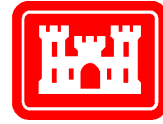


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Construction Engineering
Research Laboratory



**US Army Corps
of Engineers®**
Engineer Research and
Development Center

OCONUS Compliance Assessment Protocols — Spain

by David A. Krooks

September 2000

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14. ABSTRACT This environmental compliance assessment manual is based on the <i>Final Governing Standards for Spain</i> , May 1994. It is intended for use by the United States Air Forces Europe and should be used in conjunction with a manual based on component-specific requirements.					
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FOREWORD

This is ERDC/CERL Special Report SR-00-03, a compliance assessment manual for use by Headquarters, United States Air Forces, Europe (HQ USAFE) in Spain. It is based on the *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994.

The research was performed for HQ USAFE, under Military Interdepartmental Purchase Request (MIPR) number MIPR020000285, dated 03 February 2000. The HQ USAFE technical monitor was Capt Mark Pomerinke, HQ USAFE/CEVC.

The research was performed by the Environmental Processes Branch (CN-E), Installations Division (CN), of the Construction Engineering Research Laboratory (CERL). The Principal Investigator was Dr. David A. Krooks, CN-E. Dr. Ilker Adiguzel is Branch Chief, CN-E. Dr. John Bandy is Division Chief, CN. The associated Technical Director is Gary Schanche. Dr. Alan Moore is Acting Director of CERL.

CERL is an element of the U.S. Army Engineer Research and Development Center (ERDC), U.S. Army Corps of Engineers. The Director of ERDC is Dr. James R. Houston, and the Commander is COL James S. Weller.

NOTICE

This manual is intended as general guidance for personnel at Department of Defense (DOD) facilities. It is not, nor is it intended to be, a complete treatise on environmental laws and regulations. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information contained herein. For any specific questions about, or interpretations of, the legal references herein, consult appropriate counsel.

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MANUAL OBJECTIVES AND ORGANIZATION

The OCONUS Compliance Assessment Protocols (OCAP) for Spain provides checklists to be used during a USAFE environmental compliance assessment in that country. This manual and the appropriate service-specific supplement together serve as primary auditing tools. Specifically, OCAP-Spain is based on the *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, and other relevant and OCONUS-applicable DOD documents.

The manual is divided into 13 sections, which contain the specific environmental compliance guidelines and checklists for each of the 13 compliance categories:

- Air Emissions Management
- Cultural Resources Management
- Hazardous Materials Management
- Hazardous Waste Management
- Natural Resources Management
- Other Environmental Issues
- Pesticide Management
- Petroleum, Oil, and Lubricant (POL) Management
- Solid Waste Management
- Storage Tank Management
- Toxic Substances Management
- Wastewater Management
- Water Quality Management.

Glossary of Acronyms

Acronym	Expansion
ACM	asbestos-containing material
ACWM	asbestos-containing waste material
ADR	Accord européen sûr le transport international des marchandises dangereuses par route [Joint European Regulation on the International Transportation of Hazardous Materials]
AFPMB	Armed Forces Pest Management Board
API	American Petroleum Institute
APIRP	American Petroleum Institute Reprint
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
BOD	biochemical oxygen demand
CAS	Chemical Abstract Service
CBOD	carbonaceous biochemical oxygen demand
CEM	continuous emissions monitoring
CERL	Construction Engineering Research Laboratory
CFC	chlorofluorocarbon
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COD	chemical oxygen demand
CONUS	continental United States
CT	concentration/time
CWS	community water system
DOD	Department of Defense
DODAAC	DOD Activity Address Code
DODD	DOD Directive
DODI	DOD Instruction
DRMO	Defense Reutilization and Marketing Office
DRMS	Defense Reutilization and Marketing Service
DWTP	domestic wastewater treatment plant
EA	environmental analysis
EA	Executive Agent
EC	Emergency Coordinator
EC	Environmental Coordinator
EC	European Community
EEA	Environmental Executive Agent
EIS	Environmental Impact Statement

Acronym	Expansion
EM	Environmental Manager
ER	environmental review
ERDC	Engineer Research and Development Center
ES	environmental study
FGS	Final Governing Standards
GSA	General Services Administration
GWUDISW	groundwater under the direct influence of surface water
HAZWOPER	Hazardous Waste Operations and Emergency Response
HCFC	hydrochlorofluorocarbon
HM	hazardous materials
HMIS	Hazardous Materials Information System
HW	hazardous waste
HWAP	hazardous waste accumulation point
HWPS	hazardous waste profile sheet
HWSA	hazardous waste storage area
IC	Installation Commander
ICUZ	installation compatible use zone
IOSC	Installation On-Scene Commander
IPM	Integrated Pest Management
IRT	Installation Response Team
IWTP	industrial wastewater treatment plant
MCL	maximum contamination level
MIPR	military interdepartmental purchase request
MP	Management Practice
MSDS	material safety data sheet
MSW	municipal solid waste
MSWLF	municipal solid waste landfill
NACE	National Association of Corrosion Engineers
NFPA	National Fire Protection Association
NLR	noise level reduction
NPWS	nonpublic water system
NTNCWS	nontransient, noncommunity water system
O&M	Operations and Maintenance
OCONUS	outside the Continental United States
ODC	ozone-depleting chemical

Acronym	Expansion
ODS	ozone-depleting substance
PCB	polychlorinated biphenyl
PCT	polychlorinated terphenyl
PEL	permissible exposure limit
POC	point of contact
POE	point-of-entry
POL	petroleum, oil, and lubricant
POU	point-of-use
PPE	personal protective equipment
PWS	public water system
QA/QC	quality assurance/quality control
RQ	reportable quantity
SEL	sound exposure level
TSDf	treatment, storage, and disposal facility
TSS	total suspended solids
TTHM	total trihalomethanes
TTO	total toxic organics
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound
WWTP	wastewater treatment plant

Abbreviations

C	Celsius	mgd	million gallons per day
cm	centimeter	μg	microgram
cm ²	square centimeter	μm	micrometer
F	Fahrenheit	min	minute
ft	feet	mo	month
ft ²	square feet	mm	millimeter
ft ³	cubic feet	mm Hg	millimeters of mercury
g	gram	mrem	millirem
gal	gallons	MW	megawatt
gpd	gallons per day	NTU	nephelometric turbidity unit
gpm	gallons per minute	pCi	picoCurie
gr	grain	ppm	parts per million
gr/dscf	grain/dry standard cubic foot	ppmv	parts per million by volume
h	hour	psi	pounds per square inch
ha	hectare	psia	pounds per square inch absolute
in.	inch	psig	pounds per square inch gauge
J	Joule	qt	quart
kg	kilogram	s	second
kPa	kiloPascal	V	volt
kW	kilowatt		
L	liter		
lb	pound		
m	meter		
m ²	square meter		
m ³	cubic meter		
mi	mile		
mg	milligram		
CO	carbon monoxide	NO ₂	nitrogen dioxide
CO ₂	carbon dioxide	NO _x	nitrogen oxides
Hg	mercury	SO ₂	sulfur dioxide

Metric Conversion Table

The following conversion table may be used throughout this manual to convert the measures stated in U.S. units to their approximate metric equivalents.

1 in.	=	25.4 mm
1 ft	=	0.3048 m
1 kip	=	4448 N
1 psi	=	6.89 kPa
1 psi	=	89.300 g/cm ²
1 lb	=	0.453 kg
1 lb/h	=	0.126 g/s
1 cu ft	=	0.028 m ³
1 mi	=	1.61 km
1 sq ft	=	0.093 m ²
1 gal	=	3.78 L
°F	=	(°C + 17.78) x 1.8
°C	=	0.55 (°F - 32)
1 yd	=	0.9144 m
1 Btu/lb	=	0.556 cal/g

SECTION 1

AIR EMISSIONS MANAGEMENT

September 2000

A. Applicability of this Section

This section contains standards for air emissions and performance standards applied to Department of Defense (DOD)-owned and -operated equipment. The performance standards cover fossil-fuel-fired steam generators, hot water generating plants, electric utility steam generators, and incinerators. The standards include monitoring and data collection requirements. Motor vehicles and volatile organic compounds are also addressed. For ozone-depleting substances/chemicals (ODS/ODC), see the pollution prevention of portion of Section 6, *Other Environmental Issues*. Open burning of solid waste is addressed in Section 9, *Solid Waste Management*, and asbestos management is addressed in Section 11, *Toxic Substances Management*.

B. Sources

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapter 2.

C. Key Compliance Requirements

- Analytical samples taken to demonstrate compliance with the requirements of FGS-Spain must be tested using certain laboratories only.
- New or substantially modified fossil fuel-fired steam-generating units rated greater than 100 million British thermal units (MBtu)/h heat input but less than 170 MBtu/h heat input (between 29 and 50 MW) must meet specific emissions limitations for particulate matter, SO₂, for NO_x, and fuel sulfur content.
- New or substantially modified steam-generating units or electric utility steam-generating units rated greater than 100 MBtu/h heat input but less than 170 MBtu/h heat input (between 29 and 50 MW) must operate a properly calibrated and maintained continuous emissions monitoring (CEM) system for opacity, NO_x, and the O₂ or CO₂ content of flue gases.
- New or substantially modified electric utility steam-generating units rated greater than 100 MBtu/h heat input but less than 170 MBtu/h heat input (between 29 and 50 MW) must meet specific emissions limitations.
- Existing and new or substantially modified steam-generating units, electric utility, or thermal heating units rated greater than 100,000 Btu/h (29 kW) heat input must have an annual tune-up to ensure that specific operating requirements are met.
- New or substantially modified steam-generating units or electric utility steam-generating units rated greater than 100,000 Btu/h (29 kW) heat input must operate a properly calibrated and maintained CEM system to measure O₂ emissions and CO emissions
- Installations that burn used oil for energy recovery must comply with specific emission limit values.
- New or substantially modified incinerators that burn more than 50 tons/day [≈ 45359 kg/ day] or that burn more than 10 percent sewage sludge must meet specific emissions limitations.
- Municipal solid waste incinerators that have a capacity greater than 1 ton/h [≈ 0.9 metric ton/h] must meet certain monitoring requirements.

- Installations must maintain DOD-owned, nontactical vehicles so as to prevent excessive emissions.
- Vapor degreasers in use after 1 January 1995 must incorporate systems that minimize the direct release of VOCs to the atmosphere

D. Definitions

- *Coal Refuse* - waste products of coal mining, cleanings, and coal preparation operations (e.g., culm, gob, etc.) containing coal, matrix material, clay, and other organic and inorganic material (FGS-Spain, Chapter 2, Definitions).
- *Electric Utility Steam Generating Unit* - any furnace, boiler, or other device used for combusting fuel for the purpose of producing steam to generate electricity (FGS-Spain, Chapter 2, Definitions).
- *Existing* - any facility, source, or project in use or under construction before 1 October 1994, unless it is substantially modified (FGS-Spain 1.4.a.2).
- *Fossil Fuel* - natural gas, petroleum, coal, and any form of solid, liquid, or gaseous fuel derived from such material for the purpose of creating useful heat (FGS-Spain, Chapter 2, Definitions).
- *Incinerator* - any furnace used in the process of burning solid or liquid waste for the purpose of reducing the volume of the waste by removing combustible matter, including equipment with heat recovery systems for either hot water or steam generation (FGS-Spain, Chapter 2, Definitions).
- *New* - any facility, source, or project with a construction start date on or after 1 October 1994 (FGS-Spain 1.4.a.1).
- *Nontactical Vehicles* - commercially available vehicles that are adapted for military use (FGS-Spain, Chapter 2, Definitions).
- *Opacity* - capacity of a gaseous substance to impede the transmission of visible light. It is generally expressed as the percentage of light absorbed. 0 percent opacity corresponds to full transparency (FGS-Spain, Chapter 2, Definitions).
- *Steam Generating Unit* - any furnace, boiler, or other device used for combusting fuel for the purpose of producing steam (including fossil-fuel-fired steam generators associated with the combined cycle of gas turbines; nuclear steam generators are not included) (FGS-Spain, Chapter 2, Definitions).
- *Substantial Modification* - any modification the cost of which exceeds \$1 million, regardless of funding source (FGS-Spain 1.4.a.3).
- *Thermal Heating Unit* - any furnace, boiler, or other device used for producing hot water for heating purposes (FGS-Spain, Chapter 2, Definitions).
- *Wood Residue* - bark, sawdust, slabs, chips, shavings, mill trim, and other wood products derived from wood processing and forest management operations (FGS-Spain, Chapter 2, Definitions).

E. Records To Review

- Emission monitoring records
- Opacity records
- Instrument calibration and maintenance records
- Reports/complaints concerning air quality
- Documentation of preventive measures or actions
- Results of air sampling at the conclusion of response action
- List of boilers and their sizes

F. Physical Features To Inspect

- All air pollution sources (fuel burners, incinerators, VOC sources, etc.)
- Air pollution monitoring and control devices
- Air emission stacks
- Air intake vents

G. Guidance for Checklist Users

REFER TO CHECKLIST ITEMS:	
Missing Checklist Items/Positive Findings	AE.2.1.SP and AE.2.2.SP
All Installations	AE.10.1.SP
Fuel-Burning Facilities	AE.20.1.SP through AE.20.8.SP
Incinerators	AE.30.1.SP and AE.30.2.SP
Motor Vehicles	AE.40.1.SP
Vapor Degreasers	AE.50.1.SP

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Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>AE.2 MISSING CHECKLIST ITEMS/POSITIVE FINDINGS</p> <p>AE.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>AE.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning air emissions management have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

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<p>AE.10 ALL INSTALLATIONS</p> <p>AE.10.1.SP. Analytical samples taken to comply with the standards in FGS-Spain must be tested using certain laboratories only (FGS-Spain 2.10).</p>	<p>Verify that analytical samples are tested using one of the following:</p> <ul style="list-style-type: none"> - overseas DOD laboratories approved by the service component - laboratories authorized by Spanish authorities - Continental United States (CONUS) laboratories certified by USEPA.

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<p>AE.20 FUEL-BURNING FACILITIES</p> <p>AE.20.1.SP. New or substantially modified fossil-fuel-fired steam generating units rated greater than 100 MBtu/h heat input but less than 170 MBtu/h heat input (between 29 and 50 MW) must meet specific emissions limitations for particulate matter and SO₂ (FGS-Spain 2.1.a through 2.1.d).</p> <p>AE.20.2.SP. New or substantially modified fossil-fuel-fired steam generating units rated greater than 100 MBtu/h heat input but less than 170 MBtu/h heat input (between 29 and 50 MW) must meet specific emissions limitations for NO_x (FGS-Spain 2.1.e through 2.1.g).</p>	<p>(NOTE: Emissions limitations and percent reduction requirements are determined on a 30-day rolling average.)</p> <p>(NOTE: Particulate matter emission criteria do not apply during periods of startup, shutdown, and malfunction.)</p> <p>(NOTE: SO₂ emission criteria do not apply during periods of startup and shutdown and when emergency conditions exist.)</p> <p>Determine whether the facility burns coal, oil, wood, or a combination of fuels.</p> <p>Verify that no flue gas discharged into the atmosphere contains particulate matter in excess of 43 ng/J heat input (0.10 lb/MBtu) derived from fossil fuel or fossil fuel and wood residue.</p> <p>Verify that discharged flue gases do not exhibit more than 20 percent opacity, except for one 6-min period per hour of not more than 30 percent opacity.</p> <p>Verify that discharged flue gases do not contain SO₂ in excess of 340 ng/J heat input (0.80 lb/MBtu) derived from liquid fossil fuel or liquid fossil fuel and wood residue.</p> <p>Verify that discharged flue gases do not contain SO₂ in excess of 520 ng/J heat input (1.2 lb/MBtu) derived from solid fossil fuel or solid fossil fuel and wood residue.</p> <p>Verify that flue gas discharged to the atmosphere does not contain NO_x in excess of the following:</p> <ul style="list-style-type: none"> - 86 ng/J heat input (0.20 lb/MBtu) derived from gaseous fossil fuel - 129 ng/J heat input (0.30 lb/MBtu) derived from liquid fossil fuel, liquid fossil fuel and wood residue, or gaseous fossil fuel and wood residue - 300 ng/J heat input (0.70 lb/MBtu) derived from solid fossil fuel or solid fossil fuel and wood residue - 260 ng/J heat input (0.60 lb/MBtu) derived from lignite or lignite and wood residue. <p>Verify that, if they are compatible with existing combustion configurations, low excess air/low NO_x burners are used in new construction and major modifications.</p> <p>(NOTE: The criteria for NO_x do not apply when a fossil fuel containing at least 25 percent by weight of coal refuse is burned in combination with gaseous, liquid, other solid fossil fuel, or wood residue.)</p>

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<p>AE.20.3.SP. New or substantially modified fossil-fuel-fired steam-generating units rated greater than 100 MBtu/h but less than 170 MBtu/h (between 29 and 50 MW) must meet specific requirements with regard to fuel sulfur content (FGS-Spain 2.1.h).</p> <p>AE.20.4.SP. New or substantially modified fossil-fuel-fired steam-generating units rated greater than 100 MBtu/h but less than 170 MBtu/h (between 29 and 50 MW) must maintain records of ash contents and higher heating values (FGS-Spain 2.1.i).</p> <p>AE.20.5.SP. New or substantially modified steam-generating units or electric utility steam-generating units rated greater than 100 MBtu/h heat input but less than 170 MBtu/h heat input (between 29 and 50 MW) must operate a properly calibrated and maintained continuous emissions monitoring (CEM) system for opacity, NO_x, and the O₂ or CO₂ content of flue gases (FGS-Spain 2.3).</p>	<p>Verify that the installation conducts and records measurements of fuel sulfur content for each fuel batch.</p> <p>Verify that the fuel sulfur content does not exceed 0.5 percent by weight where this fuel is commercially available.</p> <p>Verify that diesel fuel sulfur content does not exceed 0.3 percent by weight.</p> <p>Verify that the installation maintains a record of ash contents and higher heating values for the fuel combusted in the source.</p> <p>Verify that the opacity of emissions is continuously monitored, except where gaseous or distillate fuels are the only fuels combusted.</p> <p>Verify that NO_x emissions are continuously monitored.</p> <p>Verify that the O₂ or CO₂ content of flue gases is continuously monitored at each location where either SO₂ or NO_x emissions are monitored.</p>

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<p>AE.20.6.SP. New or substantially modified electric utility steam-generating units rated greater than 100 MBtu/h heat input but less than 170 MBtu/h heat input (between 29 and 50 MW) must meet specific emissions limitations (FGS-Spain 2.2).</p>	<p>Verify that flue gases discharged into the atmosphere do not contain particulate matter in excess of 13 ng/J heat input (0.03 lb/MBtu) derived from the combustion of solid, liquid, or gaseous fuel.</p> <p>Verify that no flue gases are discharged that:</p> <ul style="list-style-type: none"> - exhibit greater than 20 percent opacity, except for one 6-min period per hour of not more than 30 percent opacity - contain SO₂ in excess of 520 ng/J heat input (1.2 lb/MBtu) and 10 percent of the potential combustion concentration derived from solid fuel - contain SO₂ in excess of 340 ng/J heat input (0.80 lb/MBtu) and 10 percent of the potential combustion concentration derived from liquid or gaseous fuels - contain NO_x in excess of the emissions limits listed in Appendix 1-1. <p>(NOTE: When emissions of SO₂ are less than 260 ng/J heat input (0.60 lb/MBtu), there is a limit of 30 percent of the potential combustion concentration derived from solid fuel.)</p> <p>(NOTE: The following fuels require the specified percent reduction in potential combustion concentrations:</p> <ul style="list-style-type: none"> - gaseous fuels, 25 percent - liquid fuels, 30 percent - solid fuels, 65 percent.) <p>Verify that fuel consumption and electrical steam output values are verified monthly in order to calculate boiler efficiency.</p>
<p>AE.20.7.SP. Existing and new or substantially modified steam-generating electric utility or thermal heating units rated greater than 100,000 Btu/h (29 kW) heat input must have an annual tune-up to ensure that specific operating requirements are met (FGS-Spain 2.4).</p>	<p>Verify that the identified unit has an annual tune-up to ensure combustion efficiency of the unit so that the following requirements are met:</p> <ul style="list-style-type: none"> - for natural gas, the minimum excess O₂ level at high firing rates is 0.5 percent through 3 percent - for liquid fuels, the minimum excess O₂ level at high firing rates is 2 percent through 4 percent - CO emissions are below 400 ppm by volume - emission limits comply with the values in Appendix 1-2 - opacity limits are not exceeded more than 3 times/day, with each period lasting less than 10 min - the flame is stable and does not impinge on the furnace walls or burner part. <p>(NOTE: The composition of fuels permitted for use in combustion is given in Appendix 1-3.)</p>

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<p>AE.20.8.SP. New or substantially modified steam-generating units or electric utility steam-generating units rated greater than 100,000 Btu/h (29 kW) heat input must operate a properly calibrated and maintained CEM system to measure O₂ emissions and CO emissions (FGS-Spain 2.5).</p>	<p>Verify that such steam-generating units operate a properly calibrated and maintained CEM system for O₂ emissions and CO emissions.</p>

