The Airport Runoff Manual
Stormwater Design To Avoid Wildlife Attractants

Washington State Department of Transportation
Presentation Overview

- Project overview
- Project objectives
- Manual modifications
- Airport Runoff Manual status
- Schedule and next steps
Project Overview
Legislature Directs WSDOT to Take Action

- Legislation introduced in 2004 by Senators Haugen, Mulliken, Horn, Morton, Plug and Kastama (Senate Bill 6173).

- The bill required stormwater and wetland mitigation for the state’s public use airports to promote safety.

- Passed out of the Senate but was unable to move out of the House Resource and Agriculture Lands Committee.

- Senator Haugen directed WSDOT to gather interested parties to explore solutions to storm water and other wildlife attractants near airports.
Hazardous Wildlife Attractant Task Force

Created In 2004
The Task Force is a 28 member committee.
  – The committee is represented by legislative staff, airport sponsors, environmental groups, community groups, public ports, and state and federal agencies.

Task Force Recommendations
  – Develop an Airport Stormwater Guidance Manual
  – Draft Memorandum of Understanding.
  – Develop Mediation Process.
How WSDOT is Addressing the Issue?

• Secured a $190,000 grant from the FAA to study issues surrounding hazardous wildlife attractants near airports and develop airport stormwater guidance.

• Hired Herrera Consultants to lead development of Airport Runoff Guidance Manual.

• ARM to update WSDOT Highway Runoff Manual to address airport runoff guidance.

• 28-member Task Force to provide input on the proposed Airport Runoff Manual
Project Objectives
Project Objectives

- Safety
- Compliance with Regulatory Requirements
- Consideration of airport operations
- Integration of stormwater BMP’s with wildlife attractant BMP’s
- Predictability in the regulatory process
- Approval by Department of Ecology and WSDOT
Manual Modifications
Manual Modifications

• Application thresholds
  – Airside vs. landside

• Recommended BMP types
  – Example: No permanent water bodies

• Modifications to individual BMPs
  – Example: Pond configuration
  – Example: Infiltration rates
Manual Modifications

• Application thresholds
  – Airside vs. landside

• Recommended BMP types
  – Example: No permanent water bodies

• Modifications to individual BMPs
  – Example: Pond configuration
  – Example: Infiltration rates
## Application Thresholds

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Landside</th>
<th>Airside</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic Treatment</strong></td>
<td>Sediment</td>
<td>Amount added impervious</td>
</tr>
<tr>
<td>Enhanced</td>
<td>Dissolved metal</td>
<td>ADT volume</td>
</tr>
<tr>
<td>Oil Control</td>
<td>Petroleum products</td>
<td>Intersection ADT, parking, maintenance</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>Nutrient</td>
<td>Discharge to listed waters</td>
</tr>
</tbody>
</table>
Manual Modifications

• Application thresholds
  – Airside vs. landside

• Recommended BMP types
  – Example: No permanent water bodies

• Modifications to individual BMPs
  – Example: Pond configuration
  – Example: Infiltration rates
Recommended BMP Types – General Rules

• BMPs taken from HRM or Ecology manuals
• Avoid permanent standing water:
  – No wet ponds or wetlands
  – Emphasis on quick drainage
  – Detention ponds okay because drain between storms
• Avoid attractive vegetation
  – Food sources
  – Shelter
• Eliminate obstacles to aircraft
  – No obstacles in flight path (trees)
  – Stable soils around runways/taxiways
## Recommended BMP Types for Flow Control

<table>
<thead>
<tr>
<th>BMP Type</th>
<th>HRM</th>
<th>ARM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infiltration / Dispersion</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Regional Facility</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Combined Flow / Treatment</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Detention</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Category 1 BMP (Wet Vaults)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Category 2 BMP (CAVFS)</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
### Recommended BMP Types for Runoff Treatment

<table>
<thead>
<tr>
<th>BMP Type</th>
<th>HRM</th>
<th>ARM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infiltration / Dispersion</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Oil Control – Absorbent boom on pond, Bioinfiltration pond (Eastern WA)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Oil Control – Sand filter, Separators</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Phosphorus – Large wet pond</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Phosphorus – Enhanced sand filter, treatment train</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
## Recommended BMP Types for Runoff Treatment

<table>
<thead>
<tr>
<th>BMP Type</th>
<th>HRM</th>
<th>ARM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic – VFS, swale, wet swale, wet pond</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Basic – VFS, swale, Ecology embankment, linear sand filter</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Enhanced – CAVFS, Ecology embankment, constructed wetland</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Enhanced – CAVFS, Ecology embankment, enhanced sand filter, treatment train</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Category 1 – Proprietary media filtration</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Category 2 – Submerged gravel filter</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Manual Modifications

