POLLUTION PREVENTION PLAN

PRESIDIO OF MONTEREY AND
ORD MILITARY COMMUNITY

MAY 2002

APPROVALS

THIS POLLUTION PREVENTION PLAN (P2 PLAN) FOR PRESIDIO OF MONTEREY AND ORD MILITARY COMMUNITY, CALIFORNIA WILL BE IMPLEMENTED AS DESCRIBED HEREIN.

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Pollution Prevention Plan

The Presidio of Monterey and
The Ord Military Community

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THE PRESIDIO OF MONTEREY AND THE ORD MILITARY COMMUNITY POLLUTION PREVENTION PLAN

1.0 INTRODUCTION

1.1 OVERVIEW

Pollution Prevention (P2) is the Presidio of Monterey (POM) and the Ord Military Community's (OMC) top environmental priority. The current emphasis on P2 is necessary to meet state and national P2 policy goals, protect public health and the environment, save money by reducing the installation's raw material purchases and waste disposal costs, and reduce the long-term liabilities associated with waste disposal.

Environmental liabilities increase directly with the volume of hazardous substances used at an installation. Reducing these long-term liabilities requires a positive commitment, a sound plan, and an aggressive program for modifying past attitudes toward the conservation of all materials. Reducing liabilities also requires actively searching for opportunities to reduce the amount of hazardous substances used and wastes generated while still accomplishing the POM and OMC's mission.

P2 is a cost-effective means of reducing these liabilities and meeting environmental objectives in an era when military installations are simultaneously subject to stricter standards for pollution control and declining budgets.

The POM and OMC P2 Plan serves as the foundation for an ongoing, comprehensive program for reducing waste and preventing adverse environmental impacts. This plan represents a written account of POM and OMC's pollution generation, its objectives for minimizing that pollution, and the options available for meeting those objectives.

1.2 PURPOSE

The POM and OMC have developed this plan to promulgate the P2 program and to ensure continued environmental compliance with federal and state P2 laws and regulations as well as Department of Defense policy. This document is a multi-media plan which provides information on various types of pollution generated and resources used. The purpose of this plan is to establish P2 goals, identify P2 opportunities that exist at the POM and OMC, and to serve as a technical reference for implementing future P2 initiatives.

1.3 SCOPE

In the past, P2 has often focused primarily on hazardous waste reduction. However, as a multi-media document, the scope of the POM and OMC P2 Plan extends beyond hazardous waste reduction issues to also include a wide range of environmental media such as solid waste reduction and recycling, Toxic Release Inventory (TRI) chemical reduction, energy conservation, and affirmative procurement. This plan focuses on identifying P2 initiatives for implementation by POM and OMC activities that will have the greatest impact on waste reduction and resource conservation. For all potential P2 initiatives identified, this plan provides a general description of the initiative as well as technical, environmental, and economic feasibility analyses. Working in tandem with this document are the Storm Water P2 Plan, August, 2000, and the Integrated Solid Waste Management Plan, December 2001. As a result, the focus on these two media will be lessened in this document.

1.4 POM AND OMC BACKGROUND

The POM and the former Ft. Ord installation have been considerably realigned and downsized due to Base Realignment and Closure (BRAC) activity when the installation officially closed in 1994. A 750-acre portion of the former Ft. Ord was retained by the Army, called the Ord Military Community (formerly the Presidio of Monterey Annex or POMA) and is an annexation of the POM. A result of closing Fort Ord, the resident population decreased substantially and industrial activity is significantly less than it had been when the infantry was present. Property outside of the OMC boundaries are in transition from Army ownership to governmental, public and private entities following property cleanup in accordance with Community Environmental Response, Compensation and Liability Act requirements and no longer covered under this plan.

2.0 REGULATORY OVERVIEW

2.1 POLLUTION PREVENTION ACT OF 1990

The Pollution Prevention Act of 1990 established the following pollution prevention hierarchy as a national policy:

- Whenever feasible, pollution should be prevented or reduced at the source.
- Pollution that cannot be prevented should be recycled whenever feasible in an environmentally safe manner.
- Pollution that can be neither prevented nor recycled should be treated whenever feasible in an environmentally safe manner.
- Disposal or other release should be employed only as a last resort and should be conducted in an environmentally safe manner.

2.2 EXECUTIVE ORDER 12759

The prime objective of Executive Order 12759, "Federal Energy Management" is to encourage wise energy management practices by federal agencies through a wide variety of energy conservation initiatives. However, a significant number of this order's provisions have since been revoked by Executive order 12902, "Energy Efficiency and Water Conservation at Federal Facilities" (March 8, 1994). The specific pollution prevention programs that still remain in effect include implementing outreach initiatives such as ride-sharing and employee awareness programs and minimizing the use of petroleum as a primary energy source by either substituting a cleaner alternative fuel such as natural gas or developing dual fuel usage.

2.3 EXECUTIVE ORDER 12843

Executive Order 12843, "Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances (ODS)," directs federal agencies to maximize their use of alternatives to ozone-depleting substances, evaluate current and future uses of ozone-depleting substances and identify opportunities for recycling. In addition, whenever economically practicable, federal agencies must modify procurement specifications and practices to substitute non-ODS for those ODS currently being used.

2.4 EXECUTIVE ORDER 12844

Executive Order 12844, "Federal Use of Alternative Fueled Vehicles", mandates that federal agencies use alternatively fueled vehicles to substantially reduce toxic and hazardous air pollutants and reduce pollution associated with energy development activities. Each federal agency was directed, given fiscal constraints, to purchase 50 percent more alternatively fueled vehicles during the period of 1993 through 1995 than specified in the Energy Policy Act of 1992. The federal fleet acquisition program implementation will be overseen by the interagency Federal Fleet Conversion Task Force convened by the Secretary of Energy.

2.5 EXECUTIVE ORDER 12845

Executive Order 12845, "Procurement of Energy Efficient Computer Equipment", requires federal agencies to ensure that all computer equipment purchased meets "EPA Energy Star" requirements for energy efficiency. Case-by-case exemptions based on commercial availability, cost differential, agency missions, and agency performance requirements will be allowed. Agencies are also directed to educate federal computer users concerning the economic and environmental benefits, including pollution prevention, of using this energy-efficient, low-power feature as outlined in the EPA Energy Star program.

2.6 EXECUTIVE ORDER 12856

Executive Order 12856, "Federal Facilities Compliance with the Emergency Planning and Community Right-to-Know Act (EPCRA)", directs each federal agency to establish voluntary goals to reduce the agency's total releases of toxic chemicals to the environment, and to reduce the off-site transfer of such toxic chemicals for treatment and/or disposal, by 50 percent by December 31, 1999. The agencies are specifically requested to use source reduction principles and activities to achieve these reductions whenever practical. In addition, each federal agency must develop a written pollution prevention plan by December 31, 1995 and conduct follow-up assessments as required to ensure the development of such plans and the pollution prevention programs.

2.7 EXECUTIVE ORDER 13101

Executive Order 13101, "Greening the Government through Waste Prevention, Recycling, and Federal Acquisition", revises Executive Order 12873 and by requiring federal activitites to implement acquisition programs aimed at procuring specific products that contain post-consumer material and tracking those purchases. For example, 30% post-consumer content was required for paper by 31 December 1998. An "Affirmative Procurement" program must be in place at Federal facilities and this requirement is now enforced by the EPA as part of RCRA inspections.

2.8 EXECUTIVE ORDER 12902

Executive Order 12902, "Energy Efficiency and Water Conservation", requires federal agencies to develop and implement a program to reduce energy consumption at their facilities 30 percent by 2005, using 1985 data as a baseline for calculations. Agencies must also increase energy efficiency at all industrial facilities 20 percent by 2005, using 1990 data as a baseline. The EO also requires agencies to conduct a prioritization survey of facilities that will be used to establish objectives for the comprehensive facility audits also mandated under this executive order. Within 180 days of completing the comprehensive facility audit, agencies must begin implementing the audit's recommendations for the installation of energy efficient, water conserving, and renewable energy technologies at individual facilities. In addition, the DOE is required to develop a program to significantly increase the use of solar and other renewable energy resources, and will take the lead in working with other federal agencies to implement the program. All agencies are required to develop and implement programs to reduce the use of petroleum at buildings and facilities by switching to a less polluting and non-petroleum-based energy source such as natural gas, solar, or other renewable energy sources. If the use of such alternative fuels is not practical or cost effective, the agency shall improve the efficiency with which petroleum is used. Finally, each agency involved in the construction of a new facility must design and construct it to use energy efficiently, conserve water, and employ renewable energy technologies.

2.9 EXECUTIVE ORDER 13031

Executive Order 13031, "Federal Alternative-Fueled Vehicle Leadership", sets forth reporting requirements to ensure that agencies comply with the Energy Policy Act of 1992 (EP Act). The EP Act requires that 33 percent of the vehicles acquired by Federal agencies in FY 1997 will be alternative-fueled vehicles (AFV's). This figure rises to 50% in 1998 and finally, to 75% in 1999. This applies to Federal agencies that own or lease and operate fleets of 20 or more light-duty, general use vehicles located in metropolitan statistical areas with populations of 250,000 or more. This executive order supersedes EO 12844.

2.10 EXECUTIVE ORDER 13148 AND TRADOC REGULATION 700-8 (DOL)

Executive Order 13148 and TRADOC Regulation 700-8 calls for the establishment of Hazardous Materials Management Programs at Federal facilities. Acquisition of hazardous materials must be tracked and reported, and attempts made to minimize such acquisition.

3.0 THE POM AND OMC P2 PROGRAM

3.1 ROLES AND RESPONSIBILITIES

3.1.1 Installation Commander

POM and OMC Installation Commander is responsible for the following:

- Ensuring that an installation P2 program is developed and maintained.
- Ensuring that command support is given to the P2 program through written policies, command briefings, and inclusion in other public forums.
- Ensuring that P2 is considered in command decisions, as applicable.

3.1.2 Directorate Environmental and Natural Resources Management

As the focal point for all installation P2 related activities, the Directorate of Environmental and Natural Resources Management will:

- Develop and provide support to execute the installation P2 Plan.
- Develop and distribute relative P2 guidance to installation activities.
- Identify or assist in the identification of installation P2 initiatives.
- Program and track funding for all DENR P2 projects.
- Execute in a timely fashion funding provided for EPR P2 projects.
- Promote P2 at the installation.
- Maintain documentation of P2 successes and progress.
- Advise and assist the DPW on new regulations, policies, and guidance relating to P2.
- Advise and assist the DOL with hazardous material identification and substitution.

- Provide air emission, wastewater, solid waste, and hazardous waste expertise to the P2 program.

3.1.3 Directorate of Logistics

As a central control point for hazardous materials and bulk purchasing, the DOL will:

- Develop and execute an affirmative procurement program in accordance with Executive Order 13101.
- Develop and execute a customer oriented hazardous material procurement and substitution program to track and reduce and/or eliminate hazardous material use and subsequent disposal. Annually compile a list of commonly used hazardous materials on the installation.

3.1.4 The Directorate of Public Works

As the contract manager for building maintenance and solid waste removal, the DPW will:

- Implement and update the POM and OMC Integrated Solid Waste Management Plan.
- Include provisions for affirmative procurement and recycling in construction, maintenance, and demolition contracts.
- Develop and execute an energy and water conservation program in accordance with Executive Order 12902.

