Resource Conservation and Pollution Prevention at U.S. Army Garrison Fort Meade, MD: Raising the Bar

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### Resource Conservation and Pollution Prevention at U.S. Army Garrison Fort Meade, MD: Raising the Bar

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USACE Baltimore District
Planning Division

- Planning and Environmental Services Branch
- Multidisciplinary staff to provide military customers with decision-making products and services
- Specializes in environmental stewardship support
U.S. Army Garrison
Fort George G. Meade (FGGM)

- Located in Anne Arundel County, MD, midway between Baltimore and Washington, D.C.
- Approximately 5,000 acres
- Fourth largest workforce among army installations
  - Approximately 10,000 military personnel and 26,000 civilians employed
  - Approximately 6,000 family members resident
U.S. Army Garrison
Fort George G. Meade (FGGM)

- Utilizes EMS to manage resources
- Committed to a safe, healthy and environmentally friendly working environment
- Prepares innovative resources to manage compliance and stewardship efforts
FGGM Pollution Prevention (P2) Plan Goals

- User Friendly
- Update of 2002 Plan
- Compatible with EMS
- Saves money and protects public health and the environment
Pollution Prevention (P2)

- “Any activity, process, or mechanism that successfully and cost-effectively avoids, prevents, or reduces the sources of pollutant discharges or emissions other than the traditional method of treating pollution at the discharge end of a pipe or stack.”
Pollution Prevention (P2)

- Cost-effective means of meeting environmental objectives by:
  - Reducing environmental compliance burden
  - Reducing operational costs
  - Reducing generation of wastes and pollution

- Essential for Environmental Management System (EMS) implementation

- FGGM has implemented its P2 program since 1997
Project Objective

- **Objective:** To improve upon FGGM’s P2 program
  - Incorporation of requirements specified in latest Executive Orders and regulations
  - Assessments of existing P2 initiatives
  - Identification of potential new P2 initiatives for implementation
  - Update FGGM’s existing P2 Plan
Regulatory P2 Drivers

- Federal Executive Orders (EOs)
  - EO 13508 (2009) – *Chesapeake Bay Protection and Restoration*
- Energy Independence & Security Act (EISA) of 2007
- Energy Policy Act (EPAct) of 2005
- Department of Defense (DoD) documents:
  - Army Regulation 200-1
    - Requires installations to develop and maintain P2 programs
  - DoD Instruction 4150.7
  - DoD Instruction 4715.4
  - DoD Directive 4500.36R
Other P2 Plan Update Drivers

- FGGM EMS Objectives & Targets
  - Solid waste diversion
    - Increase recycling to 50% of general waste by end of FY 2011
    - Increase recycling to 50% of C&D debris by end of FY 2011
  - Reduce vehicle emissions and fuel consumption
    - Reduce SOV traffic on post from 2009 levels by FY 2012

- Include significant changes since last Plan update:
  - Privatization of military housing and management
  - Increase of outsourced services requiring inclusion of tenant activities within P2 fenceline

- Anticipation of significant changes to occur:
  - Base Realignment and Closure (BRAC) activities
  - Privatization of utilities (water/wastewater, electric)
Methodology

- Perform regulatory review to identify new P2 drivers
- Benchmark existing P2 Plan with those of other installations
- Conduct preliminary phone surveys
- Conduct field surveys to:
  - Identify and evaluate existing initiatives being implemented
  - Identify potential new initiatives
- Develop P2 Opportunity Assessments (P2OAs)
- Review findings with FGGM P2 personnel
- Update P2 Plan
## P2 Goals

