
SECTION 10 ENVIRONMENTAL REQUIREMENTS

10.1 General

- 10.1.1 This section includes the minimum requirements and standards to address erosion control and stabilization requirements for development and construction activity within the City of Midland and its Extra Territorial Jurisdiction.
- 10.1.2 The Owner must provide proof of compliance with applicable federal, state, and local environmental regulations upon request by the City of Midland (City). Potential applicable regulations and permits may include, but are not limited to:
- 10.1.2.A Section 404 of the Clean Water Act (33 USC 1344);
 - 10.1.2.B Section 106 of NHPA;
 - 10.1.2.C Water Rights;
 - 10.1.2.D Section 303(d) impaired waters;
 - 10.1.2.E Migratory Bird Treaty Act;
 - 10.1.2.F Water Well Drilling;
 - 10.1.2.G Threatened and Endangered Species Act;
 - 10.1.2.H The Texas Archeological and Research Laboratory Requirements;
 - 10.1.2.I The Antiquities Code of Texas;
 - 10.1.2.J Air Quality; and,
 - 10.1.2.K TCEQ Dam Requirements.
- 10.1.3 Erosion Control Plan – An Erosion Control Plan (ECP) is required for all sites regardless of size. The ECP shall consider areas where development activities, construction activities or channel improvements occur and shall protect these areas from site erosion. Sediment carried by stormwater runoff through these areas shall be prevented from entering storm drain systems and natural watercourses through applicable Best Management Practices (BMPs). The owner should refer to City’s *Standard Details* and *Standard Specifications* for ECP requirements. It is the responsibility of the Engineer of Record (Engineer) to select and design appropriate construction controls for each site. Some acceptable forms of site erosion control devices include, but are not limited to, silt fences, silt traps, geo-netting, and geo-textiles. The minimum design storm for temporary BMPs is the 2-year, 24-hour storm event.
- 10.1.4 If the originally installed BMPs prove insufficient to address the needs of a site, then the City maintains the right to require that more extensive BMPs be added or installed.

10.2 Texas Construction General Permit and City Requirements

- 10.2.1 Although Environmental Protection Agency (EPA) Region 6 still has regulatory authority concerning stormwater discharges in Texas and surrounding states, the Texas Commission on Environmental Quality (TCEQ) has issued Construction General Permit (CGP) TXR150000 to regulate stormwater discharges from construction sites. These requirements are modified and amended from time to time. Prior to beginning construction on any site, the engineer, developer, and contractor should make themselves aware of the current EPA, TCEQ, and City requirements. Construction activities are regulated according to the area of land disturbed.

Refer to the Construction General Permit (CGP) for definitions of the Primary Operator and Secondary Operator.

10.2.2 Large construction activities:

10.2.2.A For sites that disturb 5 or more acres, or are part of a larger common plan of development that will disturb 5 or more acres, the following applies:

10.2.2.A.i Prepare and implement a Stormwater Pollution Prevention Plan (SW3P).

10.2.2.A.ii Submit a Notice of Intent (NOI) to TCEQ.

10.2.2.A.iii Submit a copy of the NOI or Construction Site Notice (CSN) to the Engineering Services Department at least seven days prior to construction and must include TXR operator number on the NOI and CSN.

10.2.2.A.iv Post a Large Construction Site Notice (CSN) where it is readily viewed by the general public during all construction activities.

10.2.2.A.v Submit a Notice of Termination (NOT) to both the State of Texas and the Engineering Services Department upon permanent stabilization and BMP removal.

10.2.3 Small construction activities:

10.2.3.A For sites that disturb at least 1 acre, but less than 5 acres, or are part of a larger common plan of development that will disturb at least 1 acre, but less than 5 acres, the following applies:

10.2.3.A.i Prepare and implement a SW3P.

10.2.3.A.ii Submit a copy of the Construction Site Notice (CSN) to the Engineering Department at least seven days prior to construction.

10.2.3.A.iii Post a Small Construction Site Notice (CSN) where it is readily viewed by the general public during all construction activities.