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<p>AE.30 INCINERATORS</p> <p>AE.30.1.SP. New or substantially modified incinerators that burn more than 50 tons/day [\cong 45359 kg/ day] or that burn more than 10 percent sewage sludge must meet specific emissions limitations (FGS-Spain 2.6.a through 2.6.c).</p> <p>AE.30.2.SP. Municipal solid waste incinerators that have a capacity greater than 1 ton/h [\cong 0.9 metric ton/h] must meet certain monitoring requirements (FGS-Spain 2.6.d).</p>	<p>Verify that no incinerator discharges any gas into the atmosphere that contains particulate matter in excess of 0.18 g/dscm (0.08 gr/dscf) corrected to 12 percent CO₂.</p> <p>Verify that incinerators that process beryllium-containing waste, beryllium, beryllium oxide, or beryllium alloys do not emit more than 10 g [0.02 lb] of beryllium into the atmosphere over a 24-h period.</p> <p>Verify that emission limit values for new or substantially modified municipal solid waste incinerators comply with Appendix 1-4.</p> <p>(NOTE: The standards are established as a function of the nominal capacity of the incineration plant.)</p> <p>Verify that values for the following are continuously measured and recorded:</p> <ul style="list-style-type: none"> - temperature - particulate matter (expressed in opacity units) - CO - O₂ - HCl. <p>(NOTE: The emissions are considered in compliance with the limits if:</p> <ul style="list-style-type: none"> - the 7 day average does not exceed the corresponding air emission limit - the 1 day average does not exceed 30 percent of the corresponding air emission limit.) <p>(NOTE: The average values are calculated including measurements collected during start-up and shutdown operations.)</p>

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<p>AE.40 MOTOR VEHICLES</p> <p>AE.40.1.SP. Installations must maintain DOD-owned, nontactical vehicles so as to prevent excessive emissions (FGS-Spain 2.9).</p>	<p>Verify that all vehicles are inspected every 2 yr to ensure that the factory-installed emission control equipment is intact and operational.</p> <p>Verify that CO emission values for gasoline vehicles do not exceed 5.0 percent by volume at 15-20 °C [≅ 59-68 °F] and 750-760 mmHg.</p> <p>Verify that motor vehicles equipped with diesel engines do not exceed the opacity values included in Appendix 1-5.</p> <p>Verify that, if available on the local economy, only unleaded gasoline is used in vehicles designed for unleaded gasoline.</p>

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<p>AE.50 VAPOR DEGREASERS</p> <p>AE.50.1.SP. Vapor degreasers in use after 1 January 1995 must incorporate systems that minimize the direct release of VOCs to the atmosphere (FGS-Spain 2.8).</p>	<p>Verify that the installation uses systems such as covered or refrigerated systems on vapor degreasers to minimize direct release of VOCs to the atmosphere.</p>

Appendix 1-1

**NO_x Emission Limits for New or Substantially Modified
Electric Steam Generating Units
(FGS-Spain Table 2-2)**

Type of Fuel	Nanograms per Joule	Emission Limits lb/MBtu
Gaseous Fuels:		
Coal-derived	210	0.50
Other	86	0.20
Liquid Fuels:		
Coal derived and shale oil	210	0.50
Other	130	0.30
Solid Fuels:		
Coal-derived	210	0.50
Subbituminous	210	0.50
Bituminous	260	0.60
Anthracite	260	0.60
Other	260	0.60

Appendix 1-2

Emission Limit Values for Fuel-Oil (FGS-Spain, Table 2-3)

Type of Fuel Used	Parameters	
	Opacity (%)	SO ₂ (mg/Nm ³)
Facilities using diesel or domestic fuel-oil	20	850
Facilities using heavy No. 1 fuel-oil	40	1700
Facilities using heavy No. 2 fuel-oil	50	3400

Appendix 1-3

Composition of Various Fuels (FGS-Spain, Table 2-4.A through 2-4.C)

Parameter	Unit	Maximum Limit
Diesel Fuel		
Density at 15 °C	kg/l	0.9
Total sulfur content	% by weight	0.3
Water and sediments	% by volume	0.1
Fuel Oil Number 1		
Viscosity at 100 °C	mm ² /S	25
Total sulfur content	% by weight	2.7
Water and sediments	% by volume	1
Water	% by volume	0.5
Fuel Oil Number 2		
Viscosity at 100 °C	mm ² /S	37
Total sulfur content	% by weight	3.5
Water and sediments	% by volume	1
Water	% by volume	0.5

Appendix 1-4

**Emission Limit Values in mg/Nm³ as a Function of the
Nominal Capacity of the Municipal Solid Waste
Incineration Plant (*)**
(FGS-Spain, Table 2-5)

Pollutant	Capacity		
	< 1 Ton/h	< 3 Ton/h but > 1 Ton/h	> 3 Ton/h
Particulate matter	200	100	30
SO _x	--	300	300
Heavy metals:			
Pb+Cr+Cu+Mn	--	5	5
Ni+As	--	1	1
Hydrochloric acid (HCl)	250	100	50
Hydrofluoric acid (HF)	--	4	2
Organic substances (TOC)	--	20	20
CO	--	100	100

(*) Values refer to a temperature of 273 °C [≅ 523 °F], 101.3 kPa of pressure, and an 11 percent oxygen or 9 percent CO₂ content. For a capacity < 1 Ton/h, emission limit values can refer to an oxygen content of 17 percent. In this case, the limit values cannot be greater than those indicated in Appendix 1-3 divided by those in Appendix 1-4.

Appendix 1-5

Motor Vehicles Limit Values for Opacity (*) (FGS-Spain Table 2-6)

Engine Power (Horsepower)	Absolute units (1)
> 200	2.1
> 100 and < 200	2.4
< 100	2.8

(*) The limit values for opacity are based on measures made at a minimum motor temperature of 60 °C [\cong 60 °F].

(1) The unit of opacity is based on measures made using the specific equipment defined in the Regulation No. 24 attached to the Geneva Agreement of 20 May 1958.

SECTION 2

CULTURAL RESOURCES MANAGEMENT

September 2000

A. Applicability of this Section

This section contains standards for required plans and programs needed to ensure proper protection and management of cultural resources, including historic and prehistoric properties under Department of Defense (DOD) control, and properties on the World Heritage List or on Spain's list equivalent to the U.S. National Register of Historic Places.

B. Source Documents

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapter 12.

C. Key Compliance Requirements

- Installations must inventory cultural property and resources and archaeological resources in areas under DOD control, if financially and otherwise practical.
- Installations must ensure that planning for major actions includes consideration of possible effects cultural or archaeological property or resources.
- Installations must notify appropriate Spanish authorities of the discovery of any potential cultural property or resources or archaeological resources not previously inventoried that are discovered on lands managed by U.S. Forces or in the course of a DOD action.
- Installations must preserve and protect certain newly discovered items pending a decision on final disposition the appropriate Spanish authority.
- Installations with cultural resources identified on the installation inventory must develop a plan for the protection and preservation of cultural resources and mitigation of any adverse effects.
- Personnel who perform cultural or archaeological resource functions must have the required expertise in world, national, and local history and culture.
- Installations must establish measures sufficient to protect known cultural property or archaeological resources until appropriate mitigation or preservation can be completed.

D. Definitions

- *Action* - all activities or programs of any kind authorized, funded, or carried out, in whole or in part, on DOD-controlled installations (FGS-Spain, Chapter 12, Definitions).
- *Adverse Effect* - changes that diminish or destroy the values that contribute to a property's eligibility for inclusion on the World Heritage List or the Spanish list equivalent to the U.S. National Register of Historic Places (FGS-Spain, Chapter 12, Definitions).
- *Archaeological Resource* - any material remains of prehistoric or historic human life or activities. Such resources include, but are not limited to: pottery, basketry, bottles, weapons, weapon projectiles, tools, structures or portions

of structures, pit houses, rock paintings, rock carvings, intaglios, graves, human skeletal materials, or any portion of any of the foregoing items (FGS-Spain, Chapter 12, Definitions).

- *Cultural Mitigation* - specific steps designed to lessen the adverse effects of a DOD action on a cultural or archeological resource, including (FGS-Spain, Chapter 12, Definitions):
 1. limiting the magnitude of the action
 2. relocating the action in whole or in part
 3. repairing, rehabilitating, or restoring the affected property
 4. recovering and recording data from cultural properties that may be destroyed or substantially altered.
- *Cultural Property or Resources* - physical remains of any prehistoric or historic district, site, building, structure, or object significant in world, national, or local history, architecture, archeology, engineering, or culture. The term includes artifacts, records, and remains that are related to such a district, site, building, structure, or object (FGS-Spain, Chapter 12, Definitions).
- *Cultural Resources Program* - identification, evaluation, documentation, curation, acquisition, protection, rehabilitation, restoration, management, stabilization, maintenance, recording, and reconstruction of cultural resources and any combination of the foregoing (FGS-Spain, Chapter 12, Definitions).
- *Inventory* - to determine the location of cultural resources that may have world, national, or local significance (FGS-Spain, Chapter 12, Definitions).
- *Material Remains* - physical evidence of human habitation, occupation, use, or activity, including the site, loci, or context in which such evidence is situated, including (FGS-Spain, Chapter 12, Definitions):
 1. surface or subsurface structures
 2. surface or subsurface artifact concentrations or scatters
 3. whole or fragmentary tools, implements, containers, weapons, clothing, and ornaments
 4. by-products, waste products, or debris resulting from manufacture or use
 5. organic waste
 6. human remains
 7. rock carvings, rock paintings, and intaglios
 8. rock shelters and caves
 9. all portions of shipwrecks
 10. any portion or piece of any of the foregoing.
- *Preservation* - the act or process of applying measures to sustain the existing form, integrity, and material of a building or structure and the existing form and vegetative cover of a site. It may include initial stabilization work where necessary, as well as ongoing maintenance of the historic building materials (FGS-Spain, Chapter 12, Definitions).
- *Property* - a site, building, object, structure, or collection of such items (FGS-Spain, Chapter 12, Definitions).
- *Protection* - the act or process of applying measures designed to affect the physical condition of a property by safeguarding it from deterioration, loss, attack, or alteration, or to cover or shield the property from danger or injury. In the case of buildings and structures, such treatment is generally temporary and anticipates future historic preservation treatment; in the case of archaeological sites, the protective measure may be temporary or permanent (FGS-Spain, Chapter 12, Definitions).

E. Records To Review

- Historic Preservation Plan
- Inventories of cultural property and archaeological resources, if any
- Base Environmental Maps

F. Physical Features To Inspect

- Construction sites
- Site or landmark of historic or archaeological interest

G. Guidance for Checklist Users

REFER TO CHECKLIST ITEMS:	
Missing Checklist Items/Positive Findings	CR.2.1.SP and CR.2.2.SP
Cultural Resources Management	CR.10.1.SP through CR.10.8.SP

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Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>CR.2 MISSING CHECKLIST ITEMS/POSITIVE FINDINGS</p> <p>CR.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>CR.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning cultural resources management have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

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**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
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**CR.10
CULTURAL RESOURCES
MANAGEMENT**

CR.10.1.SP. Installations must inventory cultural property and resources and archaeological resources in areas under DOD control, if financially and otherwise practical (FGS-Spain 12.2).

CR.10.2.SP. Installations must ensure that planning for major actions includes consideration of possible effects on cultural or archaeological property or resources (FGS-Spain 12.3.b).

CR.10.3.SP. ICs have specific responsibilities with regard to properties on the host nation's equivalent of the United States' National Register of Historic Places (16 USC 470a-2, Section 402).

Verify that, if financially and otherwise practical, the installation inventories cultural property and resources in areas under DOD control.

(NOTE: The cultural inventory can be developed from a records search and visual survey.)

Verify that, if financially and otherwise practical, the installation inventories archaeological resources in areas under DOD control.

(NOTE: The Executive Agent will maintain a copy of the Spanish inventory of significant historical and cultural resources in areas managed by U.S. Forces.)

Verify that the installation's planning for major actions includes consideration of possible effects on cultural or archaeological property or resources.

Determine whether any Federal undertaking may directly and adversely affect a property that is on the host nation's equivalent of the United States' National Register of Historic Places.

Verify that the IC informs the Secretary of the appropriate service of such property.

(NOTE: This notification is to be made so that the Secretary may take into account the effect of the undertaking on such property for purposes of avoiding or mitigating any adverse effects.)

Verify that the IC takes the above action prior to the approval of the undertaking.

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>CR.10.4.SP. Installations must notify the appropriate Spanish authority within 30 days of the discovery of any potential cultural property or resources or archaeological resources not previously inventoried that are discovered in the course of a DOD action (FGS-Spain 12.4.e).</p> <p>CR.10.5.SP. Installations must preserve and protect certain newly discovered items pending a decision on final disposition by the appropriate Spanish authority (FGS-Spain 12.4.d).</p> <p>CR.10.6.SP. Installations must develop a plan for the protection and preservation of cultural resources (FGS-Spain 12.3.a).</p> <p>CR.10.7.SP. Personnel who perform cultural or archaeological resource functions must have the required expertise in world, national, and local history and culture (FGS-Spain 12.1).</p> <p>CR.10.8.SP. Installations must establish measures sufficient to protect known cultural property or archaeological resources until appropriate mitigation or preservation can be completed (FGS-Spain 12.4.a through 12.4.c).</p>	<p>Determine whether any potential cultural property or resources or archaeological resources not previously inventoried have been discovered.</p> <p>Verify that appropriate Spanish authorities are notified within 30 days of the discovery of potential cultural or resources or archaeological resources not previously inventoried that are discovered on lands managed by U.S. Forces, or in the course of a DOD action.</p> <p>Verify that the installation preserves and protects potential cultural property or resources or archaeological resources discovered on lands managed by U.S. Forces, or in the course of a DOD action that have not previously been inventoried.</p> <p>Verify that the installation preserves and protects such items pending a decision on final disposition by the appropriate Spanish authority.</p> <p>Verify that installations with cultural resources identified on the installation inventory have a plan for the protection and preservation of cultural resources and mitigation of any adverse effects.</p> <p>Verify that personnel who perform cultural or archaeological resource functions have the requisite expertise in world, national, and local history and culture.</p> <p>Verify that known cultural property or resources and archaeological resources are protected at the installation.</p> <p>Verify that the installation has established measures to prevent personnel from disturbing or removing archaeological resources without the permission of the appropriate Spanish authorities.</p>

SECTION 3

HAZARDOUS MATERIALS MANAGEMENT

September 2000

A. Applicability of this Section

This section contains standards for the storage, handling, and disposition of hazardous materials used by the Department of Defense (DOD). It does not cover solid or hazardous waste, underground storage tanks, petroleum storage, or related spill contingency and emergency response requirements. Each of these topics is addressed in another section of this manual. Munitions are not addressed here either, because they are specifically excluded from the definition of hazardous material.

B. Source Documents

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapters 5, 6, and 18.

C. Key Compliance Requirements

- All excess hazardous material must be processed through the Defense Reutilization and Marketing Service (DRMS).
- All personnel who use, handle, or store hazardous materials must be trained.
- Drivers of hazardous material shipments must be trained according to the *Accord européen sùr le transport international des marchandises dangereuses par route* [Joint European Regulation on the International Transportation of Hazardous Materials] (ADR).
- Installations must reduce the use of hazardous materials through resource recovery, recycling, source reduction, acquisition, or other minimization strategies.
- All hazardous materials on DOD installations must be labeled and have Material Safety Data Sheets (MSDSs) either available or in the Hazardous Material Information System (HMIS).
- Installations must maintain a master listing of all storage facilities for hazardous material and an inventory of all hazardous materials contained therein.
- Each work center must maintain a file of MSDSs for each hazardous material procured, stored, or used at the work center.
- Personnel must respect the storage and handling information and requirements contained in the accompanying MSDS for products purchased in Spain or other European Community countries.
- Hazardous material transported on Spanish public roads must be labeled according to the ADR

D. Definitions

- *Accident Characterization Sheet* - shipping papers required by the ADR (FGS-Spain, Chapter 5, Definitions).
- *Hazardous Chemical Warning Label* - a label, tag, or marking on a container that is prepared in accordance with DOD Instruction (DODI) 6050.5-H, DOD *Hazardous Chemical Warning Labeling System*, and that provides the following information (FGS-Spain, Chapter 5, Definitions):
 1. identification/name of hazardous chemicals
 2. appropriate hazard warnings
 3. the name and address of the manufacturer, importer, or other responsible party.
- *Hazardous Material* - any material that is capable of posing an unreasonable risk to health, safety, or the environment if improperly handled, stored, issued, transported, labeled, or disposed of because it displays a characteristic identified in Appendix 3-1 or the material is listed in Appendix 4-1, Chart A.4 of Section 4, *Hazardous Waste Management* and/or Appendix 3-2. Munitions are excluded (FGS-Spain, Chapter 5, Definitions).
- *Hazardous Material Information System (HMIS)* - the computer-based information system developed to accumulate, maintain, and disseminate important information on hazardous material used by the DOD (FGS-Spain, Chapter 5, Definitions).
- *Hazardous Material Shipment* - unless otherwise specified by the ADR, any movement of hazardous material in a DOD land vehicle either from an installation to a final destination off the installation, or from a point of origin off the installation to a final destination on the installation, in excess of any of the following quantities (FGS-Spain, Chapter 5, Definitions):
 1. for hazardous material identified as a result of inclusion in Appendix 4-1, Chart A.4, any quantity in excess of the reportable quantity (RQ) listed in Appendix 4-1, Chart A.4
 2. for other liquid or semi-liquid hazardous material, in excess of 416 L (110 gal)
 3. for other solid hazardous material, in excess of 225 kg (500 lb)
 4. for combinations of liquid, semi-liquid, and solid hazardous materials, in excess of 340 kg (750 lb).
- *Hazardous Substance* - any substance having the potential to do serious harm to human health or the environment if spilled or released in RQ. A listing of these substances and corresponding RQ is contained in Appendix 4-1, Chart A.4. The term does not include: (FGS-Spain, Chapter 18, Definitions)
 1. petroleum, including crude petroleum, oil, and lubricant (POL) or any fraction thereof, that is not otherwise specifically listed or designated as a hazardous substance above
 2. natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).
- *Material Safety Data Sheet (MSDS)* - a form used by manufacturers of chemical products to communicate to users the chemical, physical, and hazardous properties of their product (FGS-Spain, Chapter 5, Definitions).

