



ACI – Airport Environmental Colloquium Cairo Egypt

Pollution Prevention Water Management

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Impacts of Water Pollution- Lessons Learned



- In the U.S., just 30 years ago, less than half of the population's sewage was being treated and 67% of the nation's waters were unsafe for fishing or swimming.
- Pollution was directed to water bodies with little or no treatment.
- Hundreds of Billions of dollars had to be invested to build plants to treat polluted water.
- Still is the U.S. 33% of the nation's waters remain unsafe for fishing or swimming and only 57% of the population is served by wastewater treatment plants.

The Impacts of Water Pollution- Lessons Learn



- It's far less expensive to keep the pollution out of the water than it is to treat the polluted water.
 - Simple and inexpensive measures- called best management practices- can be used to prevent pollution.
 - Because of the fuels and solvents used in aviation, airports are perfect for pollution prevention measures.
 - These measures are assembled into a plan called a "Pollution Prevention Plan"
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Regional Considerations



- Nile and other water bodies are sole source of life
 - Drinking water and food source
 - Fish, birds and other aquatic life
 - Irrigation and farming
 - Groundwater protection
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Identifying Pollutant Generating Activities



- Examples:
 - Fueling (vehicle and aircraft)
 - Fuel Tanks
 - Maintenance (vehicle, equipment, aircraft)
 - Lavatory Servicing
 - Grounds Maintenance
 - Washing outdoors (vehicle, equipment, aircraft)
 - Ramp and Aircraft Deicing



Airport Pollutants of Concern



- Bacteria - "blue juice"
 - Fuel/oil
 - Washing chemicals
 - Rubber Removal
 - Other industrial wastes
 - Herbicides and pesticides
 - Construction wastes
 - Deicing and Anti-icing Chemicals
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- Main focus is to reduce and/or eliminate the pollutants in the environment.

Pollution Prevention Planning



- Most airports develop a Plan that identifies sources of pollution and describes measures that will be used to eliminate or minimize the risk of pollutant discharges into receiving environment. The key elements of a Plan are:
 - Identifying activities on airport that can potentially contaminate the environment;
 - Development and implementation of BMPs to control pollution sources; and,
 - Regular Training of all airport and tenant employees
 - Annual review of operations and revisions to Plan

Best Management Practices (BMPs)



- BMP – Any program, technology, process, facility siting criteria, operating method, measure or other device that controls, removes or reduces pollution
- Training – All airport workers will improve success
- BMPs don't have to be expensive and can reduce long-term costs!!
- Applicability may vary



Structural and Operational BMPs



- Examples of Structural BMPs include:
 - Tank alarm systems
 - Dikes, berms, or retaining walls
 - Double wall tank construction
 - Spill containment pallets
 - Oil-water Separators
- Examples of Operational BMPs include:
 - Policies and Procedures Manuals
 - Standardized Inspection Forms
 - Annual Training and Certifications



Activity: Building/Grounds Maintenance



- Fertilizers and pesticides
 - Landscaped areas
 - Licensed contractors
- Floor and equipment wastewater
 - Hangars
 - Tenants and subtenants
- Solid waste storage
- Street/ramp sweeping
- Line Painting



Building/Grounds Maintenance - BMPs



- Pesticide and fertilizer management
 - Minimize use
 - Follow directions on label
 - Use integrated pest management
 - Seek less harmful products
- Use cleaning techniques without water
- Discharge wash water to sanitary sewer
- Properly containerize and dispose solid waste including grass clippings
- Contain/properly dispose of waste paint



Activity: Maintenance



- Leaking aircraft, vehicles and equipment
- Spills
- Material storage and use
 - Spent absorbent
 - Batteries and Battery acids
 - Paint and adhesives
 - Oils and hydraulic fluid
 - Fuels and fuel additives
 - Solvents and cleaning agents



Maintenance - BMPs



- Conduct aircraft maintenance indoors to eliminate possibility of stormwater contamination
- Conduct vehicle and equipment maintenance
 - Indoors
 - Under cover
 - Off-airport
- Consolidate maintenance areas and keep clean
- Discharge wash water to sanitary sewer
- Use mops and dry sweepers or professional cleaning services



Maintenance - BMPs



- Maintain clean equipment
 - Water-based cleaning agents or steam cleaning
 - Non-chlorinated solvents
 - Designated areas
- Periodically inspect for leaking equipment
- Schedule repairs
- Parts Storage
 - Under cover
 - Away from drains



Maintenance - BMPs



- Use drip pans
- Use “green” products
- Use absorbent materials
 - Collect/remove immediately
 - Place in labeled container
 - Properly dispose
- Recycle batteries
- Recycle or properly dispose of all fluids
- Hot drain oil filters for solid waste disposal



Activity: Washing



- Washing is NOT ALLOWED OUTDOORS unless fully contained and collected for proper disposal
- Typical contaminants
 - Oil
 - Grease
 - Other vehicle fluids
 - Residual solids (dirt and grime)
- Cleaning Supplies
 - Detergents
 - Degreasers
 - Lavatory waste