10.2.3.A.iv Once the site is permanently stabilized and BMPs have been removed, the CSN shall be signed and dated. A copy of this shall be provided to the Engineering Services Department.

10.2.4 Less than 1-acre construction activities:

10.2.4.A Projects that disturb less than 1 acre do not require an NOI or a TCEQ CSN, but are still required to provide a City of Midland CSN and associated ECP. These must be approved by the Engineering Services Director or designee at least seven days prior to initiation of construction activities.

10.3 Source of Pollutants

10.3.1 The following is a discussion of the principle sources of pollutants that are discharged from municipal storm water collection and conveyance systems:

10.3.1.A Atmospheric Deposition – Atmospheric Deposition in the form of wetfall and dryfall is a significant source of pollution in urban areas and some industrial sites. A portion of the atmospheric pollutants attach to and remain on urban surfaces, but a

significant fraction may be removed from the surfaces during storm events and are carried to the receiving waters with the runoff.

- 10.3.1.B Erosion – Erosion can result from natural activity such as eroding stream banks or from human activity such as construction or renovation. Without adequate erosion control, large quantities of sediment, which typically carries attached nutrients, organic matter, and often other absorbed pollutants, can be deposited into storm sewers, drainage channels, streams, and receiving waters.
- 10.3.1.C Construction Materials – Materials used in construction and maintenance of buildings are major sources of pollution. Many heavy metals are common materials in many structures. Over time, surfaces including those of flashing, gutters, paints, copper and metal piping, etc. dissolve, decay, or are subject to leaching and thus are susceptible to being carried away in urban runoff. This process can be exacerbated if the rainfall is acidic in nature.
- 10.3.1.D Manufactured Products – Heavy metals and synthetic organic compounds are present in the following types of products: fertilizers, insecticides, algicides and fungicides, automobile brake linings, clutch facings, tire compounds, lubricants and hydraulic fluids. All can be deposited to urban surfaces and are susceptible to deposition through urban runoff.
- 10.3.1.E Plants and Animals – Other sources of pollutants that accumulate and are washed off of urban surfaces are plant debris and animal excrement. During the growing season, nutrients leach from tree leaves and stems during storms and ultimately are deposited into the receiving waters. Also, trees and other plants deposit leaves, branches, and fruits that are washed away by storm runoff.
- 10.3.1.F Accidental Spills and Unintended Discharges – Other sources of pollution in storm water are accidentally spilled pollutants that are not contained. These could be from a number of sources such as leaking underground storage tanks, faulty septic systems, and sanitary landfills.
- 10.3.1.G There are two other sources of pollution that are carried through urban conveyance systems. These are designated by the EPA as illicit connections and illegal dumping. Illicit connections include both deliberate and inadvertent discharges of sewage or industrial flows to storm drains. Illegal dumping refers to the dumping of solid or liquid wastes. These types of pollutants have been identified as a widespread problem and the detection and elimination of such discharges are major focuses of the National Pollutant Discharge Elimination System (NPDES) storm water permits.

10.4 Storm Water Pollutants

- 10.4.1 The principle types of pollutants found in storm water and their potential adverse effects on receiving waters are the following:
 - 10.4.1.A Sediment – Suspended sediment can lead to numerous adverse effects on aquatic ecosystems. Reduced sunlight penetration, clogging of gills and filter systems in aquatic organisms, interference with egg deposition and hatching, and the potential of the sediment to transport trace amounts of pesticides and other chemicals are all potential adverse effects caused by sedimentation.

- 10.4.1.B Organics – Decomposition of organic materials depletes the dissolved oxygen levels in receiving waters. This is especially true in slower moving waters, estuaries, and lakes.
- 10.4.1.C Nutrients – Increased levels of phosphorous and nitrogen, from such things as fertilizers, in runoff can lead to accelerated eutrophication in receiving waters. Among the problems associated with high nutrient levels are surface algal scums, algal blooms, water discoloration, unpleasant tastes and odors, depressed oxygen levels and the release of toxins.
- 10.4.1.D Toxic Substances – Heavy metals and organic toxic compounds are both concerns because of their potential for contaminating drinking water supplies. Heavy metals, such as copper, lead, zinc, and cadmium, are generally found in storm water in the highest concentrations. Organic toxins found in storm water are generally those associated with pesticides and fertilizers.
- 10.4.1.E Oil and Grease – The oil and grease category includes a wide variety of hydrocarbon compounds, some of which are known to accumulate in sediments and are toxic to aquatic life in low concentrations.
- 10.4.1.F Bacteria – Fecal coliform levels in urban runoff can usually be expected to exceed standards for water contact, recreation, and shellfish harvesting. Also, if the concentration of coliforms is in excess of public health standards, water cannot be used for these purposes.

10.5 Stormwater Pollution Prevention Plan – Temporary Controls

- 10.5.1 One of the requirements of the CGP is to develop a SW3P. The purpose of the SW3P is to provide guidelines for minimizing sediment and other pollutants that may originate on the site from flowing into municipal storm systems or jurisdictional waters of the U.S. during construction. The plan must also address the principal activities known to disturb significant amounts of ground surface during construction.
- 10.5.2 The stormwater management controls included in the SW3P should focus on providing control of pollutant discharges with practical approaches that use readily available techniques, expertise, materials, and equipment. The SW3P must be implemented prior to the start of construction activities.
- 10.5.3 Construction Controls – Structural controls and general site practices may be used for controlling pollutants for stormwater discharges from small and large sites. Structural controls shall comply with details and specifications in the current edition of the City’s Standard Details and Standard Specifications. The following are acceptable temporary controls for use during construction:
 - 10.5.3.A General Site Practices
 - 10.5.3.A.i Minimizing the area of disturbance; and,
 - 10.5.3.A.ii Preserving existing vegetation.
 - 10.5.3.B Structural Controls
 - 10.5.3.B.i Filter Socks;
 - 10.5.3.B.ii Concrete Washouts;

- 10.5.3.B.iii Wind Row Perms;
- 10.5.3.B.iv Drainage Swale Buffers;
- 10.5.3.B.v Erosion Control Blankets;
- 10.5.3.B.vi Gravel or Sand Bags;
- 10.5.3.B.vii Silt fence;
- 10.5.3.B.viii Inlet protection;
- 10.5.3.B.ix Rock filter dams;
- 10.5.3.B.x Stabilized construction entrances;
- 10.5.3.B.xi Sediment traps;
- 10.5.3.B.xii Vegetated buffer strips;
- 10.5.3.B.xiii Temporary detention structures; and,
- 10.5.3.C Temporary controls must include methods to reduce dust from the construction site. This may include wetting haul roads, un-stabilized lot surfaces or areas of excavation prior to beginning work.
- 10.5.3.D Contractor may submit other methods of construction control to the Engineering Services Director or designee for consideration and review.
- 10.5.4 Waste and Hazardous Material Controls – Covered containers shall be provided for waste construction materials and daily trash. Hazardous materials shall be stored in a manner that prevents contact with rainfall and runoff. Onsite fuel tanks and other containers of motor vehicle fluids shall be placed in a bermed area with a liquid tight liner or be provided with other secondary containment and spill prevention controls. The SW3P shall require federal, state, and local reporting of any spills and releases of hazardous materials greater than the regulated Reportable Quantity (RQ) and reporting to the Engineering Services Director or designee of all spills and releases to the storm drainage system.
- 10.5.5 Temporary Stabilization
 - 10.5.5.A Portions of a site that have been disturbed, but where no work will occur for more than 21 days, shall be temporarily stabilized as soon as practicable, and no later than 14 days after soil disturbance activities have ceased, except when precluded by seasonal arid conditions or prolonged drought.
 - 10.5.5.B Temporary stabilization shall consist of providing a protective cover designed to reduce erosion on disturbed areas. Temporary stabilization may be achieved using temporary seeding, soil retention blankets, hydromulch, and other techniques that cover 70 percent of the disturbed areas until either final stabilization can be achieved or until further construction activities take place.
 - 10.5.5.C Perimeter controls such as silt fence, vegetated buffer strips, or other similar perimeter controls are intended to act as controls when stabilization has not occurred. Perimeter controls may remain in place during temporary stabilization.

