



Title	ES-301-1.06 Aircraft Deicing
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1) Activity Description:

Aircraft deicing is the application of aircraft deicing fluid (ADF) to an aircraft for the purpose of ground movement or flight. The following guideline outlines environmental requirements of aircraft deicing and of the associated activities listed below.

- Management of Virgin ADF Product
 - Storage
 - Delivery/distribution
 - Application
- Management of Spent ADF
 - Collection
 - Conveyance
 - Storage
 - Disposal/Recycling

There are several parties to which this document is applicable, including City and County of Denver Department of Aviation (Airport), Airlines (i.e., self-deicers), Recycling Contractor (RC) and Deicing Companies (DC). Unless otherwise specified, ALL of these parties are responsible for compliance with the entire document.

2) Potential Environmental Risks

- A. The following environmental concerns are associated with these activities:
- i) Unpermitted, improper, or inappropriate discharge of ADF
- B. Potential consequences from performing the activity incorrectly:
- ii) Property damage, personal injury or damage to the environment
 - iii) Regulatory non-compliance, notices of violation and related [financial & non-financial] penalties

3) Critical Operating Requirements

- A. Prohibited Activities
- i) The application of ADF in an unauthorized manner or location. For approved deicing locations and application methods, see DEN Rules and Regulations, Part 190: Aircraft Deicing Regulations.
 - ii) The use of unauthorized ADF. For approved aircraft deicing fluids, see DEN Rules and Regulations, Part 190: Aircraft Deicing Regulations or current year's DEN Snow and Ice Control Plan.
 - iii) Unauthorized discharge of ADF to the clean or Deicing Waste (DIW) sewer system without prior notification of and approval from DEN Operations Division, DEN Environmental Services (ES), and the RC.
 - iv) Spills of any kind shall not be washed into any sewer system or waterway, or onto any soils.
- B. General Considerations
- i) The Airport, Airlines, DCs and RC are responsible for understanding the applicable regulations and managing their activities accordingly; this Environmental Guideline is meant as guidance only and does not supersede any regulations.

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- ii) Airlines and DCs will not waste ADF. Care will be taken to ensure that the amount of the deicing agent applied is appropriate to the need. For safety reasons, the actual quantity of ADF applied is at the discretion of the Airline.
- iii) The Airport, Airlines, DCs and RC will comply with the most current versions of documents listed in the References section below.

C. Training Requirements

- i) Employee training programs shall inform personnel at all levels of responsibility who are involved in industrial activities that may impact stormwater runoff. Stormwater training shall address topics such as spill response, good housekeeping, and material management practices. Contractor or temporary personnel shall be informed of plant operation and design features to prevent discharges or spills from occurring.
- ii) DEN's Industrial Stormwater Permit (COS-000008), Part I.A.2.b(4) specifically "*Require[s] annual training for personnel that conduct aircraft deicing and defrosting. The training must include a description of the actions required by those applying ADF (e.g., notifications, proper disposal of spent and out-of-spec fluids).*"
- iii) See *DEN Rules and Regulations, Part 190: Aircraft Deicing Regulations* for other applicable training requirements.

D. Storage and Materials Management Requirements

- i) Operators of bulk storage structures shall have adequate protection so as to be able to contain spills and prevent any spilled material from entering State waters.
- ii) Loading/transfer of ADF will occur in areas with containment and the operator will be in control of transfer nozzle and have access to shut off valves during the entire operation.

4) Planning Requirements

- A. Airlines, DCs and RC will complete the Stormwater Management Plan (SWMP) Industrial Activities Survey/Matrix (Appendix B) to assist in identifying the Environmental Guidelines applicable to the industrial activities being conducted.
 - The SWMP (including Appendix B) is available at <http://business.flydenver.com/environmental>.
 - If applicable, the operator must decide whether to operate under the DEN SWMP or generate their own SWMP for review by DEN Environmental Services.
- B. An Aircraft Deicing Authorization (ADA) application must be submitted on an annual basis by each deicer (Self-deicing Airline or DC) prior to performing any aircraft deicing. The ADA application is obtained from and approved by the Operations Division.
- C. Airlines, DCs and RC will maintain adequate supplies of spill response equipment and materials, and are responsible for clean up as needed.
- D. Airlines and/or DCs will develop and implement an effective inspection and preventative maintenance (PM) program to minimize leakage of or spillage from deicing equipment.
- E. The Airport will follow design standards for development of new deicing areas to ensure proper collection, conveyance, storage and treatment of spent ADF.

