



UNITED STATES MARINE CORPS

MARINE CORPS AIR STATION  
BOX 99100  
YUMA, ARIZONA 85369-9100

StaO 6280.1A

3VA3D  
01 APR 1999

STATION ORDER 6280.1A

From: Commanding Officer

To: Distribution List

Subj: POLLUTION PREVENTION AND HAZARDOUS WASTE MINIMIZATION PLAN

Ref: (a) Executive Order 12856

Encl: (1) Pollution Prevention and Hazardous Waste Minimization  
Plan

1. Purpose. To implement the Pollution Prevention and Hazardous Waste Minimization Plan for Marine Corps Air Station (MCAS) Yuma and its tenants.

2. Cancellation. StaO 6280.1

3. Information

a. Reference (a) established the requirement for federal facilities to write pollution prevention plans to reduce the generation, emission, and off-site transfers of wastes. In addition, generators of hazardous waste are required to certify that a plan for the minimization of hazardous waste generation is maintained.

b. Enclosure (1) constitutes the Pollution Prevention and Hazardous Waste Minimization Plan for MCAS Yuma and the Cannon Air Defense Complex. The Air Station is committed to remaining on the cutting edge of environmental performance while maintaining the combat readiness that has made the Corps world famous.

4. Action. All commands/Departments at MCAS Yuma shall ensure that their personnel are aware of the requirements of the Pollution Prevention and Hazardous Waste Minimization Plan and shall personally support and implement policies and procedures contained therein.

  
C. J. TURNER

DISTRIBUTION: B plus 3VA (15)



# POLLUTION PREVENTION AND HAZARDOUS WASTE MINIMIZATION PLAN

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MARINE CORPS AIR STATION  
YUMA, ARIZONA

REVISION 01  
MARCH 1998

01 APR 1999

## EXECUTIVE SUMMARY

This Pollution Prevention (P2) and Hazardous Waste Minimization Plan for the Marine Corps Air Station (MCAS) Yuma, Arizona, has been prepared by Brown and Caldwell (BC) on behalf of Department of the Navy, Southwest Division, Naval Facilities Engineering Command (SWDIV). The Pollution Prevention Plan was prepared in agreement with Delivery Order No. 0010, dated August 7, 1996, under Contract N68711-95-D-7531.

This Plan has been developed in accordance with Executive Order (EO) 12856, which requires Federal facilities to comply with the Pollution Prevention Act of 1990, and to be responsible for the planning and reporting requirements regarding toxic and hazardous materials which are outlined in Sections 302 through 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA). This Plan is the successor to previous Pollution Prevention Plans implemented by MCAS, Yuma, and has been designed to meet applicable state, federal and Marine Corps requirements.

Mail completed Pollution Prevention Plan to:  
Arizona Department of Environmental Quality  
Pollution Prevention Unit  
3033 N. Central Avenue

## POLLUTION PREVENTION PLAN

### SECTION 1. GENERAL INFORMATION

Name of Company: United States Marine Corps, Air Station, Yuma

Mailing Address: Environmental, Box 99110  
Yuma, AZ 85369-9110

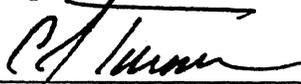
Contact Person: FREDERICK E. DANIEL Telephone Number: (520) 341-2809

One Pollution Prevention Plan may be submitted to cover more than one facility.  
Complete Section 3 for each facility covered by this Plan.

How many facilities will be covered by this Plan? 2

### SECTION 2. CERTIFICATION

"I certify that I have personally examined this Pollution Prevention Plan, that I am familiar with its contents and all attachments, and based upon my inquiry of those persons immediately responsible for obtaining the information contained in the Plan, I believe the information presented in the Plan is true, accurate and complete."



*Signature* Commanding Officer, Marine Corps Air Station, Yuma

CRAIG J TURNER

*Name*

COMMANDING OFFICER

(520) 341-2224

(520) 341-5216

*Title of person certifying the Plan*

*Telephone Number*

*Fax Number*

**FACILITY INFORMATION**

Facility Name: Marine Corps Air Station

Physical Address: Avenue 3E  
Yuma, Arizona

Principal Business Activity: Aviation, with support maintenance

SIC Code (4 digits): 9711 Other SIC Codes: \_\_\_\_\_

Geographic Location: Latitude: N 32 ° 39 ' 54.0 " Longitude: W 114 ° 35 ' 61.0 "

**Permits**

RCRA ID Number: AZ 8170024493

NPDES Permits:	None
Arizona Department of Environmental Quality	Pollution Prevention Unit ID# 200407 Air Pollution Control Operating Permit #271077-96 Air Quality Control Permit #1000020
Air Quality District, Open Burn Permit	AQD PU95121021:YUMA:DGC
City of Yuma, Industrial User Permit (wastewater)	#0001

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**SECTION 3. FACILITY INFORMATION**Facility Name: Marine Corps Air Station, Cannon ComplexPhysical Address: 14 th Avenue, Yuma, AZPrincipal Business Activity: Training, with vehicle maintenanceSIC Code (4 digits): 9711 Other SIC Codes: \_\_\_\_\_Geographic Location: Latitude: N 32 ° 37 ' 30 " Longitude: W 114° 30' 31 "**Permits**RCRA ID Number: AZ 4570024139

NPDES Permits: None

Air Quality Permits: Open Burn Permit #1907

Water Quality Permits: None

## 1.0 INTRODUCTION AND PURPOSE

In 1990, Congress passed the Pollution Prevention Act, which established a national policy of pollution prevention by source reduction, recycling, treatment, and as a last resort, disposal in an environmentally safe manner. Consistent with that objective, The State of Arizona codified requirement for Pollution Prevention Planning in Title 49 of the Arizona Revised Statutes. Facilities subject to Community Right-to-Know and Toxic Release Inventory reporting requirements are also required to implement a comprehensive pollution prevention strategy, documented in the Pollution Prevention Plan.

In 1993, the President signed Executive Order (EO) 12856, which direct all Federal facilities to comply with the requirements of the Pollution Prevention Act, as well as the Emergency Planning and Community Right-to-Know Act . This order established the policy that the Federal government and Federal facilities would establish a leadership role in implementing the national pollution reduction policy.

In compliance with EO 12856, the Secretary of Defense directed the branches of the military to implement pollution prevention and established reduction goals, called Measures of Merit.

