



GfIA Long-Term Stormwater / Deicing Runoff Management Program



KCDA Board Meeting

Gerald R. Ford International Airport, Grand Rapids, MI

September 28, 2011



Presentation Overview

- Overview of Deicing Operations and Practices
- GFIA's Deicing Management Program
- Deicing Concerns and Common Misconceptions
- Permit Requirements
- GFIA Stormwater and Deicing Runoff Management Program Development Study Process
- Schedule and Next Steps



Key Facts

- FAA requires aircraft and pavement deicing for safety & specifies the products and procedures
- Deicers have environmental implications.
- Managing deicing runoff is challenging and an airport responsibility
- GFIA has maintained 100% compliance with its stormwater permit requirements
- GFIA has shown steady improvement in reducing deicers in stormwater
- Available testing indicates no impact on the Thornapple River
- The recommended concept meets all requirements for environmental protection



GFIA's Deicing Management Program

Program Elements

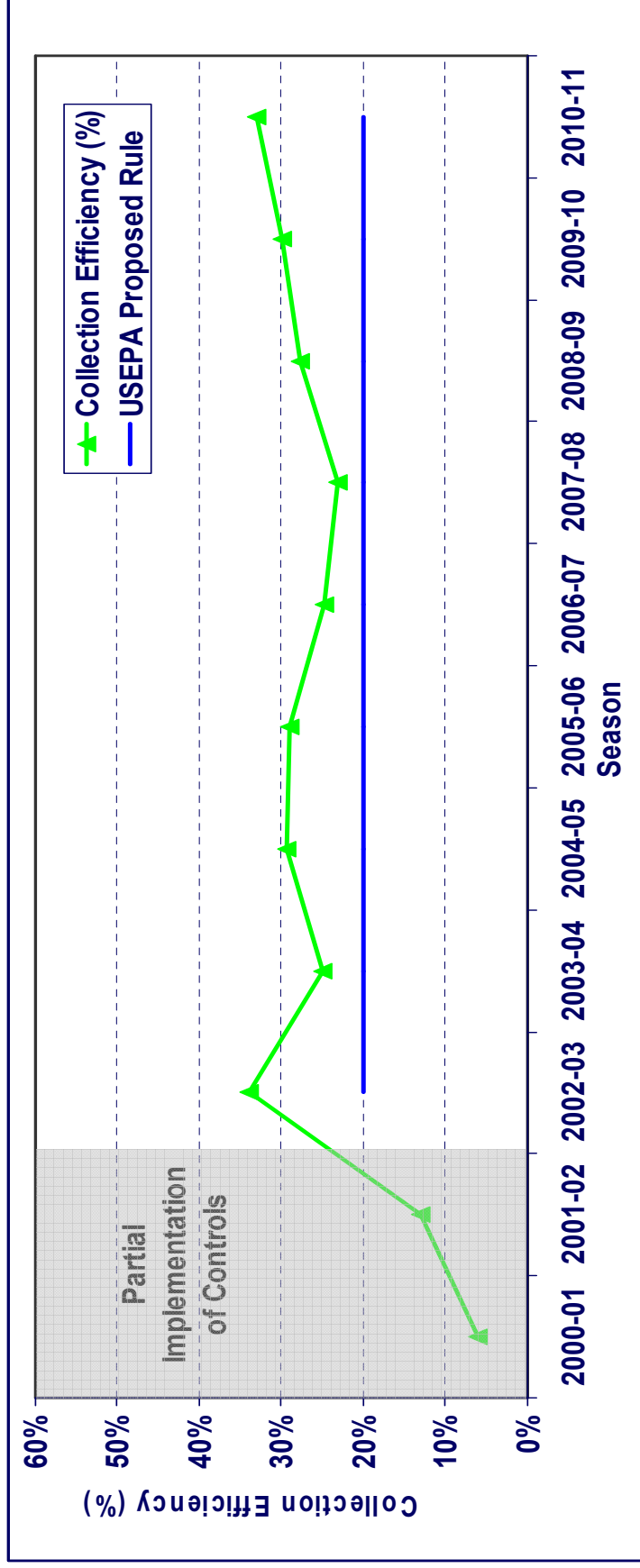
- Best Management Practices (controls)
- Water Quality & Material Usage Monitoring
- Annual Reporting and Evaluation
- Refinements to improve overall performance





GFLA's Deicing Management Program (cont.)

Performance – Collection efficiency versus EPA Proposed National Rule for Airport Deicing





Deicing Concerns and Common Misconceptions

Deicing Fluids/Propylene Glycol (PG)

Misconception: Ethylene glycol is used at GFIA.

Fact: Ethylene glycol is not used at GFIA.

Fact : PG has been in use since the 1980s and is the only glycol used today at GFIA.

Misconception: “PG is very harmful.”

