

KENT COUNTY DEPARTMENT OF AERONAUTICS

Gerald R. Ford International Airport

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LETTER OF TRANSMITTAL

To: MI DEQ
Water Resources Division
350 Ottawa NW
Grand Rapids, MI 49503

DATE: October 28, 2013

ATTENTION: Mr. Ryan Grant

RE: Annual Progress Report

WE ARE SENDING YOU:

- Attach
- Copy of Letter
- Drawing
- Prints
- Diskettes
- Plans
- Lease
- Change Order
- Airline Schedule

COPIES	DATE	DESCRIPTION
1	Oct. '13	GFIA Stormwater Mgt. Program Annual Progress Report

THESE ARE TRANSMITTED as checked below:

- For your information
- As requested
- For review and comment
- Copies for review and approval
- Copies for distribution
- For your signature
- RUSH - Immediate action desired

Remarks:

Ryan,

As required, please find the 2012/2013 Stormwater Mgt. Program Annual Progress Report attached.

Copies To: **RECEIVED**

OCT 29 2013

DEQ
WATER RESOURCES DIVISION
GRAND RAPIDS

Signed: Tom
Thomas R. Ecklund, P.E.; Facilities Mgt. Director

RECEIVED

OCT 29 2013

DEQ
WATER RESOURCES DIVISION
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Stormwater Management Program Annual Progress Report

Prepared for:
Gerald R. Ford
International Airport

October 2013

LimnoTech 
Water | Scientists
Environment | Engineers

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Ann Arbor, MI 48108
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www.limno.com

Stormwater Management Program Annual Progress Report

**Prepared for:
Gerald R. Ford International Airport**

October 2013

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INTRODUCTION

The Michigan Department of Environmental Quality (MDEQ) requires the Kent County Department of Aeronautics to obtain a Municipal Separate Storm Sewer System (MS4) permit for the Gerald R. Ford International Airport (GFIA). MDEQ also requires GFIA to obtain permit coverage for “stormwater associated with industrial activity” at the airport. Historically, both the Airport’s regulated industrial and MS4 stormwater discharges were authorized by a single National Pollutant Discharge Elimination System (NPDES) Permit (No. MI0055735).

In 2011, MDEQ decided to separate the Airport’s stormwater permits, resulting in GFIA obtaining coverage for its MS4 stormwater discharges under the State’s MS4 general permit, while still regulating GFIA’s industrial stormwater under the separate, individual NPDES permit. However, MDEQ was then forced to withdraw its MS4 general permit as the result of a contested case hearing. MDEQ rectified the MS4 permitting problem by issuing GFIA an Administrative Consent Order (ACO-000132) that operates as if GFIA was covered by the MS4 general permit. The ACO became effective June 30, 2011. The ACO requires, among other things, that GFIA submit an annual report describing certain aspects of its Stormwater Management Program (SWMP).¹

This annual report, covering the period from October 1, 2012 to October 1, 2013,² meets the requirements set forth in the ACO at Exhibit A Part I.A.11.g, and addresses the following issues:

- Compliance Assessment
- Water Quality Assessment
- Water Quality Stress Update.
- Data and Results
- Upcoming Activities
- BMP and Measurable Goal Changes
- Stormwater Drainage System Changes

MDEQ issued its revised MS4 permit in late 2012. MDEQ also established a schedule under which MS4s are required to submit an application for this permit on a rotating watershed basis. That schedule requires GFIA to submit its application by April 1, 2014. Based on this schedule, GFIA will be covered by the new MS4 permit by next October, meaning that this annual report is likely to be the last such report under the current ACO.

¹ It is important to note that GFIA’s MS4 ACO requirements address non-industrial areas of the airport (i.e., those activities that occur outside the AOA/“fenceline”). GFIA’s individual NPDES permit for “industrial” stormwater discharges addresses the regulated stormwater discharges that occur inside the AOA/“fenceline.”. However, certain aspects of this report include discussions of GFIA’s industrial stormwater permit program and compliance because they may, in some instances, result in discharge through the MS4 system or have important overlap in GFIA’s overall compliance program for both the MS4 and industrial programs. This is not to imply that any single discharge is somehow “jointly” regulated by both programs or exposes GFIA to enforcement of more than one permit for any given discharge.

² Daily inspections performed by the Airport’s Operations Department are included through October 1, 2013 to allow for review of those reports. October 2013 daily reports will be reviewed during the next reporting cycle.



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COMPLIANCE ASSESSMENT

GFIA is fully complying with MDEQ's ACO. This includes complying with its Stormwater Management Program Plan that MDEQ approved on February 23, 2007 (under GFIA's prior permit and referenced in the ACO). The SWMP includes the BMPs and other practices to implement six minimum control measures, recognizing certain limitations inherent in an airport's ability to fully implement measures generally more narrowly tailored to typical community-based MS4 systems:

- A public education and outreach program;
- Public involvement and participation;
- An illicit discharge elimination program;
- A post-construction stormwater management program;
- Construction stormwater runoff control; and,
- Pollution prevention and good housekeeping practices for GFIA operations.

2.1 PUBLIC EDUCATION AND OUTREACH

The objectives of the public education program are to accomplish the following:

- *Educate the general and job-related public of hazards associated with illicit discharges and improper disposal of waste at the airport. An important part of this education is to encourage reporting of the presence of illicit discharges or improper disposal of materials into the airport drainage system.*
- *Educate the general and job-related public about their responsibilities and stewardship to the watershed.*

GFIA remains committed to "getting the message out" that water resources stewardship is everyone's shared responsibility. Generally, however, airports serve a "public" that is focused on air transportation and not MS4 issues and concerns.

2.1.1 Educating Members of the Public That Work at the Airport

Goal: Increase airport and tenant staff awareness through regular training (deicing activities, SWPPP training, and Health and Safety (H&S) training).

Activities:

Training for GFIA tenants and Field Maintenance staff was conducted on October 15, 2012 and documentation of that session is included in Appendix A. The 2013-2014 annual deicing season and stormwater management program training is being conducted concurrent with preparation of this report (October 2013) and it is expected that documentation will be provided in the 2014 Annual Progress Report.

Goal: Publish at least two stormwater awareness articles in Airport Connections per year.



Activities:

Two stormwater awareness articles were published in Airport Connections. The first article appeared in the Winter 2013 edition (vol. 21, no. 1) and the second article was published in the Summer 2013 edition (volume 20, no. 3). Copies of both editions are included in Appendix B.

Goal: Facilitate reporting of illicit discharges through publicizing the reporting (Communications Center) phone number.

Activities:

Discharge reporting procedures were stressed in the Airport Connections newsletter and in training sessions (Appendices A and B).

There were no spill incidents associated with municipal operations documented during this reporting period.

Goal: Update GFIA Rules and Regulations if necessary.

Activities:

There was no need to update the GFIA Rules and Regulations during the reporting period. The current Rules and Regulations are available upon request.

2.1.2 Educating the General Public Traveling Through the Airport

Goal: To publish at least two stormwater awareness articles in Airport Connections per year.

Activities:

See Section 2.1.1. Copies of the Winter and Summer 2013 editions are included in Appendix B.

Goal: To maintain the utility of the Airport's website (www.grr.org) in promoting stormwater awareness.

Activities:

The website contains links to the Airport's SWMP, SWPPP, and SPCC/PIPP documents. The website address is <http://www.grr.org/Enviro.php>.

2.2 PUBLIC INVOLVEMENT AND PARTICIPATION

GFIA's public involvement and participation program is described below.

2.2.1 Public Notice Requirements

Goal: To maintain the utility of the Airport's website (www.grr.org) in promoting stormwater awareness and the availability of the SWMP for review/inspection.

Activities:

The website contains links to the Airport's SWMP, SWPPP, and SPCC/PIPP documents. The website address is <http://www.grr.org/Enviro.php>

2.2.2 Citizen Outreach and Stakeholder Advisory Committee

Goal: To engage and communicate with local citizen groups and a Stakeholder Advisory Committee regarding stormwater issues related to the Airport.



Activities:

GFIA formed a Stakeholder Advisory Committee (SAC) to provide members of the community the opportunity to advise GFIA management and its consultants on stormwater issues, including developing a new industrial stormwater collection, treatment and discharge to the Thornapple River. Organizations on the SAC include the Cascade Township, the Thornapple River Watershed Council, the Cascade Thornapple River Association (CTRA), Airport Neighbors, Grand Valley Metro Council, and the West Michigan Environmental Action Council. The SAC met three times within this reporting year (November 14, 2012; February 14, 2013; May 9, 2013) to discuss the new stormwater/deicing management system and any other issues (including potentially MS4 stormwater issues) that SAC members raise during meetings.