3.1.5 The Directorate of Contracting

As the credit card administrator and contracting office, the DOC will:

- Develop an installation policy and provide training to instruct unit credit card holders not to purchase any hazardous material without prior consent of and coordination with the DOL.
- Develop an installation policy and provide training to instruct unit credit card holders to purchase post-consumer and recycled products in lieu of virgin materials whenever feasible in conjunction with the affirmative procurement program.
- Ensure that P2 verbiage is included with all requisition, maintenance, and building contracts.

3.1.6 The Command Safety Office

As the Hazard Communication Proponent, The Command Safety Office will:

- Instruct units on the definition of hazardous materials and its proper storage in order to reduce usage and waste due to expiration.
- Advise the DOL regarding the worker safety issues related to hazardous material substitutions.

3.2 Pollution Prevention Policy Statement

The POM and OMC's primary mission as a Training and Doctrine Command installation, is to provide specialty course instruction for over 35 languages and dialects via the Defense Language Institute, Foreign Language Center to U.S. military forces and select government civilians. Additionally, the installation is tasked with the environmental clean up of contaminated areas of the former Fort Ord and the transfer of land declared excess through BRAC. Since environmental protection enhances the sustainment of those specialty forces and facilitates property transfers at the former Fort Ord, the POM and OMC have a strong commitment to the protection, enhancement, and restoration of natural resources and the environment. The following policy statement demonstrates POM and OMC's commitment to protecting the environment through P2:

> ***POM and OMC strive to safeguard the environment of the communities in which we work. It is the POM and OMC's policy to reduce or eliminate the use of hazardous materials and the generation of pollution throughout our processes to include air, wastewater, solid waste, and hazardous waste, whenever economically and technically practicable.***
>
> ***P2 is the responsibility of all of our staff. POM and OMC are committed to identifying and implementing P2 opportunities through employee training and awareness in addition to on-going reviews of hazardous materials usage.***

4.0 P2 Goals, Strategies, and Progress

4.1 Hazardous Waste

4.1.1 P2 Goal

Initiate an Affirmative Procurement Program during CY2002 as required by RCRA, in accordance with E.O. 13101.

4.1.2 P2 Progress

The following charts show the hazardous waste generation by waste stream for Presidio of Monterey (POM) and Ord Military Community for calendar year 2000. In most cases, this information can provide a basis for determining whether alternative procurement would be cost-effective. In some cases, (for example, fluorescent lights) waste generation figures are due to a one-time-only/project specific waste.

4.1.3 Current P2 Activities.

- Conversion to digital imaging at the Information Management's Visual Information Photo Lab is expected within the next few years, thereby, eliminating their silver laden waste stream.
- Recycling is available via DRMO and other recycling sources for fluorescent light tubes, aerosol cans, magnesium, mercury, nickel-cadmium, alkaline, and lead-acid batteries, antifreeze, latex paint, oil filters, photographic fixer, empty containers, used oil, and all hazardous waste liquids.
- Management control over the used oil container access to prevent contamination.
- Returning excess pharmaceuticals to the prime vendor in coordination with Madigan Regional Medical Center, WA.
- Aqueous parts washer in operation in place of a solvent parts washer at the DOL Maintenance Division and one is awaiting installation at the Autocraft Shop.
- Utilization of a heat press and reflective sheeting for signage minimizing paint usage.
- An oily rag-laundering contract is in place at the AAFES service stations and the Outdoor Recreation Maintenance Area.
- Oil filter crusher/oil separator is in use at the DENR, which allows filters to be disposed of as scrap metal.

4.1.4 Further P2 Strategies.

Each of the following hazardous waste P2 opportunities are discussed in detail in Section 5 of this Plan.

-
- Purchase sealed lead-acid batteries.
- Install a pulse battery recharging system.
- Expanded use of alternative parts washing solvents.
- Expand the rag laundering and reuse contract.
- Purchase bulk recycled oil instead of virgin quart containers.

4.2 Solid Waste.

4.2.1 P2 Goal.

Encourage recycling in OMC and POM military housing areas by issuance of policy statements and flyers.

4.2.2 P2 Progress.

In a City of Monterey memorandum to the Army dated January 24, 2001 the Army's Public Works was praised and thanked for their assistance to the City in achieving the 50% recycling goal by the end of 2000. To maintain this high diversion rate, the POM must continue to educate students and staff as they begin their duties at DLI.

4.2.3 Current P2 Activities.

- Recycling gold and copper wire is accomplished via DRMO.
- Recycling of paper, cardboard, plastic, glass, aluminum, and green waste are covered in the refuse contract managed by DPW-Army. Through participation in recycling, discounts are applied to the POM and OMC refuse contract.

4.2.4 Further P2 Strategies.

P2 Strategies covering solid and other wastes will be discussed in the POM and OMC Integrated Solid Waste Management Plan.

- Coordinate with recycling contractors, DPW COR, City of Monterey Recycling Coordinator, and waste disposal contractors to improve the POM and OMC recycling programs.
- Promote numerous source reduction strategies.
- Initiate segregated collection of yard wastes on OMC.
- Include provisions for the reuse or recycle of excess and waste material associated with construction and demolition projects.

4.3 Toxic Release Inventory (TRI) Chemicals.

4.3.1 P2 Goal.

Reduce the total releases and off-site transfers of TRI chemicals 50% by 1999 from the 1994 TRI baseline.

4.3.2 P2 Progress.

Currently, POM and OMC are not required to file a TRI report since neither is exceeding the threshold limits of any TRI chemicals. As a result, the POM and OMC's TRI baseline is zero and no reductions are necessary.

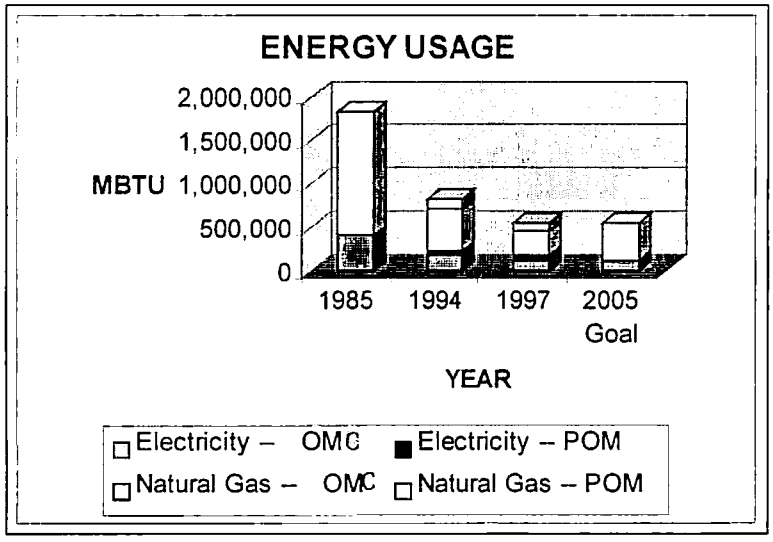
4.4 Energy Conservation.

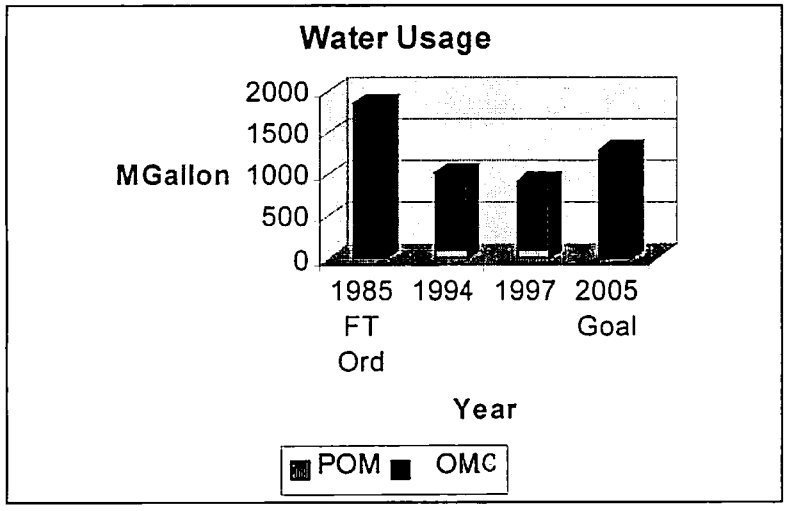
4.4.1 P2 Goals.

Reduce the energy consumption 30% by CY 2005 from a 1985 baseline.

4.4.2 P2 Progress.

The following two graphs are a comparison of 1985, 1994 and 1997 POM and OMC energy and water consumption. While a significant reduction has occurred (as shown in the graph), the reduction is mainly a result of the Fort Ord Base Realignment and Closure (BRAC) beginning in 1994. Therefore, a baseline of 1985 does not accurately reflect the average energy consumption for POM and OMC. To compensate for this, the total square footage of OMC was adjusted downward to reflect actual conditions in 1998. With the adjustment, a 20.31% reduction from the 1994 baseline has been achieved





4.4.3 Current P2 Activities.

- The POM is has entered into an Energy Savings Performance Contract to increase lighting, monitor, and control efficiency.
- Low flow toilets are installed, as older ones require replacing.
- Replacement of urinals with waterless models.
- Upgrading the lights to T-8 lamps as renovations are made.
- As property is transferred from former Fort Ord, sewer and water lines supplying OMC are upgraded; thus, any leaks are repaired conserving water and reducing the potential of a sewage spill.
- Exit signs are being replaced with LED lighting.
- All computer equipment purchased through Information Management follows the EPA Energy Star Program.
- Alternately fueled vehicles (AFV) are employed in conjunction with the GSA contract. Ten sedans and 1 light truck are capable of utilizing natural gas in addition to gasoline.

4.4.4 Further P2 Strategies.

- Place OMC on an Energy Savings Performance Contract (ESPC). Under an ESPC, a private contractor evaluates, designs, finances, acquires, installs, and maintains energy-saving equipment and systems for the installation. In return, the contractor receives compensation based on the energy savings realized from their efforts. Systems that typically fall under an ESPC include boilers, chillers, lighting, gas lines, steam traps, and utility controls.
- Use low to zero mercury light bulbs.
- Limit or prohibit lawn irrigation at industrial sites.

4.5 AFFIRMATIVE PROCUREMENT.

4.5.1 P2 Goals.

To develop an affirmative procurement program that ensures POM and OMC follow the comprehensive procurement guidelines relating to recycled-content and environmentally preferable products.

4.5.2 P2 Progress.

Executive Order 13101 applies to all Federal Agencies. Consequently, the DOD will be responsible for establishing guidance for installations to develop an official Affirmative Procurement Program. However, in an effort to strengthen post-consumer markets and foster good neighbor policies with surrounding communities, POM and OMC intend to develop and implement an Affirmative Procurement Program as suggested by Executive

Order 13101 and further delineated in the POM and OMC Integrated Solid Waste Management Plan.

4.5.3 P2 Strategies.

The Affirmative Procurement P2 Strategies are discussed in the POM and OMC Integrated Solid Waste Management Plan.

5.0 SPECIFIC ACTIVITIES, WASTE, AND P2.

The following sections discuss specific POM and OMC activities, the waste they generate, and the P2 opportunities that are most feasible. This chapter is designed for individual activity to use as a living document to update as needed locally and to provide comments for the annual P2 Plan update.

5.1 AAFES SERVICE STATION (BUILDING #230, POM).

5.1.1. Overview of Operations.

The gas stations run by AAFES are used by active and retired military personnel and their families. Vehicle maintenance operations include vehicle fluid changes, battery replacements, and tire services in addition to self-service gasoline fueling operations.