The purpose of the Pollution Prevention Plan is to:

- Identify the procedures that will be used to comply with the requirements of Executive Order (EO) 12856, Department of Defense (DoD), Department of the Navy (DoN), and Marine Corps directives, and Federal, state and local laws and regulations;
- Develop a strategy and establish methods to minimize pollutants, such as reduce the generation of solid and hazardous wastes (HW), and the procurement, storage and use of hazardous materials (HM);
- Identify major processes that use HM and generate toxic chemical releases and off-site transfers that impact the air, water, or land; and
- Develop cost-effective methods of reducing the release of toxic chemicals to the environment and off-site transfers of solid and hazardous wastes.

Facility operations at MCAS, Yuma include a number of maintenance and repair processes which necessitate the use of toxic and hazardous materials. These processes initially were assessed in the 1994 MCAS Yuma Hazardous Waste Minimization Plan (Dames and Moore, 1994). In response to the requirements of EO 12856, which mandated that all branches of the Federal Government meet the requirements and intent of Federal, State, and local laws with respect to responsible environmental management, the Activity prepared a Pollution Prevention Plan (MCAS Yuma, 1995) which was submitted to and approved by the State of Arizona, Department of Environmental Quality (DEQ).

The planning, reporting and record keeping requirements of EPCRA, Sections 301-313, are the basis for the data by which the facility can monitor continuous improvement in pollution prevention. Briefly, these requirements include:

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- . Planning Emergency Response (secs 301 -303)
- . Reporting Leaks and Spills (secs 304-305)
- . Reporting Chemical Inventories (secs 311-312)
- . Reporting Releases of Toxic Chemicals (sec 313)

Other reporting requirements (solid wastes, air emissions, and wastewater) also provide data the facility needs to identify the most effective approaches to reducing pollution.

The State of Arizona also requires that facilities which submit Pollution Prevention Plans provide annual reports on the progress of the efforts, including assessments against the numerical goals and discussion of the management practices implemented. The Annual Report is derived from the section of the Plan which discusses the Plan of Action and Milestones, Section 9.0 of this document.

This document is designed to update the current facility plan and meet the most recent Arizona DEQ guidance (ADEQ 1996) as well as the Marine Corps Headquarters Guidance (Headquarters 1995).

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## 2.0 GOALS AND OBJECTIVES

The following goals have been established for the facility and are derived from the Department of Defense Measures of Merit.

- By 1999, reduce releases and off-site transfers of toxic chemicals 50 percent from a 1994 TRI (Toxics Release Inventory) baseline;
- By 1999, reduce the disposal of hazardous waste 50 percent from a 1992 baseline;
- By 1999, reduce the disposal of non-hazardous solid waste 50 percent from a 1992 baseline;
- By 1999, recycle 50 percent of non-hazardous solid waste from a 1992 baseline.

The objectives of the P2 Plan for MCAS Yuma include the following:

- improving compliance with all applicable environmental requirements and regulations;
- reducing operating costs with respect to waste management and the purchase of raw materials;
- reducing the risk of MCAS Yuma creating environmental contamination that may result in environmental liabilities and cleanup; and
- increasing the operating productivity of MCAS Yuma by providing cleaner, healthier, and more efficient work processes through implementation of innovative P2 techniques.

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### 3.0 APPLICABILITY AND SCOPE

This section of the Plan describes all installation activities to which the Pollution Prevention Plan applies, including tenant and support organizations and on-site contractors and their personnel. This section also defines the scope of the Plan, including but not limited to Pollution Prevention associated with HM, HW and solid waste.

The MCAS Yuma Pollution Prevention/Waste Minimization Plan, implemented at the direction of the Commanding Officer, will cover the time period from **January 1997 to January 1999**. The plan addressed pollution prevention, solid waste reduction, and resource management through a continuous process of waste stream evaluation and characterization, assessment of alternatives, implementation of changes, and measurement of progress. The program will be a process of continuous improvement, with periodic reassessment of objectives and milestones and development of new goals as technology and requirements allow.

Areas considered in this program include:

- Hazardous and toxic material use and disposal;
- Solid waste management;
- Wastewater management;
- Stormwater and surface water management; and
- Air emissions from stationary and mobile sources.

Pollution Prevention is the responsibility of each tenant Unit, the overall Facility command, and contractors and service providers employed by the Base.

## 4.0 POLICY STATEMENT

On August 3, 1993, President Clinton signed Executive Order (EO) 12856, "Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements". The President signed EO 12856 to challenge the Federal Government to become a leader in pollution prevention and to be a good neighbor by providing local and state authorities with information concerning Federal government's use of toxic and hazardous chemicals and extremely hazardous substances. On December 10, 1993, the Under Secretary of Defense for Acquisition and Technology signed a memorandum that: 1) states Department's complete support for EO 12856, 2) provides a policy statement on EO 12856, and 3) sets out deadlines and assigns responsibilities to DoD components and individual facilities to meet the requirements of EO 12856. On August 11, 1994, the Secretary of Defense issued a Comprehensive Pollution Prevention Strategy incorporating the requirements of EO 12856, as well as other environmental orders.

MCAS Yuma will strive to reduce releases and off-site transfers of any toxic chemical meeting threshold reporting levels pursuant to EPCRA Section 313 by 50% by December 31, 1999. Our pollution prevention efforts will follow the environmental hierarchy established by the Pollution Prevention Act of 1990, which is as follows:

- First, pollution should be prevented at the source;
- Second, pollution that cannot be prevented should be recycled in an environmentally safe manner;
- Third, pollution that cannot be prevented or recycled, should be treated in an environmentally safe manner;
- Finally, disposal or other controlled release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.

Per the United States Marine Corps Pollution Planning Guide of June 1995, MCAS Yuma will seek additional pollution prevention opportunities, consistent with the Department of Defense (DOD) Measures of Merit. These Measures of Merit are:

- By 1999, reduce releases and off-site transfers of toxic chemicals 50 percent from a 1994 TRI baseline;
- By 1999, reduce the disposal of hazardous waste (HW) 50 percent from a 1992 baseline;
- By 1999, reduce the disposal of non-hazardous solid waste 50 percent from a 1992 baseline;
- By 1999, recycle 50 percent of non-hazardous solid waste from a 1992 baseline;
- By 1999, ensure 75 percent of acquisitions of new non-tactical vehicles are alternately fueled vehicles;
- Where practicable, reduce procurement, storage, and use of extremely hazardous substances and EPA 17 Industrial Toxics; and reduce releases of hazardous air pollutants as defined in the Clean Air Act.

At MCAS Yuma, protecting the environment is a high priority. We are committed to eliminate or reduce our generation of all wastes whenever possible. Command and management levels support development of station pollution strategies and are committed to achieving plan goals. We encourage employee participation in preventing pollution through award programs.

