STORM WATER TREATMENT PLAN REVIEW

Guidance Manual

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LIST OF ACRONYMS AND ABBREVIATIONS

AAC..... The Alaska Administrative Code
ADEC..... Alaska Department of Environmental Conservation
ADF&G..... Alaska Department of Fish and Game
ADOT&PF..... Alaska Department of Transportation and Public Facilities
AMC..... Anchorage Municipal Code
APDES ..... Alaska Pollutant Discharge Elimination System
AWWU.....Anchorage Water and Wastewater Utility
BMP..... Best Management Practice
cfs .....Cubic Feet per Second
CGP..... Construction General Permit
CWA..... Clean Water Act
DCM .....Design Criteria Manual
EPA ..... Environmental Protection Agency
ESCA.....Erosion and Sediment Control Administrator
ESC .....Erosion and Sediment Control
LID.....Low Impact Development
MEP.....Maximum Extent Practicable
MOA ..... Municipality of Anchorage
MSGP..... Multi-Sector General Permit
MS4 ..... Municipal Separate Storm Sewer System
MUSLE ..... Modified Universal Soil Loss Equation
NAICS.....North American Industry Classification System
NMFS .....National Marine Fisheries Service
NOI ..... Notice of Intent
NOT..... Notice of Termination
NPDES .....National Pollutant Discharge Elimination System
NRC..... National Response Center
OGS..... Oil and Grit Separator
OSC.....On Scene Coordinator
SIC..... Standard Industrial Classification
State ..... State of Alaska
SPCC..... Spill Prevention, Control, and Countermeasure Plans
SWPPP..... Storm Water Pollution Prevention Plan
SWTP .....Storm Water Treatment Plan
SWTPRGM..... Storm Water Treatment Plan Review Guidance Manual
TMDL.....Total Maximum Daily Load
U.S.C. ..... United States Code
USCG. .....United States Coast Guard
USFWS.....United States Fish and Wildlife Service
WMS..... Watershed Management Services

1 INTRODUCTION

Federal and State regulations require the Municipality of Anchorage (MOA) to implement storm water management programs to control storm water runoff and associated pollutants within municipal boundaries. These regulatory requirements extend to the control of storm water discharges from sites both during and after construction.

MOA regulations regarding storm water pollution control are set forth in the Anchorage Municipal Code (AMC) Title 21. The AMC requires the development, implementation, and maintenance of a *Storm Water Treatment Plan Review Guidance Manual* (SWTPRGM). The AMC further requires anyone who constructs, installs, modifies, or operates a storm water treatment or disposal system to comply with the SWTPRGM regarding storm water runoff system plan requirements and plan reviews.

Developers of both new and redeveloped sites are required to prepare and submit a Storm Water Treatment Plan (SWTP) to the MOA for review and approval prior to the start of construction. **This requirement applies to anyone who will disturb the ground or discharge or route storm water within municipal boundaries**.

This Second Edition of the SWTPRGM is intended for use in the preparation and implementation of SWTPs by designers, engineers, and contractors. SWTPs must address the following issues:

- Potential sources of pollution that may be expected to affect the quality of storm water discharges from a site;
- Temporary practices to be used to reduce pollutants in storm water discharges during construction;
- Permanent practices to be used to reduce pollutants from post-construction storm water discharges; and
- Compliance with the terms and conditions of relevant Federal, State, and MOA storm water discharge regulations.

The Storm Water Treatment Plan generally consists of the following components:

- Existing and proposed site conditions, with a detailed plot plan or construction plan
- A Stormwater Pollution Prevention Plan (SWPPP);
- A Dewatering Plan;
- A Permanent Stormwater Control Plan; and
- An Operations and Maintenance Plan

Depending on the nature of the project, not every component may be required.

1.1 Guidance Manual Overview

The goal of this manual is to provide:

- An overview of applicable pollution prevention regulations, requirements, and minimum standards;
- Information on the selection, implementation, and maintenance of temporary and permanent erosion, sediment, and stormwater management controls; and
- Guidance for the preparation and implementation of a concise and complete SWTP.

The manual addresses storm water pollution prevention and control for construction projects from developed or redeveloped sites and for discharges from permanent facilities. Topics in this manual that relate to pollution prevention requirements for **construction projects** include:

- applicable storm water pollution prevention regulations and standards;
- the selection, implementation, and maintenance of temporary erosion and sediment control Best Management Practices (BMPs);
- the development, approval, and implementation of SWTPs;
- site inspection requirements;
- violations;
- special requirements related to dewatering and underdrains; and
- termination of coverage.

Topics covered in this manual that relate to control of stormwater discharges from **permanent facilities** include:

- applicable regulations and standards;
- the selection, implementation, and maintenance of permanent BMPs;
- materials storage and handling requirements;
- pollution prevention guidance for vehicle and equipment washing;
- oil spill pollution prevention and reporting requirements;
- guidance for control of pollutants from parking areas; and
- requirements and guidance for the operation of both private and commercial snow storage facilities.

A listing of references and resources is included in Section 10.

1.2 Repeal of Prior Guidance Manuals

This manual replaces the following MOA storm water management manuals:

- *Storm Water Treatment Plan Review Guidance Manual 2nd Edition (December 2007)*,
- *Storm Water Treatment Plan Review Guidance Manual (January 1999)*, and
- *Erosion and Sediment Control and Materials Containment Guidance Manual (January 1998).*

The prior manuals are repealed.

2 REGULATORY REQUIREMENTS FOR POLLUTION PREVENTION

The MOA is required to manage storm water within municipal boundaries by Federal statutory regulations contained in the Clean Water Act (CWA), and regulatory requirements contained in the Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System (NPDES) permit program and its Oil Pollution Prevention (OPP) program which regulates oil spill pollution prevention and reporting.

