

Identifying Practices for Controlling Aircraft and Airfield Deicing Runoff

During winter weather, Federal Aviation Administration (FAA) regulations require all aircraft to be free of contamination at takeoff and that runway friction be maintained. To meet these regulations and to help assure the safety of airport passengers and personnel, deicing agents are commonly used to remove frost, snow, and ice from planes and pavement.

The Society of Automotive Engineers (SAE) Aerospace Council has a set of approved deicers for planes and runways;

however, some of these treatments have potentially harmful environmental impacts if airport runoff discharge is not managed as required by the Clean Water Act. Maintaining safety and developing effective runoff management methods can be difficult to achieve, especially for small airports that possess limited staff, resources, and funding.

ACRP Report 14: Deicing Planning Guidelines and Practices for Stormwater Management Systems (2009) was developed to help airports and aircraft operators meet this challenge. The report provides practical guidance in selecting best management practices (BMPs) for controlling deicing runoff. *ACRP Report 14* includes fact sheets which identify several deicing BMPs that can be evaluated by airport personnel and chosen to fit their facility's unique needs.

At Gerald R. Ford International Airport (GRR) in Grand Rapids, Michigan, facilities management director Thomas Ecklund and fellow airport employees utilized *ACRP Report 14* to develop a long-

term stormwater and deicing program that would maintain airport safety and comply with environmental regulations.

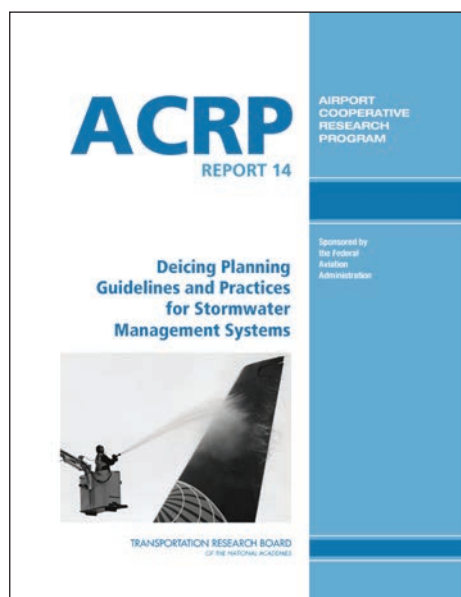
In 2010, the Michigan Department of Environmental Quality (DEQ) issued a National Pollutant Discharge Elimination System (NPDES) permit to GRR authorizing its deicing stormwater discharges, but required implementation of controls for eliminating deicing runoff into a local tributary that had been the major source of biofilm accumulation.

The permit also required GRR to continue using mobile collecting units to collect and recycle glycol, a common deicing agent approved by SAE. To comply with the permit, a long-term runoff management plan had to be submitted to the DEQ by September 1, 2011 and implemented no later than October 1, 2015.

GRR specifically used *ACRP Report 14* to identify a runoff management system and then develop a runoff management plan. The report outlines a step-by-step process for defining suitable management systems that includes:

1. Identify potential practices;
2. Select candidate practices;
3. Identify constraints on system design; and
4. Assemble and evaluate practical system alternatives.

Applying this process, GRR identified potential BMPs suggested by *ACRP Report 14*. The guidelines offered GRR successful BMPs from five different categories: aircraft deicing source reduction; airfield pavement deicing source reduction; deicing runoff contaminant/collection; deicing runoff treatment/recycling; and



Right:
Proposed route for
redirected stormwater
flows at Gerald R. Ford
International Airport.
The route utilizes twelve
natural treatment beds.

Photo courtesy of GRR.



Controlling Deicing Runoff—continued

Since 2006, an industry-driven, applied research program that develops near-term, practical solutions to problems faced by airport operators.

deicing runoff system components. The guidebook displays each BMP in a table which was assessed by GRR for various elements including ease of implementation, constraints, costs, and potential savings. “We looked at every one of those best management practices to identify those that were potentially appropriate,” said Mr. Ecklund. “We went through an elimination process and developed our long-term conceptual plan.”

Members of GRR staff, a consulting team, the FAA, and staff from the airport’s commercial airline partners, cargo and general aviation tenants attended a two-day workshop to review suggested BMPs. Each option was assessed for the following criteria to determine its success at GRR:

- Effectiveness in contributing to the required permit mandates;
- Ease of implementation;
- Impact on airline and tenant operations;
- Capital cost; and
- Operations and maintenance cost and resources.