5.1.2. Process Description.

Vehicle maintenance operations are divided into distinct activities as described below. Any or all of the processes may be performed on a vehicle.

- Cooling System Flush and Antifreeze Change. Radiators that require servicing to repair leaks or remove buildup of rust and scale are drained of their fluids into a 30-gallon container. The radiator and engine block are then flushed with a mixture of water and Super Flush. This mixture is consolidated with waste antifreeze and recycled through a DRMO contract. Leaking radiators can be repaired, sealed with Super Sealer, or replaced as necessary. When the repair is finished, the radiator is filled with a mixture of antifreeze and water. Radiator servicing is a rare event.

- Battery Service. Batteries with low or no charge are either recharged with a standard charger or replaced if they will not take a charge. Dead batteries are stored outside in secondary containment until exchanged for new batteries and sent off-site for recycling.

- Engine Oil Change. Oil is drained from oil pans into one of two portable collection containers. Each container can hold approximately 20 to 30 gallons and is fitted with an 18-inch diameter flat funnel. The used oil is poured from each of the collection

containers into a 1000-gallon aboveground storage tank at the end of each workday. Oil filters are allowed to drain in the funnel for anywhere from several minutes up to several hours before they are consolidated in a 30-gallon drum and stored in the Central Accumulation area. After the oil is drained and the filter is removed, a new filter is installed and oil is used to refill the crankcase. The empty quart containers are placed onto a draining rack to further extract remaining oils for recycling through the DRMO contract. Oil filters are brought to the DENR Hazardous Waste Central Accumulation Storage Facility for crushing, waste oil extraction and recycling.

- Replenish Fluids. Other fluids besides antifreeze and engine oil are only replenished, not changed. These fluids include brake fluid, automatic transmission fluid, and power steering fluid.

- General Lubrication. General lubrication of friction points in vehicles is performed as necessary with general lubricating grease.

- Repair and Mount Tires. Tires with repairable leaks are patched with Universal Cement. Old tires with worn tread are removed and new tires are mounted on the rims. AAFES contracts for the disposal of tires, as they are collected through the local tire supplier.

- Shop Maintenance. Cleaning materials, spray paints, insecticides, and other materials are used as necessary for building maintenance.

- Fuel Dispensing Equipment Maintenance. Routine inspection and maintenance of dispenser hoses, nozzles, vapor recovery systems require drainage of fuels from the dispenser lines prior to any maintenance being performed for safety.

- Gasoline Fueling: Three grades of gasoline fuel are dispensed through a self-service type of operation.

5.1.3 Hazardous Material Use and Waste Generation.

The following is a table showing the hazardous materials used in significant quantities at the AAFES Service Station. Estimates of the amounts used and descriptions of their uses are provided.

Table T5.1.3.1. AAFES POM Service Station Hazardous Material Use.

Hazardous Material	Quantity/Use Description
Super Flush	24 ea. 22-ounce bottles per year are used to flush radiators.
Antifreeze	96 gallons per year are used for filling and replenishing radiators.

Super Sealer Sealant	6 1 ea. 4.5-ounce cans per year are used to seal leaking radiators.
Motor Oil	260 gallons per year are used for oil changes.
WD 40	50 ea. 8-ounce cans per year are used to break rusted parts free.
Power Steering Fluid	12 ea. 32-ounce cans per year are used to replenish power steering fluid.
Brake Fluid	12 ea. 32-ounce cans per year are used to replenish brake fluid.
Carburetor and Choke Cleaner	12 ea. 13-ounce cans per year are used to clean carburetors.
Bleach, White, Spray	12 ea. 20-ounce cans per year are used to clean new tires and bathrooms.
Universal Cement	2 ea. 12-ounce cans per year are used to patch tires.
Liquid Tire Buffer and Cleaner	12 ea. 16-ounce cans per year are used to clean tires.
Lubricating Grease	Less than 1ea 55-gallon drum is used per year is used to lubricate automobile parts.
Quick Silver Cleaner, Aerosol	1 ea. 16-ounce can per year is used to clean vinyl interiors of vehicles.
Paint, Aerosol	6 ea. 12-ounce cans per year are used to paint and protect equipment.

The following is a table showing the regulated wastes generated in significant quantities at the AAFES Service Station. Descriptions of their generation are also provided.

Table T5.1.3.2 AAFES POM Service Station Hazardous Waste Generation.

Waste	Generation Description
Antifreeze	Approximately 50 gallons of antifreeze are generated per year from radiator flushing. After the radiator is drained, flushing material is circulated through the radiator, drained, and consolidated with the spent radiator fluid. It is then sent to the Central Accumulation Storage area and recycled through the DRMO contract.
Contaminated Fuels	Approximately 100 gallons of gasoline is generated that is associated with fuel dispenser maintenance. Waste fuel is

	consolidated into 55-gallon drums and transported to the Hazardous Waste Accumulation Area building 279A for disposal through DRMO.
Lead Acid Batteries	Approximately 50 spent batteries per year are generated when automobile batteries are replaced. Spent batteries are stored outside until picked up by a local contractor under the AAFES contract.
Filters	Approximately 250-gallons/1200 lbs. of oil and fuel filters are recycled under the DRMO contract or through local recycling establishments annually. Oil filters are allowed to drain for a few hours (time and space permitting) before being consolidated in a drum, crushed and then stored at the Central Accumulation Storage (CAS) area until recycled.
Oil	About 250 gallons of waste oil are generated annually from oil changes. Oil is drained into a collection basin that is used to drain oil filters and recycled off-site under the DRMO contract. Oil bottles are placed onto a separate collection basin to extract remaining new oil for recycling.
Empty Oil Bottles	# 32-ounce plastic bottles are recycled annually through the DRMO contract.

5.1.4. P2 Opportunities.

None at Present Time.

5.2 AAFES Service Station (Building #4220, OMC).

5.2.1. Overview of Operations.

The gas stations run by AAFES are used by military personnel and their families. Vehicle maintenance operations include vehicle fluid changes, battery replacements, and tire services in addition self-service gasoline fueling operations.

5.2.2. Process Description.

Vehicle maintenance operations are divided into distinct activities as described below. Any or all of the processes may be performed on a vehicle.

- Cooling System Flush and Antifreeze Change. Radiators that require servicing to repair leaks or remove buildup of rust and scale are drained of their fluids into a 30-gallon container. The radiator and engine block are then flushed with a mixture of

water and Super Flush. This mixture is consolidated with waste antifreeze as recycled waste and managed through DRMO via the DENR. Leaking radiators can be repaired, sealed with Super Sealer, or replaced as necessary. When the repair is finished, the radiator is filled with a mixture of antifreeze and water. Radiator servicing is a rare event.

- Battery Service. Batteries with low or no charge are either recharged with a standard charger or replaced if they will not take a charge. Dead batteries are stored outside with secondary containment until sent off-site for recycling.

- Engine Oil Change. Oil is drained from oil pans into one of several portable collection containers. Each container can hold approximately 20 to 30 gallons and is fitted with an 18-inch diameter flat funnel. Oil is pumped from each collection container into an outside above ground storage tank at the end of each workday. Oil filters are allowed to drain in the funnel for anywhere from several minutes up to several hours before they are consolidated as hazardous waste in a 30-gallon drum and managed through the DENR. After the oil is drained and the filter is removed, a new filter is installed and oil is used to refill the crankcase. The empty quart containers are also collected and drained into a separate container for recycling under the DRMO contract.

- Replenish Fluids. Other fluids besides antifreeze and engine oil are only replenished, not changed. These fluids include brake fluid, automatic transmission fluid, and power steering fluid.

- General Lubrication. General lubrication of friction points in vehicles is performed as necessary with general lubricating grease.

- Repair and Mount Tires. Tires with repairable leaks are patched with Universal Cement. Old tires with worn tread are removed and new tires are mounted on the rims. The used tires are collected for disposal through the local tire supplier.

- Shop Maintenance. Cleaning materials, spray paints, insecticides, and other materials are used as necessary for building maintenance.

- Fuel Dispensing Equipment Maintenance. Routine inspection and maintenance of dispenser hoses, nozzles, and vapor recovery systems require drainage of fuels from the dispenser lines prior to any maintenance operations being performed for safety.
- Gasoline Fueling: Three grades of gasoline fuel are dispensed through a self-service type of operation.

5.2.3 Hazardous Material Use and Waste Generation.

The following is a table showing the hazardous materials used in significant quantities at the AAFES Service Stations. Estimates of the amounts used and descriptions of their uses are provided.

Table T5.2.3.1 AAFES OMC Service Station Hazardous Material Use

Hazardous Material	Quantity/Use Description
Antifreeze	250 ea. 1-gallon bottles are used each year to replenish or refill radiators during radiator servicing.
Super Sealer Sealant	6 1 ea. 4.5-ounce cans per year are used to seal leaking radiators.
Super Flush	60 ea. 22-ounce bottles per year are used to flush radiators during radiator servicing.
Batteries	360 lead acid batteries are replaced each year.
Oil, 10W-40	4800 ea. 32-ounce bottles per year are used to replenish motor oil during oil changes.
Oil, 80W-90	1 ea. 32-ounce can per year is used to replenish gear oil.
Brake Fluid	12 ea. 32-ounce cans per year are used to replenish brake fluid.
Automatic Transmission Fluid	24 ea. 16-ounce bottles are used each year to replenish ATF.
Power Steering Fluid	24 ea. 6-ounce cans per year are used to replenish power steering fluid.
4 Way Penetrating Oil	12 ea. 8-ounce cans per year are used to break rusted parts free.
Grease, White, Aerosol	12 ea. 8-ounce cans per year are used to lubricate bearings and axles.
Lubricating Grease	1 ea. 120-pound drum per year is used to lubricate automobile parts.
(multi purpose) Aerosol Lubricant	9 ea. 12-ounce cans per year are used for general lubrication.
Universal Cement	6 ea. 16-ounce cans per year are used to patch tires.
Tire Mounting and Rubber Lubricant	12 ea. 32-ounce cans per year are used to mount tires.
Engine Degreaser	6 ea. 16-ounce cans per year are used to clean the exterior of engines.

Quick Silver Cleaner, Aerosol	1 ea. 16-ounce can per year is used to clean vinyl.
Carburetor and Choke Cleaner	6 ea. 13-ounce cans per year are used to clean carburetors.
Liquid Tire Buffer and Cleaner	6ea 16-ounce cans per year are used to clean tires.
Bleach, White, Spray	6ea. 32-ounce cans per year are used to clean new tires and bathrooms.
Ant and Roach Killer	1 ea. 16-ounce can per year is used to kill ants.
Paint, Ext. Enamel	1-gallon can per year is used to paint equipment.
Paint, Gloss Black	1-gallon can per year is used to paint equipment.
Paint, Safety Red	1-gallon can per year is used to paint equipment.
Enamel Paint, Aerosol	1 ea. 12-ounce can per year is used to paint equipment.
Paint, Aerosol	1 ea. 12-ounce can per year is used to paint equipment.
Plasti-Kote Paint, Aerosol	1 ea. 12-ounce can per year is used to paint equipment.
Paint, Yellow Street Marking	1-gallon can per year is used to mark parking areas.
Safety Kleen Solvent	150 gallons per year are used for parts washing.
Copier Toner	6 ea. 12-ounce bottles per year are used to make copies.

The following is a table showing the wastes generated in significant quantities at the AAFES Service Station.