In addition, GFIA staff and consultants participated in various public meetings relating to its new stormwater/deicing management system and its new industrial stormwater permit. Those meetings include: Kent County Board of Commissioners meeting on March 28, 2013; CTRA meeting on June 6, 2013; MDEQ public meeting June 13, 2013; and FAA public hearing on June 17, 2013 on the draft Environmental Assessment conducted for the new stormwater/deicing management system.

GFIA and the CTRA remain on each other's respective mailing list and have a standing agreement to meet whenever either party so desires. Members of the CTRA attended the SAC meetings.

All Airport board and board committee meetings, including those where discussions on stormwater issues are on the agenda, are open to the public for attendance and comment.

Additional information is available to the public on GFIA's website.

2.3 ILLICIT DISCHARGE ELIMINATION PROGRAM

Part I.A.11.c of Exhibit A of the ACO states: "The Airport shall develop, implement and enforce a program to prohibit and effectively eliminate illicit discharges, including discharges of sanitary wastewater, to the Airport's drainage system..."

2.3.1 Outfall Mapping

Figure 1 of the approved SWMP Plan provides a comprehensive mapping of GFIA's outfalls.

2.3.2 Dry Weather Screening

Goal: Perform dry weather screening on all stormwater outfalls, and track any issues through documenting dry weather visual outfall inspection results, monitoring results, and follow-up investigations, as necessary and appropriate.

Activities:

Dry weather screening of the GFIA outfalls was conducted during the first two years of SWMP implementation. Screening was completed in 2008 as documented in the November 2008 Annual Progress Report submitted to MDEQ. Results from that screening yielded no evidence of illicit connections to the GFIA storm sewer system.

In September 2012, GFIA conducted a second round of dry weather screening at outfalls 001, 004, 005, 006, 007, 008, and 009. As detailed in the 2012 Annual Progress Report, slightly elevated surfactant concentrations were observed for the samples collected at 006, 007, and 008. Follow-up inspections of each drainage course were conducted in September 2012 and did not identify any illicit discharges or inappropriate activities.



2.3.3 Seepage Minimization

Goal: To ensure that GFIA's MS4 system is free from seepage from sanitary sewers or on-site sewage disposal

Activities:

GFIA reviewed its storm and sanitary drainage system drawings in 2007 and 2008, resulting in the preliminary identification of locations where the elevation of the sanitary sewer is greater than that of the adjacent storm sewer. Based on the results of the dry weather screening effort, however, there are no indications of issues regarding seepage to the storm sewer system. GFIA has conducted a video inspection of its storm sewer network. No evidence of sanitary sewer seepage or illicit discharges was identified. GFIA also continues to conduct routine inspections of its storm sewer system.

In rare instances, pump station failure or other unpredictable instances can result in sanitary sewer back-ups or potential seepage. GFIA has upgraded its structural system and established procedures to help ensure that such malfunctions are avoided or immediately identified, and sanitary waste is prohibited from entering or exiting the MS4 system.

2.3.4 Illicit Discharge Reporting and MDEQ Notification

Goal: Document and report to MDEQ, as appropriate, all illicit discharges identified at GFIA.

Activities:

GFIA has established a program to coordinate information sharing between operations and environmental staffs, ensure appropriate training, and prevent illicit discharges. There were no illicit discharges reported during the reporting period.

2.3.5 Follow-up Corrective Action

Goal: To eliminate any verified illicit discharges/connections from the Airport's MS4, to be tracked by documenting the number of illicit discharges/connections identified, corrected, or removed.

Activities:

As mentioned previously, monthly inspections, sewer video inspections, and follow-up inspections have not identified any illicit discharges into or from the MS4.

2.3.6 Legal Authority

GFIA's legal authority to regulate and/or prohibit direct discharges to and from its drainage system is contained in the Airport Rules and Regulations. The Rules and Regulations were updated in July 2013. All tenants and operators at the Airport are required to comply with the Rules and Regulations through lease agreements or operating permits, respectively.

2.4 POST CONSTRUCTION STORMWATER MANAGEMENT PROGRAM FOR NEW DEVELOPMENT AND/OR REDEVELOPMENT PROJECTS

Goal: Perform any development/redevelopment projects in a manner that does not result in an increased impact to receiving waters over current conditions.

Activities: GFIA's airport layout plan document (ALP) has been updated to reflect the addition of drainage improvements associated with the long term stormwater/deicing management



system. Current and planned discharge controls (detention) are deemed sufficient for managing stormwater discharges and ensure compliance with applicable water quality standards and restrictions.

Goal: To track the number of proposed construction site plans reviewed annually; and also to track the development of forms to document this review process.

Activities: GFIA reviewed construction documents for one proposed development project during this reporting period.

2.5 CONSTRUCTION STORMWATER RUNOFF CONTROL

Goal: To ensure that applicants for construction activities at the Airport are aware of their soil erosion control and/or separate construction stormwater-related NPDES permitting requirements, as appropriate.

Activities: There were two active SESC permits for projects at the Airport during this reporting period.

Goal: Documentation of any internal or external notifications made on construction stormwater, along with follow-up actions.

Activities: GFIA is not aware of any violations of SESC permits at the Airport during this reporting period.

2.6 POLLUTION PREVENTION AND GOOD HOUSEKEEPING

Goal: Document SWPPP Inspections, sewer maintenance and follow-up activities. The focus of the SWPPP is to address stormwater discharges associated with industrial activity under the Airport's industrial NPDES permit.

Activities: Quarterly SWPPP inspections were performed in October 2012, January 2013, April 2013, and July 2013. The SWPPP also underwent its annual update in May 2013. to incorporate a revised De-Icing Management and Monitoring plan and a revised materials inventory table.

Goal: Document proper disposal of storm system materials generated during maintenance activities.

Activities: No materials were generated from storm sewer cleaning activities during the reporting period.

Goal: Document installation and proper labeling of any new outfalls.

Activities: No new outfalls were installed at GFIA during the reporting period. All storm sewer catch basin covers to be installed on new construction projects managed by the Airport now include the label "Dump No Waste, Drains to Stream" on the casting.

Goal: Document fertilizer applications through contractor invoices and inspections.

Activities: Fertilizer and herbicide applications were conducted in accordance with the landscaping contract between April 8 and August 29, 2013. Fertilizer and herbicide applications were conducted in ornamental landscape areas outside the airport AOA. Herbicide application was conducted on all perimeter fencing. The landscaping contract requires contractor personnel to be properly licensed, permitted, and certified. The 2012 landscape management report and 2013 landscape maintenance schedule are included in Appendix C. GFIA also continues to require the landscape contractor to prevent lawn clippings from entering the storm sewer system.

GFIA requires all contractors to comply with appropriate federal, state, or local controls, permitting, or other requirements related to the application of chemicals on GFIA property.

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WATER QUALITY ASSESSMENT

Two surface water bodies receive stormwater discharges from GFIA: Plaster Creek and the Thornapple River. In general, stormwater is conveyed from the west side of GFIA to Plaster Creek by three unnamed tributaries and from the north, south, and east sides of GFIA to the Thornapple River by three unnamed tributaries.

In 2002, the State of Michigan issued two Total Maximum Daily Loads (TMDLs) for Plaster Creek. One is for *Escherichia Coli* and addresses 12 miles of Plaster Creek from its confluence with the Grand River upstream to Dutton Park (Hanna Lake Avenue and 76th Street). The TMDL was issued in response to in-stream monitoring data indicating concentrations in excess of the Michigan Water Quality Standard (WQS) for total body contact recreation from May through October of 130 *E coli* colonies per 100 milliliters, as a 30-day geometric mean (MDEQ Surface Water Quality Division, June 2002). The State Water Quality Standard (WQS) instantaneous maximum for *E. coli* is 300 *E. coli* per 100 ml. in-stream.

The second TMDL is for biota and for the same 12 miles as the *E. coli* TMDL. The biota TMDL was issued in response to the poor condition of biologic communities observed during surveys conducted from 1977 to 2001. Impaired habitat quality resulting from excessive runoff, erosion, and siltation was cited as a primary reason for the degraded condition of the biologic community. The biota TMDL uses total suspended solids (TSS) as a “secondary” numeric target to address habitat degradation. The TMDL concluded sedimentation from non-point sources (streambank erosion from excessive runoff rates and erosion from development activities) are primary contributors to degraded habitat conditions. The TMDL also states that “existing NPDES permit requirements will be adequate to meet the target.”

GFIA has developed and implemented BMPs as part of its MS4 and industrial NPDES stormwater permits that it believes are consistent with its requirements under the Plaster Creek TMDLs. There is no evidence that GFIA has violated any water quality standards or in any way causes the impairments associated with these TMDLs.