E. Records To Review

- Emergency Plan documents
- MSDSs
- Inventory records
- Training records
- Inspection records
- Shipping papers
- Placarding of hazardous materials

F. Physical Features To Inspect

- Hazardous materials storage areas
- Shop activities
- Shipping and receiving area

G. Guidance for Checklist Users

REFER TO CHECKLIST ITEMS:	
Missing Checklist Items/Positive Findings	HM.2.1.SP and HM.2.2.SP
Excess Hazardous Materials	HM.10.1.SP
Training	HM.20.1.SP
Releases	HM.30.1.SP
General Operating Requirements	HM.40.1.SP through HM.40.4.SP
General Storage Requirements	HM.50.1.SP
Documentation	HM.60.1.SP through HM.60.3.SP
Batteries	HM.70.1.SP
Transportation	HM.80.1.SP and HM.80.2.SP

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Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HM.2 MISSING CHECKLIST ITEMS/POSITIVE FINDINGS</p> <p>HM.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>HM.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning hazardous materials management have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HM.10 EXCESS HAZARDOUS MATERIALS</p> <p>HM.10.1.SP. All excess hazardous material must be processed through the Defense Reutilization and Marketing Service (DRMS) (FGS-Spain 5.10).</p>	<p>Verify that excess hazardous materials are processed through DRMS.</p> <p>(NOTE: The GSA Shelf-life Hotline can provide federal customers information on shelf-life extension. Hotline staff will need to know the National Stock Number (NSN), batch number, and date of manufacture. The Hotline staff can provide extension information if the item has been tested and its shelf-life has been extended. Telephone: 209-946-6333, Fax: 209-946-6214.)</p>

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HM.20 TRAINING</p> <p>HM.20.1.SP. All personnel who use, handle, or store hazardous materials must be trained (FGS-Spain 5.11).</p>	<p>Verify that personnel who use, handle, or store hazardous materials are trained in accordance with DOD Instruction 6050.5, <i>DOD Hazard Communication Program</i>.</p> <p>Verify that drivers of hazardous material shipments are trained according to the ADR.</p>

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<p>HM.30 RELEASES</p> <p>HM.30.1.SP. Installations must take specific actions in the event of hazardous substance spills (FGS-Spain 18.4.b through 18.4.e).</p>	<p>Verify that spills of RQs of hazardous substances, hazardous waste, or POL are reported to the Installation On-Scene Coordinator (IOSC) immediately.</p> <p>Verify that immediate action is taken to eliminate the source and contain the spill.</p> <p>Verify that the appropriate Military Department and/or Defense Agency and the Executive Agent are notified immediately when any of the following occurs:</p> <ul style="list-style-type: none"> - a spill occurs inside a DOD installation and cannot be contained within any required berm or secondary containment - a spill exceeds 416 L (110 gal) - a water source has been polluted - the IOSC has determined that the spill is significant. <p>Verify that a written follow-up report is submitted in any of the above instances.</p> <p>Verify that, when a spill of hazardous substances, hazardous waste, or POL occurs inside the installation and cannot be contained within its boundaries or threatens the local Spanish drinking water resource, the following are notified immediately:</p> <ul style="list-style-type: none"> - the appropriate Military Department and/or Defense Agency - the Executive Agent - the appropriate Spanish authorities. <p>Verify that, if a hazardous substance spill in excess of the RQ occurs outside of the installation, the person in charge at the scene immediately notifies appropriate Spanish authorities and local fire departments and obtains necessary assistance.</p>

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<p>HM.40 GENERAL OPERATING REQUIREMENTS</p> <p>HM.40.1.SP. Installations must reduce the use of hazardous materials through resource recovery, recycling, source reduction, acquisition, or other minimization strategies (FGS-Spain 5.9).</p> <p>HM.40.2.SP. All hazardous materials on DOD installations must be labeled and have MSDS information either available or in HMIS (FGS-Spain 5.8).</p> <p>HM.40.3.SP. Installations must prevent the unauthorized entry of people or livestock into hazardous materials storage areas (FGS-Spain 5.12).</p> <p>HM.40.4.SP. Installations must maintain hazardous materials dispensing areas properly (FGS-Spain 5.2).</p>	<p>Verify that the installation reduces the use of hazardous materials through:</p> <ul style="list-style-type: none"> - resource recovery - recycling - source reduction - acquisition, etc. <p>Verify that all hazardous materials are labeled with a Hazardous Chemical Warning Label.</p> <p>Verify that MSDS information is either available or in HMIS.</p> <p>(NOTE: These requirements apply throughout the life cycle of the hazardous materials.)</p> <p>Verify that hazardous material transported on Spanish public roads is labeled according to the ADR.</p> <p>Verify that the installation prevents unauthorized entry into hazardous materials storage areas.</p> <p>Verify that drums and containers in hazardous materials dispensing areas are not leaking.</p> <p>Verify that drip pans/absorbent materials are placed under containers as necessary to collect drips or spills.</p> <p>Verify that container contents are clearly marked.</p> <p>Verify that new dispensing areas are located away from catch basins and storm drains.</p> <p>Verify that existing dispensing areas currently located near catch basins and storm drains are equipped with containment to prevent soil or groundwater contamination.</p>

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<p>HM.50 GENERAL STORAGE REQUIREMENTS</p> <p>HM.50.1.SP. Installations must respect storage and handling information and requirements contained in MSDSs that accompany certain products (FGS-Spain 5.1).</p>	<p>Verify that the installation obeys the storage and handling information and requirements contained in the accompanying MSDS for products purchased in Spain or other European Union countries.</p>

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HM.60 DOCUMENTATION</p> <p>HM.60.1.SP. Installations must maintain a master listing of all storage facilities for hazardous materials and an inventory of all hazardous materials contained therein (FGS-Spain 5.5).</p> <p>HM.60.2.SP. Each work center must maintain a file of MSDSs for each hazardous material procured, stored, or used at the work center (FGS-Spain 5.7).</p> <p>HM.60.3.SP. The content of MSDSs must meet specific criteria (FGS-Spain 5.6).</p>	<p>Verify that the installation maintains a master listing of all storage facilities for hazardous materials and an inventory of all hazardous materials contained therein.</p> <p>Verify that each work center maintains a file of MSDSs for each hazardous material procured, stored, or used at the work center.</p> <p>Verify that MSDSs are obtained or prepared for locally purchased items.</p> <p>Verify that the MSDSs are in English and Spanish and contain at least the following information:</p> <ul style="list-style-type: none"> - the identity used on the label: <ul style="list-style-type: none"> - if the hazardous chemical is a single substance, the chemical and common name of the substance - if the hazardous chemical is a mixture that has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients that contribute to these known hazards and the common name(s) of the mixture itself - if the hazardous chemical is a mixture that has not been tested as a whole: <ul style="list-style-type: none"> - the chemical and common name(s) of all ingredients that have been determined to be health hazards and that comprise 1 percent or greater (0.1 percent or greater for carcinogens) of the composition - the chemical and common name(s) of all ingredients that have been determined to be health hazards and that comprise less than 1 percent (0.1 percent for carcinogens) of the mixture, if there is evidence that the ingredient(s) could be released from the mixture in concentrations that would exceed an established OSHA permissible exposure limit (PEL), or could present a health hazard to personnel - the chemical and common name(s) of all ingredients that have been determined to present a physical hazard when present in the mixture

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	<ul style="list-style-type: none"> - physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point, etc.) - physical hazards of the chemical, including the potential for fire, explosion, and reactivity - health hazards of the chemical, including signs and symptoms of exposure and any medical conditions that are generally recognized as being aggravated by exposure to the chemical - primary route(s) of entry (e.g., inhalation, skin absorption, ingestion, etc.) - OSHA PELs and any other pertinent exposure limit - whether the chemical has been found to be a potential carcinogen - any generally applicable precautions, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for cleanup of spills and leaks - any generally applicable control measures, such as appropriate engineering controls, work practices, or personal protective equipment - emergency and first aid procedures - date of preparation or last change - name, address, and telephone number of the chemical manufacturer, importer, employer, or other responsible party preparing or distributing the MSDS who can provide additional information on the chemical and appropriate emergency procedures - specific storage and handling requirements for the material.

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**REGULATORY
REQUIREMENTS:**

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**HM.70
BATTERIES**

HM.70.1.SP. Lead-acid batteries that are to be recycled must be managed as hazardous material (FGS-Spain 6.9.f).

Verify that lead-acid batteries that are to be recycled are managed as hazardous material.

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Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HM.80 TRANSPORTATION</p> <p>HM.80.1.SP. Hazardous materials shipments must meet specific standards (FGS-Spain 5.3).</p> <p>HM.80.2.SP. International air shipments of hazardous materials originating from a DOD installation must meet specific standards (FGS-Spain 5.4).</p>	<p>Verify that hazardous materials shipments are accompanied throughout by shipping papers that clearly describe the quantity and identity of the material and include both:</p> <ul style="list-style-type: none"> - an MSDS - accident characterization sheets according to the ADR. <p>Verify that all drivers of hazardous material shipments are trained and certified according to the ADR.</p> <p>Verify that all vehicles used for hazardous material shipments are inspected according to the ADR.</p> <p>Verify that supervisory personnel do a walk-around inspection of the vehicles before and after the material is loaded.</p> <p>Verify that all packages are properly labeled (see checklist item HM.40.2.SP).</p> <p>Determine whether the installation ships hazardous materials internationally by air.</p> <p>Verify that the installation follows the shipping standards found in the International Civil Air Organization Rules and appropriate DOD and component instructions.</p>

Appendix 3-1

Typical Hazardous Material Characteristics (FGS-Spain, Table 5-1)

I.	The item is a health or physical hazard. Health hazards include carcinogens, corrosive materials, irritants, sensitizers, toxic materials, and materials that damage the skin, eyes, or internal organs. Physical hazards include combustible liquids, compressed gases, explosives, flammable materials, organic peroxides, oxidizers, pyrophoric materials, unstable (reactive) materials, and water-reactive materials.
II.	The item and/or its disposal is regulated by Spain because of its hazardous nature. Hazardous materials which may be regulated as a waste in Spain are included in Appendix 3-2.
III.	The item contains asbestos, mercury, or polychlorinated biphenyls (PCBs).
IV.	The item has a flashpoint below 93 °C (200 °F) closed cup, or is subject to spontaneous heating, or is subject to polymerization with release of large amounts of energy when handled, stored, or shipped without adequate control.
V.	The item is a flammable solid, or is an oxidizer, or is a strong oxidizing or reducing agent with a standard reduction potential of greater than 1.0 V or less than -1.0 V.
VI.	In the course of normal operations, accidents, leaks, or spills, the item may produce dusts, gases, fumes, vapors, mists, or smokes with one or more of the above characteristics.
VII.	The item has special characteristics that, in the opinion of the manufacturer or the DOD Components, could cause harm to personnel if used or stored improperly.

Appendix 3-2

List of Dangerous Substances (FGS-Spain, Appendix B)

Scope

The list in this table identifies substances considered dangerous in Spain and all other countries in the European Union. Substances included on this list will be treated as hazardous materials in accordance with this section.

Substances	CAS No ¹	EC No ²	Labeling
(Benzothiazol-2-ylthio)succinic acid	95154011	401-450-4	Xi
(C16 or C18-n-alkyl)(C16 or C18-n-alkyl)ammonium 2-((C16 or C18-n-alkyl)(C16 or C18-n-alkyl)(C16 or C18-n-alkyl)carbamoyl) benzenesulfonate	-	402-460-1	Xi
(Ethyl-3-oxobutanoato-O'1,O'3)(2-dimethylaminoethanolato)(1-methoxypropan-2-olato)aluminium(III), dimerized	-	402-370-2	Xi
(N-Benzul-N-ethyl)amino-3'-hydroxyacetophenone hydrochloride	55845904	401-840-4	Xi
(Tris(chloromethyl)phthalocyaninato)copper(II), reaction products with N-methylpiperazine and methoxyacetic acid	-	401-260-1	Xi
1-(2-Butoxypropoxy) propan -2-ol	24083032	603-050-00-7	Xn
1-Bromopropane	106945	602-019-00-5	Xn
1-Butyl-2-methylpyridinium bromide	26576841	402-680-8	Xn
1-Chloro-1-nitropropane	600259	610-007-00-6	Xn
1-Chlorobutane	109693	602-059-00-3	F
1-Dimethylaminopropan-2-ol	108167	603-077-00-4	C
1-Methyl-3-nitro-1-nitrosoguanidine	70257	612-083-00-6	T
1-Methylimidazole	616477	613-035-00-7	C
1-Methyltrimethylene diacrylate	19485031	607-118-00-7	C
1-Naphthylacetic acid	86873	607-087-00-X	Xn
1-Nitropropane	108032	609-001-00-6	Xn
1-Phenyl-3-pyrazolidone	92433	606-022-00-2	Xn
1,1-Dichloro-1-nitroethane	594729	610-002-00-9	T
1,1-Dichloropropene	563586	602-031-00-0	F, T
1,2-Dichloropropene	563542	602-031-00-0	F, T
1,1-Diethoxyethane	105577	605-015-00-1	F, Xi

Substances	CAS No ¹	EC No ²	Labeling
1,1-Dimethoxyethane	534156	605-007-00-8	F
1,1,2-Trichloroethane	79005	602-014-00-8	Xn
1,1,2,2-Tetrabromoethane	79276	602-016-00-9	T+
1,1,2,2-Tetrachloroethane	79345	602-015-00-3	T+
1,2 Dimethylimidazole	1739840	613-034-00-1	Xn
1,2-Dibromo-3-chloropropane	96128	602-021-00-6	T
1,2-Dichloroethylene	156605 540590	02-026-00-3	F, Xn
1,2- Dimethylhydrazine	540738	007-013-00-0	T
1,2,3-Trichloropropane	96184	602-062-00-X	Xn
1,2,3,4-Diepoxybutane	1464535	603-060-00-1	T
1,2,3,4-Tetranitrocarbazole	6202159	613-003-00-2	E, Xn
1,3 Butadiene	106990	601-013-00-X	F+, T
1,3-Dichloro -2- propanol	96231	602-064-00-0	T
1,3-Dichloro-5-ethyl-5-methylimidazolidine-2,4-dione	8941587 2	401-570-7	O, T+
1,3-Dichloropropene	542756	602-030-00-5	F, Xn
2,3-Dichloropropene	78886	602-030-00-5	F, Xn
3,3-Dichloropropene	563575	602-030-00-5	F, Xn
1,3-Dioxolane	646060	605-017-00-2	F
1,3-Propanesultone	1120714	016-032-00-3	T
1,3-Propiolactone	57578	606-031-00-1	T+
1,3-Propylene oxide	503300	603-058-00-0	F, Xn
1,3,5-Trioxan	110883	605-002-00-0	Xn
1,4 Dimethylcyclohexane	589902	601-019-00-2	F
1,4-Dioxane	123911	603-024-00-5	F, Xn
1,4,5,6,7,7-Hexachlorobicyclo (2,2,1) hept-5-ene- 2,3 -dicarboxylin anhydride chlorendic anhydride	115275	607-101-00-4	Xi
1,5-Naphthylene di-isocyanate	3173726	615-007-00-X	Xn
2.4.5-T acid	93765	607-041-00-9	Xn
2- (2-Bromoethoxy)anisole	4463596	402-010-4	Xn
2- (4-(3-(4-Chlorophenyl)-4,5-Dihydropyrazolyl)phenylsulfonyl) ethyl dimethylammonium hydrogen phosphonate	106359937	402-490-5	Xi

Substances	CAS No ¹	EC No ²	Labeling
2-(4,4-Dimethyl-2,5-dioxooxazolidin-1-yl)-2'-chloro-5'-(2-(2,4-di-tert-pentylphenoxy)butyramido)-4,4-dimethyl-3-oxovaleranilide	-	402-260-4	E
2-2'-Iminodiethylamine	11400	612-058-00-X	C
2-3-(prop-1-en-2-yl)phenyl)prop-2-yl isocyanate	2094997	402-440-2	T+
2-Amino-2-methylpropanol	124685	603-070-00-6	Xi
2-Aminobenzidine	2835690	612-045-00-9	Xn
2-Butanone oxime	96297	616-014-00-0	Xi
2-Butyne-1,4-diol	110656	603-076-00-9	T
2-Chlorobenzaldehyde	89985	605-011-00-X	C
2-Chlorobenzonitrile	873325	608-013-00-9	Xn
2-Chloroethanol	107073	603-028-00-7	T+
2-Chloropropionic acid	598787	607-139-00-1	C
2-Diethylaminoethanol	100378	603-048-00-6	Xi
2-Diethylaminoethyl methacrylate	105168	607-127-00-6	Xn
2-Dimethylaminoethanol	108010	603-047-00-0	Xi
2-Dimethylaminoethylamine	108009	612-075-00-2	F, C
2-Dimethylaminoethyl methacrylate	2867472	607-132-00-3	Xn
2-Ethoxyaniline (o) (p)	94702 156434	612-039-00-6	T
2-Ethoxyethyl acetate	111159	607-037-00-7	Xn
2-Ethylbutan-1-ol	97950	603-051-00-2	Xn
2-Ethylhexyl acrylate	103117	607-107-00-7	Xi
2-Fluoro-5-trifluoromethylpyridine	69045825	400-290-2	Xi
2-Fluoroacetamide	640197	616-002-00-5	T+
2-Hydroxyethyl acrylate	818611	607-072-00-8	T
2-Hydroxyethyl methacrylate	868779	607-124-00-X	Xi
2-Methoxyaniline (o) “ (p)	90040 104949	612-035-00-4	T+
2-Methoxyethanol	109864	603-011-00-4	Xn
2-Methyl-1-pentylpyridinium bromide	-	402-690-2	Xn
2-Methyl-4-phenylpentanol	92585245	402-770-7	Xi
2-Methylaminoethanol	109831	603-080-00-0	C

Substances	CAS No ¹	EC No ²	Labeling
2-Methylbutan-2-ol	75854	603-007-00-2	F, Xn
2-Methylcyclohexanol	583595	603-010-00-9	Xn
2-Methylcyclohexanone	583608	606-011-00-2	Xn
2-Methoxyethyl acetate	110496	607-036-00-1	Xn
2-Methylpentane-2,4-diol	107415	603-053-00-3	Xi
2-Methylpropan-2-ol	75650	603-005-00-1	F, Xn
2-Naphthol	135193	604-007-00-5	Xn
2-Naphtylamine salts	-	612-071-00-0	T
2-Nitroanaphthalene	581895	609-038-00-8	T
2-Nitropropane	79469	609-002-00-1	T
2-Nitrotoluene	88722	609-006-00-3	T
4-Nitrotoluene	99990		
2-Picoline	109068	613-036-00-2	Xn
2-Tert-Butylaminoethyl methacrylate	3775904	607-128-00-1	Xi
2,2 Dimethylpropane	463821	601-005-00-6	F
2,2- (Methylimino)diethanol	105599	603-079-00-5	Xi
2,2-Dichlorovinyl 2-ethylsufinylethyl methyl phosphate	7076531	015-077-00-6	T
2,2-Dimethyl-1,3-benzodioxol-4-ol	22961826	400-900-7	Xi
2,2-Thiodiethanol	111488	603-081-00-6	Xi
2,2,4-Trimethylhexamethylene- 1,6-di-isocyanate	16938220	615-010-00-6	T
2,4,4-Trimethylhexamethylene- 1,6-di-isocyanate	15646965		
2,3,4,6-tetrachlorophenol	58902	604-013-00-8	T
2,3,5,6-tetrachloro-4-(methylsulfonyl)pyridine	13108526	613-032-00-0	Xn
2,4 Dinitroaniline	97029	612-040-00-1	T+
2,4-D salts & esters	-	607-040-00-3	Xn
2,4-D-Acid	94757	607-039-00-8	Xn
2,4-DB salts	-	607-084-00-3	Xn
2,4-DES	149268	016-025-00-5	Xn
2,4-Dichloro-3-ethylphenol	-	401-060-4	C
2,4-Dichlorophenol	120832	604-011-00-7	Xn
2,4-Dimethylpentan-3-one	565800	606-028-00-5	F
2,4,5-T salts & esters	-	607-042-00-4	Xn
2,4,5-Trichlorophenol	95954	604-017-00-X	Xn
2,4,6-Trichlorophenol	88062	604-018-00-5	Xn

Substances	CAS No ¹	EC No ²	Labeling
2,4,6-Trinitroanisole	606-35-9	609-011-00-0	E, Xn
2,4,6-Trinitrotoluene; TNT	118967	609-008-00-4	E, T
2,4,6-Tris (dimethylaminomethyl) phenol	90722	603-069-00-0	Xn
2,6-Dimethylheptan-4-one	108838	606-005-00-X	Xi
3-(3-Methylpent-3-yl)isoxazol-5-ylamine	82560063	401-460-9	T
3-(Bis(2-ethylhexyl)aminomethyl)benzothiazole-2(3H)- thione	105254851	402-540-6	C
3-(Dimethylamino)propylurea	31506431	401-950-2	Xi
3-3'-Dimthoxybenzidine salts	-	612-037-00-5	T
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	2855132	612-067-00-9	C
3-Aminopropyldiethylamine	104789	612-062-00-1	C
3-Aminopropyldimethylamine	109557	612-061-00-6	C
3-Chloro-2-methylpropene	563473	602-032-00-6	F, Xn
3-Chloro-4,5,alpha,alpha,alpha,pentafluorotoluene	77227997	401-930-3	Xn
3-Chloro-5-trifluoromethyl-2-pyridylamine	79456261	401-670-0	Xn
3-Methyl-p-phenylenediamine sulfate	6369591	612-030-00-7	Xn
3-Methylbutan-2-one	563804	606-007-00-0	F
3,3'-Dichlorobenzidine salts	-	612-069-00-X	T
3-3'-Dimethoxybenzidine	119904	612-036-00-X	T
3,3'-Dimethylbenzidine	119937	612-041-00-7	T
3,3'-Iminopropylamine	56188	612-063-00-7	C
3,3-Dichlorobenzidine	91941	612-068-00-4	T
3,5-Dichloro-2,4-difluorobenzoyl fluoride	101513706	401-800-6	T, C
3,5-Dichloro-4-(1,1,2,2-tetrafluoroethoxy)aniline	104147322	401-790-3	Xn
3,7-Dichloroquinoline-8-carboxylic acid	84087014	402-780-1	Xi
4 Chloro-o-tolyloxyacetic acid (MCPA)	94746	607-051-00-3	Xn
4-(1(or 4 or 5 or 6)-Methyl-8,9,10-trinorborn-5-en-2-yl)pyridine, mixture of isomers	-	402-520-7	Xn
4-(2-Chloro-4-trifluoromethyl)phenoxy-2-fluoroaniline hydrochloride	-	402-190-4	T
4-(2,4-Dichlorophenoxy) butyric acid	94826	607-083-00-8	Xn
4-(4-Chloro-o-tolyloxy) butyric acid (MCPB)	94815	607-053-00-4	Xn
4-Amino benzenesulphonic acid	121573	612-014-00-X	Xn
4-Amino-N,N-diethylaniline	93050	612-080-00-X	T
4-Chloro-m-cresol	59507	604-014-00-3	Xn

