



INDUSTRIAL STORMWATER MANAGEMENT PLAN

WORK INSTRUCTION



Industrial Stormwater Management Plan.....	1
1.0 Background.....	4
1.1 Regulatory Requirements.....	4
Airport Classification and Stormwater Discharge Permit.....	5
Permit Stormwater Management Plan Requirements.....	6
1.2 Contractual and Operational Requirements.....	8
Tenant, Operator, and Contractor Participation.....	9
2.0 Development of Stormwater Management Plan.....	11
2.1 Industrial Activities.....	12
Identification of Potential Pollutant Source Activities.....	13
Aircraft Deicing.....	13
Fueling Activities.....	15
Other Activities.....	16
Identification of Potential Pollutant Source Areas.....	20
Table 2-1 Major Drainages Exiting DEN Property.....	21
Drainage Basins and Locations of Stormwater Outfalls.....	21
Surface Water Bodies.....	22
Existing Structural Control Measures to Reduce Stormwater Pollution.....	22
Tenant, Contractor, and Operator Facility Locations.....	22
Overview of Spent ADF Management System.....	23
Specific Industrial Activity Areas.....	25
Table 2-2 Summary of DIW Retention Pond Storage Volumes.....	27
History of Spills.....	35
2.2 Stormwater Management Controls.....	36
SWMP Administrator.....	36
Table 2-3 DEN SWMP Team.....	37
Environmental Guidelines.....	37
Permit-Specific Best Management Practices.....	39
Sampling Information.....	40
Preventative Maintenance.....	42
Good Housekeeping.....	42
Spill Prevention and Response Procedures.....	43
Procedures for DEN City Personnel.....	43



Procedures for Tenants, Operators, and Contractors.....	44
Employee Training.....	44
Identification of Discharges Other Than Stormwater	45
Comprehensive Inspections	47
Consistency with Other Plans.....	48
Recordkeeping Procedures.....	50
Figure 2-1: DEN Site Drainage Map	51
Figure 2-2: DEN Aircraft Deicing Fluid Collection System Overview	52
Figure 2-3: Spent ADF Management System Schematic	53
Figure 2-4: West Airfield Diversion System	54
Appendix A-1: Targeted Activities and COrrresponding Environmental Guidelines (EG) Matrix.....	55
Appendix A-2: Potential Pollutant Sources Survey.....	57
Appendix A-3: Sample Facility Map.....	58
Appendix A-4: Sample SWMP Requirement Letter	60
Appendix B: Sample Inspection Form	62
Appendix C: Acronym Index	71



1.0 BACKGROUND

Denver International Airport (DEN or Airport) is operated by the City and County of Denver's (CCoD) Department of Aviation and is about 25 miles northeast of downtown Denver. The Airport covers approximately 53 square miles and operates as an international and domestic aviation facility. The facility opened on February 28, 1995.

1.1 REGULATORY REQUIREMENTS

In response to the 1987 Amendments to the Federal Water Pollution Control Act (also called the Clean Water Act or CWA), the U.S. Environmental Protection Agency (EPA) developed Phase I of the National Pollutant Discharge Elimination System (NPDES) Stormwater Program in 1990. The Phase I program addressed sources of stormwater runoff that had the greatest potential to negatively impact water quality. These sources of stormwater runoff consist of:

- Medium and large municipal separate storm sewer systems (MS4) located in incorporated places or counties with populations greater than or equal to 100,000
- Eleven categories of industrial activity, including Standard Industrial Classification (SIC) code 45: Transpiration by Air

Under these regulations, NPDES permits are required for discharge of "stormwater associated with industrial activities" from these locations.

The State of Colorado (State), through the Colorado Department of Public Health and Environment (CDPHE), has been delegated responsibility by EPA to administer its own permit system called the Colorado Discharge Permit System (CDPS). The CDPS is the State's counterpart of the NPDES permit system. This means that the State has full authority and responsibility to develop, implement, and enforce these regulations.



AIRPORT CLASSIFICATION AND STORMWATER DISCHARGE PERMIT

The air transportation activities subject to NPDES regulations are the primary activities covered in this SWMP. The basis for the identification of these activities is the following regulations.

Regulation 61.3(2)(e)(ii)(A): "Stormwater discharge associated with industrial activity" means the discharge from any conveyance which is used for collecting and conveying stormwater and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant."

Regulation 61.3(2)(e)(ii)(B): the term "stormwater discharge associated with industrial activity" includes, but is not limited to, stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters; sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater.

Regulation 61.3(2)(e)(ii)(C): The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots, as long as the drainage from the excluded areas is not mixed with stormwater drained from the above-described areas.

Regulation 61.3(2)(e)(iii)(H): Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221 - 4225), 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under paragraphs (A)-(G) or (I)-(K) of this subsection are associated with industrial activity.

In addressing stormwater runoff associated with industrial air transportation facilities, CDPHE Water Quality Control Division (WQCD) initially covered airports under one of two general industrial permits for stormwater discharge, and classified airports as either "heavy industrial" or "light industrial" facilities. Heavy industrial airports were those where at least 1,000 gallons of deicing agents (i.e., aircraft deicing/anti-icing fluid or ADF) are used per year (raw material) and annual fuel sales are at least 1,000,000 gallons. Since DEN met both criteria, it was classified as a heavy industrial facility and, therefore, CDPHE originally regulated DEN accordingly under a *general* "heavy industrial" permit.

However, due to the facility's uniqueness, CDPHE and CCoD agreed that an *individual* permit, specific to the facility, was more appropriate. DEN's individual permit, entitled "Authorization



to Discharge under the Colorado Discharge Permit System," No. COS-000008 ("Industrial Permit" or "Permit") was first issued July 23, 2001, and was last reissued September 28, 2009, with an effective date of November 1, 2009. Amendment #1 of the Permit was issued August 31, 2011, and was effective October 1, 2011. The permit was administratively extended upon its date of expiration. A copy of the Permit is provided in Appendix A.

PERMIT STORMWATER MANAGEMENT PLAN REQUIREMENTS

Part I.A.2. of the Industrial Permit requires DEN to develop a Stormwater Management Plan (SWMP), which:

- Includes Best Management Practices (BMPs) that are selected, installed, implemented, and maintained in accordance with good engineering practices
- Identifies potential sources of pollutants that may reasonably be expected to affect the quality of stormwater discharges associated with industrial activity at the Airport
- Describes the practices to be used to reduce the pollutants in stormwater discharges associated with industrial activities at the Airport

The Permit covers stormwater discharges associated with specific industrial activities conducted at DEN. As described in Section 1.2.1, this includes vehicle maintenance, equipment cleaning operations, and airport deicing operations. Vehicle maintenance includes vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication of aircraft and ground service equipment (GSE) that service aircraft and support equipment cleaning and airport deicing operations. At DEN, these activities predominantly occur within the Air Operations Area (AOA) or airside (i.e., within the security fence), and they are the primary industrial activities regulated under the Permit and addressed in the SWMP.

The SWMP also addresses other potential pollutant sources and assesses the potential for these sources to contribute pollutants to stormwater associated with industrial activity, such as the outdoor storage of chemicals. Four tenant facilities located on DEN, that conduct industrial activities, are not covered by the DEN permit and this SWMP: (1) Fuel Farm operated by FSM Group; (2) Frontier Airlines Hangar; and (3) United Airlines Hangar including deicing equipment parking lot (4) Southwest Airlines Hangar. Each of the tenants operating these facilities has been issued separate permit coverage



for their activities by the WQCD and has subsequently developed an individual SWMP for each of the facilities.

To the extent other activities at DEN trigger the need for permit coverage, they are covered by separate permits. For example, some activities that occur landside (i.e., outside the security fence) are municipal or commercial activities covered under CCoD's MS4 Permit. The MS4 Permit (COS-000001) addresses stormwater runoff associated with municipal areas as discussed in Section 1.2. For example, a landside rental car facility that fuels and washes commercial vehicles would be regulated under the MS4 Permit.

Also, on occasion, there may be airport industrial activities that occur landside. For example, maintenance of GSE in a location that is landside could fall within the scope of the Industrial Permit and associated SMWP. Determinations are made on a case-by-case basis whenever such situations arise.

In addition to identification of potential pollutant sources and development of associated BMPs, the following are also required to be included in the SWMP and will be addressed in Section 2:

- Industrial Activity Description
 - Site Map
 - Stormwater Management Controls
- SWMP Administrator
Identification of Potential Pollutant Sources and Best Management Practices
Sampling Information
Preventive Maintenance
Good Housekeeping
Spill Prevention and Response Procedures
Employee Training
Identification of Discharges other than Stormwater (that are associated with industrial activity)



1.2 CONTRACTUAL AND OPERATIONAL REQUIREMENTS

Industrial activities are performed onsite by CCoD employees at DEN and by Airport tenants, contractors, and operators. The tenants, contractors, and operators operate under a variety of legal agreements. With a few exceptions, CCoD owns all facilities at DEN.

Most tenants hold leases with CCoD for DEN facilities. Lease agreements require overall compliance with federal, state, and local environmental rules and regulations, as well as with DEN Rules and Regulations and Tenant Development Guidelines (TDGs). DEN Rules and Regulations provide for the management, operation, control, and use of the Denver Municipal Airport System, while the TDGs dictate specific processes for review and approval of modifications and/or improvements in leased areas. CCoD also contracts specific work to be performed at DEN by contractors via professional services and other agreements. In addition, CCoD retains maintenance and/or operational agreements with operators of DEN facilities. CCoD has contractual agreements associated with components of the primary industrial activities of aircraft deicing and fueling, as described below.

The Aircraft Deicing System (ADS):

- Receives and stores Type I and Type IV ADF
- Provides undiluted Type I and Type IV ADF to airlines for their use
- Recovers spent ADF from authorized deicing areas
- Reclaims the primary ingredient of the spent ADF, propylene glycol

CCoD has contracted the maintenance, operation, and management of the ADS through a services agreement.

DEN also has an airside fuel storage and distribution system (FSDS). The system is leased to the airlines and the maintenance, operation, and management of the FSDS is contracted by the airlines and DEN through an operational agreement. The FSDS consists of the Fuel Farm; the hydrant system for fueling aircraft; the Concourse fueling stations for fueling aircraft, vehicles, and GSE; and the South Cargo fueling station for fueling aircraft, vehicles, and GSE. Four types of fuel are supplied, which vary by location. These fuels are Jet A fuel, mobile gasoline (mo gas or gasoline), aviation gasoline (av gas), and diesel.



Regardless of the type of agreement (e.g., lease, operational agreement, or professional service agreement), all require compliance with applicable environmental requirements. There may also be instances in which work or space is subcontracted by a tenant, contractor, or operator to a contractor, subcontractor, or sub lessee. DEN promotes environmental compliance with parties and agents of these agreements, including compliance with the Industrial Permit and SWMP.

TENANT, OPERATOR, AND CONTRACTOR PARTICIPATION

Given the number of parties that operate in contributing areas, it is important that stormwater management activities are well-coordinated among DEN and its tenants, operators, and contractors that conduct industrial activities onsite ("companies conducting industrial activities"). DEN requires each of the companies conducting industrial activities to comply with DEN's SWMP and either (1) elect to operate under DEN's SWMP, or (2) develop an individual SWMP that is at least equivalent to DEN's SWMP.

Companies conducting industrial activities typically elect to operate under DEN's SWMP. In this case, there is site-specific information that must be submitted to DEN Environmental Services (ES) as well as kept onsite. The information includes:

- SWMP Industrial Activities Matrix and corresponding Environmental Guidelines
- Potential Pollutant Sources Survey
- Identification of the local SWMP Administrator
- Site drainage map
- Signed letter certifying operation in compliance with DEN's SWMP

Blank forms for completion and examples of the above bulleted items are provided in Appendix B or by contacting DEN ES.

If companies conducting industrial activities elect to develop their own SWMP, their document must be at least as protective of stormwater quality as DEN's SWMP and must be reviewed by DEN ES prior to use.

To help ensure overall compliance with the SWMP, companies conducting industrial activities should continue to be involved in development, implementation, and use of stormwater management practices. The following actions are performed to facilitate participation and compliance:



DEN ES actively monitors industrial activities and locations through ongoing coordination with tenants, operators, and contractors, as well as DEN Airline Affairs, Operations Division, Maintenance Divisions, and Airport Infrastructure Management Division.

To understand site-specific characteristics, companies conducting industrial activities adopt DEN's SWMP, or develop their own SWMP and provide the Airport with the above-mentioned items required to operate under DEN's SWMP.

DEN's SWMP, which is made available to companies conducting industrial activities, contains operational controls to reduce impacts to the environment, including BMPs for stormwater management. The operational controls, identified as Environmental Guidelines (EGs), enable these companies to operate within DEN's established practices. DEN's EGs are accessible to all airport tenants, operators and contractors, and the general public at <http://www.flydenver.com/environmental>.

Every entity operating at DEN should periodically check this site for the most current version of the EG(s) applicable to their activities.

- At each company's discretion, stormwater pollution prevention training is available from DEN ES for use in the training program.
- DEN's contractual or operational agreements with companies conducting industrial activities require compliance with all rules and regulations. Therefore, companies are potentially subject to breach of contract if their actions contribute to permit non-compliance.
- Regular inspections of facilities and stormwater management practices associated with industrial activities are conducted by DEN to promote adequate stormwater quality protection.



2.0 DEVELOPMENT OF STORMWATER MANAGEMENT PLAN

Part I.A.2.a of DEN's Permit specifies that:

A SWMP shall be developed for each facility covered by this Permit and submitted to the Division. The SWMP shall include BMPs that are selected, installed, implemented, and maintained in accordance with good engineering practices. (The plan need not be completed by a registered engineer.)

The SWMP shall identify potential sources of pollutants that may reasonably be expected to affect the quality of stormwater discharges associated with industrial activity from the facility. In addition, the SWMP shall describe the practices to be used to reduce the pollutants in stormwater discharges associated with industrial activity at the facility to comply with the terms and conditions of this permit.

As discussed in Section 1 of this document, DEN maintains the Permit for the majority of the contributing areas where industrial activities are conducted. The exceptions were noted earlier. Companies conducting industrial activities are required to comply with DEN's SWMP. Components of the SWMP required by the Permit are presented in the following sections. A map of the entire site, which contains SWMP information, is provided as Figure 2-1.



2.1 INDUSTRIAL ACTIVITIES

Part I.A.2.a(1) of the Permit specifies that:

The SWMP shall provide a narrative description of the industrial activities taking place at the site.

Additionally, Part I.A.2.a(3)(ii) of the Permit specifies that:

The SWMP shall identify potential sources of pollutants at the site and assess the potential of these sources to contribute pollutants to stormwater discharges associated with industrial activity. The SWMP must also describe appropriate Best Management Practices (BMPs) to prevent or reduce the potential of these sources to contribute pollutants to stormwater discharges.

At a minimum, each of the following shall be evaluated for the reasonable potential for contributing pollutants to runoff:

Loading and unloading operations

Outdoor storage activities

Outdoor industrial or processing activities

Significant dust or particulate generating processes

On-site waste disposal practices

The presence of salt piles

Areas where discharges authorized by Part I.C and I.D occur

Areas where significant spills and significant leaks of toxic or hazardous substances have occurred at the facility from three years prior to permit issuance to the time of SWMP preparation

Pavement Deicing

Factors to consider include the toxicity of chemicals; quantity of chemicals used, produced, or discharged; the likelihood of contact with stormwater; and the history of significant leaks or spills of toxic or hazardous substances.

Due to the variety of industrial activities occurring at DEN and the various structural controls and BMPs implemented at the Airport, the requirements mentioned above are addressed in the following sections. These sections will first discuss the activities that are most likely to



contribute to stormwater pollution and then the areas of the facility where these activities are most likely to occur.

IDENTIFICATION OF POTENTIAL POLLUTANT SOURCE ACTIVITIES

There are a variety of industrial activities occurring at DEN that may be potential pollutant sources, the most significant of those being the deicing of aircraft and the fueling of aircraft, vehicles and equipment. Both deicing and fueling are discussed in more detail in the following sections, as well as other potential industrial activities that may contribute pollutants to stormwater discharges.

