 20 feet away from storm drain inlets, conveyance channels or surface wetters and secondary containment shall be provided in case of spills.
- The location of the portable toilets shall be accessible to maintenance trucks without damaging erosion and sediment controls or causing erosion or tracking problems.
- Sanitary facilities shall be fully enclosed and designed in a manner that minimizes the exposure of sanitary waste to precipitation and stormwater runoff.
- When high winds are expected, portable toilets shall be anchored or otherwise secured to prevent them from being blown over.
- The company that supplies and maintains the portable toilets shall be notified immediately if a toilet is tipped over or damaged in a way that results in a discharge. Discharged solid matter shall be vacuumed into the septic tank by the company that maintains the toilets. A solution of 10 parts water to 1 parts bleach shall be applied to all ground surfaces contaminated by liquids from the toilet.
- The operator of the municipal separate storm sewer system (MS4) shall be notified if a discharge from the portable toilets enters the MSA or a natural channel.

4.7.4 Design Guidance and Specifications

No specification for sanitary facilities is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.7.5 Inspection and Maintenance Requirements

Sanitary facilities should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for proper servicing, leaks and spills. Portable toilets shall be regularly serviced at the frequency recommended by the supplier for the number of people using the facility.

4.8 Spill and Leak Response Procedures

Description: Spill and leak response procedures address the management of spills and leaks that may occur at the construction site. The objective of the spill and leak response procedures is to minimize the discharge of pollutants from unplanned releases of chemicals, fuel, motor vehicle fluids, hazardous materials or wastes through appropriate recognition and response procedures.

Waste Control

KEY CONSIDERATIONS	APPLICATIONS
<p>DESIGN CRITERIA:</p> <ul style="list-style-type: none"> • Develop procedures based on the Material Safety and Data Sheets for substances onsite • Maintain spill kits for petroleum products and other chemicals frequently onsite • Post emergency contact numbers • Designate a spill response coordinator • Train employees • Review reporting requirements for onsite chemicals <p>LIMITATIONS:</p> <ul style="list-style-type: none"> • Procedures susceptible to being forgotten because they are seldom or never used • Larger spills and spills of extremely hazardous materials require special equipment and should be handled by professionals • Not applicable to long-term contamination remediation <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> • Review procedures regularly • Verify spill kits, MSDSs, and emergency contacts are readily available • Train new employees and regularly re-train all employees <p>TARGETED POLLUTANTS</p> <ul style="list-style-type: none"> ○ Sediment ● Nutrients & Toxic Materials ● Oil & Grease ○ Floatable Materials ● Other Construction Wastes 	<p>APPLICATIONS</p> <ul style="list-style-type: none"> Perimeter Control Slope Protection Sediment Barrier Channel Protection Temporary Stabilization Final Stabilization Waste Management Housekeeping Practices <p>REGULATION/CONSIDERATIONS</p> <ul style="list-style-type: none"> ● Capital Costs ● Maintenance ● Training ○ Suitability for Slopes > 6% <p>Other Considerations:</p> <ul style="list-style-type: none"> ● OSHA, EPA and TCEQ regulators

4.8.1 Primary Use

Spill and leak procedures are used to minimize the impact of accidental releases on surface water. Pollutants that are of concern for spill and leaks include chemicals, hazardous materials, fuel, motor vehicle fluids, washout waters, and wastes. Spill and leak response is a secondary control. Proper procedures for managing these pollutants should be the primary control and are the best way to prevent the need for spill and leak response.

4.8.2 Applications

Spill and leak response procedures are applicable on all construction sites where chemicals, hazardous materials, fuels, etc. are stored or used. They are most important when the construction site is adjacent or near to a floodplain, wetland, stream, or other waters.

4.8.3 Design Criteria

General

- An effective spill and leak response depends on proper recognition and response practices by construction workers and supervisors. Key elements are education and training.
- Records of releases that exceed the Reportable Quantity (RQ) for oil and hazardous substances should be maintained in accordance with the Federal and State regulations.
- Emergency contact information and spill response procedures shall be posted in a readily available area for access by all employees and subcontractors.
- Spill containment kits should be maintained for petroleum products and other chemicals that are regularly onsite. Materials in kits should be based on containment guidelines in the Material Safety and Data Sheets (MSDSs) for the substance most frequently onsite.
- Spill kits are intended for response to small spills, typically less than 5 gallons, of substances that are not extremely hazardous.
- Significant spills or other releases warrant immediate response by trained professionals.
- Suspected job-site contamination should be immediately reported to regulatory authorities and protective actions taken.

Coordinator

- The contractor should be required to designate a site superintendent, foreman, safety officer, or other senior person who is onsite daily to be the Spill and Leak Response Coordinator.
- The coordinator must have knowledge of and be trained in correct spill and leak response procedures.
- The coordinator shall be responsible for implementing the spill and leak procedures and training all employees and sub-contractors on the site-specific spill and leak procedures. The training should include their responsibility to immediately notify the coordinator if a spill or leak occurs.

Spill Response

- Upon discovery of a spill, employees and subcontractors shall implement the following procedures:
 - Immediately stop work and clear the area by moving upwind of the spill.
 - Remove all ignition sources.
 - Notify the Spill and Leak Response Coordinator.
 - If there is an immediate danger to health or life, contact 911.

- The Spill and Leak Response Coordinator shall perform the following when the spill is not immediately dangerous to health and safety:
 - Consult the MSDS for safety and response procedures.
 - If it can be done safely, use onsite spill kits and soil to contain the spill.
 - Notify a hazardous response company to remove and properly dispose of the spilled material and the contaminated containment materials.

Spill Reporting

- The Spill and Leak Response Coordinator is responsible for notifying authorities of spills and leaks. Notification requirements are based on Reportable Quantities as established by the type or material, quantity and location (onto land or into water in the state) of the release.
- Reportable Quantities (RQ) in the State of Texas are established by the TCEQ in Texas Administrative Code Title 30, Chapter 327 (30 TAC 327) Spill Prevention and Control.
- The Texas RQ for petroleum products and used oil is 25 gallons released onto land or any amount that causes sheen on water.
- Reportable Quantities for all other substances are listed in 30 TAC 327.4, which references the EPA List of Lists (EPA 550-B-01-003) available at: <http://www.epa.gov/epo/rls/rls3.pdf>
- The Spill and Leak Response Coordinator shall notify the following:
 - The municipality that operates the local Municipal Separate Storm Sewer System (MS4) if a spill or leak enters public rights-of-way or any type of drainage way or drainage infrastructure within the jurisdiction of the municipality.
 - State of Texas Spill Report Hotline at 1-800-632-8224 if the spill or leak exceeds the RQ; and during regular business hours, the TCEQ Dallas/Fort Worth Regional Office at 817-388-5800.
 - National Spill Response Center at 1-800-424-8802 if the spill or leak exceeds the RQ.

4.8.4 Design Guidance and Specifications

National guidance for response procedures are established by the Environmental Protection Agency (EPA) in the Code of Federal Regulations (CFR). Specific sections addressing spills are governed by:

- 40 CFR Part 88 Chemical Accident Prevention Provisions.
- 40 CFR Part 302 Designation, Reportable Quantities (RQ) and Notification.
- 40 CFR Part 355 Emergency Planning and Notification.

Guidance for emergency response procedures in the State of Texas are established by the Texas Commission on Environmental Quality (TCEQ) in the Texas Administrative Code Title 30, Chapter 327, Spill Prevention and Control.

No specification for construction of this item is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.8.5 Inspection and Maintenance Requirements

Spill and leak response measures should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Verify that spill containment materials are available for small spills. Also verify that emergency contact information is posted. These phone numbers and Material Safety and Data Sheets should be in a location that is readily accessible to workers.

If procedures are lacking, reinforce requirements by re-training employees.

4.9 Subgrade Stabilization Management

Description: Lime and other chemicals are used extensively in the North Central Texas region to stabilize pavement subgrades for roadways, parking lots, and other paved surfaces, and as a subgrade amendment for building pad sites. These chemicals are applied to the soil and mixed through disk and other techniques, and then allowed to cure. The objective of subgrade stabilization management is to reduce the potential for runoff to carry the chemicals offsite, where they may impact aquatic life in streams, ponds, and other water bodies.

Material Control

KEY CONSIDERATIONS

- DESIGN CRITERIA:**
- Educate employees on proper procedures
 - Include procedural controls in stabilization specifications
 - Limit stabilization operations to that which can be thoroughly mixed and compacted by the end of each workday
 - Prohibit vehicle traffic, other than water trucks and mixing equipment, from passing over the area being stabilized until mixing is completed
 - Avoid applications when there is a significant probability of rain that will produce runoff
 - Roughen areas adjacent and downstream of stabilized areas to intercept lime from runoff
 - Provide secondary containment according to Section 4.1
 - Chemical Management for stabilizers stored onsite

LIMITATIONS:

- Prevention of contamination is only effective method
 - Does not address spill response when discharge occurs
- MAINTENANCE REQUIREMENTS:**
- Inspect down slope perimeters and outfalls regularly during stabilization operations
 - Immediately halt operations if a discharge is found and modify procedures to prevent future discharges

TARGETED POLLUTANTS

- Sediment
- Nutrients & Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Wastes

APPLICATIONS

- Perimeter Control
- Slope Protection
- Sediment Barrier
- Channel Protection
- Temporary Stabilization
- Final Stabilization
- Waste Management

Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

- Capital Costs
 - Maintenance
 - Training
 - Suitability for Slopes > 5%
- Other Considerations:**
- Chemical management controls for onsite storage of stabilization chemicals

4.9.1 Primary Use

This measure should be implemented when chemicals are required for soil stabilization. Lime is the most commonly used for stabilization and is considered a chemical. Other agents may also be used for subgrade stabilization depending on the soil and site conditions.

4.9.2 Applications

Chemical stabilization can be used under a variety of conditions. The engineer should determine the applicability of chemical stabilization based on site conditions such as available open space, quantity of area to be stabilized, proximity of nearby water courses and other measures employed at the site. The use of diversion dikes and interceptor swales (see appropriate sections) to divert runoff away from areas to be stabilized can be used in conjunction with these techniques to reduce the potential impact of discharges from chemical stabilization.

Management of stabilization chemicals is based on implementing procedures to prevent a discharge. If a discharge occurs, it shall be considered a spill and handled according to the criteria in Section 4.3 Spill and Leak Response Procedures.

4.9.3 Design Criteria

- Construction plan notes or stabilization shall include procedural controls to minimize the discharge of chemical stabilizers.
- The contractor shall limit the amount of stabilizing agent onsite to that which can be thoroughly mixed and compacted by the end of each workday.
- Stabilizers shall be applied at rates that result in no runoff.
- Stabilization shall not occur immediately before and during rainfall events.
- No traffic other than water trucks and mixing equipment shall be allowed to pass over the area being stabilized until after completion of mixing the chemical.
- Areas adjacent and downstream of stabilized areas shall be roughened to intercept chemical runoff and reduce runoff velocity.
- Geotextile fabrics such as those used for silt fence should not be used to treat chemical runoff, because the chemicals are dissolved in the water and won't be affected by a barrier and the suspended solids are significantly smaller than the apparent opening size of the fabric.
- For areas in which phasing of chemical stabilization is impractical, a curing seal (such as Liquid Asphalt, Grace MC-250, or MC-800) applied at a rate of 0.15 gallons per square yard of surface can be used to protect the base.
- Use of sediment basins with a significant (>36 hour) drawdown time is encouraged to capture any accidental lime or chemical overflows when large areas are being stabilized (Section 3.9 Sediment Basin).
- Provide containment around chemical storage, loading and dispensing areas.
- If soil stabilizers are stored onsite, they shall be considered hazardous material and shall be managed according to the criteria in Section 4.1 Chemical Management to capture any accidental lime or chemical overflow.

4.9.4 Design Guidance and Specifications

No specification for subgrade stabilization management is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.9.5 Inspection and Maintenance Requirements

Subgrade stabilization operation should be observed frequently as the operations proceed for evidence of discharges. Inspect the down slope perimeter and all outfalls for evidence of discharges. Pay particular attention to the outfall of drainage pipes connected to inlets within the area being stabilized. If a discharge is found, immediately halt stabilization operations until additional controls can be implemented.

4.9.6 Example Schematic

The following schematic is an example application of the construction control. It is intended to assist in understanding the control's design and function.

The schematic is not for construction. It may serve as a starting point for creating a construction detail, but it must be adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

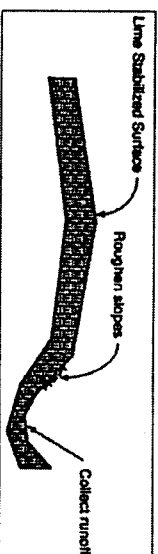


Figure 4.2 Schematic of Controls for Subgrade Stabilization

4.10 Vehicle and Equipment Management

Maintenance and Waste Control	
<p>DESCRIPTION: Vehicle and equipment management addresses the practices associated with proper use and maintenance of vehicles and equipment at construction sites. The objective is to minimize the discharge of pollutants from vehicle and equipment operation, fueling, maintenance, and washing.</p>	<p>APPLICATIONS</p> <ul style="list-style-type: none"> Perimeter Control Slope Protection Sediment Barrier Channel Protection Temporary Stabilization Final Stabilization Waste Management Housekeeping Practices
<p>KEY CONSIDERATIONS</p> <p>DESIGN CRITERIA:</p> <ul style="list-style-type: none"> Prohibit the discharge of maintenance fluids and wash water with soap If feasible, prohibit onsite vehicle washing If feasible, prohibit onsite maintenance except fueling Provide secondary containment that's 110 percent of the largest container in the containment Use spilloverflow devices for fueling Never leave a fueling operation unattended Label all waste containers Train workers in proper procedures <p>LIMITATIONS:</p> <ul style="list-style-type: none"> Cost of maintenance, repairs, and spill prevention equipment One part of a comprehensive construction site waste management program Does not address spill and leak response procedures <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> Inspect regularly Check for signs of leaks and spills and take corrective actions Place drip pans under leaking vehicles and equipment when parked Verify procedures are being followed Train new employees and regularly re-train all employees 	<p>IMPLEMENTATION CONSIDERATIONS</p> <ul style="list-style-type: none"> Capital Costs Maintenance Training Suitability for Slopes > 5% <p>Other Considerations:</p> <ul style="list-style-type: none"> None
<p>TARGETED POLLUTANTS</p> <ul style="list-style-type: none"> Sediment Nutrients & Toxic Materials Oil & Grease Floatable Materials Other Construction Wastes 	

4.10.1 Primary Use

Vehicle and equipment management is used to minimize the pollutants that enter stormwater from fueling and maintenance activities.

4.10.2 Applications

Vehicle and equipment management is applicable on every construction site. The management controls are most effective when used in conjunction with controls in Section 4.8 Spill and Leak Response Procedures.

The management techniques are based on proper recognition and handling of pollutant sources related to vehicles and equipment. Key elements are education, established procedures, and provisions for safe storage and disposal of wastes. The following list (not all inclusive) gives examples of the targeted materials:

- Fuels
- Lube Oils
- Antifreeze
- Solvents
- Wash water

4.10.3 Design Criteria

- Construction plan notes shall state that the discharge of fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance is prohibited.
- Construction plan notes shall state that the discharge of soaps or solvents used in vehicle and equipment washing is prohibited.
- On the construction plans, show the location of fuel tanks, motor vehicle fluids storage, and waste storage, including secondary containment, or require the contractor to provide this information.
- Provide secondary containment for fuel, new and waste oil, and other maintenance fluids that are stored onsite. Secondary containment shall have a minimum volume of 110 percent of the largest container within the containment.
- Criteria for the response to spills of motor vehicle fluids are in Section 4.8 Spill and Leak Response Procedures.
- The contractor should be required to designate a site superintendent, foreman, safety officer, or other senior person, who is on the site daily, to be responsible for implementing vehicle and equipment management.

Vehicle Washing

- Minimize the potential for the discharge of pollutants from equipment and vehicle washing by prohibiting these activities onsite, if practical. Vehicles and equipment should be transported to a commercial vehicle wash facility with appropriate discharge controls.
- Designate a wash area if vehicle and equipment washing must be done onsite. Require all washing to be done at this location. The area shall be graded so that all wash water flows to a sediment basin or other sediment control that provides equivalent or better treatment.
- Do not use soap for vehicle and equipment washing. Sediment controls will not remove soap from the wash water.

- Vehicle and equipment wash water may contain oils, greases, and heavy metals. Treatment to remove these pollutants is needed in addition to sediment trapping. Any wash water that has been on it must be considered polluted and cannot be discharged from the site without appropriate treatment. State or local discharge permits may be required.

Maintenance

- If possible, prohibit onsite maintenance except for fueling. Otherwise, limit onsite maintenance to routine preventive maintenance.
- Maintenance fluids should be stored in appropriate containers (closed drums or similar) and under cover.
- The ground under vehicles and equipment parked onsite should be inspected for drips and leaks before each use. Drip pans should be placed under parked vehicles and equipment that leak or drip.
- Vehicles and equipment that leak or drip should be removed from the site for repair as soon as possible.
- Vehicles and equipment that become inoperative should be removed from the site for repairs.

Fueling

- Check the municipality's requirements for fuel tanks. Some municipalities have specific requirements for the type of tank and secondary containment. At a minimum, local fire codes apply.
- Fuel should be dispensed using a drip pan or other spill/overflow device or within containment berms or other secondary containment.
- If the containment control is an earthen pit or berm, the containment shall be lined with plastic.
- If an automatic pump is used for fueling, it should be equipped with an overflow protection device.
- Workers performing fueling operations shall be trained in the correct procedures for fueling and spill response.
- Workers performing fueling operations shall be present and observe the fueling at all times. Fueling shall not be left unattended.
- A spill containment kit shall be maintained within 25 feet of the fueling area.

Waste Handling and Disposal

- Ensure that adequate waste storage volume is available.
- All waste containers shall be clearly labeled.
- Handling and disposal of waste from vehicle and equipment maintenance should be according to the criteria in *Section 4.7 Chemical Management*.

Education

- Instruct workers on procedures for washing, maintaining, and fueling vehicles and equipment.
- Instruct workers in identification of pollutants associated with vehicles and equipment.
- Have regular meetings to discuss and reinforce procedures (incorporate into regular safety meetings).
- Establish a continuing education program to train new employees.

4.10.4 Design Guidance and Specifications

No specification for vehicle and equipment management is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.10.5 Inspection and Maintenance Requirements

Vehicle and equipment management controls should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Verify that washing, fueling, storage, and disposal procedures are being followed. Correct workers where needed.

Fueling and maintenance fluid storage areas should be checked for signs of leakage or spills. If evidence is found, corrective actions should be implemented. Reinforce proper procedures through re-education of employees. Inspect areas where vehicles and equipment are parked for signs of leaks. Use drip pans where needed.

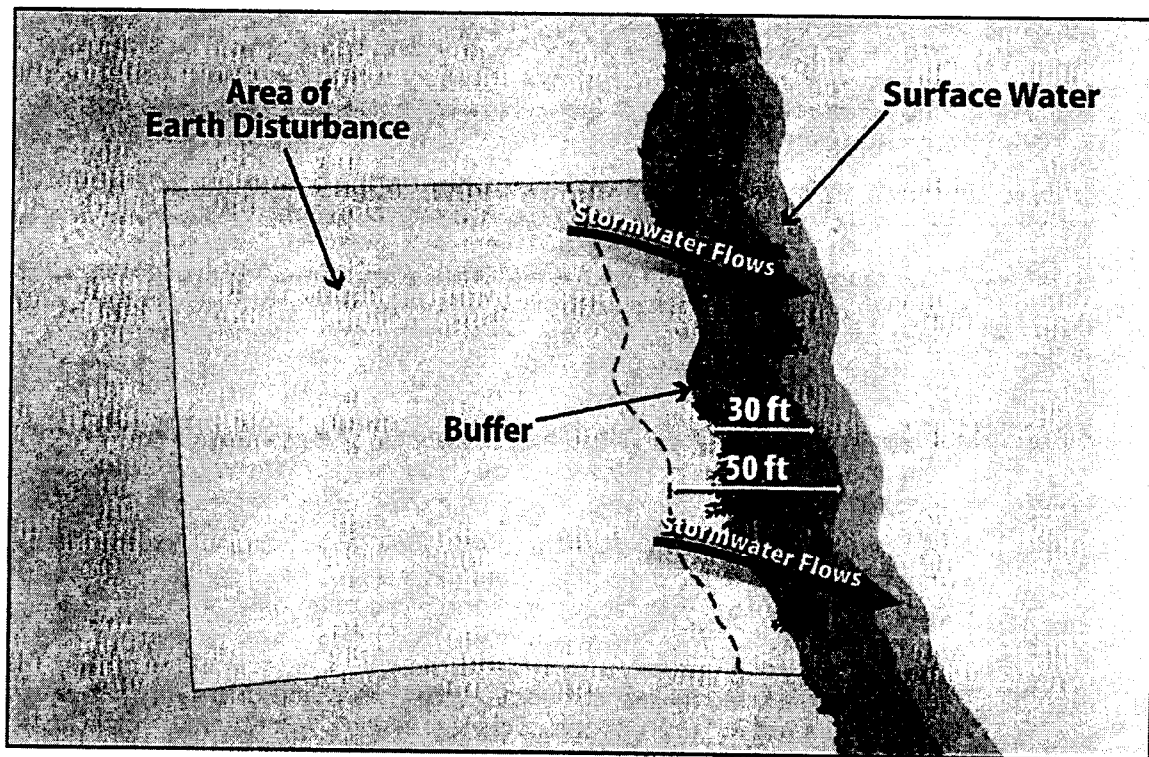
G.1 Sites That Are Required to Comply with Part 2.1.2.1

The purpose of this part is to help you determine if the requirements in Part 2.1.2.1 apply to your site.

G.1.1 Step 1 - Determine if Your Site is Within 50 Feet of a Surface Water

Part 2.1.2.1 applies to you only if your earth-disturbing activities will occur within 50 feet of a surface water that receives stormwater discharges from your site. Figure G - 1 illustrates when a site would be required to comply with the requirements in Part 2.1.2.1 due to their proximity to a surface water. If the surface water is not located within 50 feet of the earth-disturbing activities, Part 2.1.2.1 does not apply.

Figure G - 1. Example of earth-disturbing activities within 50 feet of a surface water.



If you determine that your earth-disturbing activities will occur within 50 feet of a surface water that receives stormwater discharges from your site, the requirements in Part 2.1.2.1 apply, except for certain circumstances that are described in Step 2.

Note that where some natural buffer exists but portions of the area within 50 feet of the surface water are occupied by preexisting development disturbances, or if a portion of area within 50 feet of the surface water is owned by another party and is not under your control, the buffer requirements in Part 2.1.2.1 still apply, but with some allowances.

Clarity about how to implement the compliance alternatives for these situations is provided in G.2.1.2 and G.2.2.2 below.

Note that EPA does not consider designed stormwater control features (e.g., *stormwater conveyance channels, storm drain inlets, stormwater basins*) that direct storm water to surface waters more than 50 feet from the disturbance to constitute surface waters for the purposes of determining if the buffer requirements apply.

G.1.2 Step 2 - Determine if Any Exceptions to the Requirements in Part 2.1.2.1 Apply

The following exceptions apply to the requirements in Part 2.1.2.1:

- If there is no discharge of stormwater to surface waters through the area between the disturbed portions of the site and any surface waters located within 50 feet of your site, you are not required to comply with the requirements in this Part. This includes situations where you have implemented controls measures, such as a berm or other barrier, that will prevent such discharges.
- Where no natural buffer exists due to preexisting development disturbances (e.g., *structures, impervious surfaces*) that occurred prior to the initiation of planning for the current development of the site, you are not required to comply with the requirements in this Part.

Where some natural buffer exists but portions of the area within 50 feet of the surface water are occupied by preexisting development disturbances, you are required to comply with the requirements in this Part. For the purposes of calculating the sediment load reduction for either compliance alternative 2 or 3 below, you are not expected to compensate for the reduction in buffer function that would have resulted from the area covered by these preexisting disturbances. Clarity about how to implement the compliance alternatives for these situations is provided in G.2.1.2 and G.2.2.2 below.

If during your project, you will disturb any portion of these preexisting disturbances, the area removed will be deducted from the area treated as natural buffer.

- For "linear construction projects" (see Appendix A), you are not required to comply with this requirement if site constraints (e.g., *limited right-of-way*) prevent you from complying with the requirements of the alternatives in Part 2.1.2.1a, provided that, to the extent practicable, you limit disturbances within 50 feet of the surface water and/or you provide supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the surface water. You must also document in your SWPPP your rationale for why it is infeasible for you to comply with the requirements in Part 2.1.2.1a, and describe any buffer width retained and/or supplemental erosion and sediment controls installed.
- For "small residential lot" construction (i.e., *a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre*), you have the option of complying with the requirements in Part G.2.3 of this appendix.
- The following disturbances within 50 feet of a surface water are exempt from the requirements in this Part:
 - Construction approved under a CWA Section 404 permit; or

- Construction of a water-dependent structure or water access areas (e.g., pier, boat ramp, trail).

Note that you must document in your SWPPP if any disturbances related to any of the above exceptions occurs within the buffer area on your site.

G.2 COMPLIANCE ALTERNATIVES GUIDANCE

If in Part G.1 of this guidance you determine that the buffer requirements apply to your site, you have three compliance alternatives from which you can choose:

1. Provide and maintain a 50-foot buffer undisturbed natural buffer (Part 2.1.2.1a.i);¹ or
2. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer (Part 2.1.2.1a.ii);¹ or
3. If it is infeasible to provide and maintain an undisturbed natural buffer of any size, you must implement erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer (Part 2.1.2.1a.iii).¹

The compliance alternative selected above must be maintained throughout the duration of permit coverage.

The following provides detailed guidance for how you can comply with each of the compliance alternatives. Part G.2.1 below provides guidance on how to provide and maintain natural buffers consistent with the alternatives 1 and 2, above. Part G.2.2 below provides guidance on how to comply with the requirement to provide a 50-foot buffer equivalent through erosion and sediment controls consistent with alternatives 2 and 3, above.

G.2.1 Guidance for Providing and Maintaining Natural Buffers

The following guidance is intended to assist you in complying with the requirements to provide and maintain a natural buffer during construction. This part of the guidance applies to you if you choose either alternative 1 (50-foot buffer) or alternative 2 (a buffer of < 50 feet supplemented by additional erosion and sediment controls that achieve the equivalent sediment load reduction as the 50-foot buffer), or if you are providing a buffer in compliance with one of the small residential lot compliance alternatives in Part G.2.3 below.

¹ For the compliance alternatives in 1 and 2, you are not required to enhance the quality of the vegetation that already exists in the buffer, or provide vegetation if none exists (e.g., arid and semi-arid areas). You only need to retain and protect from disturbance the natural buffer that existed prior to the commencement of construction. Any preexisting structures or impervious surfaces are allowed in the natural buffer provided you retain and protect from disturbance the natural buffer area outside the preexisting disturbance. Similarly, for alternatives 2 and 3, you are required to implement and maintain sediment controls that achieve the sediment load reduction equivalent to the undisturbed natural buffer that existed on the site prior to the commencement of construction. In determining equivalent sediment load reductions, you may consider naturally non-vegetated areas and prior disturbances. See Part G.2.2 of this Appendix for a discussion of how to determine equivalent reductions.

G.2.1.1 Buffer Width Measurement

Where you are retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:

1. The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or
2. The edge of the stream or river bank, bluff, or cliff, whichever is applicable.

Refer to Figure G - 2 and Figure G - 3. You may find that specifically measuring these points is challenging if the flow path of the surface water changes frequently, thereby causing the measurement line for the buffer to fluctuate continuously along the path of the waterbody. Where this is the case, EPA suggests that rather than measuring each change or deviation along the water's edge, it may be easier to select regular intervals from which to conduct your measurement. For instance, you may elect to conduct your buffer measurement every 5 to 10 feet along the length of the water.

Additionally, note that if earth-disturbing activities will take place on both sides of a surface water that flows through your site, to the extent that you are establishing a buffer around this water, it must be established on both sides. For example, if you choose alternative 1 above, and your project calls for disturbances on both sides of a small stream, you would need to retain the full 50 feet of buffer on both sides of the water. However, if your construction activities will only occur on one side of the stream, you would only need to retain the 50-foot buffer on the side of the stream where the earth-disturbance will occur.

Figure G - 2. This image shows buffer measurement from the ordinary high water mark of the water body, as indicated by a clear natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, and/or the presence of litter/debris.

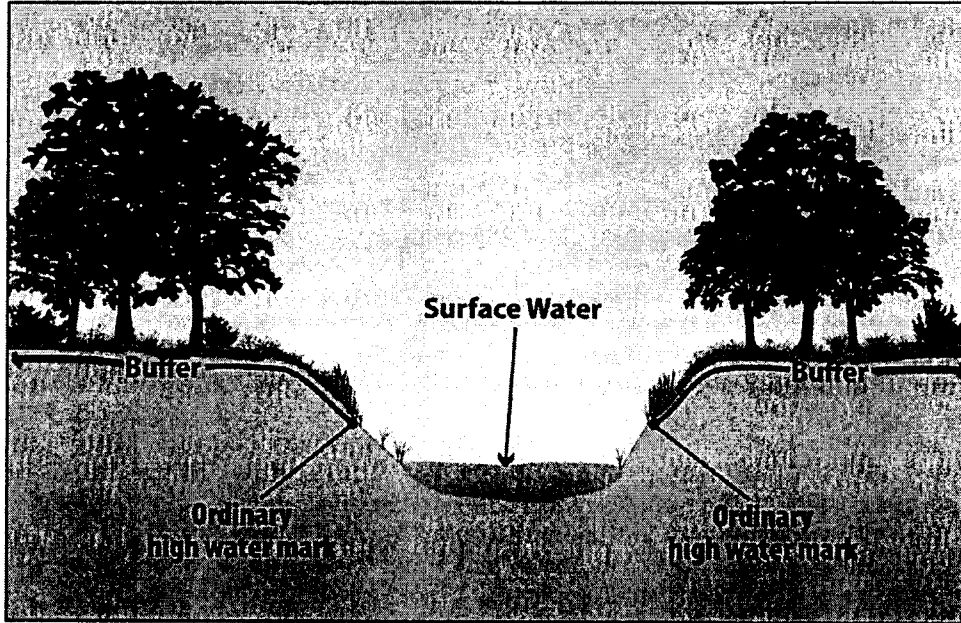
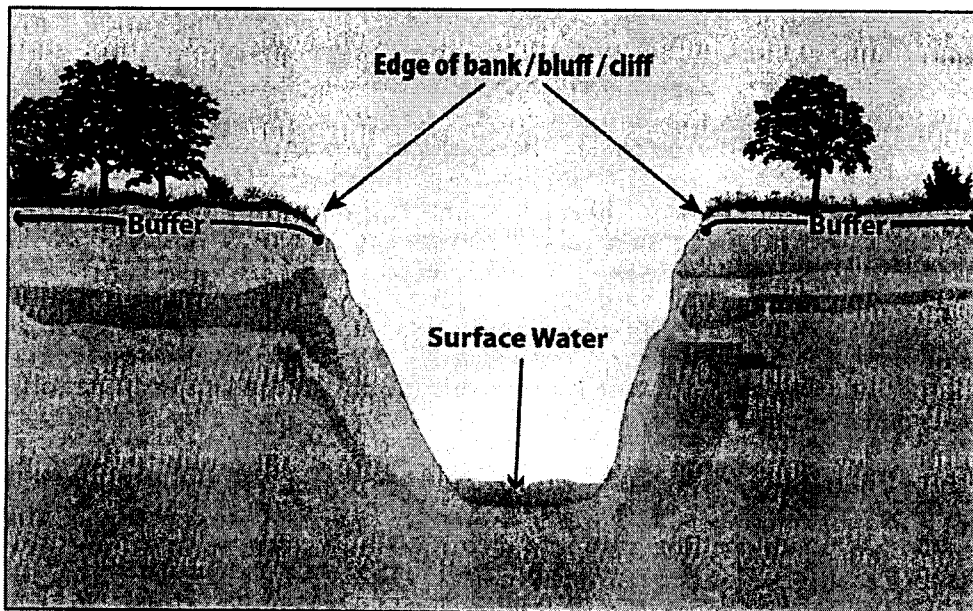


Figure G - 3. This image shows buffer measurement from the edge of the bank, bluff, or cliff, whichever is applicable.