- 10.5.5.D It is the responsibility of the individual or entity who constructs within the City Right-of-Way (ROW) to ensure that all temporary erosion controls are removed at the project's completion.
- 10.5.6 Inspection and maintenance during construction:
- 10.5.6.A The Owner must construct all controls required by the SW3P. The Owner must have qualified personnel inspect the controls at least every two weeks during construction and within 24 hours after a storm event of 0.5 inches, or greater.
- 10.5.6.B Certified inspection reports shall be retained as part of the SW3P. Within 24 hours of the inspection, controls identified as damaged or deteriorated shall be repaired or replaced, as appropriate. Controls shall also be routinely cleaned to maintain adequate capacity.
- 10.5.6.C Changes or additions to the SW3P or ECP by the Operator shall be implemented within 24 hours to prevent discharges from the site. The Owner shall implement procedures to remove discharged soil from all portions of the storm drainage system including streets, gutters, inlets, storm drain, channels, creeks, and ponds.
- 10.5.6.D Notes requiring the inspection and maintenance shall be placed on SW3P drawings. The SW3P shall identify the responsible party for inspecting and maintaining each control. If no party is identified, each owner and Operator that submitted an NOI for the site shall be fully responsible for implementing all requirements of the SW3P.
- 10.5.7 Final Stabilization – Stabilization measures that provide a protective cover must be initiated immediately in portions of the site where construction activities have permanently ceased. Final stabilization consists of soil cover such as perennial vegetation, geo-textiles, mulch, rock, or placement of pavement or concrete. For stabilizing vegetated drainage ways, sod or seeded soil retention blankets shall be used. Hydromulch will not be allowed in vegetated swales, channels, or other drainage ways. The plan for final stabilization shall be coordinated with permanent controls in the Post Construction Stormwater Quality Plan (PCSQP) (see Section 10.7.1) and with the landscaping plan (see Section 9), if applicable.
- 10.5.8 Final Site Stabilization – in accordance with Parts III.G.1 and III.G.2 of the Construction Stormwater General Permit, stabilization of all disturbed areas must, at a minimum, be initiated immediately (i.e., as soon as practicable, but no later than the end of the next work day) whenever any earthwork activities have permanently ceased on any portion of the site. The City will not support acceptance of any public infrastructure or a C.O. unless this requirement has been fulfilled. **CONTRACTOR BEWARE: THIS REQUIREMENT WILL BE STRICTLY ENFORCED.**
- 10.5.9 Notice of Termination – All parties that submitted an NOI must submit a NOT within 30 days after final stabilization is established. Temporary controls must be removed, and permanent stabilization shall be established and accepted by the City prior to submitting a NOT. When the owner of a residential subdivision transfers ownership of individual lots to builders before final stabilization is achieved, the SW3P shall include controls for each individual lot in lieu of final stabilization. These controls must consist of stabilization of the ROW and placement of structural controls at the low point of each individual lot or equivalent measures to retain soil on each lot during construction. Additionally, the builder must submit a valid NOI before a NOT can be submitted by the owner.

10.6 Best Management Practices

10.6.1 Best Management Practices (BMPs) are defined by the EPA as structural or non-structural controls, or a combination of both, designed to reduce the amount of pollution in storm water runoff.

10.6.1.A Structural BMPs – Structural controls collect and treat runoff pollution in order to decrease the amount of pollution reaching receiving waters. Typical structural BMPs include infiltration devices, wet detention basins, and extended dry detention basins. Also, locating and removing illegal sanitary sewer connections, overflow structures, and industrial drains are considered structural BMPs.

10.6.1.A.i Infiltration devices capture the storm water and allow it to percolate through the soil profile. Pollutants are removed by the natural filtration process of the soil. Even though these devices are the most effective structural storm water controls, they are effective only where soil conditions allow the captured volume of water to percolate through the profile before the next storm event.