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- F. The Airport has implemented best management practices (BMPs) regarding management of the spent ADF management system as required by Part I.A.2.b of DEN's Industrial Stormwater Permit. The BMPs are found in Section 5 below.

5) Critical Tasks

- A. The Airline and/or DC will coordinate with the DEN Ramp Tower Supervisor (RTS) and follow proper operating procedures, as required in *DEN Rules and Regulations, Part 190: Aircraft Deicing Regulations*. Specifically, but not limited to, the notification to and approval from the RTS **prior** to conducting any aircraft deicing operation at any time of year is required. The following information must be provided: date, time, location, and type of deicing to be performed (limited vs. full).
- B. Per *DEN Rules and Regulations, Part 190: Aircraft Deicing Regulations*, the Airline and/or DC shall ensure aircraft is properly positioned on pad and at gates such that it is within trench drain collection in all runoff directions.
- C. The Airline and/or DC will dispose of unused or off-specification ADF appropriately as outlined in *DEN Rules and Regulations, Part 190: Aircraft Deicing Regulations*.
- D. The Airport and RC, where appropriate, will follow these BMPs for operation of the spent ADF management system.
 - i) Capture stormwater containing spent ADF generated within deicing areas when aircraft deicing occurs. Ensure that valves controlling runoff from deicing areas are positioned in deice capture mode before aircraft deicing is authorized. See *ES-308-02.03: Spent ADF Management System Valve Positioning Work Instruction* for guidelines on how valve positioning decisions are made. Operational procedures for ensuring that valves are properly positioned prior to authorizing deicing are contained in Ramp Tower Operating Instruction #60-4: Deice Operations.
 - ii) Optimize use of spent ADF management system infrastructure for capture of stormwater containing spent ADF by following these guidelines:
 - a. Recycle spent ADF to the extent practicable to reduce the load to the sanitary sewer system. Criteria for determining what fluids can be sent to storage ponds for discharge to the sanitary sewer system, in lieu of being recycled, are contained in City Contract No. 201209071.
 - b. Actively discharge captured fluids to the sanitary sewer system to free up available storage. Discharges to the sanitary sewer system should be consistent with DEN's Wastewater Contribution Permit and agreements with the Metro Wastewater Reclamation District (Metro). Decisions regarding which pond or ponds to discharge from, and at what rates, are made based on professional judgment, in consideration of factors such as the BOD limits contained in the Metro permit, operational procedures attached to the permit, the capacity of the discharge pumps and/or conveyance lines, volumes and concentrations of spent fluid, total storage capacity, and climatic conditions.
 - c. As appropriate and feasible, divert stormwater generated during non-deicing events to the clean stormwater system if spent ADF is not expected to be present in

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significant quantities. See *ES-308-02.03: Spent ADF Management System Valve Positioning Work Instruction* for guidelines on how valve positioning decisions are made.

- d. Protect infrastructure from damage by preventing pond overflows. See *ES-308-02.03: Spent ADF Management System Valve Positioning Work Instruction* for guidelines on how decisions are made to avoid pond overflows.
 - iii) Collect stormwater from non-deicing areas (fugitive areas) when ADF is likely to be present in significant quantities within the spent ADF collection system. See *ES-308-02.03: Spent ADF Management System Valve Positioning Work Instruction* for guidelines on how to position valves within the West Airfield Diversion System (WADS) and Runway 16R/34L collection system.
- E. Check with Environmental Services for any questions.

6) Emergency Response

- A. Call DEN Communications Center immediately at 303-342-4200 for all spills regardless of whether any media was impacted.
 - See Environmental Guideline *ES-301-5.02: Spill Response*
- B. Spills/releases should be contained and cleaned up as soon as possible using either manual (e.g., absorbents, shovel) or mechanical (e.g., vacuum, sweeper) means to minimize potential stormwater impacts. Containerized wastes should be properly labeled, stored, and disposed.
- C. Spills of any kind shall not be washed into any storm sewer or waterway, or onto any soils.

7) Inspection and Maintenance Requirements

- A. Airlines and/or DCs will develop and implement inspection and PM programs to minimize leakage of or spillage from deicing equipment and storage.
- B. The Airport will follow *ES-308-03.01: Operations Manual: Deicer Contaminated Stormwater System* for the operation and maintenance of the spent ADF system.
- C. Operators of bulk storage structures will inspect implemented protective measures, as necessary.
- D. The Airport will follow *ES-308-03.03: Maintenance of Sewer System Work Instruction*. DEN Environmental Services will conduct annual inspections of the trench drains and ponds associated with the spent aircraft deicing fluid collection system (i.e., DIW system) in order to determine what, if any, maintenance activities are required.