G.2.1.2 Limits to Disturbance Within the Buffer

You are considered to be in compliance with this requirement if you retain and protect from construction activities the natural buffer that existed prior to the commencement of construction. If the buffer area contains no vegetation prior to the commencement of construction (e.g., sand or rocky surface), you are not required to plant any additional vegetation. As noted above, any preexisting structures or impervious surfaces are allowed in the buffer provided you retain and protect from disturbance the vegetation in the buffer outside the preexisting disturbance.

To ensure that the water quality protection benefits of the buffer are retained during construction, you are prohibited from conducting any earth-disturbing activities within the buffer during permit coverage. In furtherance of this requirement, prior to commencing earth-disturbing activities on your site, you must delineate, and clearly mark off, with flags, tape, or a similar marking device, the buffer area on your site. The purpose of this requirement is to make the buffer area clearly visible to the people working on your site so that unintended disturbances are avoided.

While you are not required to enhance the quality of the vegetation that already exists within the buffer, you are encouraged to do so where such improvements will enhance the water quality protection benefits of the buffer. (Note that any disturbances within the buffer related to buffer enhancement are permitted and do not constitute construction disturbances.) For instance, you may want to consider targeted plantings where limited vegetation exists, or replacement of existing vegetation where invasive or noxious plant species (see <http://plants.usda.gov/java/noxiousDriver>) have taken over. In the case of invasive or noxious species, you may want to remove and replace them with a diversity of native trees, shrubs, and herbaceous plants that are well-adapted to the climatic, soil, and hydrologic conditions on the site. You are also encouraged to limit the removal of naturally deposited leaf litter, woody debris, and other biomass, as this material contributes to the ability of the buffer to retain water and filter pollutants.

If a portion of the buffer area adjacent to the surface water is owned by another party and is not under your control, you are only required to retain and protect from construction activities the portion of the buffer area that is under your control. For example, if you elect alternative 1 above (provide and maintain a 50-foot buffer), but 10 feet of land immediately adjacent to the surface water is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you must only retain and protect from construction activities the 40-foot buffer area that occurs on the property on which your construction activities are taking place. EPA would consider you to be in compliance with this requirement regardless of the activities that are taking place in the 10-foot area that is owned by a different party than the land on which your construction activities are taking place that you have no control over.

G.2.1.3 Discharges to the Buffer

You must ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls (for example, you must comply with the Part 2.1.2.2 requirement to establish sediment controls around the downslope perimeter of your site disturbances), and if necessary to prevent erosion caused by stormwater flows within the buffer, you must use velocity dissipation devices. The purpose of this requirement is to decrease the rate of stormwater flow and

encourage infiltration so that the pollutant filtering functions of the buffer will be achieved. To comply with this requirement, construction operators typically will use devices that physically dissipate stormwater flows so that the discharge entering the buffer is spread out and slowed down.

G.2.1.4 SWPPP Documentation

You are required to document in your SWPPP the natural buffer width that is retained. For example, if you are complying with alternative 1, you must specify in your SWPPP that you are providing a 50-foot buffer. Or, if you will be complying with alternative 2, you must document the reduced width of the buffer you will be retaining (and you must also comply with the requirements in Part 2.1.2.1c to describe the erosion and sediment controls you will use to achieve an equivalent sediment reduction, as described in Part G.2.2 below). Note that you must also show any buffers on your site plan in your SWPPP consistent with Part 7.2.6.3. Additionally, if any disturbances related to the exceptions in Part 2.1.2.1e occur within the buffer area, you must document this in the SWPPP.

G.2.2 Guidance for Providing the Equivalent Sediment Reduction as the 50-foot Buffer

If you are selecting Alternative 2 (provide and maintain a buffer that is less than 50 feet that is supplemented by additional erosion and sediment controls that, together, achieve the equivalent sediment load reduction as the 50-foot buffer) or Alternative 3 (implement erosion and sediment controls that achieve the equivalent sediment load reduction as the 50-foot buffer), the following guidance is intended to assist you in demonstrating that you will achieve the equivalent sediment reduction as the 50-foot buffer.

G.2.2.1 Determine Whether it is Feasible to Provide a Reduced Buffer

EPA recognizes that there will be a number of situations in which it will be infeasible to provide and maintain a buffer of any width. While some of these situations may exempt you from the buffer requirement entirely (see G.1.2), if you do not qualify for one of these exemptions, there still may be conditions or circumstances at your site that make it infeasible to provide a natural buffer. For example, there may be sites where a significant portion of the property on which the earth-disturbing activities will occur is located within the buffer area, thereby precluding the retention of natural buffer areas. EPA believes there are likely to be other examples of situations that make it infeasible to provide any buffer area.

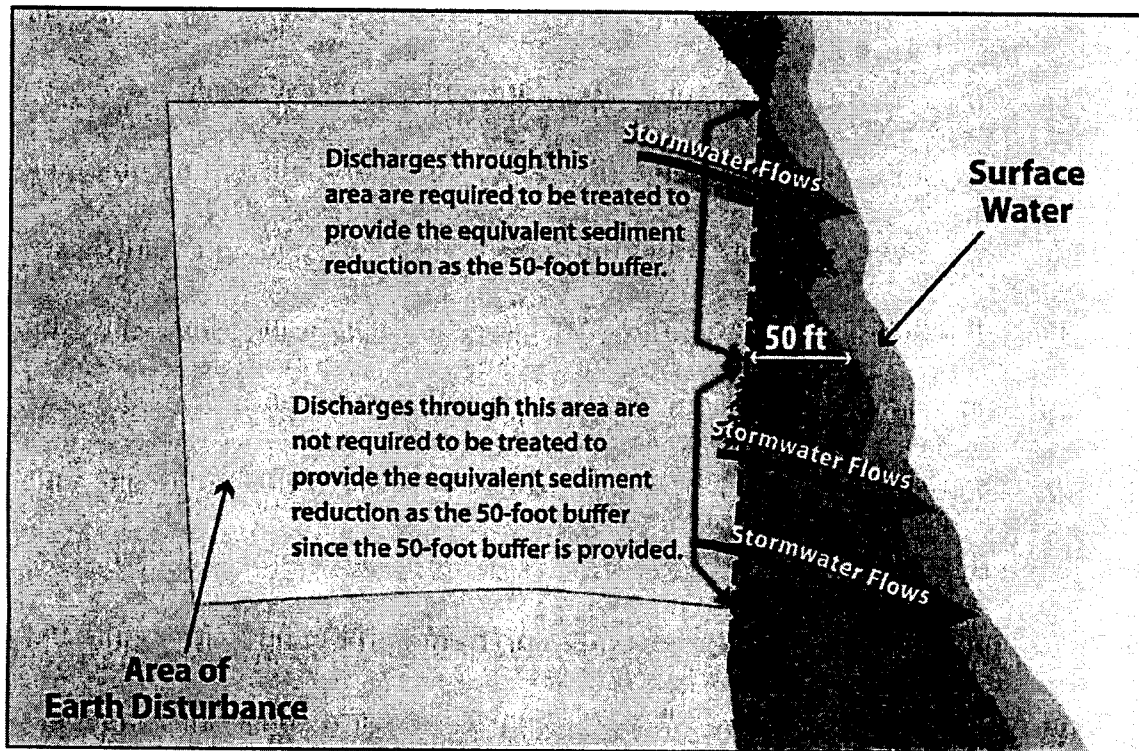
Therefore, in choosing between the 2 different compliance alternatives (Alternative 2 or 3), you should only elect to comply with Alternative 2 if it is feasible for you to retain any natural buffer on your site. (Note: For any buffer width retained, you are required to comply with the requirements in Part G.2.1, above, concerning the retention of vegetation and restricting earth disturbances.) Similarly, if you determine that it is infeasible to provide a natural buffer of any size during construction, you should elect to comply with Alternative 3. After making this determination, you should proceed to Part G.2.2.2 to determine how to provide controls that, together with any buffer areas that is being retained, if applicable, will achieve an equivalent sediment load reduction as the 50-foot buffer.

G.2.2.2 Design Controls That Provide Equivalent Sediment Reduction as 50-foot Buffer

You must next determine what additional controls must be implemented on your site that, alone or in combination with any retained natural buffer, achieve a reduction in sediment equivalent to that achieved by a 50-foot buffer.

Note that if only a portion of the natural buffer is less than 50 feet, you are only required to implement erosion and sediment controls that achieve the sediment load reduction equivalent to the 50-foot buffer for discharges through that area. You would not be required to provide treatment of stormwater discharges that flow through 50 feet or more of natural buffer. See Figure G - 4.

Figure G - 4 Example of how to comply with the requirement to provide the equivalent sediment reduction when only a portion of your earth-disturbances discharge to a buffer of less than 50-feet.



To comply with this requirement, you are required to do the following:

Step 1 - Estimate the sediment reduction expected from your site if you had retained a 50-foot natural buffer;

Step 2 - Design controls that alone or in combination with any width of buffer retained achieve the equivalent sediment removal efficiency as that expected from the 50-foot buffer; and

Step 3 - Document in your SWPPP how your controls will achieve the equivalent sediment removal efficiency of the 50-foot buffer.

Guidelines to help you work through these requirements are provided below.

a. Step 1 - Estimate the Sediment Reduction from the 50-foot Buffer

In order to design controls that match the sediment removal efficiency of a 50-foot buffer, you first need to know what this efficiency is for your site. The sediment removal efficiencies of natural buffers vary according to a number of site-specific factors, including precipitation, soil type, land cover, slope length, width, steepness, and the types of sediment controls used to reduce the discharge of sediment prior to the buffer. EPA has simplified this calculation by developing buffer performance tables covering a range of vegetation and soil types for the areas covered by the CGP. See Attachment 1, Tables G - 8 through G - 15. Note: buffer performance values in Tables G - 8 through G - 15 represent the percent of sediment captured through the use of perimeter controls (e.g., silt fences) and 50-foot buffers at disturbed sites of fixed proportions and slopes.²

Using Tables G - 8 through G - 15 (see Attachment 1), you can determine the sediment removal efficiency of a 50-foot buffer for your geographic area by matching the vegetative cover type that best describes your buffer area and the type of soils that predominate at your site. For example, if your site is located in Massachusetts (Table G - 9), and your buffer vegetation corresponds most closely with that of tall fescue grass, and the soil type at your site is best typified as sand, your site's sediment removal efficiency would be 81 percent.

In this step, you should choose the vegetation type in the tables that most closely matches the vegetation that would exist naturally in the buffer area on your site regardless of the condition of the buffer. However, because you are not required to plant any additional vegetation in the buffer area, in determining what controls are necessary to meet this sediment removal equivalency in Step 2 below, you will be able to take credit for this area as a fully vegetated "natural buffer."

Similarly, if a portion of the buffer area adjacent to the surface water is owned by another party and is not under your control, you can treat the area of land not

² EPA used the following when developing the buffer performance tables:

- The sediment removal efficiencies are based on the U.S. Department of Agriculture's RUSLE2 ("Revised Universal Soil Loss Equation 2") model for slope profiles using a 100-foot long denuded slopes.
- Sediment removal was defined as the annual sediment delivered at the downstream end of the 50-foot natural buffer (tons/yr/acre) divided by the annual yield from denuded area (tons/yr/acre).
- As perimeter controls are also required by the CGP, sediment removal is in part a function of the reduction due to a perimeter control (i.e., silt fence) located between the disturbed portion of the site and the upstream edge of the natural buffer and flow traveling through a 50-foot buffer of undisturbed natural vegetation.
- It was assumed that construction sites have a relatively uniform slope without topographic features that accelerate the concentration for erosive flows.
- It was assumed that vegetation has been removed from the disturbed portion of the site and a combination of cuts and fills have resulted in a smooth soil surface with limited retention of near-surface root mass

To represent the influence of soil, EPA analyzed 11 general soil texture classifications in its evaluation of buffer performance. To represent different types of buffer vegetation, EPA evaluated 4 or more common vegetative types for each state/territory covered under the permit. For each vegetation type evaluated, EPA considered only permanent, non-grazed and non-harvested vegetation, on the assumption that a natural buffer adjacent to the surface water will typically be undisturbed. EPA also evaluated slope steepness and found that sediment removal efficiencies present in Tables G - 8 through G - 15 are achievable for slopes that are less than nine percent.

under control as having the equivalent vegetative cover and soil type that predominates on the portion of the property on which your construction activities are occurring.

For example, if your earth-disturbances occur within 50 feet of a surface water, but the 10 feet of land immediately adjacent to the surface water is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you can treat the 10 foot area adjacent to the stream as having the equivalent soil and vegetation type as predominates in the 40 foot area under your control. You would then make the same assumption in Step 2 for purposes of determining the equivalent sediment removal.

Alternatively, you may do your own calculation of the effectiveness of the 50-foot buffer based upon your site-specific conditions, and may use this number as your sediment removal equivalency standard to meet instead of using Tables G - 8 through G - 15. This calculation must be documented in your SWPPP.

b. Step 2 - Design Controls That Match the Sediment Removal Efficiency of the 50-foot Buffer

Once you have determined the estimated sediment removal efficiency of a 50-foot buffer for your site in Step 1, you will be required to select stormwater controls that will provide an equivalent sediment load reductions. These controls can include the installation of a single designed control, such as a sediment pond, additional perimeter controls, or other type of device. Alternatively, you may elect to install a combination of stormwater controls and to retain some amount of a buffer. Whichever control(s) you select, you must demonstrate in your SWPPP that the controls will provide at a minimum the same sediment removal capabilities as the 50-foot buffer (Step 1). You are allowed to take credit for the removal efficiencies of your required perimeter controls in your calculation of equivalency, because these were included in calculating the buffer removal efficiencies in tables G - 8 through G - 15. (Note: You are reminded that the controls must be kept in effective operating condition until you have completed final stabilization on the disturbed portions of the site discharging to the surface water.)

To make the determination that your controls and/or buffer area achieve an equivalent sediment load reduction as the 50-foot buffer, you will need to use a model or other type of calculator. As mentioned above, there are a variety of models available that can be used to support your calculation, including USDA's RUSLE-series programs and the WEPP erosion model, SEDCAD, SEDIMOT, or other models. A couple of examples are provided in Attachment 3 to help illustrate how this determination could be made.

If you are retaining a buffer of less than 50 feet, you may take credit for the removal that will occur from the reduced buffer and only need to provide additional controls to make up the difference between the removal efficiency of a 50 foot buffer and the removal efficiency of the narrower buffer. For example, if you are retaining a 30 foot buffer, you can account for the sediment removal provided by the 30-foot buffer retained, and you will only need to design controls to make up for the additional removal provided by the 20-foot of buffer that is not being provided. To do this, you would plug the width of the buffer that is

retained into RUSLE or another model, along with other stormwater controls that will together achieve a sediment reduction equivalent to a natural 50-foot buffer.

As described in Step 1 above, you can take credit for the area you have retained as a "natural buffer" as being fully vegetated, regardless of the condition of the buffer area.

For example, if your earth-disturbances occur 30 feet from a surface water, but the 10 feet of land immediately adjacent to the surface water is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you can treat the 10-foot area as a natural buffer, regardless of the activities that are taking place in the area. Therefore, you can assume (for purposes of your equivalency calculation) that your site is providing the sediment removal equivalent of a 30-foot buffer, and you will only need to design controls to make up for the additional removal provided by the 20-foot of buffer that is not being provided.

c. Step 3 - Document How Site-Specific Controls Will Achieve the Sediment Removal Efficiency of the 50-foot Buffer

In Steps 1 and 2, you determined both the expected sediment removal efficiency of a 50-foot buffer at your site, and you used this number as a performance standard to design controls to be installed at your site, which alone or in combination with any retained natural buffer, achieves the expected sediment removal efficiency of a 50-foot buffer at your site. The final step is to document in your SWPPP the information you relied on to calculate the equivalent sediment reduction as an undisturbed natural buffer.

EPA will consider your documentation to be sufficient if it generally meets the following:

- For Step 1, refer to the table in Attachment 1 that you used to derive your estimated 50-foot buffer sediment removal efficiency performance. Include information about the buffer vegetation and soil type that predominate at your site, which you used to select the sediment load reduction value in Tables G - 8 through G - 15. Or, if you conducted a site-specific calculation for sediment removal efficiency, provide the specific removal efficiency, and the information you relied on to make your site-specific calculation.
- For Step 2: (1) Specify the model you used to estimate sediment load reductions from your site; and (2) the results of calculations showing how your controls will meet or exceed the sediment removal efficiency from Step 1.

If you choose Alternative 3, you must also include in your SWPPP a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size.

G.2.3 Small Residential Lot Compliance Alternatives

In this part of Appendix G, EPA provides additional compliance alternatives for operators of small residential lots. In accordance with Part 2.1.2.1e.iv, operators of small residential lots who do not

A **small residential lot** is a lot or grouping of lots being developed for residential purposes that will disturb less than 1 acre of land, but that is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre.

provide a 50-foot buffer are not required to make the demonstration outlined in Part G.2.2.2. Instead, qualifying operators can comply with the buffer requirement by choosing to implement a set of traditional sediment and erosion controls from the menu of practices provided in Part G.2.3.2.

EPA has developed two different alternatives for compliance. The following steps describe how a small residential lot operator would achieve compliance with these 2 alternatives.

G.2.3.1 Step 1 – Determine if You are Eligible for the Small Residential Lot Compliance Alternatives

In order to be eligible for the small residential lot compliance alternatives, the following conditions must be met:

- a. The lot or grouping of lots meets the definition of "small residential lot"; and
- b. The operator must comply with all other requirements in Part 2.1.2.1, including:
 - i. Ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls, and use velocity dissipation devices if necessary to prevent erosion caused by stormwater within the buffer;
 - ii. Document in the SWPPP the natural buffer width retained on the property, and show the buffer boundary on your site plan; and
 - iii. Delineate, and clearly mark off, with flags, tape, or other similar marking device, all natural buffer areas.

G.2.3.2 Step 2 – Implement the Requirements of the Small Residential Lot Compliance Alternative Selected

You must next choose from one of two small residential lot compliance alternatives and implement the stormwater control practices associated with that alternative.

Note: The compliance alternatives provided below are not mandatory. Operators of small residential lots can alternatively choose to comply with the any of the options that are available to other sites in Part 2.1.2.1a, described in Parts G.2.1 and G.2.2 in this appendix.

a. Small Residential Lot Compliance Alternative 1

Alternative 1 is a straightforward tiered- technology approach that specifies the controls that a small residential lot must implement based on the buffer width retained. To achieve compliance with Alternative 1, you must implement the

controls specified in Table G - 1 based on the buffer width to be retained. See footnote 3, below, for a description of the controls you must implement.

For example, if you are an operator of a small residential lot that will be retaining a 35-foot buffer and you choose Small Residential Lot Compliance Alternative 1, you must implement double perimeter controls between earth disturbances and the surface water.

In addition to implementing the applicable control, you must also document in your SWPPP how you will comply with Alternative 1.

Table G - 1. Alternative 1 Requirements³

Retain 50-foot Buffer	Retain <50 and >30 foot Buffer	Retain ≤ 30 foot Buffer
No Additional Requirements	Double Perimeter Controls	Double Perimeter Controls and 7-Day Site Stabilization

b. Small Residential Lot Compliance Alternative 2

Alternative 2 specifies the controls that a builder of a small lot must implement based on both the buffer width retained and their risk of sediment discharge. By incorporating the sediment risk, this approach may result in the implementation of controls that are more appropriate for the site's specific conditions.

Step 1 – Determine Your Site's Sediment Risk Level

To meet the requirements of Alternative 2, you must first determine your site's sediment discharge "risk level" based on the site's slope, location, and soil type. To help you to determine your site's sediment risk level, EPA has developed five different tables for different slope conditions. You must select the table that most closely corresponds to your site's average slope.

For example, if your site's average slope is 7 percent, you would use Table G - 4 to determine your site's sediment risk.

After you determine which table applies to your site, you must then use the table to determine the "risk level" (e.g., "low", "moderate", or "high") that corresponds to your site's location and predominant soil type.⁴

For example, based on Table G - 3, a site located in New Hampshire with a 4 percent average slope and with predominately sandy clay loam soils would fall into the "moderate" risk level.

³ **Description of Additional Controls Applicable to Small Residential Lot Compliance Alternatives 1 and 2:**

- **No Additional Requirements:** If you implement a buffer of 50 feet or greater, then you are not subject to any additional requirements. Note that you are required to install perimeter controls between the disturbed portions of your site and the buffer in accordance with Part 2.1.2.2.
- **Double Perimeter Control:** In addition to the reduced buffer width retained on your site, you must provide a double row of perimeter controls between the disturbed portion of your site and the surface water spaced a minimum of 5 feet apart.
- **Double Perimeter Control and 7-Day Site Stabilization:** In addition to the reduced buffer width retained on your site and the perimeter control implemented in accordance with Part 2.1.2.2, you must provide a double row of perimeter controls between the disturbed portion of your site and the surface water spaced a minimum of 5 feet apart, and you are required to complete the stabilization activities specified in Parts 2.2.1.2a and/or 2.2.1.2b within 7 calendar days of the temporary or permanent cessation of earth-disturbing activities.

⁴ One source for determining your site's predominant soil type is the USDA's Web Soil Survey located at <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.

Table G - 2. Risk Levels for Sites with Average Slopes of \leq 3 Percent

Soil Type \ Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	Moderate	Moderate	Moderate	Moderate	High
Puerto Rico	Moderate	Moderate	Moderate	Moderate	High
Virgin Islands	Low	Moderate	Low	Moderate	Moderate
American Samoa	Moderate	Moderate	Moderate	Moderate	High
Massachusetts and New Hampshire	Low	Moderate	Low	Low	Moderate
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Low
Washington D.C.	Low	Moderate	Low	Low	Moderate

Table G - 3. Risk Levels for Sites with Average Slopes of $>$ 3 Percent and \leq 6 Percent

Soil Type \ Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	Moderate	Moderate	Moderate	Moderate	High
Puerto Rico	Moderate	Moderate	Moderate	Moderate	High
Virgin Islands	Moderate	Moderate	Moderate	Moderate	High
American Samoa	High	High	Moderate	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Low	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Moderate
Washington D.C.	Moderate	Moderate	Moderate	Moderate	High

Table G - 4. Risk Levels for Sites with Average Slopes of > 6 Percent and ≤ 9 Percent

Soil Type \ Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	Moderate	High	Moderate	High	High
Puerto Rico	Moderate	High	Moderate	Moderate	High
Virgin Islands	Moderate	Moderate	Moderate	Moderate	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Moderate	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Moderate
Washington D.C.	Moderate	Moderate	Moderate	Moderate	High

Table G - 5. Risk Levels for Sites with Average Slopes of > 9 Percent and ≤ 15 Percent

Soil Type \ Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	High	High	High	High	High
Puerto Rico	High	High	High	High	High
Virgin Islands	Moderate	High	Moderate	High	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Moderate	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Moderate	Low	Moderate	Moderate
Washington D.C.	Moderate	High	Moderate	Moderate	High

Table G - 6. Risk Levels for Sites with Average Slopes of > 15 Percent

Soil Type Location	Clay	Silty Clay Loam or Clay- Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	High	High	High	High	High
Puerto Rico	High	High	High	High	High
Virgin Islands	High	High	High	High	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	High	High	Moderate	High	High
Idaho	Low	Low	Low	Low	Moderate
New Mexico	Moderate	Moderate	Moderate	Moderate	High
Washington D.C.	High	High	Moderate	High	High

Step 2 – Determine Which Additional Controls Apply

Once you determine your site's "risk level", you must next determine the additional controls you need to implement on your site, based on the width of buffer you plan to retain. Table G - 7 specifies the requirements that apply based on the "risk level" and buffer width retained. See footnote 3, above, for a description of the additional controls that are required.

For example, if you are the operator of a small residential lot that falls into the "moderate" risk level, and you decide to retain a 20-foot buffer, using Table G-7 you would determine that you need to implement double perimeter controls to achieve compliance with Part 2.1.2.1.

You must also document in your SWPPP your compliance with Alternative 2.

Table G - 7. Alternative 2 Requirements²

Risk Level based on Estimated Soil Erosion	Retain 25' or more buffer	Retain 25' and > 50' buffer	Retain 25' and < 10' buffer	Retain < 10' buffer
Low Risk	No Additional Requirements	No Additional Requirements	Double Perimeter Control	Double Perimeter Control
Moderate Risk	No Additional Requirements	Double Perimeter Control	Double Perimeter Control	Double Perimeter Control and 7-Day Site Stabilization
High Risk	No Additional Requirements	Double Perimeter Control	Double Perimeter Control and 7-Day Site Stabilization	Double Perimeter Control and 7-Day Site Stabilization

ATTACHMENT 1

Sediment Removal Efficiency Tables⁵

EPA recognizes that very high removal efficiencies, even where theoretically achievable by a 50-foot buffer, may be very difficult to achieve in practice using alternative controls. Therefore in the tables below, EPA has limited the removal efficiencies to a maximum of 90%. Efficiencies that were calculated at greater than 90% are shown as 90%, and this is the minimum percent removal that must be achieved by alternative controls.

Table G - 8. Estimated 50-foot Buffer Performance in Idaho*

Type of Buffer Vegetation**	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Tall Fescue Grass	42	52	44	48	85
Medium-density Weeds	28	30	28	26	60
Low-density Warm-season Native Bunchgrass (i.e., Grama Grass)	25	26	24	24	55
Northern Mixed Prairie Grass	28	30	28	26	50
Northern Range Cold Desert Shrubs	28	28	24	26	50

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

Table G - 9. Estimated 50-foot Buffer Performance in Massachusetts and New Hampshire*

Type of Buffer Vegetation**	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Warm-season Grass (i.e., Switchgrass, Lemongrass)	79	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	78	90	90	90	90
Tall Fescue Grass	76	90	81	89	90
Medium-density Weeds	66	76	60	72	66

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

⁵ The buffer performances were calculated based on a denuded slope upgradient of a 50-foot buffer and a perimeter controls, as perimeter controls are a standard requirement (see Part 2.1.2.2).

Table G - 10. Estimated 50-foot Buffer Performance in New Mexico*

Type of Buffer Vegetation **	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Tall Fescue grass	71	85	80	86	90
Medium-density Weeds	56	73	55	66	78
Low-density Warm-season Native Bunchgrass (I.e., Grama Grass)	53	70	51	62	67
Southern Mixed Prairie Grass	53	71	52	63	50
Southern Range Cold Desert Shrubs	56	73	55	65	53

* Applicable for sites with less than nine percent slope
 ** Characterization focuses on the under-story vegetation

Table G - 11. Estimated 50-foot Buffer Performance in Washington, DC*

Type of Buffer Vegetation **	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Warm-season Grass (I.e., Switchgrass, Lemongrass)	82	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	81	90	90	90	90
Tall Fescue Grass	79	90	83	89	90
Medium-density Weeds	71	79	66	75	74

* Applicable for sites with less than nine percent slope
 ** Characterization focuses on the under-story vegetation

Table G - 12. Estimated 50-foot Buffer Performance in American Samoa*

Type of Buffer Vegetation **	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Bahiagrass (Permanent cover)	82	90	90	90	83
Warm-season Grass (I.e., Switchgrass, Lemongrass)	82	90	90	90	85
Dense Grass	82	90	90	90	83
Tall Fescue Grass	82	89	82	89	79
Medium-density Weeds	70	73	62	75	59

* Applicable for sites with less than nine percent slope
 ** Characterization focuses on the under-story vegetation

Table G - 13. Estimated 50-foot Buffer Performance in Guam*

Type of Buffer Vegetation **	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Bahlagrass (Permanent cover)	80	90	90	90	89
Warm-season Grass (i.e., Switchgrass, Lemongrass)	80	90	90	90	90
Dense Grass	79	90	90	90	89
Tall Fescue Grass	76	90	80	88	87
Medium-density Weeds	63	73	53	68	61

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

Table G - 14. Estimated 50-foot Buffer Performance in Puerto Rico*

Type of Buffer Vegetation **	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Bahlagrass (Permanent cover)	83	90	90	90	90
Warm-season Grass (i.e., Switchgrass, Lemongrass)	83	90	90	90	90
Dense Grass	83	90	90	90	90
Tall Fescue Grass	82	90	84	90	89
Medium-density Weeds	72	78	65	76	64

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

Table G - 15. Estimated 50-foot Buffer Performance in Virgin Islands*

Type of Buffer Vegetation **	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Bahlagrass (Permanent cover)	85	90	90	90	90
Warm-season Grass (i.e., Switchgrass, Lemongrass)	86	90	90	90	90
Dense Grass	85	90	90	90	90
Tall Fescue Grass	85	90	88	90	89
Medium-density Weeds	75	77	71	78	63

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

ATTACHMENT 2

Using the Sediment Removal Efficiency Tables – Questions and Answers

- *What if my specific buffer vegetation is not represented in Tables G - 8 through G - 15?* Tables G - 8 through G - 15 provide a wide range of factors affecting buffer performance; however, there may be instances where the specific buffer vegetation type on your site is not listed. If you do not see a description of the type of vegetation present at your site, you should choose the vegetation type that most closely matches the vegetation type on your site. You can contact your local Cooperative Extension Service Office (www.csrees.usda.gov/Extension) for assistance in determining the vegetation type in Tables G - 8 through G - 15 that most closely matches your site-specific vegetation.
- *What if there is high variability in local soils?* EPA recognizes that there may be a number of different soil type(s) on any given construction site. General soil information can be obtained from USDA soil survey reports (<http://websoilsurvey.nrcs.usda.gov>) or from individual site assessments performed by a certified soil expert. Tables G - 8 through G - 15 present eleven generic soil texture classes, grouping individual textures where EPA has determined that performance is similar. If your site contains different soil texture classes, you should use the soil type that best approximates the predominant soil type at your site.
- *What if my site slope is greater than 9 percent after final grade is reached?* As indicated in the buffer performance tables, the estimated sediment removal efficiencies are associated with disturbed slopes of up to 9 percent grade. Where your graded site has an average slope of greater than 9 percent, you should calculate a site-specific buffer performance.
- *How do I calculate my own estimates for sediment reduction at my specific site?* If you determine that it is necessary to calculate your own sediment removal efficiency using site-specific conditions (e.g., slopes at your site are greater than 9 percent), you can do so by choosing from a range of available mathematical models that are available to facilitate this calculation, including USDA's RUSLE-series programs and the WEPP erosion model, SEDCAD, SEDIMOT, or other equivalent models.
- *What is my estimated buffer performance if my site location is not represented by Tables G - 8 through G - 15?* If your site is located in an area not represented by Tables G - 8 through G - 15, you should use the table that most closely approximates conditions at your site. You may also choose to conduct a site-specific calculation of the buffer performance.
- *What if only a portion of my site drains to the buffer area?* If only a portion of your site drains to a surface water, where that water is within 50 feet of your construction activities, you are only required to meet the equivalency requirement for the stormwater flows corresponding to those portions of the site. See Example 2 below for an example of how this is expected to work.