<sup>1</sup> Memorandum for Assistant Secretary of the Army, Assistant Secretary of the Navy, Assistant Secretary of the Air Force, Directors Defense Agency, DUSD (ES)/EQ of 13 April '95.

## 5.0 INSTALLATION DESCRIPTION AND MISSION

This section of the P2 Plan provides a mission overview and a brief description of MCAS Yuma and its tenants.

### 5.1 MISSION STATEMENT

The primary mission of MCAS Yuma is to support aerial weapons training for the Atlantic and Pacific Fleet Marine Forces and Navy, and to serve as a base of operations for Marine Aviation Weapons and Tactics Squadron-1, Marine Aircraft Group 13 and other 3rd Marine Aircraft Wing units.

### 5.2 GEOGRAPHIC OVERVIEW

MCAS Yuma is the busiest Air Station in the Marine Corps and the second busiest in the Naval service. It is also one of the largest single contributors to the economy of Yuma County. As the scheduling authority for the Yuma Training Range Complex, MCAS Yuma provides fleet squadrons access to 10,000 square miles of special-use airspace designated for military aviation training and almost 2,000 square miles of underlying land reserved as aerial bombing and gunnery ranges. Every year, approximately 50 aviation units deploy at MCAS Yuma to train on Yuma's 2.8 million-acre range complex.

### 5.3 BASE OPERATIONS/ACTIVITIES

Base operations consist of:

- Headquarters and Headquarters Squadron (H&HS): responsible for the administration and training functions of the air station. It consists of the Search and Rescue Division, the Intermediate Maintenance Activity, the Airfield Operations Department, the Fleet Services Division and the Range Management Department.
- Marine Aircraft Group (MAG) is comprised of Marine Aviation Logistics Squadron and Marine Attack Squadrons which provide close-air support, conduct armed reconnaissance and assume limited air defense roles.
- Marine Aviation Logistics Squadron (MALS) provides intermediate level maintenance and supply support to Harrier squadrons, enabling the squadrons to deploy worldwide.
- Marine Aviation Weapons and Tactics Squadron (MAWTS) is responsible for coordination and supervision of the development and presentation of formal courses of instruction, academic and flight, with both the regular and reserve establishments.
- Marine Wing Support Squadron (MWSS) provides the equipment, personnel, and skills necessary to maintain airfield operations, including weather forecasting, law enforcement, internal airfield communications, Crash, Fire and Rescue Support, Explosive Ordnance Disposal, engineer services, runway construction and repair, heavy equipment support, motor transport support, aircraft refueling operations, messing, medical services, and administration.
- Marine Air Control Squadron (MACS) is a Fleet Marine Force Unit. Its mission is to

- provide control for anti-aircraft warfare operations and continuous all-weather ATC services.
- Light Anti-aircraft Missile Battalion (LAAM) is a component of Marine Air Control Group. The battalion provides air defense against low and medium-altitude airborne targets.
  - Marine Fighter Training Squadron (VMFT) mission is to improve the Marine Corps' air-to-air combat readiness by employing current threat tactics against Marine pilots.
  - Combat Services Support Detachment (CSSD)'s mission is to provide combat service support to units stationed for training in Yuma. CSSD provides intermediate maintenance on engineer, motor transport and ordnance equipment, as well as supply support and dental services aboard MCAS.
  - The Light Armored Vehicle Test Directorate (LAVTD) conducts, coordinates and furnishes specialized management of those tests and evaluations necessary on the LAV family of vehicles. LAVTD has developed and maintains database management systems used in the collection, storage and analysis of all LAV associated test data.

#### 5.4 SUMMARY OF ENVIRONMENTAL ACTIVITIES

The following Pollution Prevention Activities were reported in the Pollution Prevention Progress Report for Calendar Year 1995 as goals which had been achieved.

**Goal Statement:** Reduce off-site transfers of hazardous waste 50% from a 1992 baseline by 1999.

Toxic substance or wastestream: Tire wash waste stream containing cadmium.

Method for reduction: Closed-loop hot water parts washer.

Baseline quantity (year): 64101 lbs. (1992)

Reduction quantity (year): -63221 lbs. (1996) 99% reduction

**Goal Statement:** Reduce off-site transfers of hazardous waste 50% from a 1992 baseline by 1999.

Toxic substance or wastestream: Spent lithium batteries

Method for reduction: discharge completely rendering material non-hazardous.

Baseline quantity (year): 11909 lbs. (1992)

Reduction quantity (year): -11338 lbs. (1996) 95% reduction

**Goal Statement:** Reduce off-site transfers of hazardous waste 50% from a 1992 baseline by 1999.

Toxic substance or wastestream: Freon-113/hydraulic fluid

Method for reduction: material substitution

Baseline quantity (year): 41667 lbs. (1992)

Reduction quantity (year): -41435 lbs. (1996) 99% reduction

**Goal Statement:** Reduce off-site transfers of hazardous waste 50% from a 1992 baseline by 1999.

Toxic substance or wastestream: Ethylene glycol

Method for reduction: Recycling

Baseline quantity (year): 10,000 lbs. (1994)

Reduction quantity (year): -4,700 lbs. (1996) 47 % reduction

## 6.0 MANAGEMENT AND ADMINISTRATIVE PROCEDURES

This section of the Plan provides details of the management structure responsible for developing and implementing the installation's P2 activities.

### 6.1 ROLES AND RESPONSIBILITIES

As a result of these directives, the Commanding Office of MCAS Yuma has issued Station Order 6280.3D for the management of hazardous waste. The Environmental Department of MCAS Yuma implements and supports procedures for all tenant and transient units to comply with the requirements of EO 12856 and Station Order 6280.3D.

In accordance with Station Order 6280.3D, each Station Department Head and Commanding Officers of all tenant units or activities appoint, in writing, Hazardous Waste coordinators. These personnel are responsible for compliance with the Station Order, which also defines the roles of each level of responsibility.

### 6.2 POLLUTION PREVENTION COMMITTEE

The Air Station has formulated a Pollution Prevention Committee which meets on a quarterly basis. This committee consists of representatives from:

- a) Station Environmental Department
- b) The Station Comptroller
- c) The Station Supply Department
- d) Marine Aircraft Group-13 Supply Department
- e) Resident Officer in Charge of Construction
- f) Unit Level Hazardous Waste Coordinators

These representatives meet quarterly to discuss Hazardous Waste Minimization aboard the Air Station.

Management informs employees of procedural changes due to Pollution Prevention Plan Goals through various methods, including:

- Monthly operation and safety meetings;
- Internal memoranda, directives, and information circulars;
- Amendments to Operations Manuals; and,
- Impromptu meetings held to discuss any immediate procedural, operational or equipment changes having to do with pollution prevention.