This plan does not address construction-related activities. Such activities are covered by a permit for "Stormwater Discharges Associated with Construction Activity" issued to DEN, a contractor, or an engineering firm.

To address those activities with the potential to impact stormwater quality, DEN has developed operational controls, identified as Environmental Guidelines (EGs), which contain BMPs to minimize the effects of these activities. DEN's EGs are accessible at <http://www.flydenver.com/environmental>

Every entity operating at DEN should periodically check these sites for the most current version of the EG(s) applicable to their activities.

Aircraft Deicing

The use of ADF presents a unique challenge in stormwater management at cold-weather airports worldwide, requiring airports to simultaneously address passenger safety and environmental concerns. The nature of the open-air application of ADF may present opportunities for migration of ADF to the surrounding environment. The high biochemical oxygen demand (BOD) of these glycol-based fluids has the potential to reduce dissolved oxygen (DO) concentrations in receiving streams. DEN is widely regarded as having one of the most advanced systems in the United States (U.S.) for collecting and managing spent ADF from deicing operations.

Aircraft deicing activities are performed by tenants, operators, or contractors, not DEN City employees. DEN requires that aircraft deicing take place only in designated areas, which maximizes the Airport's ability to collect spent ADF. The fluids from the designated deicing pads are recycled when practical. The remainder of collected ADF runoff is pumped to the Metro Wastewater Reclamation District's (Metro) for treatment at one of their facilities, in accordance with an Industrial Wastewater Contribution Permit (No. 1680-8-A2).



Glycol-based fluids are the only aircraft deicers widely employed in the U.S. Aircraft deicer formulations may include wetting agents, corrosion inhibitors, surfactants, and dyes at low concentrations to enhance their performance. Pure ADF generally is composed of either propylene glycol (PG) or ethylene glycol, and is formulated in Type I, Type II, and Type IV products. DEN prohibits the use of ethylene glycol based ADF as per *DEN Rules and Regulations Part 190: Aircraft Deicing Regulations*. Currently, only Type I and Type IV ADF fluids are used at DEN and are composed of 89 percent (Type I) and 50 percent (Type IV) propylene glycol. The remaining percentages for both types of fluids are composed of manufacturer's additives and water.

Type I fluid is an un-thickened fluid, typically mixed with water and heated before application. It is designed to melt or dislodge accumulated ice, frost, and other frozen precipitation. The majority of ADF used at DEN is Type I.

Type II and Type IV fluids contain shear-sensitive polymeric thickening agents designed to provide adherence to the aircraft as protection during taxiing and initial acceleration prior to takeoff. Since 1997, ADF users at DEN have switched from Type II to Type IV fluid because Type IV fluids exhibit improved holdover times. Therefore, during precipitation events, departing aircraft may first be deiced with Type I with a subsequent anti-icing application of Type IV. Type IV may also be applied to aircraft in the evening to minimize ice accumulation overnight, thus reducing Type I requirements prior to morning departure. Type IV formulations lose most of their viscosity and shear off the aircraft's exterior as the aircraft reaches speeds of 85 to 120 knots during takeoff.

Operational controls for the prevention or reduction of contaminants to the clean stormwater system are comprised of both BMPs and infrastructure. BMPs are preventive actions that are taken on an ongoing basis, whereas infrastructure consists primarily of passive measures of collecting stormwater runoff contaminated with ADF. Often, the success of operational measures and infrastructure are interdependent.

At DEN, operational controls are based on restricting the use of ADF to specifically authorized areas and collecting stormwater runoff from those areas. Each of these areas has a dedicated collection system that conveys ADF contaminated ("deicing waste" or "DIW") stormwater to storage and either onsite recycling or discharge to the CTP. Figure 2-2 provides a basic view of the dedicated collection areas, while Figure 2-3 provides a process flow diagram of the spent ADF management system ("DIW system"). More detail on the spent ADF management is provided in Section 2.1.2.2.

Environmental Guideline *Aircraft Deicing* includes BMPs for aircraft deicing and its associated activities. Among the topics covered in the EG are optimization of the spent ADF



management system, authorized deicing locations, and "full deicing" and "limited deicing" definitions.

Fueling Activities

As stated earlier, DEN has an airside FSDS that consists of the Fuel Farm; the hydrant system for fueling aircraft; the Concourse fueling stations for fueling aircraft, vehicles, and GSE; and the South Cargo fueling station for fueling aircraft, vehicles, and GSE. In accordance with 40 CFR Part 112, the Fuel Farm and hydrant distribution system operator has prepared a Spill Prevention Control and Countermeasure (SPCC) Plan for the FSDS. The hydrant system distributes Jet A fuel from the Fuel Farm to the concourse gates, concourse stations, and the South Cargo station. The buried portions of the system are cathodically protected against corrosion, continuously monitored for voltage, and are fitted with leak detection that can sense a 6 gallon per hour leak. There is a backup leak detection system that can assist in locating a leak should one be sensed. The concourse stations are located at the east end of each concourse on Vandriver Street vehicle service road (VSR) and allow for servicing Jet A fuel to tanker trucks that fuel regional jets and turboprops at the concourses. The South Cargo station is located just south of the General Aviation (GA) ramp (south of Gate 5) and services Jet A fuel to the GA and South Cargo ramps by truck.

The FSDS operator also supplies concourse stations and the South Cargo station with gasoline, av gas, and diesel for storage and dispensing. Compressed natural gas (CNG) is supplied by a contractor via pipeline for distribution at the concourse stations. The concourse stations have storm drains that flow to DIW Retention Pond 001, while the South Cargo station drainage is pretreated through an oil-water separator (OWS) before discharging to the clean stormwater system.

City vehicle fueling is accomplished at the Maintenance Support Center (MSC) north of the Fixed Base Operations (FBO) at GA, on the east side north of Gate 5. Additional City vehicle fueling is available at the North Vehicle Fueling Station located on the north airfield southwest of Gate 4 on Queensburg Street. Gasoline and diesel are supplied by a contractor for storage and dispensing at this location. The contractor who supplies CNG at the concourse stations and the South Cargo station also supplies CNG to this site. In addition, the MSC maintains a field fueling capability. The tanker filling location at the MSC drains through an OWS before discharging to the clean stormwater system.

There is a gasoline and diesel fueling facility for DEN landside snow removal equipment at the Tower Road / Pena Boulevard storage facility. This avoids taking the equipment out of service to drive to the MSC within the AOA for refueling. The city vehicle fueling area and the Tower Road / Pena Boulevard fueling location are both included in DEN's SPCC Plan.



Various construction projects for DEN, as well as for companies conducting industrial activities at DEN, require onsite fueling of equipment. Contractor requirements for onsite fueling activities are detailed in the DEN Technical Specifications. All fueling activities at DEN are required to follow the DEN Spill Prevention and Response Procedures (Section 2.2.6). Fuel spills are cleaned as soon as possible using absorbent materials, and the spent material appropriately disposed. In many locations, including the concourse gates, South Cargo ramp, and the GA ramp, spilled fuel that is not successfully contained at the spill site may flow to one of the DIW retention ponds when valves are positioned in collection mode. This fuel can then be skimmed from the pond or from the influent structure for appropriate disposal.

Environmental Guideline *Fueling Aircraft, Vehicles, and Auxiliary Equipment* provides BMPs and guidance for fueling activities.

Other Activities

A database of the companies conducting industrial activities at the Airport is maintained at DEN. In addition to deicing of aircraft, and fueling of aircraft, vehicles and equipment, tenants and operators at DEN also conduct the activities listed below that could contribute pollutants to industrial stormwater discharges:

- Aircraft Lavatory Services
- Aircraft Maintenance
- Aircraft Painting/Stripping
- Aircraft Washing
- Building and Grounds Maintenance
- Cargo Handling
- Chemical Storage and Handling
- Equipment Degreasing/Washing
- Equipment Maintenance
- Equipment Storage
- Materials Storage
- Operation of Fire Suppression Systems Fuel Storage
- Outdoor Ramp Washdown
- Pavement Deicing
- Vehicle Maintenance
- Vehicle/Equipment Painting/Stripping
- Vehicle Storage
- Vehicle Washing
- Waste Storage



In addition to fueling vehicles and equipment, CCoD conducts other activities that could contribute pollutants to industrial stormwater discharges, such as:

- Building and Grounds Maintenance
- Chemical Storage and Handling
- Equipment Degreasing/Washing
- Equipment Maintenance
- Equipment Storage
- Emergency Firefighting
- Fuel Storage
- Materials Storage
- Painting and Paint Removal
- Pavement Deicing
- Power Washing
- Pretreatment/Oil-Water Separation
- Rubber Removal
- Vehicle Maintenance
- Vehicle Storage
- Vehicle Washing
- Waste Storage and Collection
- Temporary Waste Storage

PAVEMENT DEICING

The deicing of paved surfaces is another critical component of safe winter operations at DEN. For aircraft and ground vehicles alike, traction is a key component of safety and is achieved through a combination of mechanical removal of snow and application of sand and chemical deicing products. Airport Rules and Regulations, Part 40, regulate the pavement deicing products used both airside and landside at DEN. The deicing of landside pavement is a municipal activity and therefore this plan focuses on airside deicing activities only. DEN Field Maintenance section is mainly responsible for pavement deicing; however, DEN tenants, operators, and contractors also conduct pavement icing on a lesser scale according to the DEN Operations Division Snow and Ice Control Plan.

Airside pavement includes all paved surfaces in the AOA. Chloride-based deicers cannot be used in the AOA due to the potential for corrosion of aircraft components and are prohibited as per DEN Rules and Regulations, Part 40. At DEN, runways and high-speed taxiways are usually chemically deiced in anticipation of a storm. However, once precipitation has begun, mechanical snow and ice removal methods (e.g., plowing, rotating brush) are typically used.



Currently, in most instances, a solution of potassium acetate (KAc) is used for runway/taxiway deicing at DEN. By using a KAc-based product, the environmental effects (toxicity and BOD) of runway deicing are lower than with the use of many other available and approved products. DEN typically applies KAc to runways and taxiways before the onset of precipitation, and only within its range of effective temperatures (approximately 15 degrees Fahrenheit [°F] to 35°F).

DEN also typically applies very fine-grain sand to runways and high-speed taxiways to improve traction after precipitation begins. The amount of sand applied is dependent on specific storm conditions and braking action conditions. DEN's stormwater detention ponds not only control the rate of runoff (i.e., peak flow rates), but also provide an opportunity for the sand to settle out. These ponds thus represent a BMP for water quality.

As a component of the West Airfield Diversion System (WADS), the southern portion of Runway 16R/34L includes a special edge drain system designed to allow the capture of low flows into the DIW stormwater system when appropriate. The capture flow rate is based on the infiltration rate into the asphalt treated permeable base (ATPB) material. Storm-flow rates in excess of this infiltration rate sheet-flow to the clean storm system. The under-drain system in this portion of the runway may also be collected into the DIW stormwater system when appropriate. The southern portion of Runway 16L/34R is also within the WADS that diverts lower flow rates from the clean stormwater system to the DIW stormwater system. Both infrastructure systems reduce the potential of pavement deicing fluid to impact stormwater discharges. The WADS boundary is depicted in Figure 2-2, and the system is discussed in greater detail in Section 2.1.2.3.2 below.

Except for the WADS area, pavement deicing materials applied to areas outside the dedicated ADF application areas are not captured for subsequent treatment or disposal. However, DEN's selection of KAc over other available and approved materials for runway/taxiway deicing represents a BMP for airside pavement deicing. KAc has a much lower 5-day biochemical oxygen demand (BOD₅) and toxicity characteristics than many of the available products approved for airside use, as detailed in the 1998 Water Quality Study (DEN 1998). Environmental Guideline *Pavement Deicing* provides BMPs for pavement deicing and authorized and prohibited deicing products.



MAINTENANCE ACTIVITIES

Maintenance of aircraft, vehicles, and GSE is another industrial activity occurring widely at the Airport. Maintenance is encouraged to be conducted primarily indoors at the tenant, contractor, operator and DEN maintenance facilities, which minimizes the potential for pollutants, such as oils and hydraulic fluids, to impact stormwater quality. However, minor maintenance of aircraft may be conducted at the concourse gates, General Aviation apron, or at DS-RON pads, (i.e., delta sierra remain overnight pads). Petroleum spills are cleaned up using absorbent material and are reported as outlined in Section 2.2.6. When valves are positioned in collection mode at certain locations, residual material may be collected into the DIW stormwater system. Absorbent booms are used to skim oils off the surface of the water and prevent the oil from discharging to the CTP. These booms are then properly disposed of. Stormwater runoff from the DS-RON pads is either directed to a DIW retention pond or through an OWS to the clean stormwater system. BMPs associated with maintenance activities are contained within Environmental Guideline *Maintenance of Aircraft, Vehicles, and Equipment*.

EQUIPMENT TESTING AND EMERGENCY FIRE-FIGHTING

Fire-fighting residuals can be a source of pollutants in industrial stormwater discharges when used in areas where industrial activities occur. The Denver Fire Department (DFD) provides fire response services to DEN, and they conduct emergency response activities and equipment testing in areas that contribute industrial stormwater runoff. The FAA (Federal Aviation Administration) establishes performance standards for aircraft rescue and firefighting (ARFF), and in accordance with those requirements DFD must currently use aqueous filmforming foams (AFFF) that contain per- and poly- fluoroalkyl substances (PFAS). When an emergency response activity is conducted in areas that contribute industrial stormwater runoff, DEN addresses fire-fighting residuals including AFFF, after the scene is safe, consistent with the spill response procedures described in Section 2.2.6.

DFD uses the following practices to minimize the potential for emergency response and equipment testing to contribute to the potential for PFAS residuals to be present in industrial stormwater discharges:

- After the foam system on an ARFF rig is triggered (e.g., during an emergency response), the system is flushed with water to remove foam residual. Foam flushing waste is contained and disposed of at a permitted facility.

- Equipment testing is conducted with water only

- Equipment testing is conducted in grassy areas where the water is allowed to infiltrate.



As described in Section 2.2.8, non-stormwater discharges from emergency fire-fighting activities are authorized under the permit if they are identified in the SWMP. EPA described the reasoning for covering these discharges in industrial stormwater permits, without a requirement to identify pollution prevention measures, in the development of the baseline industrial stormwater general permits (57 FR 41242). Consistent with EPA's reasoning, this SWMP does not identify pollution prevention measures for non-stormwater flows from emergency response fire-fighting activities, because these flows will be unplanned emergency situations where it is necessary to take immediate action to protect the public.

IDENTIFICATION OF POTENTIAL POLLUTANT SOURCE AREAS

An assessment of the potential of all the industrial areas to contribute pollutants to stormwater discharge requires an understanding of the design of the Airport's drainage system. Pollution prevention is a primary objective of the drainage system, which is designed to maintain separation of DIW stormwater from clean stormwater. A description of the entire site, the stormwater collection system, along with activities, drainage pathways, and major structural controls for each portion of the Airport are provided in the following sections, starting with an overview of the entire DEN site.

