What is the NPDES stormwater permitting program for industrial activity?

Activities, such as material handling and storage, equipment maintenance and cleaning, industrial processing or other operations that occur at industrial facilities are often exposed to stormwater. The runoff from these areas may discharge pollutants directly into nearby waterbodies or indirectly via storm sewer systems, thereby degrading water quality.

In 1990, the U.S. Environmental Protection Agency (EPA) developed permitting regulations under the National Pollutant Discharge Elimination System (NPDES) to control stormwater discharges associated with eleven categories of industrial activity. As a result, NPDES permitting authorities, which may be either EPA or a state environmental agency, issue stormwater permits to control runoff from these industrial facilities.

What types of industrial facilities are required to obtain permit coverage?

This fact sheet specifically discusses stormwater discharges from airports, airport terminals, airline carriers, and establishments as defined by Standard Industrial Classification (SIC) Major Group 45. Facilities and products in this group fall under the following categories, all of which require coverage under an industrial stormwater permit:

- Servicing, repairing, or maintaining aircraft and ground vehicles
- Equipment cleaning and maintenance (including vehicle and equipment rehabilitation mechanical repairs, painting, fueling, lubrication)
- Deicing/anti-icing operations which conduct the above described activities

The operator and the tenants of the airport that conduct industrial activities as described above and which have stormwater discharges are required to apply for coverage under an NPDES stormwater permit for the discharges from their areas of operation. The airport management and tenants of the airport are encouraged to apply as co-permittees under a permit, and to work in partnership in the development and implementation of a stormwater pollution prevention plan.

Non-stormwater discharges, including discharges from aircraft, ground vehicle and equipment wash-waters, dry weather discharges from airport deicing/anti-icing operations, and dry weather discharges resulting from runway maintenance are not required to obtain coverage under an industrial stormwater permit. Dry weather discharges are generated from processes other than those described in the definition of stormwater. The definition of stormwater includes stormwater runoff, snow melt runoff, and surface runoff and drainage.

What does an industrial stormwater permit require?

Common requirements for coverage under an industrial stormwater permit include development of a written stormwater pollution prevention plan (SWPPP), implementation of control measures, and submittal of a request for permit coverage, usually referred to as the Notice of Intent or NOI. The
SWPPP is a written assessment of potential sources of pollutants in stormwater runoff and control measures that will be implemented at your facility to minimize the discharge of these pollutants in runoff from the site. These control measures include site-specific best management practices (BMPs), maintenance plans, inspections, employee training, and reporting. The procedures detailed in the SWPPP must be implemented by the facility and updated as necessary, with a copy of the SWPPP kept on-site. The industrial stormwater permit also requires collection of visual, analytical, and/or compliance monitoring data to determine the effectiveness of implemented BMPs. For more information on EPA’s industrial stormwater permit and links to State stormwater permits, go to www.epa.gov/npdes/stormwater and click on “Industrial Activity.”

What pollutants are associated with my facilities activities?

Pollutants conveyed in stormwater discharges from air transportation facilities will vary. Generally, the concern with the use of ethylene and propylene glycols is that they exert high oxygen demands when released into receiving waters. Additionally, the concentration of nitrogen and possibly ammonia are the concern with the respect to deicing/anti-icing operations where urea is used. There are a number of factors that influence to what extent industrial activities and significant materials can affect water quality.

◆ Geographic location
◆ Topography
◆ Hydrogeology
◆ Extent of impervious surfaces (e.g., concrete or asphalt)
◆ Type of ground cover (e.g., vegetation, crushed stone, or dirt)
◆ Outdoor activities (e.g., material storage, loading/unloading, vehicle maintenance)
◆ Size of the operation
◆ Type, duration, and intensity of precipitation events

The activities, pollutant sources, and pollutants detailed in Table 1 are commonly found at air transportation facilities.