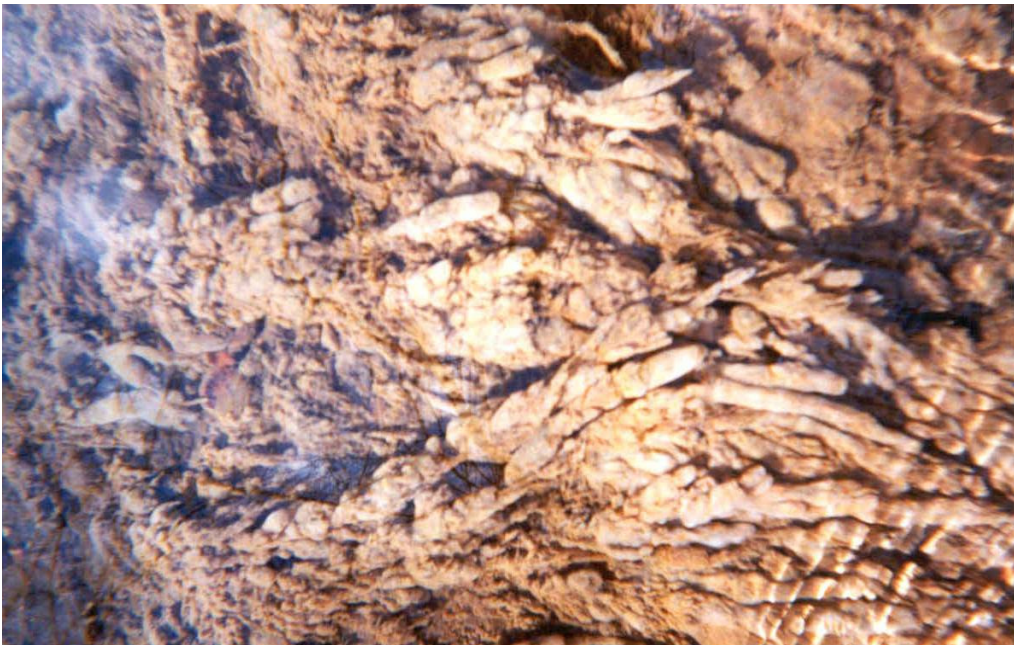
Fact : PG is “Generally Recognized As Safe” (GRAS) by the U.S. Food and Drug Administration (FDA) and is commonly used in consumer products including cosmetics and foods.

Fact : PG is very readily used as food by aquatic microorganisms.



What are Biofilms?

- Natural, complex communities of organisms
- Includes algae, fungi, bacteria, protozoa
- Prolific growth results in “nuisance” conditions
- Prolific growth requires both abundant food and suitable physical habitat





Deicing Concerns and Common Misconceptions (cont.)

Biofilm Ecology

Misconception: Factors controlling biofilm development are well-understood.

Fact: There are significant unknowns including the factors leading to nuisance conditions.

Unnamed Tributary

Misconception: “Stream is dead.”

Fact: DEQ biological surveys have shown conditions ranging from “poor” to “acceptable.”



National Pollutant Discharge Elimination System (NPDES) Permit Requirements

- Water Quality and Deicer Usage Monitoring
- Biofilm and Macroinvertebrate Monitoring
- Deicing Runoff Management Improvements
- Long-Term Deicing Runoff Management Program Development (Study)
 - Elimination of GFIA's contribution to biofilm in the Unnamed Tributary
 - Program must be fully implemented by October 1, 2015



Long-Term Deicing Runoff Management Program Development Study

Purpose

- Identify appropriate alternative to eliminate GFIA's contribution to nuisance biofilms in the Unnamed Tributary

Study Approach

- Define performance requirements
- Identify potential alternatives
 - Planning Charrette
 - Stakeholders Advisory Committee
 - Evaluation criteria
- Select Recommended Concept
- Report to MDEQ by Sept. 1, 2011



Summary of Performance Requirements Findings

- Soluble organic foods from all sources within the watershed are the contributing factor.
- Nuisance threshold has not been identified for organic enrichment, but its likely to be low.
- Physical conditions are critical for nuisance biofilm growth.
 - Water depth and flow
 - Substrate – rocky vs. sandy/silty
 - Temperature
 - Sunlight



Identification of Potential Concepts

Challenges & Considerations

- Flight Safety and Air Service Obligations
- Permit-mandated requirements
- Past Program Development and Accomplishments (System in Place)
- Potentially very large volumes of stormwater runoff must be controlled (~3,000 acres)
- No time for a trial and error approach
- Need to ensure confident decision-making



Identification of Potential Concepts (cont.)