### 6.3 POLLUTION PREVENTION TRAINING AND AWARENESS

The purpose of the pollution prevention employee training and awareness program is to teach Station personnel and employees about pollution prevention so that they can participate in

identifying opportunities and can assist in achieving the Plan goals. The objectives of this program are to:

- raise employee awareness of environmental related activities within the facility,
- train employees in their pollution prevention responsibilities,
- recognize employees for their pollution prevention efforts; and,
- encourage employee participation.

Unit Hazardous Waste Coordinators meet quarterly to discuss issues regarding the ongoing management of hazardous waste aboard the Air Station. The meetings are designed as a tool for communicating changes in hazardous materials management strategies at the Station. The topics of the meetings include:

- definitions of pollution prevention,
- benefits of pollution prevention,
- waste management hierarchy,
- the Station Pollution Prevention Plan

Employee awareness of Hazardous Waste Management is a primary function of Station Order 6280.3D. The order directs the Unit Commanders to assign responsibility for hazardous materials and waste management to designated personnel and provides for training of those personnel.

Training of hazardous waste coordinators consists of 40 hours of training in the duties and responsibilities of the role. In addition, the coordinators are required to participate in two hours of ongoing training per week which is directed by the Environmental Department. This training is directed at maintaining awareness of the current practices of hazardous waste management.

As part of the required Hazard Communication and Worker Right-to-Know Training, a module on Pollution Prevention is planned. This module will introduce all Station personnel to the concepts of Pollution Prevention, operating practices for pollution prevention, and requirements for materials management which lead to pollution prevention.

#### **6.4 POLLUTION PREVENTION GOAL MEASUREMENT**

Goals and objectives of the plan are measured by assessing hazardous materials emissions in annual reports and records and comparing them to subsequent records. The status of the goals are reported annually to the Arizona Department of Environmental Quality, as shown in Section 9.0 of this document.

#### **6.5 UPDATING THE PLAN**

The Pollution Prevention Plan is updated as needed, based on the results of the annual review of the current goals, as well as ongoing assessment of potential new areas for Pollution Prevention. The Station Environmental Office will use the process preparing of the P2 Annual Progress Report, required by ADEQ, to assess the Base P2 Program and incorporate improvements into the plan.

## 7.0

### POLLUTION GENERATING PROCESSES, OPTIONS AND P2 OPPORTUNITIES

This section of the Plan describes the processes, operations, and procedures assessed for P2 opportunities.

**ANALYSIS**

(# 1 ) Process Area : Paint Stripping - Airframes

Toxic Substance: Ethanolamine

Waste Stream: Waste Paint Stripping Material

CAS Number (found on a MSDS) : 141-43-5

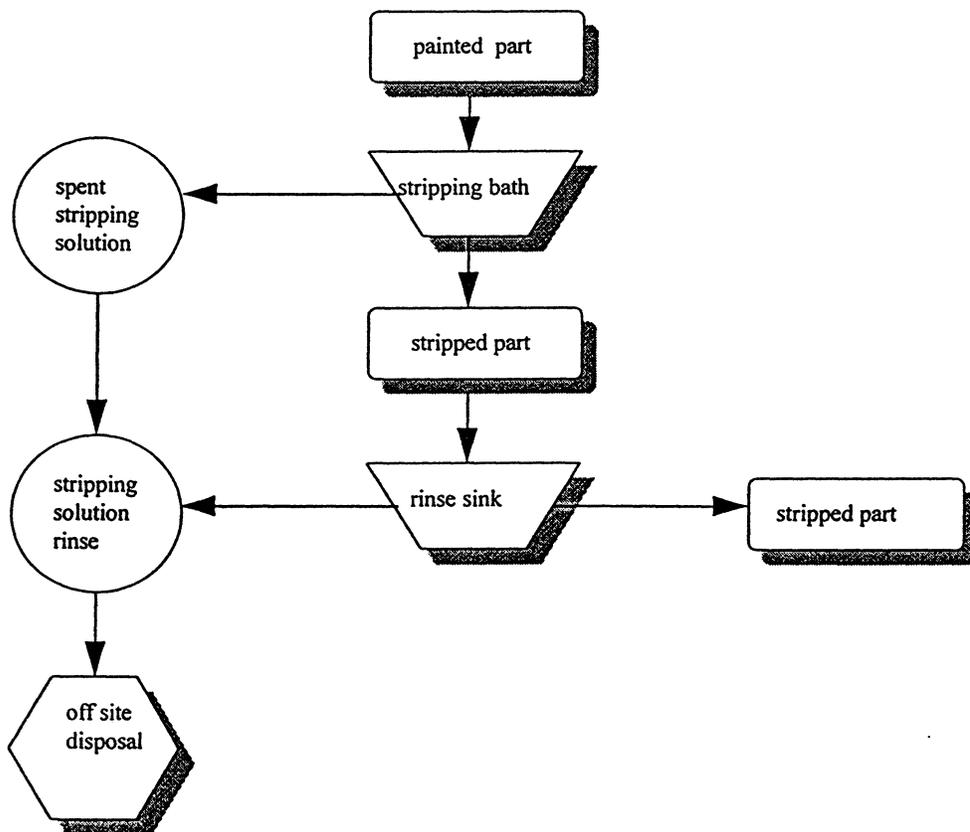
Hazardous Waste Code (if applicable) : Corrosive, Hazardous Waste Liquid

Baseline Quantity (include units) : 2000 lbs

Baseline Year: 1996

**Process summary (detailed description):**

Paint stripping operations are performed at the Airframes unit. It is a hot stripping procedure in which painted parts are soaked in the heated stripping solution and then washed with water spray. The operations remove paint from aircraft parts prior to repainting. The figure below illustrates the process flow. The primary component of the stripping solution (NIIN# 8010-010401059) is ethanolamine.