Table 5.2.3.2 OMC AAFES Service Station Waste Generation

Waste	Generation Description
Antifreeze	Approximately 150 gallons of antifreeze are generated per year from radiator flushing. First, the radiator is drained. Then, Super Flush flushing material is circulated through the radiator with water, drained, and consolidated with the spent radiator fluid. The material is recycled or disposed through the DRMO contract after being centrally stored at the DENR Central storage site.

Contaminated Fuels	Approximately 200 gallons of gasoline is generated that is associated with fuel dispenser maintenance. Waste fuel is consolidated in 55-gallon drums and transported to the Hazardous Waste Accumulation Area building 4495 for disposal through DRMO.
Lead Acid Batteries	About 300 spent batteries per year are generated when automobile batteries are replaced. Spent batteries are consolidated outside in a storage area equipped with secondary containment. The batteries are recycled off-site.
Filters	Approximately 250-gallons/4500 lbs. of oil and fuel filters are generated annually. Oil filters are recycled through local recycling establishments and fuel filters are disposed through the DRMO contract. Oil filters are allowed to drain for a few hours before being consolidated in a drum and transported to the Central HW Accumulation Storage area building 4495 for crushing, storage and transportation off-post to recycle.
Lead Wheel Weights	Approximately 330lbs. of lead wheel weights are generated annually and recycled
Grease	About 5 gallons of waste grease are generated annually from packing bearings and lubricating axles.
Oil	About 1,200 gallons of waste oil are generated annually from oil changes. Oil is drained into a collection basin. Each night the oil is pumped from the basin into an above ground double-walled tank located on the outside of the building. A contractor picks up the used oil every 90 days.
Empty Oil Bottles	4800 32-ounce plastic bottles are recycled annually through the DRMO contract. Emptied fresh oil bottles are placed onto a drain basin and residual oil is extracted into a separate container.
Rags and Dry-sweep	About 120 gallons per year of rags and dry-sweep that is saturated with oil from leaks and spills in the area.
Mop water	Soapy mop water, used for floor clean up, is disposed of via floor drain into an oil/water separator that precedes a storm drain leading to a daylight drainage ditch.

5.2.4. P2 Opportunities.

5.2.4.1 Enzyme-Based Parts Washers. Enzyme-based parts washers and the current, contractor-owned units are very similar in construction and operation. Each type of unit is roughly the same size and shape, and continuously recirculates a solvent between a holding tank and a sink. The main differences between these cleaning systems is the solvent used to clean the parts and the ability of the solvent to be reused. Enzyme-based washers use a less hazardous aqueous solution (compared to the petroleum-based solvent in the current system) to remove oil, dirt, and grease from parts. In addition, the enzyme-based systems contain microbes that are suspended in the aqueous cleaning solution. Although the microbes do not play a role in helping remove dirt and grease from parts, they serve to greatly extend the life of the solvent. They do this by producing enzymes that biodegrade the oil and grease that gets washed off of the parts. In essence, the microbes feed off of the oil and grease; thereby, removing it from the solution. In addition, these units are also equipped with a reusable filter to remove particulate contamination (which is not consumed by the microbes). By keeping the solution free of these contaminants (oil, grease, dirt), its life is greatly extended, allowing it to be used for much longer periods than petroleum-based solvent. The need to remove and replace the cleaning fluid is then reduced which, in turn, decreases the amount of waste fluid generated. In reviewing this opportunity, it was deemed unfeasible due to the lack of a payback period.

5.3 AUTOCRAFT SHOP (BUILDING #4492, OMC).

5.3.1. Overview of Operations.

The Autocraft Shop is designed to allow military personnel, federal government employees, and students/faculty from California State University and University of California to service their own vehicles. The shop has heated bays that personnel can rent. Tools are also available for rent. Personnel bring their own supplies and remove all wastes except used oil, filters, and waste antifreeze. This Shop may be closed or operated under private contractor in the future pending Base Realignment and Closure land accessions. Whether operations will be relocated has not been determined.

5.3.2. Process Description.

Vehicle maintenance operations that are typically performed are divided into distinct activities as described below. Although the exact procedure may vary among customers, they are generally similar to the procedures described below.

- Cooling System Flush and Antifreeze Change. Radiators that require servicing to repair leaks or remove buildup of rust and scale are drained of their fluids into a 30-gallon container. The radiator and engine block are then flushed with a radiator flushing mixture. This mixture is consolidated with waste antifreeze as a recyclable waste and is collected for management by the DENR. Leaking radiators can be repaired, sealed with radiator sealing mixture, or replaced as necessary. When the repair is finished, the radiator is filled with a mixture of antifreeze and water. Antifreeze, flushing material, and sealing material are provided by the customer.

- Engine Oil Change. Oil is drained from oil pans into one of several portable collection containers. Each container can hold approximately 20 to 30 gallons and is fitted with an 18-inch diameter flat funnel. Oil is pumped from each collection container into an outside above ground storage tank at the end of each workday. The tank is pumped every 90 days by a contractor. Oil filters are allowed to drain into a 55-gallon drum fitted with a collection tray. The filters are consolidated in a 30-gallon drum for recycling. After the oil is drained from the vehicle and the filter is removed, a new filter is installed and oil is added to refill the crankcase. Oil and oil filters are provided by the customer.

- Replenish and/or Change Fluids. Other fluids besides antifreeze and engine oil are also replenished or changed. These fluids include brake fluid, automatic transmission fluid, and power steering fluid. All fluids are provided by the customer.

- General Lubrication. General lubrication of friction points in vehicles is performed as necessary with general lubricating grease.

- Repair and Mount Tires. Tires with repairable leaks are patched with Universal Cement. Old tires with worn tread are removed and new tires are mounted on the rims.

- Parts Cleaning. Currently, three 35-gallon contractor-provided parts washers containing PD680 are available for cleaning parts. The contractor removes the spent solvent and replaces it with fresh solvent once each month.

- Paint Booth. A dry filter paint booth is available for use by customers. The customer provides all paint, reducer, solvent, spray gun, and is responsible for area clean-up, documentation of paint/solvent quantities used, and material removal after use. The filters are changed twice per year and turned in to DENR for disposal. In accordance with the Clean Air Act, paint, reducer, and solvent quantities are reported annually as a condition of the State issued Permit To Operate.

- Sanding. Vehicle dry body sanding is performed in the maintenance bays. Dust is collected through a cyclone system and sent through a filter prior to exiting through the roof. This filter is changed twice per year and turned in to DENR for disposal.

5.3.3 Hazardous Material Use and Waste Generation.

Table 5.3.1 shows the hazardous materials used in significant quantities at the Autocraft Shop. Estimates of the amounts used and descriptions of their uses are provided. Note that many materials that are used such as engine oil, antifreeze, paint, solvent, reducer etc. are not listed because they are provided by the customer.

Table T5.3.3.1 OMC Autocraft Shop Hazardous Material Use

Hazardous Material	Use Description
Safety Kleen solvent	300 gallons of petroleum naphtha are used per year to degrease small parts.

The following table shows the wastes generated in significant quantities at Autocraft Shop. Descriptions of their generation are provided. All other wastes are removed by the customers.

Table T5.3.3.2 OMC Autocraft Shop Waste Generation

Waste	Generation Description
Antifreeze	Approximately 200 gallons of antifreeze are generated per year from radiator flushing. The radiator is drained and a radiator flush is circulated through the radiator, drained, and consolidated with the spent radiator fluid. The waste is sent off-site for recycling through the DRMO contract.
Filters	Approximately 200-gallons/3600 lbs. of oil and fuel filters are disposed of annually. When oil is changed, the oil filters are allowed to drain overnight in a draining rack before being consolidated in a drum, and transported to DENR for crushing and sent off-site for recycling. Fuel filters are disposed through the DRMO contract.
Oil	About 1,500 gallons of waste oil are generated annually from oil changes. Oil is drained into a collection basin. Each night the oil is pumped from the basin and into an above ground double- wall constructed storage tank located on the outside of the building. A contractor picks up the oil for disposal every 90 days.

Rags and Dry-sweep	About 120 gallons per year of rags and dry-sweep that is saturated with oil from leaks and spills in the area. Rags that are not saturated are laundered through a local contractor.
Solvent	Petroleum naphtha based parts washing solvent is used. It is changed on a scheduled basis (twice per year) rather than when dirty. Approximately 200 gallons per year of solvent are recycled annually.
Mop water	Soapy mop water, used for floor clean up, is disposed of via floor drain into an oil/water separator that precedes a storm drain leading to a daylight drainage ditch. This same oil/water separator services the car wash area.

5.3.4. P2 Opportunities.

5.3.4.1 Wet Mopping. Wet floor washing occurs at the Autocraft Shop to maintain the clean appearance and remove any POL spill residuals. The standard cleaning method is mopping with a solution of water and Prism Powder 366® by Johnson Wax. The resulting mixture exits through the floor drains passing through an oil-water separator before entering the stormwater system to a drainage ditch. Prism Powder 366 is a partial emulisifer potentially inhibiting the oil-water separator efficiency and releasing oil out to the local surface water. A solution could involve a procedure where all small drips or spills of POL products are cleaned by using dry floor sweep. a small amount of non-emulsifying. or a quick release detergents only on the spill area. Quick release detergents form an emulsion to remove dirt but break the emulsion after a few minutes, which should be enough time to allow the oil-water separator to function properly.

a) Technical Feasibility. Implementation of modified housekeeping procedures and the use of a non-emulsifying detergent should not compromise the effectiveness of present cleaning results and facility operations . Therefore, this opportunity is technically feasible.

b) Environmental Feasibility. By eliminating the majority of oil at the source of release and minimizing oil emulsifying, system effectiveness is enhanced, contamination of the bay area is reduced, and oil discharge to the environment is decreased. Therefore, this opportunity is environmentally feasible.

c) Economic Feasibility. Because there is no additional equipment to purchase and thus no payback period, this opportunity is economically feasible.

5.4 OMC Directorate of Logistics Maintenance Division (Building #4506)

5.4.1 Overview of Operations.

The OMC Directorate of Logistics (DOL) Maintenance Division services the GSA fleet of automobiles and light trucks. They also repair electronic equipment (e.g., radios), forklifts, and lawn mowers. The Lawnmower Shop loans garden supply equipment to military personnel. They also dispense fertilizer and grass seed.

5.4.2. Process Description.

DOL maintenance operations are divided into distinct activities as described below. Any or all of the processes may be performed.

- Cooling System Flush and Antifreeze Change. Radiators that require servicing to repair leaks or remove buildup of rust and scale are drained of their fluids into catch pans. The fluids are then transferred to 5-gallon containers. The radiator and engine block are then flushed with a mixture of water and radiator flushing compound. This mixture is consolidated with waste antifreeze and managed as a recyclable waste through the DENR. At this point, leaking radiators can be repaired, sealed with a sealing compound, or replaced as necessary. When the repair is finished, the radiator is filled with a mixture of antifreeze and water. Radiator flushing is rarely performed.

- Battery Service. Batteries with low or no charge are either recharged using a standard charger, if possible, or replaced if they will not take a charge. Dead batteries are stored on an uncovered pallet outside. Approximately three batteries are traded in for new batteries at a supplier downtown and one is turned in to the Hazardous Waste Division for recycling each month.

- Engine Oil Change. Oil is drained from oil pans into catch pans. The oil is then transferred to a drum. Approximately 55 gallons is generated every four months. Oil filters are allowed to drain on a rack that is fitted inside a drum for anywhere from several minutes up to several hours before the filters are consolidated in a 30-gallon drum. The waste oil is then removed by a contractor for refining or energy recovery.