The MOA is also required to manage storm water and associated pollutants in accordance with specific requirements set forth in the Alaska Administrative Code (AAC), the Alaska Pollutant Discharge Elimination System, and Alaska Department of Environmental Conservation (ADEC) water quality standards, as well as its own municipal code.

2.1 EPA National Pollutant Discharge Elimination System (NPDES) Permit Program

As authorized by the CWA, the EPA's NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are specific discharges such as pipes or constructed ditches. Industrial, construction, municipal, residential, and other facilities must obtain NPDES permits if their discharges go directly to surface waters. Since its introduction in 1972, the NPDES permit program has been responsible for significant improvements to our nation's water quality.

The EPA, in coordination with the State, the regulated community, and the public, develops, implements, and conducts oversight of the NPDES permit program based on statutory requirements contained in the CWA and regulatory requirements contained in the NPDES regulations.

A NPDES permit may set a numeric limitation for a pollutant or pollutant parameter in a discharge. The permittee may typically choose which technologies to use to attain compliance. Some permits, however, contain certain generic erosion and sediment controls such as installing a screen over a pipe to keep debris out of a waterway. NPDES permits make sure that a state's mandatory standards for clean water and Federal minimum requirements are being met.

There are various methods used to monitor NPDES permit compliance, with required sampling and reporting being the most prevalent. EPA and state regulatory agencies will also send inspectors to facilities in order to determine if they are in compliance with the conditions imposed under their permits.

Federal laws provide EPA and authorized state and local regulatory agencies with various methods for taking enforcement actions against violators of permit requirements. For example, EPA and state regulatory agencies may issue administrative orders that require facilities to correct violations or impose fines. The laws also allow EPA and state agencies to pursue civil and criminal actions that may include mandatory injunctions or penalties, as well as jail sentences for persons found willfully violating requirements, and endangering the health and welfare of the public or environment. The general public can also enforce permit conditions. The facility monitoring reports are public documents, and the public can review them. If any member of the public finds that a facility is violating its NPDES permit, that member can independently start a legal action, unless EPA or the state regulatory agency has already taken an enforcement action.

The Clean Water Act intends for states to run the NPDES program, but provides for EPA to do so when states elect not to. With EPA's approval of Alaska's application, the State is implementing an EPA-approved state program, the Alaska Pollutant Discharge Elimination System (APDES) program.

Stormwater was transferred to ADEC on October 31, 2009. When this occurred, existing EPA permits were transferred to ADEC. The transferred permits will remain in effect (along with the state certifications) until ADEC issues APDES permits to replace the EPA-issued permits.

EPA will oversee the state's implementation of the program and can intervene on any permit issued, renewed or modified by the State. EPA will also continue to exercise certain responsibilities involving Tribes and other federal agencies. For example, EPA has a continuing responsibility to consult with Alaska Tribes, as well as the U.S. Fish and Wildlife Service and the National Marine Fisheries Service on impacts to endangered species and essential fish habit. Finally, a small number of special permits not eligible for transfer to the State will continue to be issued and enforced by EPA.

See Section 2.3 for a description of APDES stormwater permits.

2.2 EPA Oil Pollution Prevention and Reporting Regulations

On July 17th, 2002, the EPA issued a final rule amending the Oil Pollution Prevention (OPP) regulation promulgated under the authority of the Federal Water Pollution Control Act (Clean Water Act). The 2002 amendments address requirements for Spill Prevention, Control, and Countermeasure (SPCC) plans, and some provisions that may also affect Facility Response Plans. The EPA incorporated revisions proposed in 1991, 1993, and 1997. The new SPCC rule addresses these revisions and became effective August 16, 2002. EPA published a final rule on April 17, 2003 that extended the compliance deadlines that facilities must amend (or, for new facilities, prepare) and implement SPCC plans conforming to the new regulation.

Title 40, Part 112 of the Code of Federal Regulations (July 3, 2003 edition) established procedures, methods, and equipment requirements to prevent the discharge of oil from non-transportation-related onshore and offshore facilities, into or upon the navigable waters of the United States or adjoining shorelines. These regulations apply to owners or operators of onshore and offshore facilities engaged in producing, storing, transferring, distributing, and / or consuming oil and oil products. Amendments to these regulations were adopted in February 2007. The current OPP regulations can be referenced on the EPA's web page: http://www.epa.gov/oilspill/lawsregs.htm.

The 2002 changes to the OPP regulations clarify applicability to owners or operators that use oil. The changes also allow for tracking the scope of the rule to conform to the expanded jurisdiction of the amended CWA. The broadened range includes waters of the contiguous zone, and waters connected with activity under the Outer Continental Shelf Lands Act or Deepwater Port Act, as well as waters affecting certain natural resources of the United States.

In simple terms, any facility that stores more than 1,320 gallons of petroleum products must comply with Federal regulations for oil pollution prevention.

The 2002 Federal regulations require that SPCC plans be prepared in accordance with good engineering practices, be approved by a person with the authority to commit the resources necessary to implement the plan, and must be certified by a licensed professional engineer. At a minimum, SPCC plans must address the following three areas:

- Operations and management procedures that prevent oil spills;
- Control measures installed to prevent a spill from reaching navigable waters; and
- Countermeasures to contain, clean up, and mitigate the effects of an oil spill that could reach navigable waters.

2.3 State Regulations

2.3.1 Alaska Pollutant Discharge Elimination System (APDES)

Permit requirements in APDES-issued permits are not expected to change significantly from those issued as NPDES permits by EPA. Permit limits will continue to be based on state water quality standards and reflect wastewater treatment requirements in state and federal law.

Three things are expected to change under APDES: First, a single state permit will replace the current requirement for both a federal permit and a state certification or a state permit. Second, ADEC, instead of EPA, will monitor and enforce compliance with the permits. Finally, appeals of permits will be heard by ADEC and in the Alaska judicial system instead of by the federal Environmental Appeals Board and federal courts.