Washing - BMPs



- Aircraft washing – Indoors ONLY
- Vehicle and equipment washing
 - Indoors unless in a bermed containment area
 - Off-site facility
- Biodegradable, phosphate-free detergents
- “Dry Washing” techniques



Washing - BMPs



- Install vacuum booms
- Cover catch basins with spill mats
- Use secondary containment
- Collect wash water
 - Filter and recycle when practical
 - Discharge to sanitary sewer by permit
- Inspect and maintain sumps and drains
- Consolidate and clean wash areas



Activity: Equipment Parking/Storage Areas



- GSE (ground support equipment) parking
 - Tugs
 - Belt loaders / container loaders
 - GPUs (Ground power units)
 - Aircraft tugs
- Storage areas (a.k.a., bone yards)
 - Inoperable/damaged equipment
 - Scrap parts/Unused materials
 - Unknowns
 - SOLUTION is to schedule removal of out-of-service equipment from the airport



Equipment Parking/Storage Areas - BMPs



- Regularly inspect for leaks and schedule repairs
- Reduce unnecessary equipment and consolidate areas
- Avoid storm drains – park at least 20 feet from storm drains or catch basins
- Protect equipment using
 - Existing overhangs
 - Roofs
 - Semi-permanent coverings
 - Berms
- Drain equipment and remove batteries



Activity: Aircraft Lavatory Servicing



- From aircraft to lavatory truck to triturator to sanitary sewer
- Drips/spills can occur during
 - Mixing surfactants and disinfectants
 - Transfers from aircraft
 - Connection and Disconnection
 - Transport to triturator
 - Leaking valves on trucks or carts
 - Discharge into triturator



Aircraft Lavatory Servicing - BMPs



- Develop a written procedure
- Use buckets or pans
- Drain aircraft connecting hose
- Secure hoses, valves and equipment
- Discharge to triturator
- Wash trucks at triturator or wash rack
- Mix/transfer at triturator or under cover
- Use approved surfactants and disinfectants
- Constant maintenance essential



Aircraft Lavatory Servicing - BMPs



- Carry absorbent on lavatory truck
 - “kitty litter,” clay, mats
- Collect/absorb spilled chemicals and containerize and dispose properly
- Hose down spills only into triturator
- Inspect equipment
- Replace worn equipment
- Notify maintenance personnel for fitting replacement



Activity: Deicing/Anti-icing Operations



- Airport Facilities
 - Public roadways and sidewalks
 - Rock salt (sodium chloride)
 - Sand
 - Runways, taxiways, and ramps
 - Urea/Sand
 - Potassium Acetate
 - Sodium Formate
- Airlines and deicing contractors
 - Aircraft (MD-80)
 - Ethylene glycol
 - Propylene glycol



Deicing/Anti-icing Operations - BMPs



- Airport personnel
 - Minimize runway deicing materials using BMPs
 - Store materials under cover or in tanks
 - Utilize runway temperature sensors
 - Track weather
- Airlines and deicing contractors
 - Deice in designated areas only
 - Properly dispose/recycle fluids
 - If using ethylene glycol:
 - CERCLA notifications to U.S. EPA for RQ exceedance (roughly 535 gallons in a 24-hour period)
 - Clean up all spills
 - Vacuum deicing chemicals during



Activity: Chemical/Waste Management



- Fuels, oils, wastes, and deicers
 - ASTs
 - USTs
 - Drums
- Jet fuel ASTs
- Pesticides, herbicides and fertilizers
- Solvents and cleaning solutions



Chemical/Waste Management - BMPs



- Container/Drum Storage Requirements
 - Keep clean and inspect for spills and leaks
 - Consolidate areas and limit chemicals
 - Increase waste pickup and recycle
 - Avoid drains or store under cover or indoors
 - Protect drains during product transfer
 - Use proper containers and lids
 - Seal and store on spill pallets
 - Properly label and maintain MSDS's



Chemical/Waste Management - BMPs



- Container/Drum Handling Requirements
 - Conduct during dry weather and cover
 - Use paved areas and avoid storm drains or protect with stormwater controls
 - Position vehicles for containment
 - Avoid horizontal drum storage systems
 - Seal lids when not in use
 - Know spill kit locations
 - Clearly label kits
 - Keep well-stocked
 - Replenish when necessary
 - Contain leaks/spills and dispose



Activity: Solid Waste Management



- Food Wastes/Grease Management
 - Concessionaires
 - Vendors
 - Flight kitchens
- Foreign object debris/damage (FOD)
- Construction waste/debris
- Bird flocks and other animals



Solid Waste Management - BMPs



- Prevent leaks and overfilling
 - Conduct regular inspections
 - Maintain Cover
 - Plug drains/close valves
 - Schedule frequent pickups
 - No oil or hazardous material disposal
- Recyclables
- Eliminate wildlife
 - Close or lock containers
- Properly clean
 - Use bermed wash areas
 - Recycle or dispose wash water
 - Consider ramp scrubbers for