**ANALYSIS**

(# 2 ) Process Area : Non-destructive imaging

Toxic Substance: diethyl phthalate, 111-trichloroethane, chlorodifluoromethane

Waste Stream: NDI waste treatment carbon units

CAS Number (found on a MSDS) : 117-81-7, 71-55-6, 75-45-6

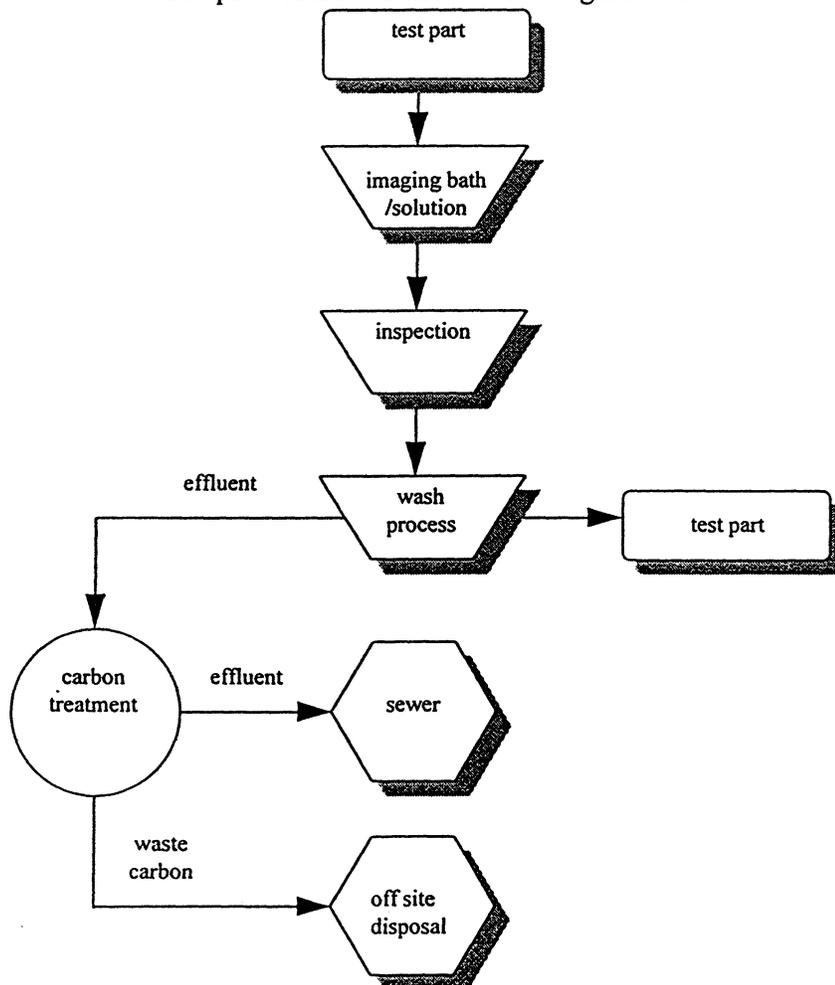
Hazardous Waste Code (if applicable) : n/a

Baseline Quantity (include units) : 3800 lbs

Baseline Year: 1996

**Process summary (detailed description):**

The non-destructive imaging (NDI) operation is used to inspect aircraft parts for reuse. The system utilizes water-based penetrant which is rinsed from the part. The rinse water is passed through a two-stage granular activated carbon filter prior to discharge to the sewer system. Each carbon canister has a treatment capacity of 1,200 gallons of water. The process flow is shown in the figure below.



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The following products were identified as being used in the NDI Process:

<b>Process chemical</b>	<b>Naval Inventory Identification Number (NIIN)</b>
Magnetic inspection compound	6850 00242 4723
Flaw Finder	6850 00782 2740
D70 Developer	6850 00145 0255
X-ray Fixer	6750 00092 5054
501 Remover	6850 00585 6426
Magnetic inspection compound	6850 00841 1347
Developer replenisher	6750 00165 7133
Isopar L	9150 01123 0298
E58-D Emulsifier	6850 01121 0948
Zyglo developer	6850 00782 2727
Britmor 600	6850 01268 6706

The chemical and materials used in this process are defined in Federal Aviation Administration and Military Specifications.

**ANALYSIS**

(# 3 ) Process Area : Facility lighting maintenance

Toxic Substance: mercury, di-ethylhexyl phthalate

Waste Stream: discarded light bulbs

CAS Number (found on a MSDS) : 117-81-7

Hazardous Waste Code (if applicable) : D009

Baseline Quantity (include units) : 8700 lbs.

Baseline Year: 1996

**Process summary (detailed description):**

Facility maintenance operations result in used fluorescent bulbs being stockpiled and managed as hazardous waste. In addition, lighting units periodically require ballast replacement. The ballast is classed as hazardous (containing DEHP).

ANALYSIS

(# 4 ) Process Area : Off-specification/excess paint and hazardous materials

Toxic Substance: mineral spirits, lead, toluene, xylene, acetone, chromium, benzene, methyl ethyl ketone

Waste Stream: off-specification paint and other hazardous material

CAS Number (found on a MSDS) : 64475-85-0, 7439-92-1, 108-88-3, 1330-20-7, 67-64-1, 7440-47-3, 71-43-2,

Hazardous Waste Code (if applicable) : D001, D035

Baseline Quantity (include units) : 8700 lbs

Baseline Year: 1996

**Process summary (detailed description):**

Waste paint related material containing paint, mineral spirits, lead, toluene, xylene, acetone, chromium, benzene, and methyl ethyl ketone. These materials are typically determined by Tenant units to be excess product or past a predetermined shelf life. The Environmental Department is contacted and oversees disposal, including packaging, manifesting, and shipping.

ANALYSIS

(# 5 ) Process Area : Fuel spills from incidents and accidents

Toxic Substance: petroleum

Waste Stream: Fuel spill cleanup residue

CAS Number (found on a MSDS) : n/a

Hazardous Waste Code (if applicable) : n/a

Baseline Quantity (include units) : \_\_\_\_\_

Baseline Year: 1996

**Process summary (detailed description):**

Spills resulting from overfill of equipment from portable fuel carriers and accidents include aircraft mishaps, result in fuel (diesel, JP-5, etc.) contaminated soils. The soils require removal and treatment. The material is placed into "Biocells" which are located on MCAS Yuma.

**ANALYSIS**

(# 6 ) Process Area : Facility Solid Waste collection

Toxic Substance: none

Waste Stream: Solid waste

CAS Number (found on a MSDS) : n/a

Hazardous Waste Code (if applicable) : n/a

Baseline Quantity (include units) : 2043 tons

Baseline Year: 1992

**Process summary (detailed description):**

MCAS Yuma is has a residential as well as an operating population requiring solid waste management. Most solid waste is landfilled. While active materials recycling has been implemented, as yet, a comprehensive solid waste management program has not been developed.

**8.0**  
**PRIORITIZATION AND SELECTION OF P2 OPTIONS**

The following forms provide a list of pollution prevention opportunities for each process area described in Section 7.