Within the APDES permit program, there are three permits that apply to the regulation of storm water discharges and associated pollutants. These three permits include the following:

1. Construction General Permit (CGP) – applies to the control of storm water discharges and associated pollutants on construction projects with one acre or more of land disturbance. The existing CGP was transferred from EPA to ADEC on October 31, 2009. ADEC reissued the permit on December 31, 2009, with changes in the NOI and NOT submittal processes and standard permit conditions. ADEC has developed an eNOI system to similar to EPA's. Contractors will operate under this APDES CGP until ADEC reissues the permit in the Spring of 2011.

2. Municipal Separate Storm Sewer System (MS4) Permit – applies to municipal separate storm sewer systems. The existing MS4 permits were transferred from EPA to ADEC on October 31, 2009.

3. Multi-Sector General Permit (MSGP) – applies to post-construction storm water discharges and potential pollutants at industrial facilities. The existing MSGP was transferred from EPA to ADEC on October 31, 2009. Facilities will operate under the EPA-issued MSGP until ADEC reissues the permit, estimated to be the fall of 2013.

The three APDES permits are described in more detail below.

2.3.2 Construction General Permit (CGP)

The CGP, as currently modified, governs all storm water discharges associated with construction on projects with one or more acres of land disturbance, including off-site borrow and haul areas. The permit is available at: http://www.dec.state.ak.us/water/wnpspc/stormwater/docs/AKR100000CGP.pdf .

The CGP regulates storm water and uncontaminated surface discharges from construction sites in EPA Region 10, which includes Alaska. The goal of the CGP is to reduce or eliminate storm water pollution related to construction activities by requiring that permittees plan and implement appropriate pollution control practices to protect water quality. "Permittees" to the CGP are all parties (owners and operators) who are signatories of a Notice of Intent for the permit. The CGP also authorizes discharges of certain non-storm water construction site discharges

The CGP places limitations on certain discharges including:

- Those containing pollutants of concern into waters with an approved Total Maximum Daily Load (TMDL) waterbody assessment; and
- Those that are likely to affect Endangered or Threatened Species.

Discharges that are not covered by the CGP include the following:

- Post-construction discharges including support activity;

- Discharges mixed with non-storm water flows, with the exception of the sources listed above; and
- Discharges that are regulated under an individual permit;

The CGP requires that persons responsible for projects with land disturbances of one acre or more prepare a Storm Water Pollution Prevention Plan (SWPPP); submit a Notice of Intent (NOI) to discharge storm water associated with construction activities to EPA; and implement the SWPPP. Implementation of the SWPPP requires that controls to reduce erosion and prevent sediments from discharging from the construction site be instituted and maintained. These controls, called BMPs, are installed by the contractor or other operator to meet the objectives of the CGP.

The site operator must perform inspections of the area covered by the SWPP at prescribed inspection frequencies and locations.

Regardless of project size and ownership, State Water Quality Standards must still be met for all storm water discharges associated with construction.

In order to obtain coverage under the CGP, the permittee must first complete a SWPPP and submit an NOI as described in Section 5.

2.3.3 Municipal Separate Storm Sewer System (MS4) Permit

The MOA and the Alaska Department of Transportation and Public Facilities (ADOT&PF) are co-permittees under an MS4 permit issued by the EPA and now administered by ADEC. The MS4 permit allows the MOA and ADOT&PF, as operators of a MS4, to discharge storm water meeting specified requirements into waters of the United States. The MS4 permit requirements are implemented through the Storm Water Management Program and include a program substantially similar to the CGP program discussed above.

The regulatory definition of an MS4 (40 CFR 122.26(b)(8)) is “a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catchbasins, curbs, gutters, ditches, man-made channels, or storm drains):

- Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created to or pursuant to state law) ... including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges into waters of the United States;
- Designed or used for collecting or conveying storm water;
- Which is not a combined sewer; and
- Which is not part of a Publicly Owned Treatment Works as defined at 40 CFR 122.2.”

In compliance with the MS4 permit, the MOA developed the SWTP program and associated guidances describing MOA storm water treatment requirements, reviews, and inspections. The SWTP program is the basis for this guidance document, which will continue to be updated periodically as EPA and ADEC regulations change or as the MOA revises its program.

The MOA SWTP review requirements outlined in this manual apply to all land areas and land disturbances within the corporate limits of the MOA and / or served by the MS4, and refer to those portions of the MS4 that are owned and operated by the MOA or ADOT&PF, and that discharge to receiving waters.

2.3.4 Multi-Sector General Permit (MSGP)

Activities that take place at industrial facilities, such as material handling and storage, often expose potential pollutants to storm water. When runoff from these activities discharges industrial pollutants into nearby storm sewer systems and waterbodies, the discharges may adversely

affect water quality. To limit pollutants in storm water discharges from industrial facilities, the APDES permit program includes an industrial storm water permitting component. Operators of industrial facilities included in one of the 30 sectors of "storm water discharges associated with industrial activity" (40 CFR 122.26 (b)(14)(i)-(xi)) that discharge storm water to an MS4, or directly to waters of the United States, require authorization under an APDES industrial storm water permit. If an industrial facility has a Standard Industrial Classification (SIC) code, or conducts operations that are contained in the narrative description listed in one or more of the 30 sectors, the facility operator must determine if the facility is eligible for coverage under either a general or an individual APDES industrial storm water permit. The North American Industry Classification System (NAICS) may eventually replace the SIC system. The U.S. Census Bureau has a conversion table to bridge the two systems online. In some cases, a facility operator may be eligible for a conditional / temporary exclusion from permitting requirements.