Table 1. Common Activities, Pollutant Sources, and Associated Pollutants at Air Transportation Facilities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Pollutant Source</th>
<th>Pollutant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft deicing/anti-icing</td>
<td>Runoff of spent deicing chemicals (e.g. ethylene glycol or propylene glycol)</td>
<td>Biochemical oxygen demand (BOD)</td>
</tr>
<tr>
<td>Runway deicing/anti-icing</td>
<td>Runoff of spent deicing chemicals (e.g. ethylene glycol, urea, potassium or sodium acetate, potassium or sodium formate)</td>
<td>BOD, nitrogen, ammonia</td>
</tr>
<tr>
<td>Aircraft servicing</td>
<td>Spills or leaks during servicing</td>
<td>Engine oil, hydraulic fluid, fuel, lavatory waste</td>
</tr>
<tr>
<td>Aircraft fueling</td>
<td>Spills and leaks during fuel transfer, spills due to “topping off” tanks, runoff from fueling areas, washdown of fueling areas, leaking storage tanks</td>
<td>Jet fuel, fuel additives, oil, lubricants, heavy metals</td>
</tr>
<tr>
<td>Aircraft, ground vehicle, and equipment maintenance and washing</td>
<td>Spills and leaks during maintenance</td>
<td>Engine oils, hydraulic fluids, transmission oil, radiator fluids, and chemical solvents</td>
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<tr>
<td></td>
<td>Disposal of waste parts</td>
<td>Batteries, oil, fuel filters, oily rags</td>
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<tr>
<td></td>
<td>Spent washwater</td>
<td>TSS, metals, fuel, hydraulic fluid, oil, lavatory waste</td>
</tr>
<tr>
<td>Runway maintenance</td>
<td>Materials removed from runway surface</td>
<td>Tire rubber, oil and grease, paint chips, jet fuel</td>
</tr>
<tr>
<td></td>
<td>Chemicals used to clean the runway surface</td>
<td>Chemical solvents</td>
</tr>
</tbody>
</table>
**What BMPs can be used to minimize contact between stormwater and potential pollutants at my facility?**

A variety of BMP options may be applicable to eliminate or minimize the presence of pollutants in stormwater discharges from air transportation facilities. You will likely need to implement a combination or suite of BMPs to address stormwater runoff at your facility. Your first consideration should be for pollution prevention BMPs, which are designed to prevent or minimize pollutants from entering stormwater runoff and/or reduce the volume of stormwater requiring management. Prevention BMPs can include regular cleanup, collection and containment of debris in storage areas, and other housekeeping practices, spill control, and employee training. It may also be necessary to implement treatment BMPs, which are engineered structures intended to treat stormwater runoff and/or mitigate the effects of increased stormwater runoff peak rate, volume, and velocity. Treatment BMPs are generally more expensive to install and maintain and include oil-water separators, wet ponds, and proprietary filter devices.

BMPs must be selected and implemented to address the following:

**Good Housekeeping Practices**

Good housekeeping is a practical, cost-effective way to maintain a clean and orderly facility to prevent potential pollution sources from coming into contact with stormwater. It includes establishing protocols to reduce the possibility of mishandling materials or equipment and training employees in good housekeeping techniques. Common areas where good housekeeping practices should be followed include trash containers and adjacent areas, material storage areas, vehicle and equipment maintenance areas, and loading docks. Good housekeeping practices must include a schedule for regular pickup and disposal of garbage and waste materials and routine inspections of drums, tanks, and containers for leaks and structural conditions. Practices also include containing and covering garbage, waste materials, and debris. Involving employees in routine monitoring of housekeeping practices has proven to be an effective means of ensuring the continued implementation of these measures.

**Minimizing Exposure**

Where feasible, minimizing exposure of potential pollutant sources to precipitation is an important control option. Minimizing exposure prevents pollutants, including debris, from coming into contact with precipitation and can reduce the need for BMPs to treat contaminated stormwater runoff. It can also prevent debris from being picked up by stormwater and carried into drains and surface waters. Examples of BMPs for exposure minimization include covering materials or activities with temporary structures (e.g., tarps) when wet weather is expected or moving materials or activities to existing or new permanent structures (e.g., buildings, silos, sheds). Even the simple practice of keeping a dumpster lid closed can be a very effective pollution prevention measure.