**POLLUTION PREVENTION OPPORTUNITIES**

**(# 1 ) Process Area : Paint Stripping - Airframes**

**Opportunity (# 1 ):**

Ongoing review of process and implementation of housekeeping procedures whenever practical to minimize the amount of waste generated in the process. Such procedures would include:

Management and Personnel Practices

- employee training
- incentives

Material Handling and inventory control

- reduce loss from mishandling
- reduce loss from expired shelf life
- proper storage

Loss prevention

- equipment spill and leak prevention

Waste segregation

Process scheduling

**Opportunity (# 2 ):**

Investigate replacement of chemical stripping operations with media blasting. Media options include carbon dioxide, plastic beads, and crystallized wheat starch. In addition to reductions in waste management, it is expected that media blasting will also result in reductions in air emissions.

A representative economic analysis is provided in the Appendix to this document.

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Will all of the opportunities listed for this process area be implemented?  YES  NO

If you checked NO, which opportunities will not be implemented and why will they not be implemented?

**POLLUTION PREVENTION OPPORTUNITIES**

(# 2 ) Process Area : Non-destructive imaging

Opportunity (# 1 ):

Ongoing review of process and implementation of operating and housekeeping procedures whenever practical to minimize the amount of waste generated in the process. Such procedures would include:

- Management and Personnel Practices
  - employee training
  - incentives
- Material Handling and inventory control
  - reduce loss from mishandling
  - reduce loss from expired shelf life
  - proper storage
- Loss prevention
  - equipment spill and leak prevention
- Waste segregation
- Process scheduling

Opportunity (#2 ):

Evaluate alternative carbon filter management options. Options for review include vendor recycling of carbon filter units.

From the TRI-SERVICE POLLUTION PREVENTION OPPORTUNITY DATA SHEET:

**Economic Analysis:** It is recommended that activated carbon be purchased from a virgin activated carbon supplier that will accept the spent carbon for regeneration. Typically, activated carbon sample analysis and shipping fees are paid by the user, however, there is no charge for regeneration. The economics associated with recycling spent activated carbon will vary based on the volume, system characteristics, contaminants, and handling mode (i.e., bulk or packaged units).

Based on preliminary estimates from one vendor, costs would range from \$200 to \$400 for the one-time profile fee (good for two years), and a per unit cost of \$475 to \$525 (plus freight), depending on waste characteristics.

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Will all of the opportunities listed for this process area be implemented?  YES     NO

If you checked NO, which opportunities will not be implemented and why will they not be implemented?

**POLLUTION PREVENTION OPPORTUNITIES**

**(# 3 ) Process Area : Facility lighting maintenance**

**Opportunity (# 1 ):**

Conduct an energy/lighting audit of all MCAS Yuma buildings. Identify lighting requirements and light levels. Evaluate current lighting and assess options for alternatives. Evaluate feasibility of installation of automatic light switches, room sensors, reduced energy lighting, direct and indirect lighting options.

**Opportunity (#2 ):**

Evaluate proper installation of current fixtures and bulb specifications. Determine if bulb and fixture life is reduced because of heat buildup in the fixture, improper installation, power supply problems (power drops which would reduce fixture/bulb life).

**Opportunity (#3 ):**

Recent technical developments have resulted in the marketing of low-mercury bulbs. The bulbs do not exceed the thresholds which result in their classification as hazardous waste.

ECONOMIC ANALYSIS: Approximate costs, based on preliminary research, of the two alternatives, are shown below.

	Standard Fluorescent	Low-mercury
Bulb (per foot)	0.49	1.11
Disposal	0.13	0*
Total	0.62	1.11

\*based on negligible additional cost for normal solid waste disposal. Low mercury bulbs can be disposed of with normal refuse.

Will all of the opportunities listed for this process area be implemented?  YES  NO

If you checked NO, which opportunities will not be implemented and why will they not be implemented?

<b>POLLUTION PREVENTION OPPORTUNITIES</b>
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(# 4 ) Process Area : Off-specification/excess paint and hazardous materials

Opportunity (# 1 ):

Implement source reduction through Station wide training in hazardous materials reuse and recycling.

---

Will all of the opportunities listed for this process area be implemented?  YES       NO

If you checked NO, which opportunities will not be implemented and why will they not be implemented?

**POLLUTION PREVENTION OPPORTUNITIES**

(# 5 ) Process Area : Fuel spills from accidents.

Opportunity (# 1 ):

Perform management review of each incident to assess opportunities for prevention.

---

Will all of the opportunities listed for this process area be implemented?  YES  NO

If you checked NO, which opportunities will not  
be implemented and why will they not be implemented?

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**POLLUTION PREVENTION OPPORTUNITIES**

(# 6 ) Process Area : Station Solid Waste Handling

Opportunity (# 1 ):

Prepare a formal Solid Waste Management Plan with goals and objectives for Solid Waste reduction.

---

Will all of the opportunities listed for this process area be implemented?  YES  NO

If you checked NO, which opportunities will not be implemented and why will they not be implemented?

## 9.0

**PLAN OF ACTION AND MILESTONES**

The following tables show the proposed plan of action and baseline measurements against which the success of implemented pollution prevention initiatives will be measured.

These forms also provide the mechanism for annual reporting of Pollution Prevention progress, required by the Arizona Department of Environmental Quality. Part of the management practices for pollution prevention include annual review of the pollution prevention planning and updating of the plan.

**POLLUTION PREVENTION GOALS**

**POLLUTION PREVENTION PLAN GOALS**

Facility Name: Marine Corps Air Station, Yuma

Note: Fill Out One Form For Each Goal.

1. Goal Statement: Goal # ( 1 ):	2. Scheduled Completion Date (Month/Year)	3. Completion Status: OS= On Schedule D = Delayed DR =Dropped C = Completed	4. Name of Toxic Substance(s); or Wastestream(s) Name; Include CAS #; and/or RCRA Waste Code #	5. State Volatile Organic Chemical "VOC", Ozone Depleting Chemical "ODC", "Both" or "N/A" For Item in Box #4
Replace chemical paint stripping with media blasting.	June '98		ethanolamine (141-43-5)	N/A

6. If You Answered "D" or "DR" In Box #3, Provide Explanation(s) Including New Date(s):

PRODUCTION RATIO (optional):

7. Reduction Method: State the Technology used to achieve the Goal (e.g. Replace MEK based inks with water based inks)	8. Measured Reduction Quantity (Pounds, kWh or therms) (circle one)	9. Month & Year #8 Was Measured	10. Baseline Year	11. Baseline Quantity (Pounds, kWh or therms) (circle one)	12. Reduction Area	13. Reduction Method	14. Reduction Activity
Investigate blasting media options (e.g. CO <sub>2</sub> , plastic beads, and crystallized wheat starch)			1996	2000 pounds			

Attachments: Please attach any further discussion on these items

**SECTION 8. POLLUTION PREVENTION GOALS**

**POLLUTION PREVENTION PLAN GOALS**

Facility Name: *Marine Corps Air Station, Yuma*

Note: Fill Out One Form For Each Goal.