Substances	CAS No ¹	EC No ²	Labeling
4-Chlorobenzoyl peroxide	94177	617-011-00-7	E, Xi
4-CPA	122883	607-073-00-3	Xn
4-Methoxy-2-nitroaniline	96968	612-038-00-0	T+
4-Methoxy-4-methylpentan-2-one	107700	606-023-00-8	-
4-Methyl-m-phenylenediamine sulfate	74283366	612-030-00-7	Xn
4-Methylpent-3-en-2-one	141797	606-009-00-1	Xn
4-Methylpentan-2-ol	108112	603-008-00-8	Xi
4-Methylpentan-2-one	108101	606-004-00-4	F
4-Nitrobiphenyl	92933	609-039-00-3	T
4-Nitrophenol	100027	609-015-00-2	Xn
4-Nitrosoaniline	659494	612-011-00-3	Xn
4-Picoline	108894	613-037-00-8	T
4,4 Carbonyldi (phthalic anhydride)	2421285	607-100-00-9	Xi
4,4'-Isobutylethylidenediphenol	6807176	401-720-1	Xi
4,4'-Methylene bis (2-chloroaniline) salts	-	612-079-00-4	T
4,4'-Methylene bis (2-chloroaniline)	101144	612-078-00-9	T
4,4'-Methylenedi(cyclohexyl isocyanate)	5124301	615-009-00-0	T
4,4'-Methylenedi-o-toluidine	838880	612-085-00-7	T
4,4'-Methylenedianiline	101779	612-051-00-1	Xn
4,6-Dinitro-o-cresol	534521	609-020-00-x	T+
5(or 6)-tert-butyl-2'chloro-6'-ethylamino-3',7'-dimethyl-spiro(isobenzofuran-1(1H),9'-xanthene)-3-one	-	400-680-2	Xn
5-Methylheptan-3-one	541855	606-020-00-1	Xi
5-Methylhexan-2-one	110123	606-026-00-4	-
5-Nitroacenaphthene	602879	609-037-00-2	T
7,7-Dimethyl-3-oxa-6-azactan-1-ol	-	400-390-6	C
8,9-Dinorborn-5-ene-2,3-dicarboxyle anhydride	123748856	607-106-00-1	Xn
8,9,10-Trinorborn-2-yl acrylate	10027-06- 2	607-121-00-3	Xn
8,9,10-Trinorborn-5-ene-2,3-dicarboxylic anhydride	129646	607-105-00-6	Xi
a,a Dichlorotoluene	98873	602-058-00-8	Xi
Acephate	30560191	015-079-00-7	Xn
Acetic acid	64197	607-002-00-6	C
Acetic anhydride	108247	607-008-00-9	C
Acetone	67641	606-001-00-8	F

Substances	CAS No ¹	EC No ²	Labeling
Acetone cyanohydrin	75865	608-004-00X	T+
Acetonitrile	75058	608-001-00-3	F, T
Acetyl chloride	75365	607-011-00-5	F, C
Acetylene	74862	601-015-00-0	F
Aconitine	302272	614-008-00-2	T+
Aconitine salts	-	614-009-00-8	T+
Acrolein	107028	605-008-00-3	f, T+
Acrylamide	79061	616-003-00-0	T
Acrylate	-	607-133-00-9	Xi
Acrylic acid	79107	607-061-00-8	C
Acrylonitrile	107131	608-003-00-4	F, T
Adipic acid	124049	607-144-009	Xi
Air, liquid	-	008-002-00-3	O
Alachlor	15972608	616-015-00-6	Xn
Aldicarb	116063	006-017-00-X	T+
Aldrin	309002	602-048-003	T
Alkali ethoxides	-	603-041-00-8	F, C
Alkali Fluorosilicates (Na, K, NH ₄)	16893851 16871902 16919190	009-012-00-0	T
Alkali methoxides	-	603-040-00-2	F, C
Alkali salts of pentachlorophenol	-	604-003-00-3	T
Allethrin	584792	006-025-00-3	Xn
Allidochlor	93710	616-004-00-6	Xn
Allyl alcohol	107186	603-015-00-6	T
Allyl chloride	107051	602-029-00-X	F, T+
Allyl glycidyl ether	1106923	603-038-00-1	Xn
Allyl iodide	556569	602-054-00-6	C
Allylamine	107119	612-046-00-4	F, T
Alpha-3-(3-(2H-benzotriazol-2-yl)-5-tert-butyl-4- hydroxy-phenyl)propionyl-omega-hydroxypoly(oxyethylene)	-	400-830-7	Xn
alpha-Naphthylamine	134327	612-020-00-2	Xn
Aluminium alkyls	-	013-004-00-2	F, C
Aluminium chloride, anhydrous	7446700	013-003-00-7	C

Substances	CAS No ¹	EC No ²	Labeling
Aluminium lithium hydride	16853853	001-002-00-4	F
Aluminium phosphide	20859738	015-004-00-8	F, T+
Aluminium powder	7429905	013-001-00-6	F
Aluminium powder (stabilized)	-	013-002-00-1	-
Aluminium-tri-isopropoxide	555317	603-042-00-3	F
Ametryn	834128	613-010-00-0	Xn
Amidithion	919766	015-080-00-2	Xn
Aminocarb	2032599	006-018-00-5	T
Aminophenol	-	612-033-00-3	Xn
Amitrole	61825	613-011-00-6	Xn
Ammonia, anhydrous	7664417	007-001-00-5	T
Ammonia solution	-	007-001-01-2	C
Ammonium bifluoride	1341497	009-009-00-4	T, C
Ammonium bis (2,4,6-trinitrophenyl)amide	2844920	612-019-00-7	E, T+
Ammonium bis (1-(3,5-dinitro-2-oxidophenylazo)-3-(N-phenylcarbamoyl)-2-naphtholato)chromate(1-)	-	400-110-2	F
Ammonium chloride	12125029	017-014-00-8	Xn
Ammonium dichromate	7789095	024-003-00-1	E, Xi
Ammonium fluoride	12125018	009-006-00-8	T
Ammonium perchlorate	7790989	017-009-00-0	O
Ammonium polysulfides	9080175	016-008-00-2	C
Ammonium salt of DNOC	2980645	609-022-00-0	T+
Amyl acetate	628637	607-130-00-2	-
Amyl alcohol	-	603-006-00-7	Xn
Amyl Formate	638-49-3	607-018-00-3	-
Amyl propionate	624544	607-131-00-8	-
Aniline	62533	612-008-00-7	T
Aniline salts	-	612-009-00-2	T
Antimony compounds	-	051-003-00-9	Xn
Antimony pentachloride	7647189	051-002-00-3	C
Antimony trichloride	10025919	051-001-00-8	C
Antimony trifluoride	7783564	051-004-00-4	T
ANTU	86884	006-008-00-0	T+
Arsenic	7440382	033-001-00-X	T

Substances	CAS No ¹	EC No ²	Labeling
Arsenic compounds	-	033-002-00-5	T
Arsenic trioxide	1327533	033-003-00-0	T+
Asbestos	12001284 12001295 12172735 77536664 77536686 77536675	650-013-00-6	T
Atropine	51558	614-010-00-3	T+
Atropine salts	-	614-011-00-9	T+
Azaconazole	60207310	613-040-00-4	Xn
Azinphos-ethyl	2642719	015-056-00-1	T+
Azinphos-methyl	86500	015-039-00-9	T+
Aziridine	151564	613-001-00-1	F, T+
Azobenzene	103333	611-001-00-6	Xn
Azothoate	5834968	015-082-00-3	Xn
Azoxybenzene	495487	611-002-00-1	Xn
Barban	101279	006-020-00-6	Xn
Barium carbonate	513779	056-003-00-2	Xn
Barium chlorate	13477004	017-003-00-8	O, Xn
Barium perchlorate	13465957	017-007-00-X	O, Xn
Barium peroxide	1304296	056-001-00-1	O, Xn
Barium polysulfides	50864670	016-003-00-5	Xi
Barium salts	-	056-002-00-7	Xn
Barium sulfide	21109955	016-002-00-X	Xn
Benomyl	17804352	613-049-00-3	Xn
Benquinox	495738	650-006-00-8	T
Bensulide	741582	015-083-00-9	Xn
Bentazone	25057890	613-012-00-1	Xn
Benzaldehyde	100527	605-012-00-5	Xn
Benzene	71432	601-020-00-8	F, T
Benzidine	92895	612-042-00-2	T
Benzidine salts	-	612-070-00-5	T
Benzoguanamine	91769	613-038-00-3	Xn

Substances	CAS No ¹	EC No ²	Labeling
Benzonitrile	100470	608-012-00-3	Xn
Benzotrichloride	98077	602-038-00-9	Xn
Benzotrifluoride	98088	602-056-00-7	F
Benzoyl chloride	98884	607-012-00-0	C
Benzo(a)anthracene	565553	601-033-00-9	T
Benzo(a)pyrene	50328	601-032-00-3	T
Benzo(b)fluoranthene	205992	601-034-00-4	T
Benzo(j)fluoranthene	205823	601-035-00-X	T
Benzo(k)fluoranthene	207089	601-036-00-5	T
Benzthiazuron	1929880	006-036-00-3	Xn
Benzyl alcohol	100516	603-057-00-5	Xn
Benzyl benzoate	120514	607-085-00-9	Xn
Benzyl bromide	100390	602-057-00-2	Xi
Benzyl chlorformate	501531	607-064-00-4	C
Benzyl chloride	100447	602-037-00-3	Xi
Benzyl Violet 4B	1694093	650-010-00-X	Xn
Benzyl-2-hydroxydodecyldimethylammonium benzoate	113694523	402-610-6	C
Benzylamine	100469	612-047-00-X	C
Benzyl dimethylamine	103833	612-074-00-7	C
Benzyltributylammonium 4-hydroxynaphthalene-1-sulfonate	102561466	402-240-5	Xn
Beryllium	7440417	004-001-00-7	T+
Beryllium compounds (except aluminium beryllium silicates)	-	004-002-00-2	T+
beta-Naphtylamine	91598	612-022-00-3	T
Binapacryl	485314	609-024-00-1	T
Biphenyl-4-ylamine	92671	612-072-00-6	T
Biphenyl-4-ylamine salts	-	612-073-00-1	T
Bis (8-hydroxyquinolinium) sulfate	134316	613-017-00-9	Xn
Bis (4-(2,3-epoxypropoxy)phenyl) propane	1675543	603-073-00-2	Xi
Bis(2-chloroethyl) ether	111444	603-029-00-2	T+
Bis(2,2,6,6-tetramethyl-4-piperidyl) succinate	62782030	402-940-0	Xi
Bis(4-fluorophenyl)-methyl-1,2,4-triazol-4-ylmethyl)silane hydrochloride	-	401-380-4	Xi
Bis(chloromethyl)ether	542881	603-046-00-5	T+

Substances	CAS No ¹	EC No ²	Labeling
Boron tribromide	10294334	005-003-00-0	T+
Boron trichloride	10294345	005-002-00-5	T+
Boron trifluoride	7637072	005-001-00-X	T+
Bromine	7726956	035-001-00-5	T+, C
Bromoacetic acid	79083	607-065-00-X	T
Bromobenzene	108861	602-060-00-9	Xi
Bromobenzylbromotoluene	99688478	402-210-1	Xn
Bromofenoxim	13181174	609-032-00-5	Xn
Bromofom	75252	602-007-00-X	T
Bromophos	2104963	015-108-00-3	Xn
Bromophos-ethyl	4824786	015-064-00-5	T
Bromoxynil	1689845	608-006-00-0	T
Brucine	357573	614-006-00-1	T+
Brucine salts	-	614-007-00-7	T+
Butane	106978	601-004-00-0	F
Butanedioldiglycidyl ether	2425798	603-072-00-7	Xn
Butanol	71363 78922 78831	603-004-00-6	Xn
Butanone	78933	606-002-00-3	F, Xi
Butyraldehyde oxime	110690	616-013-00-5	T
Butyl (dialkyloxy(dibutoxyphosphoryloxy))(titanium (trialkyloxy)titanium phosphate	-	401-100-0	F, Xi
Butyl 2,3 epoxypropyl ether	24260806	603-309-00-7	Xn
Butyl acetate	123864	607-025-00-1	-
iso-Butyl acetate	110190	607-026-00-7	F
sec-Butyl acetate	105464	607-026-00-7	F
tert-Butyl acetate	540885	607-026-00-7	F
Butyl butyrate	109217	607-031-00-4	-
Butyl chloroformate	592347	607-138-00-6	T
Butyl ethyl ketone	106354	606-003-00-9	Xn

Substances	CAS No ¹	EC No ²	Labeling
Butyl Formate (prim) (sec) (tert)	592847 589402 762754	607-017-00-8	F
Butyl propionate (sec) (tert) (iso)	591344 20487405 540421	607-029-00-3	-
Butylamine	109739	612-005-00-0	F, Xi
Butylene	106989 107017 115117	601-012-00-4	F
Butylglycol acetate	112072	607-038-00-2	Xn
Butyraldehyde	123728	605-006-00-2	F
Butyric acid	107926	607-135-00-X	C
Butyryl chloride	141753	607-136-00-5	F, C
C12-14-tert-alkylammonium diphenyl phosphorothioate	-	400-930-0	Xi
Cadmium chloride	10108642	048-008-00-3	T
Cadmium compounds	-	048-001-00-5	Xn
Cadmium cyanide	542836	048-004-00-1	T+
Cadmium fluoride	7790796	048-006-00-2	T
Cadmium fluorosilicate	17010218	048-005-00-7	T
Cadmium iodide	7790809	048-007-00-8	T
Cadmium oxide	1306190	048-002-00-0	T
Cadmiumformate	4464237	048-003-00-6	T
Calcium	7440702	020-001-00-X	F
Calcium 2,5-dichloro-4-(4-((5-chloro-4methyl-2-sulpho- natophenyl)azo)-5-hydroxy-3-methylpyrazol-1-yl)ben- zenesulfonate	-	400-710-4	Xn
Calcium carbide	75207	006-004-00-9	F
Calcium chloride	10043524	017-013-00-2	Xi
Calcium chromate	13765190	024-008-00-9	T
Calcium hydride	7789788	001-004-00-5	F
Calcium hypochlorite	7778543	017-012-00-7	O, C
Calcium iodoxybenzoate	-	053-004-00-X	E
Calcium octadecylxylenesulphonate	-	402-040-8	C

Substances	CAS No ¹	EC No ²	Labeling
Calcium phosphide	1305993	015-003-00-2	F, T+
Calcium polysulfides	1344816	016-005-00-6	Xi
Calcium sulfide	20548543	016-004-00-0	Xi
Camphechlor	8001352	602-004-00-1	T
Captafol	2425061	613-046-00-7	T
Captan	133062	613-044-00-6	Xn
Carbadox	6804075	613-050-00-9	F, T
Carbamonitrile	420042	615-013-00-2	T
Carbaryl	63252	006-011-00-7	Xn
Carbendazim	10605217	613-048-00-8	Xn
Carbofuran	1563662	006-026-00-9	T+
Carbon disulfide	75150	006-003-00-3	F, T
Carbon monoxide	630080	006-001-00-2	F, T
Carbon tetrachloride	56235	602-008-00-5	T
Carbophenothion	786196	015-044-00-6	T
Chloral hydrate	302170	605-014-00-6	T
Chloralose	15879933	605-013-00-0	Xn
Chloramine T (sodium salt)	127651	616-010-00-9	Xi
Chlordane	57749	602-047-00-8	Xn
Chlordecone	143500	606-019-00-6	T
Chlordimeform	6164983	650-007-00-3	Xn
Chlordimeform hydrochloride	19750959	650-009-00-4	Xn
Chlorfenac	85347	607-074-00-9	Xn
Chlorfenethol	80068	603-049-00-1	Xn
Chlorfenprop-methyl	14437173	607-075-00-4	Xn
Chlorfenvinphos	470916	015-071-00-3	T+
Chlorine	7782505	017-001-00-7	T
Chlormequat chloride	999815	007-003-00-6	Xn
Chloroacetic acid	79118	607-003-00-1	T
Chloroacetonitrile	107142	608-008-00-1	T
Chloroacetyl chloride	79049	607-080-00-1	C
Chloroaniline (mono-)	27134265	612-101-00-8	T
(di-)	27134276		
(tri-)	54686918		

Substances	CAS No ¹	EC No ²	Labeling
Chlorobenzene	108-990-7	602-033-00-1	Xn
Chlorodinitrobenzene	-	610-003-00-4	T
Chloroethane	75003	602-009-00-0	F
Chloroform	67663	602-006-00-4	Xn
Chloromethyl methyl ether	107302	603-075-00-3	F, T
Chloronitroaniline	-	610-006-00-0	T+
Chloropentane	29656631	602-022-00-1	F, Xn
Chlorophacinone	3691358	606-014-00-9	T
Chlorophonium chloride	115786	015-085-00-X	T
Chloropicrin	76062	610-001-00-3	T+
Chloroprene	126998	602-036-00-8	F, Xn
Chloropropane	26446764	602-018-00-X	F, Xn
Chlorosulfonic acid	7790945	016-017-00-1	C
Chlorothalonil	1897456	608-014-00-4	Xn
Chlorotoluene	108418 95498 106434	602-040-00-X	Xn
Chlorotrinitrobenzene	-	610-004-00-X	E, T+
Chlorpyrifos	2921882	015-084-00-4	T
Chlorthiamid	1918134	616-005-00-1	Xn
Chlorthion	500287	015-042-00-5	Xn
Chromic oxychloride	14977618	024-005-00-2	O, C
Chromium III chromate	24613896	024-010-00-X	O, T
Chromium trioxide	1333820	024-001-00-0	O, C
CI Direct Brown 95	16071866	611-005	T
Cinerin I	25402066	613-025-00-2	Xn
Cinerin II	121200	613-026-00-8	Xn
Colchicine	64868	614-005-00-6	T+
Commachlor	81823	607-057-00-6	Xn
Copper (I) chloride	7758896	029-001-00-4	Xn
Copper (I) oxide	1317391	029-002-00-X	Xn
Copper naphthenate	1338029	029-003-00-5	Xn
Coumaphos	56724	015-038-00-3	T+
Coumatetralyl	5836293	607-059-00-7	T+

Substances	CAS No ¹	EC No ²	Labeling
Coumithoate	572485	015-086-00-5	T
Cresol(s)	1319773	604-004-00-9	T
m-Cresol	108394		
o-Cresol	95487		
p-Cresol	106445		
Cresyl glucidyl ether	26447143	603-056-00-X	Xi
Crimidine	535897	613-004-00-8	T+
Crotonaldehyde	123739	605-009-00-9	F, T
Crotoxyphos	7700176	015-109-00-9	T
Crufomate	299865	015-074-00-X	Xn
Cumene hydroperoxide	80159	617-002-00-8	O, C
Cyanazine	21725462	613-013-00-7	Xn
Cyanogen	460195	608-011-00-8	F, T
Cyanophos	2636262	015-087-00-0	Xn
Cyanthoate	3734950	015-070-00-8	T+
Cyanuric chloride	108770	613-009-00-5	Xi
Cyclobutane-1,3-dione	15506533	606-008-00-6	F
Cyclohexane	110827	601-017-00-1	F
Cyclohexanol	108930	603-009-00-3	Xn
Cyclohexanone	108941	606-010-00-7	Xn
Cyclohexanone hydroperoxide	78182	617-009-00-6	E, C
Cyclohexanone peroxide	2407945	617-010-00-1	E, C
Cyclohexyl acrylate	3066715	607-116-00-6	Xi
Cyclohexylamine	108918	612-050-00-6	C
Cyclooct-4-en-1-yl methyl carbonate	87731188	401-620-8	Xi
Cyclopentane	287923	601-030-00-2	F
Cyclopentane-1,2,3,4-tetracarboxylic dianhydride	6053685	607-104-00-0	Xi
Cyclopentanone	120923	606-025-00-9	Xi
Cyclopropane	75194	601-016-00-6	F
Cycluron	2163691	006-027-00-4	Xn
Cyhexatin	13121705	050-002-00-0	Xn
Dapsone	80080	612-084-00-1	Xn
Dazomet	533744	613-008-00-X	Xn
DDT, 4,4DDT	50293	602-045-00-7	T

Substances	CAS No ¹	EC No ²	Labeling
Decarbofuran	1563673	006-022-00-7	T
Demeton-O	298033	015-028-00-9	T+
Demeton-O-methyl	867276	015-030-00-X	T
Demeton-S	126750	015-029-00-4	T+
Demeton-S-Methyl	919868	015-031-00-5	T
Demeton-S-methylsulphone	17040196	015-078-00-1	T
Desmetryne	1014693	613-007-00-4	Xn
Di-allate	2303164	006-019-00-0	Xn
Di-isobutylene	107391	601-031-00-8	F
Di-isopropanolamine	110974	603-083-00-7	Xi
Di-isopropyl ether	108203	603-045-00-X	F
Di-n-propyl ether	111433		
Di-isopropylamine	108189	612-048-00-5	F, Xi
Di-n-butylamine	111922	612-049-00-0	Xn
Di-n-propylamine	142847	612-048-00-5	F, Xi
di-sec-butylamine	626233	612-049-00-0	Xn
Di-tert-butyl peroxide	110054	617-001-00-2	O, Xi
Diacetone alcohol	123422	603-016-00-1	Xi
Diacetone alcohol, technical		603-017-00-7	F, Xi
Dialifos	10311849	015-088-00-6	T+
Diallyl phthalate	131179	607-086-00-4	Xn
Diazinon	333415	015-040-00-4	Xn
Dibenz(a,h)anthracene	53703	601-041-00-2	T
Dibenzoyl peroxide	94360	617-008-00-0	E, Xi
Dibutyl ether	142961	603-054-00-9	Xi
Dibuytin hydrogen borate	75113370	401-040-5	T
Dicamba	1918009	607-043-00-X	Xn
Dicamba salts	-	607-044-00-5	Xn
Dichlofenthion	97176	015-068-00-7	Xn
Dichlofluanid	1085989	616-006-00-7	Xi
Dichlone	117806	606-018-00-0	Xn
Dichloro-1,3,5-triazinetriene, sodium salt	2893789	613-030-00-X	O, Xn
Dichloro-1,3,5-triazinetriene, potassium salt	2244215		
Dichloroacetic acid	79436	607-066-00-5	C