8) Expected Records and Outputs

- A. Aircraft Deicing Authorization (ADA)

- An ADA must be obtained by each deicer prior to performing aircraft deicing, and must be renewed annually. ADAs are issued by the Operations Division, with copies of approved ADA applications sent to DEN ES.
- B. Evidence of training
- While formal certifications are not necessary, some form of “proof of training” (such as sign-in sheets and handouts) is expected and should be maintained on file.
- C. ADF usage reports
- These reports are generated by the DEN Operations Division, Airlines and/or DC.
- D. ADF recycling reports
- These reports are generated by the RC.
- E. Completed SWMP Industrial Activities Survey/Matrix (Appendix B)
- The SWMP (including Appendix B) is available at <http://business.flydenver.com/environmental..>
 - Complete and return to ES for evaluation. Retain a copy in user’s SWMP-related files.
- F. Disposal profile and manifests for old, used or off-spec ADF that cannot be accepted by the Recycling Contractor
- A disposal profile will be required by the disposal facility prior to shipping.
 - Profile and Manifest forms can be obtained from the disposal facility.
 - All disposal documents should be maintained on file by the Airline and/or DC for at least three years.
- G. Pond level and volumes
- Inventories of pond contents will be maintained per the Metro permit.
 - These inventories are also used for management of the spent ADF management system and to support valve positioning.
- H. Valve positions
- Records of all influent valve positions must be maintained to document various capture and non-capture modes (e.g., deice mode, non-deice mode, diversion mode).
- I. CDPS permit reports
- Reporting requirements include upsets, bypass, diversion mode sampling, wet weather monitoring, mass balance of ADF used annually, and annual report.
- J. Inspection and General Maintenance records for the DIW system
- Inspections are recorded on the Pond Inspection Checklist form. The form template is located on the EMS portal; ES Data Files; Recordkeeping Forms folder.

9) References

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- A. Phone Numbers
- i) DEN Communications Center (for spill reporting) (303) 342-4200
 - ii) Keith Pass (DEN Environmental Services) (303) 342-2689
 - iii) DEN Environmental Services (Main Line) (303) 342-2730
- B. Guidance Materials (list is not limited to the following)
- i) Metro Wastewater Contribution Permit
 - ii) City and County of Denver Municipal Separate Storm Sewer System (MS4) Permit
 - iii) DEN Industrial Stormwater Permit
 - iv) ES-308-02.01: DEN Stormwater Management Plan
 - v) ES-308-02.03: Spent ADF Management System Valve Positioning Work Instruction
 - vi) ES-308-03.01: Operations Manual: Deicer Contaminated Stormwater System
 - vii) ES-308-03.03 Maintenance of Sewer Systems Work Instruction
 - viii) DEN Snow and Ice Control Plan, Section 6: Airport Deice Program (developed by Operations Division)
 - ix) Ramp Tower Operating Instruction #60-4: Deice Operations (developed by Operations Division)
 - x) Deicing Standard Operating Procedures per Airline and/or DC
 - xi) SAE (Society of Automotive Engineers) glycol specifications
- C. Training Materials (list is not limited to the following)
- i) Stormwater Pollution Prevention Training (To include discussion of pertinent portions of applicable "Guidance Materials" and all appropriate infrastructure, equipment and practices.)
- D. Related Environmental Documents (list is not limited to the following)
- i) ES-301-1.07 Storage of Vehicles and Equipment Containing Chemicals
 - ii) ES-301-5.02 Spill Response
- E. Applicable Regulations (list is not limited to the following)
- i) 40 CFR 122-124 NPDES Regulations for Storm Water Discharges
 - ii) DEN Rules and Regulations, Part 190: Aircraft Deicing Regulations
- F. Other Documents (list is not limited to the following)
- i) Map Example (used in preparation of site-specific map for SWMP)
 - ii) Aircraft Deicing Fluid (ADF) Material Safety Data Sheets (MSDSs)
 - iii) City Contract No. CE45008: Aircraft Deicing System Maintenance, Operation and Management Services Agreement
 - iv) Disposal Manifest
 - v) Communications Center SOP 80-05 HAZMAT, Fuel, Glycol Spills/Failure

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