10.6.1.A.ii Wet detention basins consist of a permanent water pool, and overlying zone that can hold the design runoff volume temporarily so that it can be discharged at the design discharge rate, and a shallow vegetated zone which serves as a biological filter during discharge. For wet detention basins, the storm water runoff is treated by allowing suspended particles to settle and by removing dissolved pollutants through biological processes such as the uptake by aquatic plants.

10.6.1.A.iii An extended dry detention basin captures the storm water and detains it long enough to allow suspended pollutants to settle. In order to remove the suspended pollutants, relatively long detention times of 20 to 40 hours are required. Unlike wet detention basins, dry detention basins do not remove dissolved pollutants.

10.6.1.B Non-Structural BMPs – Non-structural BMPs are developed primarily to reduce pollution resulting from construction and to reduce pollutants from roadways; commercial, industrial and residential areas; flood management projects; landfills and other municipal waste facilities; and areas associated with the application of herbicides, pesticides, and other potentially harmful chemicals. Non-structural BMPs include such practices as street cleaning, fertilizer application control, and limiting population densities through use of zoning restrictions. An example of the non-structural BMP approach is the requirement of either a minimum lot size for a single-family residential development or the development of an area of greater population density balanced by a large portion of the site being designated as natural open space.

10.7 Post Construction Stormwater Quality Plan – Permanent Controls

10.7.1 General Requirements – A Post Construction Stormwater Quality Plan (PCSQP) must be prepared for all developments that disturb a surface area of 1 acre or greater. The PCSQP must be in accordance with the City’s checklist and must be developed and coordinated with the site drainage plan and may be shown on the same sheet. The PCSQP must identify permanent site features and BMPs that will be constructed with the project to minimize and mitigate the project’s long-term effects on stormwater quality and quantity. The PCSQP should also be coordinated with the landscaping plan (see Section 9) to prevent conflicts and ensure

compatible land use.

- 10.7.2 Number of Permanent BMPs Required – The table below provides the minimum number of permanent controls required for a site. Subdivisions with paved alleys, private access easements, or private streets shall provide at least one permanent control above the minimum.

Table 10-1. Minimum Number of Permanent BMPs Required

Area Disturbed	Minimum Number of Permanent BMPs
1 acre ≤ Disturbed Area < 5 acres	1
5 acres ≤ Disturbed Area < 10 acres	2
10 acres ≤ Disturbed Area < 20 acres	3
≥ 20 acres	4

- 10.7.3 Permanent Site Development Controls – It is the responsibility of the Engineer to design permanent controls, or BMPs, that address site specific conditions.

10.7.3.A Some of the factors to be considered when evaluating and selecting controls for a development are as follows:

- 10.7.3.A.i Impact of the development on runoff volumes and rates;
- 10.7.3.A.ii Potential pollutants from the development;
- 10.7.3.A.iii Percent of site treated by the control;
- 10.7.3.A.iv On-site natural resources;
- 10.7.3.A.v Configuration of site (including existing waterways and topography); and,
- 10.7.3.A.vi Maintenance requirements for the control.

10.7.3.B The following are some examples of permanent controls:

- 10.7.3.B.i Preservation of Natural Creeks;
- 10.7.3.B.ii Preservation of the 100-year Floodplain;
- 10.7.3.B.iii Stormwater Wetlands;
- 10.7.3.B.iv Stormwater Ponds;
- 10.7.3.B.v Extended Dry Detention Basins;
- 10.7.3.B.vi Vegetated Open Channels;
- 10.7.3.B.vii Bioretention;
- 10.7.3.B.viii Organic Filters;
- 10.7.3.B.ix Sand Filters;
- 10.7.3.B.x Hydrodynamic Separators;
- 10.7.3.B.xi Green Roofs; and,

10.7.3.B.xii Rain Harvesting.

10.7.3.C Construction and Maintenance – The Owner shall construct all permanent controls in accordance with this section and is responsible for maintenance of the controls. When the control falls within a drainage easement, the plat or separate instrument dedicating the easement must include a statement of the Owner’s responsibility for maintenance.

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