ATTACHMENT 3

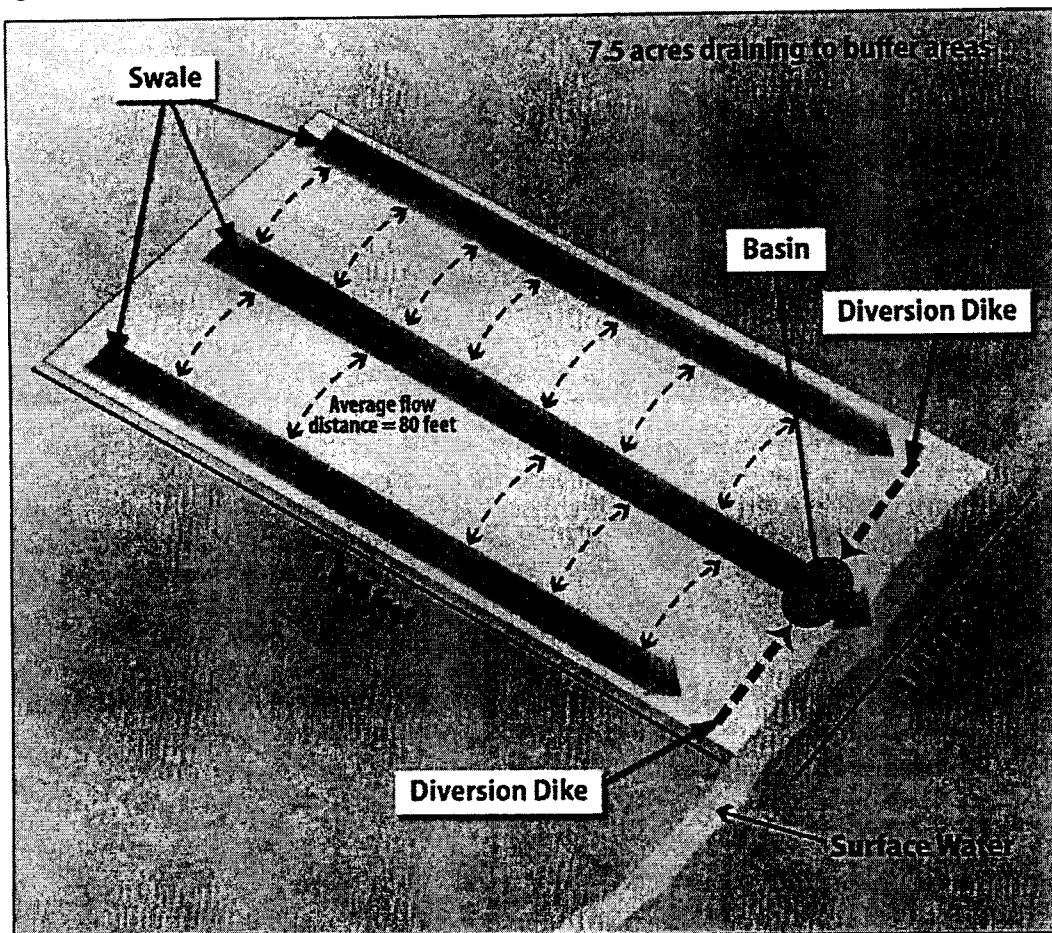
Examples of How to Use the Sediment Removal Efficiency Tables

Example 1. Comparatively Wet Location (7.5 acre site located in Massachusetts)

The operator of a 7.5-acre construction site in Massachusetts has determined that it is infeasible to establish a buffer of any size on their site, and is now required to select and install controls that will achieve an equivalent sediment load reduction as that estimated in G - 9 for their site conditions. The first step is to identify what percentage of eroded sediment is estimated to be retained from a 50-foot buffer. For this example, it is assumed that the site has a relatively uniform gentle slope (3 percent), so Table G - 9 can be used to estimate the 50-foot buffer sediment load reduction. If the site's buffer vegetation is best typified by cool-season dense grass and the underlying soil is of a type best described as loamy sand, the 50-foot buffer is projected to capture 90 percent of eroded sediment from the construction site.

The second step is to determine what sediment controls can be selected and installed in combination with the perimeter controls already required to be implemented at the site (see Part 2.1.2.2), which will achieve the 90 percent sediment removal efficiency from Table G - 9. For this example, using the RUSLE2 profile model, it was determined that installing a pair of shallow-sloped diversion ditches to convey runoff to a well-designed and maintained sediment basin provides 99 percent sediment removal. Because the estimated sediment reduction is greater than the required 90 percent that a 50-foot buffer provides, the operator will have met the buffer requirements. See Figure G - 5. The operator could also choose a different set of controls, as long as they achieve at least a 90 percent sediment removal efficiency.

Figure G - 5. Example 1 – Equivalent Sediment Load Reductions at a 7.5 ac Site in MA.



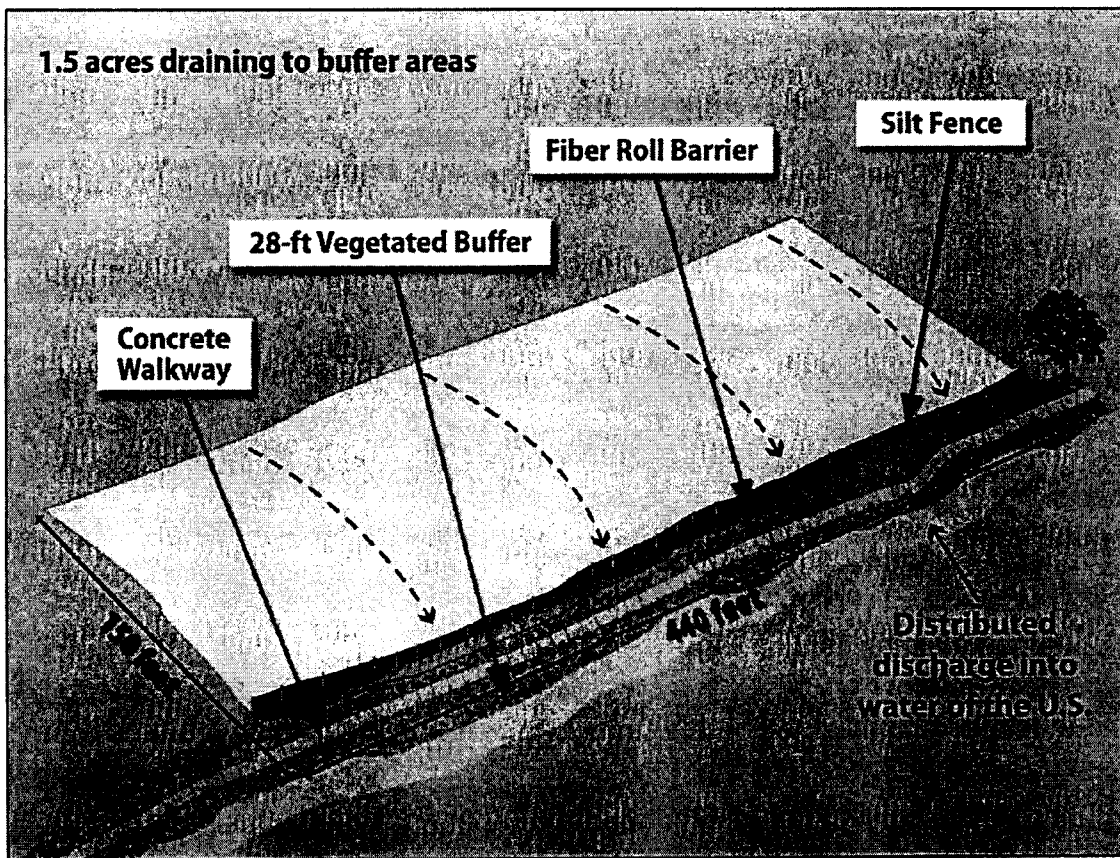
Example 2. Arid Location With Pre-existing Disturbances in the Natural Buffer (6.5 acre site located in New Mexico)

An operator of a site in New Mexico determines that it is not practicable to provide a 50-foot buffer, but a 28-foot buffer can be provided. Because the operator will provide a buffer that is less than 50 feet, the operator must determine which controls, in combination with the 28-foot buffer, achieve a sediment load reduction equivalent to the 50-foot buffer. In this example, the project will disturb 6.5 acres of land, but only 1.5 acres of the total disturbed area drains to the buffer area. Within the 28-foot buffer area is a preexisting concrete walkway. Similar to Example 1, the equivalence analysis starts with Step 1 (Part G.2.2.2) with a review of the New Mexico buffer performance (Table G - 10). The operator determines that the predominate vegetation type in the buffer area is prairie grass and the soil type is similar to silt, and that the site is of a uniform, shallow slope (e.g., 3 percent grade). Although the operator will take credit for the disturbance caused by the concrete walkway as a natural buffer in Step 2, here the operator can treat the entire buffer area as being naturally vegetated with prairie grass. Based on this information, the operator refers to Table G - 10 to estimate that the 50-foot buffer would retain 50 percent of eroded soil.

The second step is to determine, based on the 50 percent sediment removal efficiency found in Table G - 10, what sediment controls in combination with the 28-foot buffer area, can be

implemented to reduce sediment loads by 50 percent or more. The operator does not have to account the reduction in buffer function caused by the preexisting walkway, and can take credit for the entire 28-foot buffer being fully vegetated in the analysis. For this example, using the RUSLE2 profile model, the operator determined that installing a fiber roll barrier between the silt fence (already required by Part 2.1.2.2) and the 28-foot buffer will achieve an estimated 84 percent sediment removal efficiency. See Figure G - 6. Note that this operator is subject to the requirement in Part 2.1.2.1.b.i to ensure that discharges through the silt fence, fiber roll barrier, and 28-foot buffer do not cause erosion within the buffer. The estimated sediment reduction is greater than the required 50 percent; therefore the operator will have met the buffer alternative requirement.

Figure G - 6. Example 2 – Equivalent Sediment Load Reductions at a 6.5 ac Site in NM.



Effluent Limitations and Guidelines

Except as provided in 40 CFR §§125.30-125.32, any discharge regulated under this general permit, with the exception of sites that obtained waivers based on low rainfall erosivity, must achieve, at a minimum, the following effluent limitations representing the degree of effluent reduction attainable by application of the best practicable control technology currently available (BPT).

Erosion and sediment controls.

Design, install, and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed, and maintained to:

- (a) Control stormwater volume and velocity within the site to minimize soil erosion;
- (b) If any stormwater flow will be channelized at the site, stormwater controls must be designed to control both peak flowrates and total stormwater volume to minimize erosion at outlets and to minimize downstream channel and streambank erosion;
- (c) Minimize the amount of soil exposed during construction activity;
- (d) Minimize the disturbance of steep slopes;
- (e) Minimize sediment discharges from the site. The design, installation, and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
- (f) If earth disturbance activities are located in close proximity to a surface water, provide and maintain appropriate natural buffers if feasible and as necessary, around surface waters, depending on site-specific topography, sensitivity, and proximity to water bodies. Direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration. If providing buffers is infeasible, the permittee shall document the reason that natural buffers are not feasible, and shall implement additional erosion and sediment controls to reduce sediment load;
- (g) Preserve native topsoil at the site, unless infeasible; and
- (h) Minimize soil compaction in post-construction pervious areas. In areas of the construction site where final vegetative stabilization will occur or where infiltration practices will be installed, either:
 - (1) restrict vehicle and equipment use to avoid soil compaction; or
 - (2) prior to seeding or planting areas of exposed soil that have been compacted, use techniques that condition the soils to support vegetative growth, if necessary and feasible;

TCEQ does not consider stormwater control features (e.g., stormwater conveyance channels, storm drain inlets, sediment basins) to constitute "surface waters" for the purposes of triggering the buffer requirement in Part III.G.(f) above.

Soil stabilization.

Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating, or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. In the context of this requirement, "immediately" means as soon as practicable, but no later than the end of the next work day, following the day when the earth disturbing activities have temporarily or permanently ceased.

Temporary stabilization must be completed no more than 14 calendar days after initiation of soil stabilization measures, and final stabilization must be achieved prior to termination of permit coverage. In arid, semi-arid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative non-vegetative stabilization measures must be employed as soon as practicable.

Dewatering

Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited, unless managed by appropriate controls.

Pollution prevention measures

Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented, and maintained to:

- (a) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
- (b) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater; and
- (c) Minimize the discharge of pollutants from spills and leaks, and implement chemical spill and leak prevention and response procedures.

Prohibited discharges.

The following discharges are prohibited:

- (a) Wastewater from wash out of concrete trucks, unless managed by an appropriate control (see Part V of the general permit);
- (b) Wastewater from wash out and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

- (c) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and
- (d) Soaps or solvents used in vehicle and equipment washing.

Surface outlets

When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface, unless infeasible.

Appendix L

***TPDES General Permit Number TXR150000
For Construction Activities***

This Appendix contains a copy of the TPDES 2013 General Permit for Construction Activities. You may use this copy for reference if needed if you have any questions about the TXR150000.

Texas Commission on Environmental Quality
 P.O. Box 13087, Austin, Texas 78711-3087



**GENERAL PERMIT TO DISCHARGE UNDER THE
 TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM**

under provisions of
 Section 402 of the Clean Water Act
 and Chapter 26 of the Texas Water Code

This permit supersedes and replaces
 TPDES General Permit No. TXR150000, issued March 5, 2008

Construction sites that discharge stormwater associated with construction activity
 located in the state of Texas
 may discharge to surface water in the state

only according to monitoring requirements and other conditions set forth in this general
 permit, as well as the rules of the Texas Commission on Environmental Quality (TCEQ or
 Commission), the laws of the State of Texas, and other orders of the Commission of the
 TCEQ. The issuance of this general permit does not grant to the permittees the right to use
 private or public property for conveyance of stormwater and certain non-stormwater
 discharges along the discharge route. This includes property belonging to but not limited to
 any individual, partnership, corporation or other entity. Neither does this general permit
 authorize any invasion of personal rights nor any violation of federal, state, or local laws or
 regulations. It is the responsibility of the permittees to acquire property rights as may be
 necessary to use the discharge route.

This general permit and the authorization contained herein shall expire at midnight, five
 years from the permit effective date.

EFFECTIVE DATE: March 5, 2013

ISSUED DATE: FEB 19 2013

Bryan W. Dier
 For the Commission

Construction General Permit

TPDES General Permit TXR150000

**TPDES GENERAL PERMIT NUMBER TXR150000 RELATING TO
 STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION
 ACTIVITIES**

Table of Contents

Part I. Flow Chart and Definitions 5

Section A. Flow Chart to Determine Whether Coverage is Required 5

Section B. Definitions 6

Part II. Permit Applicability and Coverage 12

Section A. Discharges Eligible for Authorization 12

1. Stormwater Associated with Construction Activity 12

2. Discharges of Stormwater Associated with Construction Support Activities 12

3. Non-Stormwater Discharges 12

4. Other Permitted Discharges 13

Section B. Concrete Truck Wash Out 13

Section C. Limitations on Permit Coverage 13

1. Post Construction Discharges 13

2. Prohibition of Non-Stormwater Discharges 13

3. Compliance With Water Quality Standards 13

4. Impaired Receiving Waters and Total Maximum Daily Load (TMDL)
 Requirements 14

5. Discharges to the Edwards Aquifer Recharge or Contributing Zone 14

6. Discharges to Specific Watersheds and Water Quality Areas 14

7. Protection of Streams and Watersheds by Other Governmental Entities 14

8. Indian Country Lands 14

9. Oil and Gas Production 15

10. Stormwater Discharges from Agricultural Activities 15

11. Endangered Species Act 15

12. Other 15

Section D. Deadlines for Obtaining Authorization to Discharge 15

1. Large Construction Activities 15

2. Small Construction Activities 15

Section E. Obtaining Authorization to Discharge 16

1. Automatic Authorization for Small Construction Activities With Low Potential for
 Erosion 16

2. Automatic Authorization For All Other Small Construction Activities 17

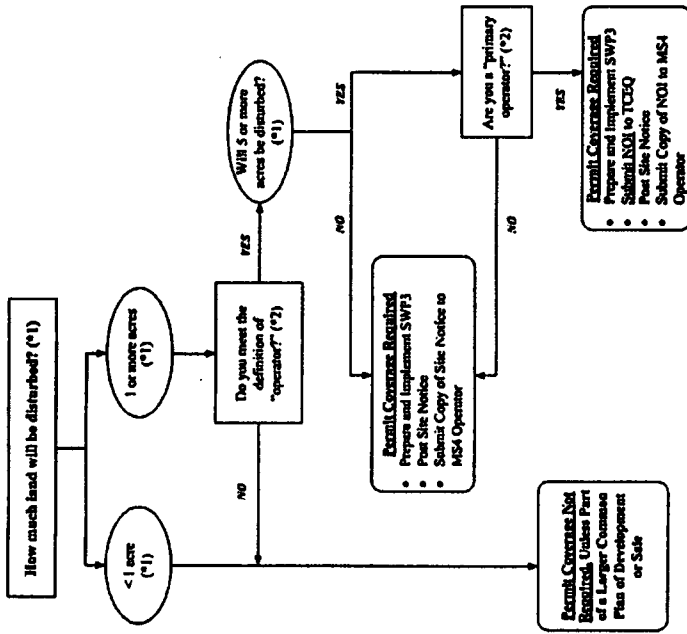
3. Authorization for Large Construction Activities 17

Construction General Permit	TPDES General Permit TXR150000
4. Waivers for Small Construction Activities:	18
5. Effective Date of Coverage	18
6. Notice of Change (NOC)	18
7. Statutory Requirement for NOI Forms, Notice of Termination (NOT) Forms, NOC Letters, and Construction Site Notices	19
8. Contents of the NOI	19
Section F. Terminating Coverage	20
1. Notice of Termination (NOT) Required	20
2. Minimum Contents of the NOT	20
3. Termination of Coverage for Small Construction Sites and for Secondary Operators at Large Construction Sites	20
4. Transfer of Operational Control	21
Section G. Waivers from Coverage	21
1. Waiver Applicability and Coverage	22
2. Steps to Obtaining a Waiver	22
3. Effective Date of Waiver	22
4. Activities Extending Beyond the Waiver Period	22
Section H. Alternative TPDES Permit Coverage	23
1. Individual Permit Alternative	23
2. Individual Permit Required	23
3. Alternative Discharge Authorization	23
Section I. Permit Expiration	23
Part III. Stormwater Pollution Prevention Plans (SWP3)	24
Section A. Shared SWP3 Development	24
Section B. Responsibilities of Operators	25
1. Secondary Operators and Primary Operators with Control Over Construction Plans and Specifications	25
2. Primary Operators with Day-to-Day Operational Control	25
Section C. Deadlines for SWP3 Preparation, Implementation, and Compliance	25
Section D. Plan Review and Making Plans Available	26
Section E. Revisions and Updates to SWP3s	26
Section F. Contents of SWP3s	26
Section G. Erosion and Sediment Control Requirements Applicable to All Sites	34
Part IV. Stormwater Runoff from Concrete Batch Plants	35
Section A. Benchmark Sampling Requirements	35
Section B. Best Management Practices (BMPs) and SWP3 Requirements	37
Section C. Prohibition of Wastewater Discharges	39

Construction General Permit	TPDES General Permit TXR150000
Part V. Concrete Truck Wash Out Requirements	40
Part VI. Retention of Records	40
Part VII. Standard Permit Conditions	40
Part VIII. Fees	41
Appendix A: Automatic Authorization	43
Appendix B: Erosivity Index (EI) Zones in Texas	45
Appendix C: Isorodent Map	46
Appendix D: Erosivity Indices for EI Zones in Texas	47

Part I. Flow Chart and Definitions

Section A. Flow Chart to Determine Whether Coverage is Required



(*) To determine the size of the construction project, use the size of the entire area to be disturbed, and include the size of the entire area of the project if the project is part of a larger project (refer to Part I.B. "Definitions" for the definition of "operator" and "primary operator"). Refer to the definitions for "operator", "primary operator", and "secondary operator" in Part I, Section B. of this permit.

Section B. Definitions

Arid Areas - Areas with an average annual rainfall of 0 to 10 inches.

Best Management Practices (BMPs) - Schedules of activities, prohibitions of practices, maintenance procedures, structural controls, local ordinances, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures, and practices to control construction site runoff, spills or leaks, waste disposal, or drainage from raw material storage areas.

Commencement of Construction - The initial disturbance of soils associated with clearing, grading, or excavation activities, as well as other construction-related activities (e.g., stockpiling of fill material, demolition).

Common Plan of Development - A construction activity that is completed in separate stages, separate phases, or in combination with other construction activities. A common plan of development (also known as a "common plan of development or sale") is identified by the documentation for the construction project that identifies the scope of the project, and may include plans, blueprints, marketing plans, contracts, building permits, a public notice or hearing, zoning requests, or other similar documentation and activities. A common plan of development does not necessarily include all construction projects within the jurisdiction of a public entity (e.g., a city or university). Construction of roads or buildings in different parts of the jurisdiction would be considered separate "common plans," with only the interconnected parts of a project being considered part of a "common plan" (e.g., a building and its associated parking lot and driveways, airport runway and associated taxiways, a building complex, etc.). Where discrete construction projects occur within a larger common plan of development or sale but are located ¼ mile or more apart, and the area between the projects is not being disturbed, each individual project can be treated as a separate plan of development or sale, provided that any interconnecting road, pipeline or utility project that is part of the same "common plan" is not included in the area to be disturbed.

Construction Activity - Includes soil disturbance activities, including clearing, grading, and excavating, and does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (e.g., the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities). Regulated construction activity is defined in terms of small and large construction activity.

Dewatering - The act of draining rainwater or groundwater from building foundations, vaults, and trenches.

Discharge - For the purposes of this permit, the drainage, release, or disposal of pollutants in stormwater and certain non-stormwater from areas where soil disturbing activities (e.g., clearing, grading, excavation, stockpiling of fill material, and demolition), construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck wash out, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located.

Drought-Stricken Area - For the purposes of this permit, an area in which the National Oceanic and Atmospheric Administration's U.S. Seasonal Drought Outlook indicates for the period during which the construction will occur that any of the following conditions are likely: (1) "Drought to persist or intensify", (2) "Drought ongoing, some improvement", (3) "Drought likely to improve, impacts ease", or (4) "Drought development likely". See https://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html.

Edwards Aquifer - As defined under Texas Administrative Code (TAC) § 213.3 of this title (relating to the Edwards Aquifer), that portion of an arcuate belt of porous, water-bearing, predominantly carbonate rocks known as the Edwards and Associated Limestones in the Balcones Fault Zone trending from west to east to northeast in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, and Williamson Counties; and composed of the Salmon Peak

Limestone, McKnight Formation, West Nueces Formation, Devil's River Limestone, Person Formation, Kainer Formation, Edwards Formation, and Georgetown Formation. The permeable aquifer units generally overlie the less-permeable Glen Rose Formation to the south, overlie the less-permeable Comanche Peak and Walnut Formations north of the Colorado River, and underlie the less-permeable Del Rio Clay regionally.

Edwards Aquifer Recharge Zone - Generally, that area where the stratigraphic units constituting the Edwards Aquifer crop out, including the outcrop of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a potential for recharge of surface waters into the Edwards Aquifer. The recharge zone is identified as that area designated as such on official maps located in the offices of the Texas Commission on Environmental Quality (TCEQ) and the appropriate regional office. The Edwards Aquifer Map Viewer, located at http://www.tceq.texas.gov/compliance/field_ops/emap/emapindex.shtml, can be used to determine where the recharge zone is located.

Edwards Aquifer Contributing Zone - The area or watershed where runoff from precipitation flows downgradient to the recharge zone of the Edwards Aquifer. The contributing zone is located upstream (upgradient) and generally north and northwest of the recharge zones for the following counties: all areas within Kinney County, except the area within the watershed draining to Segment No. 2304 of the Rio Grande Basin; all areas within Uvalde, Medina, Bexar, and Comal Counties; all areas within Hays and Travis Counties, except the area within the watersheds draining to the Colorado River above a point 1.3 miles upstream from Tom Miller Dam, Lake Austin at the confluence of William Brook Cove, Segment No. 1403 of the Colorado River Basin; and all areas within Williamson County, except the area within the watersheds draining to the Lampasas River above the dam at Stillhouse Hollow reservoir, Segment No. 1216 of the Brazos River Basin. The contributing zone is illustrated on the Edwards Aquifer map viewer at http://www.tceq.texas.gov/compliance/field_ops/emap/emapindex.shtml.

Effluent Limitations Guidelines (ELG) - Defined in 40 Code of Federal Regulations (CFR) § 122.2 as a regulation published by the Administrator under § 304(b) of the Clean Water Act (CWA) to adopt or revise effluent limitations.

Facility or Activity - For the purpose of this permit, a construction site or construction support activity that is regulated under this general permit, including all contiguous land and fixtures (for example, ponds and materials stockpiles), structures, or appliances used at a construction site or industrial site described by this general permit.

Final Stabilization - A construction site status where any of the following conditions are met:

- A. All soil disturbing activities at the site have been completed and a uniform (that is, evenly distributed, without large bare areas) perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
- B. For individual lots in a residential construction site by either:
 - (1) the homeowner completing final stabilization as specified in condition (a) above; or
 - (2) the homeowner establishing temporary stabilization for an individual lot prior to the time of transfer of the ownership of the home to the buyer and after informing the homeowner of the need for, and benefits of, final stabilization. If temporary stabilization is not feasible, then the homeowner may fulfill this requirement by retaining perimeter controls or BMPs, and informing the homeowner of the need for removal of temporary controls and the establishment of final stabilization.

Fulfillment of this requirement must be documented in the homeowner's stormwater pollution prevention plan (SWPP3).

- C. For construction activities on land used for agricultural purposes (such as pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to surface water and areas that are not being returned to their preconstruction agricultural use must meet the final stabilization conditions of condition (a) above.
- D. In arid, semi-arid, and drought-stricken areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:
 - (1) Temporary erosion control measures (for example, degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by the operator, and
 - (2) The temporary erosion control measures are selected, designed, and installed to achieve 70% of the native background vegetative coverage within three years.

Hyperchlorination of Waterlines - Treatment of potable water lines or tanks with chlorine for disinfection purposes, typically following repair or partial replacement of the waterline or tank, and subsequently flushing the contents.

Impaired Water - A surface water body that is identified on the latest approved CWA §303(d) list as not meeting applicable state water quality standards. Impaired waters include waters with approved or established total maximum daily loads (TMDLs), and those where a TMDL has been proposed by TCEQ but has not yet been approved or established.

Indian Country Land - (from 40 CFR §122.2) (1) all land within the limits of any Indian reservation under the jurisdiction of the United States government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation; (2) all dependent Indian communities with the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and (3) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.

Indian Tribe - (from 40 CFR §122.2) any Indian Tribe, band, group, or community recognized by the Secretary of the Interior and exercising governmental authority over a Federal Indian Reservation.

Large Construction Activity - Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than five (5) acres of land. Large construction activity also includes the disturbance of less than five (5) acres of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than five (5) acres of land. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (for example, the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities.)

Linear Project - Includes the construction of roads, bridges, conduits, substructures, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.

Maintain - To reduce or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer System (MS4) - A separate storm sewer system owned or operated by the United States, a state, city, town, county, district, association, or other public body (created by or pursuant to state law) having jurisdiction over the disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, that discharges to surface water in the state.

Notice of Change (NOC) - Written notification to the executive director from a discharger authorized under this permit, providing changes to information that was previously provided to the agency in a notice of intent form.

Notice of Intent (NOI) - A written submission to the executive director from an applicant requesting coverage under this general permit.

Notice of Termination (NOT) - A written submission to the executive director from a discharger authorized under a general permit requesting termination of coverage.

Operator - The person or persons associated with a large or small construction activity that is either a primary or secondary operator as defined below.

Primary Operator - the person or persons associated with a large or small construction activity that meets either of the following two criteria:

(a) the person or persons have on-site operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or

(b) the person or persons have day-to-day operational control of those activities at a construction site that are necessary to ensure compliance with a Storm Water Pollution Prevention Plan (SWP3) for the site or other permit conditions (for example, they are authorized to direct workers at a site to carry out activities required by the SWP3 or comply with other permit conditions).

Secondary Operator - The person or entity, often the property owner, whose operational control is limited to:

- (a) the employment of other operators, such as a general contractor, to perform or supervise construction activities; or
- (b) the ability to approve or disapprove changes to construction plans and specifications, but who does not have day-to-day on-site operational control over construction activities at the site.

Secondary operators must either prepare their own SWP3 or participate in a shared SWP3 that covers the areas of the construction site where they have control over the plans and specifications.

If there is not a primary operator at the construction site, then the secondary operator is defined as the primary operator and must comply with the requirements for primary operators.

Outfall - For the purpose of this permit, a point source at the point where stormwater runoff associated with construction activity discharges to surface water in the state and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances that connect segments of the same stream or other water of the U.S. and are used to convey waters of the U.S.

Permittee - An operator authorized under this general permit. The authorization may be gained through submission of a notice of intent, by waiver, or by meeting the requirements for automatic coverage to discharge stormwater runoff and certain non-stormwater discharges.

Point Sources - (from 40 CFR §122.2) Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are, or may be, discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Pollutant - Dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into any surface water in the state. The term "pollutant" does not include ball water or runoff water from irrigation or rainwater runoff from cultivated or uncultivated rangeland, pastureland, and farmland. For the purpose of this permit, the term "pollutant" includes sediment.

Pollution - (from Texas Water Code (TWC) §26.001(14)) The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any surface water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property or to public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

Rainfall Erosivity Factor (R factor) - the total annual erosive potential that is due to climatic effects, and is part of the Revised Universal Soil Loss Equation (RUSLE).

Receiving Water - A "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

Semiarid Areas - areas with an average annual rainfall of 10 to 20 inches

Separate Storm Sewer System - A conveyance or system of conveyances (including roads with drainage systems, streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains), designed or used for collecting or conveying stormwater; that is not a combined sewer, and that is not part of a publicly owned treatment works (POTW).

Small Construction Activity - Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than one (1) acre and less than five (5) acres of land. Small construction activity also includes the disturbance of less than one (1) acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one (1) and less than five (5) acres of land. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (for example, the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities.)

Steep Slopes - Where a state, Tribe, local government, or industry technical manual (e.g. stormwater BMP manual) has defined what is to be considered a "steep slope", this permit's definition automatically adopts that definition. Where no such definition exists, steep slopes are automatically defined as those that are 15 percent or greater in grade.

Stormwater (or Stormwater Runoff) - Rainfall runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Associated with Construction Activity - Stormwater runoff from a construction activity where soil disturbing activities (including clearing, grading, excavating) result in the disturbance of one (1) or more acres of total land area, or are part of a larger common plan of development or sale that will result in disturbance of one (1) or more acres of total land area.

Structural Control (or Practice) - A pollution prevention practice that requires the construction of a device, or the use of a device, to reduce or prevent pollution in stormwater

runoff. Structural controls and practices may include but are not limited to: silt fences, earthen dikes, drainage swales, sediment traps, check dams, subsurface drains, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins.

Surface Water in the State - Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark (MHW) out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or nonnavigable, and including the beds and banks of all water-courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state, except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

Temporary Stabilization - A condition where exposed soils or disturbed areas are provided a protective cover or other structural control to prevent the migration of pollutants. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either permanent stabilization can be achieved or until further construction activities take place.

Total Maximum Daily Load (TMDL) - The total amount of a pollutant that a water body can assimilate and still meet the Texas Surface Water Quality Standards.

Turbidity - A condition of water quality characterized by the presence of suspended solids and/or organic material.