General permits contain requirements for numerous types of industrial activities, allowing a facility operator to quickly obtain permit coverage. In Alaska the MSGP, as currently modified, is the general permit available to facility operators. The MSGP provides facility-specific requirements for several types of industrial facilities within one permit. The MSGP presents all requirements up front, allowing facility operators to become familiar with, and prepare for, activities such as industrial SWPPP implementation and monitoring before applying for permit coverage. This consolidated permit that applies to Alaska as of the date of this review manual is available at: http://www.epa.gov/npdes/pubs/msgp2008_finalpermit.pdf

The MSGP contains general permit requirements that pertain to all sectors, and sector-specific requirements that apply only to facilities within each of the 30 industrial sectors. Most industrial sectors have visual, analytical, and / or compliance monitoring requirements.

To apply for permit coverage under the MSGP, a facility operator must complete and submit an NOI form to ADEC. The NOI requests a variety of information, including the latitude and longitude of the facility, information related to the Endangered Species Act, and the National Historic Preservation Act.

To obtain authorization under the new modification of the MSGP permit, a facility owner will be required to:

1. Meet the eligibility requirements;
2. Develop and implement an industrial SWPPP; and
3. Submit a complete NOI.

Facility operators must submit their Annual Reports and MultiSector Discharge Monitoring Report (MDMR) to ADEC.

To discontinue permit coverage, a facility operator must complete and submit a Notice of Termination (NOT) form to the ADEC.

2.3.5 State Spill Reporting Regulations

State spill reporting regulations set forth in 18 AAC 75, Oil and Hazardous Substances Pollution Control, require that spills must be reported. Spill reporting procedures are outline in Section 9 of this manual.

2.3.6 State Water Quality Standards

The mission of the ADEC Water Quality Standards program is to protect the waters of Alaska from pollutants. The ADEC Water Quality Standards establish water quality criteria for the protection of designated uses for water supply, water recreation, and growth and propagation of fish, shellfish, other aquatic life, and wildlife. The most stringent of these criteria are those for drinking, culinary, and food processing water supply. The ADEC Water Quality Standards specify the degree of degradation that may not be exceeded in a waterbody because of human actions. The water quality standards are set by the ADEC's antidegradation policy.

The State antidegradation policy includes provisions for full protection of existing (functional) uses, maintenance of water quality of high-quality waters, and a prohibition against lowering water quality in outstanding resource waters. The antidegradation policy provides a powerful tool for the protection of water quality in regulation of point and non-point source discharges. In conjunction with beneficial uses and narrative criteria, antidegradation is used to address impacts that cannot be fully addressed by chemical criteria, such as physical and hydrologic modifications.

The specific requirements are set forth in 18 AAC 70 Water Quality Standards. The AAC is available online (http://dec.alaska.gov/regulations/pdfs/18%20AAC%2070.pdf), at the ADEC offices, and through other sources.

2.4 MOA Storm Water Pollution Control Regulations

Storm water pollution control requirements are set forth in Title 21 (Land Use Planning) of the AMC and include the following:

- Development, implementation, and maintenance of a Storm Water Treatment Plan Review Guidance Manual;
- The requirement of anyone who constructs, installs, modifies, or operates a storm water treatment or disposal system within the municipal boundaries to comply with the SWTPRGM regarding storm water runoff system plan requirements and plan reviews;
- Prohibited discharges or acts;
- Sewer construction standards;
- Storm water runoff restrictions;
- Inspection requirements;
- Plan review and inspection fees; and
- Penalties.

3 SWTP REQUIREMENTS OVERVIEW

Storm water treatment plan approval is required under AMC 21 prior to the commencement of land clearing or ground disturbing activities; the discharge of surface water (including meltwater from snow disposal sites); the construction, alteration, installation, modification, or operation of a storm water treatment or disposal system; demolition or utility work; connection to the municipal storm sewer system; work in waterways or watercourse; or dewatering activities. All construction, development, and maintenance activities shall be in accordance with the approved Storm Water Treatment Plan.

The Storm Water Treatment Plan is a comprehensive report containing all of the technical information and analysis necessary for regulatory agencies to evaluate proposed BMPs and determine if minimum requirements will be met. Contents of the plan vary with the size of the parcel, size and type of proposed development, individual site characteristics, and activities and land use associated with the site.

3.1 Submission Requirements

Table 3-1 presents the required elements of a Storm Water Treatment Plan. Individual elements are described below.

1. Handout AG.21 is included in Appendix B and available on the MOA website (http://www.muni.org/Departments/development/BSD/Handouts/handoutag21.pdf). Handout AG.21 serves as the application for a SWTP review.
2. Unless included in items 4 or 6 below, the existing and proposed conditions should include a description of the proposed development, site drainage and receiving waters, and calculations used to determine runoff quantity and to select and design BMPs. The Existing and Proposed conditions should summarize preliminary conditions and include an off-site analysis, if required. A Drainage Report, which may be required for the project, may be used to provide this information, too.
3. Plot plan, site plan, construction plan, drawing, or map showing, at a minimum
   - Vicinity map clearly locating the property
   - Existing structures, topography, vegetation, soils, wetlands, drainage systems, and critical areas
   - Road rights-of-way and easements, drainage easements, buffers, and setback requirements
   - Proposed permanent lot layout, topography, structures, drainage system, impervious areas, and access points
   - Locations of all construction-phase (if applicable) and permanent physical storm water controls, and locations where potential pollutants are or will be stored.
4. Construction Activities Stormwater Quality Control – applicable to all activities disturbing 500 square feet or more or that are greater than 4 feet in depth and some activities that are smaller. See Section 5 of this manual.
5. A copy of the Construction General Permit Notice of Intent must also be submitted if the construction project will disturb 1 acre or more. Notices of intent are covered in more detail in Section 5.3.1.
6. Dewatering Plan - Applicable to all activities involving groundwater or pumped discharges. See Section 6 of this Manual.

