ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT FACT SHEET – DRAFT

Permit Number: AKS052558

Anchorage Municipal Separate Storm Sewer System

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Public Comment Period Start Date: May 1, 2020
Public Comment Expiration Date: June 1, 2020
Alaska Online Public Notice System

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Issuance of the Alaska Pollutant Discharge Elimination System (APDES) Permit for Storm Water Discharges from the Municipal Separate Storm Sewer System (MS4) within the

MUNICIPALITY OF ANCHORAGE AND THE ALASKA DEPARTMENT OF TRANSPORATATION AND PUBLIC FACILITIES
(hereafter "permittees")

The Alaska Department of Environmental Conservation (the Department or DEC) is issuing a MS4 Permit (permit) for discharges from a Phase I MS4. The permit authorizes and sets conditions on the discharge of pollutants from municipal activities to waters of the United States. In order to ensure protection of water quality and human health, the permit establishes conditions, prohibitions, and management practices for discharges of storm water from the MS4s owned or operated by the permittee.

This fact sheet explains the nature of potential discharges from MS4 activities and the steps in the development of the permit, including:

- Information on public comment, public hearing, and appeal procedures;
- A listing of proposed control measures and other conditions;
- Technical material supporting the conditions in the permit; and
- Proposed inspection, monitoring, and reporting requirements in the permit.

Appeal Process

The Department has both an informal review process and a formal administrative appeals process for final APDES permit decisions. An informal review request must be delivered within 20 days after receiving the Departments decision to the Director of the Division of Water at the following address:

Director, Division of Water
Alaska Department of Environmental Conservation
P.O. Box 111800
Juneau, AK 99811-1800

Location: 410 Willoughby Avenue, Juneau

Interested persons can review 18 AAC 15.185 for the procedures and substantive requirements regarding a request for an informal Department review. See http://dec.alaska.gov/commish/review-guidance/informal-reviews for information regarding reviews of Department decisions.

An adjudicatory hearing request must be delivered to the Commissioner of the Department within 30 days of the permit decision or a decision issued under the informal review process. An adjudicatory hearing will be conducted by an administrative law judge in the Office of Administrative Hearings within the Department of Administration. A written request for an adjudicatory hearing shall be delivered to the Commissioner at the following address:

Commissioner
Alaska Department of Environmental Conservation
P.O. Box 111800
Juneau, AK 99811-1800

Location: 410 Willoughby Avenue, Juneau

Interested persons can review 18 AAC 15.200 for the procedures and substantive requirements regarding a request for an adjudicatory hearing. See http://dec.alaska.gov/commish/review-guidance/ for information regarding appeals of Department decisions.

Documents are Available

The permit, fact sheet, and related documents can be obtained by visiting or contacting the Department between 8:00 a.m. and 4:30 p.m., Monday through Friday at the addresses below. The permit, fact sheet, and related documents can also be located on the Departments Wastewater Discharge Authorization Program website https://dec.alaska.gov/water/wastewater/.

Dept of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501
(907) 269-6285

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1.0 INTRODUCTION

The Alaska Department of Environmental Conservation (the Department or DEC) is proposing to reissue an Alaska Pollutant Discharge Elimination System (APDES) permit that authorizes the discharge of pollutants in storm water discharges associated with municipal separate storm sewer systems (MS4s).

The permit and fact sheet reference various state and federal regulations. The state regulations are found in the Alaska Administrative Code (AAC), Chapter 83 "Alaska Pollutant Discharge Elimination System Program" (18 AAC 83). The federal regulations are incorporated by reference into the state APDES regulations in 18 AAC 83.010(b)(3). As an aid to readers, however, the permit and fact sheet in some areas cite the federal regulations where specific regulatory language can be found. If any discrepancy exists between the fact sheet and the actual permit language, the permittee must comply with the permit as written.

The Environmental Protection Agency (EPA) defines "municipal separate storm sewer" and those considered to be "large" and "medium" as Phase I MS4's and "small" as Phase II MS4's at Title 40 Code of Federal Regulations (CFR) § 122.26(b). In general, a MS4 includes any publicly-owned conveyance or system of conveyances used for collecting and conveying storm water that discharges to waters of the United States. An MS4 include roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, and storm drains. EPA has designated large, medium and small MS4s based on the population the system served; these regulated MS4s must obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for their discharges. MS4 permits require the implementation of storm water management program (SWMP) to control pollutants in the MS4 discharge to the maximum extent practicable (MEP). The regulatory background for the NPDES municipal storm water permit program, the types of pollutants typically found in urban runoff, and other information can be found in Appendix A of the fact sheet for the 2010 permit.

2.0 BACKGROUND

2.1 Delegation of Authority

In October 2008, EPA approved Alaska's application to administer the NPDES Program in the State of Alaska. The State's program is called the APDES Program. EPA's approval of the application included transferring authority to administer the APDES Program in phases. Authority to administer the storm water program transferred to DEC on October 31, 2009.

2.2 Permit Area and Applicants

In accordance with Section 402(p) of the Clean Water Act (CWA) and federal regulations at 40 CFR §122.32, the permit coverage area is on a system-wide basis for the following MS4 operators:

Permittee	Physical Address	Mailing Address
Municipality of Anchorage (MOA) Watershed Management Section Project Management & Engineering Department	4700 Elmore Road Anchorage, Alaska 99507	P.O. Box 196650 Anchorage, Alaska 99519
Alaska Department of Transportation and Public Facilities (DOT&PF) Central Region	4111 Aviation Avenue Anchorage, Alaska 99519	4111 Aviation Avenue Anchorage, AK 99519

The MS4s owned and operated by the permittees are located within the corporate boundary of the MOA. Surface runoff within the MOA is directed to a network of subsurface conveyances, ditches, and surface streets. These systems provide drainage for an area of approximately 1,955 square miles, which includes the areas under the direct jurisdiction of the MOA, as well as the smaller communities of Eagle River, Girdwood, Chugiak, and Eklutna. The MS4s discharge to waters of the United States, as discussed below in Section 3.2.

The permit specifically authorizes the discharge of urban runoff through the MS4s owned and operated by the MOA and DOT&PF, provided the permittees comply with the permit terms and conditions limiting the discharge of pollutants to their MS4s to the maximum extent practicable (MEP).

Regulated storm water discharges associated with industrial activity and/or construction activity are authorized to discharge through these MS4s, only when those discharges are separately permitted under the appropriate APDES permit. For example, storm water discharges associated with air transportation activities at facilities owned by the permittees, namely Ted Steven International Airport and Merrill Field, are separately required to manage pollutants from aircraft, vehicle and equipment maintenance and cleaning areas. They must obtain authorization to discharge such "industrial storm water" through the Ted Stevens Anchorage International Airport General Permit (ANC-GP) and DEC's Multi-Sector General Permit for Storm water Discharges Associated with Industrial Activities (Permit #AKR060000) (MSGP), respectively. Storm water discharges from gravel or sand sources owned or operated by the permittees must obtain APDES permit coverage under the MSGP. Currently, there are twenty-nine facilities that operate under the MSGP for industrial discharges of storm water with the MOA MS4. Discharge from vehicle or equipment maintenance areas must be permitted under the MSGP. Discharges from construction activities disturbing one or more acres operated by the permittees are subject to the requirements of the APDES General Permit for Storm water Discharges from Construction Activity (Permit #AKR100000) (Construction General Permit or CGP).

Storm water discharges from all other MOA or DOT&PF areas and facilities that are not associated with regulated industrial operations or construction activity meeting the regulatory definition at 40 CFR 122.26(b)(14) and (15) – including, but not limited to, drainage and runoff from permittee-owned parking areas, storage areas, and/or structural storm water runoff management controls – are therefore authorized by this permit.

There are two MS4 permitted areas within the corporate boundary of the MOA: Port of Alaska and Joint Base Elmendorf-Richardson. While they operate within the corporate boundary of the MOA MS4, they are separate and excluded from the requirements of the MOA MS4 because they are operating under their own separate MS4 permit requirements.

2.3 Description of the Permittee

The terms municipal separate storm sewer and small municipal separate storm sewer system are defined at 40 CFR §122.26(b)(8) and (b)(16), respectively. MS4s include any publicly-owned conveyance or system of conveyances used for collecting and conveying storm water that discharges to waters of the United States. The term municipality is defined at 40 CFR §122.2. An MS4 can be owned or operated by a federal, state, local or tribal entity, and includes systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings or industrial facilities.

The permittee's surface runoff within its jurisdiction is directed to a system of mostly interconnected conveyances, which consist of subsurface storm sewers, roadside ditches, and surface streets.

2.4 Permit History

EPA previously issued an NPDES permit for the MS4s owned and operated by the MOA and the ADOT&PF on January 5, 1999; the permit expired on October 28, 2003. Following the application requirements specified in 40 CFR § 122.26(d) and direction from EPA, the permittees submitted an application for reissuance of their permit to EPA on July 9, 2003. The permit was reissued on October 29, 2009, based on a complete application, with an effective date of February 1, 2010. The expiration date for the permit was January 31, 2015. The permit was reissued and became effective on August 1, 2015. The expiration date is July 31, 2020.

2.5 Storm Water Management Program Accomplishments

The permittees have managed urban storm water discharges from their MS4s in accordance with their storm water management program and associated NPDES permit requirements since 1995. During the permit term (February 1, 2010 to January 31, 2015), the permittees produced a variety of specific assessments and guidance material to address storm water discharges within the MOA, including the following:

- Little Campbell Creek Management Plan, 2010;
- Street Sweeping Performance and Assessment Report, 2010, 2011, 2012, 2013, 2014;
- Public Perception Survey, 2010;
- Dry Weather Screening Report, 2011, 2012, 2013, 2014;
- Anchorage Education Program Report, 2011, 2012, 2013, 2014;
- Storm Water Outfall Monitoring Report, 2011, 2012, 2013, 2014;
- Sedimentation Basin OGS Evaluation Project Report, 2012;
- Street Sweeping and Storm Water Controls Performance Evaluation, 2013;
- Snow Site Controls Monitoring, 2013;
- Low Impact Development Monitoring Report, 2013, 2014;
- Low Impact Development Implementation Plan, 2014; and
- Annual Meeting Report, 2011, 2012, 2013, 2014.

During the permit term August 1, 2015 to July 31, 2020 the permittees produced a variety of specific assessments and guidance material to address storm water discharges within the MOA, including the following:

- Anchorage Education Program Report, 2016, 2017, 2018, 2019;
- Annual Meeting Report, 2016, 2017, 2018, 2019, 2020;
- Street Sweeping Performance and Assessment Report, 2016, 2017, 2018;
- Catch Basin Fill Rate Data, 2018;
- Covered Sand Storage Evaluation, 2018;
- Dry Weather Screening Report, 2016, 2017, 2018;
- Low Impact Development Evaluation, 2018;

- Pesticide Use Report, 2016, 2017;
- Prohibited Discharge Complaints Map, 2016, 2018;
- Public Outreach Report, 2016;
- Storm Water Outfall Monitoring Report, 2016, 2017, 2018, 2019;
- Storm Water Outfall Monitoring Evaluation, 2018;
- Street Sweeping Report, 2017, 2018;
- Snow Disposal Site Monitoring Data Report, 2016, 2017, 2018;
- SOP Updates, 2016, 2017; and
- SWPPP Inspection Report, 2016, 2017, 2018.

3.0 DESCRIPTION OF MUNICIPALITY AND RECEIVING WATERS

3.1 Municipal Activity

3.1.1 Municipal Summary

Anchorage (officially called the Municipality of Anchorage, MOA) is a unified home rule municipality in the southcentral part of Alaska. It is the northernmost city in the United States with more than 100,00 residents and is the largest community in North America north of the 60th parallel. With an estimated 291,538 residents in 2018, it is Alaska's most populous city and contains more than 40 percent of the state's total population. The municipality has a total area of 1,961.1 square mile, of which 1,697.2 sq. mi. is land and 263.9 sq.mi. is water. Anchorage lies in a subarctic climate but with strong maritime influences that effect a moderate climate. In regard to rainfall, the climate has semi-arid influences. The average annual precipitation at the airport is 15.9 inches. Most of the precipitation falls in late summer. Average daytime summer temperatures range from approximately 55 to 78 degrees F; average daytime winter temperatures range from 5 to 30 degrees F. Anchorage has a frost-free growing season that averages slightly over 101 days.

Anchorage's largest economic sectors include transportation, military, municipal, state, and federal government, tourism, corporate headquarters for oil and gas industry, and resource extraction. Ted Stevens Anchorage International Airport (ANC) is the world's third busiest airport for cargo traffic. Joint Base Elmendorf-Richardson is a combined Air Force Base and Army Installation that employs approximately 8,500 civilian and military personnel.