Stakeholder Advisory Committee (SAC)

- Representatives from airport, regulatory, local community organizations
- Provided study information, status updates, and opportunity for input
- Five public meetings February through July 2011
- Information available on GFLIA website throughout process

(<http://www.grr.org/SWStudy.php>)

SAC Members

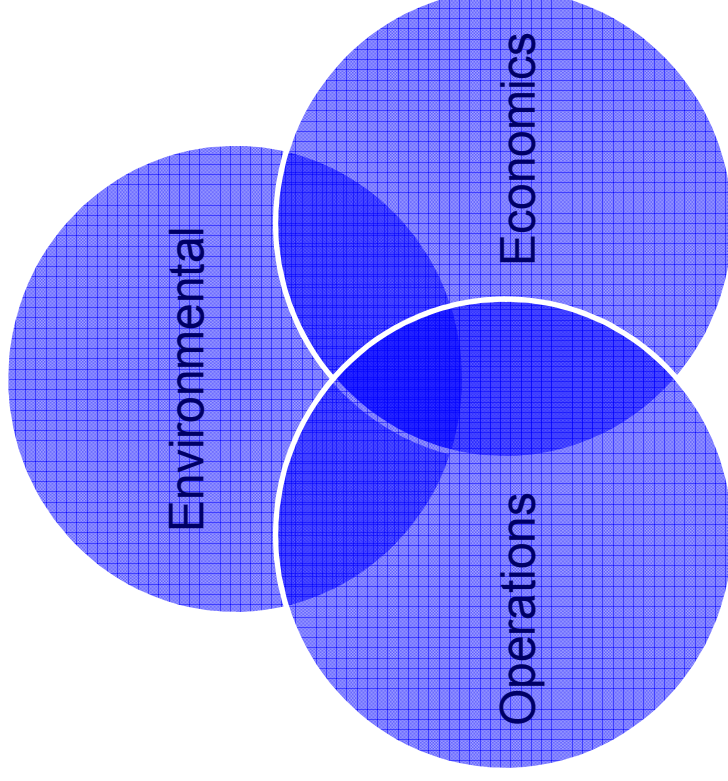
- Airport Neighbors
- Airport Tenants
- FAA
- Cascade Township
- Grand Valley Metro Council
- Kent County Drain Commission
- MDEQ
- The Right Place
- Thornapple River Watershed Council
- West Michigan Environmental Action Council



Identification of Potential Concepts (cont.)

Evaluation Criteria

- ✓ Eliminate GPIA's contribution to nuisance
- ✓ Environmental permitting
- ✓ Long-term reliability
- ✓ Implementation challenges



- ✓ Industry application
- ✓ Impact on operations
- ✓ Long-term reliability
- ✓ Training requirements
- ✓ Adaptability
- ✓ Implementation challenges

- ✓ Industry application
- ✓ Capital Costs
- ✓ O&M Costs
- ✓ Adaptability



Identified and Refined Four Concepts

All concepts include:

- 1) Continued collection and recycling.
- 2) Relocated stormwater conveyance to the Thornapple River because it's the only way to eliminate GFIA's contribution to nuisance biofilm in Unnamed Tributary.
 - Uncollectable portion of deicers is enough to support prolific biofilms in the physical conditions of the Tributary.
 - All available evidence indicates no negative impact to the Thornapple River now or with relocated conveyance.
 - MDEQ staff supported the concept of a Thornapple River outfall.



Identified and Refined Four Concepts

Relocated stormwater conveyance to the Thornapple River plus:

- A - Baseflow treatment and discharge to Unnamed Tributary
- B - Permanent diversion
- C - Permanent diversion and centralized deicing facility
- D - Seasonal diversion



Recommended Concept

B – Relocation to Thornapple River

Advantages:

- Guarantees elimination of GFIA contribution to nuisance biofilm in the Unnamed Tributary
- Will meet all environmental standards
- Low level of complexity/highest level of reliability
- Can be integrated with current operations
- Adaptable to future changes in deicing practices and environmental regulations
- Most cost-effective solution



Recommended Concept (cont.)

Misconception: “Airport plans to install a pipeline to the River.”

Fact: Storm pipe was used in concept to only provide conservative basis for cost estimation.

Fact: Path there and how it’s accomplished will be determined during design phase.

Fact: Design likely to include combination of open channel and enclosed elements (under railroad and roadways) with potential treatment options.



Recommended Concept (cont.)

Misconception: The airport plans to “dump” 90,000 to 100,000 gallons of deicing fluid into the Thornapple River.

Fact: Estimate 20,000 to 30,000 gallons of PG, mixed with about 300 million gallons of stormwater during each 6 – 7 month winter season. Average concentration is less than 0.01% PG.

Fact: This represents no increase in amount of deicers entering the Thornapple River over previous years.



Recommended Concept

(cont.)

Deicing Practices and Operations

Misconception: The planned discharges to the Thornapple River represent a threat to the environment.

Fact: Deicers have mixed with stormwater to the Thornapple River since the airport was constructed with no observed impacts to the River.

Fact: Thornapple River testing in 2000-2001 showed no negative impacts with 2 – 4 times greater amounts of deicers in stormwater than today.

Fact: GFIA will continue to refine it's BMP program and will only discharge stormwater in accordance with it's permit.



Schedule and Next Steps

- Study report submitted September 1, 2011*
- DEQ Review/Approval - December 1, 2011
- Consultant Selection - April 1, 2012
- Permitting/Design - July 1, 2013
- Bidding/Construction Award - October 1, 2013
- Construction - October 1, 2015*

*NPDES Permit-mandated milestones



Thank You



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