Table 3-1 Storm Water Treatment Plan Elements

		Type of Activity:	Any new or redevelopment project					**Existing Commercial Operation**
	Land disturbance area or depth and project setting:		Less than 500 sq ft, less than 4 ft in depth, and sufficient buffer [1]	Less 500 sq feet and less than 4 feet but insufficient buffer [1]	Greater than 4 feet in depth OR 500 sq feet up to 10,000 sq feet	Greater than 10,000 square feet but less than 1 acre	1 acre or greater	Not Applicable
	SWTP Element or Submittal Item		**Submittal Required?**					
1	Applicable checklist and signed certification from MOA Handout AG.21		No submittal required [2]	AG.21 checklists #1 and #3	AG.21 checklists #1 and #3	AG.21 checklists #2 and #3	AG.21 checklist #2, and checklist #3 if less than 5 acres	No
2	Existing and proposed conditions		No	No	No	Yes	Yes	No
3	Plot Plan or Construction Plan		No	Yes	Yes	Yes	Yes	Yes
4	Stormwater Pollution Prevention Plan		Follow AG.21 checklist #1 [3, 4]	Type 1 SWPPP [4, 5]	Type 1 SWPPP [4, 5]	Type 2 SWPPP [4, 6]	Type 3 SWPPP [7]	No
5	Copy of Notice of Intent for CGP		No [8]	No [8]	No [8]	No [8]	Yes	No
6	Dewatering Plan		No	Required if pumped discharges will be involved				No
7	Permanent Stormwater Quality Control Plan [9]	Single family or duplex	No	No	No	No	No	No
		All other [10]	No	Yes	Yes	Yes	Yes	Yes
8	Permanent Maintenance and Operations Plan	Single family or duplex	No	No	No	No	No	No
		All other [10]	No	Yes	Yes	Yes	Yes	Yes
9	Other information [11]	Single family or duplex	No	No	No	Yes	Yes	No
		All other [10]	No	Yes	Yes	Yes	Yes	Yes
10	As-built drawings [12]	Single family or duplex	No	No	No	No	No	No
		All other [10]	No	Yes	Yes	Yes	Yes	Yes

There is sufficient buffer if the distance between the disturbed area and adjacent creeks or wetlands is the greatest of one of the following:

-- 25 feet if the slope is flatter than 4:1 and 50 feet if the slope is steeper than 4:1

-- The stream setback width required under Anchorage Municipal Code Title 21

-- A distance specifically required by MOA

[2] Submittal is required if project is part of a common plan of development that collectively disturbs 10,000 square feet or more. See Section 5 of this manual.

[3] Although no submittal is required, operators of these projects must follow the controls specified in Checklist #1 of Handout AG.21 (Appendix B). These sites are subject to municipal inspection.

[4] See Section 5 for SWPPP requirements for projects that are part of a larger common plan of development.

[5] Type 1 SWPPP – Certify to and follow requirements for erosion and sediment control as shown in AG.21 Checklist #1 (included in Appendix B).

[6] Type 2 SWPPP – Prepare, certify, and implement a SWPPP as described in Section 5 of this manual. Generally the SWPPP is prepared in accordance with the APDES General Permit for stormwater discharges from construction activities (CGP) but submittal of an NOI is not required for a Type 2 SWPPP.

[7] Type 3 SWPPP – Prepare, certify and implement a SWPPP in accordance with the CGP. Submit NOI for the CGP and fulfill permit requirements applicable to the construction project.

[8] Required if the project is part of a common plan of development that collectively disturbs one or more acres

[9] Permanent stormwater controls are discussed in Chapter 7 and Appendix A of this manual.

[10] All other includes, but is not limited to, triplexes and larger multi-housing projects; commercial developments; road, street, and drainage construction projects; filling and grading, and utility construction.

[11] Other information includes a Drainage Plan, if prepared in compliance with Title 21.07 and the DCM; special reports and studies, such as soils, geotechnical, wetlands, or hydrological reports or analyses; pollution prevention plans applicable to permanent site activities, such as MultiSector General Permit SWPPPs or Spill Prevention, Control and Countermeasure (SPCC) plans; and copies of other permits, such as wetland fill permits.

[12] To be submitted when construction of permanent stormwater control facilities is completed

7. Permanent Stormwater Quality Control Plan – Applicable to new or redevelopment of triplex or larger residential developments and all commercial developments. See Section 7 of this manual.
8. Permanent Maintenance and Operations Plan – Applicable to most projects other than single family or duplex projects. See Section 8 of this manual.
9. Other information required for submittal includes:
   - Special Reports and studies, such as soils, geotechnical, wetlands, or hydrological reports or analysis
   - Other permits, such as a Corps of Engineers Section 404 (wetlands) permit, an Alaska Department Environmental Conservation dewatering permit, an Alaska Department of Natural Resources Temporary Water Use Permit, an Anchorage Water and Wastewater Utility (AWWU) discharge permit, or an MOA or ADOT&PF right-of-way permit.
10. As-built drawings. See Section 3.2, Step 10, of this manual.

3.2 Developing Storm Water Treatment Plans

The Storm water Treatment Plan is the comprehensive report containing all of the technical information and analysis necessary for the WMS to evaluate the proposed Best Management Practices and determine if the requirements will be met. Contents of Storm Water Treatment Plans will vary with the size of the parcel, type and size of proposed development, individual site characteristics, and other information required by PM&E to assess compliance with Chapter 21.67 of the Municipal code.

The steps involved in developing a Storm Water Treatment Plan are presented below. Not all steps will be needed for each site, but you must do Step 1 to determine the rest of your necessary steps to completion.

1. Determine Applicable Plan Components
2. Collect and Analyze Existing Conditions Information
3. Prepare Preliminary Development Layout
4. Perform the Existing and Proposed Conditions Section, including Off Site Analysis
5. Prepare a Permanent Stormwater Quality Control Plan
6. Finalize Development Layout
7. Prepare a Storm Water Pollution Prevention Plan and
8. Prepare a Dewatering Plan
9. Include a Maintenance and Operation Manual
10. Submit As-Built Drawings

Each of these steps is described below.