Substances	CAS No ¹	EC No ²	Labeling
Dichloroacetyl chloride	79367	607-067-00-0	C
Dichloroisocyanuric acid	2782572	613-029-00-4	O, Xn
Dichloropropane	26638197	602-020-00-0	F, Xn
Dichlorpro salts	-	607-046-00-6	Xn
Dichlorprop	120365	607-045-00-0	Xn
Dichlorvos	62737	015-019-00-X	T
Dicofol (ISO)	115322	603-044-00-4	Xn
Dicoumarin	66762	607-060-00-2	T
Dicrotophos	141662	015-073-00-4	T+
Dicumyl peroxide	80433	617-006-00-X	O, Xi
Dicyclohexylamine	101837	612-066-00-3	C
Dicyclohexylammonium nitrite	3129917	007-009-00-9	Xn
Dieldrin	60571	602-049-00-9	T+
Diethanolamine	111422	603-071-00-1	Xi
Diethyl 2,4-dihydroxycyclodisiloxane-2,4-diylbis(trimethylene)diphosphonate, tetrasodium salt, reaction products with disodium metasilicate	-	401-770-4	C
Diethyl ether	60297	603-022-00-4	F+
Diethyl oxalate	95921	607-147-00-5	Xn
Diethyl sulfate	64675	016-027-00-6	T
Diethyl(ethyltrimethylsilanolato)aluminium	55426954	401-160-8	F, C
Diethylamine	109897	612-003-00-X	F, Xi
Diethylene glycol diacrylate	4074888	607-120-00-8	T
Diethylene glycol dinitrate	693210	603-033-00-4	E, T+
Digitoxin	71636	614-022-00-9	T *
Diketene	674828	606-017-00-5	Xn
Dilauroyl peroxide	105748	617-003-00-3	O, Xi
Dilithium 6-acetamido-4-hydroxy-3-(4-((2-sulphatoxy)ethylsulphonyl)phenylazo)naphthalene-2-sulphonate	-	401-010-1	Xi
Dimefox	115264	015-061-00-0	T+
Dimercury dichloride	10112911	080-003-00-1	Xn
Dimetan	122156	006-010-00-1	T
Dimethoate	60515	015-051-00-4	Xn
Dimethyl (3-methyl-4-(5-nitro-3-ethoxycarbonyl-2-thienyl)azo)phenylnitrilodipropionate	-	400-460-6	Xi

Substances	CAS No ¹	EC No ²	Labeling
Dimethyl carbonate	616386	607-013-00-6	F, Xn
Dimethyl ether	115106	603-019-00-8	F
Dimethyl formamide	68122	616-001-00-X	Xn
Dimethyl sulfate	77781	016-023-00-4	T+
Dimethylcarbamoyl chloride	79447	006-041-00-0	T
Dimethyldichlorosilane	75785	014-003-00-X	F, Xi
Dimethylsulfamoylchloride	133600571	016-033-00-9	T+
Dimetilan	644644	613-047-00-2	T
Dimetilan-1-dimethylcarbamoyl-5-methylpyrazol-3-yl-dimethylcarbamate;	644644	006-040-00-5	T
3-methylpyrazol-5-yl-dimethylcarbamate	2532436	006-040-00-5	T
Dimexan	1468377	016-024-00-X	Xn
Dinex	131895	609-028-00-3	T
Dinex salts & esters	-	609-029-00-9	T
Dinitrobenzene	25154545	609-004-00-2	T+
Dinitrophenol	25550587	609-016-00-8	T
Dinitrotoluene	25321146	609-007-00-9	T
Dinobuton	973217	006-028-00-X	T
Dinocap	39300453	609-023-00-6	Xn
Dinocton	-	609-027-00-8	Xn
Dinosam	4097363	609-033-00-0	T
Dinosam salts & esters	-	609-034-00-6	T
Dinoseb	88857	609-025-007	T
Dinoseb acetate	2813958	609-041-00-4	T
Dinoseb salts & esters (not specified elsewhere)	-	609-026-00-2	T
Dinoterb	1420071	609-030-00-4	T
Dinoterb salts & esters	-	609-031-00-X	T
Dioxacarb	6988212	006-029-00-5	T
Dioxathion	78342	015-063-00-X	T+
Dipentene	138863	601-029-00-7	Xi
Diphenamid	957517	616-007-00-2	Xn
Diphenylamine	122394	612-026-00-5	T
Diphenylmethane-4-4'-diisocyanate, isomers & homologues	101688 9016879	615-005-01-6	Xn

Substances	CAS No ¹	EC No ²	Labeling
Diphenylmethane-4,4'-di-isocyanate	101688	615-005-00-9	Xn
Diphenylmethane-2,4'-di-isocyanate	5873541		
Diphenylmethane-2,2'-di-isocyanate	2536052		
Diquat and salts	2764729	613-005-00-3	T
Disodium 1-amino-4-(4-benzenesulphonamido-3-sulphonatoanilino)anthraquinone-2-sulphonate	851539931	400-350-8	Xi
Disodium 6-((4-chloro-6-(N-methyl)-2-toluidino)-1,3,5-triazin-2-ylamino)-1-hydroxy-2-(4-methoxy-2-sulphonatophenylazo)naphthalene-3-sulphonate	86393353	400-380-1	Xi
Disodium 6-(2,4-dihydroxyphenylazo)-3-(4-(4-(2,4-dihydroxyphenylazo)anilino)-3-sulfonatophenylazo)-4-hydroxynaphthalene-2-sulphonate	-	400-570-4	Xi
Disodium S,S'-hexane-1,6-diyl-di(thiosulphate) dihydrate	-	401-320-7	Xi
Distillate aromatic extracts (derived from petroleum & covered by EINECS No. 2651021, 2651037, 2651042, 2651110)	64742036 64742047 64742058 64742116	650-011-00-5	T
Disulfoton	298044	015-060-00-3	T+
Disulfur dichloride	10025679	016-012-00-4	C
Dithianon	3347226	613-021-00-0	Xn
Diuron	330541	006-015-00-9	Xi
Dodecyl 3-(2,2,4,4,-tetramethyl-21-oxo-7-oxa-3,20-diazadispiro(5,1,11,2)hencosan-20-yl)propionate	85099510	400-580-9	Xi
Dodine	2439103	607-076-00-X	Xn
Drazoxolon	5707697	650-008-00-9	T
Endosulfan	115297	602-052-00-5	T
Endothal	145733	607-150-00-1	T
Endothal-sodium	129679	607-055-00-5	T
Endothion	2778043	015-049-00-3	T
Endrin	72208	602-051-00-x	T+
Ephedrine	299423	614-023-00-4	Xn
Ephedrine salts	-	614-024-00-X	Xn
Epichlorohydrin	106898	603-026-00-6	T
EPN	2104645	015-036-00-2	T+
Epoxy resin (MW<700)	25068386	603-074-00-8	Xi
EPTC	759944	006-030-00-0	Xn

Substances	CAS No ¹	EC No ²	Labeling
Erbon	136254	607-077-00-5	Xn
Erionite	66733219	650-012-00-0	T
Ethanal	75070	605-003-00-6	F+, Xn
Ethane	74840	601-002-00-X	F+
Ethane- 1,2-dione	107222	605-016-00-7	Xi
Ethanethiol	75081	016-022-00-9	F, Xn
Ethanol	64175	603-002-00-5	F
Ethanolamine	141435	603-030-00-8	Xi
Ethion	563122	015-047-00-2	T
Ethoate methyl	116018	015-089-00-1	Xn
Ethoprophos	13194484	015-107-00-8	T+
Ethoxyquin	91532	613-014-00-2	Xn
Ethyl acetate	141786	607-022-00-5	F
Ethyl acrylate	140885	607-032-00-X	F, Xn
Ethyl bromide	74964	602-055-00-1	Xn
Ethyl bromoacetate	105362	607-069-00-1	T+
Ethyl carbamate (urethane)	51796	607-149-00-6	T
Ethyl chloroacetate	105395	607-070-00-7	T
Ethyl chloroformate	541413	607-020-00-4	F, T
Ethyl Formate	109944	607-015-00-7	F
Ethyl lactate	97643	607-129-00-7	-
Ethyl methacrylate	97632	607-071-00-2	F, Xi
Ethyl methyl ether	540670	603-020-00-3	F
Ethyl nitrate	625581	007-007-00-8	E
Ethyl nitrite	109955	007-006-00-2	E, Xn
Ethyl propionate	105373	607-028-00-*	F
Ethyl trans-3-dimethylaminoacrylate	924992	402-650-4	Xi
Ethylamine	75047	612-002-00-4	F, Xi
Ethylbenzene	100414	601-023-00-4	F, Xn
Ethylcyclohexylglycidyl ether	130014356	603-068-00-5	Xi
Ethyldimethylamine	598561	612-076-00-8	F+, C
Ethylene	74851	601-010-00-3	F
Ethylene dibromide	106934	602-010-00-6	T
Ethylene dichloride	107062	602-012-00-7	F, T

Substances	CAS No ¹	EC No ²	Labeling
Ethylene dimethacrylate	9795	607-114-00-5	Xi
Ethylene glycol	107211	603-027-00-1	Xn
Ethylene glycol dimethyl ether	110714	603-031-00-3	Xn
Ethylene glycol dinitrate	628966	603-032-00-9	E, T+
Ethylene glycol monobutyl ether	111762	603-014-00-0	Xn
Ethylene glycol monoethyl ether	110805	603-012-00-x	Xn
Ethylene glycol monoisopropyl ether	109591	603-013-00-5	Xn
Ethylene oxide	75218	603-023-00-X	F+, T
Ethylene thiourea	96457	613-039-00-9	Xn
Ethylenediamine	107153	612-006-00-6	C
Ethylenediammonium 0,0-bis(octyl) phosphorodithioate, mixed isomers	-	400-520-1	C
Ethylidene dichloride	75343	602-011-00-1	F, Xn
Exo-4-isopropyl-1-methyl-1,4-epoxycyclohexan-2-ol	107133879 87172892	402-470-6	O, Xn
Fatty acids, tall-oil, reaction products with iminodiethanol and boric acid	-	400-160-5	Xi
Fenamino-sulf	140567	611-003-00-7	T
Fenazaflor	14255880	613-015-00-8	Xn
Fenchlorphos	299843	015-052-00-X	Xn
Feneprop	93-72-1	607-047-00-1	Xn
Fenitrothion	122145	015-054-00-0	Xn
Fenoprop salts	-	607-048-00-7	Xn
Fenson	80386	650-003-00-1	Xn
Fensulfothion	115902	015-090-00-7	T+
Fenthion	55389	015-048-00-8	T
Fentin acetate	900958	050-003-00-6	T+
Fentin hydroxide	76879	050-004-00-1	T+
Fluometil	4301502	607-078-00-0	T+
Fluoracetic acid	144490	607-081-00-7	T+
Fluorine	7782414	009-001-00-0	T+
Fluoroacetates, soluble	-	607-082-00-2	T+
Fluoroboric acid	16872110	009-010-00-X	C
Fluorosilicates	-	009-013-00-6	Xn

Substances	CAS No ¹	EC No ²	Labeling
Fluorosilicic acid	16961834	009-011-00-5	C
Fluorosulfonic acid	7789211	016-018-00-7	C
Folpet	133073	613-045-00-1	Xn
Fonofos	944229	015-091-00-2	T+
Formaldehyde	50000	605-001-00-5	T
Formetanate	22259309	006-031-00-6	T+
Formic acid	64186	607-001-00-0	C
Formothion	2540821	015-057-00-7	Xn
Fuberidazole	3878191	613-016-00-3	Xn
Fumaric acid	110178	607-146-00-X	Xi
Fumarin	117522	607-058-00-1	T
Furfural	98011	605-010-00-4	T
Furfuryl alcohol	98000	603-018-00-2	Xn
Glycidol	556525	603-063-00-8	T
Glycidyl acrylate	106901	607-117-00-1	T
Glycidyl methacrylate	106912	607-123-00-4	Xn
Guanidinium chloride	50011	607-148-00-0	Xn
Heptachlor	76448	602-046-00-2	T
Heptachlor epoxide	1024573	602-063-00-5	T
Heptan-2-one	110430	606-024-00-3	Xn
Heptan-4-one	123193	606-027-00-X	-
Heptane	142825	601-008-00-2	F
Hexachloroacetone	116165	606-032-00-7	Xn
Hexachlorobenzene	118741	602-065-00-6	T
Hexachlorocyclohexane (gamma isomer)	608731	602-042-00-0	T
Hexachlorophene	70304	604-015-00-9	T
Hexafluoropropene	116154	602-061-00-4	Xn
Hexahydrophthalic anhydride	85427	607-102-00-x	Xi
Hexamethylene diacrylate	13048334	607-109-00-8	Xi
Hexamethylene-di-isocyanate	822060	615-011-00-1	T
Hexamethylphosphoramide	680319	015-106-00-2	T
Hexan-1-ol	111273	603-059-00-6	Xn
Hexan-2-one	591786	606-030-6	F, T
Hexane	110543	601-007-00-7	F

Substances	CAS No ¹	EC No ²	Labeling
Hexasodium 7-(4-(4-(4-(2,5-disulphonatoanilino)-6-fluoro-1,3,5-triazin -2-ylamino)-2-methylphenylazo)-7-sulphonatonaphthylazo) naphthalene-1,3,5-trisulphonate	85665969	401-650-1	Xi
Hexyl	131737	612-018-00-1	E, Tt+
Hydrazine (R,R)	302012	007-008-00-3	T+
Hydriodic acid	-	053-002-01-6	C
Hydrobromic acid	-	035-002-01-8	C
Hydrochloric acid	7647010	017-002-01-X	C
Hydrofluoric acid	7664393	009-003-00-1	T+, C
Hydrogen	1333740	001-001-00-9	F+
Hydrogen chloride anhydrous	7647010	017-002-00-2	C
Hydrogen cyanide	74908	006-006-00-x	F, T+
Hydrogen cyanide salts	-	006-007-00-5	T+
Hydrogen fluoride	7664393	009-002-00-6	T+, C
Hydrogen iodide anhydrous	10034852	053-002-00-9	C
Hydrogen peroxide (Conc>52%)	7722841	008-003-00-9 (Conc>60%)	O, C
Hydrogen sodium N-carboxylatoethyl-N-octadec-9- enyl-maleamate	-	402-970-4	Xi
Hydrogen sulfide	7783064	016-001-00-4	F, T+
Hydroquinone	123319	604-005-00-4	Xn
Hydroxypropyl acrylate	2918232	607-108-00-2	T
Hydroxypropyl methacrylate	923262 2761093	607-125-00-5	Xi
Hyoscine	51343	614-014-00-5	T+
Hyoscine salts	-	614-015-00-0	T+
Hyoscyamine	101315	614-012-00-4	T+
Hyoscyamine salts	-	614-013-00-X	T+
Imazalil	35554440	613-042-00-5	Xn
Imazalil sulfate	58594722	613-043-00-0	Xn
Iodine	7553562	053-001-00-3	Xn
Iodoacetic acid	64697	607-068-00-6	T
Iodoxybenzene	696333	053-003-00-4	E
Ioxynil	1689834	608-007-00-6	T

Substances	CAS No ¹	EC No ²	Labeling
Isobenzan	297789	602-053-00-0	T+
Isobutyl acrylate	106638	607-115-00-0	Xn
Isobutyl methacrylate	97869	607-113-00-X	Xi
Isobutyric acid	79312	607-063-00-9	Xn
Isobutyryl chloride	79301	607-140-00-7	F, C
Isodrin	465736	602-050-00-4	T+
[Isolan]	119380	006-009-00-6	T+
Isopentane	78784	601-006-00-1	F
Isophorone	78591	606-012-00-8	Xi
Isophorone di-isocyanate	4098719	615-008-00-5	T
Isoprene	78795	601-014-00-5	F+
Isopropanolamine	78966	603-082-00-1	C
Isopropenylbenzene; a-methylstyrene	98839	601-027-00-6	Xi
Isopropyl formate	625558	607-016-00-2	F
Isopropylamine	75310	612-007-00-1	F+, Si
Isopropylbenzene	98829	601-024-00-X	Xi
Isoproturon	34123596	006-044-00-7	Xn
Kelevan	4234791	607-079-00-6	T
Lead alkyls	-	082-002-00-1	T+
Lead azide	13424469	082-003-00-7	E, Xn
Lead chromate	7758976	082-004-00-2	Xn
Lead compounds	-	082-001-00-6	Xn
Lead di(acetate)	301042	082-005-00-8	T
Lead hexafluorosilicate	1310038	009-014-00-1	Xn
Lead styphnate	15245440	609-019-00-4	E, Xn
Lead (II) methanesulphonate	17570762	401-750-5	T
Leptophos	21609905	015-093-00-3	T
Lindane	58899	602-043-00-6	T
Linuron	330552	006-021-00-1	Xn
Lithium	7439932	003-001-00-4	F, C
Lithium sodium hydrogen 4-amino-6-(5-(5-chloro-2,6-difluoropyrimidin-4-ylamino)-2-sulphonatophenylazo)-5-hydroxy-3-(4-(2-(sulphonatooxy)ethylsulphonyl)naphthalene-2,7-disulphonate	108624006	401-560-2	Xi

Substances	CAS No ¹	EC No ²	Labeling
m-Chlorophenol	108430	604-008-00-0	Xn
o-Chlorophenol	95578		
p-Chlorophenol	106489		
m-Xylene	108383	601-039-00-1	Xn
Magnesium alkyls	-	012-003-00-4	F, C
Magnesium phosphide	12057748	015-005-00-3	F, T+
Magnesium powder	7439954	012-001-00-3	F
Magnesium powder or turnings	-	012-002-00-9	F
Malathion	121755	015-041-00-x	Xn
Maleic acid	110167	607-095-003	Xn
Maleic anhydride	108316	607-096-00-9	Xn
Malononitrile	109773	608-009-00-7	T
Manganese dioxide	1313139	025-001-00-3	Xn
MCPA salts and esters	-	607-052-00-9	Xn
MCPB salts and esters	-	607-054-00-X	Xn
Mecarbam	2595542	015-045-00-1	T
Mecoprop	93652	607-049-00-2	Xn
Mecoprop salts	-	607-050-00-8	Xn
Menazon	78579	015-053-00-5	Xn
Mephosfolan	950107	015-094-00-9	T+
Mercuric oxycyanide	1335315	080-006-00-8	E, T
Mercury	7439976	080-001-00-0	T
Mercury alkyls	-	080-007-00-3	T+
Mercury fulminate	628864	080-005-00-2	E, T
Mercury inorganic compounds	-	080-002-00-6	T+
Mercury organic compounds	-	080-004-00-7	T+
Mesitylene	108678	601-025-00-5	Xi
Metaldehyde	108623	605-005-00-7	Xn
Metanilic acid	1211471	612-013-00-4	Xn
Methacrylate	-	607-134-00-4	Xi
Methacrylic acid	79414	607-088-00-5	C
Methacrylonitrile	126987	608-010-00-2	F, T
Methamidophos	10265926	015-095-00-4	T+
Methane	74828	601-001-00-4	F+

Substances	CAS No ¹	EC No ²	Labeling
Methanesulphonic acid	75752	607-145-00-4	C
Methanol	67561	603-001-00-X	F, T
Methidathion	950378	015-069-00-2	T+
Methiocarb	2032657	006-023-00-2	T
methyl 2-(2-nitrobenzylidene)acetoacetate	39562271	400-650-9	Xi
Methyl 2-(3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)3-methylureidosulphonyl)benzoate	101200480	401-190-1	Xi
Methyl 3-sulfamoyl-2-thenoate	-	402-050-2	Xi
Methyl acetate	79209	607-021-00-X	F
Methyl acetoacetate	105453	607-137-00-0	Xi
Methyl acrylate	96333	607-034-00-0	F, Xn
Methyl alpha-((4,6-dimethoxypyrimidin-2-yl)ureidosulphonyl)-o-toluate	83055996	401-340-6	Xi
Methyl azoxy methyl acetate	592621	611-004-00-2	T
Methyl bromide	74839	602-002-00-3	T+
Methyl chloride	74873	602-001-00-7	F, Xn
Methyl chloroform (1,1,1 - Trichloroethane)	71556	602-013-00-2	Xn
Methyl chloroformate	79221	607-019-00-9	F, T
Methyl formate	107313	607-014-00-1	F+
Methyl iodide	74884	602-005-00-9	T
Methyl isocyanate	624839	615-001-00-7	F+, T
Methyl isothiocyanate	556616	615-002-00-2	Xn
Methyl lactate	547648	607-092-00-7	-
Methyl mercaptan	74931	016-021-00-3	F, Xn
Methyl methacrylate	80626	607-035-00-6	F, Xi
Methyl propionate	554121	607-027-00-2	F
Methyl vinyl ether	107255	603-021-00-9	F
Methylamine (mono-)	74895	612-001-00-9	F, Xi
“ (di-)	124403		
“ (tri-)	75503		
Methylcyclohexane	108872	601-018-00-7	F
Methylene chloride	75092	602-004-00-3	Xn
Methylene dibromide	74953	602-003-00-8	Xn
Methyltrichlorosilane	75796	014-004-00-5	F, Xi