Each of these criteria is described in *ACRP Report 14* for the assessment of candidate practices. At the conclusion of the workshop, potential systems were identified, including the combination of BMPs and construction. These options were then further refined by an advisory committee. The resulting plan for the new

system was submitted to the DEQ and successfully approved in December 2011.

GRR completed its design process in May 2013, took bids in July and began construction in October of that year. When completed in August 2015, the new system will include airfield storm sewer work redirecting storm flows to an alternate location on a nearby river, and the construction of natural treatment beds to reduce the impacts of glycol (approximately 80% reduction) in the discharge.

ACRP Report 14 presents easy-to-use guidelines to help airport personnel identify, construct, and maintain an effective deicing runoff management plan. The report provides a step-by-step framework (see illustration below) for developing and implementing a deicing runoff management system to comply with environmental regulatory requirements.

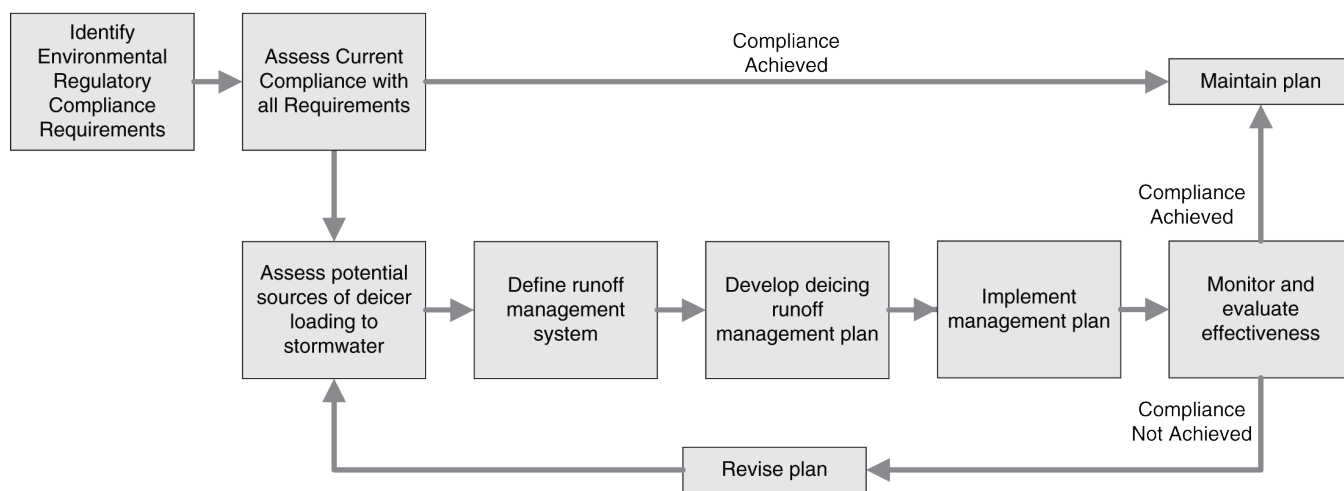
GRR utilized *ACRP Report 14* to help its staff and tenants understand and assess various BMPs that would comply with both airport safety and environmental regulations. “*ACRP Report 14* was a critical starting point for our two-day planning workshop,” noted Mr. Ecklund. “It allowed all participants to start on an equal basis when it came to identifying

A deicing runoff management system is an assemblage of practices that, as an integrated whole, achieves environmental regulatory compliance within the context and constraints of safety, as well as operational and cost requirements and objectives. Practices for controlling deicing runoff can be arranged in three categories:

1. Source reduction;
2. Containment / collection; and
3. Discharge / treatment / recycling.

ACRP Report 14:
Deicing Planning Guidelines and Practices for Stormwater Management Systems

proven, successful techniques for us to consider. The group did not have to spend precious time identifying possible BMPs and determining their potential for success.” The report’s guidelines enabled GRR to more clearly define and engineer a system that best fit the airport facility’s specific needs and to meet timely approval by the DEQ.



Above: Illustration from *ACRP Report 14* of the framework for developing and implementing a deicing runoff management strategy.

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