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<tr>
<th>Media Area</th>
<th>Goal(s)</th>
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| **Chemical Use**            | • Minimize quantities acquired, used, or disposed  
                              • Reduce quantities of pesticide applied                                                                                                                                 |
| **Hazardous & Industrial Waste** | • Continue annual reduction in overall disposal volumes                                                                                                                                 |
| **Solid Waste**             | • Divert 50% of solid waste annually  
                              • Divert 50% of construction & demolition (C&D) debris annually  
                              • Increase diversion of compostable and organic material from disposal                                                                                                                                 |
| **Air Emissions**           | • Set greenhouse gas (GHG) emissions reduction targets  
                              • Reduce vehicle emissions by reducing number of single occupant vehicles passing through installation by 10%  
                              • Phase out use of Class II ODS products (i.e., HCFCs)                                                                                                                                 |
| **Water & Wastewater**      | • Reduce potable water consumption by 2% annually (or 26% by FY 2020)  
                              • Reduce industrial, landscaping, and agricultural water consumption by 20%  
                              • Reduce N, P, and sediment pollution into Bay tributaries                                                                                                                                 |
# P2 Goals

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<thead>
<tr>
<th>Media Area</th>
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<tbody>
<tr>
<td><strong>Energy &amp; Fuels</strong></td>
<td>• Reduce energy consumption by 15% per gross square foot of building area by FY 2010 (3% annually thereafter)</td>
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<td>• Install solar hot water equipment to meet 30% of hot water demand</td>
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<td>• Increase renewable energy consumption to meet at least 50% of total electricity consumed</td>
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<td>• Reduce petroleum consumption of fleets by 20%</td>
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<td>• Increase alternative/non-petroleum fuel consumption by 10% annually</td>
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<td>• Design new buildings for reduction of fossil fuel-generated energy consumption</td>
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<td><strong>Green Procurement</strong></td>
<td>• Increase procurement/use of hybrid or alternative-fueled vehicles</td>
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<td>• Incorporate energy efficiency policies and criteria for product procurement</td>
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<td>• Increase procurement of products made from recycled materials</td>
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<td>• Design new buildings to achieve minimum LEED Silver rating</td>
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Shifts in P2 Goals Since 2002

- Previously focused on reduction of hazardous materials and wastes generated
- Shift in focus to sustainability, green buildings, energy and fuels conservation, GHG reduction
Benchmarking

- **Purpose:**
  - Evaluate FGGM’s P2 program status compared to other installations
  - Identify and evaluate any possible new initiatives not currently implemented by FGGM
- Compared existing P2 Plan (2002) to Plans of 3 other installations (2007-08)
- On average, the installations evaluated are implementing approx. 20 initiatives
Surveys

- Conducted preliminary surveys by phone
- Field visits were performed at:
  - Maintenance Shops
  - Motor Pools
  - Fueling Point
  - Water Treatment Plant
  - Wastewater Treatment Plant
  - Pesticides Management Area
  - Golf Course
  - Recycling Facility
  - Hazardous Waste Collection Facility
  - Defense Reutilization and Marketing Office
  - Medical Clinic
  - Forensic Toxicology and Drug Testing Laboratory
- Also met with various DPW division managers:
  - Energy Manager
  - Pesticides Manager
  - Hazardous Waste/Solid Waste/Recycling Manager
  - Air Program Manager
  - Green Procurement Manager
  - Water/Wastewater Manager
Existing P2 Initiatives

- Hazardous, Industrial, & Solid Wastes
  - Implementation of centralized collection and disposal, including:
    - Collection of household hazardous waste
    - Recycling of: used oil, batteries, scrap tires, fluorescent bulbs, paper, glass, plastic, metals, etc. [via operation of a Qualified Recycling Program]
  - Paint preference of water-based paints over solvent-based paints
  - Use of aqueous-based parts washers, or recycling solvents in any remaining solvent-based parts washers
  - Beneficial reuse of WWT sludge by land application
  - Significant reductions in quantities of pesticides applied - IPM
  - Use of laundry service for soiled rags
Existing P2 Initiatives

- **Water & Wastewater**
  - Use of treated effluent from wastewater treatment plant as irrigation water for golf course
  - Incorporation of indoor and outdoor water conservation strategies into building design/retrofits
    - E.g., Use of low-flow plumbing fixtures and appliances
  - Use of buffer zones near waterways downstream of golf course to minimize runoff pollution to Bay tributaries
Existing P2 Initiatives