**Erosion and Sediment Control**

BMPs must be selected and implemented to limit erosion on areas of your site that, due to topography, activities, soils, cover, materials, or other factors are likely to experience erosion. Erosion control BMPs such as seeding, mulching, and sodding prevent soil from becoming dislodged and should be considered first. Sediment control BMPs such as silt fences, sediment ponds, and stabilized entrances, trap sediment after it has eroded. Sediment control BMPs should be used to back-up erosion control BMPs.

**Management of Runoff**

Your SWPPP must contain a narrative evaluation of the appropriateness of stormwater management practices that divert, infiltrate, reuse, or otherwise manage stormwater runoff so as to reduce the discharge of pollutants. Appropriate measures are highly site-specific, but may include, among others, vegetative swales, collection and reuse of stormwater, inlet controls, snow management, infiltration devices, and wet retention measures.
A combination of preventive and treatment BMPs will yield the most effective stormwater management for minimizing the offsite discharge of pollutants via stormwater runoff. Though not specifically outlined in this fact sheet, BMPs must also address preventive maintenance records or logbooks, regular facility inspections, spill prevention and response, and employee training.

All BMPs require regular maintenance to function as intended. Some management measures have simple maintenance requirements, others are quite involved. You must regularly inspect all BMPs to ensure they are operating properly, including during runoff events. As soon as a problem is found, action to resolve it should be initiated immediately.

Implement BMPs, such as those listed below in Table 2 for the control of pollutants at air transportation facilities, to minimize and prevent the discharge of pollutants in stormwater. Identifying weaknesses in current facility practices will aid the permittee in determining appropriate BMPs that will achieve a reduction in pollutant loadings. BMPs listed in Table 2 are broadly applicable to air transportation facilities; however, this is not a complete list and you are recommended to consult with regulatory agencies or a stormwater engineer/consultant to identify appropriate BMPs for your facility.

Table 2. BMPS for Potential Pollutant Sources at Air Transportation Facilities

<table>
<thead>
<tr>
<th>Pollutant Source</th>
<th>BMPs</th>
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<tbody>
<tr>
<td>Deicing/anti-icing aircraft</td>
<td>□ Establish a centralized aircraft deicing station with containment of surface and subsurface drainage.</td>
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<tr>
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<td>□ To reduce deicing fluid applied:</td>
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<tr>
<td></td>
<td>- Forced-air deicing systems</td>
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<td></td>
<td>- Computer-controlled fixed-gantry systems</td>
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<td></td>
<td>- Infrared technology</td>
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<td>- Hot water</td>
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<td></td>
<td>- Varying glycol content to air temperature</td>
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<td></td>
<td>- Enclosed-basket deicing trucks</td>
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<tr>
<td></td>
<td>- Mechanical methods</td>
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<tr>
<td></td>
<td>- Solar radiation</td>
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<tr>
<td></td>
<td>- Hangar storage</td>
</tr>
<tr>
<td></td>
<td>- Aircraft covers</td>
</tr>
<tr>
<td></td>
<td>- Thermal blankets for MD-80s and DC-9s</td>
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<tr>
<td></td>
<td>□ Apply deicing fluid and anti-icer to planes on deicing pads if available.</td>
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<tr>
<td></td>
<td>□ Apply anti-icer to aircraft that will be parked overnight to make it easier to remove accumulated snow and ice in the morning.</td>
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<tr>
<td></td>
<td>□ Apply anti-icer to aircraft immediately after deicing to provide extended hold-over time prior to take-off.</td>
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<tr>
<td></td>
<td>□ Ensure that stormwater inlets are blocked when deicing/anti-icing during dry weather.</td>
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<td></td>
<td>□ Use mechanical vacuum systems or other devices to collect aircraft deicing runoff from the apron surface for proper disposal.</td>
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<tr>
<td></td>
<td>□ Dispose collected aircraft deicing runoff to sanitary sewage facility (if allowed by sewer authority), on-site treatment, or recycle (resell or reuse).</td>
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<tr>
<td></td>
<td>□ Use portable tanks, retention and detention ponds for temporary storage of collected deicing runoff.</td>
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<tr>
<td></td>
<td>□ Collect contaminated runoff in a wet pond for biochemical decomposition (be aware of attracting wildlife that may prove hazardous to flight operations).</td>
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<tr>
<td></td>
<td>□ Recover and recycle/dispose of unused deicing fluids in deicing trucks.</td>
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<tr>
<td></td>
<td>□ Recover deicing materials when applied during non-precipitation events (e.g., covering storm sewer inlets, using booms, installing absorptive interceptors in the drains, etc.) to prevent materials from later contaminating stormwater.</td>
</tr>
</tbody>
</table>
### Table 2. BMPS for Potential Pollutant Sources at Air Transportation Facilities (continued)