Waters of the United States - (from 40 CFR §122.2) Waters of the United States or waters of the U.S. means:

- (a) all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- (b) all interstate waters, including interstate wetlands;
- (c) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds that the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

 - (1) which are or could be used by interstate or foreign travelers for recreational or other purposes;
 - (2) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - (3) which are used or could be used for industrial purposes by industries in interstate commerce;

- (d) all impoundments of waters otherwise defined as waters of the United States under this definition;
- (e) tributaries of waters identified in paragraphs (a) through (d) of this definition;
- (f) the territorial sea; and
- (g) wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR §403.1(f)) which also meet the criteria of this definition) are not waters of the U.S. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the U.S. (such as

disposal area in wetlands) nor resulted from the impoundment of waters of the U.S. Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with EPA.

Part II. Permit Applicability and Coverage

Section A. Discharges Eligible for Authorization

- 1. Stormwater Associated with Construction Activity
Discharges of stormwater runoff from small and large construction activities may be authorized under this general permit.

2. Discharges of Stormwater Associated with Construction Support Activities

Examples of construction support activities include, but are not limited to, concrete batch plants, rock crushers, asphalt batch plants, equipment staging areas, material storage yards, material borrow areas, and excavated material disposal areas. Construction support activities authorized under this general permit are not commercial operations, and do not serve multiple unrelated construction projects. Discharges of stormwater runoff from construction support activities may be authorized under this general permit, provided that the following conditions are met:

- (a) the activities are located within one (1) mile from the boundary of the permitted construction site and directly support the construction activity;
- (b) an SWP3 is developed for the permitted construction site according to the provisions of this general permit, and includes appropriate controls and measures to reduce erosion and discharge of pollutants in stormwater runoff from the construction support activities; and
- (c) the construction support activities either do not operate beyond the completion date of the construction activity or, at the time that they do, are authorized under separate Texas Pollutant Discharge Elimination System (TPDES) authorization. Separate TPDES authorization may include the TPDES Multi Sector General Permit (MSGP), TXR050000 (related to stormwater discharges associated with industrial activity), separate authorization under this general permit if applicable, coverage under an alternative general permit if available, or authorization under an individual water quality permit.

3. Non-Stormwater Discharges

The following non-stormwater discharges from sites authorized under this general permit are also eligible for authorization under this general permit:

- (a) discharges from fire fighting activities (fire fighting activities do not include washing of trucks, run-off water from training activities, test water from fire suppression systems, or similar activities);
- (b) uncontaminated fire hydrant flushings (excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life), which include flushing from systems that utilize potable water, surface water, or groundwater that does not contain additional pollutants (uncontaminated fire hydrant flushings do not include systems utilizing reclaimed wastewater as a source water);
- (c) water from the routine external washing of vehicles, the external portion of buildings or structures, and pavement, where detergents and soaps are not used, where spills or leaks of toxic or hazardous materials have not occurred (unless spilled materials

have been removed; and if local state, or federal regulations are applicable, the materials are removed according to those regulations), and where the purpose is to remove mud, dirt, or dust;

- (d) uncontaminated water used to control dust;
- (e) potable water sources, including waterline flushings, but excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life;
- (f) uncontaminated air conditioning condensate;
- (g) uncontaminated ground water or spring water, including foundation or footing drains where flows are not contaminated with industrial materials such as solvents; and
- (h) lawn watering and similar irrigation drainage.

4. Other Permitted Discharges

Any discharge authorized under a separate National Pollutant Discharge Elimination System (NPDES), TPDES, or TCEQ permit may be combined with discharges authorized by this general permit, provided those discharges comply with the associated permit.

Section B. Concrete Truck Wash Out

The wash out of concrete trucks at regulated construction sites must be performed in accordance with the requirements of Part V of this general permit.

Section C. Limitations on Permit Coverage

1. Post Construction Discharges

Discharges that occur after construction activities have been completed, and after the construction site and any supporting activity site have undergone final stabilization, are not eligible for coverage under this general permit. Discharges originating from the sites are not authorized under this general permit following the submission of the notice of termination (NOT) or removal of the appropriate site notice, as applicable, for the regulated construction activity.

2. Prohibition of Non-Stormwater Discharges

Except as otherwise provided in Part II.A. of this general permit, only discharges that are composed entirely of stormwater associated with construction activity may be authorized under this general permit.

3. Compliance With Water Quality Standards

Discharges to surface water in the state that would cause, have the reasonable potential to cause, or contribute to a violation of water quality standards or that would fail to protect and maintain existing designated uses are not eligible for coverage under this general permit. The executive director may require an application for an individual permit or alternative general permit (see Parts II.H.2. and 3.) to authorize discharges to surface water in the state if the executive director determines that any activity will cause, has the reasonable potential to cause, or contribute to a violation of water quality standards or is found to cause, has the reasonable potential to cause, or contribute to, the impairment of a designated use. The executive director may also require an application for an individual permit considering factors described in Part II.H.2. of this general permit.

4. Impaired Receiving Waters and Total Maximum Daily Load (TMDL) Requirements
New sources or new discharges of the pollutants of concern to impaired waters are not authorized by this permit unless otherwise allowable under 30 TAC Chapter 305 and applicable state law. Impaired waters are those that do not meet applicable water quality standards and are listed on the EPA approved CWA §303(d) List. Pollutants of concern are those for which the water body is listed as impaired.

Discharges of the pollutants of concern to impaired water bodies for which there is a TMDL are not eligible for this general permit unless they are consistent with the approved TMDL. Permittees must incorporate the conditions and requirements applicable to their discharges into their SWP's, in order to be eligible for coverage under this general permit. For consistency with the construction stormwater-related items in an approved TMDL, the SWP's must be consistent with any applicable condition, goal, or requirement in the TMDL, TMDL Implementation Plan (I-Plan), or as otherwise directed by the executive director.

5. Discharges to the Edwards Aquifer Recharge or Contributing Zone

Discharges cannot be authorized by this general permit where prohibited by 30 TAC Chapter 213 (relating to Edwards Aquifer). In addition, commencement of construction (i.e., the initial disturbance of soils associated with clearing, grading, or excavating activities, as well as other construction-related activities such as stockpiling of fill material and demolition) at a site regulated under 30 TAC Chapter 213, may not begin until the appropriate Edwards Aquifer Protection Plan (EAPP) has been approved by the TCEQ's Edwards Aquifer Protection Program.

- (a) For new discharges located within the Edwards Aquifer Recharge Zone, or within that area upstream from the recharge zone and defined as the Contributing Zone (CZ), operators must meet all applicable requirements of, and operate according to, 30 TAC Chapter 213 (Edwards Aquifer Rule) in addition to the provisions and requirements of this general permit.

- (b) For existing discharges located within the Edwards Aquifer Recharge Zone, the requirements of the agency-approved Water Pollution Abatement Plan (WPAP) under the Edwards Aquifer Rule is in addition to the requirements of this general permit. BMPs and maintenance schedules for structural stormwater controls, for example, may be required as a provision of the rule. All applicable requirements of the Edwards Aquifer Rule for reductions of suspended solids in stormwater runoff are in addition to the requirements in this general permit for this pollutant.

6. Discharges to Specific Watersheds and Water Quality Areas

Discharges otherwise eligible for coverage cannot be authorized by this general permit where prohibited by 30 TAC Chapter 311 (relating to Watershed Protection) for water quality areas and watersheds.

7. Protection of Streams and Watersheds by Other Governmental Entities

This general permit does not limit the authority or ability of federal, other state, or local governmental entities from placing additional or more stringent requirements on construction activities or discharges from construction activities. For example, this permit does not limit the authority of a home-rule municipality provided by Texas Local Government Code §401.002.

8. Indian Country Lands

Stormwater runoff from construction activities occurring on Indian Country lands are not under the authority of the TCEQ and are not eligible for coverage under this general permit. If discharges of stormwater require authorization under federal NPDES

regulations, authority for these discharges must be obtained from the U.S. Environmental Protection Agency (EPA).

9. Oil and Gas Production

Stormwater runoff from construction activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline, are not under the authority of TCEQ and are not eligible for coverage under this general permit. If discharges of stormwater require authorization under Federal NPDES regulations, authority for these discharges must be obtained from the EPA.

10. Stormwater Discharges from Agricultural Activities

Stormwater discharges from agricultural activities that are not point source discharges of stormwater are not subject to TPDES permit requirements. These activities may include clearing and cultivating ground for crops, construction of fences to contain livestock, construction of stock ponds, and other similar agricultural activities. Discharges of stormwater runoff associated with the construction of facilities that are subject to TPDES regulations, such as the construction or concentrated animal feeding operations, would be point sources regulated under this general permit.

11. Endangered Species Act

Discharges that would adversely affect a listed endangered or threatened aquatic or aquatic-dependent species or its critical habitat are not authorized by this permit, unless the requirements of the Endangered Species Act are satisfied. Federal requirements related to endangered species apply to all TPDES permitted discharges and site-specific controls may be required to ensure that protection of endangered or threatened species is achieved. If a permittee has concerns over potential impacts to listed species, the permittee may contact TCEQ for additional information.

12. Other

Nothing in Part II of the general permit is intended to negate any person's ability to assert the force majeure (act of God, war, strike, riot, or other catastrophic) defenses found in 30 TAC §70.7.

Section D. Deadlines for Obtaining Authorization to Discharge

1. Large Construction Activities

(a) New Construction - Discharges from sites where the commencement of construction occurs on or after the effective date of this general permit must be authorized, either under this general permit or a separate TPDES permit, prior to the commencement of those construction activities.

(b) Ongoing Construction - Operators of large construction activities continuing to operate after the effective date of this permit, and authorized under TPDES general permit TXR15G0000 (effective on March 5, 2008), must submit an NOI to renew authorization or a NOT to terminate coverage under this general permit within 90 days of the effective date of this general permit. During this interim period, as a requirement of this TPDES permit, the operator must continue to meet the conditions and requirements of the previous TPDES permit.

2. Small Construction Activities

(a) New Construction - Discharges from sites where the commencement of construction occurs on or after the effective date of this general permit must be authorized, either

under this general permit or a separate TPDES permit, prior to the commencement of those construction activities.

(b) Ongoing Construction - Discharges from ongoing small construction activities that commenced prior to the effective date of this general permit, and that would not meet the conditions to qualify for termination of this permit as described in Part II.E. of this general permit, must meet the requirements to be authorized, either under this general permit or a separate TPDES permit, within 90 days of the effective date of this general permit. During this interim period, as a requirement of this TPDES permit, the operator must continue to meet the conditions and requirements of the previous TPDES permit.

Section E. Obtaining Authorization to Discharge

1. Automatic Authorization for Small Construction Activities With Low Potential for Erosion:

If all of the following conditions are met, then a small construction activity is determined to occur during periods of low potential for erosion, and a site operator may be automatically authorized under this general permit without being required to develop an SWP3 or submit an NOI:

- (a) the construction activity occurs in a county listed in Appendix A;
 - (b) the construction activity is initiated and completed, including either final or temporary stabilization of all disturbed areas, within the time frame identified in Appendix A for the location of the construction site;
 - (c) all temporary stabilization is adequately maintained to effectively reduce or prohibit erosion, permanent stabilization activities have been initiated, and a condition of final stabilization is completed no later than 30 days following the end date of the time frame identified in Appendix A for the location of the construction site;
 - (d) the permittee signs a completed TCEQ construction site notice, including the certification statement;
 - (e) a signed copy of the construction site notice is posted at the construction site in a location where it is readily available for viewing by the general public, local state, and federal authorities prior to commencing construction activities, and maintained in that location until completion of the construction activity;
 - (f) a copy of the signed and certified construction site notice is provided to the operator of any MS4 receiving the discharge at least two days prior to commencement of construction activities;
 - (g) any supporting concrete batch plant or asphalt batch plant is separately authorized for discharges of stormwater runoff or other non-stormwater discharges under an individual TPDES permit, another TPDES general permit, or under an individual TCEQ permit where stormwater and non-stormwater is disposed of by evaporation or irrigation (discharges are adjacent to water in the state); and
 - (h) any non-stormwater discharges are either authorized under a separate permit or authorization, or are not considered to be a wastewater.
- Part II.G. of this general permit describes how an operator may apply for and obtain a waiver from permitting for certain small construction activities that occur during a period with a low potential for erosion, where automatic authorization under this section is not available.

2. Automatic Authorization For All Other Small Construction Activities:

Operators of small construction activities not described in Part II.E.1. above may be automatically authorized under this general permit, and operators of these sites shall not be required to submit an NOI, provided that they meet all of the following conditions:

- (a) develop a SWP3 according to the provisions of this general permit, that covers either the entire site or all portions of the site for which the applicant is the operator, and implement that plan prior to commencing construction activities;
- (b) sign and certify a completed TCEQ small construction site notice, post the notice at the construction site in a location where it is safely and readily available for viewing by the general public, local, state, and federal authorities, prior to commencing construction, and maintain the notice in that location until completion of the construction activity (for linear construction activities, e.g. pipeline or highway, the site notice must be placed in a publicly accessible location near where construction is actively underway; notice for these linear sites may be relocated, as necessary, along the length of the project, and the notice must be safely and readily available for viewing by the general public; local, state, and federal authorities); and
- (c) provide a copy of the signed and certified construction site notice to the operator of any municipal separate storm sewer system receiving the discharge prior to commencement of construction activities.

Operators of small construction activities as defined in Part I.B. of this general permit shall not submit an NOI for coverage unless otherwise required by the executive director.

As described in Part I (Definitions) of this general permit, large construction activities include those that will disturb less than five (5) acres of land, but that are part of a larger common plan of development or sale that will ultimately disturb five (5) or more acres of land, and must meet the requirements of Part II.E.3. below.

3. Authorization for Large Construction Activities:

Operators of large construction activities that qualify for coverage under this general permit must meet all of the following conditions:

- (a) develop a SWP3 according to the provisions of this general permit that covers either the entire site or all portions of the site for which the applicant is the operator, and implement that plan prior to commencing construction activities;
- (b) primary operators must submit an NOI, using a form provided by the executive director, at least seven (7) days prior to commencing construction activities, or if utilizing electronic submission, prior to commencing construction activities. If an additional primary operator is added after the initial NOI is submitted, the new primary operator must submit an NOI at least seven (7) days before assuming operational control, or if utilizing electronic NOI submission, prior to assuming operational control. If the primary operator changes after the initial NOI is submitted, the new primary operator must submit a paper NOI or an electronic NOI at least ten (10) days before assuming operational control;

- (c) all operators of large construction activities must post a site notice in accordance with Part III.D.2. of this permit. The site notice must be located where it is safely and readily available for viewing by the general public, local, state, and federal authorities prior to commencing construction, and must be maintained in that location until completion of the construction activity (for linear construction activities, e.g. pipeline or highway, the site notice must be placed in a publicly accessible location near where construction is actively underway; notice for these linear sites may be relocated, as necessary, along the length of the project, and the notice must be safely and readily available for viewing by the general public; local, state, and federal authorities);

- (d) prior to commencing construction activities, all primary operators must (1) provide a copy of the signed NOI to the operator of any MS4 receiving the discharge and to any secondary construction operator, and (2) list in the SWP3 the names and addresses of all MS4 operators receiving a copy;

- (e) all persons meeting the definition of "secondary operator" in Part I of this permit are hereby notified that they are regulated under this general permit, but are not required to submit an NOI, provided that a primary operator at the site has submitted an NOI, or is required to submit an NOI, and the secondary operator has provided notification to the operator(s) of the need to obtain coverage (with records of notification available upon request). Any secondary operator notified under this provision may alternatively submit an NOI under this general permit, may seek coverage under an alternative TPDES individual permit, or may seek coverage under an alternative TPDES general permit if available; and

- (f) all secondary operators must provide a copy of the signed and certified Secondary Operator construction site notice to the operator of any MS4 receiving the discharge prior to commencement of construction activities.

4. Waivers for Small Construction Activities:

Part II.G. describes how operators of certain small construction activities may obtain a waiver from coverage.

5. Effective Date of Coverage

- (a) Operators of small construction activities as described in either Part II.E.1. or II.E.2. above are authorized immediately following compliance with the applicable conditions of Part II.E.1. or II.E.2. Secondary operators of large construction activities as described in Part II.E.3. above are authorized immediately following compliance with the applicable conditions in Part II.E.3. For activities located in areas regulated by 30 TAC Chapter 213, related to the Edwards Aquifer, this authorization to discharge is separate from the requirements of the operator's responsibilities under that rule. Construction may not commence for sites regulated under 30 TAC Chapter 213 until all applicable requirements of that rule are met.

- (b) Primary operators of large construction activities as described in Part II.E.3. above are provisionally authorized seven (7) days from the date that a completed NOI is postmarked for delivery to the TCEQ, unless otherwise notified by the executive director. If electronic submission of the NOI is provided, and unless otherwise notified by the executive director, primary operators are authorized immediately following confirmation of receipt of the NOI by the TCEQ. Authorization is non-provisional when the executive director finds the NOI is administratively complete and an authorization number is issued for the activity. For activities located in areas regulated by 30 TAC Chapter 213, related to the Edwards Aquifer, this authorization to discharge is separate from the requirements of the operator's responsibilities under that rule. Construction may not commence for sites regulated under 30 TAC Chapter 213 until all applicable requirements of that rule are met.

- (c) Operators are not prohibited from submitting late NOIs or posting late notices to obtain authorization under this general permit. The TCEQ reserves the right to take appropriate enforcement actions for any unpermitted activities that may have occurred between the time construction commenced and authorization was obtained.

6. Notice of Change (NOC)

If relevant information provided in the NOI changes, an NOC must be submitted at least 14 days before the change occurs, if possible. Where 14-day advance notice is not possible, the operator must submit an NOC within 14 days of discovery of the change. If

the operator becomes aware that it failed to submit any relevant facts or submitted incorrect information in an NOI, the correct information must be provided to the executive director in an NOC within 14 days after discovery. The NOC shall be submitted on a form provided by the executive director, or by letter if an NOC form is not available. A copy of the NOC must also be provided to the operator of any MS4 receiving the discharge, and a list must be included in the SWP3 that includes the names and addresses of all MS4 operators receiving a copy.

Information that may be included on an NOC includes, but is not limited to, the following: the description of the construction project, an increase in the number of acres disturbed (for increases of one or more acres), or the operator name. A transfer of operational control from one operator to another, including a transfer of the ownership of a company, may not be included in an NOC.

A transfer of ownership of a company includes changes to the structure of a company, such as changing from a partnership to a corporation or changing corporation types, so that the filing number (or charter number) that is on record with the Texas Secretary of State must be changed.

An NOC is not required for notifying TCEQ of a decrease in the number of acres disturbed. This information must be included in the SWP3 and retained on site.

7. Signatory Requirement for NOI Forms, Notice of Termination (NOT) Forms, NOC Letters, and Construction Site Notices

NOI forms, NOT forms, NOC letters, and Construction Site Notices that require a signature must be signed according to 30 TAC § 305.44 (relating to Signatories for Applications).

8. Contents of the NOI

The NOI form shall require, at a minimum, the following information:

- the TPDES OCP authorization number for existing authorizations under this general permit, where the operator submits an NOI to renew coverage within 90 days of the effective date of this general permit;
- the name, address, and telephone number of the operator filing the NOI for permit coverage;
- the name (or other identifier), address, county, and latitude/longitude of the construction project or site;
- the number of acres that will be disturbed by the applicant;
- confirmation that the project or site will not be located on Indian Country land;
- confirmation that a SWP3 has been developed in accordance with this general permit, that it will be implemented prior to construction, and that it is compliant with any applicable local sediment and erosion control plans; for multiple operators who prepare a shared SWP3, the confirmation for an operator may be limited to its obligations under the SWP3 provided all obligations are confirmed by at least one operator;
- name of the receiving water(s);
- the classified segment number for each classified segment that receives discharges from the regulated construction activity (if the discharge is not directly to a classified segment, then the classified segment number of the first classified segment that those discharges reach); and
- the name of all surface waters receiving discharges from the regulated construction activity that are on the latest EPA-approved CWA § 303(d) List of Impaired waters.

Section F. Terminating Coverage

1. Notice of Termination (NOT) Required

Each operator that has submitted an NOI for authorization under this general permit must apply to terminate that authorization following the conditions described in this section of the general permit. Authorization must be terminated by submitting an NOT on a form supplied by the executive director. Authorization to discharges under this general permit terminates at midnight on the day the NOT is postmarked for delivery to the TCEQ. If electronic submission of the NOT is provided, authorization to discharge under this permit terminates immediately following confirmation of receipt of the NOT by the TCEQ. Compliance with the conditions and requirements of this permit is required until an NOT is submitted.

The NOT must be submitted to TCEQ, and a copy of the NOT provided to the operator of any MS4 receiving the discharge (with a list in the SWP3 of the names and addresses of all MS4 operators receiving a copy), within 90 days after any of the following conditions are met:

- final stabilization has been achieved on all portions of the site that are the responsibility of the permittee;
- a transfer of operational control has occurred (See Section II.F.4. below); or
- the operator has obtained alternative authorization under an individual TPDES permit or alternative TPDES general permit.

2. Minimum Contents of the NOT

The NOT form shall require, at a minimum, the following information:

- if authorization was granted following submission of an NOI, the permittee's site-specific TPDES authorization number for the construction site;
 - an indication of whether the construction activity is completed or if the permittee is simply no longer an operator at the site;
 - the name, address, and telephone number of the permittee submitting the NOT;
 - the name (or other identifier), address, county, and location (latitude/longitude) of the construction project or site; and
 - a signed certification that either all stormwater discharges requiring authorization under this general permit will no longer occur, or that the applicant is no longer the operator of the facility or construction site, and that all temporary structural erosion controls have either been removed, will be removed on a schedule defined in the SWP3, or have been transferred to a new operator. If the new operator has applied for permit coverage, Erosion controls that are designed to remain in place for an indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal.
- #### 3. Termination of Coverage for Small Construction Sites and for Secondary Operators at Large Construction Sites
- Each operator that has obtained automatic authorization and has not been required to submit an NOI must remove the site notice upon meeting any of the conditions listed below, complete the applicable portion of the site notice related to removal of the site notice, and submit a copy of the completed site notice to the operator of any MS4 receiving the discharge (or provide alternative notification as allowed by the MS4 operator, with documentation of such notification included in the SWP3), within 90 days of meeting any of the following conditions:

- (a) final stabilization has been achieved on all portions of the site that are the responsibility of the permittee;
- (b) a transfer of operational control has occurred (See Section II.F.4. below); or
- (c) the operator has obtained alternative authorization under an individual or general TPDES permit.

Authorization to discharge under this general permit terminates immediately upon removal of the applicable site notice. Compliances with the conditions and requirements of this permit is required until the site notice is removed.

4. Transfer of Operational Control

Coverage under this general permit is not transferable. A transfer of operational control includes changes to the structure of a company, such as changing from a partnership to a corporation, or changing to a different corporation type such that a different filing (or charter) number is established with the Texas Secretary of State.

When the primary operator of a large construction activity changes or operational control is transferred, the original operator must submit an NOI within ten (10) days prior to the date that responsibility for operations terminates, and the new operator must submit an NOI at least ten (10) days prior to the transfer of operational control, in accordance with condition (a) or (b) below. A copy of the NOI must be provided to the operator of any MS4 receiving the discharge in accordance with Section II.F.1. above.

Operators of regulated construction activities who are not required to submit an NOI must remove the original site notice, and the new operator must post the required site notice prior to the transfer of operational control, in accordance with condition (a) or (b) below. A copy of the completed site notices must be provided to the operator of any MS4 receiving the discharge, in accordance with Section II.F.3. above.

A transfer of operational control occurs when either of the following criteria is met:

- (a) Another operator has assumed control over all areas of the site that have not been finally stabilized; and all silt fences and other temporary erosion controls have either been removed, scheduled for removal as defined in the SWP3, or transferred to a new operator, provided that the permitted operator has attempted to notify the new operator in writing of the requirement to obtain permit coverage. Record of this notification (or attempt at notification) shall be retained by the operator in accordance with Part VI of this permit. Erosion controls that are designed to remain in place for an indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal.

- (b) A homebuilder has purchased one or more lots from an operator who obtained coverage under this general permit for a common plan of development or sale. The homebuilder is considered a new operator and shall comply with the requirements listed above, including the development of a SWP3 if necessary. Under these circumstances, the homebuilder is only responsible for compliance with the general permit requirements as they apply to lot(s) it has operational control over, and the original operator remains responsible for common controls or discharges, and must amend its SWP3 to remove the lot(s) transferred to the homebuilder.

Section G. Waivers from Coverage

The executive director may waive the otherwise applicable requirements of this general permit for stormwater discharges from small construction activities under the terms and conditions described in this section.

1. Waiver Applicability and Coverage

Operators of small construction activities may apply for and receive a waiver from the requirements to obtain authorization under this general permit, where all of the following conditions are met. This waiver from coverage does not apply to non-stormwater discharges. The operator must insure that any non-stormwater discharges are either authorized under a separate permit or authorization, or are not considered to be a wastewater.

- (a) the calculated rainfall erosivity (R) factor for the entire period of the construction project is less than five (5);
- (b) the operator submits to the TCEQ a signed waiver certification form, supplied by the executive director, certifying that the construction activity will commence and be completed within a period when the value of the calculated R factor is less than five (5); and
- (c) the waiver certification form is postmarked for delivery to the TCEQ at least seven (7) days before construction activity begins or, if electronic filing is available, then any time following the receipt of written confirmation from TCEQ that a complete electronic application was submitted and acknowledged.

2. Steps to Obtaining a Waiver

The construction site operator may calculate the R factor to request a waiver using the following steps:

- (a) Estimate the construction start date and the construction end date. The construction end date is the date that final stabilization will be achieved.
- (b) Find the appropriate Erosivity Index (EI) zone in Appendix B of this permit.
- (c) Find the EI percentage for the project period by adding the results for each period of the project using the table provided in Appendix D of this permit. In EPA Fact Sheet 2.1, or in USDA Handbook 703, by subtracting the start value from the end value to find the percent EI for the site.
- (d) Refer to the Isoerodent Map (Appendix C of this permit) and interpolate the annual isocroderent value for the proposed construction location.
- (e) Multiply the percent value obtained in Step (c) above by the annual isocroderent value obtained in Step (d). This is the R factor for the proposed project. If the value is less than 5, then a waiver may be obtained. If the value is five (5) or more, then a waiver may not be obtained, and the operator must obtain coverage under Part II E.2. of this permit.

Alternatively, the operator may calculate a site-specific R factor utilizing the following online calculator: <http://el.tamu.edu/index.html>, or using another available resource. The waiver certification form is not required to be posted at the small construction site.

3. Effective Date of Waiver

Operators of small construction activities are provisionally waived from the otherwise applicable requirements of this general permit seven (7) days from the date that a completed waiver certification form is postmarked for delivery to TCEQ, or immediately upon receiving confirmation of approval of an electronic submittal, if electronic form submittals are available.

4. Activities Extending Beyond the Waiver Period

If a construction activity extends beyond the approved waiver period due to circumstances beyond the control of the operator, the operator must either:

Appendix L

***TPDES General Permit Number TXR150000
For Construction Activities***

This Appendix contains a copy of the TPDES 2013 General Permit for Construction Activities. You may use this copy for reference if needed if you have any questions about the TXR150000.

Texas Commission on Environmental Quality
P.O. Box 13087, Austin, Texas 78711-3087



**GENERAL PERMIT TO DISCHARGE UNDER THE
TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM**

under provisions of
Section 402 of the Clean Water Act
and Chapter 26 of the Texas Water Code

This permit supersedes and replaces
TPDES General Permit No. TXR150000, issued March 5, 2008

Construction sites that discharge stormwater associated with construction activity
located in the state of Texas
may discharge to surface water in the state

only according to monitoring requirements and other conditions set forth in this general
permit, as well as the rules of the Texas Commission on Environmental Quality (TCEQ or
Commission), the laws of the State of Texas, and other orders of the Commission of the
TCEQ. The issuance of this general permit does not grant to the permittee the right to use
private or public property for conveyance of stormwater and certain non-stormwater
discharges along the discharge route. This includes property belonging to but not limited to
any individual, partnership, corporation or other entity. Neither does this general permit
authorize any invasion of personal rights nor any violation of federal, state, or local laws or
regulations. It is the responsibility of the permittee to acquire property rights as may be
necessary to use the discharge route.

This general permit and the authorization contained herein shall expire at midnight, five
years from the permit effective date.

EFFECTIVE DATE: March 5, 2013

ISSUED DATE: FEB 19 2013

Bryan W. Shivers
For the Commission

Construction General Permit

TPDES General Permit TXR150000

**TPDES GENERAL PERMIT NUMBER TXR150000 RELATING TO
STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION
ACTIVITIES**

Table of Contents

Part I. Flow Chart and Definitions.....5

Section A. Flow Chart to Determine Whether Coverage is Required.....5

Section B. Definitions.....6

Part II. Permit Applicability and Coverage.....12

Section A. Discharges Eligible for Authorization.....12

1. Stormwater Associated with Construction Activity.....12

2. Discharges of Stormwater Associated with Construction Support Activities.....12

3. Non-Stormwater Discharges.....12

4. Other Permitted Discharges.....13

Section B. Concrete Truck Wash Out.....13

Section C. Limitations on Permit Coverage.....13

1. Post Construction Discharges.....13

2. Prohibition of Non-Stormwater Discharges.....13

3. Compliance With Water Quality Standards.....13

4. Impaired Receiving Waters and Total Maximum Daily Load (TMDL)
Requirements.....14

5. Discharges to the Edwards Aquifer Recharge or Contributing Zone.....14

6. Discharges to Specific Watersheds and Water Quality Areas.....14

7. Protection of Streams and Watersheds by Other Governmental Entities.....14

8. Indian Country Lands.....14

9. Oil and Gas Production.....15

10. Stormwater Discharges from Agricultural Activities.....15

11. Endangered Species Act.....15

12. Other.....15

Section D. Deadlines for Obtaining Authorization to Discharge.....15

1. Large Construction Activities.....15

2. Small Construction Activities.....15

Section E. Obtaining Authorization to Discharge.....16

1. Automatic Authorization for Small Construction Activities With Low Potential for
Erosion.....16

2. Automatic Authorization For All Other Small Construction Activities.....17

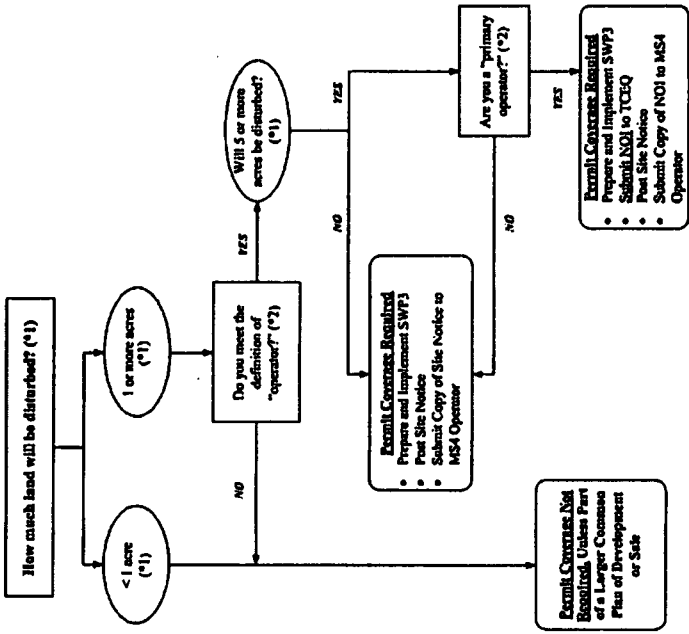
3. Authorization for Large Construction Activities.....17

Construction General Permit	TPDES General Permit TXR150000
4. Waivers for Small Construction Activities.....	18
5. Effective Date of Coverage.....	18
6. Notice of Change (NOC).....	18
7. Signature Requirement for NOI Forms, Notice of Termination (NOT) Forms, NOC Letters, and Construction Site Notices.....	19
8. Contents of the NOI.....	19
Section F. Terminating Coverage.....	20
1. Notice of Termination (NOT) Required.....	20
2. Minimum Contents of the NOT.....	20
3. Termination of Coverage for Small Construction Sites and for Secondary Operators at Large Construction Sites.....	20
4. Transfer of Operational Control.....	21
Section G. Waivers from Coverage.....	21
1. Waiver Applicability and Coverage.....	22
2. Steps to Obtaining a Waiver.....	22
3. Effective Date of Waiver.....	22
4. Activities Extending Beyond the Waiver Period.....	22
Section H. Alternative TPDES Permit Coverage.....	23
1. Individual Permit Alternative.....	23
2. Individual Permit Required.....	23
3. Alternative Discharge Authorization.....	23
Section I. Permit Expiration.....	23
Part III. Stormwater Pollution Prevention Plans (SWP3).....	24
Section A. Shared SWP3 Development.....	24
Section B. Responsibilities of Operators.....	25
1. Secondary Operators and Primary Operators with Control Over Construction Plans and Specifications.....	25
2. Primary Operators with Day-to-Day Operational Control.....	25
Section C. Deadlines for SWP3 Preparation, Implementation, and Compliance.....	25
Section D. Plan Review and Making Plans Available.....	26
Section E. Revisions and Updates to SWP3s.....	26
Section F. Contents of SWP3.....	26
Section G. Erosion and Sediment Control Requirements Applicable to All Sites.....	34
Part IV. Stormwater Runoff from Concrete Batch Plants.....	35
Section A. Benchmark Sampling Requirements.....	35
Section B. Best Management Practices (BMPs) and SWP3 Requirements.....	37
Section C. Prohibition of Wastewater Discharges.....	39

Construction General Permit	TPDES General Permit TXR150000
Part V. Concrete Truck Wash Out Requirements.....	40
Part VI. Retention of Records.....	40
Part VII. Standard Permit Conditions.....	40
Part VIII. Fees.....	41
Appendix A: Automatic Authorization.....	43
Appendix B: Erosivity Index (EI) Zones in Texas.....	45
Appendix C: Isoreodent Map.....	46
Appendix D: Erosivity Indices for EI Zones in Texas.....	47

Part I. Flow Chart and Definitions

Section A. Flow Chart to Determine Whether Coverage is Required



(*) To determine the size of the construction project, use the size of the entire area to be disturbed, and include the size of the larger common plan of development or sale, if the project is part of a larger project (refer to Part I.C., Definitions, for an explanation of "common plan of development or sale").