SITE MAP

Part I.A.2.a.(2) of the Permit specifies that:

The SWMP shall include a site map indicating the following:

- a. an outline of the drainage area of each stormwater outfall (to the extent possible);*
- b. each existing structural control measure to reduce pollutants in stormwater runoff, surface water bodies; and*
- c. the location of each sampling point identified under Part I.A.3.a(1) and (2).*

The DEN overview map (Figure 2-1) included in the SWMP shows:

- Wet and Dry Weather Monitoring Locations
- Major drainage basins
- Surface water bodies (including dry water courses)
- Existing structural control measures to reduce stormwater pollution
- Tenant, contractor and operator facility locations



TABLE 2-1 MAJOR DRAINAGES EXITING DEN PROPERTY

DRAINAGE	DESCRIPTION
First Creek	First Creek intersects Peña Boulevard and exits DEN property at or near the northwest corner of the southeast 1/4 of the southwest 1/4 of Section 8, township3 south (T3S), range 66 west (R66W) of the 6th principal meridian (PM).
Second Creek	Second Creek crosses the southwest corner of the main Airport area and exits DEN property at or near the northwest corner of the southeast 1/4 of the southwest 1/4of Section 26, T2S, R66W of 6th PM.
Third Creek	Third Creek begins just south of 71st Avenue, crosses through the site flowing just west of the main terminal building, then flows northwest, draining most of the western half of the Airport industrial areas, exiting DEN property at Detention PondT-239 at or near the southeast corner of the southeast 1/4 of the northwest 1/4 of the southwest 1/4 of Section 12, T2S, R66W of the 6th PM.
Barr Lake Tributary	The Barr Lake Tributary basin drains a small portion of the northwest Airport complex and exits DEN property at or near the corner of the northwest corner ofthe northeast 1/4 of the southeast 1/4 of Section 6, T2S, R65W of the 6th PM.
Lower Hayesmount	The Lower Hayesmount basin flows away from the Fuel Farm area and exits DEN property at or near the northwest corner of the northeast 1/4 of the southwest 1/4of Section 2, T2S, R65W of the 6th PM.
Upper Hayesmount	The Upper Hayesmount basin flows enter the DEN property from the southeastand heads north until it ties in with Box Elder Creek, which exits the property as described below.
Box Elder Creek	Box Elder Creek runs through the eastern half of the DEN property and drains aportion of the eastern industrial complex, exiting DEN property at or near the northwest corner of the northeast 1/4 of the northeast 1/4 of Section 12, T2S, R65W of the 6th PM.

Drainage Basins and Locations of Stormwater Outfalls

There are seven significant natural drainage areas of the Airport property: First Creek, Second Creek, Third Creek, Barr Lake Tributary, Lower Hayesmount, Upper Hayesmount, and Box Elder Creek.



First Creek drains a portion of the transportation corridor that contains Peña Boulevard, which links DEN to Interstate 70. There are no industrial activities conducted in the First Creek drainage area and it is not identified in the Permit; therefore, First Creek is not addressed as an industrial area in the SWMP. Each of the drainage basins is shown on Figure 2-1. A description of where each major drainage outfall exits DEN property is provided in Table 2-1.

Surface Water Bodies

Surface water bodies on the Airport property are also shown on Figure 2-1 and include ephemeral, intermittent, and perennial streams, or drainage channels; detention ponds and DIW retention ponds. Detention ponds are utilized to detain the stormwater flowing through the Airport property for the purpose of limiting the rate of flow downstream, and thus serve as water quality features. Natural wetlands are mainly along intermittent and perennial streams on undeveloped DEN property. This undeveloped property is generally located outside the security fence along various drainages, including Second and Third Creek.

Existing Structural Control Measures to Reduce Stormwater Pollution

DEN has substantial infrastructure in place to protect stormwater quality and maintain the separation of clean stormwater runoff from DIW stormwater runoff. The major structural stormwater pollution control measures at the Airport include: the DIW stormwater collection/retention system, which incorporates dedicated piping and DIW retention ponds; the West Airfield Diversion System (WADS), which diverts fugitive glycol and pavement deicer at lower flow rates from the clean stormwater system to the DIW stormwater system; dedicated aircraft deicing pads and an ADF recycling plant; secondary containment structures; OWS within the clean stormwater system; and, contained material storage and handling areas (see Figure 2-3). These systems are discussed in detail in the next sections. The major components of these systems (e.g., DIW retention ponds) are also shown on Figures 2-1 and 2-2.

Tenant, Contractor, and Operator Facility Locations

Figure 2-1 identifies major facility locations at DEN. Each company conducting industrial activities on DEN property and operating under DEN's SWMP must also provide map(s) for their leased areas that identify general stormwater-related items. A sample of such a map can be found in Appendix B. These maps and other SWMP related materials are kept by the subject companies, and copies of these materials are maintained in tenant specific files in the DEN ES central files.



Overview of Spent ADF Management System

The spent ADF management system consists of collection, conveyance, storage and onsite recycling or off-site disposal/discharge to the CTP. The system has two basic components. The first component collects stormwater from areas where deicing occurs; most of these system elements were constructed prior to Airport opening. The second component collects stormwater from areas where aircraft deicing does not occur, but the potential exists for fugitive ADF to be present due to various transport mechanisms. The component of the system designed for collection of fugitive ADF has been installed and upgraded since the airport opening. The primary element of this component is the WADS, which is discussed in more detail in Section 2.1.2.3.2 below.

To the maximum extent practicable, the spent ADF management system is operated in such a manner that storage is available for the runoff from future storms. Even so, stormwater associated with industrial activity may contain residual levels of spent ADF that migrate beyond the capture system. Because the spent ADF management system has a finite capacity, stormwater associated with industrial activity resulting from precipitation events that exceed the system's capacity has the potential to be discharged from areas within the capture system. Figure 2-2 provides a basic view of the dedicated collection areas, while Figure 2-3 provides a process flow diagram of the spent ADF management system.

ONSITE RECYCLING

Stormwater runoff from the designated deicing pads with a sufficient concentration of glycol, generally greater than one percent PG, is collected and stored in five 420,000-gallon tanks adjacent to the Glycol Recycling Plant prior to recycling. The recycling plant's throughput is dependent on influent PG concentrations; higher concentrations are technically and economically more feasible to recycle.

Finished product concentrations can run upwards of 99 percent, which has historically been sold for non-aviation/non-food uses.

DISPOSAL AT CTP

Through a Contribution Permit with Metro, DEN can pump DIW stormwater to Metro's CTP. Stormwater is metered from DEN's DIW retention ponds, after which it is combined with domestic wastewater from DEN and pumped to the CTP for treatment and discharge.

DEN's ability to discharge DIW stormwater to the CTP is limited by the Contribution Permit. The limits restrict the tonnage of BOD that can be discharged in a given unit of time. As a result, the normal mode of operation is to have one cell of a pond discharging to the CTP at any given time at a discharge rate back calculated from the BOD loading limit and the



measured BOD concentration in the subject pond. At low BOD concentrations, pumping capacity, rather than Metro loading limits, may be the limiting factor for the amount of water and BOD that may be pumped to the CTP.

To avoid "shock loads" to the CTP, DEN is also required to "ramp" discharge rates up and down over a period of several days and cannot simply turn pumps on or off at the maximum daily tonnage limit. This "ramping" requirement, along with the unpredictability of deicing storms, complicates the forecasting of future pond levels and discharge planning.

ADDITIONAL SOURCE CONTROL MEASURES

In addition to collection of DIW stormwater, several measures are in place to minimize or prevent the contamination of the clean stormwater system with ADF and other materials. Some measures have been in place since the Airport's inception, whereas others have been implemented more recently to address the observed constraints of the original DIW stormwater system and its appurtenances.

Most of the ADF used at DEN is distributed to the deicing pads from supply tanks located adjacent to the Glycol Recycling Plant. ADF can be pumped from these tanks to the pad areas via buried pipelines.

Maintaining pressure in each line and continuously monitoring the lines' pressure and the volume in the supply tanks ensures the integrity of these piping systems. Any leaks in the system would be indicated by a drop in system pressure or by volume losses (other than consumption at the pads). The system is monitored year-round. The supply tanks are equipped with concrete secondary containment.

Additional steps have been taken since the Airport opened to improve the capture of spent ADF in the DIW stormwater system. One concern with the design of the deicing pads west of the concourses was the routing of numerous utility corridors and vaults directly beneath the pads. Elevated concentrations of PG and chemical oxygen demand (COD) observed in the utility corridors suggested that ADF was entering the corridors through utility manholes on the pads. Seepage through joints in the pads' concrete may also contribute to migration of ADF to the clean stormwater system, either via the utility corridors or more directly via seepage from under the concrete at the edges of the pads and ramps.

To address the PG and COD concentrations in the utility corridors and the potential for contamination of the clean stormwater system via this pathway, DEN connected several utility corridors to a diversion system that feeds to the DIW stormwater system (see Section 2.1.2.3.2



for a description of the West Airfield Diversion System), sealed manholes on the deicing pads and continues maintenance of the seals in concrete joints.

Specific Industrial Activity Areas

The major industrial activity areas at DEN are:

- The South Campus
- The Main Ramp Area
- The North Campus

The following sections will describe these areas in detail as well as the DIW and clean stormwater systems found within each of these areas of the facility.

SOUTH CAMPUS

The South Campus incorporates the southern portion of the industrial activity area at DEN. This area includes all of the Third Creek Sub-Basin A drainage, most of Third Creek Sub-Basin B, and portions of the Second Creek drainage as described below. The following lists the facilities conducting industrial activities within each drainage.

Sub-basin A drains to the northwest and includes the following facilities conducting industrial activities:

- United Airlines (UAL) South Campus facilities, (including the UAL Flight Kitchen, UAL GSE Facility, and the UAL Cargo Facility), the GA facilities including Signature Facility Hangar and Vehicle Maintenance Building, and the GA ramp (outside the DIW system)
- GA DIW Retention Pond 004
- D deicing pad
- South Cargo GSE fueling site
- East portion of the South Cargo Facility outside of DIW system
- Snow Dumps to the north of the Mt. Elbert Parking Lot and on the eastern edge of the South Cargo apron

Sub-basin A drains into Sub-basin B, which includes the following South Campus facilities conducting industrial activities:

- DEN Maintenance Support Center
- Terminal Building
- Worldport facility
- West portion of South Cargo facility that is outside of DIW system



Snow Dumps on the western edge of the South Cargo apron and south of the AS taxiway (northeast of the eastside passenger parking lots)
East part of runway 7/25 and associated taxiways

Combined flow from Sub-basins A and B drains to the northwest into 12-foot by 12-foot double boxculverts (DBC) under taxiways B4 and WA into Detention Pond 820 (C pond).

The South Campus facilities in the Second Creek drainage are limited to the west part of runway 7/25 and the associated taxiways.

DIW Stormwater System

A small deicing pad (D Pad) for cargo and GA aircraft deicing exists near the south end of runway 17R/35L. Runoff from this pad can be collected and directed to an adjacent 420,000-gallon storage tank from which the fluids may be pumped to sanitary Lift Station One or trucked to the Glycol Recycling Plant for processing if it is of sufficient glycol concentration. However, because full deicing is presently allowed at both the South Cargo and GA ramps, companies conducting industrial activities in both areas have tended toward in-place deicing on the ramp. Thus, normal operation is full deicing on the South Cargo and GA ramps, where runoff is collected via trench drains and directed to the respective South Cargo or GA DIW pond with subsequent discharge to the CTP. If the pond contents are of acceptable quality, alternatively the fluids may be trucked to the Glycol Recycling Plant for processing.

South Cargo Ramp drainage is collected via trench drains and catch basins on the ramp and is conveyed to an influent structure adjacent to the DIW Retention Pond 005. The trench drains were designed to hydraulically limit flow into the retention pond based upon 5-year storm intensity over the ramp area. The influent structure also contains three gate valves to direct flow to one or both of the two retention pond cells or to the clean stormwater system.

Typically, during the deicing season, drainage from the ramp is considered DIW stormwater and is discharged into the DIW pond. The DIW stormwater is released from the pond's cells by gravity and metered to the sanitary sewer in accordance with DEN's Metro Contribution Permit.

Additionally, DEN has constructed a French drain system adjacent to the South Cargo ramp. The French drain directs seepage of glycol-laden water from under the concrete to the DIW



Retention Pond 005. An adjacent paved swale directs surface flows from the edges of the South Cargo Ramp to the DIW Retention Pond 005.

Similar to the South Cargo Ramp, all drainage from the GA Ramp is collected via area drains and catch basins and conveyed to the DIW Retention Pond 004. The DIW Retention Pond 004 operates similar to the DIW Retention Pond 005. However, DIW Retention Pond 004 cannot be drained by gravity, and must be pumped to the CTP via Lift Station One instead.

A summary of the storage capacity of the DIW stormwater retention ponds is provided in Table 2-2.

TABLE 2-2 SUMMARY OF DIW RETENTION POND STORAGE VOLUMES

POND #	RETENTION POND LOCATION	NUMBER OF CELLS	OPERATING VOLUME PER CELL ¹ (MG)	TOTAL OPERATING VOLUME PER POND ¹ (MG)	OVERFLOW VOLUME PER POND (MG)	APPROX. MAXIMUM PUMP CAPACITY (GPM)
001	East Airfield	3	3.6 (1-2) 10.5 (3)	14.1	16.4	1,000
002	West Airfield	2	5.5	11.0	12.5	900
003A	Glycol Recycling Plant	1	3.9	3.9	3.9	550
004	General Aviation	2	1.6	3.2	3.4	500
005	South Cargo	2	4.4	8.8	10.1	1,000 (gravity)
009	West Airfield Diversion System	4	7.5 (1-3) 9.7 (4)	32.2	33.9	2,400

¹ Calculated using 3-foot minimum water depth and no allowance for freeboard.



Clean Stormwater System

There are portions of the South Campus that drain to the clean stormwater system. Water quality control structures are installed in certain clean stormwater system detention ponds to provide treatment of "first flush" drainage, which is defined as the drainage from the first 1/2 inch of precipitation into the stormwater system. These structures allow settling of sediment and some treatment of oils and greases. As shown on Figure 2-1, water quality control structures which collect industrial runoff are installed in the following ponds:

- Detention Pond 927 (East Cargo Pond or sometimes identified as Pond 100 also), which collects drainage from a majority of the South Cargo airside and landside areas
- Detention Pond 936 (West Cargo Pond), which collects drainage from the western end of the South Cargo Area and from the area surrounding DIW Retention Pond 005
- Detention Pond 926 (East Terminal Pond), which collects drainage from the DEN MSC

MAIN RAMP AREA

The "Main Ramp area" at DEN includes the ramp area around the three passenger airline concourses (A, B, and C), and other important Airport industrial areas nearby. This Main Ramp area is in Third Creek drainage Sub-Basins C and D and portions of the Upper and Lower Hayesmount drainage basins. The drainage basins and their respective Main Ramp activity areas are depicted on Figure 2-1 and are discussed below:

Third Creek Sub-Basin C incorporates the western half of the ramp around Concourse A, deicing pads A and WA, the Glycol Recycling Plant, and Retention Pond 003A. The WADS ponds (DIW Retention Pond 009) are also in this area.

Third Creek Sub-Basin D incorporates the western half of the area surrounding Concourses B and C and deicing pads B, C, J, and DS RON (Remain Overnight) West. Also included in Sub-basin D are the DEN North Storage Facility for pavement deicers, DS RON West Snow Dump, and the DIW Retention Pond 002.

The Upper Hayesmount drainage includes the eastern halves of the areas surrounding Concourses A, B, and C, and the Snow Dumps to the east of Concourse C.

The Lower Hayesmount drainage includes DS RON East and associated Snow Dump.

DIW Stormwater System

Drainage from the concourse gate areas (approximately the first 235 feet of ramp area adjacent to each of the concourses) and from operational expansion areas east of Concourses A and C is considered to be DIW stormwater and is collected by trench drains located parallel to each concourse just behind the aircraft (as positioned at the gates). The DIW stormwater from the



east and west halves of the concourses is piped to DIW Retention Pond 001 and DIW Retention Pond 002, respectively. These trenchdrains and subsequent storm sewers were designed to collect and convey DIW stormwater runoff from a 5-year storm. Because the trench drains are the hydraulically limiting factor, runoff in excess of the capacity of the trench drains will sheet-flow across the ramp to the clean stormwater system area inlets.

DIW stormwater collected in the trench drains flows to branch lines, which in turn flow to main lines located along the east and west sides of the concourses. The stormwater lines terminate at the DIW Retention Ponds 001 and 002 located north of the concourse area. Pump stations near the retention ponds allow for transfer of DIW stormwater from one cell to another so that one cell can act as a stormwater "receiving" cell while the other cell is "profiled" for discharge to Metro. The profiled DIW stormwater is pumped through a force main until it commingles with a gravity sanitary sewer line through which it flows to sanitary Lift Station One and is discharged to Metro CTP.