<table>
<thead>
<tr>
<th>Pollutant Source</th>
<th>BMPS</th>
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</table>
| **Deicing/anti-icing runways and pads** | - Evaluate and optimize present chemical application rates  
- Use sand where possible to enhance friction.  
- Plow and broom runways prior to application of deicing chemicals.  
- Heat solid deicers and sand prior to application.  
- Install and calibrate devices to meter the amount of pavement deicer being applied.  
- Emphasize anti-icing operations which minimize the need to deice.  
- Install runway ice detection systems (“pavement sensors”) to monitor pavement temperatures.  
- Pre-wet with liquid deicers to improve adhesion of solid deicers to the iced surface.  
- Use deicers which have less of an environmental impact (e.g. sodium formate and potassium acetate as opposed to urea and glycol).  
- Ensure proper handling and disposal of unused deicing chemicals in vehicles.  
- Use ice detection systems.  
- Use airport traffic flow strategies and departure slot allocation systems. |
| **Aircraft, ground vehicle, and equipment maintenance areas (including aircraft service areas)** | Good Housekeeping  
- Eliminate floor drains that are connected to the storm or sanitary sewer; if necessary, install a sump that is pumped regularly. Collected wastes should be properly treated or disposed of by a licensed waste disposal company.  
- Prevent and contain spills and drips.  
- Do all cleaning at a centralized station so the solvents stay in one area.  
- Remove any parts that are dipped in liquid slowly to avoid spills.  
- Use drip pans, drain boards, and drying racks to direct drips back into a fluid holding tank for reuse.  
- Drain all parts of fluids prior to disposal. Oil filters can be crushed and recycled.  
- Transfer used fluids to the proper container promptly; do not leave full drip pans or other open containers around the shop. Empty and clean drip pans and containers.  
- Clean up leaks, drips, and other spills without using large amounts of water. Use absorbents for dry cleanup whenever possible.  
- Prohibit the practice of hosing down an area where the practice would result in the discharge of pollutants to a stormwater system.  
- Prohibit pouring liquid waste into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.  
- Maintain an organized inventory of materials.  
- Eliminate or reduce the number and amount of hazardous materials and waste by substituting nonhazardous or less hazardous materials.  
- Label and track the recycling of waste material (e.g., used oil, spent solvents, batteries).  
- Store batteries and other significant materials inside.  
- Dispose of greasy rags, oil filters, air filters, batteries, spent coolant, and degreasers in compliance with RCRA regulations. |
**Table 2. BMPS for Potential Pollutant Sources at Air Transportation Facilities (continued)**

