

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



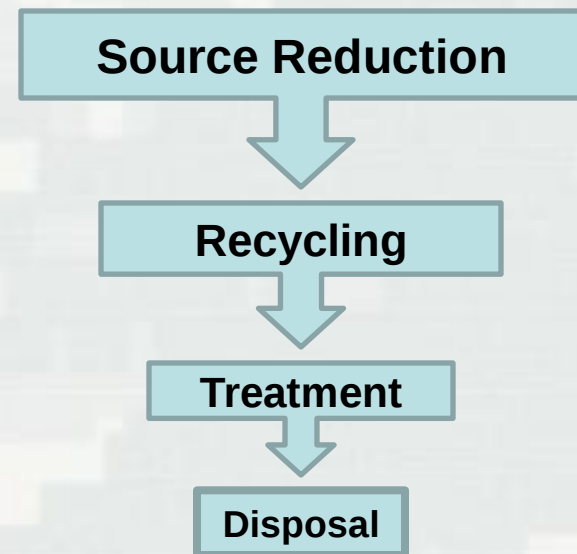
FGGM Pollution Prevention (P2) Plan Goals

- User Friendly
- Update of 2002 Plan
- Compatible with EMS
- Saves money and protects public health and the environment



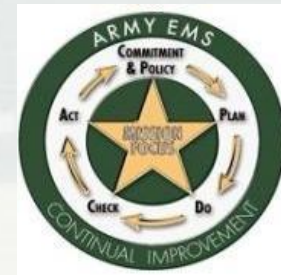
Pollution Prevention (P2)

- “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 13423 (2007) – *Strengthening Federal Environmental, Energy, and Transportation Management*
 - ▶ EO 13508 (2009) – *Chesapeake Bay Protection and Restoration*
 - ▶ EO 13514 (2009) – *Federal Leadership in Environment, Energy, and Economic Performance*
- 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

Media Area	Goal(s)
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

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



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



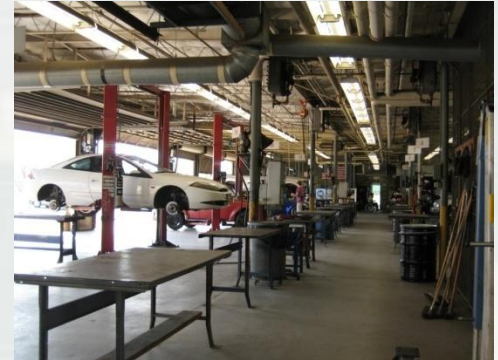
Benchmarking

- 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

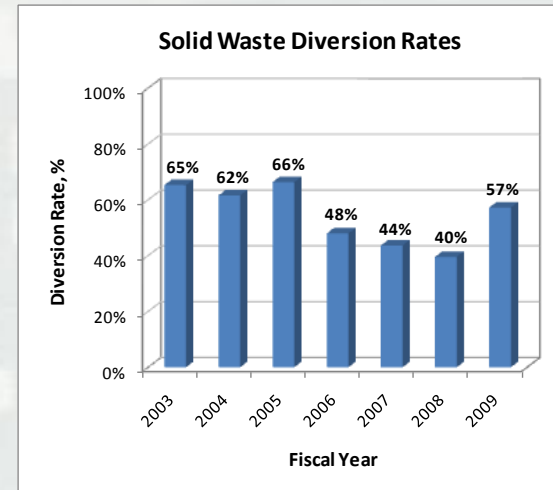
■ Hazardous Wastes

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



■ Solid Wastes

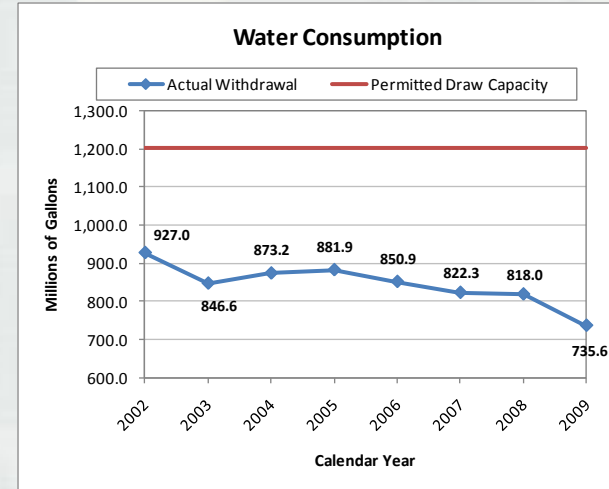
- ▶ Diversion rate has steadily exceeded 40% each FY, with a diversion rate of 57% in FY 2009
 - Includes both MSW and C&D debris