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WATER QUALITY STRESS UPDATE

Since 2000, GFIA has monitored stormwater discharges in accordance with its NPDES Industrial Stormwater Permit. GFIA is continuing to refine its Deicing Management Program and work with its tenants to minimize the amount of deicing materials in stormwater runoff under the Industrial Stormwater permit.

Seasonal attached bacterial growth (i.e., biofilms) in the unnamed tributary to the Thornapple River downstream from Outfall 001 is considered a “stress” on that waterbody. GFIA is working with MDEQ to eliminate its alleged contribution to attached bacterial growth through both its NPDES industrial stormwater permit and Long-Term Stormwater/Deicing Runoff Management Program Development Program.

MDEQ modified GFIA’s industrial stormwater permit on August 1, 2013 to establish final limits for a new outfall and related treatment system that will eliminate GFIA’s contribution to nuisance biofilm growth in the unnamed tributary to the Thornapple River. Program improvements include consolidating aircraft deicing runoff, seasonal diversion of deicing runoff away from the unnamed tributary, constructing a new stormwater conveyance and natural treatment system (NTS), and installing a submerged diffuser and outfall 011 for discharge of treated stormwater to the Thornapple River. The program improvements are expected to be completed by October 1, 2015.

GFIA has continued to investigate attached bacterial growth during the 2012-2013 season. In addition, GFIA continued its involvement as a monitoring location as part of the U.S. Transportation Research Board’s Airport Cooperative Research Program (ACRP) research into biofilms associated with airport stormwater discharges. GFIA has continued the biofilm monitoring program at three locations on the unnamed tributary to the Thornapple River downstream of outfall 001 as required by the permit. Additional information on the findings associated with these efforts is detailed in GFIA’s 2012-2013 ADF Discharge Minimization Progress Tracking Report.



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DATA AND RESULTS

No stormwater discharge monitoring is required under the ACO. GFIA collects other discharge monitoring data pursuant to its NPDES industrial stormwater permit. More information on monitoring associated with the Airport's industrial NPDES permit can be found in reports required by that permit.



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UPCOMING ACTIVITIES

GFIA will “continue to implement and comply with [the] approved Stormwater Management Program at the Airport...” per the ACO (Part III. Compliance Program, 3.2), and its SWMP will be updated as needed in the next reporting year to comply with the new anticipated MS4 permit.



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BMP AND MEASURABLE GOAL CHANGES

As detailed in the 2012 Annual Progress Report, GFIA aimed to expand its public participation goal by including participation with local governmental organizations and citizens groups. GFIA was successful in making this change and will continue to implement this approach, as well as existing BMPs and measurable goals, as previously defined.



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STORMWATER DRAINAGE SYSTEM CHANGES

As of October 2013, there are no changes to the stormwater drainage system at GFIA in the portion of the Airport covered by the ACO that are needed or expected.



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Appendix A

Deicing and Stormwater Management Program Training Documentation



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Gerald R. Ford International Airport

GFIA Storm Water and Deicing Management Programs

2012/2013 Program Kick-off

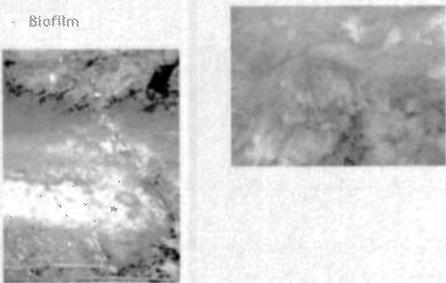
October 15, 2012

NPDES Permit Requirements

- **Current NPDES Permit requirements:**
 - Stormwater Discharge and Deicer Usage Monitoring
 - Biofilm and Macroinvertebrate Monitoring
 - Continued enhancement of existing BMP program
 - Increase collection
 - Improve Cargo BMPs
 - Deicing in designated areas
 - Snow management
 - Long-Term Deicing Runoff Management Program Development (Study)
 - Defined performance requirements
 - Identified and evaluated potential alternatives
 - Selected preferred alternative
 - Entering Design phase

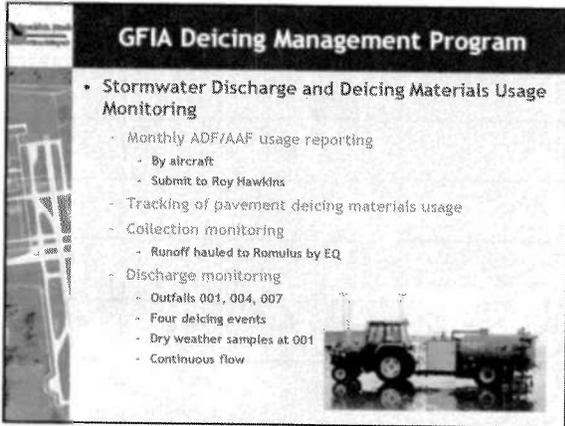
GFIA Deicing Management Program Overview

- **Program Drivers**
 - NPDES Permit
 - Biofilm



GFIA Deicing Management Program

- Stormwater Discharge and Deicing Materials Usage Monitoring
 - Monthly ADF/AAF usage reporting
 - By aircraft
 - Submit to Roy Hawkins
 - Tracking of pavement deicing materials usage
 - Collection monitoring
 - Runoff hauled to Romulus by EQ
 - Discharge monitoring
 - Outfalls 001, 004, 007
 - Four deicing events
 - Dry weather samples at 001
 - Continuous flow



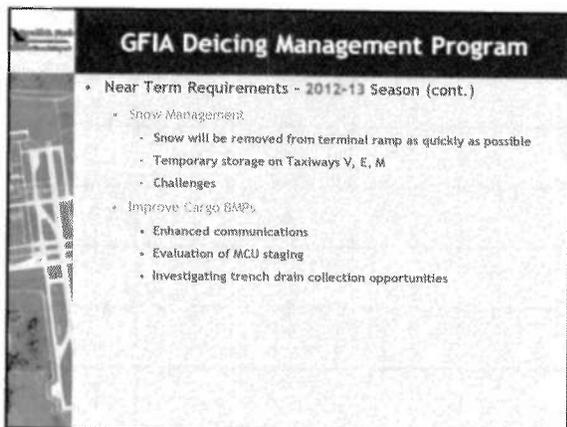
GFIA Deicing Management Program

- Near Term Requirements - 2012-13 Season
 - Increase Collection/Designated Areas
 - Deice only in designated areas
 - Do not push aircraft into snow covered areas to deice
 - Use Penalty Box whenever possible
 - Minimize time between deice and push back/departure



GFIA Deicing Management Program

- Near Term Requirements - 2012-13 Season (cont.)
 - Snow Management
 - Snow will be removed from terminal ramp as quickly as possible
 - Temporary storage on Taxiways V, E, M
 - Challenges
 - Improve Cargo BMPs
 - Enhanced communications
 - Evaluation of MCU staging
 - Investigating trench drain collection opportunities



GFIA Deicing Management Program

- **Near Term Requirements - 2012-13 Season (cont.)**
 - Documentation of Source Reduction Practices
 - Physical removal (American Eagle & Delta have used)
 - Variable mixtures (United has used)
 - Forced air deicing equipment (FedEx)
 - Others?

Aircraft Deicing Source Reduction Practices

Aircraft deicing equipment
“...use, and have available for use, deicing fluids and associated equipment which facilitate the use of efficient deicing mixtures, or otherwise reduce the total amount of glycol required to deice aircraft.”

Heating aircraft deicing mixtures
“...heat deicing mixtures to a minimum temperature of 140°F prior to application to ensure maximum fluid effectiveness.”

Application technique for aircraft deicing mixtures
“...apply deicing mixtures to aircraft surfaces in a manner and with equipment that maximizes the effectiveness of the deicing mixture while using only the amount of mixture necessary to ensure safe aircraft operations.”

Aircraft Deicing Source Reduction Practices (continued)

Proactive anti-icing
“...apply Type IV aircraft anti-icing fluid to aircraft in order to reduce BOD loading and in a manner consistent with FAA approved deicing plans when the use of anti-icing fluids will retard or prevent the formation of ice or frost on aircraft.
“Application of Type IV anti-icing fluids will be promoted for remaining overnight (RON) aircraft when snowfall is predicted during the overnight period.”

Two-step aircraft application method
“...utilize a “two-step” method of deicing and anti-icing whereby Type IV anti-icing solution will be applied to an aircraft after deicing is complete for the purpose of reducing the total volume of deicing and anti-icing materials required.”

Aircraft Deicing Source Reduction Practices (concluded)

Blending to temperature

"...apply an efficient deicing mixture which complies with FAA regulations and requirements, and the particular airline's FAA-approved deicing plan."