Substances	CAS No ¹	EC No ²	Labeling
Metoxuron	19937598	006-033-00-7	Xn
Mevinphos	7786347	015-020-00-5	T+
Mipafox	371868	015-062-00-4	T+
Mixture of 1,1'-(Methylenebis(4,1-phenylene)) dipyrrole-2,5-dione and N-(4-(4(2,5-dioxopyrrol -1-yl)benzyl)phenyl)acetamide and 1-(4-(4-(5-oxo- 2H-2-furylidenamino)benzyl)phenyl)pyrrole-2,5-dione	-	401-97 0-1	Xi
Mixture of 2-chloroethyl chloropropyl 2- chloroethylphosphonate, mixture of isomers and 2-Chloroethyl chloropropyl 2- chloropropylphosphonate, mixture of isomers	-	401-740-0	Xn
Mixture of 5-Heptyl-1,2,4-triazol-3-ylamine and 5- nonyl- 1,2,4-triazol-3-ylamine	-	401-940-8	Xn
Mixture of nitric and sulphuric acids	51602381	007-005-00-7	O, C
Mixture of Pentyl methylphosphinate and 2-methylbutyl methylphosphinate	87025523	402-090-0	C
Monocrotophos	6923224	015-072-00-9	T+
Monolinuron	1746812	006-032-00-1	Xn
Monopropylene glycol methyl ether	107982	603-064-00-3	-
Monuron	150685	006-042-00-6	Xn
Monuron-TCA	140410	006-043-00-1	Xn
Morfamquat and alts	-	613-018-00-4	Xn
Morpholine	110918	613-028-00-9	C
Morpholine-4-carbonyl chloride	15159407	613-041-00-X	Xn
Morphothion	144412	015-058-00-2	T
N-(Dichlorofluoromethylthio)phthalimide	719960	616-012-00-X	Xi
n-Butyl acrylate	141322	607-062-00-3	Xi
n-Butyl methacrylate	97881	607-033-00-5	Xi
n-Butylonitrile	109740	608-005-00-5	T
N-Ethylaniline	103695	612-053-00-2	T
N-Hexadecyl(or octadecyl)-N-hexacecyl(or octade- cyl)benzamide	-	401-980-6	Xi
n-Hexane	110543	601-037-00-0	F, Xn
N-Methyl-2-pyrrolidone	872504	606-021-00-7	Xi
N-Methylaniline	100618	612-015-00-5	T

Substances	CAS No ¹	EC No ²	Labeling
N-Methyltoluidine (m)	696446	612-055-00-3	T
“ (o)	611212		
“ (p)	623085		
N-Nitrosodimethylamine	62759	612-077-00-3	T+
Nabam	142596	006-014-00-3	Xn
Naled	300765	015-055-00-6	Xn
Naphthylindadione	1786034	606-015-00-4	T
Neopentyl glycol diacrylate	223827	607-112-00-4	T
Nickel tetracarbonyl	13463393	028-001-00-1	O, T+
Nicotine	54115	614-001-00-4	T+
Nitric acid	7697372	007-004-00-1	O, C
Nitroaniline (m)	99092	612-012-00-9	T
“ (o)	88744		
“ (p)	100016		
Nitrobenzene	98953	609-003-00-7	T+
Nitrocellulose (> 12.6% N)	-	603-037-00-6	E
Nitrocellulose (< 12.6% N)	-	603-037-01-3	F
nitroethane	79243	609-035-00-1	Xn
Nitrogen dioxide	10102440	007-002-00-0	T+
dinitrogen tetroxide	10544726		
Nitroglycerine	55630	603-034-00-X	E, T+
Nitromannite	15825704	603-036-00-0	E
Nitromethane	75525	609-036-00-7	Xn
Nitrophen	1836755	609-040-00-9	T
Nitrotoluidine	60999180	612-025-00-X	T
N,N Dimethylaniline	121697	612-016-00-0	T
N,N Dimethylphenylenediamine (m)	2836046	612-031-00-2	T
“ (o)	2836035		
“ (p)	99989		
N,N',N'',N'''-Tetrakis(4,6-bis(butyl-(N-methyl-2,2,6,6-tetramethylpiperidin-4-yl)amino)triazin-2-yl)-4,7-diazadecane-1,10-diamine	106990436	401-990-0	Xi
N,N'-(2,2-Dimethylpropylidene) hexamethylenediamine	1000788	401-660-6	Xi
N,N'-Diacetylbenzidine	613354	612-044-00-3	Xn
N,N'-diethylaniline	91667	612-054-00-8	T

Substances	CAS No ¹	EC No ²	Labeling
N,N'-Dimethylbenzidine	2810744	612-043-00-8	Xn
N,N'Dimethyltoluidine	29256937	612-056-00-9	T
N,N-bis(2-ethylhexyl)-((1,2,4-triazol-1-yl)methyl)amine	91273040	401-280-0	C
N,N-Dimethyl-2-(3-(4-chlorophenyl)-4,5-dihydropyrazol-1-ylphenylsulphonyl)ethylamine	10357990	401-410-6	Xn
N,N-Dimethylacetamide	127195	616-011-00-4	Xn
N,N-Dimethylhydrazine	57147	007-012-00-5	F,T
N,N,N',N'-tetramethyl-p-phenylenediamine	1002211	612-032-00-8	Xn
Norbormide	991424	650-004-00-7	T
o-Aminoazotoluene	97563	611-006-00-3	T
o-Dichlorobenzene (1,2)	95501	602-034-00-7	Xn
o-Ethylhydroxylamine	624862	402-030-3	F, T
o-Methylstyrene; 2-vinytoluene	611154	601-028-00-1	Xn
o-Tolidine salts	-	612-081-00-5	T
o-Xylene	95476	601-038-00-6	F, Xn
Octamethylpyrophosphoramidate (schradan)	152169	015-026-00-8	T+
Octane	111659	601-009-00-8	F
Oleum	-	016-019-00-2	C
Omethoate	1113026	015-066-00-6	T
o,o-Diethyl o-(4-methylcoumarin-7-yl) phosphorothioate	299456	015-076-00-0	T+
o,o,o',o'-tetrapropyl dithiopyrophosphate	3244904	015-081-00-8	Xn
Osmium tetroxide	20816120	076-001-00-5	T+
Ouabain	630604	614-025-00-5	T
Oxalic acid	144627	607-006-00-8	Xn
Oxalic acid salts	-	607-007-00-3	Xn
Oxydemeton methyl	301122	015-046-00-7	T
Oxydiethylene bis (chloroformate)	106752	607-141-00-2	Xn
Oxydisulfoton	2497076	015-096-00-X	T+
Oxygen, liquid	7782447	008-001-00-8	O
p-Benzoquinone	106514	606-013-00-3	T
p-Chloronitrobenzene	100005	610-005-00-5	T
p-Dichlorobenzene (1,4)	106467	602-035-00-2	Xn
p-Menthane hydroperoxide	80477	617-012-00-2	O, C
p-Toluenesulfonic acid (>5% H2SO4)	104154	016-029-00-7	C

Substances	CAS No ¹	EC No ²	Labeling
p-Toluenesulfonic acid (5% H ₂ SO ₄)	104154	016-030-00-2	Xi
p-Xylene	106423	601-040-00-7	Xn
Papaverine	58742	614-018-00-7	Xn
Papaverine salts	-	614-019-00-2	Xn
Paraldehyde	123637	605-004-00-1	F
Paraquat	1910425	613-006-00-9	T
Parathion	56382	015-034-00-1	T+
Parathion-methyl	298000	015-035-00-7	T+
Pebulate	1114712	006-034-00-2	Xn
Pentachloroethane	76017	602-017-00-4	T
Pentachloronaphthalene	1321648	602-041-00-5	Xn
Pentachlorophenol	87865	604-002-00-8	T
Penterythritol tetraacrylate	4986894	607-122-00-9	Xi
Pentaerythritol tetranitrate	78115	603-035-00-5	E
Pentaerythritol triacrylate	3524683	607-110-00-3	Xi
Pentaethylenehexamine	4067167	612-064-00-2	C
Pentan-3-one	96220	606-006-00-5	F
Pentane	109660	601-006-00-1	F
Pentane-2,4-dione	123546	606-029-00-0	Xn
Pentasodium 5-anilino-3-(4-(4-(3-sulphonatoanilino)-1,3,5-triazin-2-ylamino)-2,5-dimethylphenylazo)-2,5-disulphonatophenylazo)-4-hydroxynaphthalene-2,7-di-sulphonate	-	400-120-7	Xi
Peracetic acid	79210	607-094-00-8	O, C
Perchloric acid	7601903	017-006-00-4	O, C
Petroleum and coal tar distillates (excluding those used as motor fuels) which are complex mixtures of hydrocarbons (labelling per 88/379/EEC)	-	650-001-00-1	-
Petroleum and coal tar distillates -when flash point is below 21 °C [70 °F]	-	650-001-01-8	F
Petroleum and coal tar distillates - flash point between 21 and 55 °C [70 and 131 °F]	-	650-001-02-5	-
Phenkapton	2275141	015-037-00-8	T
Phenol	108952	604-001-00-2	T
Phenthoate	2597037	015-097-00-5	Xn
Pheynl glycidyl ether	122601	603-067-00-X	Xn
Phenylenediamine	25265763	612-028-00-6	T

Substances	CAS No ¹	EC No ²	Labeling
Phenylenediamine dihydrochloride (-m)	541695	612-029-00-1	T
“ “ (-p)	624180		
Phenylhydrazine	100630	612-023-00-9	T
Phorate	298022	015-033-00-6	T+
Phosacetim	4104147	015-092-00-8	T+
Phosalone	2310170	015-067-00-1	T
Phosgene	75445	006-002-00-8	T+
Phosmet	732116	015-101-00-5	Xn
Phosnichlor	5826766	015-043-00-0	Xn
Phosphamidon	13171216	015-002-00-6	T+
Phosphoric acid	7664382	015-011-00-6	C
Phosphorus oxychloride	10025873	015-009-00-5	C
Phosphorus pentachloride	10026138	015-008-00-X	C
Phosphorus pentasulfide	1314803	015-104-00-1	F, Xn
Phosphorus pentoxide	1314563	015-010-00-0	C
Phosphorus, red	-	015-002-00-7	F
Phosphorus sesquisulfide	1314858	015-012-001	F, Xn
Phosphorus tribromide	7789608	015-103-00-6	C
Phosphorus trichloride	7719122	015-007-00-4	C
Phosphorus, white	12185103	015-001-00-1	F, T+
Phoxim	14816183	015-100-00-X	Xn
Phthalic anhydride	85449	607-009-00-4	Xi
Physostigmine	57476	614-020-00-8	T+
Physostigmine salts	-	614-021-00-3	T+
Picramic acid	96913	612-034-00-9	E, Xn
Picric acid	88891	609-009-00-X	E, T
Pilocarpine	92137	614-016-00-6	T+
Pilocarpine salts	-	614-017-00-1	T+
Pinane hydroperoxide	5405845	617-005-00-4	O, C
Pindone	83261	606-016-00-X	T
Piperazine	110850	612-057-00-4	C
Piperidine	110894	613-027-00-3	F, T
Pirimicarb	23103982	006-035-00-8	T
Pirimifos-ethyl	23505411	015-099-00-6	T

Substances	CAS No ¹	EC No ²	Labeling
PCBs (see Aroclor)	1336363	602-039-00-4	Xn
Polyethyleneaminos	-	612-065-00-8	C
Potassium	7440097	019-001-00-2	F, C
Potassium 2-hydroxycarbazole-1-carboxylate	96566700	401-630-2	Xn
Potassium bifluoride	7789299	009-008-00-9	T, C
Potassium bromate	7758012	035-003-00-6	T, O
Potassium chlorate	3811049	017-004-00-3	O, Xn
Potassium chromate	7789006	024-006-00-8	Xi
Potassium dichromate	7778509	024-002-00-6	Xi
Potassium fluoride	7789233	009-005-00-2	T
Potassium hydroxide	1310583	019-002-00-8	C
Potassium mu-fluoro-bis(triethylaluminium)	12091086	400-040-2	F, C
Potassium nitrite	7758090	007-011-00-X	O, T
Potassium perchlorate	7778747	017-008-00-5	O, Xn
Potassium permanganate	7722647	025-002-00-9	O, Xn
Potassium polysulfides	37199669	016-007-00-7	C
Potassium sodium 5-(4-chloro-6-(N-(4-(4-chloro-6-(5-hydroxy-2,7-disulfonato-6-(2-sulfonatophenylazo)-4-naphthylamino)-1,3,5-triazin-2-ylamino)phenyl-N-methylamino)-1,3,5-triazin-2-ylamino-4-hydroxy-3-(2-sulfonatophenylazo)naphthalene-2,7-disulfonat	-	402-150-6	Xi
Potassium sulfide	1312738	016-006-00-1	C
Promecarb	2631370	006-037-00-9	T
Prop-2-yn-1-ol	107197	603-078-00-X	T
Propachlor	1918167	616-008-00-8	Xn
Propan -1 - ol	71238	603-003-00-0	F
Propan -2 - ol	67630		
Propanal	123386	605-018-00-8	F
Propane	74986	601-003-00-5	F
Propanil	709988	616-009-00-3	Xn
Propionic acid	79094	607-089-00-0	C
Propionic anhydride	123626	607-010-00-X	C
Propionyl chloride	79038	607-093-00-2	F, C
Propoxur	114261	006-016-00-4	T
Propyl acetate	109604	607-024-00-6	F

Substances	CAS No ¹	EC No ²	Labeling
Isopropyl acetate	108214		
Propyl chloroformate	109615	607-142-00-8	T
Propyl propionate	106365	607-030-00-9	-
Propylbenzene	103651	601-024-00-X	Xi
Propylene	115071	601-001-00-9	F
Propylene glucol monobutyl ether	5131668	603-052-00-8	Xi
Propylene oxide	75669	603-005-00-4	F+, T
Propyleneimine	75558	613-033-00-6	F, T+
Prothoate	2275185	015-032-00-0	T+
Pyrazoxon	108349	015-023-00-1	T+
Pyrethrin I	121211	613-023-00-1	Xn
Pyrethrin II	121299	613-024-00-7	Xn
Pyrethrins including cinerins	-	613-022-00-6	Xn
Pyridine	110861	613-002-00-7	F, Xn
Pyrocatechol	120809	604-016-00-4	Xn
Pyrogallol	87661	604-009-00-6	Xn
Pyromellitic dianhydride	89327	607-098-00-X	Xi
Resorcinol	106-463	604-010-00-1	Xn
Resorcinol diglycidyl ether	101906	603-065-00-9	T
Rotenone	83794	650-005-00-2	T
S-(3-Trimethoxysilyl)propyl 19-isocyanato-11-(6-isocyanatohexyl)-10,12-dioxo-2,9,11,13-tetraazonadecanethioate	85702905	402-290-8	Xn
S-Benzyl N,N-dipropylthiocarbamate	528809	401-730-6	Xn
S-(2-(Ethylsulphinyl) ethyl) o,o-dimethyl phosphorodithiolate	301122	015-065-00-0	T+
S-(2-(Isopropylsulphinyl) ethyl) o,o-dimethyl phosphorothioate	2635509	015-075-00-5	T
Salts of dinitrophenol	-	609-017-00-3	T
Salts of nicotine	-	614-002-00-x	T+
Salts of picric acid	-	609-010-00-5	E, T
Salts of strychnine	-	614-004-00-0	T+
sec-Butylamine	13952846	612-052-00-7	F, C
Selenium	7782492	034-001-00-2	T
Selenium compounds except cadmium sulfoselenide	-	034-002-00-8	T
Silicon tetrachloride	10026047	014-002-00-4	Xi

Substances	CAS No ¹	EC No ²	Labeling
Silver nitrate	7761888	047-001-00-2	C
Sodium	7440235	011-001-00-0	F, C
Sodium (1-(5-(4-(4-anilino-3-sulphophenylazo)-2-methyl-5-methylsulphonamidophenylazo)-4-hydroxy-2-oxido-3-(phenylazo)phenylazo)-5-nitro-4-sulphonato-2-naphtholato)iron (II)	-	401-220-3	Xn
Sodium 3,5-dichloro-2-(5-cyano-2,6-bis(3-hydroxypropylamino)-4-methylpyridin-3-ylazo)benzenesulphonate	-	401-870-8	Xi
Sodium azide	26628228	011-004-00-7	T+
Sodium bifluoride	1333831	009-007-00-3	T, C
Sodium carbonate	497198	011-005-00-2	Xi
Sodium chlorate	7775099	017-005-00-9	O, Xn
Sodium dichloroisocyanurate	51580860	613-030-01-7	Xn
Sodium dichromate	10588019	024-004-00-7	Xi
Sodium fluoride	7681494	009-004-00-7	T
Sodium hydride	7646697	011-003-00-X	F
Sodium hydrosulfite	7775146	016-028-00-1	Xn
Sodium hydroxide	1310732	011-002-00-6	C
Sodium hypochlorite	7681529	017-011-00-1	C
Sodium isopropylxanthate	140932	006-024-00-8	Xn
Sodium methyldithiocarbamate	137428	006-013-00-8	Xn
Sodium nitrite	7632000	007-010-00-4	O, T
Sodium perchlorate	7601890	017-010-00-6	O, Xn
Sodium peroxide	1313606	011-003-00-1	O, C
Sodium polysulfides	1344087	016-010-00-3	C
Sodium salt of DNOC	5787962 2312767	609-021-00-5	T
Sodium sulfide	1313822	016-009-00-8	C
Sodium trichloroacetate	650511	607-005-00-2	Xn
Stannic chloride	7646788	050-001-00-5	C
Strontium chromate	7789062	024-009-00-4	T
Strophantin-K	11005633	614-026-00-0	T
Strychnine	572494	614-003-00-5	T+
Styphnic acid	82713	609-018-00-9	E, Xn
Styrene	100425	601-026-00-0	Xn

Substances	CAS No ¹	EC No ²	Labeling
Styrene oxide	96093	603-084-00-2	T
Succinic anhydride	108305	607-103-00-5	Xi
Sulfallate	95067	006-038-00-4	T
Sulfamic acid	5329146	016-026-00-0	Xi
Sulfolane	126330	016-031-00-8	Xn
Sulfotep	3689245	015-027-00-3	T+
Sulfur dichloride	10545990	016-013-00-X	C
Sulfur dioxide	7446095	016-011-00-9	T
Sulfur tetrachloride	13451086	016-014-00-5	C
Sulfuric acid	7664939 8014957	016-020-00-8	C
Sulfuryl chloride	7791255	016-016-00-6	C
TEPP	107493	015-025-00-2	T+
Tert-butyl cumyl peroxide	3457612	617-007-00-5	O, Xi
Tetrachloroethylene	127184	602-028-00-4	Xn
Tetradecyl 3-(2,2,4,4-tetramethyl-21-oxo-7-oxa-3,20-diazadispiro(5,1,11,2)hencosan-20-yl)propionate	85099509	400-580-9	Xi
Tetraethyl silicate	78104	014-005-00-0	Xn
Tetraethylenepentamine	112572	612-060-00-0	C
Tetrahydro-2-furyl-methanol	97994	603-061-00-7	Xi
Tetrahydrofuran	109999	603-025-00-0	F, Xi
Tetrahydrofuran-2,5-diyl-dimethanol	104803	603-062-00-2	Xi
Tetrahydrophthalic anhydride	85438	607-099-00-5	Xi
Tetralin hydroperoxide	771299	617-004-00-9	O, C
Tetramethylene diacrylate	1070708	607-119-00-2	C
Tetranitronaphthalene	-	609-014-00-7	E, Xn
Tetrasodium 2-(chloro-4-(4-(2,5-dimethyl-4-(2,5-disulphonatophenylazo)phenylazo)-3-ureidoanilino)-1,3,5-triazin-2-ylamino)benzene-1,4-disulphonate	-	400-430-2	Xi
Tetrasodium 3,3'-piperazine-1,4-diylbis((6-chloro-1,3,5-triazine-4,2-diyl)imino(2-acetamido)4,1-phenylene-azo))bis(naphthalene-1,5-disulphonate)	81898604	400-010-9	Xi
Tetrasodium 5'-(4,6-dichloro-5-cyanopyrimidin-2-ylamino)-4'-hydroxy-2,3'-azodinaphthalene-1,2',5,7'-disulphonate	-	400-130-1	Xn