- Replenish Fluids. Other fluids besides antifreeze and engine oil are only replenished, not changed. These fluids include brake fluid, automatic transmission fluid, and power steering fluid.

- General Lubrication. General lubrication of friction points in vehicles is performed as necessary with general lubricating grease. Chain oil is used to lubricate chain saws.

- Repair and Mount Tires. Tires with repairable leaks are patched with tire cement. Tires with worn tread are removed and new tires are mounted on rims.

- Parts Cleaning. PD680 Type II solvent is used to clean electronic components. This dip tank solvent has not been changed in 3 years. All mechanical parts are cleaned in an aqueous parts washer. The skimming and sludge are collected and added to the used oil container. Break Free is used on occasion to loosen frozen bolts.

- Equipment Maintenance. Maintenance is performed on equipment such as lawnmowers and vacuum cleaners as necessary. This maintenance may require parts cleaning or lubrication. All equipment is drained of oils and fuels prior to equipment maintenance.

- Shop Maintenance. Cleaning materials, spray paints, pesticides and other materials are used as necessary to keep the garage clean and well maintained.

- Vehicle Wash. Vehicles are periodically washed at the outdoors open washrack using an emulsifying soap. The water is processed through a flow-through oil-water separator.

5.4.3. Hazardous Material Use and Waste Generation.

The following is a table showing the hazardous materials used in significant quantities at the DOL Maintenance Division. Estimates of the amounts used and descriptions of their uses are provided.

Table T5.4.3.1 OMC DOL Maintenance Division Hazardous Material Use

Hazardous Material	Use Description
Break-Free	6ea 2-gallon cans per year are used to break rusted parts free.
Brake Fluid	10ea 2-gallon cans per year are used to replenish brake fluid.
Battery Cleaner	6ea 12-ounce cans per year are used to clean automotive batteries.
Paint, Aerosol	2ea 12-ounce cans per year are used to paint equipment.
Diesel Pro Flo	48ea 12-ounce bottles are used as a diesel fuel additive.
Paint, Lacquer	36ea 13-ounce aerosol cans per year are used to paint equipment.

Hazardous Material	Use Description
Battery Corrosion Resistant Coating	6ea 12.25-ounce aerosol cans per year used for battery servicing.
Coating, Stencil cover	2ea 13-ounce aerosol cans per year are used for coating stencils prior to stenciling.
Gasket ADH	4ea 8.75-ounce aerosol cans per year are used as an adhesive for gaskets during engine maintenance.
Gasket Remover	4ea 12-ounce aerosol cans per year are used for removing gaskets during engine maintenance.
Engine Primer	12ea 7.8-ounce aerosol cans per year are used for starting engines.
Carburetor Cleaner	36ea 12-ounce aerosol cans per year are used for cleaning carburetors.
Vulcanizing Cement	4 8ea 1ounce cans per year are used for tire patching.
Battery Cleaner	10ea 14-ounce aerosol cans per year are used for cleaning battery posts.
Lube Compound	6ea 16-ounce aerosol cans per year are used for lubrication.
Antifreeze	10ea 1-gallon bottles per year are used with 50% water for filling and replenishing antifreeze in radiators.
Radiator Stop Leak	8ea 2-ounce tubes per year are used for sealing leaks in radiators.
Radiator Flushing Compound	6ea 12-ounce bottles per year are used for flushing radiators during radiator maintenance.
Flux Solder	1ea 4-ounce can per year is used for preparing surfaces for soldering.
White Brazing Flux	1ea 6.5-ounce bottle per year is used for preparing surfaces for brazing.
Engine Oil	360ea 1-quart cans per year are used for maintenance of police car engines.
10/30 Lube Oil	36ea quarts per year are used for maintaining lawnmowers.
Oil, 15/40	10ea 55-gallon drums per year are used for maintenance of automobile and truck engines.

Hazardous Material	Use Description
Oil, 85/140	Less than 1ea 55-gallon drum per year is used for lubrication.
Oil, 10 Wt.	Less than 1ea 55-gallon drum per year is used for lubrication.
Fuel Oil, Diesel	8ea 55-gallon drums per year are used with gasoline for running generators and forklifts.
White Grease	4ea 14-ounce cans per year are used for lubrication.
Anti-Seize Lube	2ea 4-ounce bottles per year are used for lubrication.
Pipe Seal Tape	10ea rolls per year are used for sealing threads when joining sections of pipe.
Sealing Compound	6ea 0.1-ml bottles per year are used for sealing.
Liquid Gasket	2ea 1-pint cans per year are used for forming gaskets.
Simple Green Cleaner	12ea 1-gallon bottles per year are used for cleaning.
Windshield Washing Compound	14ea 1-gallon bottles per year are used for cleaning windshields and replenishing windshield wiper reservoirs.
Chain & Bar Oil	1ea gallon per year is used to lubricate chain saws.
PD 680 Solvent, Type II	1ea 55-gallon drum per year is used for parts cleaning.
Power Steering Fluid	6ea 12-ounce bottles per year are used for replenishing power steering fluid.
Dexron II Hydraulic Fluid	24ea quarts per year are used for replenishing hydraulic fluid.
Transmission Fluid, Type F	6ea quarts per year are used for replenishing transmission fluid.
Hydraulic Jack Oil	2ea 1-gallon bottles per year are used for replenishing hydraulic jack oil.
High Temperature Grease	70 pounds per year are used for lubrication.
State Chemical Scrub	18ea 1-gallon bottles per year are used for washing hands.
Detergent, Pine Oil	20ea quarts per year are used for cleaning.
Scouring Powder	6ea 21-ounce cans per year are used for cleaning.

Hazardous Material	Use Description
Glass Cleaner	12ea 23-ounce aerosol cans per year are used for cleaning windows.
Deodorant GP	12ea 10-ounce aerosol cans per year are used for deodorizing rooms.
Insecticide	24ea 11-ounce aerosol cans per year are used for pest control.

The following is a table showing the wastes generated in significant quantities at the DOL Maintenance Division. Descriptions of their generation are also provided.

Table T5.4.3.2 DOL Maintenance Division Regulated Waste Generation

Waste	Generation Description
Antifreeze	Antifreeze is rarely generated. However, if it is, then it is consolidated at the Central HW Accumulation site and recycled or disposed through the DRMO contract.
Lead Acid Batteries	Approximately 50 wet-cell automotive batteries are generated annually from replacing dead, non-rechargeable batteries in vehicles. They are turned into DENR and recycled through a local contractor.
Filters	Approximately 300 gallons/5400 lbs of oil and fuel filters are generated annually from routine maintenance of vehicles. Filters are turned into the Central HW Accumulation site building 4495 with the oil filters being crushed and recycled. Fuel filters are disposed through the DRMO contract.
Fuel Oil	Approximately 55 gallons per year of contaminated fuel oil was generated from the removal of fuel oil from forklifts. Recycled through the DRMO contract.
Hydraulic Fluids	Hydraulic fluids such as transmission fluid and brake fluid are generated on a non-routine basis. At this time these fluids are replenished as necessary, but not changed except when the fluid is contaminated with a foreign material, such as water. Then the hydraulic fluid may be drained and replaced. The spent fluid is recycled under DRMO Contract.
Oil	About 320 gallons annually are generated from changing oil in trucks and automobiles. 100 gallons per year of the used oil is generated from equipment maintenance. Used oil is taken off-site every 90 days for recycling under the DRMO contract.

Rags/Debris	Saturated dry-sweep and rags are generated on a non-routine basis from spills of oil or other fluids. Dry-sweep from cleaning small drips and small spills is discarded in the trash if it is not saturated with oil.
Tires	Tires are returned to the vendor for managing.
Gasoline	60 gallons per year of contaminated gasoline is generated per year and recycled.
Adhesives	Adhesive wastes are generated on a non-routine basis when material prematurely hardens or becomes contaminated. Ultimate disposition depends on the material.

5.4.4 P2 Opportunities. The following paragraphs describe various P2 opportunities and their technical, economic, and environmental feasibility.

5.4.4.1 Optima Battery Usage. The optima battery system incorporates lead-acid chemistry into a type of battery construction. Each 12-volt Optima battery is approximately the same size and weight as a regular 12-volt lead acid-battery. The inner components, however, are arranged differently which extends the life of the battery and helps prevent leaks even when the battery's casing has broken open. The Optima battery consists of six cells which are electrically connected. Each cell has two long plates (one positive and one negative) wound tightly together in a spiral configuration. The plates are separated by an absorbent, micro porous glass material which holds the electrolyte. The spiral configuration provides more structural strength as compared with the traditional configuration of a series of parallel positive and negative plates. As a result, the lead does not need to be strengthened by adding materials such as antimony and calcium to form a stronger lead alloy (as found in typical lead-acid batteries). The use of pure lead (instead of a lead alloy) reduces the amount of grid corrosion and extends the life of the battery. The Optima has been found to have a life of 3 to 5 years (as opposed to approximately 1 year for typical lead-acid batteries used in many Army operations). In addition, because the electrolyte is completely absorbed within the micro porous glass layers, it will not leak from the battery even if the casing becomes damaged eliminating the need for secondary containment.

a) Technical Feasibility. A 12-volt Optima battery can be installed into a vehicle exactly like a typical lead-acid battery or installed upside down if needed. It is not considered hazardous and can be shipped through the mail. This battery is not the solution to all battery problems as the battery is not designed for continuous deep cycling operations like running battery powered forklifts. It will work for vehicles that do not run equipment directly off the battery or while idling for long periods (several hours at a time). For standard trucks and GSA vehicles, the Optima battery is technically feasible.

b) Environmental Feasibility. Assume that an Optima battery will last 4 times longer than a typical lead-acid battery. As a result, Optima batteries would have to be purchased only once every 4 years rather than once per year like the current batteries being used. Therefore, over 4 years, only 48 Optima batteries would have to be purchased as compared with 192 batteries (4 batteries/month x 12 month/year x 4 years) under the current system. Over those 4 years, the difference in battery usage would then be 144 less batteries for the Optima system. Prorating this to a 1-year time span (rather than 4 years) shows the following annual waste reduction (assuming each Optima battery weighs 40 lb):

$$\frac{144\,battery}{4\,year} = \frac{36\,battery}{year}$$

$$\frac{36\,battery}{year} \times \frac{40\,lb}{battery} = \frac{1440\,lb}{year}$$

Due to a 1440 lbs annual waste reduction and material usage, this opportunity is environmentally feasible.

c) Economic Feasibility. Because there is no additional equipment to purchase and thus no payback period, opportunity is economically feasible.

i) Implementation Costs. No increase in operational costs are associated with implementation. Each Optima battery costs approximately $135 (distributor). If the motor pool were to buy all 48 batteries, the total for a four year supply would be $6,480, or equivilent to $1,620 per/year. Currently, the motor pool spends $9,600 ($50 each x 192) for a four year supply on lead-acid batteries, or equivilent to $2,400 per/year . To implement the Optima battery P2 alternative, the motor pool would have reduced expenditure of $3120 over four years, or equivilent to -$780 less per/year. Therefore, no costs are associated with implementing usage of Optima batteries since savings are immediate.

ii) Recurring Cost. There are no additional costs associated with utilizing sealed lead-acid batteries as they are handled in the same manner as traditional lead-acid batteries.

iii) Cost Savings Due to Reduced Material Usage. As seen in the paragraph above, the implementation of Optima batteries would reduce the annual battery usage by an estimated 36 batteries per year. At a cost of $50 apiece with no additional labor expenses, this would save the motor pool the following amount per year offset by the difference in cost (12x50 – 12x135 = $1020):

$$\frac{36\ battery}{year} \times \frac{\$50}{battery} = \frac{\$1{,}800 - \$1{,}020}{year} = \$780/year$$

iv) Cost Savings Due to Reduced Disposal Fees. Since the vendor includes the core charge in the purchase price of the battery, there is no cost savings from reduced disposal fees.

v) Payback Period. The payback period is calculated by dividing the implementation costs by the cost savings as follows:

$$\frac{\$0}{\$780/year} = 0\ year$$

Since the estimated life of an Optima battery is 4 years and the payback period is 0 years, the implementation of this alternative essentially has immediate cost savings.. If combined with other activities such as Outdoor Recreation and DPW, this opportunity may have greater economic benefits in addition to the reduction of waste generated.