Activity: Fueling Operations



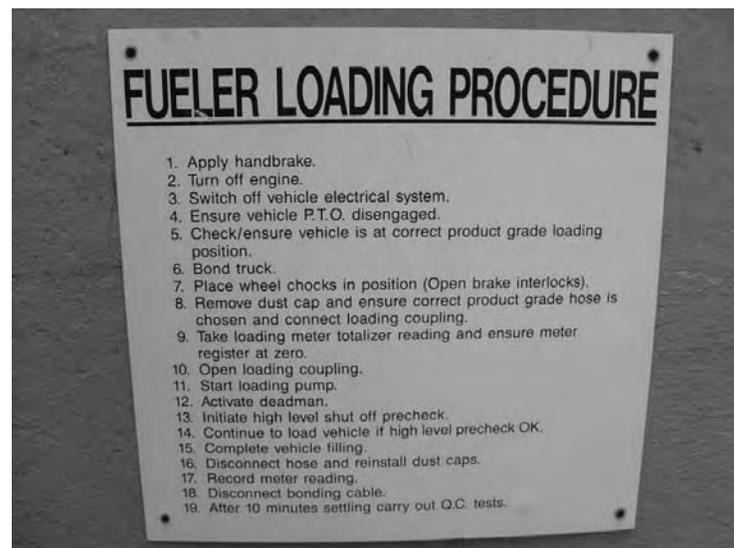
- Ground vehicles and equipment
 - Maintenance areas
 - Fire Rescue
 - Car rental facilities
 - Public Gas Station
- Aircraft
 - Terminals and cargo facilities
 - Fuel hydrant system
 - Mobile Refuelers
 - Sump fuel from fuel inspections



Fueling Operations - BMPs



- Develop written procedures
- Maintain spill equipment
- Post response procedures at fueling areas
- Train often



Fueling Operations - BMPs



- Fuel only in designated areas
- Do not “top off” tanks
- Actively monitor equipment
- Perform regular maintenance of fuel nozzles
- Use mats or drain covers
- Properly manage drips and spills
- Avoid mobile fueling of equipment
- Inspect fuel properly
 - DO NOT pour sump fuel onto ground
 - Pour into sump or bowser



Oil-Water Separator (OWS) Management



- Oil-water separators
 - Used to reduce the quantity of floating and settling materials
 - Constructed by installing baffles inside of a tank or structure
 - Some use “coalescing plates” to enhance oil recovery
 - Reduce the flow velocity and turbulence allowing light materials to rise and heavier solids to settle
 - Used for sanitary discharge and stormwater discharge



OWS Management



- Can REDUCE the amount of pollutants
 - depends on the quantity of pollutants, flow rates and maintenance
 - OWS does not completely eliminate pollutants
- Don't rely on OWS to handle spills
- Don't use detergents or emulsifiers that disperse oil
- Reduce materials (solids and oils) that enter separators
 - reduces operational/disposal costs
- Reduce flow rates



OWS Management



- Oil-water separators at Airport
 - Discharge to sanitary sewer system
 - Inspect at least every 6 months
 - Clean at least annually
 - Develop written operating, sampling and reporting procedures
 - Train appropriate personnel



Spill Response



- Effective spill response is critical to reduce impact on environment.
- Effective means:
 - Having a spill response plan
 - Having adequate spill response materials
 - Having trained response personnel
 - Having drums to containerize wastes
 - Expeditiously removing waste containers from airport property



Spill Response Plan



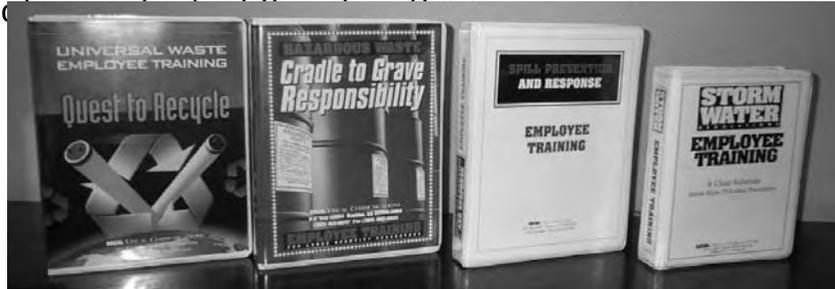
- An Airport-specific spill response flow chart
 - Step-by-step instruction on how to respond to a spill
 - Posted in operational and chemical storage areas
- A drainage plan illustrating where a spill may go and how to stop it from reaching a receiving stream
- Spill Report Form to track appropriate handling



Pollution Prevention Training



- Train employees
 - Materials and processes
 - Preventive practices
 - Spill response equipment
 - Spill reporting
 - Spill response drills
 - Daily/weekly briefings
- Perform inspections
- Promote



Final Considerations



- Our actions affect the environment
- Pollution prevention is less costly than cleaning it up in the soil or water
- Airport and tenant employees must manage their operations to reduce pollution and keep it out of rivers and lakes