1. Goal Statement:	2. Scheduled Completion Date (Month/Year)	3. Completion Status: OS=On Schedule D = Delayed DR =Dropped C=Completed	4. Name of Toxic Substance(s); or Wastestream(s) Name; Include CAS #; and/or RCRA Waste Code #	5. State Organic Chemical "VOC", Depleting Chemical "ODC", "Both" or "N/A" For Item in Box #4
<p><b>1. Goal Statement:</b> Goal # ( 2 ) : Develop Pollution Prevention training to be provided to all station personnel.</p>	<p>June '98</p>		<p>N/A</p>	<p>N/A</p>

6. If You Answered "D" or "DR" In Box #3, Provide Explanation(s) Including New Date(s):

PRODUCTION RATIO (optional): \_\_\_\_\_

**7. Reduction Method:**

State the Technology used to achieve the Goal  
(e.g. Replace MEK based inks with water based inks)

Not applicable. Training development will be performed in accordance with facility and Marine procedures.

8. Measured Reduction Quantity (Pounds, Gallons, KWH or therms) (circle one)	9. Month & Year Measured	10. Baseline Year	11. Baseline Quantity (Pounds, Gallons, KWH or therms) (circle one)	12. Reduction Area	13. Reduction Method	14. Reduction Activity

**SECTION 8. POLLUTION PREVENTION GOALS**

Attachments: Please attach any further discussion on these items

**POLLUTION PREVENTION PLAN GOALS**

Facility Name: Marine Corps Air Station, Yuma

Note: Fill Out One Form For Each Goal.

1. Goal Statement:	2. Scheduled Completion Date (Month/Year)	3. Completion Status: OS = On Schedule D = Delayed DR = Dropped C = Completed	4. Name of Toxic Substance(s); or Wastestream(s) Name; Include CAS #; and/or RCRA Waste Code #	5. State Organic "VOC", Depleting Chemical "ODC", "Both" or "N/A" For Item In Box #4
Goal # ( 3 ): Eliminate hazardous waste disposal of carbon filters from the NDI treatment process.	June 1998		di-2-ethylhexylphthalate (117-81-7) 1,1,1-trichloroethane (71-55-6) hydroquinone (123-31-9) ethylene glycol (107-21-1)	N/A

6. If You Answered "D" or "DR" In Box #3, Provide Explanation(s) Including New Date(s):

PRODUCTION RATIO (optional):

7. Reduction Method:

State the Technology used to achieve the Goal (e.g. Replace MEK based inks with water based inks)

Reactivate carbon treatment units.

8. Measured Reduction Quantity (Pounds, Gallons, KWH or (therms) (circle one)	9. Month & Year Box #8 Was Measured	10. Baseline Year	11. Baseline Quantity (Pounds, Gallons, KWH or (therms) (circle one)	12. Reduction Area	13. Reduction Method	14. Reduction Activity
		1996	3800 pounds			

**POLLUTION PREVENTION GOALS**

Attachments: Please attach any further discussion on these items

**POLLUTION PREVENTION PLAN GOALS**

Facility Name: *Marine Corps Air Station, Yuma*

Note: Fill Out One Form For Each Goal.

1. Goal Statement: Goal # ( 4 ):	2. Scheduled Completion Date (Month/Year)	3. Completion Status: OS=On Schedule D = Delayed DR =Dropped C=Completed	4. Name of Toxic Substance(s); or Wastestream(s) Name; Include CAS #; and/or RCRA Waste Code #	5. State Volatile Organic Chemical "VOC", Ozone Depleting "ODC", "Both" or "N/A" For item in Box #4
Reduce energy consumption in florescent lighting across facility.	June 1998		mercury (D009)	N/A

6. If You Answered "D" or "DR" In Box #3, Provide Explanation(s) Including New Date(s):

PRODUCTION RATIO (optional):

7. Reduction Method: State the Technology used to achieve the Goal (e.g. Replace MEK based inks with water based inks) Apply for funds to conduct an energy/lighting audit and replace the lighting systems with low-mercury non-hazardous bulbs.	8. Measured Reduction Quantity (Pounds, Gallons, KWH or therms) (circle one)	9. Month & Year #8 Was Measured	10. Baseline Year	11. Baseline Quantity (Pounds, Gallons, KWH or therms) (circle one)	12. Reduction Area	13. Reduction Method	14. Reduction Activity
			1996	7100 lbs.			

Attachments: Please attach any further discussion on these items

**POLLUTION PREVENTION GOALS**

**POLLUTION PREVENTION PLAN GOALS**

Facility Name: *Marine Corps Air Station, Yuma*

Note: Fill Out One Form For Each Goal.

1. Goal Statement:	2. Scheduled Completion Date (Month/Year)	3. Completion Status: DS = On Schedule D = Delayed DR = Dropped C = Completed	4. Name of Toxic Substance(s); or Wastestream(s) Name; Include CAS #; and/or RCRA Waste Code #	5. State Volatile Organic Chemical "VOC", Ozone Depleting Chemical "ODC", "Both" or "N/A" For item in Box #4
Goal # ( 5 ): Reduce fuel spills on facility grounds.	June 1998		Fuel contaminated soil	N/A

6. If You Answered "D" or "DR" In Box #3, Provide Explanation(s) Including New Date(s):

PRODUCTION RATIO (optional):

7. Reduction Method: State the Technology used to achieve the Goal Perform management review of all fuel spills. Identify cause and potential remedial actions.	8. Measured Quantity (Pounds, Gallons, KWH or therms) (circle one)	9. Month & Year #8 Was Measured	10. Baseline Year	11. Baseline Quantity (Pounds, Gallons, KWH or therms) (circle one)	12. Reduction Area	13. Reduction Method	14. Reduction Activity

Attachments: Please attach any further discussion on these items

**POLLUTION PREVENTION GOALS**

**POLLUTION PREVENTION PLAN GOALS**

Facility Name: Marine Corps Air Station, Yuma

Note: Fill Out One Form For Each Goal.