• Application thresholds
  – Airside vs. landside

• Recommended BMP types
  – Example: No permanent water bodies

• Modifications to individual BMPs
  – Example: Pond configuration
  – Example: Infiltration rates
Manual Modifications

- Tables for each BMP specifying appropriate locations

<table>
<thead>
<tr>
<th>Area</th>
<th>Yes/No</th>
<th>Area</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Washington</td>
<td>Yes</td>
<td>Object Free Area (OFA)</td>
<td>Yes</td>
</tr>
<tr>
<td>Western Washington</td>
<td>Yes</td>
<td>Runway Safety Area (RSA)</td>
<td>Yes</td>
</tr>
<tr>
<td>Landside Areas</td>
<td>Yes</td>
<td>Taxiway Safety Area (TSA)</td>
<td>Yes</td>
</tr>
<tr>
<td>Airside Areas</td>
<td>Yes</td>
<td>Clearway (CWY)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stopway (SWY)</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Airport-Specific Vegetated Filter Strip

- CAVFS limited to top 4 inches in airside applications
- CAVFS use within 100 feet of airfield operations areas should include measures to control worms that may attract wildlife
- If a gravel flow spreader is used, gravel should be outside of the runway shoulder and should meet the specifications for shoulder ballast listed in Section 9-03.9(2) of the WSDOT Standard Specifications.
Airport-Specific Pond Modifications

- Alternate pretreatment required (proprietary hydrodynamic separator, filter strip or swale)
- Two-cell configuration
- Avoid irregular-shaped ponds and maximize length to width ratio
- Steeper side slopes
- Vegetation restrictions
- Planting of bottom of upstream cell required (see Appendix A)
- Flow spreader required at inlet
- Elimination of sediment storage depth to reduce hazard associated with standing water

- Same volume captured, same quality of treatment provided while discouraging wildlife!
BMP Design Guidelines

• Detention Ponds (BMP FC.03)
  – Steeper side slopes
  – 2-cell design

- Frequently inundated lower cell (approx. 35% of volume) protected by floating ball cover
- Upper cell provides storage for less frequent events
- Steeper side slopes (2H:1V)
BMP Design Guidelines

• Infiltration Pond (BMP IN.02)
  – 1 in/hour infiltration rate (rather than 0.5 inches/hour as in HRM)

  Pre-treatment required (use method other than pre-settling cell)

Max. width at overflow elev. 30’ unless waterfowl disruption fence is used
Additional airport-specific considerations (Appendices)

• A – Vegetation
  – No vertical intrusions into airspace (trees)
  – Minimize food sources
  – Minimize shelter
  – Minimize required maintenance
  – Combination of factors
  – Lists of acceptable and non-acceptable vegetation
Additional airport-specific considerations (Appendices)

• B – Wildlife of Concern at Airports
  – Waterfowl
  – Birds of prey
  – Doves and pigeons
  – Cranes
  – Pelicans
  – Herons
  – Shorebirds
  – Crows/Ravens
  – Other small birds
  – Deer
  – Coyotes
Additional airport-specific considerations (Appendices)

• **C – Open Water Controls**
  – Allows for retrofit of existing facilities
  – Methods prioritized based on effectiveness per WSDOT/TAC comments
  – Habitat suitability reduction (vegetation, disruption fences)
  – Open water covers (floating covers, floating ball covers)
  – Open water access elimination (netting, wires)
Manual Status
Airport Runoff Manual Status

- Manual text – review by WSDOT
- BMP Design guidelines – review by TAC or Task Force
- Ecology coordination/review
Schedule and Next Steps
Proposed Meeting Schedule and Public Comment

• **Task Force Meeting Schedule**
  – January 9, 2007: Review Public Comments and provide recommendations

• **Public Review Schedule**
  – Public Meeting: December 5, 2007 – Presentation on the Airport Runoff Manual
  – Public Comment Period: Comment period open for 20-days November 28 through December 18

• **Adoption by WSDOT and Department of Ecology**
  – June 2008
Schedule and Next Steps

- **October 25, 2007**: Submission of Draft Airport Runoff Manual to Task Force
- **October 30, 2007**: Task Force Meeting
- **November 7, 2007**: Task Force Comments submitted to consultant
- **November 28, 2007**: Start of public comment period
- **December 5, 2007**: Public Meeting
- **December 17, 2007**: End of public comment period
- **January 9, 2008**: Task Force Meeting to consider public comments and provide recommendations