Step 1: Determine Applicable Plan Components

The required submittals, based on project type, are listed in Table 3-1 and described in Section 3.1

Step 2: Collect and Analyze Existing Conditions Information

Collect and review information on the existing site condition, including topography, drainage patterns, and waterbodies in the vicinity of the proposed system, soils, ground cover, critical areas, adjacent areas, existing development, existing stormwater facilities, and on- and off-site utilities. Analyze data to determine site limitations including: (1) areas with high potential for erosion and sediment deposition (based on soil properties, slope, etc.) and (2) locations of sensitive and critical areas (e.g., wetlands, water quality sensitive areas, etc.).

In this step you prepare what will become the Existing and Proposed Conditions (Part 2 of your Storm Water Treatment Plan, see Table 3-1), Part of the information you gather here will be useful as you prepare your SWPPP (Part 4).

Step 3: Prepare Preliminary Development Layout

Based on the results of the analysis of existing site condition limitations, locate the buildings, roads, parking lots, and landscaping features for the proposed development. Consider the following points when laying out the site: (1) fit development to the terrain to minimize land disturbance, (2) confine construction activities to least critical areas, (3) minimize impervious areas, and (4) utilize the natural drainage systems. Include flow diagrams showing the direction and amount of each stormwater discharge and the receiving systems.

You'll use the development layout you design here for your plot plan or construction plan (Part 3 of the Storm Water Treatment Plan).

Step 4: Perform Off Site Analysis

The off-site analysis, which is not required for all projects, is to be included with the Existing and Proposed Conditions (Part 2 of the Storm Water Treatment Plan).

Conduct an analysis of off-site water quality impacts resulting from the project. The study area should include areas that are upstream and/or tributary to the points of discharge from the site, including the site itself, and extend a distance of ¼ mile downstream of the proposed site discharge location(s).

The off-site analysis should include the following components:

1. A description of the tributary area contributing runoff to the site, drainage channels, conveyance systems, stormwater discharge location(s) including the receiving area(s)(a distance of ¼ mile downstream of the site), and downstream receiving waters
2. A review of existing or potential problems resulting from the development, including but not limited to:
   - sedimentation
   - streambank erosion
   - violations of water quality standards
   - spills and discharge of priority pollutants
3. Demonstrate that the proposed stormwater control Best Management Practices will sufficiently mitigate potential water quality and quantity impacts (e.g. detain flows to meet Minimum Requirement #5)
4. Demonstrate adequate capacity of the downstream system to handle flow conditions after development with proposed BMPs.

Step 5: Prepare a Permanent Stormwater Quality Control Plan

The Permanent Stormwater Quality Control Plan addresses permanent control of stormwater pollution from the developed site. It involves selecting and designing permanent stormwater control BMPs, including the conveyance system for managing runoff on the site. The Permanent Stormwater Quality Control Plan will become Part 6 of the Storm Water Treatment Plan.

The Permanent Stormwater Quality Control Plan should contain the following sections:

1. Narrative including
   - Selected source control BMPs
   - Selected permanent runoff treatment and streambank erosion control BMPs
   - Description of maintenance procedures for each BMP
2. Site Plan, including
   - Vicinity map clearly locating property

- Existing structures topography, vegetation, soils, critical areas, drainage systems, etc.
- Road rights-of-way and easements and setback requirements
- Proposed lot layout, topography, structures, drainage system, impervious areas, access, etc.
- Location of all stormwater control Best Management Practices, including structural details

3. Calculations, showing how treatment controls were sized and designed

The selection process for permanent stormwater control BMPs is discussed in detail in Section 7.

Step 6: Finalize Development Layout and the Existing and Proposed Conditions Section

Locate the design permanent stormwater control and related conveyance facilities on-site to provide discharge at natural locations. Account for these facilities when finalizing the development layout. The final development layout should be shown on the plot plan or construction plan for Part 3 of the Storm Water Treatment Plan.

Incorporate the information developed from steps 2, 4, and 5 into a narrative describing the Existing and Proposed conditions, including all pertinent information that justifies BMP selection, sizing, and location.

Step 7: Prepare a Storm Water Pollution Prevention Plan and Evaluate Threat to Water Quality

A SWPPP is a plan for temporary control of pollution generated during construction. The Storm Water Treatment Plan should contain one of three types of SWPPPs (Type 1, 2, and 3) which differ in detail and scope depending on the area of disturbance. Complete and submit either Checklist #1 or Checklist #2 (from AG-21; Appendix B). See Section 5 of this manual for detailed information.

If the area of disturbance is less than five acres, evaluate the site's potential threat to water quality by completing the Construction Runoff Threat Analysis Form, Checklist #3 (from AG-21, Appendix B). Submit this with the SWPPP.

Step 8: Prepare a Dewatering Plan

If groundwater will be involved or it is known that dewatering is planned, the Storm Water Treatment Plan must include Dewatering Plan that describes how and under what conditions and controls groundwater, pumped water, and other non-stormwater or stormwater mixed with non-stormwater will be discharged from the site. See Section 6 of this manual for detailed information.

Step 9: Prepare a Maintenance and Operation Manual

The Storm Water Treatment Plan must contain the maintenance and operations procedures for all BMPs and related structures. Include a statement identifying persons who will own, operate, and maintain the proposed system(s). If site activities require coverage under the MultiSector General Permit, submit the SWPPP that has been prepared. If site activities require a Spill Prevention Control and Countermeasure (SPCC) plan, submit the SPCC plan that has been prepared for the site.