New Initiatives/Requests:

- Frac tanks are available for disposal of dilute loads
- Asking everyone to evaluate blending practices used at other stations for use at GFIA
- GFIA is investigating the feasibility of mobile blending station technology

What is Needed from Carriers for a Successful Season

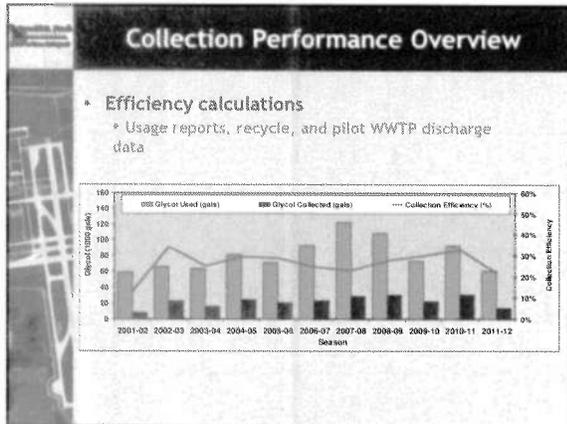
- **Conscientious collaboration and cooperation with glycol collection operations**
 - Cannot achieve optimum performance without it.
- **Accurate and timely usage reporting**
- **Documentation of any and all BMPs employed**
- **Essential to maintain DEQ's confidence and trust**
- **Permit requires documentation of improvements**

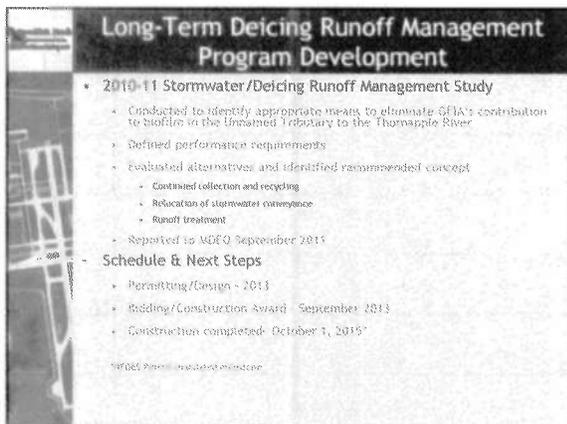
Airfield Pavement Deicing Source Reduction Practices

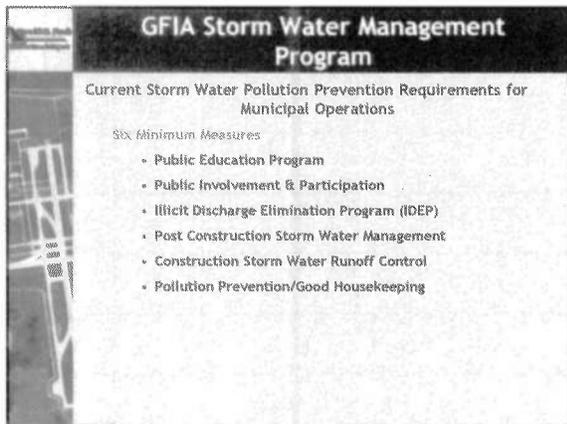
-Pavement deicing

- Heated sand
- Chemical selection/urea ban
- Physical removal
- Proactive anti-icing
- Application area
- SF availability
- Record keeping/reporting
- Handling and storage procedures









GFIA Storm Water Management Program

Be aware and report all:

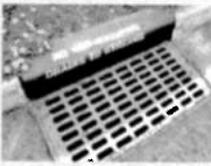
- Illicit discharges
- Improper disposal of waste

Reporting Procedures

- GFIA Communications 24/7 - (616) 233-6055

Thornapple River and Plaster Creek Watersheds

- All activities have potential to affect local waters (Pollution Prevention and Good Housekeeping)
- Impacts of storm water runoff



GFIA Storm Water Pollution Prevention Program

Storm Water Pollution Prevention Plan (SWPPP) for Industrial Operations

Elements include:

- Locations and areas of significant materials - petroleum and deicing materials
- Structural and non-structural controls to prevent/minimize exposure to storm water
- Available at <http://www.grr.org/PDFs/SWPPP2012.pdf>



GFIA Storm Water Pollution Prevention Program

Significant Materials

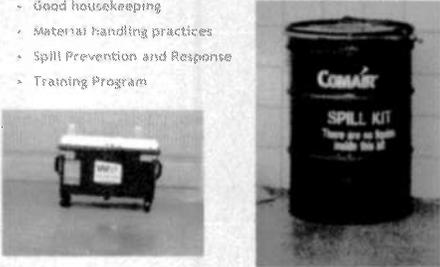
- Aircraft Deicing and Anti-icing Materials
- Pavement Deicing Materials
- Petroleum
- Other minor chemicals



GFIA Storm Water Pollution Prevention Program

Non-Structural Controls

- Routine maintenance and inspections
- Good housekeeping
- Material handling practices
- Spill Prevention and Response
- Training Program



The image shows two items related to spill prevention: a black spill kit container on the left and a black spill kit bucket on the right. The bucket has the text 'COMAIR SPILL KIT' and 'There are no holes made on it' printed on it.

GFIA Storm Water Pollution Prevention Program

Structural Controls

- Roofed or underground storage
- Secondary containment
- Catch basin inserts



The image shows two examples of structural controls: a roofed storage structure on the left and a secondary containment setup on the right. The secondary containment setup includes a white plastic liner and a catch basin insert.

GFIA Storm Water and Deicing Management Programs

Questions/Discussion



The image shows a truck on a snowy field, likely demonstrating a deicing management program.



Snow and Ice Control Debriefing
 October 15, 2012

Name	Company
Ray D Hawkins	KCDA
Chad Elliott	Amway
Kyle Bukhuyzen	Procure / Fed ex
Chris Cieciek	LimnoTech
Jon Remnik	PREIN & NEWHOF
Jason Eosim	Bissell
Gandy Corbin	Aero Med
Bret Faford	Shuttle America
Myron Huebner	KCDA
ARNOLD FOLKERDMA	UFI
Curt Bowers	UFI
Mike Cloud	UAL
Danny Favreau	AMWAY
JASON SMART	KCDA
Chris Real	Northern Air
JOHN BENGEL	UAL
Lori Nichols	Quickflight / Allegiant Air
Tom Meice	Amway
Jeff Munk	KCDA F/im
JAMES L BURGEM	Delta
Ben Orange	United
RUCE TEMPLE	L3
Phil Johnson	KCDA
TOM ECKLUND	KCDA
Gene Cross	Servisair
Peter Simms	American Eagle
MATT HANSON	SERVISAIR
Brian Ricks	KCDA
LYNN MAX KOWSKI	DELTA

Snow and Ice Control Debriefing
October 15, 2012

Name	Company
Ryan Law	Delta Air Lines
MARK CARROLL	Delta Air Lines
PEDRO COPACIDES	Delta Air Lines
DAN CONNER	DELTA
Steve Butler	Delta Air Lines
KEO BENSTEIN	KODA
JOSHUA JACOMAIN	UNITED
WARD WORTERS	KODA
BRENDA KOUK	AF

Appendix B

Airport Connections Stormwater Articles



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Winter 2013

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Deicing Runoff
Management and Natural
Treatment System

| Sounds of the Season

| Airport Board Welcomes
Newest Member, Elects
New Chair

| Parking Rates Largely
Unchanged for 2013

| Connected

| News In Brief

Now Arriving: Southwest Airlines Announces Flight Schedule from GFIA

On February 4, Southwest Airlines, the world's largest low-fare air service provider, officially announced that Grand Rapids, MI is the next AirTran city to be converted to Southwest service. The new service will kick-off on August 11, 2013. In addition to converting existing routes flown to Baltimore/Washington International and Orlando International, Southwest is also initiating nonstop service to Denver International and Lambert - St. Louis International, strengthening West Michigan's connection to three of Southwest Airlines' top ten busiest hubs.



"These service enhancements essentially provide business and leisure travelers with access to the entire Southwest network," says Brian Ryks, executive director of GFIA. "The result of the new Southwest service will be more flight options, to and from more locations, at more competitive prices. Bottom line: This will make it easier for travelers to get where they want to go."

Southwest Airlines and AirTran Airways serve a combined 97 destinations in 41 American states and six neighboring international countries. "As we bring Southwest into Grand Rapids we're not simply swapping airlines, we're adding new cities, we're bringing in larger airplanes and flying more flights," said Ron Ricks, Executive Vice President for the Dallas-based carrier. The larger aircraft size is great news for West Michigan; the additional seats alone on six flights per day provides an increase of nearly 1,100 seats per week departing GFIA.