- **Air Emissions**
  - Replacement and retrofit of oil-fired boilers with gas-fired units

- **Energy & Fuels**
  - Acquired 10 electric vehicles for on-site use
  - Use of electric forklifts at some maintenance shops
  - Installation of solar-powered lighting at installation gates

- **Green Procurement**
  - Increased procurement of products made from recyclable materials
P2 Metrics

- Solid Waste Annual Reports (SWAR) – solid waste, recycling
- Biennial RCRA Hazardous Waste Reports – hazardous waste
- Wastewater Treatment Plant’s Raw Flow Data – wastewater generation
- Annual Energy & Water Reporting System (AEWRS) – energy, water consumption
  - Annual Air Emissions Inventory/ Certification Report
  - Fuel Automated System Enterprise Server
Progress Since 2002

- **Hazardous Wastes**
  - Quantities disposed have been decreasing since CY 2001 (disposing 20% of quantity disposed in CY 2001)

- **Solid Wastes**
  - Diversion rate has steadily exceeded 40% each FY, with a diversion rate of 57% in FY 2009
    - Includes both MSW and C&D debris
Progress Since 2002

- **Water Consumption**
  - Quantities consumed have been decreasing since CY 2005
  - Annual withdrawal quantities are below the permitted draw capacity of 3.3 MGD (1205 MGY)

- **Wastewater Generation**
  - Generation decreased between CY 2003 and 2007, increased slightly in CY 2008
  - Plant is also currently meeting more stringent ENR N and P limits
Progress Since 2002

- **Air Emissions**
  - Steady decrease in all pollutants since CY 2003

- **Energy Utilization Index**
  - Well below goal of 152.6 thousand Btu/square foot of conditioned space
Progress Since 2002

- **Fuel Consumption**
  - Tracked by fuel type:
    - Diesel – GSA vehicles only
    - Gasoline – GSA vehicles only
    - Fuel Oil – portable heaters, emergency generators
  - Steady decrease of vehicle fuel use (diesel + gasoline) since CY 2006
Potential New P2 Initiatives

- **Hazardous Materials**
  - Evaluate substituting less hazardous components in anti-freeze (e.g., propylene glycol)
  - Evaluate use of “green” pesticides
  - Evaluate participation in DLA’s Closed Loop Re-refined Oil Program

- **Hazardous, Industrial, & Solid Wastes**
  - Phase out use of solvent-based parts washers (or retrofit with solvent-recycling system)
  - Evaluate use of biodegradable oil absorbent materials
  - Establish policies for two-sided/duplex copying and printing
  - Evaluate recycling/crushing of empty propane cylinders
  - Evaluate recycling of styrofoam
Potential New P2 Initiatives

- **Air Emissions**
  - Establish inventory of equipment containing ozone-depleting substances (ODS) for tracking phase-out
  - Establish GHG emissions reduction targets

- **Water & Wastewater**
  - Evaluate potential upgrades to water distribution system
    - Pending water/wastewater privatization
  - Evaluate potential upgrades to wastewater treatment processes to accommodate biological nutrient removal to reduce chemical use
  - Evaluate potential upgrades to oil/water separators throughout installation and establish formal maintenance and inspection program
  - Establish and implement nutrient management plan
Potential P2 Initiatives

**Energy & Fuels**
- Consider implementation of bicycle loan program as alternative form of transportation on-site installation
- Consider implementation of formal carpool/rideshare program
- Consider use of biodiesel or other alternative fuels where possible
- Upgrade/retrofit lighting fixtures to be energy-efficient
  - Pending development of FGGM’s Energy Conservation Plan

**Green Procurement**
- Implement the green procurement program that incorporates training, tracking, and reporting elements
- Increase fleet of vehicles that are electric or utilize alternative fuels
- Upgrade any equipment currently not Energy Star certified where possible
Summary

- General road map for FGGM
  - Assessed the P2 program’s current status
  - Developed future program direction and goals

- Selected potential New P2 opportunities, based on:
  - Efficiency and effectiveness
  - Availability of future resources

- Incorporated into updated P2 Plan