(*) Refer to the definitions for "operator", "primary operator", and "secondary operator" in Part I., Section B, of this permit.

Section B. Definitions

Arid Areas - Areas with an average annual rainfall of 0 to 10 inches.

Best Management Practices (BMPs) - Schedules of activities, prohibitions of practices, maintenance procedures, structural controls, local ordinances, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures, and practices to control construction site runoff, spills or leaks, waste disposal, or drainage from raw material storage areas.

Commencement of Construction - The initial disturbance of soils associated with clearing, grading, or excavation activities, as well as other construction-related activities (e.g., stockpiling of fill material, demolition).

Common Plan of Development - A construction activity that is completed in separate stages, separate phases, or in combination with other construction activities. A common plan of development (also known as a "common plan of development or sale") is identified by the documentation for the construction project that identifies the scope of the project, and may include plats, blueprints, marketing plans, contracts, building permits, a public notice or hearing, zoning requests, or other similar documentation and activities. A common plan of development does not necessarily include all construction projects within the jurisdiction of a public entity (e.g., a city or university). Construction of roads or buildings in different parts of the jurisdiction would be considered separate "common plans," with only the interconnected parts of a project being considered part of a "common plan" (e.g., a building and its associated parking lot and driveways, airport runway and associated taxiways, a building complex, etc.). Where discrete construction projects occur within a larger common plan of development or sale but are located ¼ mile or more apart, and the area between the projects is not being disturbed, each individual project can be treated as a separate plan of development or sale, provided that any interconnecting road, pipeline or utility project that is part of the same "common plan" is not included in the area to be disturbed.

Construction Activity - Includes soil disturbance activities, including clearing, grading, and excavating, and does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (e.g., the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities). Regulated construction activity is defined in terms of small and large construction activity.

Dewatering - The act of draining rainwater or groundwater from building foundations, vaults, and trenches.

Discharge - For the purposes of this permit, the drainage, release, or disposal of pollutants in stormwater and certain non-stormwater from areas where soil disturbing activities (e.g., clearing, grading, excavation, stockpiling of fill material, and demolition), construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck wash out, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located.

Drought-Stricken Area - For the purposes of this permit, an area in which the National Oceanic and Atmospheric Administration's U.S. Seasonal Drought Outlook indicates for the period during which the construction will occur that any of the following conditions are likely: (1) "Drought to persist or intensify", (2) "Drought ongoing, some improvement", (3) "Drought likely to improve, impacts ease", or (4) "Drought development likely". See http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html.

Edwards Aquifer - As defined under Texas Administrative Code (TAC) § 213.3 of this title (relating to the Edwards Aquifer), that portion of an arcuate belt of porous, water-bearing, predominantly carbonate rocks known as the Edwards and Associated Limestones in the Balcones Fault Zone trending from west to east to northeast in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, and Williamson Counties; and composed of the Salmon Peak

Construction General Permit

TPDES General Permit TXR450000

Limestone, McKnight Formation, West Nueces Formation, Devil's River Limestone, Person Formation, Kainer Formation, Edwards Formation, and Georgetown Formation. The permeable aquifer units generally overlie the less-permeable Glen Rose Formation to the south, overlie the less-permeable Comanche Peak and Walnut Formations north of the Colorado River, and underlie the less-permeable Del Rio Clay regionally.

Edwards Aquifer Recharge Zone - Generally, that area where the stratigraphic units constituting the Edwards Aquifer crop out, including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a potential for recharge of surface waters into the Edwards Aquifer. The recharge zone is identified as that area designated as such on official maps located in the offices of the Texas Commission on Environmental Quality (TCEQ) and the appropriate regional office. The Edwards Aquifer Map Viewer, located at http://www.tceq.texas.gov/compliance/field_ops/emap/mapdisplay.html, can be used to determine where the recharge zone is located.

Edwards Aquifer Contributing Zone - The area or watershed where runoff from precipitation flows downgradient to the recharge zone of the Edwards Aquifer. The contributing zone is located upstream (upgradient) and generally north and northwest of the recharge zone for the following counties: all areas within Kinney County, except the area within the watershed draining to Segment No. 2304 of the Rio Grande Basin; all areas within Uvalde, Medina, Bexar, and Comal Counties; all areas within Bexar and Travis Counties, except the area within the watershed draining to the Colorado River above a point 1.3 miles upstream from Tom Miller Dam, Lake Austin at the confluence of Barrow Brook Cove, Segment No. 1403 of the Colorado River Basin; and all areas within Williamson County, except the area within the watershed draining to the Lampasas River above the dam at Stillhouse Hollow reservoir, Segment No. 1216 of the Brazos River Basin. The contributing zone is illustrated on the Edwards Aquifer map viewer at http://www.tceq.texas.gov/compliance/field_ops/emap/mapdisplay.html.

Effluent Limitations Guideline (ELG) - Defined in 40 Code of Federal Regulations (CFR) § 122.2 as a regulation published by the Administrator under § 304(b) of the Clean Water Act (CWA) to adopt or revise effluent limitations.

Facility or Activity - For the purpose of this permit, a construction site or construction support activity that is regulated under this general permit, including all contiguous land and fixtures (for example, ponds and materials stockpiles), structures, or appliances used at a construction site or industrial site described by this general permit.

Final Stabilization - A construction site status where any of the following conditions are met:

- A. All soil disturbing activities at the site have been completed and a uniform (that is, evenly distributed, without large bare areas) perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
- B. For individual lots in a residential construction site by either:
 - (1) the homeowner completing final stabilization as specified in condition (a) above; or
 - (2) the homeowner establishing temporary stabilization for an individual lot prior to the time of transfer of the ownership of the home to the buyer and after informing the homeowner of the need for, and benefits of, final stabilization. If temporary stabilization is not feasible, then the homeowner may fulfill this requirement by retaining perimeter controls or BMPs, and informing the homeowner of the need for removal of temporary controls and the establishment of final stabilization.

Construction General Permit

TPDES General Permit TXR150000

Fullfillment of this requirement must be documented in the homeowner's stormwater pollution prevention plan (SWP2).

C. For construction activities on land used for agricultural purposes (such as pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to surface water and areas that are not being returned to their preconstruction agricultural use must meet the final stabilization conditions of condition (a) above.

D. In arid, semi-arid, and drought-stricken areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:

- (1) Temporary erosion control measures (for example, degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by the operator; and
 - (2) The temporary erosion control measures are selected, designed, and installed to achieve 70% of the native background vegetative coverage within three years.
- Hypochlorination of Waterlines** - Treatment of potable water lines or tanks with chlorine for disinfection purposes, typically following repair or partial replacement of the waterline or tank, and subsequently flushing the contents.
- Impaired Water** - A surface water body that is identified on the latest approved CWA 303(g)(4) list as not meeting applicable state water quality standards. Impaired waters include waters with approved or established total maximum daily loads (TMDLs), and those where a TMDL has been proposed by TCEQ but has not yet been approved or established.
- Indian Country Land** - (from 40 CFR §122.2) (1) all land within the limits of any Indian reservation under the jurisdiction of the United States government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation; (2) all dependent Indian communities with the borders of the United States whether within the limits of a state; and (3) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.
- Indian Tribe** - (from 40 CFR §122.2) any Indian Tribe, band, group, or community recognized by the Secretary of the Interior and exercising governmental authority over a Federal Indian Reservation.
- Large Construction Activity** - Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than five (5) acres of land. Large construction activity also includes the disturbance of less than five (5) acres of total land area that is part of a larger common plan of development or site if the larger common plan will ultimately disturb equal to or greater than five (5) acres of land. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (for example, the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities.)
- Linear Project** - Includes the construction of roads, bridges, conduits, substations, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.
- Minimize** - To reduce or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer System (MS4) - A separate storm sewer system owned or operated by the United States, a state, city, town, county, district, association, or other public body (created by or pursuant to state law) having jurisdiction over the disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, that discharges to surface water in the state.

Notice of Change (NOC) - Written notification to the executive director from a discharger authorized under this permit, providing changes to information that was previously provided to the agency in a notice of intent form.

Notice of Intent (NOI) - A written submission to the executive director from an applicant requesting coverage under this general permit.

Notice of Termination (NOT) - A written submission to the executive director from a discharger authorized under a general permit requesting termination of coverage.

Operator - The person or persons associated with a large or small construction activity that is either a primary or secondary operator as defined below:

Primary Operator - the person or persons associated with a large or small construction activity that meets either of the following two criteria:

(a) the person or persons have on-site operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or

(b) the person or persons have day-to-day operational control of those activities at a construction site that are necessary to ensure compliance with a Storm Water Pollution Prevention Plan (SWP3) for the site or other permit conditions (for example, they are authorized to direct workers at a site to carry out activities required by the SWP3 or comply with other permit conditions).

Secondary Operator - The person or entity, often the property owner, whose operational control is limited to:

- (a) the employment of other operators, such as a general contractor, to perform or supervise construction activities; or
- (b) the ability to approve or disapprove changes to construction plans and specifications, but who does not have day-to-day on-site operational control over construction activities at the site.

Secondary operators must either prepare their own SWP3 or participate in a shared SWP3 that covers the areas of the construction site where they have control over the plans and specifications.

If there is not a primary operator at the construction site, then the secondary operator is defined as the primary operator and must comply with the requirements for primary operators.

Outfall - For the purpose of this permit, a point source at the point where stormwater runoff associated with construction activity discharges to surface water in the state and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances that connect segments of the same stream or other water of the U.S. and are used to convey waters of the U.S.

Permittee - An operator authorized under this general permit. The authorization may be gained through submission of a notice of intent, by waiver, or by meeting the requirements for automatic coverage to discharge stormwater runoff and certain non-stormwater discharges.

Point Source - (from 40 CFR §122.2) Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are, or may be, discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Pollutant - Dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into any surface water in the state. The term "pollutant" does not include tail water or runoff water from irrigation or rainwater runoff from cultivated or uncultivated rangeland, pastureland, and farmland. For the purpose of this permit, the term "pollutant" includes sediment.

Pollutions - (from Texas Water Code (TWC) §26.001(4)) The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any surface water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property or to public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

Rainfall Erosivity Factor (R factor) - the total annual erosive potential that is due to climatic effects, and is part of the Revised Universal Soil Loss Equation (RUSLE).

Receiving Water - A "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

Sensitized Areas - areas with an average annual rainfall of 10 to 20 inches

Separate Storm Sewer System - A conveyance or system of conveyances (including roads with drainage systems, streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains), designed or used for collecting or conveying stormwater, that is not a combined sewer, and that is not part of a publicly owned treatment works (POTW).

Small Construction Activity - Construction activities including clearing, grading, and excavating that result in land disturbances of equal to or greater than one (1) acre and less than five (5) acres of land. Small construction activity also includes the disturbance of less than one (1) acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one (1) and less than five (5) acres of land. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (for example, the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities.)

Slope Slopes - Where a state, Tribe, local government, or industry technical manual (e.g. stormwater BMP manual) has defined what is to be considered a "steep slope", this permit's definition automatically adopts that definition. Where no such definition exists, steep slopes are automatically defined as those that are 15 percent or greater in grade.

Stormwater (or Stormwater Runoff) - Rainfall runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Associated with Construction Activity - Stormwater runoff from a construction activity where soil disturbing activities (including clearing, grading, excavating) result in the disturbance of one (1) or more acres of total land area, or are part of a larger common plan of development or sale that will result in disturbance of one (1) or more acres of total land area.

Structural Control (or Practices) - A pollution prevention practice that requires the construction of a device, or the use of a device, to reduce or prevent pollution in stormwater

runoff. Structural controls and practices may include but are not limited to: silt fences, earthen dikes, drainage swales, sediment traps, check dams, subsurface drains, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins.

Surface Water in the State - Lakes, bays, ponds, impounding reservoirs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark (MHW) out 10.30 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or nonnavigable, and including the beds and banks of all water-courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state, except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

Temporary Stabilization - A condition where exposed soils or disturbed areas are provided a protective cover or other structural control to prevent the migration of pollutants. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either permanent stabilization can be achieved or until further construction activities take place.

Total Maximum Daily Load (TMDL) - The total amount of a pollutant that a water body can assimilate and still meet the Texas Surface Water Quality Standards.

Turbidity - A condition of water quality characterized by the presence of suspended solids and/or organic material.

Waters of the United States - (from 40 CFR §122.2) Waters of the United States or waters of the U.S. means:

- (a) all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- (b) all interstate waters, including interstate wetlands;
- (c) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds that the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
 - (1) which are or could be used by interstate or foreign travelers for recreational or other purposes;
 - (2) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - (3) which are used or could be used for industrial purposes by industries in interstate commerce;
- (d) all impoundments of waters otherwise defined as waters of the United States under this definition;
- (e) tributaries of waters identified in paragraphs (a) through (d) of this definition;
- (f) the territorial sea; and
- (g) wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR §423.11(m) which also meet the criteria of this definition) are not waters of the U.S. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the U.S. (such as

disposal area in wetlands) nor resulted from the impoundment of waters of the U.S. Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with EPA.

Part II. Permit Applicability and Coverage

Section A. Discharges Eligible for Authorization

1. Stormwater Associated with Construction Activity

Discharges of stormwater runoff from small and large construction activities may be authorized under this general permit.

2. Discharges of Stormwater Associated with Construction Support Activities

Examples of construction support activities include, but are not limited to, concrete batch plants, rock crushers, asphalt batch plants, equipment staging areas, material storage yards, material borrow areas, and excavated material disposal areas.

Construction support activities authorized under this general permit are not commercial operations, and do not serve multiple unrelated construction projects. Discharges of stormwater runoff from construction support activities may be authorized under this general permit, provided that the following conditions are met:

- (a) the activities are located within one (1) mile from the boundary of the permitted construction site and directly support the construction activity;
 - (b) an SWP3 is developed for the permitted construction site according to the provisions of this general permit, and includes appropriate controls and measures to reduce erosion and discharge of pollutants in stormwater runoff from the construction support activities; and
 - (c) the construction support activities either do not operate beyond the completion date of the construction activity or, at the time that they do, are authorized under separate Texas Pollutant Discharge Elimination System (TPDES) authorization. Separate TPDES authorization may include the TPDES Multi Sector General Permit (MSGP), TXR090000 (related to stormwater discharges associated with industrial activity), separate authorization under this general permit if applicable, coverage under an alternative general permit if available, or authorization under an individual water quality permit.
- ### 3. Non-Stormwater Discharges
- The following non-stormwater discharges from sites authorized under this general permit are also eligible for authorization under this general permit:
- (a) discharges from fire fighting activities (fire fighting activities do not include washing of trucks, run-off water from training activities, test water from fire suppression systems, or similar activities);
 - (b) uncontaminated fire hydrant flushings (excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life), which include flushings from systems that utilize potable water, surface water, or groundwater that does not contain additional pollutants (uncontaminated fire hydrant flushings do not include systems utilizing reclaimed wastewater as a source water);
 - (c) water from the routine external washing of vehicles, the external portion of buildings or structures, and pavement, where detergents and soaps are not used, where spills or leaks of toxic or hazardous materials have not occurred (unless spilled materials

have been removed; and if local state, or federal regulations are applicable, the materials are removed according to those regulations), and where the purpose is to remove mud, dirt, or dust;

- (d) uncontaminated water used to control dust;
- (e) potable water sources, including waterline flushings, but excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life;
- (f) uncontaminated air conditioning condensate;
- (g) uncontaminated ground water or spring water, including foundation or footing drains where flows are not contaminated with industrial materials such as solvents; and
- (h) lawn watering and similar irrigation drainage.

4. Other Permitted Discharges

Any discharge authorized under a separate National Pollutant Discharge Elimination System (NPDES), TPDES, or TCEQ permit may be combined with discharges authorized by this general permit, provided those discharges comply with the associated permit.

Section B. Concrete Truck Wash Out

The wash out of concrete trucks at regulated construction sites must be performed in accordance with the requirements of Part V of this general permit.

Section C. Limitations on Permit Coverage

1. Post Construction Discharges

Discharges that occur after construction activities have been completed, and after the construction site and any supporting activity site have undergone final stabilization, are not eligible for coverage under this general permit. Discharges originating from the sites are not authorized under this general permit following the submission of the notice of termination (NOT) or removal of the appropriate site notice, as applicable, for the regulated construction activity.

2. Prohibition of Non-Stormwater Discharges

Except as otherwise provided in Part II.A. of this general permit, only discharges that are composed entirely of stormwater associated with construction activity may be authorized under this general permit.

3. Compliance With Water Quality Standards

Discharges to surface water in the state that would cause, have the reasonable potential to cause, or contribute to a violation of water quality standards or that would fail to protect and maintain existing designated uses are not eligible for coverage under this general permit. The executive director may require an application for an individual permit or alternative general permit (see Parts II.H.2. and 3.) to authorize discharges to surface water in the state if the executive director determines that any activity will cause, has the reasonable potential to cause, or contribute to a violation of water quality standards or is found to cause, or contribute to a violation of water quality standards, or the impairment of a designated use. The executive director may also require an application for an individual permit considering factors described in Part II.H.2. of this general permit.

4. Impaired Receiving Waters and Total Maximum Daily Load (TMDL) Requirements
New sources or new discharges of the pollutants of concern to impaired waters are not authorized by this permit unless otherwise allowable under 30 TAC Chapter 305 and applicable state law. Impaired waters are those that do not meet applicable water quality standards and are listed on the EPA approved CWA §303(d) List. Pollutants of concern are those for which the water body is listed as impaired.

Discharges of the pollutants of concern to impaired water bodies for which there is a TMDL are not eligible for this general permit unless they are consistent with the approved TMDL. Permittees must incorporate the conditions and requirements applicable to their discharges into their SWP3, in order to be eligible for coverage under this general permit. For consistency with the construction stormwater-related items in an approved TMDL, the SWP3 must be consistent with any applicable condition, goal, or requirement in the TMDL, TMDL Implementation Plan (I-Plan), or as otherwise directed by the executive director.

5. Discharges to the Edwards Aquifer Recharge or Contributing Zone

Discharges cannot be authorized by this general permit where prohibited by 30 TAC Chapter 213 (relating to Edwards Aquifer). In addition, commencement of construction (i.e., the initial disturbance of soils associated with clearing, grading, or excavating activities, as well as other construction-related activities such as stockpiling of fill material and demolition) at a site regulated under 30 TAC Chapter 213, may not begin until the appropriate Edwards Aquifer Protection Plan (EAPP) has been approved by the TCEQ's Edwards Aquifer Protection Program.

- (a) For new discharges located within the Edwards Aquifer Recharge Zone, or within that area upstream from the recharge zone and defined as the Contributing Zone (CZ), operators must meet all applicable requirements of, and operate according to, 30 TAC Chapter 213 (Edwards Aquifer Rule) in addition to the provisions and requirements of this general permit.

- (b) For existing discharges located within the Edwards Aquifer Recharge Zone, the requirements of the agency-approved Water Pollution Abatement Plan (WPAP) under the Edwards Aquifer Rule is in addition to the requirements of this general permit. BMPs and maintenance schedules for structural stormwater controls, for example, may be required as a provision of the rule. All applicable requirements of the Edwards Aquifer Rule for reductions of suspended solids in stormwater runoff are in addition to the requirements in this general permit for this pollutant.

6. Discharges to Specific Watersheds and Water Quality Areas

Discharges otherwise eligible for coverage cannot be authorized by this general permit where prohibited by 30 TAC Chapter 311 (relating to Watershed Protection) for water quality areas and watersheds.

7. Protection of Streams and Watersheds by Other Governmental Entities

This general permit does not limit the authority or ability of federal, other state, or local governmental entities from placing additional or more stringent requirements on construction activities or discharges from construction activities. For example, this permit does not limit the authority of a home-rule municipality provided by Texas Local Government Code §401.002.

8. Indian Country Lands

Stormwater runoff from construction activities occurring on Indian Country lands are not under the authority of the TCEQ and are not eligible for coverage under this general permit. If discharges of stormwater require authorization under federal NPDES

regulations, authority for these discharges must be obtained from the U.S. Environmental Protection Agency (EPA).

9. Oil and Gas Production

Stormwater runoff from construction activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline, are not under the authority of the TCEQ and are not eligible for coverage under this general permit. If discharges of stormwater require authorization under federal NPDES regulations, authority for these discharges must be obtained from the EPA.

10. Stormwater Discharges from Agricultural Activities

Stormwater discharges from agricultural activities that are not point source discharges of stormwater are not subject to TPDES permit requirements. These activities may include clearing and cultivating ground for crops, construction of fences to contain livestock, construction of stock ponds, and other similar agricultural activities. Discharges of stormwater runoff associated with the construction of facilities that are subject to TPDES regulations, such as the construction of concentrated animal feeding operations, would be point sources regulated under this general permit.

11. Endangered Species Act

Discharges that would adversely affect a listed endangered or threatened aquatic or aquatic-dependent species or its critical habitat are not authorized by this permit, unless the requirements of the Endangered Species Act are satisfied. Federal requirements related to endangered species apply to all TPDES permitted discharges and site-specific controls may be required to ensure that protection of endangered or threatened species is achieved. If a permittee has concerns over potential impacts to listed species, the permittee may contact TCEQ for additional information.

12. Other

Nothing in Part II of the general permit is intended to negate any person's ability to assert the force majeure (act of God, war, strike, riot, or other catastrophe) defenses found in 30 TAC §70.7.

Section D. Deadlines for Obtaining Authorization to Discharge

1. Large Construction Activities

(a) **New Construction** - Discharges from sites where the commencement of construction occurs on or after the effective date of this general permit must be authorized, either under this general permit or a separate TPDES permit, prior to the commencement of those construction activities.

(b) **Ongoing Construction** - Operators of large construction activities continuing to operate after the effective date of this permit, and authorized under TPDES general permit TXR15G0000 (effective on March 5, 2008), must submit an NOI to renew authorization or a NOI to terminate coverage under this general permit within 90 days of the effective date of this general permit. During this interim period, as a requirement of this TPDES permit, the operator must continue to meet the conditions and requirements of the previous TPDES permit.

2. Small Construction Activities

(a) **New Construction** - Discharges from sites where the commencement of construction occurs on or after the effective date of this general permit must be authorized, either

under this general permit or a separate TPDES permit, prior to the commencement of those construction activities.

(b) **Ongoing Construction** - Discharges from ongoing small construction activities that commenced prior to the effective date of this general permit, and that would not meet the conditions to qualify for termination of this permit as described in Part II.E of this general permit, must meet the requirements to be authorized, either under this general permit or a separate TPDES permit, within 90 days of the effective date of this general permit. During this interim period, as a requirement of this TPDES permit, the operator must continue to meet the conditions and requirements of the previous TPDES permit.

Section E. Obtaining Authorization to Discharge

1. Automatic Authorization for Small Construction Activities With Low Potential for Erosion:

If all of the following conditions are met, then a small construction activity is determined to occur during periods of low potential for erosion, and a site operator may be automatically authorized under this general permit without being required to develop an SWP3 or submit an NOI:

- the construction activity occurs in a county listed in Appendix A;
 - the construction activity is initiated and completed, including either final or temporary stabilization of all disturbed areas, within the time frame identified in Appendix A for the location of the construction site;
 - all temporary stabilization is adequately maintained to effectively reduce or prohibit erosion, permanent stabilization activities have been initiated, and a condition of final stabilization is completed no later than 30 days following the end date of the time frame identified in Appendix A for the location of the construction site;
 - the permittee signs a completed TCEQ construction site notice, including the certification statement;
 - a signed copy of the construction site notice is posted at the construction site in a location where it is readily available for viewing by the general public, local state, and federal authorities prior to commencing construction activities, and maintained in that location until completion of the construction activity;
 - a copy of the signed and certified construction site notice is provided to the operator of any MS4 receiving the discharge at least two days prior to commencement of construction activities;
 - any supporting concrete curb plant or asphalt curb plant is separately authorized for discharges of stormwater runoff or other non-stormwater discharges under an individual TPDES permit, another TPDES general permit, or under an individual TCEQ permit where stormwater and non-stormwater is disposed of by evaporation or irrigation (discharges are adjacent to water in the state); and
 - any non-stormwater discharges are either authorized under a separate permit or authorization, or are not considered to be a wastewater.
- Part II.G of this general permit describes how an operator may apply for and obtain a waiver from permitting for certain small construction activities that occur during a period with a low potential for erosion, where automatic authorization under this section is not available.

2. Automatic Authorization For All Other Small Construction Activities:

Operators of small construction activities not described in Part II.E.1. above may be automatically authorized under this general permit, and operators of these sites shall not be required to submit an NOI, provided that they meet all of the following conditions:

- (a) develop a SWP3 according to the provisions of this general permit, that covers either the entire site or all portions of the site for which the applicant is the operator, and implement that plan prior to commencing construction activities;
- (b) sign and certify a completed TCEQ small construction site notice, post the notice at the construction site in a location where it is safely and readily available for viewing by the general public, local, state, and federal authorities, prior to commencing construction, and maintain the notice in that location until completion of the construction activity (for linear construction activities, e.g. pipeline or highway, the site notice must be placed in a publicly accessible location near where construction is actively underway; notice for these linear sites may be relocated, as necessary, along the length of the project, and the notice must be safely and readily available for viewing by the general public; local, state, and federal authorities); and
- (c) provide a copy of the signed and certified construction site notice to the operator of any municipal separate storm sewer system receiving the discharge prior to commencement of construction activities.

Operators of small construction activities as defined in Part I.B of this general permit shall not submit an NOI for coverage unless otherwise required by the executive director.

As described in Part I (Definitions) of this general permit, large construction activities include those that will disturb less than five (5) acres of land, but that are part of a larger common plan of development or sale that will ultimately disturb five (5) or more acres of land, and must meet the requirements of Part II.E.3. below.

3. Authorization for Large Construction Activities:

Operators of large construction activities that qualify for coverage under this general permit must meet all of the following conditions:

- (a) develop a SWP3 according to the provisions of this general permit that covers either the entire site or all portions of the site for which the applicant is the operator, and implement that plan prior to commencing construction activities;
- (b) primary operators must submit an NOI, using a form provided by the executive director, at least seven (7) days prior to commencing construction activities, or if utilizing electronic submittal, prior to commencing construction activities. If an additional primary operator is added after the initial NOI is submitted, the new primary operator must submit an NOI at least seven (7) days before assuming operational control, or if utilizing electronic NOI submittal, prior to assuming operational control. If the primary operator changes after the initial NOI is submitted, the new primary operator must submit a paper NOI or an electronic NOI at least ten (10) days before assuming operational control;
- (c) all operators of large construction activities must post a site notice in accordance with Part III.D.2. of this permit. The site notice must be located where it is safely and readily available for viewing by the general public, local, state, and federal authorities prior to commencing construction, and must be maintained in that location until completion of the construction activity (for linear construction activities, e.g. pipeline or highway, the site notice must be placed in a publicly accessible location near where construction is actively underway; notice for these linear sites may be relocated, as necessary, along the length of the project, and the notice must be safely and readily available for viewing by the general public; local, state, and federal authorities);

- (d) prior to commencing construction activities, all primary operators must (1) provide a copy of the signed NOI to the operator of any MS4 receiving the discharge and to any secondary construction operator, and (2) list in the SWP3 the names and addresses of all MS4 operators receiving a copy;

(e) all persons meeting the definition of "secondary operator" in Part I of this permit are hereby notified that they are regulated under this general permit, but are not required to submit an NOI, provided that a primary operator at the site has submitted an NOI, or is required to submit an NOI, and the secondary operator has provided notification to the operator(s) of the need to obtain coverage (with records of notification available upon request). Any secondary operator notified under this provision may alternatively submit an NOI under this general permit, may seek coverage under an alternative TPDES individual permit, or may seek coverage under an alternative TPDES general permit if available; and

- (f) all secondary operators must provide a copy of the signed and certified Secondary Operator construction site notice to the operator of any MS4 receiving the discharge prior to commencement of construction activities.

4. Waivers for Small Construction Activities:

Part II.G. describes how operators of certain small construction activities may obtain a waiver from coverage.

5. Effective Date of Coverage

- (a) Operators of small construction activities as described in either Part II.E.1. or II.E.2. above are authorized immediately following compliance with the applicable conditions of Part II.E.1. or II.E.2. Secondary operators of large construction activities as described in Part II.E.3. above are authorized immediately following compliance with the applicable conditions in Part II.E.3. For activities located in areas regulated by 30 TAC Chapter 213, related to the Edwards Aquifer, this authorization to discharge is separate from the requirements of the operator's responsibilities under that rule. Construction may not commence for sites regulated under 30 TAC Chapter 213 until all applicable requirements of that rule are met.
 - (b) Primary operators of large construction activities as described in Part II.E.3. above are provisionally authorized seven (7) days from the date that a completed NOI is postmarked for delivery to the TCEQ, unless otherwise notified by the executive director. If electronic submission of the NOI is provided, and unless otherwise notified by the executive director, primary operators are authorized immediately following confirmation of receipt of the NOI by the TCEQ. Authorization is non-provisional when the executive director finds the NOI is administratively complete and an authorization number is issued for the activity. For activities located in areas regulated by 30 TAC Chapter 213, related to the Edwards Aquifer, this authorization to discharge is separate from the requirements of the operator's responsibilities under that rule. Construction may not commence for sites regulated under 30 TAC Chapter 213 until all applicable requirements of that rule are met.
 - (c) Operators are not prohibited from submitting late NOIs or posting late notices to obtain authorization under this general permit. The TCEQ reserves the right to take appropriate enforcement actions for any unpermitted activities that may have occurred between the time construction commenced and authorization was obtained.
 6. Notice of Change (NOC)
- If relevant information provided in the NOI changes, an NOC must be submitted at least 14 days before the change occurs, if possible. Where 14-day advance notice is not possible, the operator must submit an NOC within 14 days of discovery of the change. If

the operator becomes aware that it failed to submit any relevant facts or submitted incorrect information in an NOI, the correct information must be provided to the executive director in an NOC within 14 days after discovery. The NOC shall be submitted on a form provided by the executive director, or by letter if an NOC form is not available. A copy of the NOC must also be provided to the operator of any MS4 receiving the discharge, and a list must be included in the SWP3 that includes the names and addresses of all MS4 operators receiving a copy.