Executive Director, Brian Ryks says, "This new service from Southwest Airlines is a fantastic next step in helping us achieve an air service balance of both legacy and low cost carriers. West Michigan travelers have embraced the AirTran service, and that support was certainly a key element in this new service arriving at GFIA."

Tickets are available now at southwest.com and swabiz.com for travel between August 11, 2013 and September 27, 2013.

"Bottom line: This will make it easier for travelers to get where they want to go."

Brian Ryks, A.A.E.
Executive Director, GFIA

A Capitol Idea: United Airlines to begin nonstop service to Washington, DC

Beginning Wednesday, May 1, United Airlines is expanding its daily nonstop destinations to include Washington Dulles International Airport, Washington DC (IAD). This twice-daily service, to be operated by ExpressJet under the United Express banner, will be the sixth nonstop destination for United from Gerald R. Ford International Airport, and it will bring to 22 the total number of nonstop destinations available from Gerald R. Ford International Airport.

Scheduled weekday departures from GFIA will be at 9:15 am and 2:30 pm, with scheduled arrivals back at GFIA at 2:05 pm and 8:23 pm. The route will be operated with 50-seat Embraer regional jet aircraft.

United currently serves West Michigan to hubs at Chicago O'Hare, Cleveland, Denver, Houston and New York - Newark. Rounding out the list of nonstop destinations from GFIA are: Atlanta, Baltimore, Cincinnati, Dallas/Fort Worth, Detroit, Fort Lauderdale,



capitol idea
continued on page 4

Long-Term Stormwater/Deicing Runoff Management and Natural Treatment System

The Gerald R. Ford International Airport (GFIA) is permitted by the Michigan Department of Environmental Quality (MDEQ) under the Clean Water Act to discharge stormwater containing deicing materials. MDEQ has required GFIA to develop a long-term stormwater/deicing runoff management system to eliminate stormwater discharges from reaching an unnamed tributary of the Thornapple River because small amounts of these deicing materials can serve as a food source, which could potentially promote bacterial growth in the tributary.

In August 2011, GFIA completed a study, identifying the possible solutions to satisfy the State's permitting goal and route impacted stormwater away from the tributary. GFIA also created a Stakeholder Advisory Committee to allow interested parties, including neighbors, airport tenants, local governments, watershed groups, and the business community, to engage in developing a solution. That study resulted in a recommendation to improve the stormwater management system as illustrated in Figure 1, including:

- Continuing to collect and recycle aircraft deicing runoff and implement best management practices (BMPs) for deicing operations.
- Consolidating deicing areas into a single drainage system to divert it away from the affected tributary during the deicing season.
- The system will be designed to direct typical flows to the tributary during the non-deicing season.
- Building a pre-treatment system to remove sediment and trash from stormwater drainage.
- Installing natural treatment system (NTS) cells to biologically treat deicing-related stormwater. Figure 2 is a drawing of a typical NTS unit.
- Building a pipe to release treated stormwater from the NTS facility to a submerged Thornapple River diffuser.

GFIA initiated its design process in September 2012. MDEQ is modifying GFIA's permit to include the new drainage, treatment and release requirements for treated stormwater into the Thornapple River. This project also requires the FAA to approve an Environmental Assessment, which GFIA will submit in early 2013. GFIA hopes to begin construction of the project in late 2013, and with an anticipated completion date in late 2015.

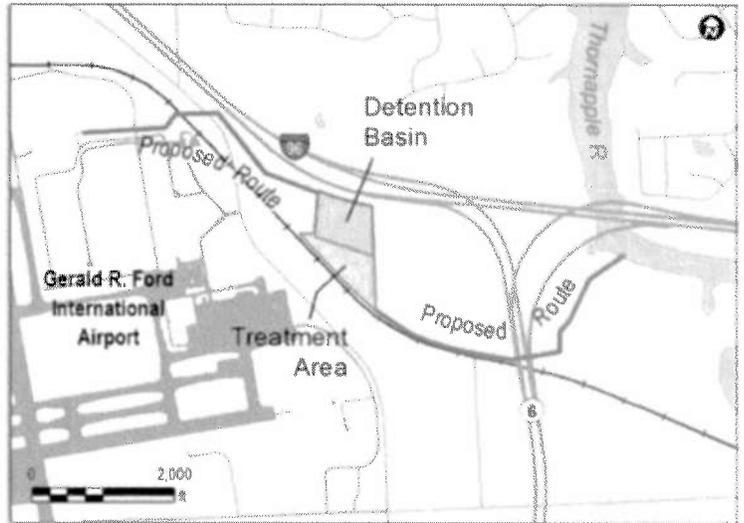


Figure 1. Map of proposed new stormwater management system route.

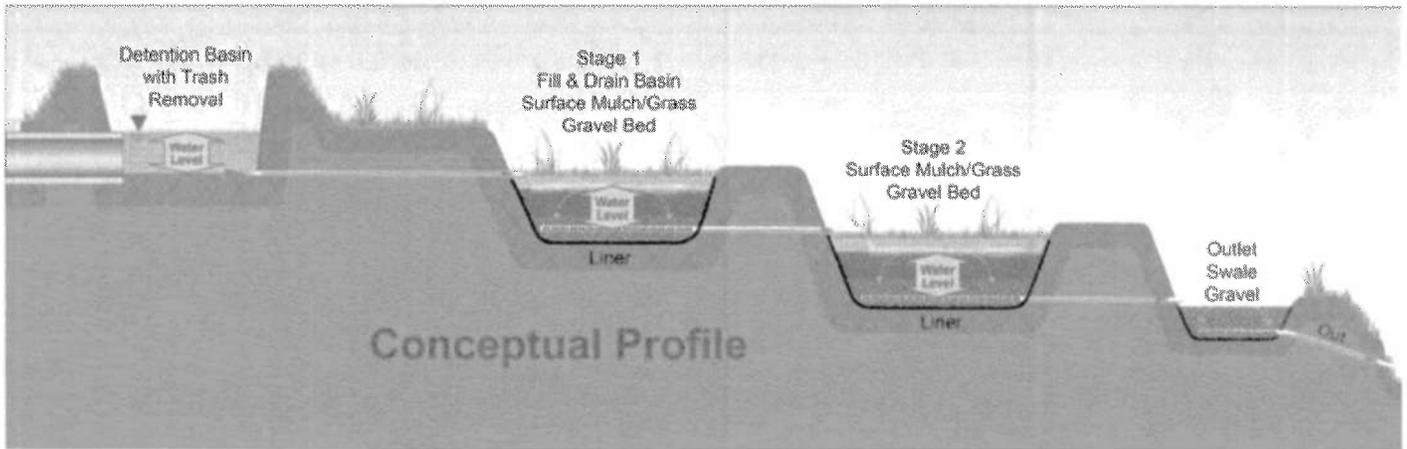


Figure 2. Profile view of a typical natural treatment system (NTS).

Sounds of the Season

From December 3 through 7, the airport's Grand Hall was transformed into a holiday concert venue for 18 area junior and senior high school vocal groups, including five new choirs. Coincidentally, this was also the 18th annual Airport Holiday Music Festival, a tradition that has become a favorite of airport employees and patrons alike.

From the 12-voice ensemble of The Potter's House High School Vocal Ensemble to the 215-voice Jenison Schools 5th & 6th grade choirs, these student groups filled the air with a wide variety of musical stylings from Latin arias to classic carols to some new twists on old seasonal favorites. In fact, the holiday spirit was so transforming that one group of travelers commented, "We were just talking about how it doesn't feel like Christmas because there isn't any snow here yet. Now, we are completely in the holiday spirit!"

The audience isn't the only one having fun either. The students and directors love coming to the airport to perform. "Some years we've had a large audience, others rather small, but the students have a great time performing out here. It's probably our most-anticipated performance of the season," remarked one of our veteran directors.

The Department of Aeronautics would like to thank the following schools for sharing their talented students with us this year:

- Caledonia High School
- City and Creston High Schools
- East Kentwood High School
- Grandville High School*
- Jenison Elementary Schools*
- Legacy Christian School
- Moline Christian School
- Northpointe Christian Middle and High Schools
- Ottawa Hills High School
- The Potter's House Middle and High* Schools
- Unity Christian Schools*
- Walker Charter Academy
- West Michigan Aviation Academy*
- Wyoming High School*

* indicates a new choir for the 2012 Festival



The Northpointe Christian High School Symphonic Choir, under the direction of Lisa Spangler, is a perennial favorite at the Airport Holiday Music Festival.

Airport Board Welcomes Newest Member, Elects New Chair

With the retirement of citizen member Joe Tomaselli, the Gerald R. Ford International Airport Board needed not only to have a new citizen member appointed by the Kent County Board of Commissioners, they also had to elect a new Chair – a position held by Tomaselli since 2011.