Substances	CAS No ¹	EC No ²	Labeling
Tetrasodium 5-benzamido-3-(5-(4-fluoro-6-(1-sulphonato-2-naphthylamino)-1,3,5-triazin-2-ylamino)-2-sulphonatophenylazo)-4-hydroxynaphthalene-2,7- disulphonate	85665970	400-790-0	Xi
Tetryl	479458	612-017-00-6	E, T
Thallium	7440280	081-001-00-3	T+
Thallium compounds	-	081-002-00-9	T+
Thiocyanic acid	463569	615-003-00-8	Xn
Thiocyanic acid salts	-	615-004-00-3	Xn
Thioglycolic acid	68111	607-090-00-6	T
Thiometon	640153	015-050-00-9	T
Thionyl chloride	7719097	016-015-00-0	C
Thioquinox	93754	613-019-00-X	Xn
Thiourea	62566	612-082-00-0	Xn
Thiram	137268	006-005-00-4	Xn
Tin(II) methanesulphonate	53408949	401-640-7	C
Titanium tetrachloride	7550450	022-001-00-5	C
Toluene	108883	601-021-00-3	F, Xn
Toluene-2-4-di-isocyanate	584849	615-006-00-4	T
Toluene-2-6-di-isocyanate	91087		
Toluidine	121536138	612-024-00-4	T
Tosyl isocyanate	4083641	615-012-00-7	Xn
Tri-allate	2303175	006-039-00-X	Xn
Trialkylboranes	-	005-004-00-6	F, C
Triamiphos	1031476	015-024-00-7	T+
Triarimol	26766278	603-043-00-9	Xn
Tributyl phosphate	126738	015-014-00-2	Xn
Tributyltin compounds	-	050-008-00-3	T
Tributyltin lindeate	24124252	050-015-00-1	Xn
Tributyltin naphthenate	85409172	050-016-00-7	Xn
Tributyltin oleate	3090355	050-014-00-6	Xn
Trichlorfon	52686	015-021-00-0	Xn
Trichloroacetic acid	76039	607-004-00-7	C
Trichloroacetonitrile	545062	608-002-00-9	T
Trichloroethylene	79016	602-027-00-9	Xn

Substances	CAS No ¹	EC No ²	Labeling
Trichloroisocyanuric acid	87901	613-031-00-5	O, Xn
Trichloronate	327980	015-098-00-0	T+
Trichlorosilane	10025782	014-001-00-9	F
Tricresyl phosphate	-	015-015-00-8	T
Tricresyl phosphates		015-016-00-3	Xn
Tricresyl phosphates (>1% esterified o-cresol)		015-017-00-9	T
Tricresyl phosphates (max 1% esterified o-cresol)	-	015-018-00-4	Xn
Tricyclohexyltin compounds	-	050-012-00-5	Xn
Tridemorph	24602866	613-020-00-5	Xn
Triethoxyisobutylsilane	17980471	402-810-3	Xi
Triethyl phosphate	78400	015-013-00-7	Xn
Triethylamine	121448	612-004-00-5	F, Xi
Triethylene glycol diacrylate	1680213	607-126-00-0	Xi
Triethylenetetramine	112243	612-059-00-5	C
Triethyltin compounds	-	050-006-00-2	T+
Trifluoroacetic acid	76051	607-091-00-1	C
Trihexyltin compounds	-	050-010-00-4	Xn
Trilead bis(orthophosphate)	7446277	082-006-00-3	T
Trimellitic anhydride	552307	607-097-00-4	Xn
Trimethyl borate	121437	005-005-00-1	Xn
Trimethylolpropane triacrylate	15625895	607-111-00-9	Xi
Trimethyltin compounds	-	050-005-00-7	T+
Trinitrobenzene	25377326	609-005-00-8	E, T+
Trinitrocresol	28905717	609-012-00-6	E, Xn
Trinitroxylene	-	609-013-00-1	E, Xn
Trioctyltin compounds	-	050-013-00-0	Xi
Tripentyltin compounds	-	050-009-00-9	Xn
Triphenyl phosphite	101020	015-105-00-7	Xi
Triphenyltin compounds	-	050-011-00-X	T
Tripropyltin compounds	-	050-007-00-8	T
Tris(2-chloroethyl) phosphate	115968	015-102-00-0	Xn
Trisodium (6-anilino-2-(5-nitro-2-oxidophenylazo)-3-sulphonato-1-naphtholato)(4-sulfonato-1,1'-azodi-2,2'-naphtholato)chromate(1-)	-	402-500-8	Xi

Substances	CAS No ¹	EC No ²	Labeling
Trisodium 6-(2,4-dihydroxyphenylazo)-3-(4-(4-(a7-(2,4- dihydroxyphenylazo)-1-hydroxy-3-sulphonato-2-naphthylazo)anilino)-3-sulphonatophenylazo)-4-hydroxynaphthalene-2-sulphonate	-	400-570-4	Xi
Trisodium 6-(2,4-dihydroxyphenylazo)-3-(4-(4-(7-(2,4- dihydroxyphenylazo)-1-hydroxy-3-sulphonato-2-naphthylazo)anilino)-3-sulphonatophenylazo)-4-hydroxynaphthalene-2-sulphonate	-	400-570-4	
Trisodium 7-(4-(6-fluoro-4-(2-(2-vinylsulfonylethoxy)ethylamino)-1,3,5 -triazin-2-ylamino)-2-ureidophenylazo)-naphthalene-1,3,6-trisulfonate	106359915	402-170-5	Xi
Trisodium bis(2-(5-chloro-4-nitro-2-oxidophenylazo)-5-sulphonato-1-naphtholato)chromate(1-)	93952240	402-870-0	Xi
Trisodium bis(7-acetamido-2-(4-nitro-2-oxidophenylazo)-3-sulphonato-1-naphtholato)chromate(1-)	-	400-810-8	Xn
Trizinc diphosphide (3ZnP ₂)when present at concentrations greater than 10%	1314847	015-006-00-9	T+, F
Turpentine	8006642	650-002-00-6	Xn
Uranium	7440611	092-001-008	T+
Uranium compounds	-	092-002-00-3	T+
Valeric acid	109524	607-143-00-3	C
Valinamide	20108785	402-840-7	Xi
Vamidothion	2275232	015-059-00-8	T
Vanadium pentoxide	1314621	023-001-00-8	Xn
Vinyl acetate	108054	607-023-00-0	F
Vinyl bromide	593602	602-024-00-2	F
Vinyl chloride	75014	602-023-00-7	F, T
Vinylcyclohexane diepoxide	106876	603-066-00-4	T
Vinylidene chloride	75354	602-025-00-8	F+, Xn
Warfarin	81812	607-056-00-0	T
Xylene, mixture of isomers (flash point < 21 °C [70 °F])	1330207	601-022-00-9	F, Xn
Xylene, mixture of isomers (flash point > 21 °C [70 °F])	1330207	601-022-01-6	Xn
Xylenol	1300716	604-006-00-X	T
Xylidine	1300738	612-027-00-0	T
Zinc 2-hydroxy-5-C13-18alkylbenzoate	-	402-280-3	Xi
Zinc alkyls	-	030-004-00-8	F, C
Zinc chloride	7646857	030-003-00-2	C

Substances	CAS No ¹	EC No ²	Labeling
Zinc chromates	-	024-007-00-3	T
Zinc dimethyl dithiocarbamate	137304	006-012-00-2	Xn
Zinc powder (pyrophoric)	7440666	030-001-00-1	F
Zinc dust	-	030-002-00-7	-
Zirconium powder (non pyrophoric)	-	040-002-00-9	-
Zirconium powder (pyrophoric)	7440677	040-001-00-3	F

NOTES:

1= Chemical Abstract Service (CAS) Registry Number

2= European Community (EC) Identification Number

C= Corrosive

E= Explosive

F= Highly flammable

F+= Extremely flammable

O= Oxidizing

T= Toxic

T+= Very toxic

Xi= Irritant

Xn= Noxious

SECTION 4

HAZARDOUS WASTE MANAGEMENT

September 2000

A. Applicability of this Section

This section contains standards for a comprehensive management program to ensure that hazardous waste is identified, stored, transported, treated, disposed of, and recycled in an environmentally sound manner. This program provides a tracking system for management of hazardous waste from generation to ultimate disposal.

B. Source Documents

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapter 6.

C. Key Compliance Requirements

- Installations must recycle or reuse hazardous waste to the maximum extent practical.
- Installations must use safe and environmentally acceptable methods to identify, store, prevent leakage of, and dispose of hazardous wastes.
- Analytical samples taken to comply with the standards in this protocol must be tested using certain laboratories only.
- Installations must inspect Hazardous Waste Storage Areas (HWSAs) for malfunction, deterioration, operator errors, and discharges.
- Installations must develop a waste analysis plan.
- Installations must maintain a hazardous waste profile sheet (HWPS) for each waste stream handled by each HWSA.
- Generators must identify and characterize the wastes generated at their sites.
- Installation personnel who handle hazardous waste must meet specific training requirements.
- Each generator must use its DODAAC number for all recordkeeping, reports, and manifests for hazardous wastes.
- Generators must maintain an audit trail of hazardous waste from the point of generation to disposal.
- Hazardous Waste Accumulation Point (HWAP) container storage areas must have containment systems.
- When HWAP accumulation limits are reached, the generator must make arrangements either to move the hazardous waste to an HWSA or to ship it offsite for treatment or disposal.
- HWAPs must be inspected weekly for leaking containers and deterioration of the containment system caused by corrosion and other factors.
- HWAPs must maintain a hazardous waste log, inspection logs, manifests, and waste analysis/characterization records.

- HWSA container storage areas must have a containment system.
- Specific equipment must be present at each HWSA and must be tested.
- HWSAs must be inspected weekly for leaking containers and for deterioration of containers and the containment system caused by corrosion and other factors.
- HWSAs must maintain a hazardous waste log, inspection logs, manifests, and waste analysis/characterization records.
- HWSAs must have a written closure plan.
- All hazardous waste that leaves the installation must be accompanied by an HWPS and a manifest.
- Spanish facilities used by installations to store, treat, or dispose of DOD-generated waste must be approved by the appropriate Spanish authorities as being in compliance with their regulatory requirements.
- Installations that dispose of hazardous wastes in landfills must do so only in landfills that meet specific requirements.
- Incinerators used to dispose of hazardous waste must meet design and operating requirements.

D. Definitions

- *Acute Hazardous Waste* - those wastes listed in Appendix 4-1, Chart A.4 with a USEPA waste number with the designator “P” or those wastes with (H) following the waste number (FGS-Spain, Chapter 6, Definitions).
- *Department of Defense Activity Address Code (DODAAC)* - a unique number used to identify a DOD activity for accounting purposes (FGS-Spain, Chapter 6, Definitions).
- *Disposal* - the utilization of those methods of treatment and/or containment technologies, as are approved in FGS-Spain 6.11, that effectively mitigate the hazards to human health or the environment of the discharge, deposit, injection, dumping, spilling, leaking, or placing of a hazardous waste into, or on any land or water in a manner that, without application of such methods, such hazardous wastes or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwater (FGS-Spain, Chapter 6, Definitions).
- *DOD Hazardous Waste Generator* - in DOD a generator is considered to be the installation or activity on an installation that produces a regulated hazardous waste (FGS-Spain, Chapter 6, Definitions).
- *Hazardous Constituent* - a chemical compound that is listed by name in Appendix 4-1 or Appendix 3-2, or possesses a characteristic described in Appendix 4-1 (FGS-Spain, Chapter 6, Definitions).
- *Hazardous Waste (HW)* - a solid, semisolid, or liquid material, or a contained gas that has been discarded or is no longer suitable for its intended purpose and that either exhibits a characteristic of a hazardous waste as described in Appendix 4-1, Section A-1 or is listed as a hazardous waste in Appendix 4-1, Chart A.4, or that meets the criteria defining a toxic and dangerous waste under the Spanish system as described in Appendix 4-2 (FGS-Spain, Chapter 6, Definitions).
- *Hazardous Waste Accumulation Point (HWAP)* - an area at or near the point of generation where hazardous wastes are temporarily stored, up to 208 L (55 gal) of hazardous waste or 1 L (1 qt) of acute hazardous waste, from each waste stream, until removed to a Hazardous Waste Storage Area (HWSA) or shipped for treatment or disposal (FGS-Spain, Chapter 6, Definitions).

- *Hazardous Waste Fuel* - hazardous wastes burned for energy recovery. Fuel produced from hazardous waste by processing, blending, or other treatment is also hazardous waste fuel (FGS-Spain, Chapter 6, Definitions).
- *Hazardous Waste Generation* - any act or process that produces hazardous waste as defined in FGS-Spain (FGS-Spain, Chapter 6, Definitions).
- *Hazardous Waste Profile Sheet (HWPS)* - a document that identifies and characterizes the waste by providing user's knowledge of the waste and/or lab analysis, and details the physical, chemical, and other descriptive properties or processes that created the hazardous waste (FGS-Spain, Chapter 6, Definitions).
- *Hazardous Waste Storage Area* - a location on a DOD installation where more than 208 L (55 gal) of hazardous waste or 1 L (1 qt) of acute hazardous waste from any one waste stream is stored prior to shipment for treatment or disposal (FGS-Spain, Chapter 6, Definitions).
- *Hazardous Waste Storage Area Manager* - a person or agency on the installation assigned the operational responsibility for receiving, storing, inspecting, and general management of the installation's HWSA or HWSA program (FGS-Spain, Chapter 6, Definitions).
- *Incompatible Wastes* - wastes that can react together dangerously, giving rise to the formation of notable quantities of heat, explosive, flammable and/or toxic products (FGS-Spain, Chapter 6, Definitions).
- *Land Disposal* - placement in or on the land, including, but not limited to, land treatment facilities, surface impoundments, underground injection wells, salt dome formations, salt bed formations, underground mines, or caves (FGS-Spain, Chapter 6, Definitions).
- *Toxic and Dangerous Waste* - wastes that contain, or are suspected of containing, certain toxic or dangerous substances in quantities or concentrations sufficient to pose a risk to human health or the environment (see Appendix 4-2) (FGS-Spain, Chapter 6, Definitions).
- *Toxic and Dangerous Waste Landfill Unit* - landfill authorized for the disposal of toxic and dangerous wastes (see Appendix 4-2) (FGS-Spain, Chapter 6, Definitions).
- *Treatment* - any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, recover energy or material resources from the waste, or render such waste nonhazardous, or less hazardous; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume (FGS-Spain, Chapter 6, Definitions).
- *Treatment, Storage, and Disposal Facility (TSDF)* - any facility not located on a DOD installation that is used for the collection, source separation, storage, transportation, transfer, processing, treatment, or disposal of hazardous waste (FGS-Spain, Chapter 6, Definitions).
- *Used Oil Burned for Energy Recovery* - used oil that is burned for energy recovery is termed used oil fuel. Used oil fuel includes any fuel produced from used oil by processing, blending, or other treatment. "Used oil" means any oil or other waste petroleum, oil, and lubricant (POL) product that has been refined from crude oil, or is a synthetic oil, has been used, and as a result of such use, is contaminated by physical or chemical impurities. Used oil exhibiting the characteristics of reactivity, ignitability, and corrosivity is still considered used oil, unless it has been mixed with other hazardous waste. However, used oil that exhibits the characteristic of toxicity as described in Appendix 4-1 is a hazardous waste and will be managed as such. In addition, used oil mixed with hazardous waste is a hazardous waste and will be managed as such (FGS-Spain, Chapter 6, Definitions).

E. Records To Review

- Generators:
 - Hazardous waste manifests
 - Manifest exception reports
 - Personnel training documentation
 - Contingency plan
 - Notifications of hazardous waste oil fuel marketing or blending activity
 - Hazardous waste disposal turn-in document (DD Form 1348-1)
- HWSAs (in addition to the above records):
 - Unmanifested waste reports
 - Facility audit reports (inspection log)
 - Waste analysis plan(s)
 - Operating record
 - Groundwater monitoring records and annual reports
 - Closure/post-closure plans
 - Closure/post-closure notices (where applicable)

F. Physical Features To Inspect

- Disposal sites
- Generating areas
- Accumulation points
- Incinerators
- Vehicles used for transport
- Storage facilities (including drums)

G. Guidance for Checklist Users

	REFER TO CHECKLIST ITEMS:
Missing Checklist Items/Positive Findings	HW.2.1.SP and HW.2.2.SP
All Installations	
General	HW.10.1.SP through HW.10.4.SP
Plans/Surveys	HW.20.1.SP through HW.20.3.SP
Waste Identification	HW.30.1.SP
Training	HW.40.1.SP and HW.40.2.SP
Hazardous Waste Generators	
Operating Procedures	HW.50.1.SP through HW.50.3.SP
Specific Wastes	HW.60.1.SP through HW.60.4.SP
Hazardous Waste Accumulation Points	
Design Requirements	HW.70.1.SP through HW.70.4.SP
Operating Procedures	HW.80.1.SP through HW.80.3.SP
Containers	HW.90.1.SP
Documentation	HW.100.1.SP
Hazardous Waste Storage Areas	
Design Requirements	HW.110.1.SP through HW.110.8.SP
Operating Procedures	HW.120.1.SP through HW.120.5.SP
Containers	HW.130.1.SP
Documentation	HW.140.1.SP and HW.140.2.SP
Closure	HW.150.1.SP
Transportation of Hazardous Waste	HW.160.1.SP and HW.160.2.SP
Hazardous Waste Disposal	
General	HW.170.1.SP through HW.170.5.SP
Land Disposal	HW.180.1.SP
Incinerators	HW.190.1.SP and HW.190.2.SP

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<p>HW.2 MISSING CHECKLIST ITEMS/POSITIVE FINDINGS</p> <p>HW.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>HW.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning hazardous waste management have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

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ALL INSTALLATIONS

**HW.10
General**

HW.10.1.SP. Installations must use safe and environmentally acceptable methods to identify, store, prevent leakage of, and dispose of hazardous wastes (FGS-Spain 6.11.f).

Verify that safe and environmentally acceptable methods are used to identify, store, prevent leakage of, and dispose of hazardous wastes in order to minimize risks to health and the environment.

HW.10.2.SP. Analytical samples taken to comply with the standards in FGS-Spain must be tested using certain laboratories only (FGS-Spain 6.12).

Verify that analytical samples are tested using one of the following:

- overseas DOD laboratories approved by the service component
- laboratories authorized by Spanish authorities
- Continental U.S. (CONUS) laboratories certified by the USEPA.

HW.10.3.SP. Installations must recycle or reuse hazardous waste to the maximum extent practical (FGS-Spain 6.11.f).

Verify that hazardous waste is recycled or reused to the maximum extent practical.

HW.10.4.SP. Installations must inspect HWSAs for malfunction, deterioration, operator errors, and discharges (FGS-Spain 6.3.h).

Verify that inspections are conducted according to a written schedule that is kept at the HWSA and at a sufficient frequency to identify problems in time to correct them before they harm human health or the environment.

Verify that the schedule identifies the type of problems that are to be looked for during the inspection.

Verify that inspections cover all equipment and areas involved in the storage and handling of hazardous waste.

Verify that areas subject to spills, such as loading and unloading areas, are inspected daily when in use.

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	<p>(NOTE: The frequency at which equipment/facilities other than containers are inspected should be based on the rate of possible deterioration of the equipment and probability of an environmental or human health incident if the deterioration or malfunction or any operator error goes undetected between inspections. In addition, containers are inspected weekly by the HWSA manager (see checklist item HW.120.1.SP).)</p> <p>Verify that the installation remedies any deterioration or malfunction of equipment or structures that the inspection reveals on a schedule that ensures that the problem does not lead to an environmental or human health hazard.</p> <p>Verify that, when an imminent hazard is identified or one has already occurred, the installation takes immediate action.</p> <p>Verify that inspections are recorded in an inspection log or summary that is kept for at least 5 yr from the date of inspection and that includes at least:</p> <ul style="list-style-type: none"> - the date and time of inspection - the name of the inspector - notation of the observations made - the date and nature of any repairs or other remedial actions.