5.4.4.2. Lazarus® System. The Lazarus system is a pulse technology that reverses and prevents sulfating in vehicle lead-acid batteries. The Lazarus system consists of a wall-mounted unit designed for use in battery shops with multiple battery charging systems using 10-battery bus bars. New battery chargers are now commercially available which greatly improve charging effectiveness. This is accomplished by slow charging batteries using battery bus bars that convey the battery's charging needs to the charger which prevents the batteries from becoming over or undercharged.

a) Technical Feasibility. Use of the new battery charging system along with the Lazarus system can return approximately 80% of 'unserviceable' batteries back to their fully rated capacity. Both the charging unit and the Lazarus system are easy to operate and require minimal training in their usage. Thus, this opportunity is technically feasible.

b) Environmental Feasibility. The ability to reclaim 80% of the "spent" batteries would result in an average annual waste reduction of:

$$\frac{2{,}400\ lb}{year} \times 0.8 = \frac{1920\ lb}{year}$$

Thus, making this opportunity environmentally feasible.

c) Economic Feasibility.

i) Implementation Costs. A battery charger capable of charging 10 batteries simultaneously will cost approximately $500 (manufacturer). To utilize the charger fully,

one 10-battery bus bar ($250) [manufacturer] and one Lazarus unit ($1,500) [manufacturer] would be required. Approximately 3 hours of labor is required to set the equipment up and train on its operation; therefore, labor costs are:

$$3\,hour \times \frac{\$25}{hour} = \$75$$

Therefore, the total implementation cost is $2,375.

ii) Recurring Costs. There are no recurring costs associated with this P2 option since the difference in labor and utility costs are negligible. The one-time purchase of the charging unit and Lazarus system is all that is required.

iii) Savings from Reduced Material Usage. Because the Lazarus system can return approximately 80% of normally unserviceable batteries back to service, the motor pool would purchase 80% fewer batteries each year. The annual cost savings would be:

$$\frac{48\,battery}{year} \times 0.8 \times \frac{\$50}{battery} = \frac{\$1920}{year}$$

iv) Payback Period. The payback period is calculated by dividing the implementation costs by the total annual cost savings as follows:

$$\frac{\$2,375}{\$1,920/year} = 1.2\,years$$

Depending on the actual amount of batteries purchased, 48 batteries per year was an estimated figure, this pollution opportunity is economically feasible.

5.4.4.3 Rag Laundering. DOL maintenance workers use rags to wipe dirt, oil, and grease from equipment, parts, floors, and hands. Once they become soiled beyond use, they are disposed of as a hazardous waste. Rather than dispose of used shop rags, activities can use a rag laundering service (like AAFES and Outdoor Recreation) whereby a contractor provides clean shop rags on a regular basis and collects soiled ones for laundering and reuse.

a) Technical Feasibility. Overall, this initiative would not affect the production of any operations but would require a few procedural changes. These changes included no longer disposing of rags and using dedicated containers to hold the used rags until they can be collected by the contractor. All other aspects of this initiative (soiled rag pick-up, rag laundering, and rag delivery) would be handled by the rag service contractor.

b) Environmental Evaluation. If the DOL maintenance shop uses one 50 pound bundle of rags each month or roughtly 200 rags, disposing of the rags once they become used results in

600 pounds of hazardous waste per year (50 lbs/month x 12 month/year). By laundering and reusing the rags, this waste stream could be eliminated altogether.

c) Economic Evaluation.

i) Implementation Costs. The only implementation cost associated with this initiative would be for each maintenance shop to purchase a dedicated receptacle for used rag storage. The cost for such a receptacle is estimated to be $50.

ii) Recurring Costs. The cost of the service contract is the only cost associated with rag recycling. Assume that a contractor charges about $286 to deliver 50 clean rags and collect and launder the used ones each week ($0.11 each). Additional charges include inventory maintenance due to loss at 4 rags per week ($0.35 each) or $72.80 annually and an environmental flat fee of $2 per week or $104 per year. Thus, the total annual cost is $463.

iii) Recurring Cost Savings. Savings result from no longer having to buy new rags (they are provided in the contract) and no longer paying disposal fees.

Rag Purchase. If purchasing a 50 pound bundle of new rags costs $20, a maintenance shop using 12 bundles per year pays $240 in annual purchase costs. This cost would be completely avoided since the shop would no longer have to purchase its own rags (they would be provided as part of the laundering contract cost).

Rag Disposal. At a disposal cost of $0.15 per pound, disposing of 600 pounds of used rags per year costs $90 annually. By having the rags laundered, this cost would be completely avoided as well.

Total Recurring Cost Savings. The total annual cost associated with the rag laundering are $133 [$330 ($240 + $90) – $463] .

iv) Payback Period. The payback period is calculated by dividing the implementation cost by the difference between the recurring cost savings and the recurring cost. Since the cost is greater than the savings, this opportunity is not economiically feasible and will be revisited during the next P2 Plan update.

5.4.4.4 Vehicle Washing. Vehicle washing occurs at the DOL Maintenance Activitiy wash rack to maintain a clean outer appearance of the GSA vehicles. A standard steam cleaner is used with Simple Green® by Sunshine Makers, Inc. added. The resulting mixture is channeled over a paved surface and enters an oil-water separator before exiting into a storm drain that discharges to surface water. Simple Green emulisifes the oil potentially inhibiting the oil-water separator operation and releasing oil to the local surface water. Possible solutions to enabale the oil/water seperator system to function as designed and to elimiate oil contamination to the enviornment would include:

1) washing vehicles with water only or
2) the use of a quick release, non-emulsifying detergent that form an emulsion to remove dirt but break the emulsion after only a few minutes allowing the oil-water separator to function properly.

a) Technical Feasibility. Water only washing may be suitable for the majority of applications. When vehicle requires the use of a cleaner, a non-emulsifying detergent could be used and should not effect the cleaning process. Therefore, this opportunity is technically feasible.

b) Environmental Feasibility. By allowing the oil to be trapped in the oil-water separator, contamination of the surface water/soils and potentially the Monterey Marine Sanctuary is eliminated; therefore, this opportunity is environmentally feasible.

c) Economic Feasibility. Because there is no additional equipment to purchase and thus no payback period, this opportunity is economically feasible.

5.4.4.5. Re-refined Motor Oil. Re-refined motor oil approved by the Army's Mobility Technology Center-Belvoir is currently available through the Defense Supply Center Richmond. The re-refined oil meets the American Petroleum Institute "SH" specification and the International Lubricant Standardization and Approval Committee "GF-1" standard. The re-refined oil contains a 25% minimum re-refined base stock. Table T5.4.4.5.1 shows the national stock numbers.

a) Technical Feasibility. The use of re-refined motor oil in vehicle engines is technically feasible as it meets the American Petroleum Institute "SH" specification and the International Lubricant Standardization and Approval Committee "GF-1" standard.

Table T5.4.4.5.1 Re-refined Oil Material Costs

NSN	Viscosity	Unit of Issue	Cost
9150-01-413-6897	10W30	Box, 12 Quarts	$11.52
9150-01-413-6892	10W30	5-gallon can	$18.25
9150-01-413-6990	10W30	55-gallon drum	$158.50

b) Environmental Feasibility. Using re-refined oil does not reduce the amount of oil generated; however, it provides a larger market base for re-refined oil, which in turn, reduces the depletion of natural resources. Additionally, purchasing in bulk reduces hazardous waste disposal of the quart containers.

c) Economic Feasibility. There are no implementation costs or additional labor cost involved in using re-refined oil; however, re-refined oil costs $2.88 per gallon (purchased in bulk) as opposed to $3.02 for virgin oil. Table T5.4.4.5.2 shows an example cost difference.

Table T5.4.4.5.2 Example Cost Comparison Between Virgin and Re-refined Oil

Vehicle Type	Total Gallons	Cost per Virgin Oil Change	Cost per Re-refined Oil Change
Various Vehicles	320	$ 966.40	$ 921.60

This P2 opportunity is environmentally beneficial, easy to implement, and economical.

5.5 POM DENTAL ACTIVITY (BUILDING 422).

5.5.1. Overview of Operations.

The POM Dental Activity (DENTAC) provides incoming and outgoing personnel dental examinations. Long term personnel are also given annual examinations. The DENTAC performs approximately 15 large panoramic x-rays and 300 small x-rays each month.

5.5.2 Process Description.

Dental examination operations (relevant to pollution prevention efforts) that are typically performed are divided into distinct activities as described below. These processes are not necessarily performed sequentially and other processes can be performed. Any or all of the processes may be performed on a patient.

- X-Ray. Patients receive dental x-rays as they in-process at the POM and by scheduled appointment as needed.

- Develop Film. X-ray film is developed in an automatic film-processing machine with Air Techniques Developer and Fixer. The film is sequentially immersed in the developer, the fixer, and a rinse. Developer and fixer are automatically replenished as they are used by the machine. They are pumped out of their containers into the machine when the machine runs. As the developer and fixer are added, spent developer overflows out of the machine. The developer and the rinse water are sent to the local POTW. The fixer is collected in a five-gallon container and sent through DRMO for off-site silver recovery and fixer rejuvenation.

- Equipment Maintenance. The developer is cleaned periodically to remove the buildup of process chemicals on the rollers. Once per month, the machine is emptied and the rollers are cleaned using Spray 2000 Cleaner. The developer, fixer, and wash water are managed as described above.

5.5.3 Hazardous Material Use and Waste Generation.

The following is a table showing the hazardous materials used in significant quantities at the DENTAC facility. Estimates of the amounts used and descriptions of their uses are provided.

Table T5.5.3.1 POM DENTAC Hazardous Material Use

Hazardous Material	Use Description
Air Techniques Developer	50 gallons of developer are used per year to develop exposed x-ray film.
Air Techniques Fixer	50 gallons of fixer are used per year to develop exposed x-ray film.
Spray 2000	Four (4) quarts per year are used to clean the x-ray-developing machine.

Table T5.5.3.2 shows the regulated wastes generated in significant quantities at the DENTAC facility. Descriptions of their generation are also provided.

Table T5.5.3.2 POM DENTAC Waste Generation

Waste	Generation Description
Fixer	About 150 gallons of waste fixer are generated each year from the x-ray developing process. It is collected and sent through DRMO for off-site silver recovery.
Lead Foil	About 1.5 gallons/142 lbs. of lead foil are generated from the X-ray developing process per year. The lead foil is used as a backing for the film during the patient x-ray. It is removed before the film is developed. Lead foil waste is collected and recycled.
Amalgam	Minimal amounts of amalgam are collected for disposal off-site as a hazardous waste.
Regulated Medical Waste	The DENTAC regulated medical waste is combined with the MEDDAC regulated medical waste and not accounted for separately.