At their January 24 meeting, the Board of Commissioners appointed Birgit Klohs as the newest citizen member of the Airport Board. Birgit is the President and CEO of The Right Place, Inc., a regional non-profit economic development organization. The Commission also reappointed Commissioner Dick Vander Molen to another three-year term. Rounding out the Airport Board are citizen members Floyd Wilson, Jr., Terri Lynn

Land, and David Slikkers and County Commissioners Ted Vonk and Roger Morgan. At its January 30 organizational meeting, the Airport Board elected Commissioner Roger Morgan as chairman and Commissioner Dick VanderMolen as vice chairman for 2013.

Policy and general oversight of GFIA are the responsibility of the Gerald R. Ford International Airport Board, a seven-member body appointed by the Kent County Board of Commissioners. The Airport Board comprises three Kent County commissioners and three Kent County citizen members, and one citizen member from a county other than Kent in the West Michigan combined statistical area, each serving staggered three-year terms.



Birgit Klohs



Richard VanderMolen



Roger Morgan

News In Brief

- » Rob Benstein, Public Safety & Operations Director, has been elected Chair of the Airports Council International - North America (ACI-NA) Public Safety & Security Committee.
- » The Department of Aeronautics' Comprehensive Annual Financial Report has once again been awarded the Certificate of Achievement for Excellence in Financial Reporting. This Certificate is the highest form of recognition in governmental accounting and financial reporting, and its attainment represents a significant accomplishment by a government unit and its management. This is the 19th consecutive year that the Department has received this honor.
- » The next three meetings of the Gerald R. Ford International Airport Board will be held February 27, March 27, and April 24, 2013 at 8:30 am. All meetings will be held in the International Room at the passenger terminal building unless otherwise posted on our website at www.FlyFord.org and are open to the public.

Airport Connections is the quarterly newsletter of the Gerald R. Ford International Airport. We encourage our readers to contact us with comments, suggestions, and submissions. If you wish to be added to the mailing list for *Airport Connections*, please contact the Kent County Department of Aeronautics:

Phone: 616.2336000

Email: gfiainfo@grr.org

Facebook: GeraldRFordInternationalAirport

Airport Board | Roger Morgan', chair; Dick Vander Molen', vice chair; Birgit Klohs; Terri Lynn Land; David Slikkers; Ted Vonk'; Floyd Wilson, Jr.

' County Commissioner

Executive Director | Brian D. Ryks, A.A.E.

Editor | Susan Sherman, Community Relations Coordinator, SSherman@grr.org

capitol idea

continued from page 1

Fort Myers, Las Vegas, Minneapolis, New York - LaGuardia, Orlando International, Orlando - Sanford, Phoenix - Mesa, Saint Petersburg - Clearwater, Tampa International, and Toronto.

Airport Executive Director, Brian Ryks, states, "We are very pleased to be a part of United Airline's expanding network. The addition of service to Washington - Dulles International not only offers our West Michigan flyers a nonstop flight to our nation's capital, it also provides excellent domestic and international connections through another major hub airport."

Tickets are available now for travel on or after May 1, 2013.

Connected

How can you stay connected with what's happening at your airport?

On Facebook:

GeraldRFordInternationalAirport

On the web:

www.FlyFord.org

Subscribe to *Airport Connections*:

Send an email to gfiainfo@grr.org with "Subscribe" in the subject line.

Parking Rates Largely Unchanged for 2013

Parking rates at Gerald R. Ford International Airport are as follows:

Short-term Parking:

\$2 first hour

\$1 per additional ½ hour

\$24 daily maximum

Long-term Garage Parking:

\$2 per hour

\$13 daily maximum

\$78 weekly maximum

Long-term Parking in the North Lot:

\$2 per hour

\$10 daily maximum

\$60 weekly maximum

Express Shuttle Parking:

\$2 per hour

\$9 daily maximum

\$54 weekly maximum

Valet Parking:

\$18 per day

\$12 for five hours or less

For all parking (except Valet) there is a \$10 lost-ticket fee if original parking stub is not presented when exiting the parking facility.

For your convenience, we offer a parking calculator on our website to assist you in estimating your parking fees. Visit www.FlyFord.org for more information.

Kent County Department of Aeronautics
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Airport Connections



A Quarterly Publication of Gerald R. Ford International Airport

volume 21 | no. 3
Summer 2013

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Luv Is In The Air...The Airport, Too!

Southwest Airlines officially landed at GFIA on Sunday, August 11, 2013. The first canyon blue Boeing 737 touched down at 11:56 am and taxied to the terminal beneath a water cannon salute from the Aircraft Rescue Firefighters. At the gate, inbound passengers from Baltimore were welcomed to Grand Rapids as excited travelers waited to board their flight to depart for St. Louis.

The celebration included speeches from Airport Executive Director Brian Ryks, Southwest Airlines Senior Director Pete Houghton, Airport Board Chairman and Kent County Commissioner Roger Morgan, Regional Air Alliance of West Michigan Founder & Chairman Dick DeVos, and Experience Grand Rapids President Doug Small.



The first arrival was celebrated with a water cannon salute by the Aircraft Rescue Firefighters.



The celebration's keynote address was given by Dick DeVos.

Houghton shared his enthusiasm for the new service. "Southwest Airlines is excited to offer nonstop routes from Gerald R. Ford International to Baltimore/Washington, Orlando, St. Louis, Denver, and soon to be Ft. Myers and Tampa, connecting them to more than 70 cities across the nation," Houghton stated. "Not only are we giving Michigan customers more options, we're providing our more than 100 million customers annually access to Grand Rapids Michigan."

As it enters the market, Southwest Airlines is more than doubling the number of available seats. This significant increase comes from the addition of flights to Denver and St. Louis and as a result of the larger all-737 fleet they fly (AirTran flew 717 aircraft). During seasonal service to Tampa and Ft. Myers, that gain will be even more dramatic.

In his keynote address, DeVos stated, "This is a great day for West Michigan. Now, we have to start flying from Ford International, start flying on Southwest and we'll validate this decision. We earn it by the fact that we pay attention, and that we reward those who serve

us."

"We appreciate Southwest embracing our community by bringing the very best in air service," Airport Executive Director Brian Ryks said. "We are eager to expand our partnership as we promote LUV throughout West Michigan."

The event continued as arriving passengers received a warm West Michigan welcome and goodie bag when entering the terminal. Not to be forgotten, those heading out to St. Louis and beyond were treated to a hearty send-off and bag of swag.

So, before you plan your next vacation or business trip, be sure check out Southwest Airline's fares only available at Southwest.com.



LUV doesn't get any sweeter than this beautiful and delicious cake created by the Cakabakery!



Airport Board Recognizes Military Honor

Tom Edson would say he is no more deserving of recognition than the other soldiers he served with in Afghanistan, but his extraordinary efforts were acknowledged at the June 26, 2013 meeting of the Gerald R. Ford International Airport board.

Edson, a 16-year military veteran, received a roaring round of applause from airport board members, staff and the public for his dedication to our country. The 41-year-old returned to work at the airport on May 1, 2013 after his most recent nine months of service in the Michigan Army National Guard.

Edson received the Meritorious Service Medal upon returning from Afghanistan. He was one of three people in his unit that were bestowed with the medal, and joins others recipients like Corporal Pat Tillman and Senator John McCain. "I was with 188 others in my unit serving our country," Edson said. "Any one of them could be honored. We all had dangerous jobs and went through some rough firefights."

In the National Guard, Edson serves as a combat engineer. His special skill set involved leading a unit responsible for searching for and destroying IEDs (Improvised Explosive Devices) and patrolling dangerous Taliban-occupied areas.

The father of four is re-adjusting to life back in the United States and is catching up on time with his daughters and wife, Heather. Edson credits airport staff for looking out for his family while he was at war. "My airport family was there for my family while I was gone," said Edson. "The guys at the shop were always checking in. They were wonderful."

Edson has worked in the Kent County Department of Aeronautics Field Maintenance Division since October 2000.



Airport Passes FAA Inspection With Flying Colors

The Gerald R. Ford International Airport (GFIA) recently passed its annual Federal Aviation Administration (FAA) certification and safety inspection with zero discrepancies. Commercial air carrier airports such as GFIA are regulated by the FAA. Federal Aviation Regulation (FAR) Part 139 sets rules for the certification and operation of airports. This includes strict standards for governing airfield and pavement conditions, airfield lighting, snow and ice control, aircraft rescue and firefighting, personnel training, and handling and storage of hazardous materials. In addition, emergency planning and wildlife hazard management are reviewed.

The following divisions are involved with the operation and maintenance of the airfield; Airfield Maintenance, Building Maintenance, Aircraft Rescue Fire Fighting (ARFF), and Operations. This annual three-day comprehensive inspection revealed that GFIA is being operated in full compliance with FAR Part 139 rules. The FAA applauded the Kent County Department of Aeronautics, owner and operator of GFIA, on its procedures and noted their effectiveness.

"We commend you for the procedures you are using in the day-to-day operation of the airport," said Alberto Rodriguez, FAA Lead Airport Certification & Safety Inspector.

2013 marks the fourth consecutive year the Gerald R. Ford International Airport has not had a single discrepancy.

"I am very pleased with the recent inspection results from the FAA verifying our airfield is in excellent condition," said GFIA Executive Director Brian Ryks. "This is a testament to the professional staff we have working at the Gerald R. Ford International Airport and the dedication they exhibit each and every day to ensure our facilities are safe and secure for the traveling public."



Fire chief Todd Szakacs, captain Joe Dancz, firefighter Kirk Smith, equipment operator Jeff Phillips, field maintenance supervisor Jeff McNally, mechanic Craig Senna, airport maintenance worker Mike Gatens, building maintenance supervisor Robert Wilson, electrician Brian Kamp, communications specialist Kelly Felker and operations supervisor Bruce Applebach (L to R above) represent the 60+ employees directly responsible for the safe and secure operation of the airfield.

A Centennial Birthday Celebration

President Gerald R. Ford would have observed his 100th Birthday on Sunday, July 14, 2013 and the Gerald R. Ford International Airport held a Centennial Celebration in President Ford's honor.

On the afternoon of Friday, July 12, the airport hosted a "Birthday Party" to honor President Ford. As with all good birthday parties, the festivities included red, white and blue cupcakes along with various giveaways and games.

"He was affable. Just so kind and so sweet...he made us feel like family."

~ Barbara VanGenderen
about President Ford

from Jackson Hole, Wyoming. Mrs. VanGenderen worked for President Ford and said that he was a kind man who always took the time to stop, say hello and cared for his staff.

"He was very affable. Just so kind and so sweet," said Mrs. VanGenderen. "He kept to himself, but was never demanding and made us feel like family."



Barbara and Larry VanGenderen

It was our smallest travelers who seemed to have the most fun at the party with balloons and cupcakes as a part of the celebration. Needless to say, the blue cupcakes were the most popular and left the best frosting faces!

We'd like to offer a big thank you to Meijer, Inc. for donating the cupcakes and cake!



Who could help but smile at these sweet faces?

Giving Our Youngest Travelers A Lift

You know the saying – we've all heard it – "It's the little things that count." And busy parents of toddlers and young children know that better than anyone. At GFIA, we are always interested to find ways to make traveling with your kids easier and more enjoyable. So, when an airport traveler sent us an email about this new amenity, we were instantly intrigued.

Step-and-wash stools are now installed in a number of restrooms both pre- and post-security screening.

They can give our young travelers a bit of freedom – and free up mom or dad's hands in the meantime – as they wash up. Paired with our motion activated sinks, soap and towel dispensers, kids can be more independent and parents have one less thing to lift when preparing for air travel.

Special thanks to Tracey S. for contacting us with her suggestion! Do you have a suggestion for an airport amenity you would like to see at GFIA? If so, feel free to contact us at gfiainfo@grr.org. We love hearing from our patrons!



Airport Employee Information Corner

An important and unique feature of GFIA's stormwater/deicing improvements project is a Natural Treatment System (NTS) that will remove deicing materials from stormwater. Deicing materials are used during the winter season to ensure flight safety. The NTS will significantly improve the quality of stormwater leaving the airport before it is discharged into local waterways. The NTS design includes a detention basin that is used to control the flow of stormwater into six treatment cells, after which it flows into a second set of six treatment cells. Gravity will be used to move the stormwater from the detention basin through the cells with no mechanical pumping required. Layers of gravel and sand in the treatment cells provide habitat for communities of microbes that feed on organic matter, including the deicing materials.

This technology has been used for over 50 years to provide reliable and natural water treatment. While this is the first such system used at an airport in Michigan, similar NTS facilities have been successfully installed at airports in North America and

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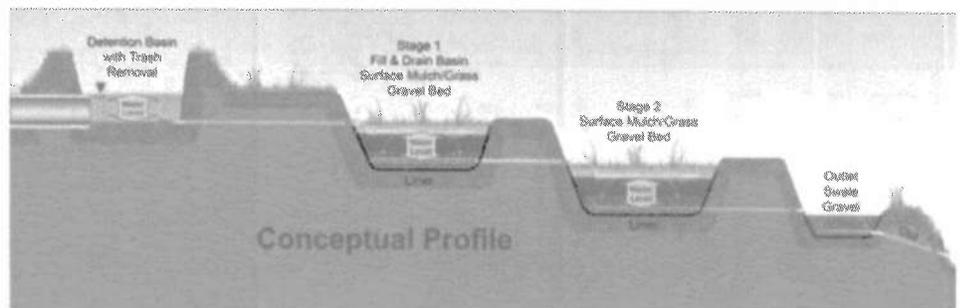
News In Brief

- » The next three meetings of the GFIA Board will be held on August 28, September 25, and October 30, 2013 at 8:30 am in the International Room in the passenger terminal building. Public is welcome.
- » Air Canada has announced that it will no longer serve the Grand Rapids market effective September 3, 2013.
- » Frontier Airlines has announced that it will no longer serve the Grand Rapids market effective September 8, 2013. Denver-bound travelers will still be able to choose from three daily nonstop flights offered by United Airlines and Southwest Airlines.

information

continued from page 3

around the world. The NTS is expected to remove 80% of the deicers from stormwater on an annual basis which will provide a level of environmental protection that exceeds state and federal requirements.



GFIA also reminds everyone that the active participation of staff and tenants is a critical part of the overall stormwater management program at the airport. If you observe any practices or situations that appear to have the potential to impact the quality of stormwater at the Airport, call Airport Communications at (616) 233-6055 and report your observation(s).

Airport Connections is the quarterly newsletter of the Gerald R. Ford International Airport. We encourage our readers to contact us with comments, suggestions, and submissions. If you wish to be added to the mailing list for *Airport Connections*, please contact the Kent County Department of Aeronautics:

Phone: 616.233.6000

Email: gfainfo@grr.org

Facebook: [GeraldRFordInternationalAirport](https://www.facebook.com/GeraldRFordInternationalAirport)

Airport Board | Roger Morgan', chair; Dick Vander Molen', vice chair; Birgit Klohs; Terri Lynn Land; David Slikkers; Ted Vonk'; Floyd Wilson, Jr. (' County Commissioner)

Executive Director | Brian D. Ryks, A.A.E.

Editors | Tara Hernandez, Marketing & Communications Manager | Susan Sherman, Community Relations Coordinator

Appendix C

2013 Landscape Maintenance Schedule



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GRAND RAPIDS

HOLLAND

KALAMAZOO

Submitted To: Kent County Dept of Aeronautics
Roy Hawkins
5500 44th St SE
Grand Rapids, MI 49512

Project: 018105
Date: March 28, 2013
GR Ford Int'l - 2012 Land. Mgmt. Report
5500 44th St SE
Grand Rapids, MI 49512

2012 Landscape Management Report

It has been another exciting year for us at DJ's Landscape Management. We continually adjust to the challenges that we are faced with on a facility that has major new construction in conjunction with existing regular property maintenance. This past season was similar to previous years in that there were many irrigation issues that needed attention. Many of these issues were caused by construction at West Michigan Aviation Academy and some were the result of age and use. One notable project was to install 2 new 1" gate valves and new meter gaskets in the meter pit. We also installed an additional ball valve after the meters to provide another source to shut the water off. Other irrigation issues that came up were miscellaneous wiring, valve and leak repairs.

The 2012 growing season was one of the hottest and driest summers in a 50 year recorded period. The weather and sometimes struggling irrigation system made it difficult to keep the grass green and plants healthy. Despite this, we installed 40 new 3" Red Maples along the north side of East Cargo Rd. We also transplanted several plants on the property in an effort to salvage them from new construction. We also attempted to bring a new annual color display to GRFIA but the issues with the irrigation and weather proved to be too much for the annuals to thrive properly and ultimately a decision was made to return to the old annual color display for upcoming seasons. Despite all of the limiting factors mentioned, our team worked to return the turf to the vibrant green color of previous years during these times of drought or irrigation system failure. We were also able to keep over 95% of the newly installed and transplanted plants alive which is astonishing considering the temperature and moisture related challenges.