The majority of ADF used at DEN is applied to passenger aircraft at the dedicated deicing pads located west of the concourses. ADF-contaminated runoff from these pads is collected via trench drains and directed to storage in one of two locations. The trench drains in the dedicated deicing pads A, B, C, and J are piped to a diversion structure that allows fluids to be diverted to the Glycol Recycling Plant or to the DIW Retention Pond 002. Trench drains in deice pad WA are piped to the Glycol Recycling Plant via an 800,000-gallon storage tank or to the DIW Retention Pond 009. If the PG in the runoff is of sufficient concentration and capacity is available, runoff from the pads is directed to storage tanks at the onsite recycling plant. This is the normal mode of operation during deicing conditions since deicing at the pads usually yields highly concentrated runoff. However, when recycling is not possible, the pads' runoff will instead be directed to DIW Retention Ponds 002 or 009. From there, the stormwater is pumped to the CTP in accordance with the Metro Contribution Permit. During non-deicing conditions, runoff from the pads is typically sent to DIW Retention Ponds 002 or 009 to prevent dilution of the highly concentrated runoff in the recycling plant's tanks.

The DIW Retention Ponds 001, 002, and 009 were sized based on the following factors: hydrologic data for the area, methodology of deicing utilized by the airlines, the maximum discharge rate (based on pounds of BOD per day) allowed for pumping the detained DIW stormwater to the CTP, and the volume of DIW stormwater from a 5-year storm. The 5-year storm criteria for design of the DIW stormwater system was selected based on statements



made in the mitigation portion of the original EPA- and CDPHE-approved DEN Environmental Impact Statement. The 5-year storm volume was determined using the Rational Method.

The design volume of the DIW Retention Ponds 001 and 002 was based on the existing configuration of the Airport and accounted for the full build-out of the ramp area surrounding Concourses A, B, and C. To be conservative, the capacity of the ponds was doubled to capture back-to-back 5-year storms. In addition, capacity is obtained because the conveyance system allows additional storage before overflow occurs. Hydrologic analyses conducted in the original sizing of the ponds demonstrated the adequacy of the selected volumes. The ponds were determined to have sufficient capacity for nearly all precipitation events, which has been confirmed in operation. Results of the DEN Receiving Water Study, dated March 2003, demonstrate that the system and, more specifically, the 5-year design capacity protect the beneficial uses of the receiving waters.

Pond 003A was originally constructed to collect runoff from Concourse B to allow recycling of that fluid if it is of sufficient glycol concentration and quality. Pond 003A also collects runoff from the Glycol Recycling Plant industrial yard.

The spent ADF management system has the capability to divert influent water from the DIW stormwater system to the clean stormwater system as outlined in the *Spent ADF Management System Valve Positioning Work Instruction*. Discharge of pond cell contents to the clean system is a more complicated matter; this generally requires pumping. However, DIW Retention Pond 002 can discharge contents of the west cell by gravity down to the elevation of the discharge pipe. DIW Retention Ponds 004 and 005 can discharge a portion of either cell contents by gravity; again, only to the elevation of the discharge pipe.

Clean Stormwater System

The clean stormwater system was designed to intercept the 10-year storm runoff with provisions to accommodate the 100-year storm without flooding the airside concourse buildings. Runoff from roof drains at the concourses and drainage from the main ramp outside of the DIW system collection area (beyond the trench drains, which are approximately 235 feet from the gate and collect the water between the gate and drains) are collected into the clean stormwater system. Flow from the area west of center core at each of the concourses drains to the west, ultimately to Third Creek. Flows east of center core go to the Upper Hayesmount drainage. Stormwater on the Main Ramp outside of the DIW collection area flows across the



ramp in a north/south direction away from the concourses into east-west collection laterals that range from 15 to 54 inches in diameter.

The collection laterals west of the center core of Concourse A, along with flows from the west roof drains, flow to the west into a 72-inch main that discharges into Detention Pond 820 (C pond). The area around WA Pad and the Recycling Plant, outside of Retention Pond 003A collection area, flows overland to Detention Pond 820 as well. Sub-basin C drains to the north into an 8-foot by 6-foot box culvert that discharges into the Third Creek drainage channel.

The collection laterals on the west end of Concourses B and C, along with the roof drains flow to the west into a north-south interceptor main that ranges from a 54-inch diameter pipe on the south end to a 108-inch diameter pipe on the north end. This main flows into a 12-foot by 12-foot DBC, which flows to the west then southwest where it discharges into Detention Pond 818 (D pond).

When runoff from the DS-RON West pad is not diverted to the DIW stormwater system, snowmelt and any potential overflows from DIW Retention Pond 002 flow overland to the west and northwest to stormwater collection drains and eventually into the main line described in the previous paragraph.

Runoff from the DS-RON West pad flows through an OWS prior to entering the clean stormwater system. The area around the North Maintenance Storage area flows overland to the west into the DBC. Detention Pond 818 (D pond) drains to the south into a 42-inch pipe, which discharges into the Third Creek drainage channel.

The flows from Third Creek Detention Ponds 820 (C pond) and 818 (D pond) combine in the main stem of Third Creek at Runway 16R/34L just north of taxiway WB. The flow from Sub-basin E (Detention Pond 819) then enters the main stem of Third Creek at about Gun Club Road. Third Creek exits DEN property approximately 100 yards west of Detention Pond T-239.

East of the concourse center core, the collection laterals drain to the east into two main pipes. The southern main collects the drainage from the area around Concourse A and discharges to a drainage channel east of runway 17R/35L along the south flank of cross-field taxiway EC. The northern main collects the drainage from the area around Concourses B and C and the north side of Concourse A and discharges to a drainage channel east of runway 17R/35L; this channel then flows along the south flank of cross-field taxiway ED. Both drainage channels flow under



runway 17R/35R near taxiway P8, then east into the Upper Hayesmount drainage basin, as shown in Figure 2-1.

Runoff from the operational expansion areas east of Concourses A and C (see Figure 2-2) is collected into the DIW stormwater system when activities warrant; however, these areas have the capability to route the runoff through an OWS and subsequently into the Upper Hayesmount drainage basin.

DS-RON East pad was designed and constructed identical to the DS-RON West pad, in that pad runoff can be routed either to the DIW stormwater system (Retention Pond 001) or to the clean stormwater system through an OWS.

West Airfield Diversion System (WADS)

An under-drain system was designed to convey moisture out from under the runways and taxiways to maintain their structural integrity. However, shortly after the airport opened in 1995, it was discovered that deicing fluid was seeping through joints and cracks in the concrete surfaces, thereby entering the clean system via the under drains and seepage. Glycol contamination in the clean stormwater system was observed west of the concourses.

In late 1997, WADS, a major project to reduce the concentrations of ADF in the receiving waters west of the deicing pad area, was constructed. Portions of the clean stormwater system, including some under drains, were tied into the DIW stormwater system. This was done to capture ADF observed in those portions of the clean stormwater system. The WADS piping allowed DEN to divert a portion of DIW runoff in the clean stormwater system and under drains west of the concourses to the DIW Retention Pond 003A. Use of this system began in the 1997-1998 deicing season and resulted in reduced ADF concentrations in the Third Creek Basin.

Upsizing of the WADS piping, completed in 2003, allows collection of higher flows when conditions warrant. The upsized WADS discharges to Retention Pond 009, which was also completed in 2003 and consists of three 7.5-million-gallon cells (22.5-million-gallon total). A 10.1-million-gallon fourth cell was added to Pond 009 in 2011. With the availability of Pond 009, the WADS piping no longer discharges to Pond 003A. A 2,400-gallons-per-minute (gpm) pump station serves Retention Pond 009 for discharges to the CTP. Figure 2-4 contains a diagram of the current WADS. Modulation of the WADS valves is conducted in accordance with the *Spent ADF Management System Valve Positioning Work Instruction*.



NORTH CAMPUS

The North Campus incorporates United Airlines, Frontier Airlines and Southwest Airlines hangars, Fuel Farm, and the Southwest Airlines provisioning center. As noted earlier, the airline hangars and the Fuel Farm have stormwater permits separate from DEN's Permit. The Southwest Airlines provisioning center is in Third Creek Sub-Basin E and drains west into Detention Pond 819 (Figure 2-1). As described below, different areas of the Frontier Hangar complex can drain either to Third Creek Sub- Basin E or to the Lower Hayesmount drainage basin. The UAL Hangar, SWA Hangar and Fuel Farm are in the Lower Hayesmount drainage basin and drain towards the northeast.

DIW Stormwater System

One potential deicing area exists near the west end of Runway 8/26: the EE pad. Runoff from deicing on the EE pad drains to a sump from which, if of acceptable quality, the fluids may be pumped to temporary tanks and trucked to the Glycol Recycling Plant. If the runoff is not of acceptable quality for recycling, it can drain by gravity to DIW Retention Pond 001. Little deicing has historically been conducted at the EE pad.

Collection infrastructure is available at the Frontier Hangar, although deicing has not been performed to date at this location. In the event of deicing at the Frontier Hangar, a valve is to be operated by Frontier personnel that will direct flow from the Frontier Hangar ramp to an underground storage tank (approximately 10,000-gallon). Runoff collected within the tank can either be trucked to the Glycol Recycling Plant or metered to the sanitary sewer. A smaller lined retention pond (approximately 0.5 million gallons), located adjacent to the Frontier Hangar, provides retention of runoff from that area for flows not directed to the tank.

Clean Stormwater System

Runoff from the area surrounding the UAL Hangar outside the hangar apron and the west end of the runway 8/26 complex is collected by the clean system infrastructure. The collection infrastructure consists of 24-inch to 48-inch pipes that drain to the east and then north to interceptor trenches, and ultimately discharge into an open space within the Lower Hayesmount drainage basin north of runway 8/26. Any potential overflows from the DIW Retention Pond 001 would also flow overland to the clean collection system described above. Stormwater runoff from the UAL Hangar apron area is collected by trench drains and area inlets



and pretreated through an OWS prior to being discharged to the clean stormwater system north of the hangar and ultimately into the Lower Hayeshmount drainage basin north of runway 8/26.

Runoff from the areas surrounding the Frontier Hangar (e.g., the employee parking area) are discharge to an unlined detention pond to the southwest of the hangar, and from there to a collection trench located north of the Southwest Airlines provisioning center. Flow from the detention pond and the areassurrounding the Southwest Airlines provisioning center drain to an 18-inch interceptor pipe, which is routed west to discharge into Detention Pond 819. Detention Pond 819 discharges to an undeveloped area within the Third Creek Sub-Basin E drainage. Stormwater runoff from the tarmac south of the hangar can be conveyed to the unlined detention pond or to a 50,000-gallon three-stage clarifier, and from there to a lined retention pond to the northeast of the hangar. In case of a spill or release on the tarmac, Frontier personnel operate a diverter valve to route the flow to the three-stage clarifier. Discharge from the Frontier Hangar retention pond would flow north and then east underneathQueensburg Street and ultimately into the Lower Hayeshmount drainage.

When deicing is not occurring on EE pad and following a post-deicing qualifying “first flush” of thesystem, runoff from the pad flows to the Lower Hayeshmount drainage basin.

The north end of Runway 16L/34R complex drains to the northwest into the Barr Lake Tributary drainage.

The Fuel Farm is in the Lower Hayeshmount drainage basin (as shown in Figure 2-1) and drains toward the east. As noted earlier, the Fuel Farm holds a separate stormwater permit.

RUNWAYS, TAXIWAYS, ROADS, AND PARKING LOTS

Most runways, taxiways, roads, and parking lots discharge directly into the clean stormwater system. However, as stated in Section 2.1.1.3, the southern third of Runway 16R/34L includes a special edge drain system designed to allow capture of low flows, which may contain spent ADF as well as pavementdeicing materials, into the DIW system. Snow control and deicing materials for the runways and taxiways are stored and managed by the DEN MSC. Granular deicing materials (e.g., salt/sand mixture) and/or liquid deicing chemicals are stored at:



DEN MSC (Vandriver St.; Third Creek Basin)
North Pavement Deicing Storage Facility (Queensburg St.; Lower Hayesmount Basin)
South Pavement Deicing Storage Facility (71st Ave.; Third Creek Basin)
Tower Road/Peña Boulevard Storage Facility (Second Creek Basin)
I-70 and Airport Boulevard (Irondale Gulch drainage)

Additional detail on pavement deicing was provided in Section 2.1.1.3.

History of Spills

The above sections thoroughly evaluated areas of the facility where a potential exists for spills to occur. Spills that occur at DEN are reported to the Operations Division Communications Center as outlined in Section 2.2.6 and logged into an electronic database. DEN's spill reporting practice is consistent with the Colorado Water Quality Control Division Policy No: WQE-10: Guidance for Reporting Spills under the Colorado Water Quality Control Act and Colorado Discharge Permits (effective 3/1/08). CDPHE has therefore already received notification of all DEN reportable spills.



2.2 STORMWATER MANAGEMENT CONTROLS

Part I.A.2.a(3) of the Permit specifies that:

The SWMP shall include a description of stormwater management controls appropriate for the industrial activities covered under this permit. The permittee shall implement these controls. The appropriateness and priorities of controls in a SWMP shall reflect identified potential sources of pollutants at the facility.

Stormwater management controls implemented at DEN include:

- SWMP administrator
- Environmental Guidelines
- Sampling and Analysis Plan
- Preventive maintenance
- Good housekeeping
- Spill prevention and response procedures
- Employee training
- Identification of discharges other than stormwater

Details on these stormwater management controls are in the following sections.

SWMP Administrator

Part I.A.2.a.(3)(i) of the Permit specifies that:

The SWMP shall identify a specific individual(s) who is responsible for developing the SWMP and coordinating its implementation, maintenance, and revision. The activities and responsibilities of the administrator shall address all aspects of the facility's SWMP.

A team administers the SWMP at DEN. Their names, titles, and responsibilities related to the SWMP are listed in Table 2-3.



TABLE 2-3 DEN SWMP TEAM

NAME/TITLE	CONTACT INFORMATION	RESPONSIBILITIES
Phillip A. Washington Chief Executive Officer	303-342-2206 Phil.Washington@flydenver.com	Overall management of DEN including primary signatory authority for DEN's Industrial Permit
Janet Kieler Director of Env. Programs	303-342-4480 Janet.Kieler@flydenver.com	Overall management of DEN's environmental compliance programs with delegated signatory authority for permits, including the Industrial Stormwater Permit.
Thomas Somers Environmental Administrator	303-342-2733 Tom.Somers@flydenver.com	Management of the Industrial Permit and coordination of compliance activities associated with the Permit.
Kim Ohlson Environmental Public Health Analyst Senior	303-342-2637 Kim.Ohlson@flydenver.com	Coordination of tenant, contractor and operator inspections, conducts training for DEN employees and ensures day-to day compliance with the DEN Environmental Enforcement Program per Denver Municipal Code 56 Rules and Regulations Chapter 7
Krystina Spencer Environmental Public Health Analyst	Krystina.Spencer@flydenver.com	Coordination of tenant, contractor and operator inspections, conducts training for DEN employees and ensures day-to day compliance with the DEN Environmental Enforcement Program per Denver Municipal Code 56 Rules and Regulations Chapter 7
Tenants, Operators, and Contractors with Industrial Activities	Databases are maintained onsite at DEN	Compliance with DEN's SWMP and applicable Environmental Guidelines

¹ As of January 1, 2023

Environmental Guidelines

The Permit requires the development and implementation of BMPs to address pollutants originating from industrial sources. DEN has developed EGs that are operational controls designed to reduce overall impacts to the environment. BMPs for stormwater management are contained within the EGs. A stormwater BMP can be described as any program, technology, process, criteria, operating method, measure, or device that controls, removes, or reduces



pollution. DEN's EGs are accessible at <http://www.flydenver.com/environmental>. Every entity operating at DEN should periodically check these sites for the most current version of the EG(s) applicable to their activities.