<table>
<thead>
<tr>
<th>Pollutant Source</th>
<th>BMPS</th>
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</table>
| Aircraft, ground vehicle, and equipment maintenance areas (including aircraft service areas) (continued) | Minimizing Exposure  
- Perform all cleaning operations indoors or under covering when possible. Conduct the cleaning operations in an area with a concrete floor with no floor drainage other than to sanitary sewers or treatment facilities.  
- If operations are uncovered, perform them on a concrete pad that is impervious and contained.  
- Park vehicles and equipment indoors or under a roof whenever possible and maintain proper control of oil leaks/spills.  
- Check vehicles closely for leaks and use pans to collect fluid when leaks occur.  
Management of Runoff  
- Use berms, curbs, grassed swales, or other diversion measures to ensure that stormwater runoff from other parts of the facility does not flow over the maintenance area.  
- Collect the stormwater runoff from the cleaning area and provide treatment or recycling.  
- Discharge vehicle wash or rinse water to the sanitary sewer (if allowed by sewer authority), wastewater treatment, a land application site, or recycle on-site. DO NOT discharge washwater to a storm drain or to surface water.  
Inspections and Training  
- Inspect the maintenance area regularly to ensure BMPs are implemented.  
- Train employees on waste control and disposal procedures.  
- Inspect the maintenance area regularly for proper implementation of control measures.  
- Train employees on proper waste control and disposal procedures. |
| Aircraft, ground vehicle, and equipment cleaning areas |  
- Perform all cleaning operations indoors.  
- Confine activities to designated areas outside drainage pathways and away from surface waters.  
- If washing outdoors, cover the cleaning operation and ensure that all washwaters drain to the intended collection system.  
- Use phosphate-free biodegradable detergents.  
- Contain and recycle washwaters.  
- Collect stormwater runoff from the cleaning area and provide treatment or recycling.  
- Inspect cleaning area regularly to ensure BMPs are implemented and maintained.  
- Train employees on proper washing procedures. |
| Aircraft, ground vehicle, and equipment storage areas |  
- Store aircraft, ground vehicles and equipment indoors.  
- Cover the storage area with a roof.  
- Store aircraft, ground vehicles, and equipment awaiting maintenance in designated areas only.  
- Park leaking deicing trucks in contained areas.  
- Install perimeter drains, berms, and dikes around storage areas to limit run-on.  
- Use absorbents for dry cleanup for spills and leaks.  
- Use drip pans under all vehicles and equipment for the collection of fluid leaks.  
- Clean pavement surface to remove oil and grease without using large amounts of water. |
### Table 2. BMPS for Potential Pollutant Sources at Air Transportation Facilities (continued)

<table>
<thead>
<tr>
<th>Pollutant Source</th>
<th>BMPS</th>
</tr>
</thead>
</table>
| **Aircraft, ground vehicle, and equipment storage areas (continued)** | ❑ Regularly sweep area to minimize debris on the ground.  
❑ Provide dust control if necessary. When controlling dust, sweep and/or apply water or materials that will not impact surface or ground water.  
❑ Inspect the storage yard for filling drip pans regularly to ensure BMPs are implemented.  
❑ Train employees on procedures for storage and inspection items. |
| **Material storage areas** | ❑ Store materials indoors.  
❑ Maintain good integrity of all storage containers (e.g., used oils, hydraulic fluids, spent solvents, waste aircraft fuel).  
❑ Create a centralized storage area for waste materials.  
❑ Cover and/or enclose chemical storage areas (including temporary cover such as a tarp that prevents contact with precipitation).  
❑ Provide secondary containment around chemical storage areas.  
❑ If containment structures have drains, ensure that the drains have valves, and that valves are maintained in the closed position. Institute protocols for checking/testing stormwater in containment areas prior to discharge.  
❑ Locate storage areas away from high traffic areas and surface waters.  
❑ Inspect storage tanks and piping systems (pipes, pumps, flanges, couplings, hoses, and valves) for failures or leaks and perform preventive maintenance.  
❑ Plainly label all containers.  
❑ Maintain an inventory of fluids to identify leakage.  
❑ Provide fluid level indicators.  
❑ Properly dispose of chemicals that are no longer in use.  
❑ Store and handle reactive, ignitable, or flammable liquids in compliance with applicable local fire codes, local zoning codes, and the National Electric Code.  
❑ Provide drip pads/pan where chemicals are transferred from one container to another to allow for recycling of spills and leaks.  
❑ Develop and implement spill plans or spill prevention, containment, and countermeasures (SPCC) plans, if required for your facility.  
❑ Train employees in spill prevention and control and proper materials management. |
| **Airport fuel system and fueling areas** | ❑ Conduct fueling operations (including the transfer of fuel to tank trucks) on an impervious or contained pad and under a roof or canopy where possible. Covering should extend beyond spill containment pad to prevent rain from entering.  
❑ When fueling in uncovered area, use concrete pad (asphalt is not chemically resistant to the fuels being handled).  
❑ Develop and implement a system to report any spill exceeding 5 feet in any direction or which has entered the storm drainage system.  
❑ Use drip pans and absorptive materials beneath aircraft during fueling operations where leaks or spills of fuel can occur and where making and breaking hose connections.  
❑ Use fueling hoses with check valves to prevent hose drainage after filling.  
❑ Insure that storm water valves, plugs and similar appurtenances are closed during fuel transfer operations. |
Table 2. BMPS for Potential Pollutant Sources at Air Transportation Facilities (continued)