Another notable issue was the removal and elimination of a highly invasive and poisonous plant known as poison sumac from the AOA viewing area planting beds. The poison sumac was a new challenge in 2012. The rapid germination was caused by the removal of several trees in this area which allowed for more sunlight onto the soil where the dormant seed was waiting for the ideal conditions. Once this plant germinated it only took a few weeks to spread and establish a large stand. It was overtaking other desired plants and working into the lawn area. We were able to effectively kill it through the use of specifically engineered herbicides and special handling efforts. These efforts needed to be taken because of the toxic oils released by the plant as a defense mechanism. Our Team continued to monitor the area for signs of new growth but did not see any for the remainder of the 2012 season. This is a very good sign that we have adequately killed the initial stand and that following seasons will have little or no poison sumac to report in that area. The additional sunlight also caused other unwanted weeds to thrive in that area and a significant amount of additional time was needed to continually cater to this new challenge. We will allocate more time for our bed maintenance crews to keep this area under control in future seasons.

We also worked in 2012 to manage the growth of cattails and other unwanted vegetation within the AOA. The cattails on the airfield began to establish in areas causing drainage problems and providing habitat for various animals targeted by birds of prey. In an effort to reduce the possibility of a bird strike by an aircraft and to reduce the drainage backups, we were tasked to eliminate the invasive and unwanted plants. An aquatic safe herbicide was applied in accordance with EPA regulations to eliminate the cattails which were currently in the areas which were prioritized. However, cattails growth will continue if the conditions support it so this will need to be continually monitored on an annual basis. Additional applications of herbicide will need to occur to meet the expectation of keeping the designated areas free of cattails in the future.

One of our primary goals this season was to improve the health and vigor of the plants and trees, specifically the large Juniper groupings lining the entrance drive. In order to continue to do this we must create a comprehensive plan of attack. The first thing to consider is continuing a fungicide program to protect them against Phomopsis blight. Phomopsis is a fungal pathogen commonly known to affect Juniper that flourishes in wet conditions with mild temperatures. It attaches itself to the foliage and works its way into the woody material, eventually girdling stems. Three well timed fungicide applications beginning at leaf expansion should keep disease development at bay. The other primary problem facing these Juniper groups is winter exposure to temperature and wind, which leads to winter injury or desiccation. We cannot influence the temperature or the wind but we can influence their access to water, and help to limit winter transpiration. Dry air, low temperatures, and high wind increase the transpiration of evergreen plants during the winter months. Plants that have already experienced drought conditions during the growing season are at much higher risk to suffer injury during the winter season. We can better prepare these plants for the winter by properly timed heavy watering before the ground freezes. In addition, an anti-transpirant spray can be applied to reduce water loss and protect the foliage through the harsh winter season. The effects of the continual wind are evident by the amount the trees are leaning. Staking could reduce further lean but it may be necessary to excavate them and reset them vertically to accomplish the proper correction.

Another landscape planting we have been monitoring is the arctic willow. The entrance drive is home to groupings of arctic willows. They are quite vigorous and take over the landscape space rapidly despite the regular contracted pruning visits. Basal pruning is the most effective maintenance for this type of planting. Basal pruning cuts the shrub at the base leaving the root system to flush out a new healthy crown. At the rate that the arctic willows grow, we would recommend two basal pruning's a season to keep them at a manageable size and to remove any dead or dying limbs. We are recommending this option and associated cost be considered in future years to allow for the proper care of this landscape planting.

We have several projects on schedule for 2013; beginning with all of the landscape and irrigation repairs at West Michigan Aviation Academy exit drive. DJ's Landscape will also continue to monitor the aforementioned areas and continue to provide suggestions and solutions.

Respectfully Submitted By:

Greg Mielczarek
DJ's Landscape Management

March 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27 Spring Bark Installation Bed Preparation & Spring Perennial Cut- down	28 Spring Bark Installation Bed Preparation & Spring Perennial Cut- down	29 Spring Bark Installation Bed Preparation & Spring Perennial Cut- down	30 Spring Bark Installation
31						

April 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	Spring Bark Installation	2 Spring Bark Installation	3 Spring Bark Installation	4 Spring Bark Installation	5	6
7	Plant Fertilization	9	10	11	12	13
14	15 Planting Bed Maintenance	16 1" Mowing Visit Bi-weekly Mowing Concrete Edging - Entire Site	17 Site Inspection	18	19	20
21	22 Turf Fertilization Round 1	23	24 Site Inspection	25	26	27
28	29 Planting Bed Maintenance	30 Mowing Visit Bi-weekly Mowing - A				

May 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 Site Inspection	2 Plant Health Care Application #1	3	4
5	6 Broad Spectrum Herbicide Application #1	7 Mowing Visit Bi-weekly Mowing - B	8 Pruning Visit #1 Site Inspection	9	10	11
12	13 Planting Bed Maintenance	14 Mowing Visit Bi-weekly Mowing - A	15 Site Inspection	16	17	18
19	20	21 Mowing Visit Bi-weekly Mowing - B	22 Site Inspection Irrigation System Activation	23 Irrigation System Activation	24	25 Irrigation System Activation
26	27 Memorial Day	28 Planting Bed Maintenance	29 Mowing Visit Bi-weekly Mowing - A	30 Site Inspection	31	

June 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3 Annual Flower Installation	4 Mowing Visit Bi-weekly Mowing - B	5 Site Inspection	6 Irrigation Inspection	7 Plant Health Care Application #2	8
9	10 Planting Bed Maintenance	11 Mowing Visit Bi-weekly Mowing - A Concrete Edging - Terminal Dr	12 Site Inspection Turf Fertilization Application #2	13 Irrigation Inspection	14	15
16	17	18 Mowing Visit Bi-weekly Mowing - B	19 Site Inspection	20 Irrigation Inspection	21	22
23	24 Planting Bed Maintenance	25 Mowing Visit Bi-weekly Mowing - A	26 Site Inspection	27 Irrigation Inspection	28	29
30						

July 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 Pruning Visit #2	2 Mowing Visit Bi-weekly Mowing - B	3 Site Inspection	4 Independence Day	5 Irrigation Inspection	6
7	8 Planting Bed Maintenance	9 Mowing Visit Bi-weekly Mowing - A	10 Site Inspection	11 Irrigation Inspection	12 Plant Health Care Application #3	13
14	15	16 Mowing Visit Bi-weekly Mowing - B	17 Site Inspection	18 Irrigation Inspection	19	20
21	22 Planting Bed Maintenance	23 Mowing Visit Bi-weekly Mowing - A Concrete Edging - Entire Site	24 Site Inspection	25 Irrigation Inspection	26	27
28	29	30 Mowing Visit Bi-weekly Mowing - B	31 Site Inspection			

August 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 Irrigation Inspection	2	3
4	5 Planting Bed Maintenance	6 Mowing Visit Bi-weekly Mowing - A	7 Site Inspection	8 Irrigation Inspection	9	10
11	12 Broad Spectrum Herbicide Application #2	13 Mowing Visit Bi-weekly Mowing - B	14 Site Inspection Fall Bark Installation	15 Irrigation Inspection Fall Bark Installation	16 Fall Bark Installation	17 Fall Bark Installation
18	19 Fall Bark Installation	20 Mowing Visit Bi-weekly Mowing - A	21 Site Inspection	22 Irrigation Inspection	23	24
25	26 Planting Bed Maintenance	27 Mowing Visit Bi-weekly Mowing - B	28 Site Inspection	29 Turf Fertilization Application #3	30 Irrigation Inspection	31

September 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2 Labor Day	3 Mowing Visit Bi-weekly Mowing - A Concrete Edging - Terminal Dr	4 Site Inspection	5 Irrigation Inspection	6	7
8	9 Planting Bed Maintenance	10 Mowing Visit Bi-weekly Mowing - B	11 Site Inspection	12	13	14
15	16	17 Mowing Visit Bi-weekly Mowing - A	18 Site Inspection Lawn Core Aeration	19 Irrigation Inspection	20	21
22	23	24 Mowing Visit Bi-weekly Mowing - B	25 Site Inspection	26	27	28
29	30 Irrigation System Shut Down					

October 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 Irrigation System Shut Down	2 Site Inspection	3	4	5
6	7	8 Mowing Visit Bi-weekly Mowing - A	9	10	11	12
13	14 Pruning Visit #3 & Perennial Cut Down	15	16 Site Inspection	17 Bulb Installation	18	19
20	21	22 Mowing Visit Bi-weekly Mowing - B Concrete Edging - Entire Site	23	24	25	26
27	28	29	30 Site Inspection	31		

November 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
3	4	5	6	7	8	9
10	11	12	13 Site Inspection	14 Vole Control	15	16
17	18	19	20	21	22	23
24	25	26	27	28 Thanksgiving	29	30