Part 1.A.2.a(3)(ii) of the Permit includes:

The description of the BMPs shall include:

- 1) **Stormwater Diversion:** *Describe how and where stormwater will be diverted away from industrial areas to reduce or control stormwater contamination.*
- 2) **Materials Handling and Spill Prevention:** *Where materials and materials handling activities result in potential pollutant discharges, BMPs must be described and employed that would prevent or reduce such discharges.*
- 3) **Sediment and Erosion Prevention:** *The SWMP shall identify areas that, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify measures taken to limit erosion.*
- 4) **Other Pollution Prevention Measures:** *The SWMP shall identify any other structural and non-structural measures for stormwater quality control onsite.*

To prevent stormwater contamination from DEN's most significant industrial activity, aircraft deicing, DEN complies with Environmental Guideline *Aircraft Deicing*. The EG contains BMPs for operation of the spent ADF management system, including positioning of valves, and is designed to assist in collection of concentrated fluids to optimize recycling of spent ADF while reducing hydraulic loading to the Metro CTP and allowing clean flow to reach the receiving waters. Other stormwater management control measures associated with aircraft deicing are described in Section 2.1.1.1, and an overview of the spent ADF management system is provided in Section 2.1.2.2. In addition, Section 2.1.2.3 describes the stormwater control components of the DIW and Clean Stormwater Systems within the major industrial activity areas at DEN.

Many of DEN's EGs mandate the proper management of materials; Environmental Guideline *Storage, Handling and Management of Hazardous Materials* provides basic guidance for this activity. Also, Environmental Guideline *Management of Petroleum Storage Tanks and Containers* specifies operating requirements for petroleum storage tanks and containers. These



requirements include stormwater pollution prevention techniques such as installing and maintaining adequate secondary containment on storage tanks and specify that the secondary containment control design must consider precipitation impacts. Other EGs are available for material handling activities such as Cargo Loading and Offloading; Abandoned Materials Response; and Management of Recyclable and Reusable Materials, Universal Waste, and Special Waste.

Guidance for sediment and erosion prevention is provided in Environmental Guideline *Construction*, and the BMPs identified in Environmental Guideline *Inspection and Maintenance of MS4 Structural Controls* serve as sediment and erosion control measures. In addition, DEN complies with the sediment and erosion prevention and/or control requirements contained in CCoD's MS4 Permit (e.g., Construction Sites Program, Municipal Facility Runoff Control Plans, etc.)

Within all of the EGs applicable to stormwater, many measures are detailed for preventing stormwater pollution. For example, Environmental Guideline *Spill Response* outlines the proper steps taken in the event a spill does occur.

Part 1.A.2.b of DEN's Permit states:

Any BMPs included in DEN's SWMP shall become permit requirements and must be implemented in order to remain in compliance with the permit.

Therefore, the BMPs contained within the EGs must be implemented by both DEN and the companies conducting industrial activities at DEN. Appropriate EGs are selected for industrial facilities based on the Targeted Activities and Corresponding Environmental Guideline Matrix (Appendix B; Table B-1) and site inspections. An inventory of the types of activities at DEN was provided in Section 2.1. Companies conducting industrial activities and operating under DEN's SWMP must identify the applicable DEN EG(s) for their activities using Table B-1. Typically, these are the only EGs the company is responsible for unless they have additional company specific EGs or BMPs.

Permit-Specific Best Management Practices

Part 1.A.2.b of the Permit details Permit-specific BMPs. The Permit-specific BMPs all refer to deicing-related activities and are specifically addressed in Environmental Guideline *Aircraft*



Deicing, and through the implementation of *Spent ADF Management System Valve Positioning Work Instruction*. Another permit-specific BMP requires annual training for personnel that conduct aircraft deicing and defrosting and must include a description of the actions required by those applying ADF (e.g., notifications, proper disposal of spent and out-of-spec fluids). This BMP is enforced through *DEN Rules and Regulations Part 190: Aircraft Deicing Regulations*.

Sampling Information

Part I.A.2.a.(3)(iii) of the Permit specifies that:

The SWMP shall include a summary of any existing discharge sampling data describing pollutants in stormwater discharges, and a description of each permit monitoring location.

Stormwater monitoring data collected in compliance with the Permit is retained for a minimum of three

(3) years and is maintained in the DEN ES central files.

A stormwater-monitoring program was developed to help prevent pollutants associated with industrial activities at DEN from entering the storm sewer system and to comply with specific requirements of DEN's Industrial Permit. The objectives of the program are to:

- Characterize discharges to the storm sewer system
- Identify pollutant sources so that industrial practices can be evaluated and modified as necessary to prevent or reduce pollutant discharge to stormwater
- Detect illicit discharges to the storm sewer system
- Evaluate the effectiveness of EGs in preventing or reducing pollutants from entering the clean watersystem
- Aid in implementation of the SWMP

The monitoring requirements for discharges of stormwater associated with industrial activity can be found in Part I.A.3 of the Permit (Attachment A). The DEN *Sampling and Analysis Plan (SAP)*, located on DEN's internal Environmental Management System (EMS) website or in hardcopy in the DENES library, provides detailed information on the monitoring locations and requirements outlined in the Permit. The following summarizes the different types of monitoring that occur at the Airport.

Wet Weather Monitoring: DEN conducts wet weather monitoring at designated locations on the property to monitor stormwater quality. The sampling sites' locations are chosen to



represent discharges from industrial activity areas and are identified in Part I.A.3.a(2) of the Permit in Appendix A of this document. All wet weather sampling is conducted in accordance with the Permit, which requires that samples be collected from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1-inch rainfall or water content in snow) storm event. Other wet weather monitoring condition requirements are identified in Part I.A.3.b of the Permit and are addressed in the *DEN Sampling and Analysis Plan*.

Dry Weather Monitoring: See Section 2.2.8 below.

Biological Sampling: Biological sampling is discussed at I.A.3.a(1) of the Permit. A fish survey will be conducted between August and October 2011, to meet the once per Permit term requirement. Sampling will take place within Third Creek where the receiving water exits the Airport property.

Diversion Mode Sampling: Diversion mode sampling is discussed in Part I.A.3.a(4) of the Permit and addressed in Section 4 of the *DEN Sampling and Analysis Plan*. Diversion mode sampling occurs when DIW valves are changed from capture mode to non-capture mode, diverting to the clean stormwater system, and is conducted as soon as feasible following the valve(s) change. Part I.A.2.b of the Permit includes conditions for diversion and discharge of stormwater runoff from ADF application areas, and guidance for diversion mode decisions is provided in the *Spent ADF Management System Valve Positioning Work Instruction*.

Compliance data collected to date at DEN (i.e., since its opening on February 28, 1995) under the Permit have been summarized in regular discharge monitoring reports or in the Annual Report submitted to CDPHE by November 28 of each year. Copies of these reports are available in the DEN ES files and at CDPHE. For more detailed information regarding DEN's monitoring programs, refer to the *DEN Sampling and Analysis Plan* located on DEN's internal EMS website or in the DEN ES library.



Preventative Maintenance

Part I.A.2.a(3)(iv) of the Permit specifies that:

A preventive maintenance program is required and shall include inspection and maintenance of stormwater management devices (cleaning oil/water separators, catch basins, etc.) as well as inspecting and testing airport equipment and systems to identify conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters.

Preventive maintenance is a key operational control in DEN's stormwater management program and consists of several components, for which DEN and companies conducting industrial activities may be subject to, including:

Inspection and maintenance of OWSs on a regular basis as outlined in Environmental Guideline *Maintenance of Pretreatment Devices*.

Inspection of stormwater sampling sites on a routine basis as outlined in the SAP.

Inspection and maintenance of DEN's clean and DIW stormwater systems infrastructure as outlined in Environmental Guideline Inspection and Maintenance of MS4 Structural Controls and Maintenance of Sewer System Work Instruction, respectively.

Good Housekeeping

Part I.A.2.a(3)(v) of the Permit specifies that:

Good housekeeping requires the maintenance of a clean, orderly facility. This part of the SWMP shall address, for example, cleaning and maintenance schedules, trash disposal and collection practices, and grounds maintenance.

Good housekeeping is an essential stormwater operational control. There are many BMPs that may be included in various EGs and contribute to good housekeeping, including:

Inspection of AOA for foreign object debris (FOD) by DEN Operations Division. There are many containers, including roll-off containers and front-load containers, located throughout the DEN property for disposal of trash/debris or recycling of certain materials. These containers typically have lids that are kept closed to prevent contact with stormwater and are on routine collection schedules to prevent overfilling. Guidance for waste management and other housekeeping practices can be found in Environmental Guideline *General Waste Management* and DEN Rules and Regulations Part 40.



Ramp washing performed by DEN contractors or tenants. Washing of the ramp area is conducted on a routine basis and more often as-needed following the guidance in Environmental Guideline *Cleaning/Washing – Outdoor Areas and Structures*.

Grounds maintenance may be performed by the DEN Field Maintenance section, contractors, or tenants. DEN's Field Maintenance section performs tasks on an as-needed basis typically in response to work orders. These tasks may consist of erosion control and culvert cleanout among other things. Guidance for these activities can be found in Environmental Guideline *Inspection and Maintenance of MS4 Structural Controls*.

Spill Prevention and Response Procedures

Part I.A.2.a(3)(vi) of the Permit specifies that:

Areas where potential spills can occur, and their accompanying drainage points, shall be identified clearly in the SWMP. Where appropriate, consideration shall be given to identifying specific material handling procedures and storage requirements in the SWMP. Procedures for cleaning up spills shall be identified in the SWMP and made available to the appropriate personnel. The necessary equipment to implement a cleanup shall be available to personnel.

Areas of potential spills and the associated drainages include the industrial areas at DEN as described in Sections 2.1.2.3. DEN is an FAA-certified airport and, as such, is required to develop and implement various contingency plans. The contingency document governing environmental spills is the "Hazmat Contingency Plan." This plan identifies the roles and responsibilities of various City sections in the event of a spill. The document is controlled and maintained by the DEN Operations Division and is in the Emergency Operations Center (EOC).

The spill prevention, containment and response procedures for DEN City personnel, tenants, operators, and contractors are outlined below.

Procedures for DEN City Personnel

City personnel are trained to call the DEN Operations Division Communications Center (303-342-4200) in the event of a spill. The Communications Center, in turn, implements the notification strategy detailed in the Communications Standard Operating Procedure 80-5, which includes notification to the Denver Fire Department (DFD) personnel at five fire stations on DEN property and Denver Police Department (DPD). DFD and DPD personnel at DEN are on duty 24 hours a day, 7 days a week, 365 days a year. The procedure also provides for notification of spills or releases to DEN ES, which then determines what, if any, external



notifications are required by regulation, DEN's permits, or DEN's plans. The reporting requirements summarized below and the notification requirements in DEN's SPCC Plan are consistent with the DEN Communications Center Standard Operating Procedure 80-5.

DEN City personnel are required to follow the procedures outlined below when there is a spill of oil, fuel, solid waste, hazardous waste, unknown materials, etc., and to refer to the documents indicated:

Immediately contact the Communications Center at 303-342-4200 to report the spill.

Refer to Environmental Guideline *Spill Response*.

Refer to Environmental Guideline General Waste Management.

DEN ES will refer to *Notification Handbook for Spills and Releases to the Environment* (Handbook) to determine external notification requirements. As outlined in the Handbook, DEN ES will make a courtesy notification to Farmers Reservoir and Irrigation Company (FRICO), Tri County Health Department and downstream users in any event related to surface water which requires notification to the State and/or National Response Center (NRC).

Procedures for Tenants, Operators, and Contractors

Companies conducting industrial activities at DEN are instructed to follow the steps 1 to 3 outlined in Section 2.2.6.1 above. Any notifications external to the Airport will be made by the tenant with notice to DEN ES identifying which entities were contacted. Also, the company's SPCC Plan or other spill related documents will be consistent with the procedures outlined within this section of the SWMP.

Employee Training

Part I.A.2.a(3)(vii) of the Permit specifies that:

Employee training programs shall inform personnel (at all levels of responsibility who are involved in industrial activities that may impact stormwater runoff) of the components and goals of the SWMP. Training shall address topics such as spill response, good housekeeping, and material management practices. The SWMP shall identify periodic dates or schedules for such training. Contractor or temporary personnel shall be informed of airport operation and design features in order to reduce the potential for discharges or spills to occur.

Existing City Airport staff who conduct industrial activities that may impact stormwater runoff (e.g., fueling, maintenance, painting, etc.) are trained in stormwater pollution prevention



(SWPP) regularly, typically on an annual schedule. New employees participate in environmental awareness training during new employee orientation, which includes a brief overview of the stormwater management program at DEN. After new employees successfully pass their probationary period, they are then included in the routine SWPP training schedule.

Companies conducting industrial activities at DEN are responsible for their own training and conduct it annually with the option of using training materials available from the Airport. New employees are trained as soon as practical after the time of hire and DEN encourages such training within 60 days of hire. DEN ES personnel are also available to assist companies in their training programs, if needed.

Identification of Discharges Other Than Stormwater

Part I.A.2.a(3)(viii) of the Permit specifies that:

The stormwater conveyance system on the site shall be evaluated for the presence of discharges other than stormwater. The SWMP shall include a description of the results of any evaluation for the presence of discharges other than stormwater, the method used, the date of the evaluation, and the on-site drainage points that were directly observed during the evaluation.

Part I.A.2.e of the Permit notes that:

- 1) *Except as provided in subsection (2) below, all discharges authorized by Part I.A.1 of this permit shall be composed entirely of stormwater associated with industrial activity.*
- 2) *Discharges from the following sources are authorized by this permit, provided that the discharge is identified in the SWMP (see Part I.A.2.a(3)(viii) of the Permit):*
 - i) *Allowable Non stormwater: Non stormwater discharges from emergency firefighting activities, uncontaminated condensate from air conditioners, coolers, and other compressors and from outside storage of refrigerated gases or liquids, irrigation drainage, lawn watering, uncontaminated springs, and foundation or footing drain where water is not contaminated with process materials.*



Entrapped Water: Water originating from stormwater discharges associated with industrial activities that is entrapped behind baffles/stop blocks/influent structures; pipeback-ups; concourse foundation drains; utility manholes; pavement structure; backfilled soil; vaults; sumps; and secondary containment structures of any type may be discharged back into the stormwater drainage system below the entrapment, via gravity and/or physical/mechanical means, and shall be subject to the BMPs identified in the SWMP for that drainage system.

Discharges of entrapped water are not authorized by this subsection of the permit when the water has been contaminated with pollutants unique to those structures, including, but not limited to, pollutants that may have leaked from tanks in secondary containment and from pipes and pumps in vaults.

Since DEN is a relatively new facility and an engineering review is typically conducted for new development or major changes in existing facilities, it is unlikely there are illegal connections to the storm sewer system. Environmental Guidelines *Planning and Design* and *Tenant Relocation or Closeout* outline requirements for when such changes are proposed.

Nonetheless, illicit discharges to the storm sewer system are possible, so DEN implements a dry weather monitoring program. The Industrial Permit requires that dry weather monitoring be conducted to monitor "deicing activities"; "concourse activities"; and "hangars, maintenance, ground services equipment, vehicle storage, and cargo activities" (see Permit Part I.A.3.a(3)). Dry weather monitoring is used to detect illicit discharges of industrial pollutants and consists of:

- Formal dry weather inspections of key storm sewer outfalls on an annual basis;
- Regular drive-around inspections; and
- Spill or illicit discharge investigations as needed.

Formal dry weather monitoring is typically conducted in the summer after an approximately 72-hour dry period. The outfalls are inspected for non-stormwater discharges and, if suspect flow is observed, visual observations are noted, sample(s) collected, and an unauthorized discharge investigation performed.

Unless the investigation demonstrates there is no unauthorized discharge, the collected sample(s) are tested for the parameters identified in Part I.A.3.a(3)(i), (ii), and (iii) depending on the industrial area from which the discharge emanated. Instructions for DEN's Dry Weather



Monitoring activities are in Section 3 of the DEN *Sampling and Analysis Plan* on the internal EMS website or the DEN ES library.