Information that may be included on an NOC includes, but is not limited to, the following: the description of the construction project, an increase in the number of acres disturbed (for increases of one or more acres), or the operator name. A transfer of operational control from one operator to another, including a transfer of the ownership of a company, may not be included in an NOC.

A transfer of ownership of a company includes changes to the structure of a company, such as changing from a partnership to a corporation or changing corporation types, so that the filing number (or charter number) that is on record with the Texas Secretary of State must be changed.

An NOC is not required for notifying TCEQ of a decrease in the number of acres disturbed. This information must be included in the SWP3 and retained on site.

7. Signatory Requirement for NOI Forms, Notice of Termination (NOT) Forms, NOC Letters, and Construction Site Notices

NOI forms, NOT forms, NOC letters, and Construction Site Notices that require a signature must be signed according to 30 TAC § 305.44 (relating to Signatories for Applications).

8. Contents of the NOI

The NOI form shall require, at a minimum, the following information:

- (a) the TPDES CGP authorization number for existing authorizations under this general permit, where the operator submits an NOI to renew coverage within 90 days of the effective date of this general permit;
- (b) the name, address, and telephone number of the operator filing the NOI for permit coverage;
- (c) the name (or other identifier), address, county, and latitude/longitude of the construction project or site;
- (d) the number of acres that will be disturbed by the applicant;
- (e) confirmation that the project or site will not be located on Indian Country lands;
- (f) confirmation that a SWP3 has been developed in accordance with this general permit, that it will be implemented prior to construction, and that it is compliant with any applicable local sediment and erosion control plans; for multiple operators who prepare a shared SWP3, the confirmation for an operator may be limited to its obligations under the SWP3 provided all obligations are confirmed by at least one operator;
- (g) name of the receiving water(s);
- (h) the classified segment number for each classified segment that receives discharges from the regulated construction activity (if the discharge is not directly to a classified segment, then the classified segment number of the first classified segment that those discharges reach); and
- (i) the name of all surface waters receiving discharges from the regulated construction activity that are on the latest EPA-approved CWA § 303(d) List of Impaired waters.

Section F. Terminating Coverage

1. Notice of Termination (NOT) Required

Each operator that has submitted an NOI for authorization under this general permit must apply to terminate that authorization following the conditions described in this section of the general permit. Authorization must be terminated by submitting an NOT on a form supplied by the executive director. Authorization to discharge under this general permit terminates at midnight on the day the NOT is postmarked for delivery to the TCEQ. If electronic submission of the NOT is provided, authorization to discharge under this permit terminates immediately following confirmation of receipt of the NOT by the TCEQ. Compliance with the conditions and requirements of this permit is required until an NOT is submitted.

The NOT must be submitted to TCEQ, and a copy of the NOT provided to the operator of any MS4 receiving the discharge (with a list in the SWP3 of the names and addresses of all MS4 operators receiving a copy), within 30 days after any of the following conditions are met:

- (a) final stabilization has been achieved on all portions of the site that are the responsibility of the permittee;
- (b) a transfer of operational control has occurred (See Section II.F.4. below), or the operator has obtained alternative authorization under an individual TPDES permit or alternative TPDES general permit.

2. Minimum Contents of the NOT

The NOT form shall require, at a minimum, the following information:

- (a) if authorization was granted following submission of an NOI, the permittee's site-specific TPDES authorization number for the construction site;
 - (b) an indication of whether the construction activity is completed or if the permittee is simply no longer an operator at the site;
 - (c) the name, address, and telephone number of the permittee submitting the NOT;
 - (d) the name (or other identifier), address, county, and location (latitude/longitude) of the construction project or site; and
 - (e) a signed certification that either all stormwater discharges requiring authorization under this general permit will no longer occur, or that the applicant is no longer the operator of the facility or construction site, and that all temporary structural erosion controls have either been removed, will be removed on a schedule defined in the SWP3, or have been transferred to a new operator if the new operator has applied for permit coverage. Erosion controls that are designed to remain in place for an indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal.
- ##### 3. Termination of Coverage for Small Construction Sites and for Secondary Operators at Large Construction Sites
- Each operator that has obtained automatic authorization and has not been required to submit an NOI must remove the site notice upon meeting any of the conditions listed below, complete the applicable portion of the site notice related to removal of the site notice, and submit a copy of the completed site notice to the operator of any MS4 receiving the discharge (or provide alternative notification as allowed by the MS4 operator, with documentation of such notification included in the SWP3), within 30 days of meeting any of the following conditions:

- (a) final stabilization has been achieved on all portions of the site that are the responsibility of the permittee;
- (b) a transfer of operational control has occurred (See Section II.F.4. below); or
- (c) the operator has obtained alternative authorization under an individual or general TPDES permit.

Authorization to discharge under this general permit terminates immediately upon removal of the applicable site notice. Compliance with the conditions and requirements of this permit is required until the site notice is removed.

4. Transfer of Operational Control

Coverage under this general permit is not transferable. A transfer of operational control includes changes to the structure of a company, such as changing from a partnership to a corporation, or changing to a different corporation type such that a different filing (or charter) number is established with the Texas Secretary of State.

When the primary operator of a large construction activity changes or operational control is transferred, the original operator must submit an NOI within ten (10) days prior to the date that responsibility for operations terminates, and the new operator must submit an NOI at least ten (10) days prior to the transfer of operational control, in accordance with condition (a) or (b) below. A copy of the NOI must be provided to the operator of any MSA receiving the discharge in accordance with Section II.F.1. above.

Operators of regulated construction activities who are not required to submit an NOI must remove the original site notice, and the new operator must post the required site notice prior to the transfer of operational control, in accordance with condition (a) or (b) below. A copy of the completed site notices must be provided to the operator of any MSA receiving the discharge, in accordance with Section II.F.3. above.

A transfer of operational control occurs when either of the following criteria is met:

- (a) Another operator has assumed control over all areas of the site that have not been finally stabilized; and all silt fences and other temporary erosion controls have either been removed, scheduled for removal as defined in the SWP3, or transferred to a new operator, provided that the permitted operator has attempted to notify the new operator in writing of the requirement to obtain permit coverage. Record of this notification (or attempt at notification) shall be retained by the operator in accordance with Part VI of this permit. Erosion controls that are designed to remain in place for an indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal.
- (b) A homebuilder has purchased one or more lots from an operator who obtained coverage under this general permit for a common plan of development or sale. The homebuilder is considered a new operator and shall comply with the requirements listed above, including the development of a SWP3 if necessary. Under these circumstances, the homebuilder is only responsible for compliance with the general permit requirements as they apply to lot(s) it has operational control over, and the original operator remains responsible for common controls or discharges, and must amend its SWP3 to remove the lot(s) transferred to the homebuilder.

Section G. Waivers from Coverage

The executive director may waive the otherwise applicable requirements of this general permit for stormwater discharges from small construction activities under the terms and conditions described in this section.

1. Waiver Applicability and Coverage

Operators of small construction activities may apply for and receive a waiver from the requirements to obtain authorization under this general permit, where all of the following conditions are met. This waiver from coverage does not apply to non-stormwater discharges. The operator must insure that any non-stormwater discharges are either authorized under a separate permit or authorization, or are not considered to be a wastewater.

- (a) the calculated rainfall erosivity (R) factor for the entire period of the construction project is less than five (5);
- (b) the operator submits to the TCEQ a signed waiver certification form, supplied by the executive director, certifying that the construction activity will commence and be completed within a period when the value of the calculated R factor is less than five (5); and
- (c) the waiver certification form is postmarked for delivery to the TCEQ at least seven (7) days before construction activity begins or, if electronic filing is available, then any time following the receipt of written confirmation from TCEQ that a complete electronic application was submitted and acknowledged.

2. Steps to Obtaining a Waiver

The construction site operator may calculate the R factor to request a waiver using the following steps:

- (a) Estimate the construction start date and the construction end date. The construction end date is the date that final stabilization will be achieved.
- (b) Find the appropriate Erosivity Index (EI) zone in Appendix B of this permit.
- (c) Find the EI percentage for the project period by adding the results for each period of the project using the table provided in Appendix D of this permit, in EPA Fact Sheet 2.1, or in USDA Handbook 703, by subtracting the start value from the end value to find the percent EI for the site.
- (d) Refer to the Isoerodent Map (Appendix C of this permit) and interpolate the annual isocrodent value for the proposed construction location.
- (e) Multiply the percent value obtained in Step (c) above by the annual isocrodent value obtained in Step (d). This is the R factor for the proposed project. If the value is less than 5, then a waiver may be obtained. If the value is five (5) or more, then a waiver may not be obtained, and the operator must obtain coverage under Part II.E.2. of this permit.

Alternatively, the operator may calculate a site-specific R factor utilizing the following online calculator: <http://at.tamu.edu/index.html>, or using another available resource.

The waiver certification form is not required to be posted at the small construction site.

3. Effective Date of Waiver

Operators of small construction activities are provisionally waived from the otherwise applicable requirements of this general permit seven (7) days from the date that a completed waiver certification form is postmarked for delivery to TCEQ, or immediately upon receiving confirmation of approval of an electronic submittal, if electronic form submittals are available.

4. Activities Extending Beyond the Waiver Period

If a construction activity extends beyond the approved waiver period due to circumstances beyond the control of the operator, the operator must either:

- (a) recalculate the R factor using the original start date and a new projected ending date, and if the R factor is still under five (5), submit a new waiver certification form at least two (2) days before the end of the original waiver period; or
- (b) obtain authorization under this general permit according to the requirements delineated in either Part II.E.2. or Part II.E.3. before the end of the approved waiver period.

Section H. Alternative TPDES Permit Coverage

1. Individual Permit Alternative

Any discharge eligible for coverage under this general permit may alternatively be authorized under an individual TPDES permit according to 30 TAC §303 (relating to Consolidated Permits). Applications for individual permit coverage should be submitted at least three hundred and thirty (330) days prior to commencement of construction activities to ensure timely authorization.

2. Individual Permit Required

The executive director may suspend an authorization or deny an NOI in accordance with the procedures set forth in 30 TAC §305 (relating to General Permits for Waste Discharges), including the requirement that the executive director provide written notice to the permittee. The executive director may require an operator of a construction site, otherwise eligible for authorization under this general permit, to apply for an individual TPDES permit in the following circumstances:

- (a) the conditions of an approved TMDL or TMDL 1-Plan on the receiving water;
 - (b) the activity being determined to cause a violation of water quality standards or being found to cause, or contribute to, the loss of a designated use of surface waters in the state; and
 - (c) any other consideration defined in 30 TAC Chapter 205 (relating to General Permits for Waste Discharges) including 30 TAC Chapter 205-4(c)(3)(D), which allows the commission to deny authorization under the general permit and require an individual permit if a discharger "has been determined by the executive director to have been out of compliance with any rule, order, or permit of the commission, including non-payment of fees assessed by the executive director."
- Additionally, the executive director may cancel, revoke, or suspend authorization to discharge under this general permit based on a finding of historical and significant noncompliance with the provisions of this general permit, relating to 30 TAC §60.3 (Use of Compliance History). Denial of authorization to discharge under this general permit or suspension of a permittee's authorization under this general permit shall be done according to commission rules in 30 TAC Chapter 205 (relating to General Permits for Waste Discharges).

3. Alternative Discharge Authorization

Any discharge eligible for authorization under this general permit may alternatively be authorized under a separate general permit according to 30 TAC Chapter 205 (relating to General Permits for Waste Discharges), if applicable.

Section I. Permit Expiration

- 1. This general permit is effective for a term not to exceed five (5) years. All active discharge authorizations expire on the date provided on page one (1) of this permit. Following public notice and comment, as provided by 30 TAC §205.3 (relating to

- Public Notice, Public Meetings, and Public Comment), the commission may amend, revoke, cancel, or renew this general permit.
- 2. If the executive director publishes a notice of the intent to renew or amend this general permit before the expiration date, the permit will remain in effect for existing authorized discharges until the commission takes final action on the permit. Upon issuance of a renewed or amended permit, permittees may be required to submit an NOI within 90 days following the effective date of the renewed or amended permit, unless that permit provides for an alternative method for obtaining authorization.

- 3. If the commission does not propose to reissue this general permit within 90 days before the expiration date, permittees shall apply for authorization under an individual permit or an alternative general permit. If the application for an individual permit is submitted before the expiration date, authorization under this expiring general permit remains in effect until the issuance or denial of an individual permit. No new NOIs will be accepted nor new authorizations honored under the general permit after the expiration date.

Part III. Stormwater Pollution Prevention Plans (SWP3)

All regulated construction site operators shall prepare an SWP3, prior to submittal of an NOI, to address discharges authorized under Parts II.E.2. and II.E.3. of this general permit that will reach Waters of the U.S., including discharges to MS4s and privately owned separate storm sewer systems that drain to Waters of the U.S., to identify and address potential sources of pollution that are reasonably expected to affect the quality of discharges from the construction site, including off-site material storage areas, overburden and stockpiles of dirt, borrow areas, equipment staging areas, vehicle repair areas, fueling areas, etc., used solely by the permitted project. The SWP3 must describe the implementation of practices that will be used to minimize to the extent practicable the discharge of pollutants in stormwater associated with construction activity and non-stormwater discharges described in Part II.A.3., in compliance with the terms and conditions of this permit.

Individual operators at a site may develop separate SWP3s that cover only their portion of the project, provided reference is made to the other operators at the site. Where there is more than one SWP3 for a site, permittees must coordinate to ensure that BMPs and controls are consistent and do not negate or impair the effectiveness of each other. Regardless of whether a single comprehensive SWP3 is developed or separate SWP3s are developed for each operator, it is the responsibility of each operator to ensure compliance with the terms and conditions of this general permit in the areas of the construction site where that operator has control over construction plans and specifications or day-to-day operations.

Section A. Shared SWP3 Development

For more effective coordination of BMPs and opportunities for cost sharing, a cooperative effort by the different operators at a site is encouraged. Operators must independently obtain authorization, but may work together to prepare and implement a single, comprehensive SWP3 for the entire construction site.

- 1. The SWP3 must clearly list the name and, for large construction activities, the general permit authorization numbers, for each operator that participates in the shared SWP3. Until the TCEQ responds to receipt of the NOI with a general permit authorization number, the SWP3 must specify the date that the NOI was submitted to TCEQ by each operator. Each operator participating in the shared plan must also sign the SWP3.

2. The SWP3 must clearly indicate which operator is responsible for satisfying each shared requirement of the SWP3. If the responsibility for satisfying a requirement is not described in the plan, then each permittee is entirely responsible for meeting the requirement within the boundaries of the construction site where they perform construction activities. The SWP3 must clearly describe responsibilities for meeting each requirement in shared or common areas.
3. The SWP3 may provide that one operator is responsible for preparation of a SWP3 in compliance with the CGP, and another operator is responsible for implementation of the SWP3 at the project site.

Section B. Responsibilities of Operators

1. Secondary Operators and Primary Operators with Control Over Construction Plans and Specifications
All secondary operators and primary operators with control over construction plans and specifications shall:

- (a) ensure the project specifications allow or provide that adequate BMPs are developed to meet the requirements of Part III of this general permit;
- (b) ensure that the SWP3 indicates the areas of the project where they have control over project specifications, including the ability to make modifications in specifications;
- (c) ensure that all other operators affected by modifications in project specifications are notified in a timely manner so that those operators may modify their BMPs as necessary to remain compliant with the conditions of this general permit; and
- (d) ensure that the SWP3 for portions of the project where they are operators indicates the name and site-specific TPDES authorization number(s) for operators with the day-to-day operational control over those activities necessary to ensure compliance with the SWP3 and other permit conditions. If the party with day-to-day operational control has not been authorized or has abandoned the site, the person with control over project specifications is considered to be the responsible party until the authority is transferred to another party and the SWP3 is updated.

2. Primary Operators with Day-to-Day Operational Control

Primary operators with day-to-day operational control of those activities at a project that are necessary to ensure compliance with an SWP3 and other permit conditions must ensure that the SWP3 accomplishes the following requirements:

- (a) meets the requirements of this general permit for those portions of the project where they are operators;
- (b) identifies the parties responsible for implementation of BMPs described in the SWP3;
- (c) indicates areas of the project where they have operational control over day-to-day activities; and
- (d) includes, for areas where they have operational control over day-to-day activities, the name and site-specific TPDES authorization number of the parties with control over project specifications, including the ability to make modifications in specifications.

Section C. Deadlines for SWP3 Preparation, Implementation, and Compliance

The SWP3 must be prepared prior to obtaining authorization under this general permit, and implemented prior to commencing construction activities that result in soil

disturbance. The SWP3 must be prepared so that it provides for compliance with the terms and conditions of this general permit.

Section D. Plan Review and Making Plans Available

1. The SWP3 must be retained on-site at the construction site or, if the site is inactive or does not have an on-site location to store the plan, a notice must be posted describing the location of the SWP3. The SWP3 must be made readily available at the time of an on-site inspection to: the executive director; a federal, state, or local agency approving sediment and erosion plans, grading plans, or stormwater management plans; local government officials; and the operator of a municipal separate storm sewer receiving discharges from the site. If the SWP3 is retained off-site, then it shall be made available as soon as reasonably possible. In most instances, it is reasonable that the SWP3 shall be made available within 24 hours of the request.
2. A primary operator of a large construction activity must post the TCBO site notice near the main entrance of the construction site. An operator of a small construction activity seeking authorization under this general permit and a secondary operator of a large construction activity must post the TCBO site notices required in Part II.E.1., 2., or 3. of this general permit in order to obtain authorization. If the construction project is a linear construction project, such as a pipeline or highway, the notices must be placed in a publicly accessible location near where construction is actively underway. Notices for these linear sites may be relocated, as necessary, along the length of the project. The notices must be readily available for viewing by the general public; local, state, and federal authorities; and contain the following information:
 - (a) the site-specific TPDES authorization number for the project if assigned;
 - (b) the operator name, contact name, and contact phone number;
 - (c) a brief description of the project; and
 - (d) the location of the SWP3.
3. This permit does not provide the general public with any right to trespass on a construction site for any reason, including inspection of a site; nor does this permit require that permittees allow members of the general public access to a construction site.

Section E. Revisions and Updates to SWP3s

The permittee must revise or update the SWP3 whenever the following occurs:

1. a change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants and that has not been previously addressed in the SWP3;
2. changing site conditions based on updated plans and specifications, new operators, new areas of responsibility, and changes in BMPs; or
3. results of inspections or investigations by site operators, operators of a municipal separate storm sewer system receiving the discharge, authorized TCBO personnel, or a federal, state or local agency approving sediment and erosion plans indicate the SWP3 is proving ineffective in eliminating or significantly minimizing pollutants in discharges authorized under this general permit.

Section F. Contents of SWP3

The SWP3 must include, at a minimum, the information described in this section and must comply with the construction and development effluent guidelines in Part III, Section G of the general permit.

1. A site or project description, which includes the following information:

- (a) a description of the nature of the construction activity;
 - (b) a list of potential pollutants and their sources;
 - (c) a description of the intended schedule or sequence of activities that will disturb soils for major portions of the site, including estimated start dates and duration of activities;
 - (d) the total number of acres of the entire property and the total number of acres where construction activities will occur, including off-site material storage areas, overburden and stockpiles of dirt, and borrow areas that are authorized under the permittee's NOI;
 - (e) data describing the soil or the quality of any discharges from the site;
 - (f) a map showing the general location of the site (e.g. a portion of a city or county map);
 - (g) a detailed site map (or maps) indicating the following:
 - (i) drainage patterns and approximate slopes anticipated after major grading activities;
 - (ii) areas where soil disturbance will occur;
 - (iii) locations of all controls and buffers, either planned or in place;
 - (iv) locations where temporary or permanent stabilization practices are expected to be used;
 - (v) locations of construction support activities, including off-site activities, that are authorized under the permittee's NOI, including material, waste, borrow, fill, or equipment or chemical storage areas;
 - (vi) surface waters (including wetlands) either in, adjacent, or in close proximity to the site, and also indicating those that are impaired waters;
 - (vii) locations where stormwater discharges from the site directly to a surface water body or a municipal separate storm sewer system;
 - (viii) vehicle wash areas; and
 - (ix) designated points on the site where vehicles will exit onto paved roads (for instance, this applies to construction transition from unstable dirt areas to exterior paved roads).
- Where the amount of information required to be included on the map would result in a single map being difficult to read and interpret, the operator shall develop a series of maps that collectively include the required information.
- (h) the location and description of support activities authorized under the permittee's NOI, including asphalt plants, concrete plants, and other activities providing support to the construction site that is authorized under this general permit;
 - (i) the name of receiving waters at or near the site that may be disturbed or that may receive discharges from disturbed areas of the project;
 - (j) a copy of this TPDES general permit;
 - (k) the NOI and acknowledgment certificate for primary operators of large construction sites, and the site notice for small construction sites and for secondary operators of large construction sites;
 - (l) stormwater and allowable non-stormwater discharge locations, including storm drain inlets on site and in the immediate vicinity of the construction site; and

2. A description of the BMPs that will be used to minimize pollution in runoff:

- (m) locations of all pollutant-generating activities, such as paving operations; concrete, paint and stucco washout and water disposal; solid waste storage and disposal; and dewatering operations.
- The description must identify the general timing or sequence for implementation. At a minimum, the description must include the following components:
- (a) General Requirements
 - (i) Erosion and sediment controls must be designed to retain sediment on-site to the extent practicable with consideration for local topography, soil type, and rainfall.
 - (ii) Control measures must be properly selected, installed, and maintained according to the manufacturer's or designer's specifications.
 - (iii) Controls must be developed to minimize the offsite transport of litter, construction debris, and construction materials.
 - (b) Erosion Control and Stabilization Practices

The SWP3 must include a description of temporary and permanent erosion control and stabilization practices for the site, compliant with the requirements of Part III.G.1 and G.2 of this general permit, including a schedule of when the practices will be implemented. Site plans should ensure that existing vegetation is preserved where it is possible.

 - (i) Erosion control and stabilization practices may include but are not limited to: establishment of temporary or permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of existing trees and vegetation, slope tenting, temporary velocity dissipation devices, flow diversion mechanisms, and other similar measures.
 - (ii) The following records must be maintained and either attached to or referenced in the SWP3, and made readily available upon request to the parties listed in Part III.D.1 of this general permit:
 - (A) the dates when major grading activities occur;
 - (B) the dates when construction activities temporarily or permanently cease on a portion of the site; and
 - (C) the dates when stabilization measures are initiated.
 - (iii) Erosion control and stabilization measures must be initiated immediately in portions of the site where construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days. Stabilization measures that provide a protective cover must be initiated immediately in portions of the site where construction activities have permanently ceased. The term "immediately" is used to define the deadline for initiating stabilization measures. In the context of this requirement, "immediately" means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased. Except as provided in (A) through (D) below, these measures must be completed as soon as practicable, but no more than 14 calendar days after the initiation of soil stabilization measures:
 - (A) Where the immediate initiation of stabilization measures after construction activity temporarily or permanently ceased is precluded

by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable.

- (B) In arid areas, semi-arid areas, or drought-stricken areas where the immediate initiation of stabilization measures after construction activity has temporarily or permanently ceased or is precluded by arid conditions, erosion control and stabilization measures must be initiated as soon as practicable. Where vegetative controls are not feasible due to arid conditions, the operator shall immediately install, and within 14 calendar days of a temporary or permanent cessation of work in any portion of the site complete, non-vegetative erosion controls. If non-vegetative controls are not feasible, the operator shall install temporary sediment controls as required in Paragraph (C) below.

(C) In areas where temporary stabilization measures are infeasible, the operator may alternatively utilize temporary perimeter controls. The operator must document in the SWP3 the reason why stabilization measures are not feasible, and must demonstrate that the perimeter controls will retain sediment on site to the extent practicable. The operator must continue to inspect the BMPs at the frequency established in Section III.F.7(a) for unstabilized sites.

(D) If the initiation or completion of vegetative stabilization is affected by circumstances beyond the control of the permittee, vegetative stabilization must be initiated or completed as soon as conditions or circumstances allow it on the site. The requirement to initiate stabilization is triggered as soon as it is known with reasonable certainty that work will be stopped for 14 or more additional calendar days.

(iv) Final stabilization must be achieved prior to termination of permit coverage.

(v) TCEQ does not expect that temporary or permanent stabilization measures to be applied to areas that are intended to be left un-vegetated or un-stabilized following construction (e.g., dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, or materials).

(c) Sediment Control Practices

The SWP3 must include a description of any sediment control practices used to remove eroded soils from stormwater runoff, including the general timing or sequence for implementation of controls.

(i) Sites With Drainage Areas of Ten or More Acres

(A) Sedimentation Basin(s)

(1) A sedimentation basin is required, where feasible, for a common drainage location that serves an area with ten (10) or more acres disturbed at one time. A sedimentation basin may be temporary or permanent, and must provide sufficient storage to contain a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained. When calculating the volume of runoff from a 2-year, 24-hour storm event, it is not required to include the flows from offsite areas and flow from onsite areas that are either undisturbed or have already undergone permanent stabilization, if these flows are diverted around both the disturbed areas of the site and the sediment basin. Capacity calculations shall be included in the SWP3.

(2) Where rainfall data is not available or a calculation cannot be performed, the sedimentation basin must provide at least 3,600 cubic feet of storage per acre drained until final stabilization of the site.

(3) If a sedimentation basin is not feasible, then the permittee shall provide equivalent control measures until final stabilization of the site. In determining whether installing a sediment basin is feasible, the permittee may consider factors such as site soils, slope, available area, public safety, precipitation patterns, site geometry, site vegetation, infiltration capacity, geotechnical factors, depth to groundwater, and other similar considerations. The permittee shall document the reason that the sediment basins are not feasible, and shall utilize equivalent control measures, which may include a series of smaller sediment basins.

(4) Unless infeasible, when discharging from sedimentation basins and impoundments, the permittee shall utilize outlet structures that withdraw water from the surface.

(B) Perimeter Controls: At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions.

(ii) Controls for Sites With Drainage Areas Less than Ten Acres:

(A) Sediment traps and sediment basins may be used to control solids in stormwater runoff for drainage locations serving less than ten (10) acres. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions.

(B) Alternatively, a sediment basin that provides storage for a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained may be utilized. Where rainfall data is not available or a calculation cannot be performed, a temporary or permanent sediment basin providing 3,600 cubic feet of storage per acre drained may be provided. If a calculation is performed, then the calculation shall be included in the SWP3.

(C) If sedimentation basins or impoundments are used, the permittee shall comply with the requirements in Part III.G.6 of this general permit.

3. Description of Permanent Stormwater Controls

A description of any measures that will be installed during the construction process to control pollutants in stormwater discharges that may occur after construction operations have been completed must be included in the SWP3. Permittees are only responsible for the installation and maintenance of stormwater management measures prior to final stabilization of the site or prior to submission of an NOT.

4. Other Required Controls and BMPs

(a) Permittees shall minimize, to the extent practicable, the off-site vehicle tracking of sediments and the generation of dust. The SWP3 shall include a description of controls utilized to accomplish this requirement.

- (b) The SWP3 must include a description of construction and waste materials expected to be stored on-site and a description of controls to minimize pollutants from these materials.
 - (c) The SWP3 must include a description of potential pollutant sources from areas other than construction (such as stormwater discharges from dedicated asphalt plants and dedicated concrete batch plants), and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.
 - (d) Permittees shall place velocity dissipation devices at discharge locations and along the length of any outfall channel (i.e., runoff conveyance) to provide a non-erosive flow velocity from the structure to a water course, so that the natural physical and biological characteristics and functions are maintained and protected.
 - (e) Permittees shall design and utilize appropriate controls to minimize the off-site transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water from the site.
 - (f) Permittees shall ensure that all other required controls and BMPs comply with all of the requirements of Part III.G of this general permit.
5. Documentation of Compliance with Approved State and Local Plans
- (a) Permittees must ensure that the SWP3 is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or stormwater management site plans or site permits approved by federal, state, or local officials.
 - (b) SWP3s must be updated as necessary to remain consistent with any changes applicable to protecting surface water resources in sediment erosion site plans or site permits, or stormwater management site plans or site permits approved by state or local officials for which the permittee receives written notice.
 - (c) If the permittee is required to prepare a separate management plan, including but not limited to a WPAP or Contributing Zone Plan in accordance with 30 TAC Chapter 213 (related to the Edwards Aquifer), then a copy of that plan must be either included in the SWP3 or made readily available upon request to authorized personnel of the TCEQ. The permittee shall maintain a copy of the approval letter for the plan in its SWP3.
6. Maintenance Requirements
- (a) All protective measures identified in the SWP3 must be maintained in effective operating condition. If, through inspections or other means, the permittee determines that BMPs are not operating effectively, then the permittee shall perform maintenance as necessary to maintain the continued effectiveness of stormwater controls, and prior to the next rain event if feasible. If maintenance prior to the next anticipated storm event is impracticable, the reason shall be documented in the SWP3 and maintenance must be scheduled and accomplished as soon as practicable. Erosion and sediment controls that have been intentionally disabled, run-over, removed, or otherwise rendered ineffective must be replaced or corrected immediately upon discovery.
 - (b) If periodic inspections or other information indicates a control has been used incorrectly, is performing inadequately, or is damaged, then the operator shall replace or modify the control as soon as practicable after making the discovery.
 - (c) Sediment must be removed from sediment traps and sedimentation ponds no later than the time that design capacity has been reduced by 50%. For perimeter

- controls such as silt fences, berms, etc., the trapped sediment must be removed before it reaches 50% of the above-ground height.
 - (d) If sediment escapes the site, accumulations must be removed at a frequency that minimizes off-site impacts, and prior to the next rain event, if feasible. If the permittee does not own or operate the off-site conveyance, then the permittee shall work with the owner or operator of the property to remove the sediment.
7. Inspections of Controls
- (a) Personnel provided by the permittee must inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, discharge locations, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Personnel conducting these inspections must be knowledgeable of this general permit, familiar with the construction site, and knowledgeable of the SWP3 for the site. Sediment and erosion control measures identified in the SWP3 must be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking. Inspections must be conducted at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.
- Where sites have been finally or temporarily stabilized or where runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or frozen ground exists), inspections must be conducted at least once every month. In arid, semi-arid, or drought-stricken areas, inspections must be conducted at least once every month and within 24 hours after the end of a storm event of 0.5 inches or greater. The SWP3 must also contain a record of the total rainfall measured, as well as the approximate beginning and ending dates of winter or drought conditions resulting in monthly frequency of inspections.
- As an alternative to the above-described inspection schedule of once every 14 calendar days and within 24 hours of a storm event of 0.5 inches or greater, the SWP3 may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, then the inspection must occur regardless of whether or not there has been a rainfall event since the previous inspection.
- The inspections may occur on either schedule provided that the SWP3 reflects the current schedule and that any changes to the schedule are conducted in accordance with the following provisions: the schedule may be changed a maximum of one time each month, the schedule change must be implemented at the beginning of a calendar month, and the reason for the schedule change must be documented in the SWP3 (e.g., end of "dry" season and beginning of "wet" season).
- (b) Utility line installation, pipeline construction, and other examples of long, narrow, linear construction activities may provide inspection personnel with limited access to the areas described in Part III.F.7.(a) above. Inspection of these areas could require that vehicles compromise temporarily or even permanently stabilized areas, cause additional disturbance of soils, and increase the potential for erosion. In these circumstances, controls must be inspected at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater, but representative inspections may be performed. For representative inspections, personnel must inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described in Part III.F.7.(a)

above. The conditions of the controls along each inspected 0.25 mile portion may be considered as representative of the condition of controls along that reach extending from the end of the 0.25 mile portion to either the end of the next 0.25 mile inspected portion, or to the end of the project, whichever occurs first.