5.6 MEDICAL ACTIVITY (BUILDING #422, POM).

5.6.1. Overview of Operations.

The Medical Activity (MEDDAC) provides incoming and outgoing personnel physical examinations. Long term personnel are also given annual examinations. A small laboratory performs basic urinalysis tests. The medical clinic performs approximately Six-seven hundred x-rays are performed each month, depending on the number of students arriving or leaving.

5.6.2. Process Description.

Activities that are typically performed are divided into distinct activities as described below:

- Radiography. Patients receive x-rays either when they arrive at the POM or by scheduled appointment.

- Develop Film. X-ray film is developed in an automatic film-processing machine with Kodak RP X-Omat Developer and Fixer. The film is sequentially immersed in the developer, the fixer, and a rinse. One gallon each of developer and fixer concentrate is mixed with water to make 5 gallons each of developer and fixer. The developer and fixer are automatically added as the machine is used. As the developer and fixer are added, spent material overflows out of the developing machine. The spent developer and the rinse water are sent to the local POTW. The fixer is collected in a five-gallon container and sent off-site for silver recovery. The spent films are collected and sent to DRMO for disposition.

- Equipment Maintenance. The developer is cleaned periodically to remove the buildup of process chemicals on the rollers. Once per month, the machine is emptied and the rollers are cleaned. The developer, fixer, and wash water are managed as described above. On a weekly basis, the rollers and other parts with which the film may come in contact are cleaned.

- Patient Care. The medical activity is a general clinic that handles basic care: bumps, bruises, some sutures, general exams, etc. Inherent to patient care is the generation of regulated medical waste (RMW). This waste stream is collected and disposed of via a local contractor.

5.6.3. Hazardous Material Use and Waste Generation

The following is a table showing the hazardous materials used in significant quantities at the MEDDAC facility. Estimates of the amounts used and descriptions of their uses are provided.

Table T5.6.3.1. POM MEDDAC Hazardous Material Use

Hazardous Material	Use Description
Kodak RP X-Omat Developer	50 gallons of developer are used per year to develop exposed x-ray film.
Kodak RP X-Omat Fixer	50 gallons of fixer are used per year to develop exposed x-ray film.

The following is a table showing the regulated wastes generated in significant quantities at the MEDDAC facility. Descriptions of their generation are also provided.

Table T5.6.3.2. POM MEDDAC Waste Generation

Waste	Generation Description
Regulated Medical Waste	Roughly, 700 lbs. of RMW is generated annually.
Fixer	About 200 gallons of waste fixer is generated each year from the X-ray film developing process.

5.6.4. P2 Opportunity - Regulated Medical Waste Segregation. Segregation involves separating the RMW at the source of generation by distinguishing between which items belong in general solid waste trash receptacles and which items must go in appropriate RMW containers for disposal. Typically, plastic wrapping, rubber gloves, paper, and glassware with an occasional candy wrapper are found in the RMW stream. Poor segregation generates larger RMW volumes and higher disposal costs. Simple management tools can be applied to increase segregation: training in RMW, posting signage, and limiting access to RMW bags. Site specific RMW training can be provided to all employees within a medical treatment facility. This training can include the local definition of RMW, proper waste segregation, and the standard operating procedure for its handling. Besides volume reduction, training eliminates confusion and frustration among the generators and handlers of RMW over which wastes belong in the RMW bags. Posting signs near RMW bags throughout the facility stating the items that are defined as RMW serves as a simple reminder that general trash is not an RMW. Periodic spot checks for proper segregation can be used to evaluate the effectiveness of the training and posted signs. A third management tool for effective segregation is limiting access to RMW bags. Limiting access involves removing RMW bags from diagnostic treatment room receptacles and storing them in a nearby cabinet or drawer. This reduces the convenience of placing the general trash in the nearest container instead of the appropriate one while providing for instances when an RMW bag is warranted. Increased segregation reduces disposal, labor, and maintenance costs by removing

non-RMW from the RMW stream. This P2 initiative is easily implemented through management controls.

5.7 POM Outdoor Recreation (Building #228, POM)

5.7.1. Overview of Operations.

The POM Outdoor Recreation Facility maintains and services a variety of rental recreational equipment to include vans, a bus, minibuses, a light truck, and a few boats.

5.7.2. Process Description.

The POM Outdoor Recreation maintenance operations performed on vehicles and boats are similar and are described below.

- Cooling System Flush and Antifreeze Change. Radiators that require servicing to repair leaks or remove buildup of rust and scale are drained of their fluids into a 30-gallon container. The radiator and engine block are then flushed with a mixture of water and Super Flush. Fluid is packaged and turned in to the Central HW Site for recycling or disposal through the DRMO contract. At this point, leaking radiators are repaired, sealed, or replaced as necessary. When the repair is finished, the radiator is filled with a mixture of antifreeze and water.

- Engine Oil Change. Oil is drained from oil pans into one of several portable collection containers. Each container can hold approximately 20 to 30 gallons and is fitted with an 18-inch diameter flat funnel. Oil filters are allowed to drain in the funnel for anywhere from several minutes up to several hours before they are consolidated in a 30-gallon drum. After the oil is drained and the filter is removed, a new filter is installed and 10W40 oil (or similar) is used to refill the crankcase.

- Replenish Fluids. Other fluids besides antifreeze and engine oil are only replenished, not changed. These fluids include brake fluid, automatic transmission fluid, and power steering fluid.

- General Lubrication. General lubrication of friction points in vehicles is performed as necessary with general lubricating grease.

- Shop Maintenance. Cleaning materials, spray paints, insecticides, and other materials are used as necessary to keep the garage organized, neat and livable.

5.7.3. Hazardous Material Use and Waste Generation.

Table T5.7.3.1 shows the hazardous materials used in significant quantities at the POM Outdoor Recreation. Estimates of the amounts used and descriptions of their uses are provided.

Table T5.7.3.1 POM Outdoor Recreation Hazardous Material Use

Hazardous Material Use Description	
Johnson TC W-3	240ea 16-ounce bottles are used as a fuel additive for 2 cycle boat engines annually
Triple band Greaser	12ea 14-ounce bottles are used to grease steering columns of boats annually
Power Trim	9ea 1-ounce bottles of this hydraulic oil are used per year to replenish power trim tabs reservoirs in boats
OMC Carbon Guard	240ea 12-ounce bottles per year are used to add and remove carbon to fuel systems of older boat motors
Berryman B-12 Chemtool	26ea 13-ounce bottles per year are used as a fuel additive for boat engines
Berryman B-12 Chemtool	52ea 16-ounce bottles per year are used as a parts cleaner for boat engines
Castrol GTX 10 W 40 oil	216ea 32-ounce bottles per year are used to replenish and change motor oil
Castrol GTX 20 W 50 oil	96ea 32-ounce bottles per year are used to replenish and change motor oil
Preferred Antifreeze	52gallons per year are used to replenish/change coolant in cooling systems
Windshield cleaner	104ea 44-ounce bottles are used to clean windshields
Brake and Parts cleaner	104ea 44-ounce bottles are used to clean brakes and parts
Power Steering Fluid	12ea 12-ounce cans per year are used to replenish power steering fluid
Tuff stuff Foam	4ea 22-ounce cans per year are used to clean upholstery
Tuff Stuff glass cleaner	78ea 22-ounce cans per year are used to clean windows
Westerly car wash	52ea 64-ounce bottles per year are used to wash cars
Mapp gas	8ea 16-ounce cylinders are used for low temperature heating

Table T5.7.3.2 shows the regulated wastes generated in significant quantities at the POM Outdoor Recreation facility. Descriptions of their generation are also provided.

Table 5.7.3.2 POM Outdoor Recreation Waste Generation

Waste	Generation Description
Filters	Approximately 60 gallons/1080 lbs. of oil filters and fuel filters are generated annually. When oil is changed, the oil filters are allowed to drain for 5 - 10 minutes before being consolidated in a drum and sent to the hazardous waste group for crushing and disposal. Oil filters are recycled and fuel filters are disposed of through the DRMO contract.
Oil	About 120 gallons of waste oil are generated annually from oil changes. Oil is drained into a collection basin and pumped into a storage drum where it is collected and disposed via DRMO contract every 90 days.
Solvent	Solvent is combined with oil in this shop.
Propane	20ea 16 oz. empty non-refillable, steel containers are returned from camping rentals & maintenance torch use
Contaminated gasoline	About 12 gallons of contaminated gasoline are generated each year from contaminated fuel systems and is disposed through the DRMO contract.

5.7.4.1. Re-refined Motor Oil. Re-refined motor oil approved by the Army's Mobility Technology Center-Belvoir is currently available through the Defense Supply Center Richmond. The re-refined oil meets the American Petroleum Institute "SH" specification and the International Lubricant Standardization and Approval Committee "GF-1" standard. The re-refined oil contains a 25% minimum re-refined base stock. Table 2-2 shows the national stock numbers.

a) Technical Feasibility. The use of re-refined motor oil in vehicle engines is technically feasible as it meets the American Petroleum Institute "SH" specification and the International Lubricant Standardization and Approval Committee "GF-1" standard.

Table 5.7.4.1 Re-refined Oil Material Costs

NSN	Viscosity	Unit of Issue	Cost
9150-01-413-6897	10W30	Box, 12 Quarts	$11.52
9150-01-413-6892	10W30	5-gallon can	$18.25
9150-01-413-6990	10W30	55-gallon drum	$158.50

b) Environmental Feasibility. Using re-refined oil does not reduce the amount of oil generated; however, it provides a larger market base for re-refined oil, which in turn, reduces the depletion of natural resources. Additionally, purchasing in bulk reduces hazardous waste disposal of the quart containers.

c) Economic Feasibility. There are no implementation costs or additional labor cost involved in using re-refined oil; however, re-refined oil costs $2.88 per gallon (purchased in bulk) as opposed to $3.02 for virgin oil. Table T5.7.4.2 shows an example cost difference.

Table 5.7.4.2 Example Cost Comparison Between Virgin and Re-refined Oil

Vehicle Type	Total Gallons	Cost per Virgin Oil Change	Cost per Re-refined Oil Change
Various Vehicles	120	$ 362.40	$ 345.60

Thus, this P2 opportunity is economically beneficial.

5.8 Directorate of Public Works (Building # 4518, OMC and #268, POM).

5.8.1 Overview of Operations.

Facility maintenance at POM and OMC is under contract to the cities of Monterey and Seaside. Opportunities for Pollution Prevention need additional review for each area.

5.8.2 Process Description.

DPW maintenance operations are divided into distinct activities as described below. Any or all of the processes may be performed.

- Building Repair. Various repairs are performed on housing units and other federal buildings at both facilities. Repairs that require the use of hazardous materials include roofs, tiling, plumbing, and electrical work. Empty containers, which contained the hazardous materials needed for these processes, are collected. Other wastes generated from building repairs include batteries from flashlights and instruments as well adhesives and roofing tar that have hardened or have otherwise become contaminated with foreign material.

5.8.3 Hazardous Material Use and Waste Generation,

Table T5.8.3.1 on the following page shows the hazardous materials used in significant quantities at the DPW maintenance division. Estimates of the amounts used and descriptions of their uses are provided.