Comprehensive Inspections

Part I.A.2.d of the Permit specifies that:

The SWMP shall identify qualified personnel that shall inspect designated equipment, airport areas, and the stormwater management system. The procedures and intervals of the comprehensive inspection also shall be specified in the SWMP and shall be consistent with the requirements of this section. Comprehensive inspections shall in no case be completed less than twice a year (in the spring and fall). The operator shall keep a record of such inspections for a minimum of three years. This record shall be made available to the Division upon request and summarized in the Annual Report.

- 1) *Material handling areas, disturbed areas, areas used for material storage that are exposed to precipitation, and other potential sources of pollution identified in the SWMP in accordance with Part I.A.2.a(3)(ii) of this permit shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Structural stormwater management measures, sediment and control measures, and other structural pollution prevention measures identified in the SWMP shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the SWMP, such as spill response equipment, shall be made.*
- 2) *Based on the results of the inspection, the description of potential pollutant sources and pollution prevention measures identified in the SWMP shall be revised as appropriate within 30 days of such inspection. Such revisions shall provide for implementation of any changes to the SWMP in a timely manner, but no more than 90 days after the inspection. However, if the change is structural, implementation may take longer than 90 days.*
- 3) *A report summarizing the scope of the inspection, personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the SWMP, and actions taken in accordance with paragraph (2), above, shall be made and retained as part of the SWMP for at least three years. The report shall be signed in accordance with Part I.H.4 of this permit.*



Comprehensive inspections of facilities or areas where industrial activities occur, including City owned and operated facilities as well as those facilities operated by tenants, contractors, or operators performing industrial activities, are conducted a minimum of two times per year by qualified DEN personnel. The main focus of the inspections is to ensure compliance with stormwater BMPs contained in the applicable EGs. Follow-up inspections are scheduled as needed to ensure corrective actions are implemented. In addition to the comprehensive inspections, DEN environmental inspectors also conduct drive-around inspections, which are unscheduled but effective in further evaluating compliance with the SWMP. These voluntary inspections are conducted at least weekly and address items such as housekeeping, labeling and storage of drums outside, and condition of equipment. A sample inspection form can be found in Appendix C. Inspections may include observation of:

- Outdoor chemical and materials storage, including used oil tanks, chemical drums, and trash dumpsters
- Storm drainage systems, including detention ponds, inlets, outlets, etc.
- Pretreatment devices and inspection and maintenance records
- General good housekeeping practices
- Inventory of appropriate spill response materials are maintained onsite and strategically deployed based on the type and quantities of chemicals present
- Personnel SWPP training records

Companies conducting industrial activities are encouraged to formally inspect their own facilities or areas at least as frequently as DEN and to document the findings and corrective actions taken. Generally, these inspections are performed by the company's SWMP Administrator or by a qualified member of the SWMP team.

Consistency with Other Plans

Under the Oil Pollution Prevention section of the CWA (40 CFR 112; revised and effective January 14, 2010) an SPCC Plan must be prepared if the aggregate aboveground oil storage capacity of the facility is greater than 1,320 gallons or the completely buried oil storage capacity is greater than 42,000 gallons. "Aggregate storage" includes all containers greater than or equal to 55 gallons. "Oil" includes, in whatever form – solid or liquid: synthetic oils, mineral oils, vegetable oils, animal fats, and petroleum derivatives.

The SPCC Plan defines the measures a facility shall take to prevent, control, and remediate oil product releases to navigable waters, as defined by EPA, or adjoining shores. At a minimum,



each plan shall describe site layout and drainage patterns; types of products and storage sizes; a prediction of the direction, rate of flow, and total quantity of oil that could be released from each individual oil storage vessel; likely reception points of spilled product; locations and types of spill control equipment and diversionary structures; site and emergency contact persons; training requirements and procedures for spill prevention, control and abatement; and facility security.

Facilities meeting the SPCC Plan applicability requirements (40 CFR 112.1) and in operation on or before August 16, 2002, shall maintain their Plan, but must amend it, if necessary, and implement the Plan to ensure compliance with 40 CFR 112.3, on or before November 10, 2010. Facilities that become operational after August 16, 2002, through November 10, 2010, and could reasonably be expected to have a discharge as described in 112.1(b), must prepare and implement a Plan on or before November 10, 2010. For facilities that become operational after November 10, 2010, and could reasonably be expected to have a discharge, they must prepare and implement a Plan before beginning operations.

DEN has amended its SPCC Plan to meet the new requirements and applicable portions of the Plan are incorporated by reference in this SWMP. Tenant and operator final SPCC Plans, certified by a Professional Engineer, shall be available to the DEN ES for review before implementation. The written plan shall be maintained by the tenant or operator on site for review.

Each company conducting industrial activities shall submit their SPCC Plan to the EPA Regional Administrator for review whenever their facility has:

Discharged more than 1,000 gallons of oil or fuel into or upon navigable waters in a single spill event, or
Discharged more than 42 gallons of oil or fuel into or upon navigable waters in each of two spillevents
within any 12-month period

The SPCC Plan shall be submitted within 60 days from the time a facility becomes subject to the submittal requirements defined above. The Regional Administrator for EPA is:

U.S. EPA, Region 8

Emergency Response Branch 8HWM-ER1595 Wynkoop Street

Denver, Colorado 80202-1129

(303) 312-6312

All SPCC Plans shall be reviewed and evaluated at least every 5 years. The facility's owner or operator shall document completion of the review and evaluation and shall sign a statement as



to whether the Plan will be amended. Any technical amendments to an SPCC Plan shall be certified by a Professional Engineer.

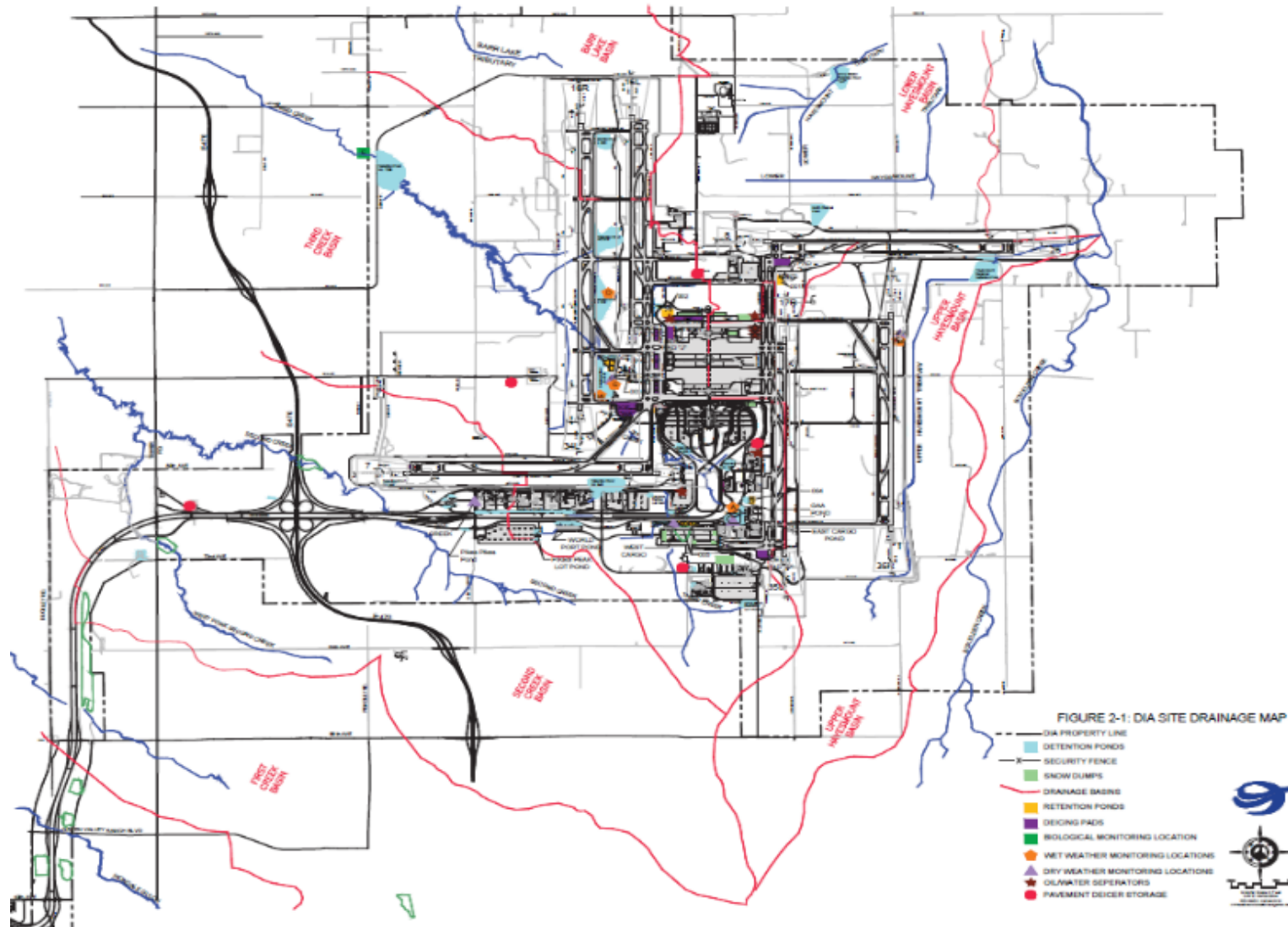
DEN has developed and implemented an SPCC Plan for its facilities and this SWMP is consistent with the SPCC Plan. Tenants required to develop and implement their own SPCC Plan should ensure it is consistent with the DEN SWMP.

Recordkeeping Procedures

The SWMP Administrator or designated member(s) of the SWMP team maintains records related to compliance with the Permit and SWMP such as spills, notifications to external parties, sampling data, discharge monitoring reports, etc. in accordance with the *Document and Records Management Process*.

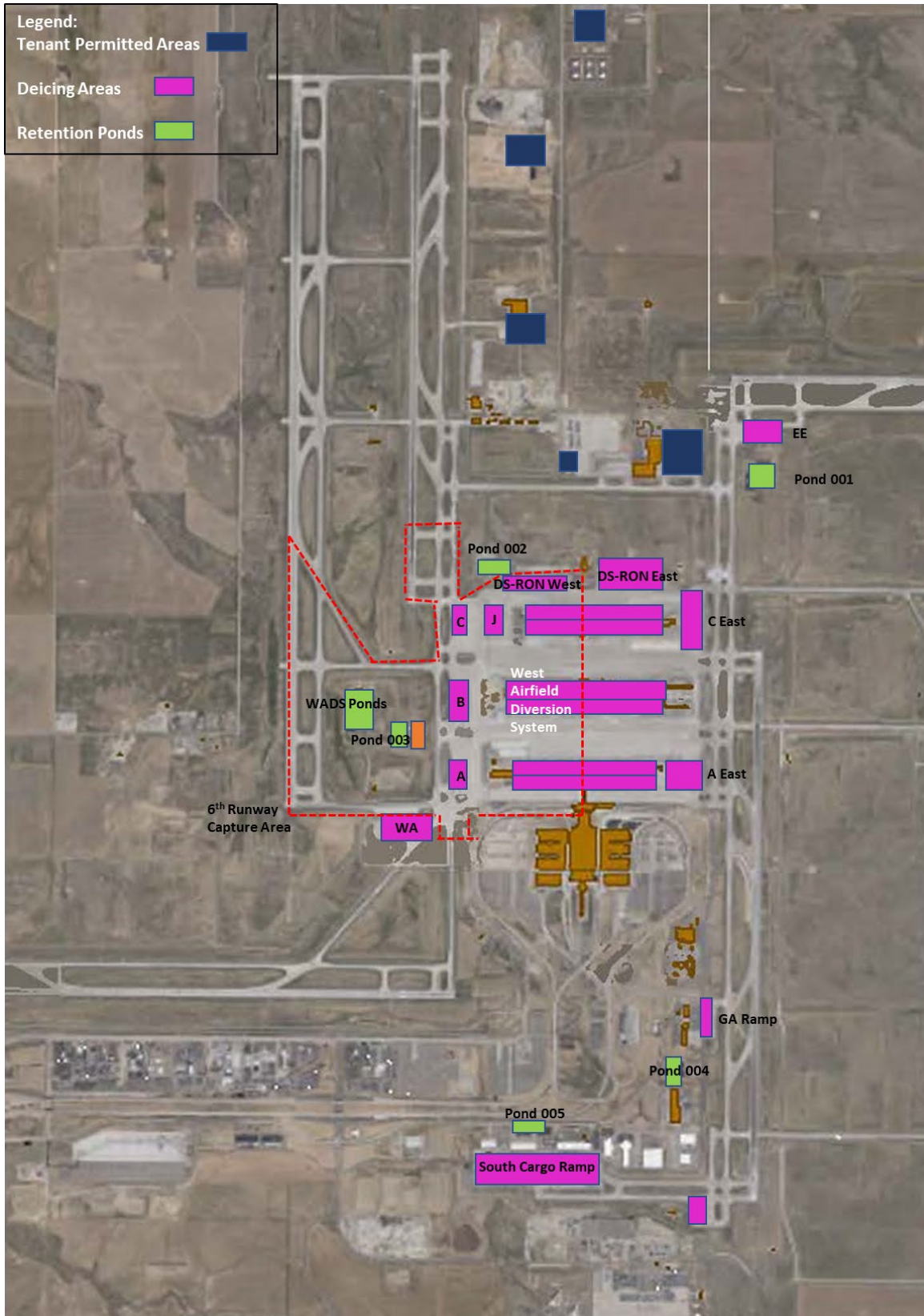
Companies conducting industrial activities maintain the DEN SWMP and applicable site-specific information (e.g., survey/matrix, site map, EGs) onsite, and are encouraged to maintain any records related to compliance with the SWMP (e.g., facility inspections, employee SWPP training records, spill records, etc.) for a minimum of three years.

FIGURE 2-1: DEN SITE DRAINAGE MAP



Always refer to the on-line DEN EMS document library prior to use to ensure you are using the most current copy. All other versions are UNCONTROLLED.

FIGURE 2-2: DEN AIRCRAFT DEICING FLUID COLLECTION SYSTEM OVERVIEW



Always refer to the on-line DEN EMS document library prior to use to ensure you are using the most current copy. All other versions are UNCONTROLLED.