As an alternative to the above-described inspection schedule of once every 14 calendar days and within 24 hours of a storm event of 0.5 inches or greater, the SWP3 may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, the inspection must occur regardless of whether or not there has been a rainfall event since the previous inspection. The inspections may occur on either schedule provided that the SWP3 reflects the current schedule and that any changes to the schedule are conducted in accordance with the following provisions: the schedule may be changed a maximum of one time each month, the schedule change must be implemented at the beginning of a calendar month, and the reason for the schedule change must be documented in the SWP3 (e.g., end of "dry" season and beginning of "wet" season).

(c) In the event of flooding or other uncontrollable situations which prohibit access to the inspection sites, inspections must be conducted as soon as access is practicable.

(d) The SWP3 must be modified based on the results of inspections, as necessary, to better control pollutants in runoff. Revisions to the SWP3 must be completed within seven (7) calendar days following the inspection. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule must be described in the SWP3 and wherever possible those changes implemented before the next storm event. If implementation before the next anticipated storm event is impracticable, these changes must be implemented as soon as practicable.

(e) A report summarizing the scope of the inspection, the date(s) of the inspection, and major observations relating to the implementation of the SWP3 must be made and retained as part of the SWP3. Major observations should include: The locations of discharges of sediment or other pollutants from the site; locations of BMPs that need to be maintained; locations of BMPs that failed to operate as designed or proved inadequate for a particular location; and locations where additional BMPs are needed.

Actions taken as a result of inspections must be described within, and retained as a part of, the SWP3. Reports must identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the facility or site is in compliance with the SWP3 and this permit. The report must be signed by the person and in the manner required by 30 TAC §905.128 (relating to Signatories to Reports).

The names and qualifications of personnel making the inspections for the permittees may be documented once in the SWP3 rather than being included in each report.

8. The SWP3 must identify and ensure the implementation of appropriate pollution prevention measures for all eligible non-stormwater components of the discharge, as listed in Part III.A.3. of this permit.

9. The SWP3 must include the information required in Part III.B. of this general permit.

10. The SWP3 must include pollution prevention procedures that comply with Part III.G.4 of this general permit.

Section G. Erosion and Sediment Control Requirements Applicable to All Sites

Except as provided in 40 CFR §§125.90-125.92, any discharge regulated under this general permit, with the exception of sites that obtained waivers based on low rainfall erosivity, must achieve, at a minimum, the following effluent limitations representing the degree of effluent reduction attainable by application of the best practicable control technology currently available (BPT).

1. *Erosion and sediment controls.* Design, install, and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed, and maintained to:
 - (a) Control stormwater volume and velocity within the site to minimize soil erosion;
 - (b) If any stormwater flow will be channelized at the site, stormwater controls must be designed to control both peak flowrates and total stormwater volume to minimize erosion at outlets and to minimize downstream channel and streambank erosion;
 - (c) Minimize the amount of soil exposed during construction activity;
 - (d) Minimize the disturbance of steep slopes;
 - (e) Minimize sediment discharges from the site. The design, installation, and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
 - (f) If earth disturbance activities are located in close proximity to a surface water, provide and maintain appropriate natural buffers if feasible and as necessary, around surface waters, depending on site-specific topography, sensitivity, and proximity to water bodies. Direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration. If providing buffers is infeasible, the permittee shall document the reason that natural buffers are not feasible, and shall implement additional erosion and sediment controls to reduce sediment load;
 - (g) Preserve native topsoil at the site, unless infeasible; and
 - (h) Minimize soil compaction in post-construction pervious areas. In areas of the construction site where final vegetative stabilization will occur or where infiltration practices will be installed, either:
 - (1) restrict vehicle and equipment use to avoid soil compaction; or
 - (2) prior to seeding or planting areas of exposed soil that have been compacted, use techniques that condition the soils to support vegetative growth, if necessary and feasible;
 - (i) TCRQ does not consider stormwater control features (e.g., stormwater conveyance channels, storm drain inlets, sediment basins) to constitute "surface waters" for the purposes of triggering the buffer requirement in Part III.G.(f) above.
2. *Soil stabilization.* Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating, or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. In the context of this requirement, "immediately" means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased. Temporary

stabilization must be completed no more than 14 calendar days after initiation of soil stabilization measures, and final stabilization must be achieved prior to termination of permit coverage. In arid, semi-arid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative non-vegetative stabilization measures must be employed as soon as practicable. Refer to Part III, P.2.(b) for complete erosion control and stabilization practice requirements.

3. **Dewatering.** Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited, unless managed by appropriate controls.
4. **Pollution prevention measures.** Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented, and maintained as follows:
 - (a) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge.
 - (b) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary wastes, and other materials present on the site to precipitation and to stormwater, and
 - (c) Minimize the discharge of pollutants from spills and leaks, and implement chemical spill and leak prevention and response procedures.
5. **Prohibited discharges.** The following discharges are prohibited:
 - (a) Wastewater from wash out of concrete trucks, unless managed by an appropriate control (see Part V of the general permit);
 - (b) Wastewater from wash out and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
 - (c) Fuel, oils, or other pollutants used in vehicle and equipment operation and maintenance; and
 - (d) Soaps or solvents used in vehicle and equipment washing.
6. **Surface outlets.** When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface, unless infeasible.

Part IV. Stormwater Runoff from Concrete Batch Plants

Discharges of stormwater runoff from concrete batch plants at regulated construction sites may be authorized under the provisions of this general permit provided that the following requirements are met for concrete batch plants authorized under this permit. If discharges of stormwater runoff from concrete batch plants are not covered under this general permit, then discharges must be authorized under an alternative general permit or individual permit. This permit does not authorize the discharge or land disposal of any wastewater from concrete batch plants at regulated construction sites. Authorization for these wastes must be obtained under an individual permit or an alternative general permit.

Section A. Benchmark Sampling Requirements

1. Operators of concrete batch plants authorized under this general permit shall sample the stormwater runoff from the concrete batch plants according to the requirements

of this section of the general permit, and must conduct evaluations on the effectiveness of the SWP3 based on the following benchmark monitoring values:

Table 1. Benchmark Parameters

Benchmark Parameter	Benchmark Value	Sampling Frequency	Sample Type
Oil and Grease	15 mg/L	1/quarter ⁽¹⁾ , ⁽²⁾	Grab ⁽³⁾
Total Suspended Solids	100 mg/L	1/quarter ⁽¹⁾ , ⁽²⁾	Grab ⁽³⁾
pH	6.0 - 9.0 Standard Units	1/quarter ⁽¹⁾ , ⁽²⁾	Grab ⁽³⁾
Total Iron	1.3 mg/L	1/quarter ⁽¹⁾ , ⁽²⁾	Grab ⁽³⁾

⁽¹⁾ When discharge occurs. Sampling is required within the first 30 minutes of discharge. If it is not practicable to take the sample, or to complete the sampling, within the first 30 minutes, sampling must be completed within the first hour of discharge. If sampling is not completed within the first 30 minutes of discharge, the reason must be documented and attached to all required reports and records of the sampling activity.

⁽²⁾ Sampling must be conducted at least once during each of the following periods. The first sample must be collected during the first full quarter that a stormwater discharge occurs from a concrete batch plant authorized under this general permit.

- January through March
- April through June
- July through September
- October through December

For projects lasting less than one full quarter, a minimum of one sample shall be collected, provided that a stormwater discharge occurred at least once following submission of the NOI or following the date that automatic authorization was obtained under Section II.E.2., and prior to terminating coverage.

⁽³⁾ A grab sample shall be collected from the stormwater discharge resulting from a storm event that is at least 0.1 inches of measured precipitation that occurs at least 72 hours from the previously measurable storm event. The sample shall be collected downstream of the concrete batch plant, and where the discharge exits any BMPs utilized to handle the runoff from the batch plant, prior to commingling with any other water authorized under this general permit.

2. The permittee must compare the results of sample analyses to the benchmark values above, and must include this comparison in the overall assessment of the SWP3's effectiveness. Analytical results that exceed a benchmark value are not a violation of this permit, as these values are not numeric effluent limitations. Results of analyses are indicators that modifications of the SWP3 should be assessed and may be necessary to protect water quality. The operator must investigate the cause for each exceedance and must document the results of this investigation in the SWP3 by the end of the quarter following the sampling event.

The operator's investigation must identify the following:

- (a) any additional potential sources of pollution, such as spills that might have occurred;
- (b) necessary revisions to good housekeeping measures that are part of the SWP3;
- (c) additional BMPs, including a schedule to install or implement the BMPs, and
- (d) other parts of the SWP3 that may require revisions in order to meet the goal of the benchmark values.

Background concentrations of specific pollutants may also be considered during the investigation. If the operator is able to relate the cause of the exceedance to background concentrations, then subsequent exceedances of benchmark values for that pollutant may be resolved by referencing earlier findings in the SWP3. Background concentrations may be identified by laboratory analyses of samples of stormwater runoff to the permitted facility, by laboratory analyses of samples of stormwater run-off from adjacent non-industrial areas, or by identifying the pollutant is a naturally occurring material in soils at the site.

Section B. Best Management Practices (BMPs) and SWP3 Requirements

Minimum SWP3 Requirements - The following are required in addition to other SWP3 requirements listed in this general permit (including, but not limited to Part III.F.7 of this permit):

1. **Description of Potential Pollutant Sources** - The SWP3 must provide a description of potential sources (activities and materials) that may reasonably be expected to affect the quality of stormwater discharges associated with concrete batch plants authorized under this permit. The SWP3 must describe practices that that will be used to reduce the pollutants in these discharges to assure compliance with this general permit, including the protection of water quality, and must ensure the implementation of these practices.

The following must be developed, at a minimum, in support of developing this description:

- (a) **Drainage** - The site map must include the following information:
 - (1) the location of all outfalls for stormwater discharges associated with concrete batch plants that are authorized under this permit;
 - (2) a depiction of the drainage area and the direction of flow to the outfall(s);
 - (3) structural controls used within the drainage area(s);
 - (4) the locations of the following areas associated with concrete batch plants that are exposed to precipitation, vehicle and equipment maintenance activities (including fueling, repair, and storage areas for vehicles and equipment scheduled for maintenance); areas used for the treatment, storage, or disposal of wastes; liquid storage tanks; material processing and storage areas; and loading and unloading areas; and
 - (5) the locations of the following: any bag house or other dust control device(s); recycle/sedimentation pond, clarifier or other device used for the treatment of facility wastewater (including the areas that drain to the treatment device); areas with significant materials, and areas where major spills or leaks have occurred.
- (b) **Inventories of Exposed Materials** - A list of materials handled at the concrete batch plant that may be exposed to stormwater and that have a potential to

affect the quality of stormwater discharges associated with concrete batch plants that are authorized under this general permit.

- (c) **Spills and Leaks** - A list of significant spills and leaks of toxic or hazardous pollutants that occurred in areas exposed to stormwater and that drain to stormwater outfalls associated with concrete batch plants authorized under this general permit must be developed, maintained, and updated as needed.

- (d) **Sampling Data** - A summary of existing stormwater discharge sampling data must be maintained, if available.

2. **Measures and Controls** - The SWP3 must include a description of management controls to regulate pollutants identified in the SWP3's "Description of Potential Pollutant Sources" from Part IV.B.1.(a) of this permit, and a schedule for implementation of the measures and controls. This must include, at a minimum:
 - (a) **Good Housekeeping** - Good housekeeping measures must be developed and implemented in the area(s) associated with concrete batch plants.
 - (1) Operators must prevent or minimize the discharge of spilled cement, aggregate (including sand or gravel), settled dust, or other significant materials from paved portions of the site that are exposed to stormwater. Measures used to minimize the presence of these materials may include regular sweeping or other equivalent practices. These practices must be conducted at a frequency that is determined based on consideration of the amount of industrial activity occurring in the area and frequency of precipitation, and shall occur at least once per week when cement or aggregate is being handled or otherwise processed in the area.
 - (a) Operators must prevent the exposure of fine granular solids, such as cement, to stormwater. Where practicable, these materials must be stored in enclosed silos, hoppers or buildings, in covered areas, or under covering.
 - (b) **Spill Prevention and Response Procedures** - Areas where potential spills that can contribute pollutants to stormwater runoff, and the drainage areas from these locations, must be identified in the SWP3. Where appropriate, the SWP3 must specify material handling procedures, storage requirements, and use of equipment. Procedures for cleaning up spills must be identified in the SWP3 and made available to the appropriate personnel.
 - (c) **Inspections** - Qualified facility personnel (i.e., a person or persons with knowledge of this general permit, the concrete batch plant, and the SWP3 related to the concrete batch plant(s) for the site) must be identified to inspect designated equipment and areas of the facility specified in the SWP3. The inspection frequency must be specified in the SWP3 based upon a consideration of the level of concrete production at the facility, but must be a minimum of once per month while the facility is in operation. The inspection must take place while the facility is in operation and must, at a minimum, include all areas that are exposed to stormwater at the site, including material handling areas, above ground storage tanks, hoppers or silos, dust collection/containment systems, truck wash down and equipment cleaning areas. Follow-up procedures must be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections must be maintained and be made readily available for inspection upon request.
 - (d) **Employee Training** - An employee training program must be developed to educate personnel responsible for implementing any component of the SWP3, or personnel otherwise responsible for stormwater pollution prevention, with the provisions of the SWP3. The frequency of training must be documented in

- the SWP3, and at a minimum, must consist of one training prior to the initiation of operation of the concrete batch plant.
- (e) Record Keeping and Internal Reporting Procedures - A description of spills and similar incidents, plus additional information that is obtained regarding the quality and quantity of stormwater discharges, must be included in the SWP3. Inspection and maintenance activities must be documented and records of those inspection and maintenance activities must be incorporated in the SWP3.
- (f) Management of Runoff - The SWP3 shall contain a narrative consideration for reducing the volume of runoff from concrete batch plants by diverting runoff or otherwise managing runoff, including use of infiltration, detention ponds, retention ponds, or reusing of runoff.
3. Comprehensive Compliance Evaluation - At least once per year, one or more qualified personnel (i.e., a person or persons with knowledge of this general permit, the concrete batch plant, and the SWP3 related to the concrete batch plant(s) for the site) shall conduct a compliance evaluation of the plant. The evaluation must include the following:
- (a) Visual examination of all areas draining stormwater associated with regulated concrete batch plants for evidence of, or the potential for, pollutants entering the drainage system. These include but are not limited to: cleaning areas, material handling areas, above ground storage tanks, hoppers or silos, dust collection/containment systems, and truck wash down and equipment cleaning areas. Measures implemented to reduce pollutants in runoff (including structural controls and implementation of management practices) must be evaluated to determine if they are effective and if they are implemented in accordance with the terms of this permit and with the permittee's SWP3. The operator shall conduct a visual inspection of equipment needed to implement the SWP3, such as spill response equipment.
- (b) Based on the results of the evaluation, the following must be revised as appropriate within two weeks of the evaluation: the description of potential pollutant sources identified in the SWP3 (as required in Part IV.B.1., "Description of Potential Pollutant Sources"); and pollution prevention measures and controls identified in the SWP3 (as required in Part IV.B.2., "Measures and Controls"). The revisions may include a schedule for implementing the necessary changes.
- (c) The permittee shall prepare and include in the SWP3 a report summarizing the scope of the evaluation, the personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the SWP3, and actions taken in response to the findings of the evaluation. The report must identify any incidents of noncompliance. Where the report does not identify incidences of noncompliance, the report must contain a statement that the evaluation did not identify any incidences(s), and the report must be signed according to 30 TAC §905.128, relating to Signatories to Reports.
- (d) The Comprehensive Compliance Evaluation may substitute for one of the required inspections delineated in Part IV.B.2.(c) of this general permit.

Section C. Prohibition of Wastewater Discharges

Wastewater discharges associated with concrete production including wastewater disposal by land application are not authorized under this general permit. These wastewater discharges must be authorized under an alternate TCEQ water quality permit or otherwise disposed of in an authorized manner. Discharges of concrete truck wash out at construction sites may be authorized if conducted in accordance with the requirements of Part V of this general permit.

Part V. Concrete Truck Wash Out Requirements

This general permit authorizes the wash out of concrete trucks at construction sites regulated under Sections II.E.1., 2., and 3. of this general permit, provided the following requirements are met. Authorization is limited to the land disposal of wash out water from concrete trucks. Any other direct discharge of concrete production waste water must be authorized under a separate TCEQ general permit or individual permit.

1. Direct discharge of concrete truck wash out water to surface water in the state, including discharge to storm sewers, is prohibited by this general permit.
2. Concrete truck wash out water shall be discharged to areas at the construction site where structural controls have been established to prevent direct discharge to surface waters or to areas that have a minimal slope that allow infiltration and filtering of wash out water to prevent direct discharge to surface waters. Structural controls may consist of temporary berms, temporary shallow pits, temporary storage tanks with slow rate release, or other reasonable measures to prevent runoff from the construction site.
3. Wash out of concrete trucks during rainfall events shall be minimized. The direct discharges of concrete truck wash out water is prohibited at all times, and the operator shall insure that its BMPs are sufficient to prevent the discharge of concrete truck wash out as the result of rainfall or stormwater runoff.
4. The discharge of wash out water must not cause or contribute to groundwater contamination.
5. If a SWP3 is required to be implemented, the SWP3 shall include concrete wash out areas on the associated site map.

Part VI. Retention of Records

The permittee must retain the following records for a minimum period of three (3) years from the date that a NOI is submitted as required by Part II.K.3. For activities in which an NOI is not required, records shall be retained for a minimum period of three (3) years from the date that the operator terminates coverage under Section II.F.3. of this permit. Records include:

1. A copy of the SWP3;
2. All reports and actions required by this permit, including a copy of the construction site notice;
3. All data used to complete the NOI, if an NOI is required for coverage under this general permit; and
4. All records of submittal of forms submitted to the operator of any MSA receiving the discharge and to the secondary operator of a large construction site, if applicable.

Part VII. Standard Permit Conditions

1. The permittee has a duty to comply with all permit conditions. Failure to comply with any permit condition is a violation of the permit and statutes under which it was issued, and is grounds for enforcement action, for terminating, revoking, or delaying coverage under this general permit, or for requiring a discharge to apply for and obtain an individual TPDES permit.
2. Authorization under this general permit may be suspended or revoked for cause. Filing a notice of planned changes or anticipated non-compliance by the permittee does not stay any permit condition. The permittee must furnish to the executive director, upon request and within a reasonable time, any information necessary for the executive director to determine whether cause exists for revoking, suspending, or

- terminating authorization under this permit. Additionally, the permittee must provide to the executive director, upon request, copies of all records that the permittee is required to maintain as a condition of this general permit.
3. It is not a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the permit conditions.
 4. Inspection and entry shall be allowed under TWC Chapter 26-28, Texas Health and Safety Code §§361.032-361.033 and 361.037, and 40 CFR §122.41(i). The statement in TWC §26.014 that commission entry of a facility shall occur according to an establishment's rules and regulations concerning safety, internal security, and fire protection is not grounds for denial or restriction of entry to any part of the facility or site, but merely describes the commission's duty to observe appropriate rules and regulations during an inspection.
 5. The discharger is subject to administrative, civil, and criminal penalties, as applicable, under TWC Chapter 7 for violations including but not limited to the following:
 - (a) negligently or knowingly violating the federal CWA §§301, 302, 306, 307, 308, 318, or 405, or any condition or limitation implementing any sections in a permit issued under CWA §402, or any requirement imposed in a pretreatment program approved under CWA §§402(e)(3) or 402(b)(8);
 - (b) knowingly making any false statement, representation, or certification in any record or other document submitted or required to be maintained under a permit, including monitoring reports or reports of compliance or noncompliance; and
 - (c) knowingly violating §303 of the federal CWA, and placing another person in imminent danger of death or serious bodily injury.
 6. All reports and other information requested by the executive director must be signed by the person and in the manner required by 30 TAC §305.128 (relating to Signatories to Reports).
 7. Authorization under this general permit does not convey property or water rights of any sort and does not grant any exclusive privilege.
 8. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.
 9. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
 10. The permittee shall comply with the reporting requirements in 40 CFR §122.41(i), as applicable.

Part VIII. Fees

1. A fee of must be submitted along with the NOI:
 - (a) \$325 if submitting a paper NOI, or
 - (b) \$225 if submitting an NOI electronically.

2. Fees are due upon submission of the NOI. An NOI will not be declared administratively complete unless the associated fee has been paid in full.
3. No separate annual fees will be assessed for this general permit. The Water Quality Annual Fee has been incorporated into the NOI fees as described above.

Construction General Permit

TPDBS General Permit TXR150000

Appendix A: Automatic Authorization
Periods of Low Erosion Potential by County - Eligible Date Ranges

Andrews: Nov. 15 - Apr. 30
 Archer: Dec. 15 - Feb. 14
 Armstrong: Nov. 15 - Apr. 30
 Bailey: Nov. 1 - Apr. 30, or Nov. 15 - May 14
 Baylor: Dec. 15 - Feb. 14
 Borden: Nov. 15 - Apr. 30
 Brewster: Nov. 15 - Apr. 30
 Briscoe: Nov. 15 - Apr. 30
 Brown: Dec. 15 - Feb. 14
 Callahan: Dec. 15 - Feb. 14
 Cannon: Nov. 15 - Apr. 30
 Castro: Nov. 15 - Apr. 30
 Childress: Dec. 15 - Feb. 14
 Cochran: Nov. 1 - Apr. 30, or Nov. 15 - May 14
 Coke: Dec. 15 - Feb. 14
 Coleman: Dec. 15 - Feb. 14
 Collingsworth: Jan. 1 - Mar. 30, or Dec. 1 - Feb. 28
 Concho: Dec. 15 - Feb. 14
 Cottle: Dec. 15 - Feb. 14
 Crane: Nov. 15 - Apr. 30
 Crockett: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30
 Crosby: Nov. 15 - Apr. 30
 Culbertson: Nov. 1 - May 14
 Dallam: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30
 Dawson: Nov. 15 - Apr. 30
 Deaf Smith: Nov. 15 - Apr. 30
 Dickens: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30
 Dimmit: Dec. 15 - Feb. 14
 Donley: Jan. 1 - Mar. 30, or Dec. 1 - Feb. 28
 Eastland: Dec. 15 - Feb. 14

Ector: Nov. 15 - Apr. 30
 Edwards: Dec. 15 - Feb. 14
 El Paso: Jan. 1 - Jul. 14, or May 15 - Jul. 31, or Jan. 1 - Aug. 14, or Jun. 15 - Sept. 14, or Jul. 1 - Oct. 14, or Jul. 15 - Oct. 31, or Aug. 1 - Apr. 30, or Aug. 15 - May 14, or Sept. 1 - May 30, or Oct. 1 - Jun. 14, or Nov. 1 - Jun. 30, or Nov. 15 - Jul. 14
 Fisher: Dec. 15 - Feb. 14
 Floyd: Nov. 15 - Apr. 30
 Foard: Dec. 15 - Feb. 14
 Galena: Nov. 15 - Apr. 30
 Garza: Nov. 15 - Apr. 30
 Glasscock: Nov. 15 - Apr. 30
 Hale: Nov. 15 - Apr. 30
 Hall: Feb. 1 - Mar. 30
 Hansford: Nov. 15 - Apr. 30
 Hardeman: Dec. 15 - Feb. 14
 Hardley: Nov. 15 - Apr. 30
 Haskell: Dec. 15 - Feb. 14
 Hockley: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30
 Howard: Nov. 15 - Apr. 30
 Hudspeth: Nov. 1 - May 14
 Hutchinson: Nov. 15 - Apr. 30
 Irion: Dec. 15 - Feb. 14
 Jeff Davis: Nov. 1 - Apr. 30, or Nov. 15 - May 14
 Jones: Dec. 15 - Feb. 14
 Kent: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30
 Kerr: Dec. 15 - Feb. 14
 Kimble: Dec. 15 - Feb. 14
 King: Dec. 15 - Feb. 14
 Kinney: Dec. 15 - Feb. 14
 Knox: Dec. 15 - Feb. 14
 Lamb: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30

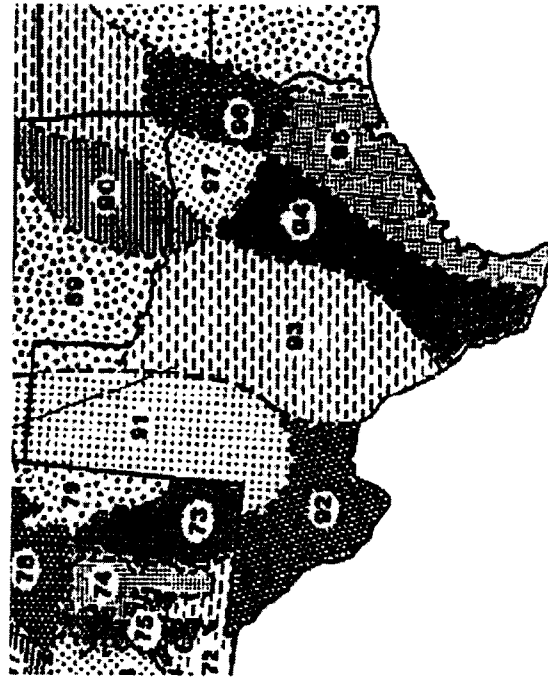
Construction General Permit

TPDBS General Permit TXR150000

Loving: Nov. 1 - Apr. 30, or Nov. 15 - May 14
 Lubbock: Nov. 15 - Apr. 30
 Lynn: Nov. 15 - Apr. 30
 Martin: Nov. 15 - Apr. 30
 Mason: Dec. 15 - Feb. 14
 Maverick: Dec. 15 - Feb. 14
 McCulloch: Dec. 15 - Feb. 14
 Menard: Dec. 15 - Feb. 14
 Midland: Nov. 15 - Apr. 30
 Mitchell: Nov. 15 - Apr. 30
 Moore: Nov. 15 - Apr. 30
 Motley: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30
 Nolan: Dec. 15 - Feb. 14
 Oldham: Nov. 15 - Apr. 30
 Parmer: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30
 Pecos: Nov. 15 - Apr. 30
 Potter: Nov. 15 - Apr. 30
 Presidio: Nov. 1 - Apr. 30, or Nov. 15 - May 14
 Randall: Nov. 15 - Apr. 30
 Reagan: Nov. 15 - Apr. 30
 Real: Dec. 15 - Feb. 14
 Reeves: Nov. 1 - Apr. 30, or Nov. 15 - May 14
 Runnels: Dec. 15 - Feb. 14
 Schleicher: Dec. 15 - Feb. 14

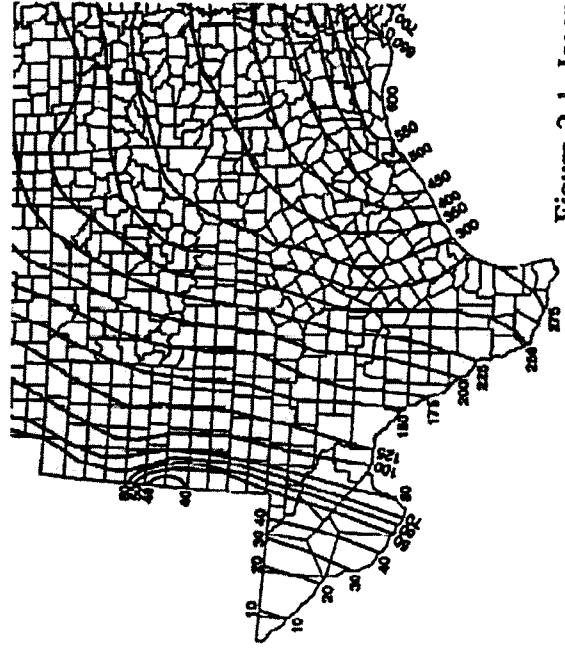
Scurry: Nov. 15 - Apr. 30
 Shackelford: Dec. 15 - Feb. 14
 Sherman: Nov. 15 - Apr. 30
 Stephens: Dec. 15 - Feb. 14
 Sterling: Nov. 15 - Apr. 30
 Stonewall: Dec. 15 - Feb. 14
 Sutton: Dec. 15 - Feb. 14
 Swisher: Nov. 15 - Apr. 30
 Taylor: Dec. 15 - Feb. 14
 Terrell: Nov. 15 - Apr. 30
 Terry: Nov. 15 - Apr. 30
 Throckmorton: Dec. 15 - Feb. 14
 Tom Green: Dec. 15 - Feb. 14
 Upton: Nov. 15 - Apr. 30
 Uvalde: Dec. 15 - Feb. 14
 Val Verde: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30
 Ward: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30
 Wichita: Dec. 15 - Feb. 14
 Willbarger: Dec. 15 - Feb. 14
 Winkler: Nov. 1 - Apr. 30, or Nov. 15 - May 14
 Yoakum: Nov. 1 - Apr. 30, or Nov. 15 - May 14
 Young: Dec. 15 - Feb. 14
 Wheeler: Jan. 1 - Mar. 30, or Dec. 1 - Feb. 28
 Zavala: Dec. 15 - Feb. 14

Appendix B: Erosivity Index (EI) Zones in Texas



Adapted from Chapter 2 of USDA Agriculture Handbook 703: "Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)," U.S. Department of Agriculture, Agricultural Research Service

Appendix C: Isoerodent Map



Adapted from Chapter 2 of USDA Agriculture Handbook 703: "Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)," U.S. Department of Agriculture, Agricultural Research Service

Appendix D: Erosivity Indices for EI Zones in Texas

Periods:

El #	1/1	1/15	1/31	2/15	2/28	3/15	3/31	4/15	4/30	5/15	5/31	6/15	6/30	7/15	7/31	8/15	8/31	9/15	9/30	10/15	10/31	11/15	11/30	12/15	12/31
89	0	1	1	2	3	4	7	2	8	27	38	48	58	62	69	76	83	90	94	97	98	99	100	100	100
90	0	1	3	3	4	6	8	13	21	29	37	45	54	60	66	74	81	87	92	95	97	98	99	100	100
91	0	0	0	0	1	1	1	3	6	16	29	39	46	53	60	67	74	81	88	95	99	100	100	100	100
92	0	0	0	0	1	1	1	2	6	16	29	39	46	53	60	67	74	81	88	95	99	100	100	100	100
93	0	1	1	2	3	4	6	8	13	26	40	49	57	64	72	78	85	92	97	98	99	100	100	100	100
94	0	1	3	4	6	8	10	15	21	29	38	47	53	61	68	75	82	89	93	97	98	99	100	100	100
95	0	1	3	6	7	9	11	14	18	27	35	41	48	55	62	70	78	84	89	93	97	98	99	100	100
96	0	2	4	6	9	12	17	23	30	37	43	49	54	61	68	74	78	82	86	90	94	97	99	100	100
97	0	1	3	6	7	10	14	20	28	37	48	58	68	81	94	108	121	134	148	161	174	187	200	214	227
106	0	3	6	9	13	17	21	27	33	38	44	49	55	61	67	71	76	81	84	88	90	94	97	100	100

- Each period begins on the date listed in the table above and lasts until the day before the following period. The final period begins on December 11 and ends on December 31.