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

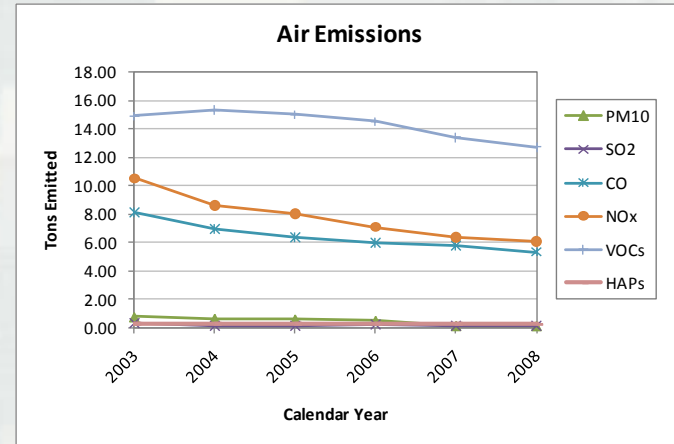
- ▶ Generation decreased between CY 2003 and 2007, increased slightly in CY 2008
- ▶ Plant is also currently meeting more stringent ENR N and P limits



Progress Since 2002

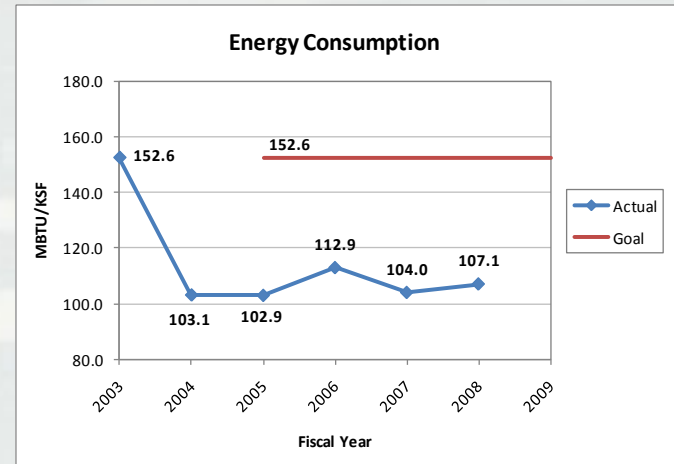
■ Air Emissions

- ▶ Steady decrease in all pollutants since CY 2003



■ Energy Utilization Index

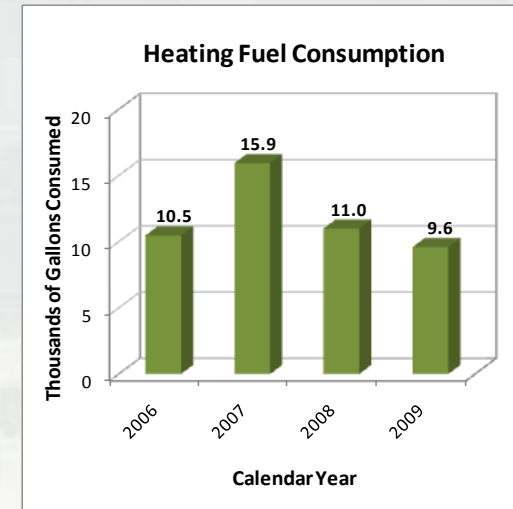
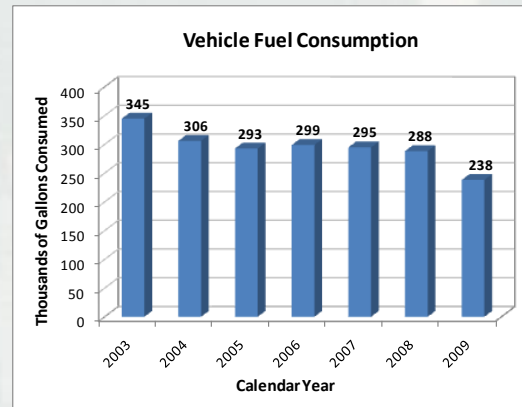
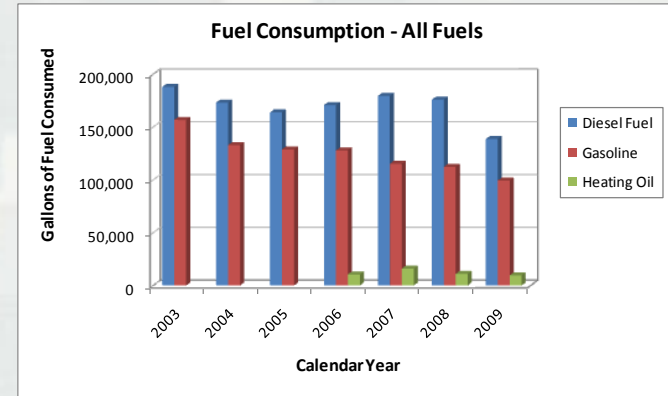
- ▶ Well below goal of 152.6 thousand Btu/square foot of conditioned space



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