FIGURE 2-3: SPENT ADF MANAGEMENT SYSTEM SCHEMATIC

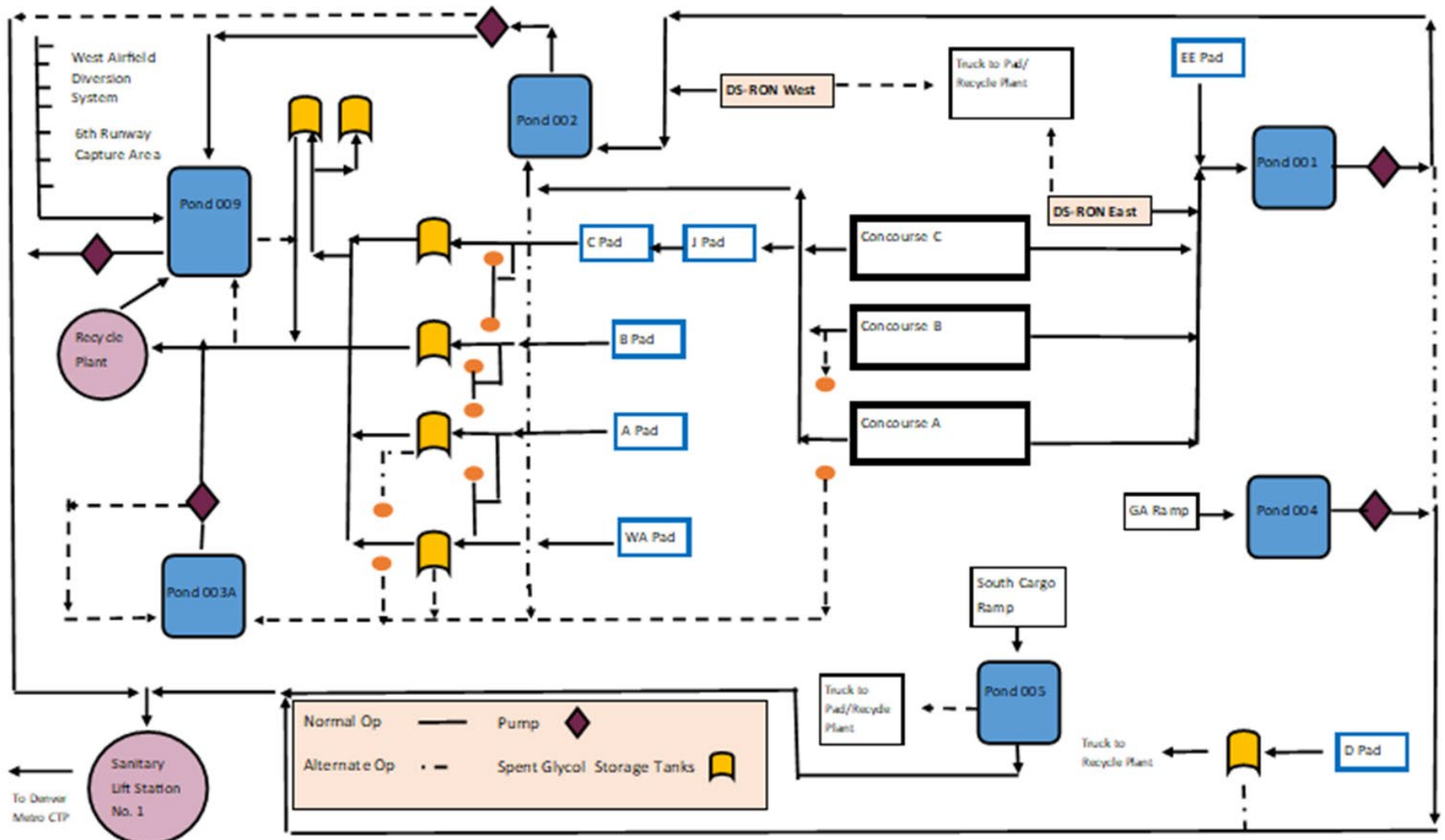
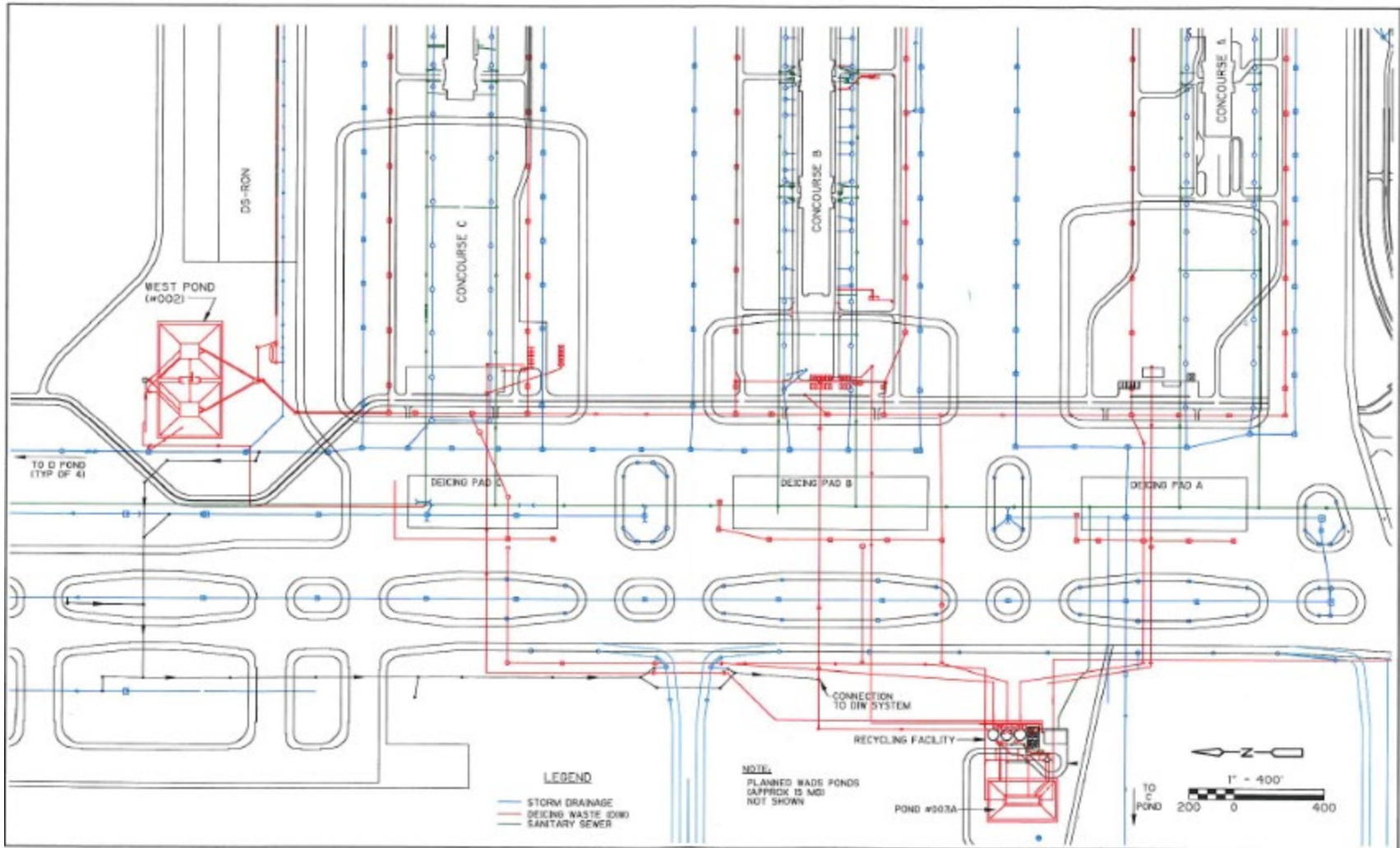


FIGURE 2-4: WEST AIRFIELD DIVERSION SYSTEM





APPENDIX A-1: TARGETED ACTIVITIES AND CORRESPONDING ENVIRONMENTAL GUIDELINES (EG) MATRIX

Companies conducting industrial activities at DEN can find templates for site-specific informational forms within Appendix B. Appendix B contains documents that the companies conducting industrial activities are required to complete, submit to DIA ES, and retain a copy onsite to ensure compliance with DEN's SWMP. Instructions for completion of each of the items follow.

contains the Targeted Activities and Corresponding Environmental Guidelines Matrix. A matrix must be completed for each area the company conducts industrial activities within. Note the date that the matrix is completed, the company name, and the location for which the matrix is completed. To complete the matrix, follow the instructions in **bold** under **Recommend EGs**. For those activities that are conducted by a contractor, the contractor's name should be noted as well. Each EG corresponding to industrial activities conducted by the company or company's contractor contains stormwater Best Management Practices (BMPs) with which the company must comply. DEN's EGs are accessible at <http://www.flydenver.com/environmental>. Every entity operating at DEN should periodically check these sites for the most current version of the EG(s) applicable to their activities.

contains the Potential Pollutant Sources Survey. A survey must be completed for each area the company conducts industrial activities within. Note the date that the survey is completed, the company name, and the location for which the survey is completed. Place a check mark in the column next to any materials stored and/or used onsite at DEN that could potentially impact stormwater runoff. If there are other materials onsite that are not listed, note in the bottom box. Also, note in the column or bottom box whether materials are stored and/or used outdoors and whether they are provided secondary containment and cover.

contains a legend and sample map to be used by each facility. A site drainage map must be developed for each area the company conducts industrial activities within using the legend provided. The map may be hand drawn or completed electronically.

contains a letter template that is designed to notify DEN of the company's local SWMP Administrator and certify the company's intent to operate under and in compliance with DEN's SWMP.



Table B-1: Targeted Activities and Corresponding Environmental Guidelines (EGs) Matrix

Recommended EGs:

Look across the row of potential activities to the right. If the activity is performed at your facility, then go down that column to the Xs and check the box in that row next to the EGs below for review. You'll notice some EGs are recommended to all for review. These boxes have been checked for you.

- ES-301-1.01 Fueling Aircraft, Vehicles, and Auxiliary Equipment
- ES-301-1.02 Cleaning/Washing - Aircraft, Vehicles and Equipment
- ES-301-1.03 Cargo Loading and Offloading
- ES-301-1.04 Management of Aircraft Lavatory Water and Waste
- ES-301-1.05 Maintenance of Aircraft, Vehicles and Equipment
- ES-301-1.06 Aircraft Deicing
- ES-301-1.07 Storage of Vehicles and Equipment Containing Chemicals
- ES-301-2.02A Management of Refrigerant in Stationary Equipment
- ES-301-2.02B Management of Refrigerant in MVAC Systems
- ES-301-2.03 Power Generation
- ES-301-2.04 Painting and Paint Removal
- ES-301-2.05 Cleaning/Washing - Indoor Industrial Surfaces
- ES-301-2.06 Maintenance - Janitorial
- ES-301-2.07 Maintenance of Pretreatment Devices
- ES-301-2.08 Metal Finishing, Coating, Machining, and Cooling
- ES-301-2.09 Parts Washing
- ES-301-3.01 Construction
- ES-301-3.02 Planning and Design
- ES-301-3.03 Procurement
- ES-301-3.04 Tenant Operating Guidance
- ES-301-3.05 Tenant Relocation or Closeout
- ES-301-4.01 Management of Pesticides and Herbicides
- ES-301-4.02 Petroleum Exploration and Production Activities
- ES-301-4.03 Cleaning/Washing - Outdoor Areas and Structures
- ES-301-4.04 Management of Fire Control Agents
- ES-301-4.05 Remediation of Contaminated Soils
- ES-301-4.06 Pavement Deicing
- ES-301-4.07 Potable Water-Using Municipal Activities
- ES-301-4.08 Inspection and Maintenance of MS4 Structural Controls
- ES-301-4.09 Management of Petroleum Storage Tanks and Containers
- ES-301-4.10 Cathodic Protection Corrosion Prevention (Tanks and Piping)
- ES-301-4.11 Storage, Handling, and Management of Hazardous Materials
- ES-301-5.01 Abandoned Material Response
- ES-301-5.02 Spill Response
- ES-301-6.01 General Waste Management
- ES-301-6.03 Management of Recycle and Reusable Materials
- ES-301-6.04 Management of Hazardous Wastes
- ES-301-6.05 Management of Universal Wastes
- ES-301-6.06 Management of Special Wastes

Potential Activities	Aircraft Deicing/Anti-icing	Aircraft Fueling	Aircraft Maintenance	Aircraft Painting/Stripping	Aircraft Lavatory Service	Building & Grounds Maintenance	Buried Tanks & Pipes	Cargo Handling	Cleaning Indoor Industrial Surfaces	Chemical Storage	Construction	Contaminated Soil Remediation	Equipment Fueling	Equipment Degreasing/Washing	Equipment Maintenance	Fire Fighting	Fuel Storage	Garage Collection	HVAC Maintenance & Operations	Janitorial Activities	Materials Storage	Outdoor Ramp Operations	Pavement Deicing	Pesticide/Herbicide Storage/Usage	Petroleum Exploration/Production	Potable Water Municipal Activities	Power Generation	Pretreatment/Oil-Water Separation	Refrigerant	Relocation or Closeout	Steam Cleaning	Vehicle Fueling	Vehicle Maintenance	Vehicle Painting/Stripping	Vehicle Washing	Waste Storage			
ES-301-1.01 Fueling Aircraft, Vehicles, and Auxiliary Equipment	X									X														X						X									
ES-301-1.02 Cleaning/Washing - Aircraft, Vehicles and Equipment				X							X																		X		X					X			
ES-301-1.03 Cargo Loading and Offloading						X	X						X							X																	X		
ES-301-1.04 Management of Aircraft Lavatory Water and Waste				X				X																															
ES-301-1.05 Maintenance of Aircraft, Vehicles and Equipment		X	X									X	X				X							X							X	X	X	X	X				
ES-301-1.06 Aircraft Deicing	X																																						
ES-301-1.07 Storage of Vehicles and Equipment Containing Chemicals	X	X	X	X		X	X	X				X	X	X						X	X	X		X				X							X				
ES-301-2.02A Management of Refrigerant in Stationary Equipment					X				X	X			X	X			X	X					X				X												
ES-301-2.02B Management of Refrigerant in MVAC Systems								X									X	X															X						
ES-301-2.03 Power Generation																									X														
ES-301-2.04 Painting and Paint Removal			X		X			X												X															X			X	
ES-301-2.05 Cleaning/Washing - Indoor Industrial Surfaces					X			X	X								X															X							
ES-301-2.06 Maintenance - Janitorial				X		X	X									X	X														X							X	
ES-301-2.07 Maintenance of Pretreatment Devices				X	X			X			X										X					X					X	X					X		
ES-301-2.08 Metal Finishing, Coating, Machining, and Cooling		X	X		X			X			X	X																				X	X					X	
ES-301-2.09 Parts Washing		X						X			X																					X						X	
ES-301-3.01 Construction				X	X			X																															
ES-301-3.02 Planning and Design				X	X			X																															
ES-301-3.03 Procurement	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ES-301-3.04 Tenant Operating Guidance	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ES-301-3.05 Tenant Relocation or Closeout	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ES-301-4.01 Management of Pesticides and Herbicides						X		X																X														X	
ES-301-4.02 Petroleum Exploration and Production Activities					X				X															X															
ES-301-4.03 Cleaning/Washing - Outdoor Areas and Structures				X																		X																	
ES-301-4.04 Management of Fire Control Agents				X			X						X																										
ES-301-4.05 Remediation of Contaminated Soils									X																														
ES-301-4.06 Pavement Deicing				X																			X																
ES-301-4.07 Potable Water-Using Municipal Activities																									X														
ES-301-4.08 Inspection and Maintenance of MS4 Structural Controls				X																						X													
ES-301-4.09 Management of Petroleum Storage Tanks and Containers		X			X	X		X		X	X	X	X	X						X				X							X	X							
ES-301-4.10 Cathodic Protection Corrosion Prevention (Tanks and Piping)					X	X		X					X		X									X															
ES-301-4.11 Storage, Handling, and Management of Hazardous Materials	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ES-301-5.01 Abandoned Material Response	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ES-301-5.02 Spill Response	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ES-301-6.01 General Waste Management	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ES-301-6.03 Management of Recycle and Reusable Materials	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ES-301-6.04 Management of Hazardous Wastes		X	X	X		X	X	X	X	X	X			X	X	X							X				X	X						X	X			X	
ES-301-6.05 Management of Universal Wastes			X	X		X		X				X					X											X							X				X
ES-301-6.06 Management of Special Wastes		X	X	X	X			X	X	X	X					X	X								X	X	X								X				X



