1. Goal Statement: Goal # ( 6 ): Reduce solid waste facility wide.	2. Scheduled Completion Date (Month/Year)	3. Completion Status: OS = On Schedule D = Delayed DR = Dropped C = Completed	4. Name of Toxic Substance(s); or Wastestream(s) Name; Include CAS #; and/or RCRA Waste Code #	5. State Volatile Organic Chemical "VOC", Ozone Depleting Chemical "ODC", "Both" or "N/A" For Item in Box #4
	June 1998		Solid waste	N/A

6. If You Answered "D" or "DR" In Box #3, Provide Explanation(s) Including New Date(s):

PRODUCTION RATIO (optional):

7. Reduction Method: State the Technology used to achieve the Goal	8. Measured Reduction Quantity (Pounds, Gallons, KWH or therms) (circle one)	9. Month & Year #8 Was Measured	10. Baseline Year	11. Baseline Quantity (Pounds, Gallons, KWH or therms) (circle one)	12. Reduction Area	13. Reduction Method	14. Reduction Activity
Prepare a formal Solid Waste Management Plan with goals and objectives for Solid Waste reduction.			1992	2043 tons			

Attachments: Please attach any further discussion on these items

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## 10.0

## POTENTIAL BARRIERS TO POLLUTION PREVENTION GOALS

In order to enhance the implementation of the planned pollution prevention opportunities identified in Section 9.0, the following potential barriers were identified.

Goal	Goal Statement	Potential Barriers
1	Replace chemical paint stripping with media blasting.	Training of staff. ----- Lack of funding for expenses required for testing options. ----- Implementation is contingent on successful testing of selected option.
2	Develop Pollution Prevention training to be provided to all station personnel.	High turnover rates at facility result in large training costs.
3	Eliminate hazardous waste disposal of carbon filters from the NDI treatment process	Economically viable options may not be available. Costs of providers to service the Yuma facility may be more expensive than current options.
4	Apply for funds to conduct an energy/lighting audit.	Competing projects may make funding unavailable.
5	Replace current bulbs with low-mercury non hazardous	Bulbs are currently more expensive.
6	Perform management review of all fuel spills. Identify cause and potential remedial actions.	Best practices may be implemented and additional oversight may not improve performance. ----- Resources may not be available to implement changes identified.
7	Prepare a formal Solid Waste Management Plan with goals and objectives for Solid Waste reduction.	Funding for the project may not be available.

## REFERENCES

*Pollution Prevention Plan Guidance Manual*, Arizona Department of Environmental Quality, Pollution Prevention Unit, ADEQ Document Number TB 96-2, September, 1996.

Emergency Planning and Community Right to Know Act of 1986 (EPCRA; 42 USC, Secs 11001-11050), Title III of the Superfund Amendments and Reauthorization Act (SARA), Secs 311, 312, 313.

*Hazardous Waste Minimization Plan, Marine Corps Air Station, Yuma, Arizona*, 1994, Dames and Moore, July 27.

*Pollution Prevention Planning Guide*, Headquarters, United States Marine Corps, June 1995.

Pollution Prevention Plan, Marine Corps Air Station, Yuma, Arizona, submitted to the Arizona Department of Environmental Quality, 1995.

## APPENDIX

## TRI-SERVICE POLLUTION PREVENTION OPPORTUNITY DATA SHEET CO<sub>2</sub> Pellet Blasting

### **Economic Analysis:**

#### CO<sub>2</sub> Pellet Blasting:

Units come in several different configurations. The blasting unit alone can be:

1. Purchased- \$25,000 to \$50,000 or
2. Rented- \$1,500 to \$2,500 per month.
3. Units that combine pelletizing and blasting are also available, but generally are not economical unless the blasting operation is performed 24 hours/day, seven days/week
4. Pellet blasting jobs can be done on a contract basis for a cost between \$200 to \$300 per hour including labor, pellets, and equipment (not including travel time or travel expenses).
5. Pellet cost:
  - Made by a stand-alone pelletizer that can be purchased for a cost between \$50,000 to \$130,000 (cost to make pellets from delivered liquid carbon dioxide is about \$0.10-0.15/lb), or
  - Purchased directly from a manufacturer for a cost between \$0.10/lb and \$0.50/lb delivered, depending on the purity and the distance from the manufacturer (pelletizer purchase is reported to be economical only if blasting is done more than 40 hours/week).

#### CO<sub>2</sub> Snow Blasting:

Units are much lower in cost and operation, as compared to CO<sub>2</sub> pellet blasting, and again there are several different configurations to choose from:

1. All manual units cost about \$2,000.
2. Semi-automated units (can also be used in assembly applications) cost between \$3,000 to \$5,000.
3. For highest quality precision cleaning with substantial volume requirements, CO<sub>2</sub> purifiers are also available. Units that can purify commercial grade liquid CO<sub>2</sub> start at a cost of about \$5,000.

Some of the following data was obtained from US Air Force for paint stripping of FX Fighter Aircraft using CO<sub>2</sub> blasting:

#### ◆ Assumptions:

- CO<sub>2</sub> blasting equipment cost: \$50,000
- Aircraft skin area: 3,100 ft<sup>2</sup>
- Paint removal and cleaning area: 2,410 ft<sup>2</sup>
- Labor rate: \$60/hr
- CO<sub>2</sub> cost: \$0.50/lb
- Paint and solvent sludge disposal cost: \$2/gal
- Dry paint waste disposal cost: \$2/lb
- Water treatment/disposal cost: \$8.24/1,000 gal
- Chemical procurement cost: \$11/gal
- One aircraft is de-painted per month
- Paint removal average rate: 11 ft<sup>2</sup>/hr

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- Paint removal and cleaning time: 219 hr/aircraft or 2,628 hr/yr
- Total CO<sub>2</sub> usage (including training): 101,430 lb/aircraft or 1,217,160 lb/yr
- Dry paint waste residue: 27 lb/aircraft or 324 lb/yr

#### Chemical stripping

- Total chemical usage: 1,373 gal/aircraft or 16,476 gal/yr
- Paint removal and cleaning time: 1,500 hr/aircraft or 18,000 hr/yr
- Wet chemical waste residue: 1,373 gal/aircraft or 16,476 gal/yr
- Contaminated wastewater residue: 308,700 gallons

#### Annual Operating Cost Comparison for CO<sub>2</sub> Blasting Process and Chemical Stripping

	CO <sub>2</sub> Blasting	Chemical Stripping Operational Costs:
Labor:	\$157,700	\$1,080,000
Material	\$608,600	\$181,200
Waste Disposal	\$650	\$33,000
Wastewater Treatment	\$0	\$2,500
Total Operational Costs:	\$766,950	\$1,296,700
Total Recovered Income	\$0	\$0
Net Annual Cost/Benefit:	-\$766,950	-\$1,296,700

#### Economic Analysis Summary

Annual Savings for CO<sub>2</sub> Blasting: \$529,750

Capital Cost for Diversion Equipment/Process: \$50,000

Payback Period for Investment in Equipment/Process: <1 year