Table adopted from Chapter 2 of USDA Agriculture Handbook 709: "Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)," U.S. Department of Agriculture, Agricultural Research Service

Appendix M

Concrete Batch Plant Requirements
Material Management Sheet
Pollution Prevention Team
Employee Training Form
Quarterly Visual Monitoring Form
Annual Comprehensive Compliance Form
Non-Storm Water Discharges
DMR Report
Rain Gauge Log

This Appendix contains information regarding the use of Supporting Concrete Batch Plants for Construction Activities and copies of the DMR Report required for Concrete Batch Plants.

Storm Water Runoff from Concrete Batch Plants

Discharges of storm water runoff from concrete batch plants at regulated construction sites may be authorized under the provisions of this general permit provided that the following requirements are met for concrete batch plant(s) authorized under this permit. If discharges of storm water runoff from concrete batch plants are not covered under this general permit, then discharges must be authorized under an alternative general permit or individual permit. This permit does not authorize the discharge or land disposal of any wastewater from concrete batch plants at regulated construction sites. Authorization for these wastes must be obtained under an individual permit or an alternative general permit.

Section A. Benchmark Sampling Requirements

1. Operators of concrete batch plants authorized under this general permit must sample the storm water runoff from the concrete batch plants according to the requirements of this section of this general permit, and must conduct evaluations on the effectiveness of the SWP3 based on the following benchmark monitoring values:

Benchmark Parameter	Benchmark Value	Sampling Frequency	Sample Type
Oil and Grease	15 mg/L	1/quarter (*1)(*2)	Grab (*3)
Total Suspended Solids	100 mg/L	1/quarter (*1)(*2)	Grab (*3)
pH	6.0 - 9.0 Standard Units	1/quarter (*1)(*2)	Grab (*3)
Total Iron	1.3 mg/L	1/quarter(*1)(*2)	Grab (*3)

- (*1) When discharge occurs. Sampling is required within the first 30 minutes of discharge. If it is not practicable to take the sample, or to complete the sampling, within the first 30 minutes, sampling must be completed within the first hour of discharge. If sampling is not completed within the first 30 minutes of discharge, the reason must be documented and attached to all required reports and records of the sampling activity.
- (*2) Sampling must be conducted at least once during each of the following periods. The first sample must be collected during the first full quarter that a storm water discharge occurs from a concrete batch plant authorized under this general permit.

January through March
 April through June
 July through September
 October through December

For projects lasting less than one full quarter, a minimum of one sample shall be collected, provided that a storm water discharge occurred at least once following submission of the NOI or following the date that automatic authorization was obtained under Section II.E.2., and prior to terminating coverage.

- (*3) A grab sample shall be collected from the storm water discharge resulting from a storm event that is at least 0.1 inches of measured precipitation that occurs at least 72 hours from the previously measurable storm event. The sample shall be collected downstream of the concrete batch plant, and where the discharge exits any BMPs utilized to handle the runoff from the batch plant, prior to commingling with any other water authorized under this general permit.
2. The permittee must compare the results of sample analyses to the benchmark values above, and must include this comparison in the overall assessment of the SWP3's effectiveness. Analytical results that exceed a benchmark value are not a violation of this permit, as these values are not numeric effluent limitations. Results of analyses are indicators that modifications of the SWP3 should be assessed and may be necessary to protect water quality. The operator must investigate the cause for each exceedance and must document the results of this investigation in the SWP3 by the end of the quarter following the sampling event.

The operator's investigation must identify the following:

- (a) any additional potential sources of pollution, such as spills that might have occurred,
- (b) necessary revisions to good housekeeping measures that are part of the SWP3,
- (c) additional BMPs, including a schedule to install or implement the BMPs, and
- (d) other parts of the SWP3 that may require revisions in order to meet the goal of the benchmark values.

Background concentrations of specific pollutants may also be considered during the investigation. If the operator is able to relate the cause of the exceedance to background concentrations, then subsequent exceedances of benchmark values for that pollutant may be resolved by referencing earlier findings in the SWP3. Background concentrations may be identified by laboratory analyses of samples of storm water runoff to the permitted facility, by laboratory analyses of samples of storm water runoff from adjacent non-industrial areas, or by identifying the pollutant is a naturally occurring material in soils at the site.

Best Management Practices (BMPs) and SWP3 Requirements

Minimum Storm Water Pollution Prevention Plan (SWP3) Requirements - The following are required in addition to other SWP3 requirements listed in this general permit (including, but not limited to Part III.F.7. of this permit):

Description of Potential Pollutant Sources - The SWP3 must provide a description of potential sources (activities and materials) that may reasonably be expected to affect the quality of storm water discharges associated with concrete batch plants authorized under this permit. The SWP3 must describe practices that that will be used to reduce the pollutants in these discharges to assure compliance with this general permit, including the protection of water quality, and must ensure the implementation of these practices.

The following must be developed, at a minimum, in support of developing this description:

- (a) **Drainage** - The site map must include the following information:
- (1) the location of all outfalls for storm water discharges associated with concrete batch plants that are authorized under this permit;
 - (2) a depiction of the drainage area and the direction of flow to the outfall(s);
 - (3) structural controls used within the drainage area(s);
 - (4) the locations of the following areas associated with concrete batch plants that are exposed to precipitation: vehicle and equipment maintenance activities (including fueling, repair, and storage areas for vehicles and equipment scheduled for maintenance); areas used for the treatment, storage, or disposal of wastes; liquid storage tanks; material processing and storage areas; and loading and unloading areas; and
 - (5) the locations of the following: any bag house or other dust control device(s); recycle/sedimentation pond, clarifier or other device used for the treatment of facility wastewater (including the areas that drain to the treatment device); areas with significant materials; and areas where major spills or leaks have occurred.

Inventory of Exposed Materials - A list of materials handled at the concrete batch plant that may be exposed to storm water and that have a potential to affect the quality of storm water discharges associated with concrete batch plants that are authorized under this general permit.

Spills and Leaks - A list of significant spills and leaks of toxic or hazardous pollutants that occurred in areas exposed to storm water and that drain to storm water outfalls associated with concrete

batch plants authorized under this general permit must be developed, maintained, and updated.

Sampling Data - A summary of existing storm water discharge sampling data must be maintained, if available.

Measures and Controls - The SWP3 must include a description of management controls to regulate pollutants identified in the SWP3's "Description of Potential Pollutant Sources" from Part IV.B.1.(a) of this permit, and a schedule for implementation of the measures and controls. This must include, at a minimum:

Good Housekeeping - Good housekeeping measures must be developed and implemented in the area(s) associated with concrete batch plants.

Operators must prevent or minimize the discharge of spilled cement, aggregate (including sand or gravel), settled dust, or other significant materials from paved portions of the site that are exposed to storm water. Measures used to minimize the presence of these materials may include regular sweeping or other equivalent practices. These practices must be conducted at a frequency that is determined based on consideration of the amount of industrial activity occurring in the area and frequency of precipitation, and shall occur at least once per week when cement or aggregate is being handled or otherwise processed in the area.

Operators must prevent the exposure of fine granular solids, such as cement, to storm water. Where practicable, these materials must be stored in enclosed silos, hoppers or buildings, in covered areas, or under covering.

Spill Prevention and Response Procedures - Areas where potential spills that can contribute pollutants to storm water runoff, and the drainage areas from these locations, must be identified in the SWP3. Where appropriate, the SWP3 must specify material handling procedures, storage requirements, and use of equipment. Procedures for cleaning up spills must be identified in the SWP3 and made available to the appropriate personnel.

Inspections - Qualified facility personnel (i.e., a person or persons with knowledge of this general permit, the concrete batch plant, and the SWP3 related to the concrete batch plant(s) for the site) must be identified to inspect designated equipment and areas of the facility specified in the SWP3. The inspection frequency must be specified in the SWP3 based upon a consideration of the level of

concrete production at the facility, but must be a minimum of once per month while the facility is in operation. The inspection must take place while the facility is in operation and must, at a minimum, include all areas that are exposed to storm water at the site, including material handling areas, above ground storage tanks, hoppers or silos, dust collection/containment systems, truck wash down and equipment cleaning areas. Follow-up procedures must be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections must be maintained and be made readily available for inspection upon request.

Employee Training - An employee training program must be developed to educate personnel responsible for implementing any component of the SWP3, or personnel otherwise responsible for storm water pollution prevention, with the provisions of the SWP3. The frequency of training must be documented in the SWP3, and at a minimum, must consist of one training prior to the initiation of operation of the concrete batch plant.

Record Keeping and Internal Reporting Procedures - A description of spills and similar incidents, plus additional information that is obtained regarding the quality and quantity of storm water discharges, must be included in the SWP3. Inspection and maintenance activities must be documented and records of those inspection and maintenance activities must be incorporated in the SWP3.

Management of Runoff - The SWP3 shall contain a narrative consideration for reducing the volume of runoff from concrete batch plants by diverting runoff or otherwise managing runoff, including use of infiltration, detention ponds, retention ponds, or reusing of runoff.

Comprehensive Compliance Evaluation - At least once per year, one or more qualified personnel (i.e., a person or persons with knowledge of this general permit, the concrete batch plant, and the SWP3 related to the concrete batch plant(s) for the site) shall conduct a compliance evaluation of the plant. The evaluation must include the following.

Visual examination of all areas draining storm water associated with regulated concrete batch plants for evidence of, or the potential for, pollutants entering the drainage system. These include but are not limited to: cleaning areas, material handling areas, above ground storage tanks, hoppers or silos, dust collection/containment systems, and truck wash down and equipment cleaning areas. Measures implemented to reduce pollutants in runoff (including

structural controls and implementation of management practices) must be evaluated to determine if they are effective and if they are implemented in accordance with the terms of this permit and with the permittee's SWP3. The operator shall conduct a visual inspection of equipment needed to implement the SWP3, such as spill response equipment.

Based on the results of the evaluation, the following must be revised as appropriate within two weeks of the evaluation: the description of potential pollutant sources identified in the SWP3 (as required in Part IV.B.1., "Description of Potential Pollutant Sources"); and pollution prevention measures and controls identified in the SWP3 (as required in Part IV.B.2., "Measures and Controls"). The revisions may include a schedule for implementing the necessary changes.

The permittee shall prepare and include in the SWP3 a report summarizing the scope of the evaluation, the personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the SWP3, and actions taken in response to the findings of the evaluation. The report must identify any incidents of noncompliance. Where the report does not identify incidences of noncompliance, the report must contain a statement that the evaluation did not identify any incidence(s), and the report must be signed according to 30 TAC Section 305.128, relating to Signatories to Reports.

The Comprehensive Compliance Evaluation may substitute for one of the required inspections delineated in Part IV.B.2.(c) of this general permit.

Prohibition of Wastewater Discharges

Wastewater discharges associated with concrete production including wastewater disposal by land application are not authorized under this general permit. These wastewater discharges must be authorized under an alternative TCEQ water quality permit or otherwise disposed of in an authorized manner. Discharges of concrete truck washout at construction sites may be authorized if conducted in accordance with the requirements of Part V of this general permit.

Concrete Truck Wash Out Requirements

This general permit authorizes the wash out of concrete trucks at construction sites regulated under Sections II.E.1., 2., and 3. of this general permit, provided the following requirements are met. Authorization is limited to the land disposal of wash out water from concrete trucks that are associated with off-site production facilities. Wash out water associated with on-site concrete production facilities must be authorized under a separate TCEQ general permit or individual permit.

1. Direct discharge of concrete truck wash out water to surface water in the state, including discharge to storm sewers, is prohibited by this general permit.
2. Concrete truck wash out water shall be discharged to areas at the construction site where structural controls have been established to prevent direct discharge to surface waters, or to areas that have a minimal slope that allow infiltration and filtering of wash out water to prevent direct discharge to surface waters. Structural controls may consist of temporary berms, temporary shallow pits, temporary storage tanks with slow rate release, or other reasonable measures to prevent runoff from the construction site.
3. Wash out of concrete trucks during rainfall events shall be minimized. The direct discharge of concrete truck wash out water is prohibited at all times, and the operator shall insure that its BMPs are sufficient to prevent the discharge of concrete truck washout as the result of rain.
4. The discharge of wash out water shall not cause or contribute to groundwater contamination.
5. If a SWP3 is required to be implemented, the SWP3 shall include concrete wash out areas on the associated map.

Pollution Prevention Team

Team Member: _____
Responsibilities: _____

Team Member: _____
Responsibilities: _____

Team Member: _____
Responsibilities: _____

Team Member: _____
Responsibilities: _____

Team Member: _____
Responsibilities: _____

Pollution Prevention Measures & Controls

Employee Training Program							
Training Topic	Was this topic covered?		Date of Training				
	Yes	No	Year 1	Year 2	Year 3	Year 4	Year 5
Materials management & handling							
Spill prevention methods							
Location of spill cleanup supplies							
Spill cleanup equipment							
Spill cleanup techniques							
Proper spill reporting							
Good housekeeping measures							
Best management practices							
Goals of the SWP3							

Employee Education Program							
Training Topic	Was this topic covered?		Date of Training				
	Yes	No	Year 1	Year 2	Year 3	Year 4	Year 5
Basic goals of the SWP3							
Contacting the Pollution Prevention Team							

Quarterly Visual Monitoring Form

Fill out a separate form for each sample you collect (one form per outfall).

Outfall number:		Person collecting/examining sample:	
Quarter/year:		Date & time collected:	Date & time examined:
Rainfall amount:		Qualifying: Yes or No	Runoff source: rainfall or snowmelt
Parameter	Parameter Description	Parameter Characteristics	
Color	Does the water appear to be colored? Yes No	Describe:	
Clarity	Is the water clear or transparent, meaning can you see through it? Yes No	Which of the following best describes the clarity of the water? Clear Milky Opaque Other (describe) _____	
Oil sheen	Can you see a rainbow effect or sheen on the water surface? Yes No	Which of the following best describes the water sheen? Oily Silver Iridescent	
Odor	Does the sample have an odor? Yes No	Describe:	
Floating solids	Is there something floating on the surface of the sample? Yes No	Describe:	
Suspended solids	Is there something suspended in the water column or sample? Yes No	Describe:	
Settled solids	Is there something settled at the bottom of the sample? Yes No	Describe:	
Foam	Is there foam or material forming on top of the water? Yes No	Describe:	
<i>Detail any concerns, corrective actions taken, and any other obvious indicators of pollution present in the sample:</i>			
Collector's signature:			

Annual Comprehensive Compliance

Comprehensive Site Compliance Inspection Report					
Inspection Date:	Are you substituting this inspection for one of your quarterly inspections?				
Inspection Element	Inspector	Evaluated		Findings	Corrective Action
		Yes	No		
All areas identified in the inventory of exposed materials section of your SWP3					
All structural controls, including maintenance and effectiveness					
All nonstructural controls, including BMP effectiveness, good housekeeping measures and spill prevention					
All reasonably accessible areas immediately downstream of each storm water outfall					
Review all records required by the MSGP					
Employee training & education program					

Annual Comprehensive Compliance

Revision of the SWP3?			
Element	SWP3 Updated		
	Yes	No	N/A
Any additional elements (e.g. structural controls or BMPs) that should be added or modified for prevention of pollution			
The site map			
The inventory of exposed materials			
The description of good housekeeping measures			
The description of nonstructural controls			
Any other elements of the plan that were found to be inaccurate or that will be modified			

Signature: _____

Date: _____

Non-Storm Water Discharges

Approved Non-Storm Water Discharges	
Type of Discharge	Process or Activity

Narrative Description of Non-Storm Water Discharge Investigation: _____

Non-Storm Water Discharge Investigation		
Date	Findings	Corrective Action Taken

Certification:
 I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: _____ **Title:** _____ **Date:** _____

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

NAME ADDRESS

PERMIT NUMBER

DISCHARGE NUMBER

FACILITY LOCATION

MONITORING PERIOD

FROM TO

YEAR MO DAY

NOTE: Read instructions before

PARAMETER	QUANTITY OR LOADING			QUALITY OR CONCENTRATION			NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
	AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM			
SAMPLE PERMIT REQUIREMENT									
SAMPLE PERMIT REQUIREMENT									
SAMPLE PERMIT REQUIREMENT									
SAMPLE PERMIT REQUIREMENT									
SAMPLE PERMIT REQUIREMENT									
SAMPLE PERMIT REQUIREMENT									
SAMPLE PERMIT REQUIREMENT									
SAMPLE PERMIT REQUIREMENT									
SAMPLE PERMIT REQUIREMENT									
SAMPLE PERMIT REQUIREMENT									

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER

TYPED OR PRINTED

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

TELEPHONE

DATE

AREA NUMBER YEAR MO DAY

Appendix N

Spill Prevention and Response Procedures, Contact Numbers and Spill Response Forms

Spill Prevention and Response Procedures - Areas where potential spills that can contribute pollutants to storm water runoff, and the drainage areas from these locations, must be identified in the SWP3. Where appropriate, the SWP3 must specify material handling procedures, storage requirements, and use of equipment. Procedures for cleaning up spills must be identified in the SWP3 and made available to the appropriate personnel.

SPILL PREVENTION AND RESPONSE

Consistent with the general permit requirements, all potential pollutants will be handled and disposed of in a manner that does not cause contamination of storm water. Non-sediment pollutants that may be present during construction activities include:

- Petroleum products including fuel, lubricants, hydraulic fluids, and form oils
- Polymer used for soil stabilization
- Water treatment chemicals (coagulant, acid, sodium bicarbonate)
- Concrete
- Paints
- Fertilizers

These materials, and other materials used during construction with the potential to impact storm water, will be stored, managed, used, and disposed of in a manner that minimizes the potential for releases to the environment and especially into storm water.

Emergency contacts for the project are included at the end of this section.

General Materials Handling Practices

The following general practices will be used throughout the project to reduce the potential for spills.

- Potential pollutants will be stored and used in a manner consistent with the manufacturer's instructions in a secure location. To the extent practicable, material storage areas should not be located near storm drain inlets and should be equipped with covers, roofs, or secondary containment as needed to prevent storm water from contacting stored materials. Chemicals that are not compatible (such as sodium bicarbonate and hydrochloric acid) shall be stored in segregated areas so that spilled materials cannot combine and react.
- Materials disposal will be in accordance with the manufacturer's instructions and applicable local, state, and federal regulations.
- Materials no longer required for construction will be removed from the site as soon as practicable.
- Adequate garbage, construction waste, and sanitary waste handling and disposal facilities will be provided to the extent necessary to keep the site clear of obstruction and BMPs clear and functional.

Specific Materials Handling Practices

- All pollutants, including waste materials and demolition debris, that occur on-site during construction will be handled in a way that does not contaminate storm water.
- All chemicals including liquid products, petroleum products, water treatment chemicals, and wastes stored on site will be covered and contained and protected from vandalism.
- Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants, will be conducted under cover during wet weather and on an impervious surface to prevent the release of contaminants onto the ground. Materials spilled during maintenance operations will be cleaned up immediately and properly disposed of.
- Wheel wash water will be settled and discharged on site by infiltration. Wheel wash water will not be discharged to the storm water system or the storm water treatment system.
- Application of agricultural chemicals, including fertilizers and pesticides, will be conducted in a manner and at application rates that will not result in loss of chemical to storm water runoff. Manufacturers' recommendations will be followed for application rates and procedures.
- pH-modifying sources will be managed to prevent contamination of runoff and storm water collected on site. The most common sources of pH-modifying materials are bulk cement, cement kiln dust (CKD), fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, and concrete pumping and mixer washout waters.

Spill Response

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize their migration into storm water runoff and conveyance systems. If the release has impacted on-site storm water, it is critical to contain the released materials on site and prevent their release into receiving waters.

If a spill of pollutants threatens storm water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The site superintendent will be notified immediately when a spill, or the threat of a spill, is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping project site and entering the receiving waters, facility personnel will respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
- If oil sheen is observed on surface water (e.g., settling ponds, detention pond, and swales), absorbent pads and/or booms will be applied to contain and remove the oil. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- The site superintendent, or his designee, will be responsible for completing the spill reporting form and for reporting the spill to the appropriate state or local agency (see Forms at the end of this section).

Notification

In the event of a spill, make the appropriate notification(s) consistent with the following procedures:

- Any spill of oil which 1) violates water quality standards, 2) produces a "sheen" on a surface water, or 3) causes a sludge or emulsion must be reported immediately by telephone to the National Response Center Hotline.
- Any oil, hazardous substance, or hazardous waste release which exceeds the reportable quantity *see below for reference* must be reported immediately by telephone to the National Response Center Hotline.
- Any spill of oil or hazardous substance to waters of the state must be reported immediately by telephone to the EPA National Response Center.

Reportable Quantities Quick Reference

Material	Released to	Reportable Quantity
Engine Oil, Fuel Hydraulic and Brake Fluid	Land / Water	25 Gallons Visible Sheen
Battery Acid Antifreeze Gasoline Engine Degreasers	Air / Land / Water	100 lbs
Refrigerant	Air	1 lb

SPILL RESPONSE CONTACT NUMBERS:

EPA NATIONAL RESPONSE CENTER

(800) 424-8802

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ)

STATE OF TEXAS SPILL-REPORTING HOTLINE

(800) 832-8224

Spill Report Form

LOCATION OF SPILL AT PROJECT: _____		
	Date: _____	Time: _____
Regulatory agencies notified (date, time, person, agency, and how): _____ _____ _____		
Material spilled: _____		
Quantity spilled: _____		
Source: _____		
Cause: _____ _____		
Extent of injuries (if any): _____ _____		
Immediate remedial actions taken at time of spill: _____ _____		
Measures taken or planned to prevent recurrence: _____ _____ _____		
Was Storm Water Pollution Prevention Plan "SWPPP" Updated: _____		
Was Erosion Control Plan updated to show Spill Location: _____		
This report prepared by: _____		
(Signature)	(Date)	(Job title)

Appendix O

Definitions

Definitions

Arid Areas - Areas with an average annual rainfall of 0 to 10 inches.

Best Management Practices (BMPs) - Schedules of activities, prohibitions of practices, maintenance procedures, structural controls, local ordinances, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures, and practices to control construction site runoff, spills or leaks, waste disposal, or drainage from raw material storage areas.

Commencement of Construction - The initial disturbance of soils associated with clearing, grading, or excavation activities, as well as other construction-related activities (e.g., stockpiling of fill material, demolition)

Common Plan of Development - A construction activity that is completed in separate stages, separate phases, or in combination with other construction activities. A common plan of development (also known as a "common plan of development or sale") is identified by the documentation for the construction project that identifies the scope of the project, and may include plats, blueprints, marketing plans, contracts, building permits, a public notice or hearing, zoning requests, or other similar documentation and activities. A common plan of development does not necessarily include all construction projects within the jurisdiction of a public entity (e.g., a city or university). Construction of roads or buildings in different parts of the jurisdiction would be considered separate "common plans," with only the interconnected parts of a project being considered part of a "common plan" (e.g., a building and its associated parking lot and driveways, airport runway and associated taxiways, a building complex, etc.). Where discrete construction projects occur within a larger common plan of development or sale but are located ¼ mile or more apart, and the area between the projects is not being disturbed, each individual project can be treated as a separate plan of development or sale, provided that any interconnecting road, pipeline or utility project that is part of the same "common plan" is not included in the area to be disturbed.

Discharge - For the purposes of this permit, the drainage, release, or disposal of pollutants in storm water and certain non-storm water from areas where soil disturbing activities (e.g., clearing, grading, excavation, stockpiling of fill material, and demolition), construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck washout, fueling), or other industrial storm water directly related to the construction process (e.g., concrete or asphalt batch plants) are located.

Edwards Aquifer - As defined under Texas Administrative Code § 213.3 of this title (relating to the Edwards Aquifer), that portion of an arcuate belt of porous, water-bearing, predominantly carbonate rocks known as the Edwards and Associated Limestone's in the Balcones Fault Zone trending from west to east to northeast in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, and Williamson Counties; and composed of the Salmon Peak Limestone, McKnight Formation, West Nueces Formation, Devil's River Limestone, Person Formation, Kainer Formation, Edwards Formation, and Georgetown Formation. The permeable aquifer units generally overlie the less-permeable Glen Rose Formation to the south, overlie the less-permeable Comanche Peak and Walnut Formations north of the Colorado River, and underlie the less-permeable Del Rio Clay regionally.

Edwards Aquifer Recharge Zone - Generally, that area where the stratigraphic units constituting the Edwards Aquifer crop out, including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a potential for recharge of surface waters into the Edwards Aquifer. The recharge zone is identified as that area designated as such on official maps located in the offices of the Texas Commission on Environmental Quality and the appropriate regional office. The Edwards Aquifer Map Viewer, located at http://www.tceq.state.tx.us/compliance/field_ops/eapp/mapdisclaimer.html, can be used to determine where the recharge zone is located.

Edwards Aquifer Contributing Zone - The area or watershed where runoff from precipitation flows down gradient to the recharge zone of the Edwards Aquifer. The contributing zone is located upstream (up gradient) and generally north and northwest of the recharge zone for the following counties: all areas within Kinney County, except the area within the watershed draining to Segment 2304 of the Rio Grande Basin; all areas within Uvalde, Medina, Bexar, and Comal Counties; all areas within Hays and Travis Counties, except the area within the watersheds draining to the Colorado River above a point 1.3 miles upstream from Tom Miller Dam, Lake Austin at the confluence of Barrow Brook Cove, Segment 1403 of the Colorado River Basin; and all areas within Williamson County, except the area within the watersheds draining to the Lampasas River above the dam at Stillhouse Hollow reservoir, Segment 1216 of the Brazos River Basin. The contributing zone is illustrated on the Edwards Aquifer map viewer at http://www.tceq.state.tx.us/compliance/field_ops/eapp/mapdisclaimer.html.

Facility or Activity - For the purpose of this permit, a construction site or construction support activity that is regulated under this general permit, including all contiguous land and fixtures (e.g., ponds and materials stockpiles), structures, or appurtenances used at a construction site or industrial site described by this general permit.

Final Stabilization - A construction site status where any of the following conditions are met:

- (a) All soil disturbing activities at the site have been completed and a uniform (i.e., evenly distributed, without large bare areas) perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
- (b) For individual lots in a residential construction site by either:
 - (1) The homebuilder completing final stabilization as specified in condition (a) above; or
 - (2) The homebuilder establishing temporary stabilization for an individual lot prior to the time of transfer of the ownership of the home to the buyer and after informing the homeowner of the need for, and benefits of, final stabilization. If temporary stabilization is not feasible, then the homebuilder may fulfill this requirement by retaining perimeter controls or other best management practices, and informing the homeowner of the need for removal of temporary controls and the establishment of final stabilization.
- (c) For construction activities on land used for agricultural purposes (e.g. pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to surface water and areas that are not being returned to their preconstruction agricultural use must meet the final stabilization conditions of condition (a) above.
- (d) In arid, semi-arid, and drought-stricken areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:
 - (1) Temporary erosion control measures (e.g., degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by the operator, and
 - (2) The temporary erosion control measures are selected, designed, and installed to achieve 70 percent vegetative coverage within three years.

Hyperchlorination of Waterlines - Treatment of potable water lines or tanks with chlorine for disinfection purposes, typically following repair or partial replacement of the waterline or tank, and subsequently flushing the contents.

Indian Country Land - (from 40 CFR 122.2) (1) all land within the limits of any Indian reservation under the jurisdiction of the United States government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation; (2) all dependent Indian communities with the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and (3) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.

Indian Tribe - (from 40 CFR 122.2) any Indian Tribe, band, group, or community recognized by the Secretary of the Interior and exercising governmental authority over a Federal Indian Reservation.

Large Construction Activity - Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than five (5) acres of land. Large construction activity also includes the disturbance of less than five (5) acres of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than five (5) acres of land. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (e.g., the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities.)

Municipal Separate Storm Sewer System (MS4) - A separate storm sewer system owned or operated by the United States, a state, city, town, county, district, association, or other public body (created by or pursuant to state law) having jurisdiction over the disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under state law such as a sewer district, flood control or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, that discharges to surface water in the state.

Notice of Change (NOC) - Written notification to the executive director from a discharger authorized under this permit, providing changes to information that was previously provided to the agency in a notice of intent form.

Notice of Intent (NOI) - A written submission to the executive director from an applicant requesting coverage under this general permit.

Notice of Termination (NOT) - A written submission to the executive director from a discharger authorized under a general permit requesting termination of coverage.

Operator - The person or persons associated with a large or small construction activity that is either a primary or secondary operator as defined below:

Primary Operator - the person or persons associated with a large or small construction activity that meets either of the following two criteria:

- (a) The person or persons have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
- (b) The person or persons have day-to-day operational control of those activities at a construction site that are necessary to ensure compliance with a storm water pollution prevention plan (SWP3) for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWP3 or comply with other permit conditions).

Secondary Operator - The person whose operational control is limited to the employment of other operators or to the ability to approve or disapprove changes to plans and specifications. A secondary operator is also defined as a primary operator and must comply with the permit requirements for primary operators if there are no other operators at the construction site.

Outfall - For the purpose of this permit, a point source at the point where storm water runoff associated with construction activity discharges to surface water in the state and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances that connect segments of the same stream or other water of the U.S. and are used to convey waters of the U.S.

Permittee - An operator authorized under this general permit. The authorization may be gained through submission of a notice of intent, by waiver, or by meeting the requirements for automatic coverage to discharge storm water runoff and certain non-storm water discharges.

Point Source - (from 40 CFR §122.2) Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are, or may be, discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into any surface water in the state. The term "pollutant" does not include tail water or runoff water from irrigation or rainwater runoff from cultivated or uncultivated rangeland, pastureland, and farmland. For the purpose of this permit, the term "pollutant" includes sediment.

Pollution - (from Texas Water Code §26.001(14)) The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any surface water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property or to public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

Rainfall Erosivity Factor (R factor) - the total annual erosive potential that is due to climatic effects, and is part of the Revised Universal Soil Loss Equation (RUSLE).

Semiarid Areas - areas with an average annual rainfall of 10 to 20 inches

Separate Storm Sewer System - A conveyance or system of conveyances (including roads with drainage systems, streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains), designed or used for collecting or conveying storm water; that is not a combined sewer, and that is not part of a publicly owned treatment works (POTW).

Small Construction Activity - Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than one (1) acre and less than five (5) acres of land. Small construction activity also includes the disturbance of less than one (1) acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one (1) and less than five (5) acres of land. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (e.g., the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities.)

Storm Water (or Storm Water Runoff) - Rainfall runoff, snow melt runoff, and surface runoff and drainage.

Storm Water Associated with Construction Activity - Storm water runoff from a construction activity where soil disturbing activities (including clearing, grading, excavating) result in the disturbance of one (1) or more acres of total land area, or are part of a larger common plan of development or sale that will result in disturbance of one (1) or more acres of total land area.

Structural Control (or Practice) - A pollution prevention practice that requires the construction of a device, or the use of a device, to capture or prevent pollution in storm water runoff. Structural controls and practices may include but are not limited to: silt fences, earthen dikes, drainage swales, sediment traps, check dams, subsurface drains, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins.

Surface Water in the State - Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark (MHW) out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or non-navigable, and including the beds and banks of all water-courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

Temporary Stabilization - A condition where exposed soils or disturbed areas are provided a protective cover or other structural control to prevent the migration of pollutants. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either permanent stabilization can be achieved or until further construction activities take place.

Waters of the United States - (from 40 CFR, Part 122, Section 2) Waters of the United States or waters of the U.S. means:

- (a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- (b) All interstate waters, including interstate wetlands;
- (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds that the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
 - (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;
 - (2) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - (3) Which are used or could be used for industrial purposes by industries in interstate commerce;
- (d) All impoundments of waters otherwise defined as waters of the United States under this definition;
- (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;
- (f) The territorial sea; and
- (g) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.