Step 10: Submit As-built Drawings of Stormwater Control Facilities

Submit as-built drawings, stamped by the engineer, at the completion of construction activity involving permanent BMPS and other permanent stormwater control facilities. As-built information for shall be marked on a clean set of full-size paper copy drawings and submitted to WMS Crossed out information shall remain legible. The name of the as-built drawing preparer and the date of preparation shall appear on each sheet.

3.3 SWTP Reviews

The SWTP will be reviewed by the MOA and approved if deemed acceptable. If not, comments will be provided, noting corrections that must be addressed and resubmitted. Written approval will be provided when the plan is acceptable.

3.4 Changes in Approved SWTPs

3.4.1 Changes in Temporary Controls

Updated plans for changing site conditions are required for all activities requiring a Type 2 or 3 SWPPP. These updates allow the construction team to address differing site conditions; changes in the schedule, sequences, or methods of construction. Plan updates also allow removal of areas from permit coverage, for sites covered by the EPA CGP. BMP substitutions can expose the environment to erosion and sedimentation when done improperly.

Changes in temporary controls do not need to be submitted to WMS but must be described, dated, and signed in the on-site copy of the Type 2 or 3 SWPPP. Changes in Type 3 SWPPPs must be documented and conducted in accordance with the CGP.

3.4.2 Changes in Permanent Controls

To ensure that the BMPs are appropriate for a construction project, the MOA requires that any changes to permanent controls in an approved plan be submitted for approval prior to implementation, unless waived in writing by a Municipal stormwater inspector. Any re-submittal must go to the MOA for storm water review and approval. The re-submittal should include enough information to allow the reviewer to determine if the change is warranted, and that the substitution or revised plan will work as intended.

3.4.3 Changes in Maintenance Plans and SWPPPs for Industrial Facilities

Changes in maintenance plans or SWPPPs written for industrial facilities other than construction sites do not need to be resubmitted to WMS but must be described, dated, and signed in the on-site copy of the maintenance plan or SWPPP. For SWPPPs written for compliance with the MSGP, changes must be documented and conducted in accordance with the MSGP.

3.5 Municipal Inspections

Site inspections performed by the MOA stormwater inspectors will be completed periodically during construction. At a minimum, these will be conducted at the frequency listed in Table 3-2, and will result in the production of an inspection report. The inspection report contains a record of any compliance or non-compliance found at the project site.

Table 3-2 Municipal Inspection Frequency

Site	Municipal Inspection Frequency
(A) All sites disturbing 5 acres or more (B) All other sites disturbing 10,000 square feet or more, or are part of larger common plan of development, which are determined to be a significant threat to water quality	At least monthly during the construction season.
C) All other construction sites disturbing 10,000 square feet or more, or part of larger common plan of development and do not meet the criteria specified in (A) or (B)	At least once per construction season
(D) Construction sites disturbing less than 10,000 square feet	Inspection must occur as needed based on evaluation of the factors that are a threat to water quality.

MOA inspection frequency may depend on evaluation of the site condition's threat to water quality. Factors affecting this evaluation include soil erosion potential, site slope, project size and type, site proximity to receiving water bodies, sensitivity of receiving water bodies, non-storm water discharges, and past record of non-compliance by the operators of the construction sites. In order for the operator to know whether and MOA to be informed when a project disturbing five acres or less is a threat or significant threat to water quality, the Construction Runoff Threat Analysis Form (Checklist #3 on AG-21) must be completed and submitted with the SWTP.

4 BEST MANAGEMENT PRACTICES

Stormwater controls are often referred to as Best Management Practices, or BMPs. BMPs are schedules of activities, regulatory prohibitions, physical structures, maintenance procedures, and management decisions that prevent or reduce the release of pollutants and other negative impacts to waters.

The goal for BMP selection and implementation is that storm water discharges shall meet local, state, and Federal requirements, specifically: AMC 21 Drainage and Water Pollution Control, 18 AAC 70 Water Quality Standards, and the Clean Water Act 33 United States Code 1251 et. seq., as amended by the Water Quality Act of 1987, Public Law 100-4.

In most instances, one BMP will not provide enough treatment to meet water quality standards. Therefore, many designs incorporate multiple BMPs in series, called treatment trains. Through the use of multiple BMPs, the strengths of each BMP can be taken advantage of, and the joining and combining of processes can address weaknesses.

4.1 Best Management Practice Toolbox Overview

A BMP is a tool, and it is critical that the most appropriate tool be selected to address a specific erosion and sediment control problem. Use of the wrong BMP for a particular application might ultimately work, however, the task will not be done as effectively as it would be with the right BMP. A brief discussion about the selection, implementation, and maintenance of BMPs that are useful in Anchorage is presented in Appendix A. The toolbox presented, however, is not intended to be comprehensive, and alternate individual engineering solutions will be reviewed and considered by the MOA.

4.1.1 Best Management Practice Equivalency and Design Parameters

BMP design and implementation is a dynamic and creative process. All potential scenarios have not been addressed in this manual for the design, construction, materials, and implementation of BMPs. To allow for creativity and innovations in BMP use, general design principles are given as guidance in this manual (see the BMP Toolbox in Appendix A). Equivalency to these principles is generally acceptable as well. The objective is clear; all discharges must meet water quality standards. How each construction site meets this objective is up to the design and construction team.

4.1.2 Site Considerations

Assuming the design is correct, the implementation of the BMPs should be in accordance with the approved plans. The only exception is that the characteristics of the project site will change over time as the earth-moving and land-disturbance operations progress. As the site characteristics change, BMPs may also need revision and replacement to accommodate the different grades and slopes of the landmasses. In some instances, the design may not have considered all features of the site and adjacent areas, and may need revisions to operate effectively. The contractor should be aware of this fact and that immediate action to remedy the deficiencies, such as contacting the engineer, may be required.