Table T5.8.3.1 OMC/POM DPW Hazardous Material Use

Hazardous Material	Use Description
Paint Thinner	60 gallons of thinner are used each year for thinning paint and for cleaning paint equipment.
Lacquer Thinner	16 gallons are used each year for thinning paint and for cleaning paint equipment.
Acetone	10 gallons are used each year for thinning paint and for cleaning paint equipment.
Mineral Spirits	15 gallons are used each year for thinning paint and for cleaning paint equipment.
Latex Paint	Various latex paints are used for painting buildings as well as traffic markings. About 500 to 600 gallons are used each year.
Oil Based Paints	Various oil-based paints are used for painting. About 160 gallons are used each year.
Varnish and Lacquer	Various varnishes and lacquers are used for painting. About 2 gallons are used each year.
Silk-screen Maskant	Silk-screen maskant is applied to silk screens to make them easier to clean after use. About 5 gallons are used each year.
Paint Stripper	4 gallons of paint stripper are used each year for removing paint.
Aerosol Paint	11 gallons per year of paint are applied using 16-ounce aerosol cans.
Patching Compound	55 pounds per year are used to patch walls before painting.
Caulk	18 tubes of caulk are used per year for sealing cracks and joints.
Joint Treatment	14 gallons per year are used for treating joints.
Patching Compound	55 gallons of patching compound are used per year for patching holes in walls.
Putty/Glazing Compound	27 pounds are used per year for various maintenance operations.
DTE Oil Medium	Two 5-gallon cans are used per year as a machine lubricant.

Hazardous Material	Use Description
Glass Cleaner	Three 22-ounce cans (Chem Pak) and two 22-ounce cans (C. R. Lawrence Co.) are used per year.
Silicone Caulk	Four 10.1-ounce tubes are used per year for caulking.
Diamond Tool Coolant	Three 1-gallon containers are used per year as a coolant during machining.
DAP 33 Glazing	One 5-gallon container is used per year for building maintenance.
Molecular Sieve Adsorbent	One 1-gallon container is used per year for building maintenance.
Sealant, CLR 230	15 ten-ounce tubes are used per year for caulking.
Adhesive	130 gallons of adhesive are used for housing maintenance each year. Various adhesives are used for laying floor tiling and installing panels and sideboards. The products used include Cold Process Adhesive, Wet Surface Cement, CLR Floor 430 Adhesive, Adhesive 80, and Linoleum 150 Adhesive.
C Flux Lead Free	25 twelve-ounce tubes are used per year to prepare surfaces for soldering.
Sealacone DAP	Five 3-ounce tubes are used per year. Efforts are being made to stop using this product. It is used for sealing joints and cracks.
So-Sure S-70 Disinfectant	Five 1-gallon cans and 60 16-ounce cans are used per year.
White/Dry/Tile Grout	Six 5-pound boxes (Grout Scot) are used per year for filling spaces between tiles.
Fluid Film	23ea 22-ounce cans are used per year at the Glass Shop.
1973 Glass Cleaner	120ea 16-ounce cans are used per year at the Glass Shop.
Grease-B-Gone	500 - 600 ounces per year used to remove greases.
Wet R Dry PVX Cement 725	10 pints per year are used for building maintenance.
Glazing compound 33	Five pints per year are used for building maintenance.
Propane	About 1000 pounds per year are used for brazing.
Cement PVC 705	30 pints per year are used for building maintenance.
Mapp Gas	60 pounds per year are used for brazing
Solder	One 10-pound spool per year is used for soldering.

Hazardous Material	Use Description
Slic-Tite with Teflon	20 pints per year are used for building maintenance.
RTV Blue Form-A-Gasket	120 ounces per year are used for building maintenance.
Contact Cement	30 one-gallon cans per year are used for building maintenance.
Asbestos Encapsulate	Two 5-gallon cans per year are used for encapsulating asbestos.
PVC Glue	Quantity not determined. The glue is issued in one-pint containers and is used for joining sections of PVC pipe.
Quikrete	100 six-pound tubes per year are used for building maintenance.
Plumbers Putty	40ea 14-ounce containers are used for building maintenance.
DAP	200 10.2-ounce tubes per year are used for building maintenance.
Acetylene	Ten 150-pound cylinders per year are used for welding.
Oxygen	Ten 150-pound cylinders per year are used for welding.
Argon	Eight 150-pound cylinders per year are used for welding.

Table T5.8.3.2 shows the regulated wastes generated in significant quantities at DPW maintenance facilities. Descriptions of their generation are also provided.

Table T5.8.3.2 OMC/POM DPW Regulated Waste Generation

Waste	Generation Description
Roofing Tar	About 12 gallons per year of unused roofing tar are generated as hazardous waste. Roofing tar is used for repairing leaks on roofs. Typically a whole can is used for patching a leak and the empty cans are discarded as empty containers. On occasion, hardened or contaminated tar becomes a waste. The roofing tar is then consolidated as hazardous waste for disposal through DRMO.
Empty Containers	Empty one and five-gallon containers, which previously contained hazardous materials, are consolidated as hazardous waste for off-site disposal. Approximately 140 cans are generated per year.
Paint	Approximately 120 gallons of waste paint are generated per year.

Waste	Generation Description
Batteries	NiCad batteries from radios, flash lights, meters and other equipment are generated in small quantities.
Fluorescent Tubes	Approximately 7500 pounds are generated annually.
Fluorescent Light Ballast	Approximately 155-gallons/620 lbs. are generated annually.
Adhesives	About 60 gallons of unused adhesive become a hazardous waste each year because of material hardening or contamination.

5.8.4 P2 Opportunity - Aerosol Can Puncturing and Recycling. Aerosol can puncturing, crushing, and recycling is a way to eliminate disposing of aerosol cans as solid or hazardous waste. Aerosol can puncture devices are available that breach and empty the cans to make them classifiable as "empty," for EPA requirements. The processed cans are then no longer considered to be a hazardous waste and can be recycled at a lower cost. While the aerosol are being recycled via DRMO, the generation of the waste as hazardous still counts toward the installation's annual report.

a) Technical Feasibility. Aerosol can puncturing devices safely puncture the cans, capturing their contents for easy recycling or disposal. Spray nozzles are removed as well. A simple, low-capacity can operator puncturing unit does not require power and is manually operated. The operator presses on a handle which causes a puncture pin to pierce the aerosol can. The can's contents are collected in storage containers according to different waste types. However, permit requirements and costs need to be researched prior to implementing this measure.

b) Environmental Feasibility. Empty steel paint and aerosol cans are accepted by the steel industry for recycling. Aerosol cans must be completely empty, with the plastic lid removed (spray nozzles do not need to be removed for recycling). Residues remaining in aerosol cans are subject to federal and state regulations. Puncturing the cans reduces the hazardous waste volume going to a permitted landfill. Recycling aerosol cans reduces the amount of solid waste disposed and provides a raw material for future products thereby conserving resources; thus, this opportunity is environmentally feasible.

c) Economic Feasibility. The following analysis assumes a generation rate of 1/8 ton of aerosols per year.

i) Implementation Cost. The capital costs for a manual aerosol cans puncturing system is $775.

ii) Recurring Costs. The operating costs for an aerosol can puncturing and recycling program include labor costs for a coordinator/monitor and materials

handling costs assumed to be 4 hours per month at $25 per hour or $1,200 per year. The transportation costs to consolidate the aerosol cans for puncturing are estimated to cost $50 per month or $600 per year. Additionally, the hazardous waste disposal costs of the residual liquid collected in the 55-gallon drum is estimated at $125 per 55-gallons. Assuming the puncturing process generates 2 55-gallon drums annually, the disposal cost is $250 per year. Thus, the total annual recurring cost is estimated at $2.050.

iii) Recurring Cost Savings. Market prices for scrap steel are about $5 per ton. Based on a 1/8 ton of aerosol cans generated annually, the revenue generated from the sale is $1.00 per year. The cost avoidance due to reduced recycled hazardous waste disposal at $2.25 per pound or $4,500 per ton is $562.50 per year. Thus the total annual cost savings is $563.

iv) Payback Period. The payback period is non-recoverable; therefore, this opportunity is not economically feasible.

6.0 IMPLEMENTATION SCHEDULE.

This section sets goals for when each opportunity should be implemented. The goals are divided into several implementation time frames and each opportunity is placed within a time frame based upon its feasibility. The time frames are short term, intermediate term, and long term. For the purposes of these goals, short term is within one year and encompasses those opportunities that are very easy to implement and require little or no funding (i.e., the required funds are immediately available to the project). The intermediate term is between one and three years and will include projects that are relatively easy to implement but require larger amounts of funding (i.e., funds are not readily available and must be requested through mechanisms such as the EPR process). With intermediate term projects, requests for funds should be initiated immediately with the expectation that the funds will arrive in time to actually implement the project within the three years. The long term is beyond three years and includes projects that require extensive research before implementation and/or large amounts of funding that are not typically available to P2 projects through the EPR process. For long term projects, research and/or requests for funds should be initiated immediately with the expectation that the project will eventually be implemented. Some opportunities may never be recommended for implementation and are not included on the schedule. This is because the opportunity may not be feasible or it may be less feasible than other opportunities identified.

Table T6.1. P2 Implementation Schedule

P2 Opportunity	Location	Waste Reduction (lbs/year)	Cost Savings ($/year)	Implementation Schedule			
				Short (< 1 year)	Intermediate (1-3 years)	Long (3+ years)	
Alternative Solvents Enzyme based Parts Washer	AAFES, OMC	789	250			X	NO
Wet Mopping	Autocraft Shop	Unknown	0	X			NO
Optima Battery Usage	DOL	1,440	780		X		NO
Lazarus System	DOL	1,920	1,920		X		
Rag Laundering	DOL	600	0		X		
Water Washing	DOL	Unknown	0	X			
~~Digital Imaging~~ Separation of Reg. Med. Waste	DENTAC	2,700	Unknown			X	Oct'01 Implement
	MEDDAC	2,700	Unknown			X	
Re-refined Motor Oil	DOL	0	45	X			
	Outdoor Recreation	0	17	X			NO

Appendix A. General Pollution Prevention references .

1. The Defense Environmental Network & Information eXchange (DENIX) provides DoD personnel in the environmental security with timely access to environmental legislative, compliance, restoration, cleanup, and DoD guidance information. It is intended to serve as a central electronic "meeting place" where information can be exchanged among environmental professionals worldwide. DENIX is accessible via the internet at http://www.denix.osd.mil.

2. Environmental Products Catalog. The Defense Logistics Agency (DLA) has hundreds of environmental products in its supply system ranging from citrus-based degreasers and complete antifreeze recycling systems to natural resource conservation products. Many different units of issue are available to help ensure you buy only what you need. Most of these items can be shipped directly from the supplier to your location. DLA is accessible via the internet at http://www.dscr.dla.mil.

3. U.S. Environmental Protection Agency's Pollution Prevention Programs Page contains links to various P2 programs and publications. It is accessible via the internet at http://www.epa.gov/epahome/media.htm#p2. The following list is an example of the different types of information available.
Design for the Environment (DfE) - helps businesses incorporate environmental considerations into the design/redesign of products, processes, and technical and management systems.
Energy Star Program - information about voluntary industry partnerships that encourage the production and use of energy-efficient equipment to reduce energy usage and prevent air pollution.
Environmentally Preferable Purchasing Program - a federal-wide program that encourages and assists Executive agencies to purchase environmentally preferable products and services.
Enviroene - this site provides a single repository for pollution prevention, compliance assurance, and enforcement information and data bases.
Presidential Green Chemistry Challenge - this program seeks to promote pollution prevention and industrial ecology through a partnership with the chemical industry.
Pollution Prevention - works for "source reduction," and other practices that reduce or eliminate the creation of pollutants.