3.1.2 Precipitation and Temperature

The National Oceanic and Atmospheric Administration's (NOAA) Western Regional Climate Center maintains historical climate information for various weather stations throughout the western United States. Annual average precipitation at the airport in Anchorage is approximately 15.9 water equivalent inches per year (see Figure 1 and Figure 2). Snow is the predominant precipitation during the winter months.

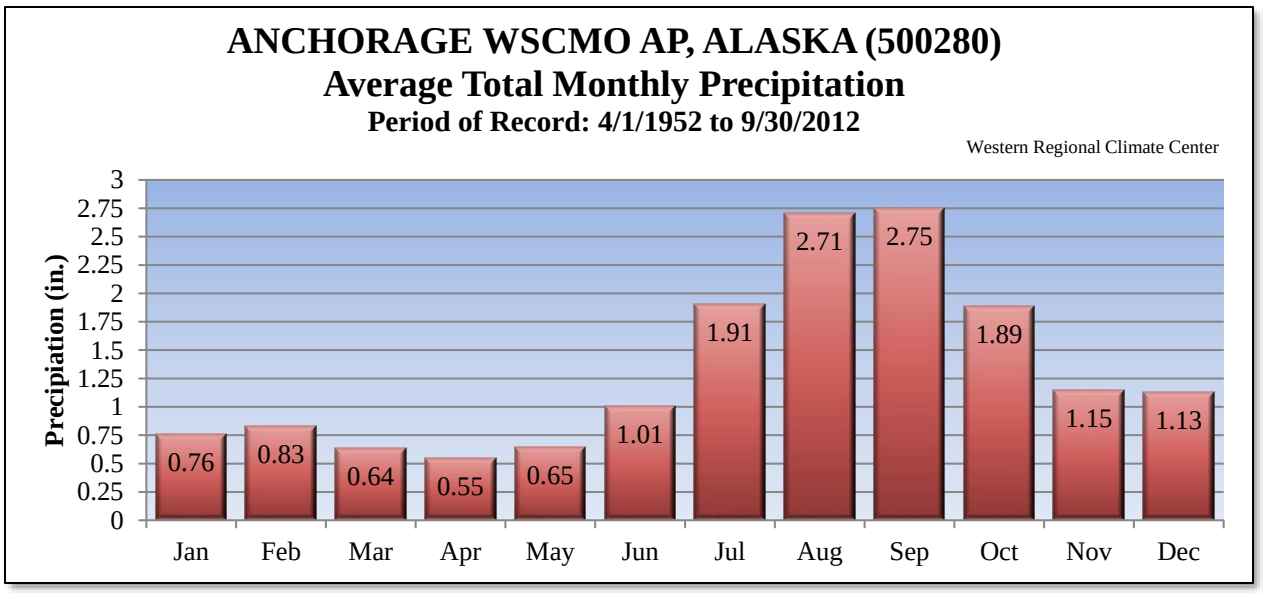

Figure 1: Average Total Monthly Precipitation (water equivalent) in Anchorage, Alaska

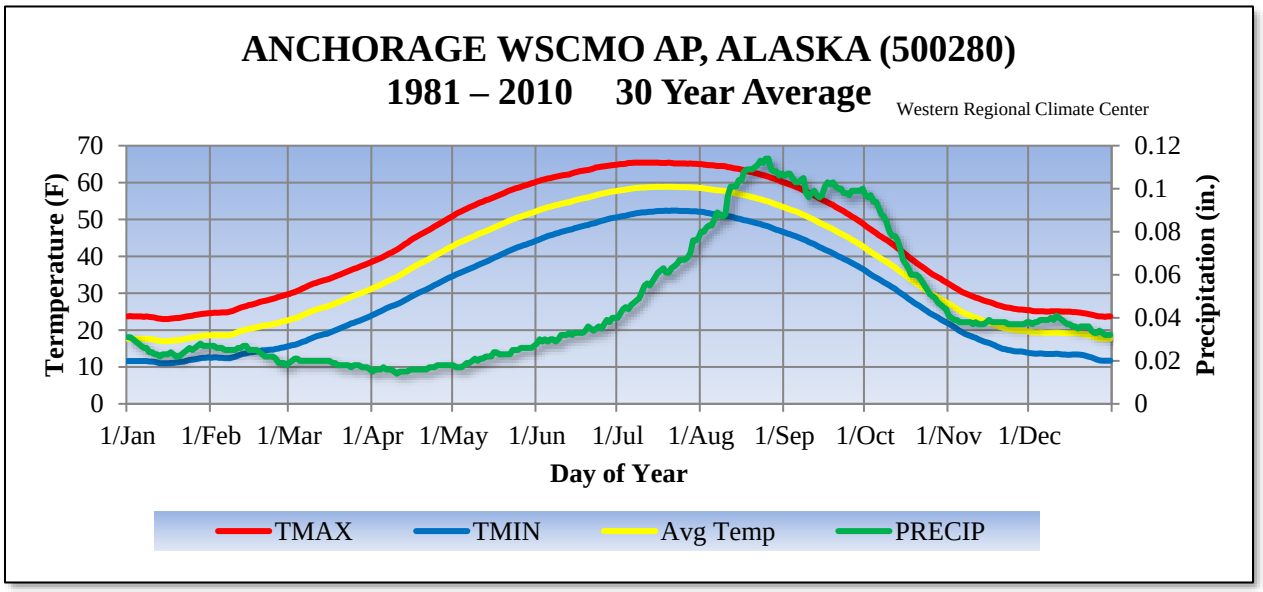

Figure 2: Temperature record for Anchorage

The average rainfall depth in the Anchorage area, based on 45 years of 24-hour precipitation data obtained from NOAA and collected at Anchorage International Airport, demonstrates that approximately 90% of all storms in the Anchorage area result in a rainfall volume of 0.52 inches or less (USEPA 2010 Fact Sheet, Appendix E).

3.2 Receiving Waters

3.2.1 Water Quality Standards

Regulations in 18 AAC 70 require that the conditions in permits ensure compliance with Alaska Water Quality Standards (WQS). The state's WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an antidegradation policy. The use classification system designates the beneficial uses that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the state to support the beneficial use classification

of each water body. The antidegradation policy ensures that the beneficial uses and existing water quality are maintained.

Water bodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230 as listed under 18 AAC 70.230(e). Some water bodies in Alaska can also have site-specific water quality criterion per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b).

Alaska WQS designate seven uses for fresh waters (A) water supply: (i) drinking; culinary, and food processing; (ii) agriculture, including irrigation and stock watering; (iii) aquaculture; (iv) industrial; (B) water recreation: (i) contact recreation, (ii) secondary recreation; and (C) growth and propagation of fish, shellfish, other aquatic life, and wildlife. Waters within MOA have been classified by DEC in 18 AAC 70.020 as fresh water with the designated uses described above.

For marine waters Alaska WQS designate seven uses (A) water supply (aquaculture, seafood processing, and industrial); (B) water recreation (contact and secondary); (C) growth and propagation of fish, shellfish, other aquatic life, and wildlife; and (D) harvesting for consumption of raw mollusks or other raw aquatic life. Waters adjacent to MOA's western boundary (Knik Arm) have been classified by DEC in 18 AAC 70.020 as marine water with the designated uses described above.

3.2.2 Water Quality Status of Receiving Water

DEC proposes to authorize storm water discharges from the MS4s owned and operated by the permittees to waters of the United States within the corporate limits of the MOA.

Waters receiving discharges from the MS4s include: Cook Inlet, Knik River, Eklutna River, Edmonds Lake Creek, Mink Creek, Parks Creek, Mirror Creek, Little Peters Creek, Peters Creek, Carol Creek, Fire Creek, Eagle River, Meadow Creek, South Fork Eagle River, Ship Creek, Chester Creek, North Fork Chester Creek, Middle Fork Chester Creek, South Fork Chester Creek, Fish Creek, Campbell Creek, North Fork Campbell Creek, South Fork Campbell Creek, Little Campbell Creek, Craig Creek, Bayshore Creek, Furrow Creek, Hood Creek, Little Survival Creek, Rabbit Creek, Elmore Creek, Little Rabbit Creek, Potter Creek, Rainbow Creek, Bird Creek, Indian Creek, Tidewater Slough, Alyeska Creek, California Creek, Glacier Creek, Virgin Creek, Winner Creek, Crow Creek, Peterson Creek, Twentymile River, Portage Creek, and Placer River, their tributaries, associated lake systems, and wetlands

In 18 AAC 70.020, DEC has classified state waters within MOA as:

- fresh water, with the following designated uses: water supply, water recreation, and growth and propagation of fish, shellfish, other aquatic life, and wildlife; and
- marine water, with the following designated uses: water supply, water recreation, and growth and propagation of fish, shellfish, other aquatic life, and wildlife with the addition of harvesting for consumption of raw mollusks or other raw aquatic life.

3.2.3 Potential Municipal Impact on Water Quality

Storm water is the surface runoff that results from precipitation events and snow melt. Storm water flowing across land surfaces has the potential to contain or mobilize high levels of contaminants. Under most natural conditions, storm water runoff is slowed and filtered as it flows through vegetation and wetlands. These flows soak into the ground, gradually recharging groundwater, and eventually seep into surface receiving waters.

Urban development has significantly altered the natural infiltration capability of the land, and often generates a host of pollutants that are associated with the activities of dense populations. This developed

area in turn causes an increase in storm water runoff volumes and pollutant loadings in the storm water discharged to receiving waters. Urban development increases the amount of impervious surface in a watershed, as naturally vegetated areas are replaced with parking lots, roadways, and commercial, industrial, and residential structures. These surfaces inhibit rainfall infiltration into the soil and reduce evaporation and transpiration, thereby increasing the amount of precipitation which is converted to runoff. Storm water and snow melt runoff washes over impervious surfaces, picking up pollutants while gaining speed and volume because of the inability to disperse and filter into the ground.[1]

Uncontrolled storm water discharges from areas of urban development can negatively impact receiving waters by changing the physical, biological, and chemical composition of the water, resulting in an unhealthy environment for aquatic organisms, wildlife, and humans. The Nationwide Urban Runoff Program (NURP), conducted by EPA between 1978 through 1983, demonstrated that storm water runoff is a significant source of pollutants. The study indicated that discharges from separate storm sewer systems draining from residential, commercial, and light industrial areas carried more than 10 times the annual loadings of total suspended solids (TSS) than discharges from municipal sewage treatment plants providing secondary treatment. The study also identified a variety of other contaminants, such as oil and grease, copper, lead, and zinc that were detected frequently at levels of concern. Numerous other studies and reports have confirmed the average pollutant concentration data collected in the NURP study.

3.2.4 Impaired Waters

A number of water bodies in the greater Anchorage watershed are on the 303(d) list of impaired waters. The WQS that have been exceeded historically include those for fecal coliform, dissolved oxygen and petroleum products. In analyses done to 2009, the source of these pollutants has been broadly attributed to storm water runoff within the greater Anchorage area. Thirteen fecal coliform TMDLs developed for various water bodies in the Anchorage area have been completed by DEC and are approved by EPA. ADEC, 2010)

Discharges to Ship Creek are subject to additional constraints as Ship Creek is designated as “impaired” on DEC’s CWA §303(d) list due to increased levels of fecal coliform bacteria and petroleum, oil, and grease. Any water body that does not, or is not expected to meet applicable WQS is described as impaired or as a water quality-limited segment. Section §303(d) of the CWA requires states to develop Total Maximum Daily Load (TMDL) management plans for water bodies that are determined to be impaired. A TMDL is the amount or loading capacity of a specific pollutant that a water body can receive and still comply with applicable WQS, such as those mandated by the CWA.

The segment of Ship Creek from the mouth to the Glenn Highway bridge was originally Section §303(d) listed because fecal coliform bacteria and petroleum hydrocarbons, oil and grease exceeded the respective water quality standards for these parameters. An approximate two-mile stretch within this segment of Ship Creek (Glenn Highway bridge to mouth of Ship Creek) traverses Joint Base Elmendorf Richardson (JBER), and the JBER storm sewer system outfall discharges to Ship Creek 1.3 miles downstream from the upper boundary of the impaired segment.

3.2.4.1 Petroleum Hydrocarbons, Oil, and Grease

DEC has not established a TMDL for petroleum hydrocarbons, oil, and grease in Ship Creek. This means that Ship Creek is a Category 5, Section 303(d) listed water body with respect to petroleum hydrocarbons, oil, and grease. Category 5 water bodies are impaired by pollutant(s) for one or more designated uses and are awaiting establishment of a TMDL. In 2011, DEC completed a petroleum hydrocarbon assessment of Ship Creek. The finding of the report was Ship Creek is currently meeting

[1] 64 FR 68725-27 (December 8, 1999)

state WQS for petroleum hydrocarbon. DEC in its draft 2012 Integrated Report to EPA requested that the impairment status be removed. As of April 2015 , the draft *2012 Integrated Report* had not been approved by EPA, so the impairment status has not changed. The Final *2012 Integrated Report* removed Ship Creek listing for Petroleum Hydrocarbons from Category 5 and placed it in Category 2.

3.2.4.2 Fecal Coliform Bacteria

DEC listed Ship Creek on its 1990 CWA section §303(d) list of impaired waterbodies for excessively high levels of fecal coliform bacteria. Ship Creek is still on the list but has a TMDL (DEC, 2004). This means that Ship Creek is a Category 4a water body with respect to fecal coliform bacteria impairment. Category 4a water bodies are impaired, but TMDLs have been established for them.

The fecal coliform bacteria levels found in Ship Creek regularly exceed State of Alaska thresholds for contact recreation such as wading and boating.

Throughout the Anchorage area, there are fourteen water bodies, including Ship Creek, listed as impaired due to the presence of fecal coliform bacteria. Potential sources of fecal coliform bacteria include the waste of all warm blooded animals including human sewage. Sewer system leaks are not considered to be a notable source in the Anchorage area. Domestic and wild animals are the greatest sources of the bacteria. Wild animals with the greatest contribution are likely waterfowl such as ducks and geese. Mammals such as moose and bears are also potential sources. Many wild animals use corridors along streams for forage and movement through populated areas. One of the largest sources of fecal coliform bacteria in Anchorage is domestic animals, mostly dogs. There are about 65,000 dogs in Anchorage, which produce 48,000 pounds of waste each day. Parks and paths near waterways as well as street runoff into storm drains are both conduits for fecal coliform bacteria to enter steams. JBER contributes both of the above discussed sources for potential fecal coliform bacteria pollution into Ship Creek.

High levels of fecal coliform bacteria can occur any time of year, though generally the coldest months of winter have lower levels. Spring snowmelt and periods of high rainfall during the summer often result in spikes of the bacteria in Ship Creek. Sediment influx is also a factor in the timing of fecal coliform bacteria spikes. Early spring generally has the highest spikes of fecal coliform bacteria due to the massive influx of sediment washed into streams from winter road sanding. The bacteria attach to grains of sand and can also sink to the bottom and are re-suspended later due to a high flow event. Street sweeping early in the spring greatly helps this problem by cleaning up a large portion of the grit and preventing it from washing down storm drains.

3.3 Total Maximum Daily Loads (TMDLs)

Any water body that does not, and/or is not expected to meet applicable water quality standards is described as “impaired” or as a “water quality-limited segment.” Section 305 of the Clean Water Act, 33 U.S.C. § 1315, requires the State to include that waterbody on its list of impaired waters submitted biannually to EPA for approval. Section 303(d) of the CWA, 33 U.S.C. § 1313(d), requires States to develop water quality management plans, in the form of Total Maximum Daily Loads (TMDLs), for water bodies determined by the State to be impaired. TMDLs define both waste load allocations (WLAs) and load allocations (LAs) that specify how much of a particular pollutant can be discharged from both regulated and unregulated sources, respectively, such that the waterbody will again meet State water quality standards.

A number of water bodies in the Anchorage watershed are on the State’s 303(d) of impaired waters. The WQS that have been exceeded include those for fecal coliform bacteria, dissolved oxygen and petroleum products. The source of these pollutants has been broadly attributed to storm water runoff. Thirteen fecal

coliform bacteria TMDLs developed for various water bodies in the Anchorage area have been completed and approved by EPA. Three additional TMDLs for fecal coliform bacteria, dissolved oxygen, and petroleum products are scheduled for completion by DEC in the coming years.

The permittees must work to reduce pollutant discharges in runoff from the urban area to meet the goals of the TMDLs such that these waters will again meet Alaska WQS. DEC has proposed actions and activities intended to specifically control fecal coliform bacteria and petroleum products as the primary pollutants of concern. DEC has also included requirements to broadly monitor and assess how effective such controls are when fully implemented by the permittees.

4.0 Basis for Permit Conditions

4.1 General Information

The conditions established by the permit are based on Section 402(p)(3)(B) of the CWA, 33 U.S.C. §1342(p)(3)(B), and 40 CFR 122.26 adopted by reference in 18 AAC 83.010(b)(3); which requires an APDES permit for MS4 discharges to 1) effectively prohibit non-storm water discharges from entering the MS4, and 2) require controls necessary to reduce pollutants in MS4 discharges to the MEP, including management practices, control techniques, system design and engineering methods, and other such provisions determined by DEC to be appropriate.

As authorized by 40 CFR §122.44(k), the permit will be utilizing BMPs, in the form of required pollution prevention measures and a comprehensive SWMP, as the mechanism to implement the statutory requirements. While Section 402(p)(3)(B)(iii) of the CWA clearly includes structural controls as a component of MEP, the Department encourages municipalities to first explore opportunities for pollution prevention measures, reserving more costly structural controls for where source controls are infeasible or ineffective.

EPA's permitting approach for storm water discharges uses best management practices (BMPs) in the first five year permit (1998 permit), and expanded or better tailored BMPs in subsequent permit(s) (2010 and 2015 permit) with the goal of WQS attainment. See *"Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits*," 61 Fed. Reg. 43761 (Aug. 26, 1996). EPA reiterated this approach to address how to incorporate WLAs for storm water discharges into NPDES permits in its November 2014 guidance entitled, "*Revisions to the November 22, 2002 Memorandum* "*Establishing Total Maximum Daily Load Wasteload Allocations for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs"* (USEPA 2014).[2]

For the 2020 permit, DEC determined that BMPs, implemented and enforced through a comprehensive storm water management program (SWMP), are the most effective mechanisms for reducing the discharge of pollutants to the MEP and for complying with the water quality provisions of the CWA. This permit proposes to continue the use of BMPs as the primary means to ensure storm water discharges meet WQS and the WLAs set forth in the TMDLs. In accordance with EPA policy and guidance, DEC also proposes monitoring and other specific actions based on the TMDL analysis to augment the SWMP activities set forth in the permittees NPDES permit application. Further discussion of these requirements is contained below.

[2] http://water.epa.gov/polwaste/npdes/stormwater/upload/EPA_SW_TMDL_Memo.pdf

4.2 Permit Requirements for TMDL Implementation

As previously noted, all APDES permit conditions must be consistent with the assumptions and requirements of available WLAs (see 40 C.F.R. § 122.44(d)(1)(vii)(B)). EPA's 2014 TMDL Guidance Memo (USEPA, 2014) further defines how NPDES permit conditions for regulated storm water discharges can be consistent with the assumptions and requirements of available WLAs through the use of narrative BMPs. Where BMPs are used as permit limitations to implement WLAs, the permit must require monitoring activities as necessary to assure compliance with the WLAs.

The TMDLs for receiving waters in the Anchorage area attribute storm water runoff as the sole contributor of fecal coliform bacteria, and, thus, assign the entire WLA to urban storm water from the regulated MS4s subject to the proposed permit. In two cases, the TMDLs for Jewell Lake and Hood/Spenard Lake, the TMDLs were approved before the issuance of the 2002 TMDL Guidance Memo (USEPA 2002) and therefore include storm water discharges as a load allocation. A load allocation is typically an allocation for non-point sources; however, within the Anchorage area, municipal storm water runoff is regulated under the APDES program and is therefore considered a point source. Despite the discrepancy, this permit recognizes also the load allocations attributed to runoff within these TMDLs.

As discussed above, the TMDL Guidance Memo recommends that the permitting authority (DEC) use BMPs to implement WLAs and load reduction targets in a APDES permit. In addition, when BMPs are used, the permit must provide a mechanism to require the use of expanded or better tailored BMPs when monitoring demonstrates they are necessary to implement the WLA and protect water quality. DEC uses this approach in the permit. As such, the permit requires the implementation of certain practices to meet the WLAs and load reduction targets. In addition, the permit requires water quality monitoring to help determine whether the permittees are meeting those WLAs and targets. If water quality monitoring indicates failure to protect water quality, DEC will consider re-evaluating the actions and activities outlined in the permit and may modify the permit requirements if necessary.

In its 2003 report entitled *Fecal Coliform in Anchorage Streams: Sources and Transport Processes*, the MOA determined that elevated fecal coliform bacteria concentrations in Anchorage streams occur mainly on a seasonal basis during summer associated with increasing rainfall and associated runoff. Fecal coliform bacteria levels appear to be directly responsive to snow melt, precipitation events, and increased seasonal stream flows. Different land uses within a particular watershed, combined with the types of storm drainage conveyances and the degree of stream modification, all in some manner affect fecal coliform bacteria levels found in a particular stream. The primary source of the elevated fecal coliform bacteria concentrations in Anchorage streams is of animal (non-human) origin, and is transported over landscaped surfaces within densely urbanized areas drained by curb and gutter piped conveyance systems. Runoff from rural residential areas also contributes fecal coliform bacteria to streams, but to a lesser degree, due to the ditched storm water conveyance systems that allow for more infiltration of storm water runoff. Domestic pets and wildlife, particularly waterfowl, are thought to be the primary sources of fecal coliform bacteria; secondary sources may include human contaminants mobilized from exposed garbage. Piped and/or on-site sewerage systems, and street surface material are considered to be minor contributing sources.

Given the available evidence, the report indicates that controlling fecal coliform contamination will likely be accomplished through source control of storm water runoff hydraulics using various strategies appropriate to either densely urban or rural residential land uses. Specific control strategies are suggested, such as:

- Providing public education, including signage, describing storm water system uses, management, and impacts.
- Implementing and enforcing setback and storm water controls for all animal holding areas, including formal design requirements for all large-scale facilities.
- Restricting use of on-site drain-field systems for select landforms.
- Implementing on-site storm water detention and infiltration standards (otherwise known as low-impact development or LID) for all commercial and residential development and redevelopment.
- Disconnection of storm water outfalls, allowing storm water to infiltrate into soils before entering surface waters rather than directly connecting storm water flows to surface waters.
- Optimizing use of ditch and swale designs for storm water drainage systems, including required application of these structures to all 'headwater' streets.
- Implementing requirements for installation of storm water runoff sheet flow controls ("yard breaks") for all driveways, and yards, and other landscaping served by curb and gutter piped drainage systems.
- Optimizing street sweeping practices and schedules to remove fine particulates for all curb and gutter road systems.
- Optimizing storm water hydraulic connection to natural wetlands, or to detention and water quality treatment basins.
- Implementing riparian zone conservation and recovery programs (including implementation of function-based setback standards), and restricting stream channel ditching and armoring.
- Implementing non-obstructive stream crossing design standards and retrofit of existing constricted stream crossings .

Because Anchorage is a northern city located in a precipitation shadow, it has unique climatic conditions that provide specific challenges for implementing storm water controls.[3] The effectiveness of many storm water BMPs is reduced in cold climates; however, several types of BMPs have been found to be effective at rates appropriate for implementing the Anchorage area TMDLs. These BMPs include: wet ponds, shallow marsh wetlands, submerged gravel wetlands, detention and dry extended detention ponds, and infiltration basins. These structural controls are estimated to reduce fecal coliform bacteria loadings at rates of 70-90%. In Anchorage, storm events are generally of long duration, yielding low amounts of precipitation, with fewer intense periods of precipitation. A high percentage of storm events produce snow that generally accumulates until the spring melt. The most effective types of BMPs for such a precipitation scenario have been found to be those that control drainage at a site-level scale (i.e., LID practices), as opposed to practices that try to treat the water after it enters the conveyance system. The MOA is actively encouraging LID practices for new construction and retrofitting. In particular, yard breaks and rain gardens are practices that allow for infiltration of storm water at the site where it is generated. This permit incorporates requirements for the permittees to continue the use of such practices to control the total volume of runoff from entering the MS4 and receiving waters, and to reduce overall

[3] Alaska Department of Environmental Conservation, *Total Maximum Daily Loads (TMDLs) for Fecal Coliform Bacteria in the Waters of Campbell Creek and Campbell Lake in Anchorage, Alaska*, May 2006.

pollutant loading. In addition, continued monitoring of the effectiveness of these practices will increase confidence that the techniques are working as intended.

Given the multiple and often complex variables that contribute to fecal coliform bacteria pollutant loading throughout the Anchorage area, it is not currently possible to know the exact mix of appropriate control strategies that will consistently reduce pollutant loadings in discernable amounts throughout all Anchorage watersheds. Both DEC, through the TMDL development process, and MOA, through its assessment of fecal coliform bacteria sources and transport, have narrowed the scope of likely actions that will reduce fecal coliform bacteria levels. DEC suggests that the permittees implement a variety of SWMP activities with a specific focus on controlling fecal coliform bacteria.

DEC further suggests that the permittees consider the Little Campbell Creek watershed as an appropriate watershed within which to measure the effectiveness of BMPs. Within this watershed, each of the land uses commonly found in the Anchorage area, (i.e., forested, semi-rural, residential, commercial/ industrial) are represented. The upper portion of the watershed is primarily forest cover. Urban land use (including landscaping, total impervious surfaces, and streets) accounts for land cover in the lower Little Campbell Creek basin. Storm water management actions that are deemed effective at reducing fecal coliform bacteria levels in this watershed can then reasonably be implemented throughout the other TMDL watersheds in the future.

In Part II.B.2 of the 2010 permit, EPA proposed that the permittees require the design, construction, and maintenance of practices that manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 90th percentile rainfall event. As previously noted, the 90th percentile rainfall event for the Anchorage area is estimated to be approximately 0.52 inches. In the 2010 permit, EPA proposed that the permittees control 100 percent of all rainfall events equal to or less than the 90th percentile rainfall event because small, frequently-occurring storms account for a large proportion of the annual precipitation volume, and the runoff from those storm events also significantly alters discharge frequency, rate and temperature. The runoff produced by these small storms, and the initial portion of larger storms, has a strong negative cumulative impact on receiving water hydrology and water quality. In areas that have been developed, runoff is generated from almost all storms, both small and large, due to the impervious surfaces associated with development and the loss of soils and vegetation. In contrast, natural or undeveloped areas discharge little or no runoff from small storms because the rain is absorbed by the landscape and vegetation. Studies in other areas of the country have shown that increases in runoff event frequency, volume and rate can be diminished or eliminated through the use of green infrastructure designs and practices, which infiltrate, evapotranspire and capture and use storm water. See Appendix E of the fact sheet for the 2010 permit for further information. The 2015 and 2020 permits have retained this requirement.

5.0 PERMIT CONDITIONS

This section is intended to help the permittees and members of the public understand the intent and basis of the permit language. If any confusion or conflicts exist between this summary and the actual permit language, the permittee must comply with the permit as written.

The conditions established by the permit are based on Section 402(p)(3)(B) of the CWA, 33 U.S.C. §1342(p)(3)(B), and 18 AAC 83.105-120. This section requires that permits for an MS4 must effectively prohibit non-storm water discharges from entering the MS4 and requires controls to reduce the discharge of pollutants to the MEP, including management practices, control techniques and system, design and

engineering methods, and other provisions as the permitting authority determines appropriate for the control of such pollutants.

The permit uses BMPs as the primary means to control the sources of pollution in storm water discharges. DEC has determined that BMPs implemented and enforced through a comprehensive local SWMP are the most effective mechanism for reducing the discharge of pollutants to the MEP and for complying with the water quality provisions of the CWA. EPA considers MEP to be an iterative process in that an initial SWMP (1998 permit) is proposed and then periodically upgraded as new BMPs (2010, 2015 and 2020 permits) are developed or new information becomes available concerning the effectiveness of existing BMPs.[4] DEC concurs with EPA's iterative process approach for MS4 improvement. NPDES regulations at 40 CFR §122.44(k) allow for use of BMPs when numeric limits are infeasible. EPA's *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits Policy* (August 1996) addresses the use of BMPs in storm water permits to provide for attainment of WQS. This policy is available on-line at http://www.epa.gov/npdes/pubs/swpol.pdf.

The APDES application requirements for MS4 permittee's at 18 AAC 83.110 describe in detail the information that must be submitted to DEC to obtain permit coverage. The MS4 permittee is required to develop, implement, and enforce a SWMP designed to reduce the discharge of pollutants from its MS4 to the MEP, to protect water quality, and to satisfy the water quality requirements of the CWA. DEC then determines the specific permit conditions necessary to reduce the discharge of pollutants to the MEP. DEC carefully considered the program information submitted by the permittee in its APDES application (MOA, 2020) to develop the required permit conditions.

5.1 Applicability

5.1.1 Discharges Authorized Under this Permit

The permit authorizes the discharge of storm water to waters of the United States from all portions of the MS4 which are owned and operated by the permittees within the MOA. The permit limits the authorization to discharge municipal storm water in a variety of ways:

- Storm water runoff that is commingled with process wastewater, non-process wastewater, and storm water associated with industrial or construction activity (as defined in 40 CFR §122.26(b)(14) and (15)) are authorized to be discharged from the MS4, provided the commingled flows are authorized by a separate individual or general APDES permit (e.g., CGP, MSGP) as necessary.
- Certain types of discharges unrelated to precipitation events (i.e., "non-storm water discharges"), which are listed in 40 CFR §122.26(d)(2)(iv)(B)(1) are allowed to enter the MS4, as long as the discharges are not considered to be sources of pollution to the waters of the United States. However, the permittees are responsible for the quality of the combined discharge and therefore have an interest in locating any uncontrolled or un-permitted discharges to the storm drain system. In Part 3.5, the permit requires the permittees to continue to prohibit, through ordinance or other enforceable means, all other so-called illicit discharges into the MS4(s). The permittees conduct a dry weather screening program to identify illicit discharges to the MS4. Fecal coliform bacteria and turbidity have been the parameters reported in the 2010 permit cycle. (MOA, 2014a).
- Discharges from the MS4s must not cause violations of state WQS.

[4] 64 FR 68754 (December 8, 1999)

5.1.2 Limitations on Permit Coverage

5.1.2.1 Non-Storm Water Discharges

The permit authorizes the discharge of non-storm water if it meets one of three conditions: (1) the discharge is in compliance with a separate APDES permit, (2) the discharge is the result of a spill due to unusual and severe weather event, seismic event, or consists of an emergency discharge, where reasonable and prudent measures have been taken to prevent or minimize the impact of such discharge, or (3) consists of uncontaminated water from a list of approved sources, and the discharge is not a source of pollution to waters of the United States.

5.1.2.2 Discharges Threatening Water Quality

The permit does not authorize the discharge of storm water that DEC determines will cause, or have the reasonable potential to cause or contribute to, violations of WQS.

5.1.2.3 Snow Disposal to Receiving Waters

Disposal of snow directly into waters of the United States, or directly to the MS4, is prohibited, due to concerns that the accumulated snow and melt water may contain elevated levels of chloride and other salts, suspended sediment, turbidity, and metals associated with sediment and turbidity. Discharges of snow melt resulting from or associated with the permittee's snow management practices (such as street plowing and application of traction material) are conditionally authorized, provided such activities are conducted in accordance with BMPs and a manner that minimizes adverse water quality impacts. DEC recognizes the permittees use of the snow management practice of using ditches for snow storage as an acceptable management practice. The primary function of using the ditches during the winter months is for snow storage and as is part of the permittees snow disposal and management practices. The ditches are maintained by the permittees and are lined with gravel, soil, and vegetation that allows melting of snow and rainwater to infiltrate into the ground to help filter pollutants from directly entering surface receiving waters. As stated in the permit, discharges from the permittees snow disposal and snow management practices are authorized under the permit when such practices are operated using appropriate BMPs required in the permit. BMPs may include detention basins, dikes, berms, ditches, and vegetative buffers. BMPs shall be designed, operated, and maintained to prevent and reduce pollutants in the discharges to MEP so as to avoid excursions above WQS.

Permit Requirements for TMDL Implementation

As previously noted, all APDES permit conditions must be consistent with the assumptions and requirements of available WLAs (40 CFR 122.44). EPA's 2014 TMDL Guidance Memo (USEPA, 2014) further defines how APDES permit conditions for regulated storm water discharges can be consistent with the assumptions and requirements of available WLAs through the use of narrative BMPs. Where BMPs are used as permit limitations to implement WLAs, the permit must require monitoring activities as necessary to assure compliance with the WLAs. The permit requires the wet weather monitoring of ten outfalls during the permit term (Part 4.1.7). The permit also requires the dry weather screening at fifteen outfalls during the permit term (Part 3.5.4)

5.2 Storm Water Management Program Requirements

5.2.1 General Requirements

The permittees are required to update, implement, and enforce a SWMP designed to reduce pollutants to the MEP, to control the discharge of pollutants from the MS4 in order to protect water quality, and to satisfy the water quality requirements of the CWA.

The APDES permit application submitted by the applicant in January 2020 contains proposed revisions to the 2015 permit. The 2020 permit includes the specific activities put forth by the permittee. Reports to be submitted and compliance dates are contained in Table 1: Schedule of Submissions of the permit. Annual reports are required to document program accomplishments. DEC may review and approve any plans or plan modifications required by the permit.

5.2.2 Reviewing and Updating the Storm Water Management Program

The SWMP is intended to be a functioning mechanism for the permittee to use. Therefore, minor changes and adjustments to the various SWMP elements are expected and may be necessary to more successfully adhere to the goals of the permit. DEC has determined that minor changes to the SWMP shall not constitute the need for permit modifications as defined in the regulations at 18 AAC 83.135. Part 2.3 of the permit describes procedures to be used to perform additions and minor changes to the SWMP. The permit does not allow the permittee to remove elements in the SWMP that are required through permit conditions or regulatory requirements. Any changes requested by the permittee will be reviewed by DEC.

5.2.3 Transfer of Ownership, Operational Authority, or Responsibility for SWMP Implementation

DEC does not intend to mandate a permit modification should the permittee annex additional lands or accept the transfer of operational authority over portions of the MS4. Implementation of appropriate SWMP elements for these additions (annexed land or transferred authority) is required. The permittee must notify DEC of any such additions or transfers in the Annual Report. DEC may require a modification to the permit based on such new information.

5.2.4 Storm Water Management Program Requirements

The permittees are required to continue their SWMP that is designed to limit, to the MEP, the discharge of pollutants from the MS4 to protect water quality and to satisfy the appropriate water quality requirements of the CWA. The basic framework outlined by EPA regulations for the municipal SWMP is discussed in Appendix A of the Fact Sheet for the 2010 permit.

In the 2020 permit, DEC has refined, or in some cases incorporated additional, SWMP actions and activities to further ensure that storm water discharges from the permittees MS4s meet water quality standards to the MEP. DEC intends certain requirements to specifically address the load and waste load allocations set forth in the TMDL plans for the receiving waters within the Anchorage area. The SWMP activities also provide opportunities for the permittees to collectively target programs and pollutant reductions in other waters that TMDLs have not yet been approved.

The 2020 permit follows the format of the 2010 and 2015 permits, with minor changes. The proposed permit contains provisions directing overall program management, planning, and coordination between permittees and with other entities. The required storm water management actions and activities are contained in Part 3 of the permit and are broadly summarized as:

1. Construction Site Runoff Control Program
2. Storm Water Management for Areas of New Development and Redevelopment
3. Industrial and Commercial Storm Water Discharge Management
4. Storm Water Infrastructure and Street Management
5. Illicit Discharge Management
6. Public Education and Involvement

Monitoring, evaluation, reporting and recordkeeping requirements are specified in Part 4 of the permit. The permit requires the permittees to monitor water quality and project effectiveness in a variety of ways. Approved quality assurance plans (QAPs) must be used in conjunction with all sampling and monitoring activities; annual reports will provide narrative documentation of program implementation and accomplishments.

5.3 Control Measure Requirements

Part 2.2 of the permit address DEC's expectations for the overall SWMP and program coordination. Permit Part 2.6 allows the permittees to share implementation of SWMP activities. The premise of "shared implementation" allows the permittees to cooperate with other organizations and acknowledge that shared responsibility to DEC through the Annual Reports. This opportunity to share responsibility for particular SWMP actions and activities is optional, and may be used at the permittees discretion. This requirement differs from the interjurisdictional agreement between MOA and DOT&PF required in Part 1.3.3 of the permit, insofar as Part 2.6 allows the permittees to engage with outside entities that are not subject to the terms and conditions of the permit in order to accomplish the required SWMP activities. The permittees remain responsible for compliance with the permit in the event the entity fails to implement the required action/activity.

As required by the permit, with each annual report the MOA reported the costs of the program for each of the permittees.

Under the 2010 permit, the MOA completed one watershed plan for Little Campbell Creek and updated the plan for Chester Creek in compliance with the permit conditions. The 2015 permit identifies that MOA will continue to complete watershed plans for each municipal watershed. Watershed planning is a valuable opportunity to engage the community and identify necessary choices and actions that will maintain or restore watershed quality. DEC has included the requirement in Part 2.7 to develop another watershed plan.

5.3.1 Construction Site Storm Runoff Control Program

Storm water discharges generated during construction activities can cause an array of physical, chemical, and biological water quality impacts. A primary concern at most construction sites is the erosion and transport process related to fine sediment. Storm water runoff from construction sites also include pollutants related to the construction activity itself, such as phosphorus, nitrogen, pesticides, petroleum derivatives, construction chemicals, and solid wastes that may become mobilized when vegetation is removed and the landscape is altered for development.

Preventing erosion (as well as the runoff containing other pollutants) from active construction sites is fundamental to protecting water quality in urban areas. Properly implemented and enforced construction site ordinances requiring erosion, sediment and material management controls can effectively reduce these pollutants. Municipal jurisdictions are in the best position to define how construction activities are to be designed and conducted, as well as to enforce requirements. Other public entities, such as state transportation entities, are in a similar position to control activities conducted within their jurisdiction/rights of way. DEC expects MS4 operators to use ordinances, or other reasonable mechanisms as provided by State law, to create baseline expectations for construction activity occurring within their areas in order to protect water quality. DEC expects MS4 operators to fully enforce those requirements when necessary.

DEC is requiring that the permittees continue to enforce a construction site storm water management program to reduce pollutants in storm water runoff from private and public construction activities that

involve a total land disturbance of 10,000 square feet or more at a single construction site or as part of a common plan of development.

In Part 3.1 of the permit, DEC is requiring that the permittees refine their existing program in the following ways:

- Permittees must adopt, implement and enforce requirements for erosion, sediment and onsite material controls consistent with DEC's APDES requirements for construction sites.
    - Although DOT&PF does not have the power to enact ordinances, DOT&PF may comply with this requirement by ensuring that DOT&PF staff, contractors, and right-of-way permits follow the construction-related requirements developed by the permittees. These requirements must be developed to complement the requirements of the Alaska CGP to ensure adequate and enforceable local oversight of construction projects.
- Permittees must update the MOA Erosion, Sediment Control and Material Containment manual, and the equivalent DOT&PF manual (or other directive).
- Permittees must refine plan review and approval procedures.
- Permittees must continue to inspect sites and enforce local requirements, as necessary.
- Permittees must implement a written enforcement policy for construction sites.
- Permittees must ensure that their plan review and inspection staff are sufficiently trained regarding local construction requirements, as well as provide appropriate education for construction site operators.

The permittees made considerable progress in their Construction Site Storm Water Management Program during the first, second and third permit terms, evidenced by increased awareness of the requirements for managing storm water among construction operators, and in the number of construction site operators who applied for coverage under the CGP. The required activities in the 2020 permit for MOA and DOT&PF's are intended to build a more complete and effective local program.

In the 2020 permit, the permittees would continue to implement a Construction Operator Certification program; this program would provide appropriate training to manage onsite activities to protect water quality. Over the last several years,DEC, DOT &PF, MOA, the U.S. Army Corps of Engineers, and others have established the Certified Erosion and Sediment Control Lead (AK-CESCL) training program for Alaska, designed to accomplish the same purpose. DEC has chosen to broadly require the permittees to provide ongoing education and training for construction site operators, and to require that there is one person onsite at all times during construction who is appropriately trained. The AK-CESCL program has provided training for construction site operators within the Anchorage area. To meet the training requirement, the MOA and DOT each host one to two AK-CESCL trainings in the spring of each year of the permit term.

Table 1 provides a summary of the inspections carried out during the permit term by the MOA. For each of these inspections, the SWPPP or other site documentation was reviewed and a physical inspection of the site was preformed to confirm there were no illicit discharges. At the conclusion of each visit, an inspection report of findings and any required corrections was given to the site representative. Where corrections were indicated, a re-inspection was scheduled to confirm compliance. Where compliance isn't achieved within the specified period of time, a stop work order is issued until compliance is achieved. During the permit term no stop work orders were issued.

Table 1: Summary of Construction Inspections carried out by the MOA 2016-2019

Type of Facility	2016	2017	2018	2019	2014
Commercial	358	255	319	140	186
Residential	492	424	418	518	450

Reducing sediment and other materials from construction sites supports the necessary actions to accomplish the pollutant reductions called for in the Anchorage area TMDLs. Sediments from street surfaces play a role in how urban fecal contamination is transported in storm water runoff. Adequate erosion and sedimentation control during the active construction phase serves to reduce the amount of material potentially discharged directly from the site and/or is tracked out by construction vehicle traffic and accumulates on paved street surfaces.

5.3.2 Storm Water Management for Areas of New Development and Redevelopment

Part 3.2 of the permit requires the permittees to continue and improve their program to reduce pollutants in permanent (i.e., post-construction) runoff from new development and redevelopment through enforceable requirements, plan review and approval, inspection and education. In addition, the permit proposes that the permittees further evaluate the use of green infrastructure and LID practices through pilot projects.

Uncontrolled runoff from new development and redevelopment areas can significantly and negatively affect receiving water bodies if appropriate considerations are not taken at the planning, design and construction stages. Typical storm water management practices have resulted in the current convention of control and treatment strategies that are largely hard infrastructure engineered, end-of-pipe, and site-focused practices concerned with controlling peak flow rate and suspended solids concentrations control. A 2008 National Research Council report on urban storm water confirmed the shortcomings of such storm water control efforts. Three of the report's findings on storm water management approaches are particularly relevant.

1 Individual controls on storm water discharges are inadequate as the sole solution to storm water in urban watersheds;

2 Storm water control measures such as product substitution, better site design, downspout disconnection, conservation of natural areas, and watershed and land-use planning can dramatically reduce the volume of runoff and pollutant load from new development; and

3 Storm water control measures that harvest, infiltrate, and evapotranspire storm water are critical to reducing the volume and pollutant loading of small storms. [5]

The practice of storm water management is evolving beyond engineered approaches applied at the site level to an approach that looks at managing storm water at the regional, neighborhood, and site scales through natural approaches. EPA refers to such approaches as "green infrastructure" techniques, which represent long term storm water management that are more cost-effective, sustainable, and environmentally friendly.[6] Green infrastructure is the use of soil, trees, vegetation, and wetlands and open space (either preserved or created) in urban areas to capture rain while enhancing wastewater and storm water treatment. A comprehensive green infrastructure approach to storm water management seeks to:

[5] National Research Council, 2008.
[6] Information on EPA's green infrastructure recommendations can be found online at https://www.epa.gov/green-infrastructure

- *Preserve*: Protect and enhance natural features, such as undisturbed forests, meadows, wetlands, and other natural areas that provide natural storm water management.
- *Reduce*: Reduce land consumption and use land efficiently to reduce total watershed or regional impervious cover.
- *Recycle*: Recycle land by directing new development to already degraded land, e.g., parking lots, vacant buildings, abandoned malls.
- *Reuse*: Direct storm water into the ground near where it fell through infiltration, evapotranspiration, or reuse techniques. [7] [8]

LID techniques are those that serve to mimic the predevelopment site hydrology in order to store, infiltrate, evaporate and detain runoff.

MOA has adopted many aspects of a "green infrastructure" and "LID" approach for new development and redevelopment. In addition to its watershed planning/management activities and open space policies, MOA published a Low Impact Development Design Guidance Manual containing specific guidelines for the use of rain gardens, infiltration trenches, soak away pits and filter strips at new development sites.[9]

MOA since 2008 has sponsored an incentive program for installing rain gardens supported by a grant from the U.S. Fish and Wildlife Service. The program supported the installation of thirty-one gardens in 2010, thirty-three in 2011, fourteen in 2012, nine in 2013, and four in 2014. The program has since discontinued due to a lack of funding.

Through the 2010 permit, EPA and DEC required the permittees to increase the utilization of LID and green infrastructure approaches, and to push the local design requirements to require a volume based target for onsite storm water management. In the 2020 permit, DEC continued the emphasis on LID and green infrastructure. In Permit Part 3.2, DEC has proposed that each permittee;

- Update the implementation of an ordinance or other regulatory means to require installation and maintenance of permanent storm water management controls at new development or redevelopment sites
    - DEC is requiring that, prior to the expiration date of the permit, the permittees revise their existing design specifications to require onsite treatment of the first 0.52 inches of rainfall.
- Develop/update a design criterial manual that specifies acceptable management controls;
- Develop and implement a Green Infrastructure/LID Strategy and Projects, including evaluations to examine the effectiveness of various practices at permittee – owned locations
- Deleted specific requirements for: rain gardens; riparian zone management; repair of public streets, roads, or parking lots; and parking lot retrofits and included them under general consideration of Part 3.2.3.1.
- Maintain a system to review and approve plans

[7] National Management Measures to Control Nonpoint Source Pollution From Urban Areas, EPA-841-B-05-004, January 2006; and 64 FR 68725 – 68728 and 68759, December 8, 1999.
[8] Technical Guidance on Implementing Section 438 of the Energy Independence and Security Act, US EPA, December 2009.

[9] http://anchoragewatershed.com/development.html

- Ensure proper operation and maintenance (O&M) of permanent controls through inventory and tracking of control facilities, O&M agreements, and inspection and enforcement of permittee requirements as necessary
- Conduct training and provide education for permittee staff and local audiences.

DEC proposes that the permittees explore the use of techniques like water reuse or water harvesting, in addition to infiltration techniques, as a possible means to control such a target volume at new development and redevelopment sites. It is worth investigating whether such alternative techniques will work in the Alaskan climate to provide additional options for managing runoff from impervious areas.

Retrofitting existing development is also a crucial consideration to better manage storm water runoff. Parking lots and snow disposal sites are excellent candidate locations for evaluating the effectiveness of site level management techniques designed to reduce receiving water impacts from both pollutants and overland flow. The permittees in the 2010 permit term designed and constructed five pilot projects. In the 2015 permit term, the permittees monitored the projects to determine the five pilot projects effectiveness.

In 2013 the permittees proposed a modification to this Part and DEC approved the modification. The modification consists of the permittees developing a five-year implementation plan for complying with Part II.B.2 (a). In the 2015 permit DEC changed the retention requirement to a treatment requirement.

5.3.3 Industrial and Commercial Storm Water Discharge Management

Permit Part 3.3 requires the permittees to continue managing industrial and commercial storm water to reduce the discharge of pollutants from industrial and commercial operations to the MS4. Specifically, DEC proposes that the permittees:

- Bi-annually maintain an inventory and map of certain industrial and commercial activities, including all snow disposal sites and animal confinement facilities. The purpose of the inventory is to assist the permittees in identifying problem areas, with particular emphasis on sources known to likely contribute fecal coliform bacteria or other pollutants of concern to receiving waters. The inventory and map should be updated at least annually using information obtained from field activities and intra-agency sources (e.g., business licenses, pretreatment permits, sanitary sewer hookups) to ensure that the inventory remains current and accurate. For facilities identified as needing a separate APDES permit under the storm water requirements, the permittees may inform sources of their obligation directly, or notify DEC by providing basic facility information for further action.
- Update inventory of all known public and privately owned snow disposal sites within the permit area, and evaluate whether additional local requirements are necessary to adequately protect water quality.
- Evaluate whether animal confinement facilities are sufficiently managing animal waste material to prevent water quality problems, and consider possible revisions to AMC Title 17 to require all discharges from commercial animal confinement facilities to be controlled onsite. Animal confinement facilities include kennels, pens, recreational facilities, stables, zoos and show facilities. The purpose of this requirement is to reduce fecal coliform bacteria levels from domestic animal waste and ensure that all possible controls are in place to implement the fecal coliform bacteria WLAs of the various TMDLs for the Anchorage area.

These activities support the pollutant reduction goals of the TMDL by requiring the permittees to focus their assessment, education and enforcement efforts on those types of facilities that are most likely to discharge pollutants of concern**.**

In the 2010 permit, EPA included a list of a wide variety of commercial facilities, such as carpet cleaners, car washes, mobile vehicle washing operations, retail gasoline outlets, retail automotive services (including repair facilities), and any other commercial facility that is likely to contribute fecal coliform bacteria and/or petroleum products to receiving waters. EPA also included requirements for an industrial and commercial facility inspection/enforcement program whereby all facilities would be inspected at least once every two years for compliance with local ordinances and projected compliance with WQS. In the 2003 application, the permittees identified that they would enact performance standards for two industry categories commonly associated with citizen complaints. In 2012, the MOA evaluated snow disposal areas and animal facilities and developed performance standards for these activities. In light of the other activities required by the 2015 permit, DEC has included in the 2020 permit requirements for the permittees to focus their SWMP efforts on at least two different types of commercial or industrial activities in order to reduce pollutant discharges to the MS4s and nearby receiving waters as necessary. This effort is continued in the 2020 permit for animal facilities.

5.3.4 Storm Water Infrastructure and Street Management

The permittees must continue to operate and maintain their MS4s and associated permittee-owned facilities to prevent or reduce pollutant runoff to the MEP. As described in the 2020 permit and consistent with the approved TMDLs in the Anchorage area, DEC requires that the permittees must:

- Maintain a storm water system inventory and map of the entire MS4;
- Inspect and maintain all catch basins and storm sewer system inlets;
- Design, fund, build and operate a facility to process catch basin and inlet cleaning materials (both solid and liquid portions of the waste stream) for proper handling and disposal;
- Ensure adequate pollutant reduction from street and road maintenance activities by updating the Street Maintenance Standard Operating Procedures (SOPs); maintaining the inventory of sand and salt usage on streets and roads, and maintain covered storage facilities at each permittee's primary sand/salt/material storage locations;
- Update the Street and Road Sweepings Management Plan to identify areas as needing street sweeping on a high, medium or low frequency schedule, and implement street sweeping to optimize pollutant removal based on the results of the report *Anchorage Street Sweeping and Storm Water Controls: 2013 Performance Evaluation* Report Number WMP Apr14001;
- Ensure the proper use of pesticides, herbicides and fertilizers in all permittee uses and activities; and
- Conduct regular training for appropriate permittee staff.

Much of the work to develop a comprehensive, system-wide maintenance program was accomplished during the previous permit terms, and permittees can modify and update existing SOPs and manuals as necessary. DEC has proposed requirements in the 2020 permit to continue the permittees focus on permittee-owned portions of the MS4, and to provide specific expectations for the performance of those activities.

Proper operation and maintenance of the storm drain system demands that SOPs reflect the required maintenance of the overall MS4, including implemented or proposed BMPs. Because of the diverse

nature of the MS4 (i.e., streets, parking lots, storm water ponds, underground pipes, drainage ditches, etc.), individual SOPs, including inspection and maintenance schedules, are necessary for each type of infrastructure and facility. The SOPs should include a protocol for testing and safely disposing of waste materials and water.

DEC in Part 3.4 includes that the permittees continue to inventory street maintenance materials and to improve equipment and practices used for sweeping arterial and collector streets. Street flushing in the early spring is considered a major source of pollutants to the Anchorage area receiving waters. The permittees must continue to diligently manage the application and removal of materials. Street sweeping should be conducted as a precursor to flushing of streets to minimize accumulated pet waste and other contaminants from being delivered to local streams. This requirement is consistent with the implementation of the fecal coliform bacteria TMDLs, and is reflected in the permit text specifying high, medium, and low frequency street sweeping schedules. For the 2020 permit the tandem sweeper requirement was discontinued for the summer and fall sweepings and retained for the spring sweeping. The permittees will continue to report on the "visually clean" evaluation annually to ensure this reduction in sweeping requirement does not affect the quality of the road sweeping effort.

The report *Anchorage MS4 Street Sweeping Report for 2013* provided the following summary:

> Both swept dirt loads and residual dirt loads remaining on the street surfaces after sweeping are higher than national norms. Swept dirt loads are expected to be higher than national norms due to the amount of winter traction sanding employed by the different MS4 operators due to the nature of Anchorage's wintertime climate. However, reported load numbers may be biased high due to inaccurate measurement techniques for determining volume of sediment from typically wet slurries delivered by the street sweepers. Hypothesis for high post sweep dirt loads include: overemphasis on full width sweeping; not enough sweeping passes; overwatering when sweeping; road conditions including weathered road surfaces and uneven gutter pans; track out from unpaved areas; and unrestricted parking on streets during sweeping operations.

The report *Anchorage Street Sweeping and Storm Water Controls: 2013 Performance Evaluation* Report Number WMP Apr14001 contained the following recommendations:

1. Modify street sweeping practices to improve particulate (mineral and organic) pollutant removal performance from a water quality perspective;
2. Adopt and implement optimum design criteria for catch basins and Oil/Grit Separators;
3. Develop and implement monitoring and modeling tools to support seasonal street sweeping performance assessment and long-term (5-year interval) performance evaluation of storm water systems;
4. Based on seasonal sweeping performance monitoring and long-term modeling evaluations, identify and implement modifications to sweeping practices and storm water control as maintenance schedules; and
5. Sweeping using vacuum sweepers should not be performed on the same day that flushing or heavy sprinkling is done.

The use of pesticides, herbicides, and fertilizers by MOA and DOT&PF maintenance crews can be a source of pollutants if the chemicals are not selected appropriately, used properly, and stored safely. It is important that permittee staff tasked with applying or otherwise handling these chemicals be trained regarding BMPs for reducing the discharge of these pollutants to the MS4 and receiving waters. Additionally, an effort should be made to investigate and encourage the use of alternative products that

achieve the same or similar results and pose less risk to the environment. When chemicals are being applied, they should be used only per label instructions and only as needed. Chemical use should be avoided just prior to or during wet weather to reduce the amount of chemicals mobilized in runoff. Finally, future landscaping efforts should focus on the use of native or low-maintenance vegetation where possible to reduce the need for fertilizers, herbicides, and pesticides by selecting plants that are well-adapted to local conditions.

5.3.5 Illicit Discharge Management

An illicit discharge is any discharge to a MS4 that is not composed entirely of storm water. Exceptions to this definition, such as firefighting activities, certain types of *de minimus* discharges, or otherwise permitted discharges, are addressed in Part 1.4.1 of the permit.

The permittees previously established a program to prohibit, detect and respond to illicit discharges during the 1998 permit term. In the 2020 application, the permittees proposed to continue providing complaint response, dry weather screening of outfalls, investigation of pollutant sources, and to enact to performance standards for two industries commonly associated with complaints.

In the 2020 permit, DEC requires that each permittee continue to take the following actions:

- Update the ordinance or other regulatory mechanism prohibiting non-storm water discharges, as necessary;
- Maintain a program to receive and to respond complaints from the public;
- Map locations of illicit discharge/connections to identify priority areas;
- Continue dry weather screening of outfalls, including mandatory follow-up actions to identify and/or eliminate problems;
- Maintain all spill prevention and response capabilities, including a used oil and toxic material disposal program, through coordination with appropriate entities to provide maximum water quality protection at all times; and
- Provide training for appropriate municipal and state staff to respond to spills, complaints and illicit discharges/connections to the MS4.

The permit requires the permittees to continue their illicit discharge complaint reporting and response program through the use of a telephone hotline, community education, and detailed response procedures. A system and protocols should be in place to track calls from citizens and to direct reports of discharges/dumping to the appropriate emergency response authorities. Staff designated to handle calls should be trained in storm water issues and emergency response so they can gather and transfer the right information to responders. Conducting an investigation as soon as possible after the initial complaint report is crucial to the success of this activity. Sources of illicit discharges are often intermittent or mobile, yet the frequency or severity of such discharges can have lasting effects on water quality. The nature, extent, and conclusions of each inspection should be recorded with the original complaint to provide a full picture of each incident. This information will not only be helpful in tracking permittee activities in spill response, but it also provides detailed information about the types and locations of discharges, their possible sources, and other information pertinent to targeting future inspection, outreach, and education activities. Additionally, a complete file documenting an incident can provide better evidence in cases where a criminal citation is issued.

Data collected through reporting of illicit discharges and connections, as well as through dry weather screening, can reveal important trends in pollutant generation and transport to the MS4. The permittees

mapped the occurrences of illicit discharges. During the 2010 permit term, the number of reported illicit discharges were 5 in 2010, 26 in 2011, 18 in 2012, and 35 in 2013. During the 2015 permit term, the number of reported illicit discharges were 13 in 2016, 18 in 2017, 23 in 2018, and in 18 in 2019.

DEC requires that the permittees continue to conduct dry weather analytical and field screening monitoring of outfalls. DEC requires that samples taken during dry weather screening be screened for pH, total chlorine, detergents, total copper, total phenols, fecal coliform bacteria, and turbidity. DEC has also included a requirement that follow-up activities must begin within 15 days of identifying elevated concentrations of screening parameters. During the 2010 permit cycle, reports from the dry weather screening program identified various outfalls with discharges containing elevated fecal coliform bacteria levels; however, these reports contained limited discussion concerning subsequent actions taken by the permittees to determine the source of the pollution. Given the TMDL WLAs for fecal coliform bacteria, it is crucial for the permittees to effectively follow-up on such information to ensure that the dry weather discharges are being eliminated.

Threshold limits for monitoring results are important to distinguish pollutant spikes from normal background conditions at a particular outfall. MOA has established threshold levels which, when exceeded, results in retesting to determine whether the sample was an isolated event or an ongoing water quality issue. The permittees should also consider establishing a visual baseline for each outfall type to establish what constitutes “normal” dry weather flows so as to distinguish between background conditions (ground water sources, for example) and abnormal non-storm water flows prohibited by the permit.

The proposed permit requires the permittees to appropriately respond to spills and facilitate the proper management, disposal and/or recycling of used oil, vehicle fluids, toxic materials, and other household hazardous wastes. Permittees should encourage recycling and proper disposal of used oil and household hazardous waste through community outreach and public education. Education in schools could include youth instructing youth, classroom presentations, and interactive learning methods. Community outreach and public education could target “do-it-yourselfers,” promote local and certified collection centers at fire stations and gas stations, and identify curbside collection opportunities.

Permittees must provide training to staff regarding how to identify and respond to illicit discharges, connections and/or spills to the MS4. Municipal staff can be the “eyes and ears” of the storm water program if they are trained to identify illicit discharges and spills or evidence of illegal dumping.

In the 2020 permit the permittees must monitor a minimum of 30 outfalls per year for evidence of illicit discharges, and conduct monitoring at outfalls where illicit discharges are suspected. Evidence of illicit discharges may include: flow during dry weather conditions; odor, color, clarity, floatables, deposits/stains, foam, or sheen suggestive of abnormal non-storm water flows; and/or reports of dumping prohibited by the permit. Monitoring may include sampling, field screening, and/or characterization of such flows. Monitoring may also include, if appropriate, recognizance of up to three MS4 access points within the outfall’s upgradient drainage system to identify potential pollutant sources.

The permittees continued ability to adequately respond to reports of illicit discharges, and to effectively eliminate those discharges where necessary, supports the implementation of the Anchorage area TMDLs. Continued outfall screening and dedicated investigation of those outfalls found to have elevated levels of fecal coliform bacteria or petroleum products will further reduce pollutant loading to receiving waters.

5.3.6 Public Education and Involvement

DEC maintains that the public can provide valuable input and assistance to the local SWMP. Public support is crucial to the success of a SWMP and citizens that participate in the development and decision making process are more likely to take an active role in its implementation. Community education and opportunities for public involvement are important elements of successful water quality protection programs.

The permittees began their public education program in the mid 1990's and continued efforts during the 2015 permit term. In 2005, the MOA conducted a Watershed Public Awareness Survey to determine public knowledge of watershed issues, proper disposal of material that could affect water quality, and local watershed outreach activities.[10] The survey results indicated that there is a general understanding of watersheds and water quality problems among Anchorage residents. To increase public understanding of key issues, the survey's authors recommended that future outreach activities include targeted messages focused on the following ideas/topics:

- Everyone lives in a watershed;
- Water released into the storm drain system flows to local waterways and may impact water quality;
- Correct car washing locations, and describe potential impacts on water quality when cars are washed in the street; and
- Proper disposal of pet waste and impacts on water quality that pet waste can cause.

The survey also recommended using television and newspapers as a means of reaching the public, and promoting the MOA water quality hotline.

In the 2003 application, the permittees identified education projects that would occur in concert with the revisions to the construction site management activities and source controls associated with new development and redevelopment. Education efforts to be targeted included projects devoted to promoting rain gardens for residential yards, parking lot retrofits, riparian zone/outfall disconnection, construction operator certification, and training on construction site plan requirements.

During the 2015 permit term the MOA, on behalf of the permittees, entered into an agreement with the Anchorage Waterways Council (AWC) to conduct the ongoing public education required by the permit. The AWC worked with schools, neighborhoods, property managers, residents, businesses, and local citizens to educate and improve environmental stewardship in the community. The Scoop the Poop committee is a special group solely focused on reducing dog waste and fecal coliform bacteria in local waterways. "Creeks as Classrooms" is a program that AWC teaches in the Anchorage School District and other youth groups year-round for students to learn about creek stewardship, water quality monitoring, recycling, and the science of life in the creeks. AWC selected a neighborhood and distributed quarterly storm water newsletters and has been observed regularly for measurable positive changes in behavior. Through Scoop the Poop, Creeks as Classrooms, focused neighborhood observations, flyers, publications, Creek Clean-Up Day, AWC continues to foster storm water education in the MOA. The 2020 permit continues these activities.

DEC is requiring the following public education and involvement requirements to include the actions outlined by the permittees:

[10] *Anchorage Watersheds and Their Protection: A Survey of Anchorage Residents*, MOA, December 2005.

- Conduct broad public outreach and education efforts to various audiences highlighting basic information on the impacts of storm water runoff on receiving waters;
- Conduct specific training/outreach to the public and MS4 permittee staff to ensure support for various requirements of this permit, including appropriate construction site management, new development and redevelopment techniques, illicit discharge response, and maintenance of storm water infrastructure and streets;
- Organize an annual meeting to exchange information and provide opportunities for intra-agency and interagency coordination;
- Continue to maintain and promote a publicly accessible storm water website. The existing website must be updated to reflect the activities and resources of both permittees.

In their 2003 permit application, the permittees outlined a "receiving water hydrology and chemical monitoring program" to be designed and conducted through a technical advisory board (TAB), supported by the permittees. The TAB was carried out during the 2010 permit term and was discontinued during the 2015 permit term. During the 1998 permit term, the role of the TAB was specified in the permit "to assist with providing information to public forums on issues related to storm water pollution and the monitoring program."[11] During the 2010 permit term, a TAB was not used, and is not required in the 2020 permit.

Annual meetings have in the past been a valuable means of educating the public as well as local officials and other stakeholders who are not directly involved in storm water management. The meetings also provide a forum to share technical information between different groups who work on water quality issues in the area. The permittees held these meetings annually during the both the 1998 and 2010 permit terms. During the 2010 permit term, the annual meeting attracted approximately 100 participants a year. During the 2015 permit term, the annual meeting attracted approximately 110 participants a year. DEC is retaining the annual meeting requirement

5.4 Dissolved Copper Monitoring, Evaluation, Reporting, and Record Keeping Requirements

5.4.1 Monitoring and Evaluation of Overall Program Effectiveness

The Phase II storm water regulations at 40 CFR §122.34(g) require that the permittee evaluate program compliance, the appropriateness of BMPs in their SWMPs, and progress towards meeting their measurable goals. These requirements have been included in Part 4 of the permit.

The Monitoring Program Plan must be designed to meet the following objectives:

- Assess compliance with this permit;
- Measure the effectiveness of the permittee's SWMP;
- Measure the chemical, physical, and biological impacts to the receiving waters resulting from storm water discharges;
- Characterize storm water discharges;
- Identify sources of specific pollutants; and
- Detect and eliminate illicit discharges and illegal connections to the MS4.

[11] Part II.A.5.c of NPDES Permit #AKS052558, issued January 20, 1999

The nature of the monitoring activities to be implemented by the permittee largely depends on the measurable goals selected by the permittee. Measurable goals in the permit application are primarily measures of the level of effort given to implementing a particular BMP (such as frequency of street sweeping), but may also encompass actual measures of water quality improvement. DEC encourages a mix of physical, chemical, biological, and programmatic indicators to evaluate the appropriateness of BMPs and progress towards achieving their measurable goals. The purpose of this evaluation is to determine whether or not the MS4 is meeting the requirements of the minimum control measures of the permit. During the 2010 permit term, the permittee opted for measurable goals that defined and reported on a level of effort for implementation of BMPs. This information was submitted to DEC in the Annual Report. The monitoring included the following: pesticide screening, dry weather screening, structural controls, snow storage site retrofits, storm water outfalls, and LID monitoring. For chemical, biological, or physical storm water monitoring conducted by the permittee, Part 4.1.2 of the permit includes requirements related to representative monitoring, test procedures, and recording results. All chemical, physical, or analytical monitoring must be conducted according to a Quality Assurance Project Plan (QAPP). The permit required a revised QAPP to be submitted to DEC and be available upon request.

The 2020 permit requires continued monitoring of the following: pesticide screening, dry weather screening, storm water outfalls, and LID monitoring. Sampling for dissolved copper was added to wet weather outfall monitoring and using the test method in 40 CFR Part 136. The purpose of the addition is to more accurately assess whether copper is present within Anchorage stormwater runoff. Based on the monitoring during the 2010 permit term, Permit Part 4.1.8 was added to specify the evaluation of specific BMPs and their effectiveness to reduce the monitoring results for turbidity and fecal coliform bacteria in specific catchment areas.

The evaluation of snow storage retrofits (Part 4.1.9) is considered complete in the 2015 permit term so it is deleted from the 2020 permit.

5.4.2 Annual Reports

In general, the annual report must document and summarize implementation of the SWMP during the previous year and evaluate program results and describe planned changes towards continuous improvement. DEC requires the permittee to use the Summary Annual Report Template in the permit to obtain summary information about the status of the MS4. In addition to the summary annual report, the permittee must also submit a more detailed annual report. Requirements for the minimum control measures in Part 3.0 of the permit detail specific information to be reported for each control measure. The detailed annual report should clearly illustrate three key items for each SWMP area:

- **Summary of the Year's Activities.** The summary should describe and quantify program activities for each SWMP component. Responsible persons, agencies, or departments should be included in the summary. Each activity should be described in relation to achievement of established goals or performance standards.
- **Description of SWMP Effectiveness.** The annual report should not only describe the previous year's activities, but should also highlight the SWMP's effectiveness (Part 4.3 of the permit) using indicators required in Part 4.1 of the permit.
- **Planned Activities and Changes.** The annual report should describe activities planned for the next year highlighting any changes made to improve control measures or program effectiveness.

The Annual Report(s) may be submitted to DEC in electronic format (preferred) on CD-ROM(s) using universally available document formats, such as Adobe Acrobat PDF or other available means. However, while the Annual Report text can be submitted in electronic format, the required certification

statement must be signed and dated in hard copy by the permittee as directed in Appendix A, Part 1.12.2 of this permit.

During the 2015 permit term, the annual reports were submitted on-time and contained a proper summary of the work accomplished during the year and described the task due that particular year. All tasks were reported in the year they were required to be reported on.

5.4.3 Recordkeeping

Part 4.5 of the permit requires the permittee to keep all records required by the permit for a period of at least five years. Records need to be submitted only when requested by DEC. The permittee's SWMP must be available to the public; the permittee may charge a reasonable fee for copies, and may require a member of the public to provide advance notice of their request. DEC encourages the permittee to make their program materials available to the public electronically via a website or other viable means.

5.4.4 Addresses

Submittals required by the permit must be made to the address specified in the permit, Appendix A, Part 1.12.

5.5 Appendices

5.5.1 Standard Conditions (Appendix A)

Appendix A of the permit contains standard regulatory language that must be included in all APDES permits. These requirements are based on the regulations and cannot be challenged in the context of an individual APDES permit action. The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements; compliance responsibilities; and other general requirements.

5.5.2 Acronyms (Appendix B)

Appendix B is a list of acronyms found in the permit and fact sheet which aids in the understanding of the permit and its requirements.

5.5.3 Definitions (Appendix C)

Appendix C contains definitions of statutory, regulatory, and other terms important for understanding the permit and its requirements.

5.5.4 Annual Report Form (Appendix D)

Appendix D contains an annual report form for summarizing the annual results of storm water activities.

6.0 ANTIBACKSLIDING

18 AAC 83.480 requires that "effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit." 18 AAC 83.480(c) also states that a permit may not be reissued "to contain an effluent limitation that is less stringent than required by effluent guidelines in effect at the time the permit is renewed or reissued." All permit requirements are at least as stringent as the previous permit.

7.0 ANTIDEGRADATION

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the waterbody's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy and implementation methods. Alaska's current Antidegradation Policy and implementation methods are presented in 18 AAC 70.015 *Antidegradation policy* (Policy) and in 18 AAC 70.016 *Antidegradation implementation methods for discharges authorized under the federal Clean Water Act* (Implementation Methods). The Policy and Implementation Methods amended through April 6, 2018 are consistent with 40 CFR 131.12; and were approved by EPA on July 26, 2018.

The following subsections document the Department's conformance with the Policy and Implementation Methods for reissuance of the Permit.

7.1 Receiving Water Status, Tier Determination, and Analysis Requirements

Alaska's antidegradation policy (through 18 AAC 70.015(a)(1)-(3)) identifies three tiers of water quality and water quality protections, Tiers 1, 2, and 3 respectively. An antidegradation analysis is tier-specific. Using the Policy and corresponding Implementation Methods, the Department determines a Tier 1 or Tier 2 classification and protection level on a parameter by parameter basis. A Tier 3 protection level would apply to a designated waterbody or segment.

- Tier 1 requires existing water uses and the level of water quality necessary to protect existing uses be maintained and protected. Tier 1 applies to all waters of the U.S. in the state. If criteria are exceeded for a water quality parameter (and the receiving water is not a Tier 3 water), then Tier 1 is the only protection level. This can be due to naturally occurring constituents in the water or can be due to pollutants introduced by humans.
- Tier 2 applies when the water quality for a parameter does not exceed the applicable criteria, and is presumed to apply as the default protection level for all parameters in all waters in Alaska unless found otherwise.
- Tier 3 applies to designated waters and no lowering of the water quality is allowable unless temporary and limited. At this time, no Tier 3 waters have been designated in Alaska.

Tier 1 protection applies to all waters of the U.S. in the state, the analysis must be conducted with implementation procedures in 18 AAC 70.016(b)(5). For Tier 2 protection level the analysis is performed on a parameter by parameter basis consistent with 18 AAC 70.016(c)(1) and 18 AAC 70.015(a)(2) that states if the quality of water exceeds levels necessary to support propagation of fish, shellfish, wildlife, and recreation in and on the water, that quality must be maintained and protected, unless the Department authorizes a reduction in water quality for a short-term variance under 18 AAC 70.200, a zone of deposit under 18 AAC 70.210, a mixing zone under 18 AAC 70.240 or another purpose as authorized in a department permit, certification, or approval. Lastly, because the antidegradation analysis is for a general permit, 18 AAC 70.016(e) also applies.

7.2 Tier 1 Analysis of Existing Use Protection

The summary below presents the Department's analyses and findings for the Tier 1 analysis of existing use protections per 18 AAC 70.016(b)(5) finding that:

(A) existing uses and the water quality necessary for protection of existing uses have been identified based on available evidence, including water quality and use related data, information submitted by the applicant, and water quality and use related data and information received during public comment;

(B) existing uses will be maintained and protected, and

(C) *the discharge will not cause water quality to be lowered further where the department finds that the parameter already exceeds applicable criteria in 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b).*

For the purpose of this analysis, the Department classifies the impaired water bodies (Categories 4 or 5) in *Alaska's Final 2014/2016 Integrated Water Quality Monitoring and Assessment Report*) as Tier 1 for the parameters causing the impairment. Compliance with permit conditions will limit discharges to those water bodies listed as impaired. As a result, water quality in those water bodies is likely to improve subject to compliance with permit conditions. Accordingly, DEC finds that the existing uses in those water bodies designated as Tier 1 for the parameters they are impaired for will be maintained and protected. The remainder of this antidegradation analysis conservatively assumes that all other waters are Tier 2 waters, which provides for the next highest level of protection.

7.3 Tier 2 Analysis for Lowering Water Quality

Scope of Tier 2 Analysis. Per 18 AAC 70.016(c)(2), an antidegradation analysis is only required for those waterbodies needing Tier 2 protection and which have any new or existing discharges that are being expanded based on permitted increases in loading, concentration, or other changes in effluent characteristics that could result in comparative lower water quality or pose new adverse environmental impacts. Per 18 AAC 70.016(c)(2)(A), the analysis will only be conducted for the portion of the discharge that represents an increase from the existing authorized discharge. Additionally, per 18 AAC 70.016(c)(3), DEC is not required to conduct an antidegradation analysis for a discharge that is not expanding.

Per 18 AAC 70.990(75), "new or expanded" with respect to discharges means discharges that are regulated for the first time or discharges that are expanded such that they could result in an increase in pollutant load or concentration or other discharge characteristics that could lower water quality or have other adverse environmental impacts.

In the context of the permit, there are no increases in permitted loads or concentration to existing, previously regulated discharges. Therefore, for Tier 2 protection, the analysis must comply with 18 AAC 70.016(c)(7)(A-F). Lastly, the analysis and associated finding are summarized below.

Tier 2 Analysis.

Per Antidegradation Policy and Implementation Methods 18 AAC 70.016(c)(7)(A-F) stipulates that after review of available evidence, the department finds that the proposed discharge will lower water quality in the receiving water, the department will not authorize a discharge unless the department finds that

- 18 AAC 70.016(c)(7) (A) the reduction of water quality of water exceeds levels necessary to support propagation of fish, shellfish, wildlife, and recreation in and on the water, that quality must be maintained and protected, and not violate water the applicable criteria of 18 AAC 70.020 or 18 AAC 70.235, or whole effluent toxicity limit in 18 AAC 70.235, unless the Department authorizes a reduction in water quality for a short-term variance under 18 AAC 70.200, a zone of deposit under 18 AAC 70.210, or a mixing zone under 18 AAC 70.240.

The adaptive management approach (from permit cycle to permit cycle) is used in MS4 permits (unlike other types of NPDES permits) because there is not a need to require strict compliance with WQS if discharges are controlled to the MEP and comply with such other provisions as the NPDES authority determines to be appropriate (See *Defenders of Wildlife v. Browner*, 191 F3d 1159 (9th Cir., 1999)). The MEP provision of the CWA allows the NPDES authority the broad discretion whether to require strict compliance with state WQS.

A key requirement in the storm water Phase II rule[12] is a report (40 CFR 122.34(g)(3)) that includes "the status of compliance with permit conditions, an assessment of the appropriateness of identified [control measures] and progress towards achieving identified measurable goals for each of the minimum control measures." This assessment is critical to the storm water program framework which uses an adaptive management approach of implementing controls, conducting assessments, and designating refocused controls leading toward attainment of water quality criteria. The permittee is required to conduct an annual effectiveness assessment to assess the effectiveness of significant control measures, SWMP components, and the SWMP as a whole. The permittee is to assess and modify, as necessary, any or all existing SWMP components and adopt new or revised SWMP components to optimize reductions in storm water pollutants through an iterative process. This iterative process includes routine assessment of the need to further improve water quality and protect beneficial uses, review of available technologies and practices to accomplish the needed improvement, and evaluate resources available to implement the technologies and practices. Through this type of analysis, the applicable criteria found in 18 AAC 70.020 will be maintained and protected.

With respect to 18 AAC 70.235 and 18 AAC 70.030, no site-specific criteria has been designated for any of the subject water bodies and permit conditions are designed to control potentially toxic discharges.

The Department has determined that reducing water quality will not violate the applicable criteria of 18 AAC 70.020, 18 AAC 70.235, or the whole effluent toxicity limit in 18 AAC 70.030, and that the finding is satisfied.

- 18 AAC 70.016(c)(7) (B) each requirement under 18 AAC 70.016(b)(5) for a discharge to a Tier 1 water is met:

As discussed in the preceding Tier 1 analysis, the waters within a project site are protected for all uses. Hence, this finding is satisfied.

- 18 AAC 70.016(c)(7) (C) point source and state-regulated nonpoint source discharges to the receiving water will meet requirements under 18 AAC 70.015(a)(2)(D) where all wastes and other substances discharged will be treated and controlled to achieve (i) for new and existing point sources, the highest statutory and regulatory requirements, and (ii) for non-point sources, all cost-effective and reasonable best management practices the most effective and reasonable methods of pollution prevention control and treatment will be applied to all wastes and other substances to be discharged. To make this finding the department will
    - Identify point sources and state-regulated nonpoint sources that discharge to, or otherwise impact the receiving water;
    - Consider whether there are outstanding noncompliance issues with other point source permits or required state-regulated nonpoint source best management practices, consider whether receiving water quality has improved or degraded over time, and if necessary and appropriate, take actions that will achieve the requirements of 18 AAC 70.015(a)(2)(D); and
    - Coordinate with other state and federal agencies as necessary.

DEC generally implements permit conditions that specify that a municipality implement controls, BMPs or control measures, and other activities to reduce pollutants as identified in a SWMP. The SWMP may address control measures such as: public education and outreach, public participation/involvement, illicit discharge detection and elimination, construction site runoff control, post construction runoff control, and pollution prevention/good housekeeping. The SWMP must also include measureable goals to

[12] Stormwater Phase II Final Rule (64 FR 68722).

evaluate the effectiveness of individual control measures and the SWMP as a whole, requirements for industrial storm water discharges to the MS4, and reporting requirements.

The site-specific, activity-specific process of developing, implementing, and adjusting the pollution control practices contained in the SWMP constitutes the type of alternatives analysis and use of "the most effective and reasonable" . . . "methods of pollution, prevention, control, and treatment" cited as requirements under Alaska's antidegradation policy for activities that would degrade water quality.

Control measures that prevent or minimize water quality impacts from municipal activities and construction activities are described in Part 3.0 of the proposed MS4 permit and in Chapters 4 and 5 of the *Alaska Storm Water Guide* (DEC, 2009). The *Alaska Storm Water Guide* provides detailed information on temporary storm water controls for active construction sites. The storm water management process outlined in those chapters consists of the development of a SWMP which provides the basis for all pollutant discharge prevention/minimization activities. As noted below, development of the SWMP requires a comprehensive evaluation of the community, the proposed construction activities, and possible pollutant discharges. This information is used to create the SWMP, which contains structural and non-structural management practices; specifications for selecting, sizing, sitting, operating, and maintaining them; and procedures for inspecting the management practices and repairing or replacing them as needed.

A permittee is required to implement erosion, sediment, and other storm water management practices to avoid or minimize pollutant discharges, as detailed in Part 3.0 of the permit. Alternative control measures that may provide equal or better water quality protection are also allowable, and encouraged, especially where those alternatives would provide better water quality and environmental protection.

The Department uses an integrated approach in the permit for developing and implementing "methods of pollution, prevention, control, and treatment" required by Alaska's antidegradation policy. This integrated approach includes requirements for:

- Erosion and sediment control, pollution prevention measures and prohibiting certain discharges (Part 3.1),
- Revised and expanded training requirements for the construction and post-construction (Part 3.1 and 3.2), and
- Monitoring of storm water discharges for illicit discharges (Part 3.5).

Most pollution controls at construction sites are not installed in isolation, but instead are part of a suite of control measures that are all designed to work together. Designers use the treatment train approach to design a series of practices that minimize storm water pollution and achieve compliance with Alaska Construction General Permit (CGP, AKR100000) requirements. For example, a designer may use as a series of control measures to prevent sediment discharges from a site – a diversion ditch at the top of a disturbed slope (to minimize storm water flowing down the slope), mulching on the slope (to minimize erosion), and silt fence at the bottom of the slope (to capture sediment). This treatment train would help protect the slope better than relying on a single control measure, such as silt fence.

The site-specific nature of the SWMP, the requirement that it be implemented in a manner that addresses storm water impacts to the maximum extent practicable, and provisions that the approach be adjusted to ensure ongoing storm water management effectiveness provide the implementation methods needed to appropriately support the antidegradation policy.

The Department has determined the methods of pollution prevention, control, and treatment in the permit to be the most effective and reasonable, which will be applied to all wastes and other substances to be discharged, and the finding is satisfied.

- 18 AAC 70.016(c)(7) (D) the alternatives analysis provided demonstrates that (i) a lowering of water quality under 18 AAC 70.015(a)(2)(A) is necessary; when one or more practicable alternatives that would prevent or lessen the degradation associated with the proposed discharge are identified, the department will select one of the alternatives for implementation; and (ii) the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the department to be the most effective and practicable;

The *MS4 Permit Improvement Guide* (EPA, 2010), in conjunction with the six minimum control measures, constitutes the highest regulatory requirements for municipal storm water management. This permit, as part of the iterative process of improvement of MS4 permits, forms the basis from which incremental changes will be made in the future through changes in the permit requirements.

Green infrastructure is an approach that communities can choose to maintain healthy waters, provide multiple environmental benefits and support sustainable communities. Green infrastructure uses vegetation, soils, and natural processes to manage water and create healthier urban environments. At the scale of a city or county, green infrastructure refers to the patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. At the scale of a neighborhood or site, green infrastructure refers to storm water management systems that mimic nature by soaking up and storing water.

LID is an approach to land development (or re-development) that works with nature to manage storm water as close to its source as possible. By preserving and recreating natural landscape features, LID minimizes effective imperviousness, creating functional and appealing site drainage that treats storm water as a resource rather than a waste product. Bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements are some of the LID practices used to adhere to these principles. By implementing LID principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed. Applied on a broad scale, LID can maintain or restore a watershed's hydrologic and ecological functions.

The requirements contained in the Alaska CGP, the SWPPP development process (Part 5 of the CGP permit), development and implementation of the SWMP to include construction site storm water runoff control and post-construction storm water management control measures and good housekeeping measures (Part 3 of this permit), and BMP's provided in the *Alaska Storm Water Guide* (Chapter 4) comprise a comprehensive, integrated approach for developing and implementing "methods of pollution, prevention, control, and treatment" required by Alaska's antidegradation policy.

The Department has determined that the permit complies with the highest statutory and regulatory requirements for the industry and types of pollutants expected from this industry. The department concludes that this finding is satisfied.

- 18 AAC 70.016(c)(7) (E) except if not required under (4)(F) of this subsection, the social or economic importance analysis provided under (4)(G) and (5) of this subsection demonstrates that a lowering of water quality accommodates important social or economic development under 18 AAC 70.015(a)(2)(A); and

In order to conduct their important ongoing municipal and civic functions, the permittees require that infrastructure be constructed and maintained to accommodate important economic and social development in the area. Without road construction and maintenance, as well as storm water collection systems with discharge points, successful operations of the permittees important functions (and the citizens they serve) would be severely hampered. Storm water discharges associated with the permittee

activities will be controlled via the requirements of applicable SWMPs, which implement the most effective and reasonable practices. Accordingly, in order to provide important services and employment opportunities to the resident and visiting population, the lowering of water quality is necessary.

The Department has determined that the lowering of water quality is necessary to accommodate important economic and social development in the area where the waters are located and that the finding is satisfied.

- 18 AAC 70.016(c)(7) (F) 18 AAC 70.015 and this section have been applied consistent with 33 U.S.C. 1326 (CWA §316) with regard to potential thermal discharge impairments.

Discharges authorized under the permit are not associated with a potential thermal discharge impairment; therefore, the finding is not applicable.

8.0 OTHER REQUIREMENTS

8.1 Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies (commonly known as the "Services") to consult with National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) to determine if the permitted actions could beneficially or adversely affect any threatened or endangered species. As a state agency, DEC is not required to consult with these federal agencies regarding permitting actions; however, DEC voluntarily contacted the agencies to notify them of the development of the permit and to obtain listings of threatened and endangered species near the proposed discharges. There is one listed species for Cook Inlet, the Beluga Whale with a designated critical habitat in the greater Cook Inlet and Knik Arm. The Services will be provided the draft permit and fact sheet during public review. Any comments received from the Services regarding the listing of threatened or endangered species will be considered prior to reissuance of this permit.

8.2 Essential Fish Habitat

Essential fish habitat (EFH) includes the waters and substrate (sediments, etc.) necessary for fish from commercially-fished species to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires federal agencies to consult with NOAA when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. As a state agency, DEC is not required to consult with federal agencies regarding permitting actions; however, DEC has initiated discussions with NFMS on this permit.

This permit includes non-fishing activities that may have the potential to adversely affect the quantity or quality of EFH in upland and riverine systems. DEC addressed EFH considerations in its Antidegradation Analysis. DEC believes with the addition of the non-numeric effluent limits (the control measures detailed in Part 3.0 of the permit) that all the non-fisheries impacts expected by this industry are being addressed in the permit.

Most pollution controls at construction sites are not installed in isolation, but instead are part of a suite of control measures that are all designed to work together. Designers use the treatment train approach to design a series of practices that minimize storm water pollution and achieve compliance with APDES CGP requirements. For example, a designer may use as a series of control measures to prevent sediment discharges from a site – a diversion ditch at the top of a disturbed slope (to minimize storm water flowing down the slope), mulching on the slope (to minimize erosion), and silt fence at the bottom of the

slope (to capture sediment). This treatment train would help protect the slope better than relying on a single control measure, such as silt fence. Because the permit encourages the treatment train approach, DEC believes the permit addresses EFH considerations.

8.3 Permit Expiration

The permit will expire five years from the effective date of the permit.

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