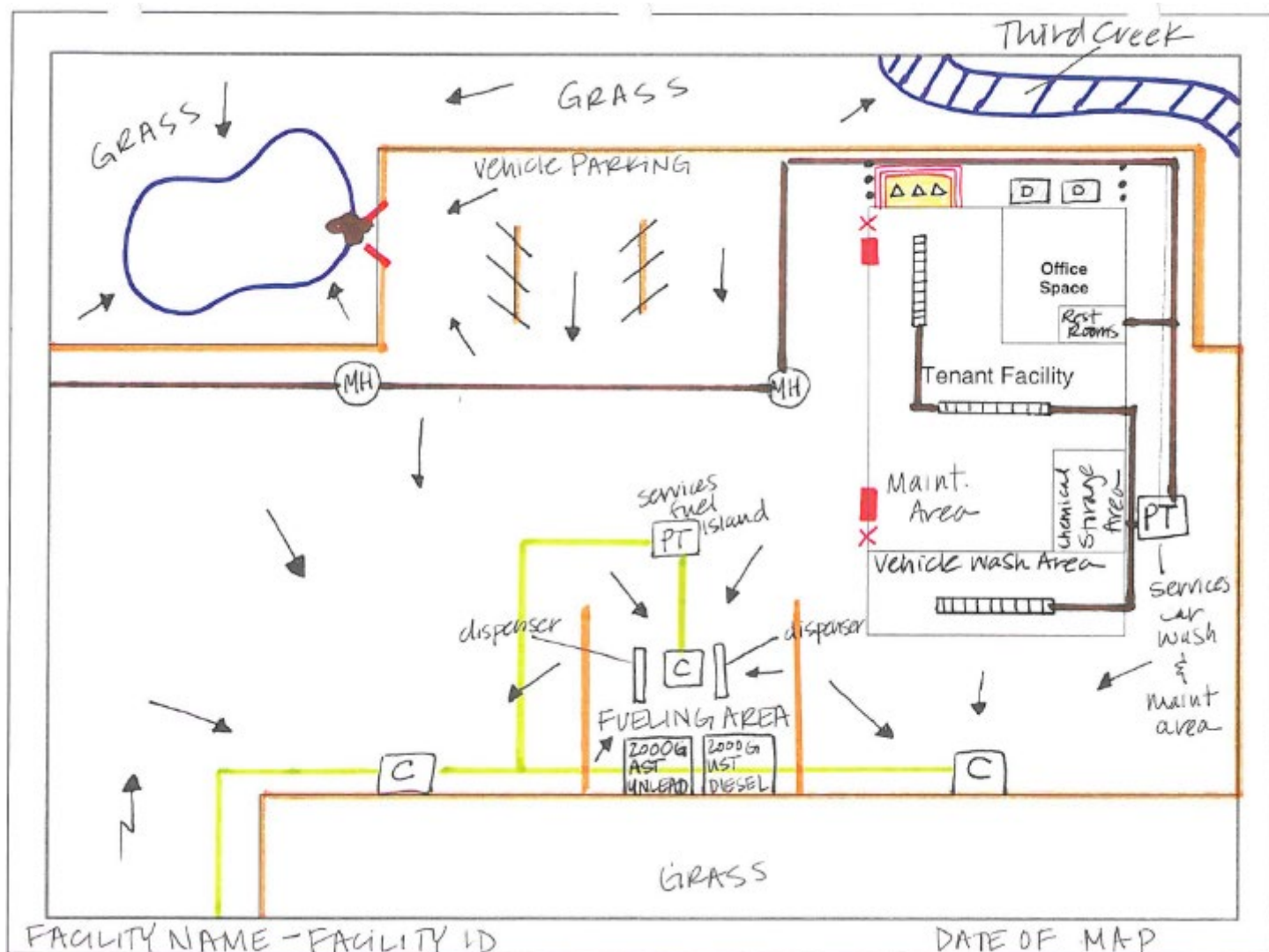
APPENDIX A-2: POTENTIAL POLLUTANT SOURCES SURVEY

POTENTIAL POLLUTANT SOURCES	CHECK ANY POTENTIAL SOURCES
Aircraft Deicing Fluid	
Antifreeze	
Hydraulic Fluid	
Oils and Greases	
Fuels	
Solvents	
Transmission Fluid	
Batteries	
Radiator Flush	
Degreasers/Parts Cleaner	
Detergents/Surfactants	
Brake Fluid	
Paints and Related Materials	
Windshield Solvent	
Lavatory Materials	
Starting Fluid	
Carburetor Cleaner	
Interior Cleaner	
Power Steering Fluid	
Aqueous Film Forming Foam	
Pavement Deicer - what type?	
Other: Please Specify	

APPENDIX A-3: SAMPLE FACILITY MAP

LEGEND

	Detention Pond		Berms or Curbing		Tanks -Label with volume, content, type (AST, UST), etc...
	Outfall		Canopy		Drums
	Trench Drain		Bollards		Flam Cabinet
	Manhole		Secondary Containment		Dumpster
	Storm Sewer (SDG Piping)		Pretreatment Devices *label what it services		Activity Areas (e.g. washing, chemical storage, etc...)
	Sanitary Sewer (SAG Piping)		Spill Kits		Sump
	Waterbody		Riprap		Direction of Surface Water Flow
	Catch Basin (inlet)				Groundcover (e.g. paved asphalt, exposed soil, grass, other)
	Facility and/or Building Bdry.				





APPENDIX A-4: SAMPLE SWMP REQUIREMENT LETTER

DATE

Environmental Program Administrator
Denver International Airport
Environmental Services
Airport Office Building
8500 Pena Boulevard
Denver, CO 80249-6340

To whom it may concern:

SUBJECT: Denver International Airport (DEN) Stormwater Management Plan (SWMP) Requirements

COMPANY plans to begin operations or is currently operating at DEN as of **DATE** and will require coverage under DEN's Stormwater Management Plan (SWMP) consistent with the activities identified in the attachments. The following attachments are submitted for your review and records:

Targeted Activities and Corresponding Environmental Guidelines Matrix (SWMP, Appendix B-1)
Potential Pollutant Sources Survey (SWMP, Appendix B-2)
Site drainage map (SWMP, Appendix B-3)

COMPANY's local SWMP Administrator will be:

NAME

TITLE

MAILING ADDRESS

PHYSICAL ADDRESS

OFFICE PHONE NUMBER

CELL PHONE NUMBER

FAX NUMBER

EMAIL ADDRESS

By signing below, **COMPANY** certifies election to ___operate___ not operate (*indicate election by checking one*) under DEN's SWMP and in compliance with its contents. If "not operate" is checked, an individual SWMP will be prepared and submitted to DEN Environmental Services for review.

Signature

Date



Printed Name

Title

If you have any questions regarding this correspondence, please contact me at **PHONE NUMBER**.

Attachments

cc: **XX**



APPENDIX B: SAMPLE INSPECTION FORM

Date/Time*

Facility Type*

- Rental Car
- Airline Ramp
- Airline GSE
- Airline Services
- Construction
- Food Service
- Gasoline Station
- City and County

Facility Name*

Address*

City

State

Zip Code

Contact Name*

Contact Phone Number*

Contact E-mail Address*

Inspector Name(s)*

Storm Water Inspection

Storm Management Plan and Training

Does facility operate under DIA's SWMP?*

- Yes No N/A



Storm Water Management Plan Documents*

- Plan
- Map
- Matrix
- Potential Pollutant Survey
- Environmental Guidelines
- Certification Letter

Is annual storm water training up to date?*

- Yes No N/A

What was the date of the last Storm Water training?*

Was the training documented?*

- Yes No

Surface Drainage Conveyances and Outfalls

Type of Drainage Structure*

- Storm Drain
- Oil Water Separator
- Sand Trap
- Detention Pond
- Other

Location of Conveyance Structure and Condition:*

Where is maintenance work being performed?*

What kind of maintenance is being performed?*

What kind of chemicals are being used regularly in the maintenance area?*

Where is washing of vehicles/equipment being performed?*

- Inside the building Outside Offsite N/A

What kind of washing is being performed?*

Are there any pretreatment devices in the wash area?*



Do all facility personnel know the DIA contact number to call to report a spill is 303-342-4200? *

Yes No

Is there an adequate number of spill kits? *

Yes No

Are the spill kits in strategic and appropriate area? *

Yes No

What are the contents of the spill kit? *

Comments and Corrective Actions: *

Facility Contact Signature / Date *

Signature

Inspector Signature / Date *

Signature

Multi-Media Compliance Assistance

SPCC Plan and Management

Petroleum Material Storage (Type of Material / Storage Capacity) *



>1320 gallons of storage capacity for diesel, gasoline, and oils? *

Yes No

Does the SPCC Plan apply to this facility? *

Yes No

Is a copy of the SPCC Plan available on-site? *

Yes No N/A

Greater than 5 years old? *

Yes No N/A

Change in facility operations? *

Yes No N/A

Change in storage capacity? *

Yes No N/A

Change in storage location(s)? *

Yes No N/A

Is the annual training up to date? *

Yes No N/A

Date of training: *

Is annual training documented? *

Yes No N/A

Are monthly inspections documented? *

Yes No N/A

Is secondary containment used? *

Yes No N/A

Is an integrity test completed on all outdoor tanks? *

Yes No N/A

Are all documents retained on site for 3 years? *

Yes No N/A

Material and Waste Management

Are waste streams characterized correctly? *

Yes No

Are waste streams segregated correctly? *

Yes No



Are all containers securely closed? *

- Yes No

Are all containers in good condition for storage of material? *

- Yes No

Which containers are in poor condition? *

Are all containers containing liquid stored in secondary containment? *

- Yes No

Which containers are not in secondary containment? *

Hazardous Waste:

Does the facility generate Hazardous Waste? *

- Yes No

Does the facility know its hazardous waste generation status? *

- Yes No N/A

Which EPA Generator Waste status appropriate? *

- Conditionally Exempt Small Quantity (<=100 kg/month)
 Small Quantity (100 to 1000 kg/month)
 Large Quantity (>= 1000 kg/month)
 N/A

Does the facility do annual Hazardous Waste training? *

- Yes No N/A

What was the date of their last Hazardous Waste training? *

Are gasoline filters and gasoline-contaminated absorbent managed as Hazardous Waste? *

- Yes No N/A

Does the label say "Hazardous Waste" and words that identify the contents of the container? *

- Yes No N/A

Does the facility store Hazardous Waste in Satellite Accumulation Areas? *

- Yes No N/A

Is the SAA close to the generation point? *

- Yes No N/A



Is the SAA under the control of the generator of the Hazardous Waste? *

Yes No N/A

Are weekly inspections completed? *

Yes No N/A

Is there <55 gallons of Hazardous Waste for each waste stream in this area? *

Yes No N/A

Used Oil:

Does the facility store Used Oil? *

Yes No

Are used oil containers labeled "used oil"? *

Yes No N/A

Are used oil drums and tanks in secondary containment? *

Yes No N/A

Are used oil filters hot-drained, crushed, punctured, or dismantled? *

Yes No N/A

Universal Waste:

Are aerosol cans used? *

Yes No

Are cans punctured? *

Yes No N/A

Are cans punctured with an appropriate device? *

Yes No N/A

Is there a written procedure for puncturing cans? *

Yes No N/A

Is the residue managed appropriately as Hazardous Waste? *

Yes No N/A

Are the punctured cans recycled as scrap metal? *

Yes No N/A

Are the aerosol cans managed as Universal Waste? *

Yes No

Is the container labeled "Universal Waste Aerosol Can", or "Waste Aerosol Can"? *

Yes No N/A

Is the container less than 1 year old? *

Yes No N/A

How are light bulbs managed? *

Universal Waste Lessee No plan Contractor

Who is the Lessee or Contractor? *

Is the container labeled "Universal Waste Lamp", or "Waste Lamp"? *

Yes No N/A



Is the container less than 1 year old? *

Yes No N/A

Are the bulbs placed in a sealed container? *

Yes No

How are used batteries managed? *

Vendor takes back for recycling Universal Waste Not managed

Who is the Vendor? *

Is the container labeled "Universal Waste Batteries" or "Waste Batteries"? *

Yes No N/A

Is the container less than 1 year old? *

Yes No

How are waste electronics managed? *

Vendor takes back for recycling Universal Waste Not managed

Who is the Vendor? *

Is the container labeled "Universal Waste Electronics" or "Waste Electronics"? *

Yes No N/A

Is the container less than 1 year old? *

Yes No N/A

Metal Finishing Compounds

Does your facility complete aircraft maintenance? *

Yes No N/A

Does your facility perform aircraft repair? *

Yes No N/A

Does your facility perform any kind of metal preparation or finishing? *

Yes No N/A

Does your metal preparation or finishing processes use Alodine or Cadmium compounds? *

Yes No N/A

Where is your Alodine stored? *

Where is your Cadmium compound stored? *

Does your facility have 3 years of Hazardous Waste manifests on file on site? *

Yes No N/A

Recyclable Material

Which materials are currently recycled at this facility? *

Office paper

Newspaper

Scrap metal

Plastic bottles



- Glass bottles
- Plastic film
- Aluminum cans
- None

Does recycling information need to be provided? *

- Yes
- No

Which recycling material information is needed? *

- Office paper
- Newspaper
- Scrap metal
- Plastic bottles
- Glass bottles
- Plastic film
- Aluminum cans

Storage Tanks

Are there storage tanks at the facility? *

- Yes
- No

Are the tanks AST state registered? *

- Yes
- No
- N/A

Is the ullage recorded? *

- Yes
- No
- N/A

Are inspections occurring weekly? *

- Yes
- No
- N/A

Does the AST contain underground lines? *

- Yes
- No
- N/A

Are annual line tightness tests completed and documented? *

- Yes
- No
- N/A

Are the tanks UST state registered? *

- Yes
- No
- N/A

Is the operator certified? *

- Yes
- No
- N/A

Are the UST inspections occurring monthly? *

- Yes
- No
- N/A

Air

Is an air permit needed? *

- Yes
- No

Is there an air permit in place? *

- Yes
- No
- N/A

Is the facility abiding by their permit? *

- Yes
- No
- N/A

Does the facility service MVAC systems? *

- Yes
- No

Are the MVAC service personnel trained and certified? *



Yes No N/A

Is the equipment used for the MVAC system certified? *

Yes No N/A

Description Area

Does the facility have refrigeration equipment with over 50 lbs. of Ozone Depleting Compounds? *

Yes No

Does the facility perform annual leak rate calculations? *

Yes No N/A

Are repairs made within 30 days if the annual leak rate is >35%? *

Yes No N/A

Is stationary equipment with >= compressor horsepower registered with the state? *

Yes No

Is equipment with >= 300 lbs. of ODC at a facility that sells food for human consumption registered with the state? *

Yes No

Has the facility paid an annual registration fee? *

Yes No N/A

Tire Management

Are more than 10 used tires stored at the facility? *

Yes No

Description Area

Does the facility have more than 99 waste tires stored outside? *

Yes No N/A

Is there a fence and a lock securing the tire storage area? *

Yes No N/A

Additional Comments: *

Facility Contact Signature / Date *

Signature

Inspector Signature /Date *



APPENDIX C: ACRONYM INDEX

°F	degrees Fahrenheit
ADF	Aircraft Deicing Fluid
ADS	Aircraft Deicing System
AOA	Air Operations Area
ARFF	Airport Rescue and Fire Fighting
ASIG	Air Service International Group
ATPB	Asphalt Treated Permeable Base
AV Gas	Aviation Gasoline
BMPs	Best Management Practices
BOD	Biochemical Oxygen Demand
BOD5	5-Day Biochemical Oxygen Demand
CCoD/CCD	City and County of Denver
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
CM	Control Measure
CNG	Compressed Natural Gas
COD	Chemical Oxygen Demand
CTP	Central Treatment Plant
CWA	Clean Water Act
DBC	Double Box Culvert
DFD	Denver Fire Department
DEN or Airport	Denver International Airport
DIW	Deicing Waste
DO	Dissolved Oxygen
DPD	Denver Police Department
EG	Environmental Guidelines
EMS	Environmental Management System
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ES	Environmental Services
FBO	Fixed Base Operations
FOD	Foreign Object Debris
FRICO	Farmers Reservoir and Irrigation Company
FSDS	Fuel Storage and Distribution System
GA	General Aviation
gpm	Gallons per Minute



GSE	Ground Service Equipment
KAc	Potassium Acetate
Metro	Metro Wastewater Reclamation District
Mo gas	Mobile Gasoline or Gasoline
MS4	Municipal Separate Storm Sewer Systems
MSC	Maintenance Support Center
NPDES	National Pollutant Discharge Elimination System
NRC	National Response Center
OWS	Oil Water Separator
Permit/ Industrial Permit	“Authorization to Discharge under the Colorado Discharge Permit System”, Permit # COS-000008
PG	Propylene Glycol
SAP	Sampling and Analysis Plan
SIC	Standard Industrial Classification
SPCC	Spill Prevention Control and Countermeasure
State	State of Colorado
SWMP	Stormwater Management Plan
SWPP	Stormwater Pollution Prevention
UAL	United Airlines
VSR	Vehicle Service Road
WADS	West Airfield Diversion System
WQCD	Water Quality Control Division