<table>
<thead>
<tr>
<th>Pollutant Source</th>
<th>BMPs</th>
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</table>
| Airport fuel system and fueling areas (continued) | ❑ Provide spill kits on all fuel trucks, at fueling stations, in each hangar and at strategic locations. Each kit should have at a minimum, loose absorbent, pigs, broom and shovel. Store used materials in individual sealed container and labeled to ensure proper handling and disposal as a hazardous material.  
❑ Keep spill cleanup materials readily available.  
❑ Clean up spills and leaks immediately.  
❑ Use dry cleanup methods for fuel areas rather than hosing down the fuel area. Sweep up absorbents as soon as spilled substances have been absorbed.  
❑ Use spill and overflow protection devices.  
❑ Minimize run-on of stormwater into the fueling area by grading the area such that stormwater only runs off.  
❑ Collect stormwater runoff and provide treatment or recycling.  
❑ Provide curbing or posts around fuel pumps to prevent collisions from vehicles.  
❑ Regularly inspect and perform preventive maintenance on fuel storage tanks to detect potential leaks before they occur.  
❑ Inspect the fueling area for leaks and spills.  
❑ Do not allow “topping off” of the fuel in the receiving equipment.  
❑ Train personnel on vehicle fueling BMPs. |
| Storing liquid fuels               | ❑ If area is uncovered, connect sump outlet to sanitary sewer (if allowed by the sewer authority) or an oil/water separator, catch basin filter, etc. If connecting to a sanitary sewer check with the system operator to ensure that the discharge is acceptable. If implementing separator or filter technologies ensure that regular inspections and maintenance procedures are in place.  
❑ Develop and implement spill plans.  
❑ Train employees in spill prevention and control.  
Above ground tanks                 | ❑ Provide secondary containment, such as dikes, with a height sufficient to contain a spill (the greater of 10 percent of the total enclosed tank volume or 110 percent of the volume contained in the largest tank).  
❑ If containment structures have drains, ensure that the drains have valves, and that valves are maintained in the closed position. Institute protocols for checking/testing stormwater in containment areas prior to discharge.  
❑ Use double-walled tanks with overflow protection.  
❑ Keep liquid transfer nozzles/hoses in secondary containment area.  
Portable containers/drums           | ❑ Store drums indoors when possible.  
❑ Store drums, including empty or used drums, in secondary containment with a roof or cover (including temporary cover such as a tarp that prevents contact with precipitation).  
❑ Provide secondary containment, such as dikes or portable containers, with a height sufficient to contain a spill (the greater of 10 percent of the total enclosed tank volume or 110 percent of the volume contained in the largest tank).  
❑ Clearly label drum with its contents. |
| Deicing chemical loading areas     | ❑ Store bulk aircraft deicing fluids in contained areas.  
❑ Load deicing trucks in contained areas. |
What if activities and materials at my facility are not exposed to precipitation?

The industrial stormwater program requires permit coverage for a number of specified types of industrial activities. However, when a facility is able to prevent the exposure of ALL relevant activities and materials to precipitation, it may be eligible to claim no exposure and qualify for a waiver from permit coverage.

If you are regulated under the industrial permitting program, you must either obtain permit coverage or submit a no exposure certification form, if available. Check with your permitting authority for additional information as not every permitting authority program provides no exposure exemptions.

Where do I get more information?

For additional information on the industrial stormwater program see www.epa.gov/npdes/stormwater/msgp.

A list of names and telephone numbers for each EPA Region or state NPDES permitting authority can be found at www.epa.gov/npdes/stormwatercontacts.

References

Information contained in this Fact Sheet was compiled from EPA's past and current Multi-Sector General Permits and from the following sources: