Industrial Stormwater

Fact Sheet Series

Sector AB: Transportation Equipment, Industrial, or Commercial Machinery Manufacturing Facilities

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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 facilities that manufacture transportation equipment, industrial, or commercial machinery as described in SIC Major Groups 35 and 37 (except 357 and 373). This includes:

- Engines and turbines (SIC Code 351)
- Farm and garden machinery and equipment (SIC Code 352)
- Construction, mining, and materials handling machinery and equipment (SIC Code 353)
- Metalworking machinery and equipment (SIC Code 354)
- Special industry machinery, except metalworking machinery (SIC Code 355)
- General industrial machinery and equipment (SIC Code 356)
- Refrigeration and service industry machinery (SIC Code 358)
- Miscellaneous industrial and commercial machinery and equipment (SIC Code 359)
- Motor vehicles and motor vehicle equipment (SIC Code 371)
- Aircraft and parts (SIC Code 372)
- Motorcycles, bicycles, and parts (SIC Code 375)
- Guided missiles and space vehicles and parts (SIC Code 376)
- Miscellaneous transportation equipment (SIC Code 379)

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 facilities involved with the manufacturing of transportation equipment, industrial, or commercial machinery will vary. 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
- 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 transportation equipment, industrial, or commercial machinery manufacturing facilities.

Table 1. Common Activities, Pollutants Sources, and Associated Pollutants at Transportation Equipment, Industrial, or Commercial Machinery Manufacturing Facilities

Activity	Pollutant Source	Pollutant
Outdoor material loading/unloading	Wooden pallets, castings, foundry sand, limestone, spills/leaks from material handling equipment, solvents	Total suspended solids (TSS), turbidity, dust, oil and grease, organics
Outdoor material and equipment storage	Foundry sand, limestone, used equipment, above ground storage tanks, scrap metal, oil and grease, raw materials (e.g., aluminum, steel, iron, copper), castings, solvents, acids, and paints	TSS, turbidity, dust, oil and grease, heavy metals, organics
	Stored hazardous waste, including: paint wastes, solvent wastes, and sludge wastes; stored nonhazardous wastes: glass, tires, used wooden pallets, used equipment and machinery, plastics and rubber wastes	TSS, oils, solvents
Air emissions from stacks and ventilation systems	Engine exhaust from manufacturing equipment, paint residue, particulates in fumes from metal processing activities such as cutting, grinding, shaping, and welding	Particulates, heavy metals
Vehicle fueling and maintenance	Parts cleaning	Solvents, oil, heavy metals, acid/alkaline wastes

Table 1. Common Activities, Pollutants Sources, and Associated Pollutants at Transportation Equipment, Industrial, or Commercial Machinery Manufacturing Facilities (Continued)

Activity	Pollutant Source	Pollutant
Vehicle fueling and maintenance (continued)	Waste disposal of oily rags, oil and gas filters, batteries, coolants, degreasers	Oil, heavy metals, solvents, acids
	Fluid replacement including hydraulic fluid, oil, transmission fluid, radiator fluids, and grease	Oil and grease, arsenic, lead, cadmium, chromium, COD, and benzene
	Fueling	Diesel, gasoline, oil

Note: Activities may have additional pollutant sources that contain PFAS and can come into contact with stormwater discharges. Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals that include PFOA, PFOS, GenX, and many other chemicals.

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 transportation equipment, industrial, or commercial machinery manufacturing 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. Industrial facilities can conduct activities that use, store, manufacture, transfer, and/or dispose of PFAS containing materials. Successful good housekeeping practices to minimize PFAS exposure to stormwater could include inventorying the location, quantity, and method of storage; using properly designed storage and transfer techniques; providing secondary containment around chemical storage areas; and using proper techniques for cleaning or replacement of production systems or equipment.

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. Another example could include locating PFAS-containing materials and residues away from drainage pathways and surface waters.

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. Incorporating treatment like granular activated carbon may be helpful to remove certain pollutants like PFAS.

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 transportation equipment, and industrial and commercial machinery manufacturing 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 transportation equipment, industrial, or commercial machinery manufacturing 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 Transportation Equipment, Industrial, or Commercial Machinery Manufacturing Facilities

Pollutant Source	BMPs
Outdoor material loading and unloading	❑ Confine loading/unloading activities to a designated area outside drainage pathways and away from surface waters ❑ Load/unload indoors or in a covered area. ❑ Cover loading/unloading area with permanent cover (e.g., roofs) or temporary cover (e.g., tarps). ❑ Close storm drains during loading/unloading activities in surrounding areas. Avoid loading/unloading materials in the rain. ❑ Slope the impervious concrete floor or pad to collect spills and leaks and convey them to proper containment and treatment. ❑ Provide overhangs or door skirts to enclose trailer ends at truck loading/unloading docks. ❑ For rail transfer, a drip pan shall be installed within the rails to collect spillage from the tank. ❑ Where liquid or powdered materials are transferred in bulk to/from truck or rail cars, ensure hose connection points at storage containers are inside containment areas, or drip pans are used in areas where spillage may occur which are not in a containment area. ❑ Inspect all containers prior to loading/unloading of any raw or spent materials. ❑ Provide diversion berms, dikes or grassed swales around the perimeter of the area to limit run-on. ❑ Use dry cleanup methods instead of washing the areas down. ❑ 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. ❑ Develop and implement spill prevention, containment, and countermeasure (SPCC) plans ❑ Train employees on proper loading/unloading techniques and spill prevention and response.
Outdoor material storage	❑ Cover storage areas with roofs or tarps. ❑ Confine storage of raw materials, parts, and equipment to designated areas away from high traffic, outside drainage pathways and away from surface waters. ❑ 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. ❑ Provide diversion berms, dikes or grassed swales around the perimeter of the area to limit run- on. ❑ Direct stormwater runoff to an on-site retention pond. ❑ Ensure that all containers are properly sealed and valves closed. ❑ Conduct container integrity testing and provide leak detection. ❑ 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.

Table 2. BMPs for Potential Pollutant Sources at Transportation Equipment, Industrial, or Commercial Machinery Manufacturing Facilities

Pollutant Source	BMPs
Outdoor material storage (continued)	❑ Wash and rinse containers indoors before storing them outdoors. ❑ Provide transfer of PFAS containing materials and their proper collection and disposal methods in the event of a release from their container. ❑ Train employees on proper spill prevention and response techniques. ❑ Train employees on proper waste control and disposal.
Foundry sand and limestone storage	❑ Confine storage to areas outside of drainage pathways and away from surface waters. ❑ Divert stormwater around storage areas with vegetated swales, and/or berms. ❑ Practice good housekeeping measures such as frequent removal of dust and debris. Cleanup methods may include mobile sweepers, scrapers, or scoops. ❑ Use control measures such as berms, silt fences or waddles to control sediment from leaving storage area. ❑ Train employees in good housekeeping measures.
Waste management	❑ Store waste in enclosed and/or covered areas. ❑ Store wastes in covered, leak proof containers (e.g., dumpsters, drums). ❑ Cover the dumpsters or move them indoors. ❑ Use linked dumpsters that do not leak. ❑ Provide a lining for the dumpsters. ❑ Direct runoff to on-site retention pond. ❑ Ensure hazardous and solid waste disposal practices are performed in accordance with applicable federal, state, and local requirements. ❑ Ship all wastes to offsite licensed landfills or treatment facilities.
Particulate emission management	❑ Clean around vents and stacks. ❑ Place tubs around vents and stacks to collect particulates. ❑ Inspect air emission control systems (e.g., baghouses) regularly and repair or replace when necessary.
Vehicle fueling	❑ Conduct fueling operations (including the transfer of fuel from tank trucks) on an impervious or contained pad or under a roof or canopy where possible. Covering should cover extend beyond spill containment pad to prevent rain from entering. ❑ When fueling in uncovered area, use concrete pad (not asphalt). ❑ Use drip pans 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. ❑ Clean up spills and leaks immediately. ❑ Minimize/eliminate run-on onto fueling areas with diversion dikes, berms, curbing, surface grading or other equivalent measures. ❑ Collect stormwater runoff and provide treatment or recycling. ❑ Use dry cleanup methods for fuel area rather than hosing the fuel area down. Sweep up absorbents as soon as spilled substances have been absorbed.

Table 2. BMPs for Potential Pollutant Sources at Transportation Equipment, Industrial, or Commercial Machinery Manufacturing Facilities (continued)

Pollutant Source	BMPs
Vehicle fueling (continued)	❑ Regularly inspect and perform preventive maintenance on storage tanks to detect potential leaks before they occur. ❑ Inspect the fueling area for leaks and spills ❑ Provide curbing or posts around fuel pumps to prevent collisions from vehicles. ❑ Discourage "topping off" of fuel tanks. ❑ Train personnel on vehicle fueling BMPs
Vehicle maintenance	Good Housekeeping ❑ Plug floor drains that are connected to the storm or sanitary sewer; if necessary, install a sump that is pumped regularly. ❑ Use drip plans, drain boards, and drying racks to direct drips back into a sink or fluid holding tank for reuse. ❑ Drain all parts of fluids prior to disposal. Oil filters can be crushed and recycled. ❑ Promptly transfer used fluids to the proper container; do not leave full drip pans or other open containers around the shop. Empty and clean drip pans and containers. ❑ Dispose of greasy rags, oil filters, air filters, batteries, spent coolant, and degreasers properly. ❑ Label and track the recycling of waste material (e.g., used oil, spent solvents, batteries). ❑ Maintain an organized inventory of materials. ❑ Eliminate or reduce the number or amount of hazardous materials and waste by substituting nonhazardous or less hazardous materials. ❑ Clean up leaks, drips, and other spills without using large amounts of water. ❑ Prohibit the practice of hosing down an area where the practice would result in the exposure of pollutants to stormwater. ❑ Clean without using liquid cleaners whenever possible. ❑ Do all cleaning at a centralized station so the solvents stay in one area. ❑ If parts are dipped in liquid, remove them slowly to avoid spills. ❑ Do not pour liquid waste down floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections. 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 concrete pad that is impervious and contained. ❑ Park vehicles and equipment indoors or under a roof whenever possible where proper control of oil leaks/spills is maintained and exposure to stormwater is prevented. ❑ Watch vehicles closely for leaks and use pans to collect fluid when leaks occur.

Table 2. BMPs for Potential Pollutant Sources at Transportation Equipment, Industrial, or Commercial Machinery Manufacturing Facilities (continued)

Pollutant Source	BMPs
Vehicle maintenance (continued)	Management of Runoff ❑ Use berms, curbs, or similar means 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 providing 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 recycled on-site. DO NOT discharge washwater to a storm drain or to surface water. Inspections and Training ❑ Inspect the maintenance area regularly for proper implementation of control measures. ❑ Train employees on proper waste control and disposal procedures.

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:

- U.S. Department of Defense, Department of the Navy. "Storm Water Best Management Practices (BMP) Decision Support Tool - Stormwater Pollution Prevention Options by Category: Vehicle Maintenance."
  http://205.153.241.230/stormwaterbmp/cgi-bin/P2Cat.cfm?Cat=Vehicle%20Maintenance
- U.S. Department of Defense, Department of the Navy. "Storm Water Best Management Practices (BMP) Decision Support Tool—Stormwater Pollution Prevention Options by Category: Fueling."
  http://205.153.241.230/stormwaterbmp/cgi-bin/P2Cat.cfm?Cat=Vehicle%20Fueling

- U.S. EPA. September 1992. Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices. EPA 832-R-92-006. **www.epa.gov/npdes/stormwater**
- U.S. EPA, Office of Science and Technology. 1999. Preliminary Data Summary of Urban Stormwater Best Management Practices. EPA-821-R-99-012 **www.epa.gov/OST/stormwater/**
- U.S. EPA, Office of Wastewater Management. *NPDES Stormwater Multi-Sector General Permit for Industrial Activities (MSGP)*. **www.epa.gov/npdes/stormwater/msgp**