4.2 Best Management Practices Types

The selection of a BMP must be based on the soil properties, topography, rainfall characteristics, construction schedule, and storm water flow characteristics at a construction site. BMPs fall into two main categories - procedural and physical - both of which can be either permanent or temporary controls. Procedural BMPs are the planning, design, maintenance, and education measures that are applied on a project in order to protect the environment from erosion and sedimentation effects. Procedural controls rely on processes rather than devices to provide environmental protection.

4.2.1 Temporary Controls: Erosion and Sediment Control (ESC) Practices

The goal of erosion and sediment control (ESC) practices is to keep sediments from leaving a construction site. The operator must implement control measures to minimize pollutants in storm water discharges. The term "minimize" means reduce and/or eliminate to the extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice.

The operator must select, install, and maintain control measures (e.g., Best Management Practices ("BMPs"), controls, practices, etc.) for each major construction activity during the project. All control measures must be properly selected, installed, and maintained in accordance with any relevant manufacturer specifications and good engineering practices. The operator must implement the control measures from commencement of construction activity until final stabilization is complete. [1]

The most cost-effective and efficient way of reducing erosion and sedimentation from a construction site is to not let the soil mobilize in the first place. In recognition of this fact, upstream controls work more effectively, and are less costly in reducing erosion and sedimentation than are downstream controls. It is much easier and cheaper to reduce erosion than to remove mobilized sediments. Appendix H gives an overview of the effect of land disturbing activities on erosion, sedimentation, and runoff.

ESC practices fall into three major classes: erosion prevention, erosion control, and sediment control. These three classes are discussed in more detail below.

- **Erosion Prevention**

Erosion prevention is any means used to keep soil particles in place. Erosion prevention is the least expensive option of all ESC practices and should be the first line of defense employed. Many erosion prevention efforts can occur without any physical modification of a site, and include planning, training, scheduling, sequencing, and land management practices. The easiest and most cost-effective erosion prevention measure is to minimize the area of disturbance and retain existing vegetation. However, if used as the exclusive ESC practice, erosion prevention would result in a no-build alternative, which is normally not feasible.

- **Erosion Control**

Erosion control is a practical alternative to the exclusive use of erosion prevention, and should be the primary ESC practice employed on construction sites. In its simplest form, erosion control consists of preventing soils in construction areas from being mobilized. Erosion control minimizes the forces from raindrops, concentrated runoff flows, and wind, each of which detach and transport soil particles. Erosion controls treat the soil as a valued resource that must be conserved in place. Most of the current literature on erosion control promotes several key concepts:

- Minimize areas of disturbance – Undisturbed natural vegetation is the best inhibitor of erosion. As a rule, it takes five years for erosion rates of areas disturbed by construction and subsequently revegetated to return to pre-construction rates.
- Cover and stabilize disturbed areas as soon as possible. Any efforts to quickly cover areas of disturbance are rewarded with reduced soil erosion.
- Sequence and schedule construction to take advantage of weather patterns – Proper sequencing and scheduling of construction offers many benefits, such as reduced ESC costs, quicker re-establishment of vegetation, and protection of the environment.
- Divert runoff around erodible areas – Measures that keep flow from traversing disturbed areas reduce the need for additional sediment control efforts. Diversion ditches and benching are effective means of routing runoff away from erodible surfaces.

[1] 2009 APDES CGP Part 3

- Reduce runoff quantities and velocities – Keeping runoff velocities low offers significant savings in ESC. The doubling of runoff velocity theoretically results a 64-fold increase in the size of a particle that can be transported. Lining drainage channels with materials such as rock, erosion control blankets, or vegetation reduces velocities and enables the channels to perform more similarly to natural stream channels than channels with smooth armoring.
- Prepare the drainage system to handle flows occurring during both construction and post-construction conditions – Construction of drainage systems and impervious surfaces alters the natural runoff regime, and results in higher peak flows and increased runoff volumes. These changes in the flow regime must be addressed at the discharge points downstream of the site to ensure that adverse effects do not occur. Measures to control peak flow may be necessary at points where erosion is possible.
- Inspect and maintain erosion control measures – Erosion control measures can become sources of pollutants and sediment if not properly maintained. In some cases, unmaintained ESC measures can create bigger problems than if no controls were present.

- **Sediment Control**

Sediment controls are used to keep sediment from leaving a construction site. Sediment control is any mechanism that removes sediment from water by filtration, gravity, chemical, or other means. Unlike erosion controls, sediment controls treat the soil as a waste product that must be continually removed and disposed of properly. Sediment control is the least cost-effective means to meet ESC objectives, since removal of sediment from runoff is more costly than keeping soil in place. Sediment controls for the construction phase shall be designed to handle two-year, 24-hour duration storm without damage to the BMP itself and without any degradation to the water quality of the receiving water body.[2] The two-year 24-hour storm event is defined in the *Municipality of Anchorage Drainage Design Guidelines.*

4.2.2 Permanent Physical Controls

Physical controls are devices that alter the flow, velocity, duration, and other characteristics of runoff to provide environmental protection. They vary from simple grass-lined ditches to elaborate proprietary systems. Most physical controls require regular maintenance or other procedural controls. Three categories of physical controls are described below and discussed further in Section 7.

- **Source Control**

Source control BMPs prevent pollution, prevent or minimize the loss of soil from the land, or prevent other adverse effects of storm water. Source control BMPs can be either procedural or physical.

- **Treatment Controls**

Treatment BMPs include facilities that remove pollutants by simple gravity settling of particulate pollutants, filtration, centrifugal force, biological uptake, chemical addition, or soil adsorption.

- **Flow Attenuation and Control**

Flow control BMPs typically control the rate, frequency, and flow duration of storm water surface runoff and include practices that divert flows away from disturbed areas. Flow control measures help mitigate the erosive forces and transport functions of runoff.

[2] 2009 APDES CGP Part 3.1.1