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<p>ALL INSTALLATIONS</p> <p>HW.20 Plans/Surveys</p> <p>HW.20.1.SP. Installations must develop a waste analysis plan (FGS-Spain 6.3.c.1).</p> <p>HW.20.2.SP. Installations must have and keep on file an HWPS for each waste stream handled by each HWSA (FGS-Spain 6.3.c.2).</p> <p>HW.20.3.SP. Installations must have a contingency plan to manage spills and releases of hazardous waste (FGS-Spain 6.6).</p>	<p>Verify that the installation, in conjunction with the HWSA manager, has developed a plan to determine how and when wastes are to be analyzed.</p> <p>Verify that the plan includes:</p> <ul style="list-style-type: none"> - procedures for characterizing and verifying the testing of both onsite and off-site hazardous waste - testing parameters and the rationale for selecting them - frequency of analysis - test and sampling methods. <p>Verify that an HWPS is kept for each waste stream handled by each HWSA.</p> <p>Verify that the HWSA accepts no waste for storage unless it has received an HWPS.</p> <p>Verify that the installation has a contingency plan to manage spills and releases of hazardous waste.</p> <p>Verify that a current copy of the contingency plan is maintained at the HWSA and each HWAP.</p> <p>Verify that a copy of the plan has been submitted to all police departments, fire departments, hospitals, and emergency response teams upon which the plan relies to provide emergency services.</p> <p>Verify that the plan is available in both English and Spanish.</p> <p>(NOTE: See Section 8, <i>Petroleum, Oil, and Lubricants (POL) Management</i>, for further details on the contents of the spill plan.)</p>

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<p>ALL INSTALLATIONS</p> <p>HW.30 Waste Identification</p> <p>HW.30.1.SP. Generators must identify and characterize the wastes generated at their sites (FGS-Spain 6.1.a and 6.1.b).</p>	<p>Determine whether the installation generates, transports, treats, stores, or disposes of any hazardous waste (see Appendix 4-1 for guidance).</p> <p>Verify that the generators identify and characterize their wastes.</p> <p>(NOTE: Used oil must also be characterized.)</p> <p>(NOTE: Wastes may be identified and characterized on the basis of knowledge of the materials and processes that generated the wastes, or on the basis of laboratory analysis of the waste.)</p> <p>Verify that wastes have been identified according to:</p> <ul style="list-style-type: none"> - physical properties (solid, liquid, gaseous) - chemical properties (chemical constituents, technical or chemical name) - other descriptive properties (ignitable, corrosive, reactive, toxic). <p>(NOTE: See Appendices 4-3 and 4-4.)</p> <p>Verify that the properties defining the characteristics are measurable by standardized and available testing protocols as follows:</p> <ul style="list-style-type: none"> - wastes generated by DOD operations that are collected, stored, or handled on DOD installations are characterized using the definitions contained in Appendix 4-2, together with the characteristics described in Appendix 4-1, Section A-2 - wastes that are prepared for transport to and disposal in a facility in Spain are characterized in accordance with the above definitions and characteristics - wastes that are prepared for retrograde to the United States for disposal are characterized in accordance with Appendix 4-1 and current U.S. law. <p>Verify that a HWPS or its Spanish equivalent is used to identify each hazardous waste stream.</p>

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**HW.40
TRAINING**

HW.40.1.SP. Installation personnel whose duties involve actual or potential exposure to hazardous waste must meet specific training requirements (FGS-Spain 6.10.a through 6.10.d and 6.3.i).

Verify that all DOD personnel (including U.S. military, civilian, and local national personnel) whose duties involve actual or potential exposure to hazardous waste receive training.

(NOTE: The following persons are subject to this requirement:

- those who determine which wastes are hazardous wastes
- those who complete hazardous waste recordkeeping requirements
- those who handle/store hazardous waste containers
- those who transfer hazardous waste to or from accumulation tanks or containers
- those who transport hazardous waste
- those who perform hazardous waste cleanup (nonemergency)
- those who inspect, manage, or work at a HWAP or HWSA
- those who collect hazardous waste samples
- those who conduct other hazardous waste related activities as designated by the Installation Commander (IC) and/or Environmental Coordinators (ECs).)

Verify that the training program is conducted by qualified trainers who have completed an instructor training program in the subject or who have comparable academic credentials and experience.

Verify that the training program includes sufficient information to enable personnel to comply fully with and carry out requirements in FGS-Spain.

Verify that the program is designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, equipment, and systems.

Verify that training for personnel whose duties include hazardous waste handling and management addresses the following in particular:

- emergency procedures (response to fire/explosion/spills; use of communications/alarm systems; body and equipment clean-up)
- handling and storage of drums and containers
- safe use of hazardous waste equipment
- protection of personnel, including:
 - Personal Protective Equipment (PPE)
 - safety and health hazards
 - hazard communication
 - worker exposure
- for generators and HWSA operators:
 - recordkeeping
 - security

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<p>HW.40.2.SP. All hazardous waste training for each individual assigned duties involving actual or potential exposure to hazardous waste must be documented (FGS-Spain 6.10.e).</p>	<ul style="list-style-type: none"> - inspections - contingency plans - storage requirements - transportation requirements. <p>Verify that training for personnel assigned to duties involving actual or potential exposure to hazardous wastes is completed prior to their assuming those duties.</p> <p>Verify that such personnel work under direct supervision until training is completed.</p> <p>Verify that annual refresher hazardous waste training is provided.</p> <p>(NOTE: Hazardous Waste Operations and Emergency Response (HAZWOPER) training may fulfill the requirements of this checklist item, depending on the duties of the individual.)</p> <p>Verify that all hazardous waste training is documented for each individual assigned duties involving actual or potential exposure to hazardous waste.</p> <p>Verify that up-to-date training records are kept by the HWSA manager or the responsible installation office.</p> <p>Verify that training records are retained for 5 yr after termination of duty of these personnel.</p>

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<p>HAZARDOUS WASTE GENERATORS</p> <p>HW.50 Operating Procedures</p> <p>HW.50.1.SP. Each generator must use its DODAAC number for all recordkeeping, reports, and manifests for hazardous wastes (FGS-Spain 6.1.c).</p> <p>HW.50.2.SP. Generators must maintain an audit trail of hazardous waste from the point of generation to disposal (FGS-Spain 6.1.d.3 and 6.1.d.4).</p> <p>HW.50.3.SP. Generators must update HWPSs as needed to reflect new waste streams or process modifications (FGS-Spain 6.3.c.2).</p>	<p>Verify that each generator uses its DODAAC number for all recordkeeping, reports, and manifests for hazardous wastes.</p> <p>Verify that generators maintain an audit trail of hazardous waste from the point of generation to disposal.</p> <p>Verify that generators using DRMS disposal services have a signed copy of the manifest from the initial DRMS recipient of the waste.</p> <p>Verify that, if a generator uses a hazardous waste management and/or disposal program of a DOD component with a different DODAAC number, it obtains a signed copy of the manifest from the receiving component.</p> <p>Verify that installations that dispose of their wastes outside of the DRMS system have developed their own manifest tracking system to provide an audit trail from point of generation to ultimate disposal.</p> <p>Verify that generators maintain waste disposal records for a period of 5 yr.</p> <p>Verify that generators provide data for disposal planning purposes to the appropriate Spanish authorities upon request.</p> <p>Verify that the generator updates the HWPS as needed to reflect any new waste streams or process modifications that change the character of the hazardous waste being handled at the storage area.</p>

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<p>HAZARDOUS WASTE GENERATORS</p> <p>HW.60 Specific Wastes</p> <p>HW.60.1.SP. Hazardous waste must not be used for dust suppression or road treatment (FGS-Spain 6.9.e).</p> <p>HW.60.2.SP. Lead-acid batteries that are not recycled must be managed as hazardous waste (FGS-Spain 6.9.f.2).</p> <p>HW.60.3.SP. Mercury, nickel-cadmium, lithium, and lead-acid batteries must be treated prior to disposal (FGS-Spain 6.11.i.5).</p> <p>HW.60.4.SP. Treatment residues of wastes categorized as hazardous must be managed as hazardous waste (FGS-Spain 6.11.i.1 through 6.11.i.4).</p>	<p>Verify that hazardous waste is not used for dust suppression or road treatment.</p> <p>Determine whether the installation has lead-acid batteries that have exhausted their life cycle and are not recycled.</p> <p>Verify that the installation manages such batteries as hazardous waste.</p> <p>Verify that mercury, nickel-cadmium, lithium, and lead-acid batteries are being treated prior to disposal to stabilize, fix, or recover heavy metals and neutralize any corrosives.</p> <p>Verify that treatment residues from the following technologies are managed as hazardous waste, if they are characterized as hazardous:</p> <ul style="list-style-type: none"> - for organics: <ul style="list-style-type: none"> - incineration - fuel substitution where the units are operated so that destruction of hazardous constituents is efficient, and hazardous emissions are no greater than those produced by incineration - degradation by microbial action - recovery - chemical degradation - for heavy metals: <ul style="list-style-type: none"> - stabilization or fixation - recovery - for reactives: <ul style="list-style-type: none"> - treatments that change the chemical or physical composition of a material so that it no longer exhibits the characteristic of reactivity

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- for corrosives:
 - neutralization of corrosives to a pH value between 6.0 and 9.0
 - recovery
 - incineration
 - chemical or electrolytic oxidation
 - chemical reduction
 - stabilization.

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<p>HAZARDOUS WASTE ACCUMULATION POINTS</p> <p>HW.70 Design Requirements</p> <p>HW.70.1.SP. HWAPs must meet specific design standards (FGS-Spain 6.2.a and 6.2.b).</p> <p>HW.70.2.SP. Each HWAP must have warning signs appropriate to the waste being accumulated at that site (FGS-Spain 6.2.a).</p> <p>HW.70.3.SP. HWAP container storage areas must have containment systems (FGS-Spain 6.2.c).</p> <p>HW.70.4.SP. HWAPs that have containers holding ignitable or reactive waste must be located at least 15 m (50 ft) inside the installation boundary (FGS-Spain 6.2.c and 6.4.c).</p>	<p>Verify that the HWAP is at or near the point of generation and that no more than 208 L (55 gal) of hazardous waste or 1 L (1 qt) of acute hazardous waste (see Appendix 4-1) from each waste stream is accumulated there.</p> <p>Verify that each HWAP is designed to provide appropriate segregation for different waste streams, including those that are chemically incompatible.</p> <p>(NOTE: See Appendix 4-5 for a list of incompatible wastes.)</p> <p>Verify that each HWAP has warning signs appropriate to the waste being accumulated at the site.</p> <p>Verify that each container storage area has a containment system, such as a drip pan, with sufficient capacity to contain 10 percent of the volume of the containers or the volume of the largest container, whichever is greater.</p> <p>(NOTE: This applies only to containers that hold free liquids.)</p> <p>Verify that containers that hold ignitable or reactive waste are at least 15 m (50 ft) inside the installation boundary.</p>

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<p>HAZARDOUS WASTE ACCUMULATION POINTS</p> <p>HW.80 Operating Procedures</p> <p>HW.80.1.SP. When accumulation limits are reached, the generator must make arrangements either to move the hazardous waste to an HWSA or to ship it offsite for treatment or disposal (FGS-Spain 6.2.b).</p> <p>HW.80.2.SP. HWAPs must be inspected weekly for leaking containers and deterioration of the containment system caused by corrosion and other factors (FGS-Spain 6.2.c and 6.4.a.5).</p> <p>HW.80.3.SP. HWAPs must handle incompatible wastes in accordance with specific requirements (FGS-Spain 6.2.c and 6.4.d).</p>	<p>Verify that, when the accumulation limits are reached, the generator makes arrangements either to move the hazardous waste to an HWSA or to ship it offsite for treatment or disposal.</p> <p>(NOTE: Accumulation limits for HWAPs are: 208 L (55 gal) of hazardous waste or 1 L (1 qt) of acute hazardous waste (see Appendix 4-1) from each waste stream.)</p> <p>Verify that a weekly inspection is performed for leaking containers and for deterioration of containers and the containment system.</p> <p>Verify that secondary containment systems are inspected for defects and emptied of accumulated wastes.</p> <p>Verify that hazardous wastes and materials that can react with each other to cause extreme heat, explosions, fire, or toxic products are not placed in the same container.</p> <p>Verify that hazardous waste is not placed in an unwashed container that previously held an incompatible waste or material.</p> <p>Verify that storage containers holding a hazardous waste that is incompatible with any waste or other materials stored nearby in containers, piles, open tanks, or surface impoundments, are separated from the other materials or protected from them by means of a dike, berm, wall, or other device.</p>

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<p>HAZARDOUS WASTE ACCUMULATION POINTS</p> <p>HW.90 Containers</p> <p>HW.90.1.SP. Containers at HWAPs must meet specific requirements (FGS-Spain 6.2.c and 6.4.a.1 through 6.4.a.4).</p>	<p>Verify that containers are in good condition and free from severe rusting, bulging, or structural defects.</p> <p>Verify that containers, including overpack containers, are compatible with the materials stored.</p> <p>Verify that containers are kept closed, except when they need to be opened to add or remove waste.</p> <p>Verify that containers are not opened, handled, or stored in a manner that could cause a rupture or a leak.</p> <p>Verify that containers are marked with a hazardous waste marking and a label indicating the hazard class of the contents (flammable, corrosive, etc.) and the date the waste was placed in the container.</p> <p>Verify that all text is written in both English and Spanish.</p>

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<p>HAZARDOUS WASTE ACCUMULATION POINTS</p> <p>HW.100 Documentation</p> <p>HW.100.1.SP. HWAPs must maintain a hazardous waste log, inspection logs, manifests, and waste analysis/characterization records (FGS-Spain 6.5.a through 6.5.e).</p>	<p>Verify that a written hazardous waste log is maintained that includes the following:</p> <ul style="list-style-type: none"> - name, address, and DODAAC number of the generator - description and hazard class of the waste - number and types of containers - quantity of hazardous waste - date stored - storage location - disposition data, including dates received, sealed, transported, and transporter used. <p>Verify that the hazardous waste log is available to emergency personnel in the event of a fire or a spill and is maintained until closure of the installation.</p> <p>Verify that the HWAP maintains inspection logs for 5 yr.</p> <p>Verify that the HWAP retains manifests of incoming and outgoing hazardous wastes for 5 yr.</p> <p>Verify that the HWAP retains waste analysis/characterization records until 5 yr after closure.</p>

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<p>HAZARDOUS WASTE STORAGE AREAS</p> <p>HW.110 Design Requirements</p> <p>HW.110.1.SP. New HWSAs must be located so as to minimize the risk of a release due to seismic activity, floods, or other natural events (FGS-Spain 6.3.a).</p> <p>HW.110.2.SP. HWSAs that have containers holding ignitable or reactive waste must be located at least 15 m (50 ft) inside the installation boundary (FGS-Spain 6.4.c).</p> <p>HW.110.3.SP. HWSAs must meet specific security requirements (FGS-Spain 6.3.d.1 and 6.3.d.2).</p> <p>HW.110.4.SP. HWSAs must have signs that meet specific requirements (FGS-Spain 6.3.d.3 and 6.3.j.3.b).</p>	<p>Verify that new HWSAs are (to the maximum extent possible) located so as to minimize the risk of release due to seismic activity, floods, or other natural events.</p> <p>Verify that, for storage areas located where such risks may be encountered, the installation spill plan addresses the risk.</p> <p>Verify that new HWSAs are located in coordination with the appropriate Spanish authorities.</p> <p>Verify that containers which hold ignitable or reactive waste are at least 15 m (50 ft) from the installation boundary.</p> <p>Verify that the HWSA is designed to prevent the unknowing entry, and minimizes the possibility of unauthorized entry, of people or livestock onto HWSA grounds.</p> <p>Verify that the HWSA security system consists of either of the following:</p> <ul style="list-style-type: none"> - a 24-h surveillance system (e.g., television monitors, surveillance by guards or other designated personnel) that continuously monitors and controls entry - an artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff) that completely surrounds the area, combined with a means to control entrance at all times (e.g., an attendant, television monitors, locked gate, or controlled roadway access). <p>Verify that a sign is posted with the words DANGER UNAUTHORIZED PERSONNEL KEEP OUT - PELIGRO, RESTRINGIDO EL ACCESO A PERSONAL AUTORIZADO at each entrance and at other locations in sufficient numbers to be seen from any approach to the HWSA.</p> <p>Verify that signs are legible from a distance of at least 8 m or 25 ft.</p> <p>(NOTE: Existing signs with a legend other than the above may be used if the legend appears in both English and Spanish and indicates that only authorized personnel are allowed to enter and that entry can be dangerous.)</p>

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<p>HW.110.5.SP. Aisle space at each HWSA must allow unobstructed movement (FGS-Spain 6.3.e).</p> <p>HW.110.6.SP. HWSA container storage areas must have a containment system (FGS-Spain 6.4.b).</p> <p>HW.110.7.SP. Specific equipment must be present at each HWSA and must be tested (FGS-Spain 6.3.f and 6.3.g).</p>	<p>Verify that NO SMOKING - PROHIBIDO FUMAR signs are conspicuously placed wherever there is a hazard from ignitable or reactive waste.</p> <p>Verify that sufficient aisle space is maintained to allow unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of the facility operation.</p> <p>Verify that no containers obstruct exits.</p> <p>Verify that the container storage area has a containment system that has sufficient capacity to contain 10 percent of the volume of stored containers or the volume of the largest container, whichever is greater.</p> <p>Verify that the HWSA is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed.</p> <p>(NOTE: Storage areas that store containers holding only wastes that do not contain free liquids need not have such a containment system, provided that the storage area is sloped or otherwise designed and operated to drain and remove liquid from precipitation, or the containers are elevated or otherwise protected from contact with accumulated liquid.)</p> <p>Verify that the following equipment is easily accessible to personnel in HWSAs and in working condition:</p> <ul style="list-style-type: none"> - an internal communications or alarm system capable of providing immediate emergency instruction (voice or signal) to HWSA personnel - a device, such as an intrinsically safe telephone (immediately available at the scene of operations) or hand-held two-way radio, capable of summoning emergency assistance from base security, fire departments, or emergency response teams - portable fire extinguishers, fire control equipment appropriate to the material in storage (including special extinguishing equipment as needed, such as that using foam, inert gas, or dry chemicals) - spill control equipment - decontamination equipment - water at adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems - readily available PPE appropriate to the materials stored - eyewash and shower facilities. <p>Verify that the equipment is periodically tested and maintained as necessary to ensure proper operation in an emergency.</p>

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HW.110.8.SP. HWSAs must be designed, constructed, maintained, and operated with specific goals in mind (FGS-Spain 6.3.b).	Verify that the HWSA is designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned release of hazardous waste or hazardous waste constituents to air, soil, or surface water that could threaten human health or the environment.

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<p>HAZARDOUS WASTE STORAGE AREAS</p> <p>HW.120 Operating Procedures</p> <p>HW.120.1.SP. HWSAs must be inspected weekly for leaking containers and for deterioration of containers and the containment system caused by corrosion and other factors (FGS-Spain 6.4.a.6).</p> <p>HW.120.2.SP. The storage of ignitable, reactive, or incompatible wastes at HWSAs must not threaten human health or the environment (FGS-Spain 6.3.j).</p> <p>HW.120.3.SP. HWSAs must handle incompatible wastes in accordance with specific requirements (FGS-Spain 6.4.d).</p>	<p>Verify that a weekly inspection is performed.</p> <p>Verify that secondary containment systems are inspected for defects and emptied of accumulated releases.</p> <p>Verify that the storage of ignitable, reactive, or incompatible wastes is accomplished so as to prevent threats to human health or the environment.</p> <p>Verify that the HWSA manager takes precautions to prevent accidental ignition or reaction of ignitable or reactive wastes.</p> <p>Verify that ignitable and reactive wastes are separated and protected from sources of ignition or reaction.</p> <p>(NOTE: Sources of ignition or reaction include but are not limited to, open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks [static, electrical, or mechanical], spontaneous ignition [e.g., from heat-producing chemical reactions], and radiant heat.)</p> <p>Verify that, while ignitable or reactive waste is being handled, smoking and open flames are confined to specially designated areas.</p> <p>Verify that water-reactive waste is not stored in the same area as flammable and combustible liquids.</p> <p>Verify that no hazardous waste is held for more than 6 mo prior to disposal.</p> <p>Verify that incompatible wastes and materials are not placed in the same container.</p> <p>Verify that hazardous waste is not placed in an unwashed container that previously held an incompatible waste or material.</p>

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<p>HW.120.4.SP. HWSA managers must conduct periodic verification testing of the hazardous waste in storage (FGS-Spain 6.3.c.2).</p> <p>HW.120.5.SP. Prior to accepting waste from a generator, the HWSA manager must follow specific procedures (FGS-Spain 6.3.c.3).</p>	<p>Verify that storage containers holding a hazardous waste that is incompatible with any waste or other materials stored nearby in containers, piles, open tanks, or surface impoundments are separated from the other materials or protected from them by means of a dike, berm, wall, or other device.</p> <p>Verify that periodic verification testing is carried out to ensure that the generator has accurately identified the stored hazardous wastes.</p> <p>Verify that, prior to accepting waste from generators, the HWSA manager:</p> <ul style="list-style-type: none"> - inspects the waste to ensure that it matches the description provided - requests a new HWPS from the generator if there is reason to believe that the process generating the waste has changed - analyzes waste shipments to see if they match the waste description on the accompanying manifest and documents - rejects shipments that do not match the accompanying waste descriptions, unless the generator provides an accurate description.

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HAZARDOUS WASTE MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HAZARDOUS WASTE STORAGE AREAS</p> <p>HW.130 Containers</p> <p>HW.130.1.SP. Containers at HWSAs must meet specific standards (FGS-Spain 6.4.a.1 through 6.4.a.4).</p>	<p>Verify that containers are in good condition and free from severe rusting, bulging, or structural defects.</p> <p>Verify that containers, including overpack containers, are compatible with the materials stored.</p> <p>Verify that containers are kept closed, except when they need to be opened to add or remove waste.</p> <p>Verify that containers are not opened, handled, or stored in a manner that could cause a rupture or a leak.</p> <p>Verify that containers are marked with a hazardous waste marking and a label indicating the hazard class of the contents (flammable, corrosive, etc.) and the date the waste was placed in the container.</p> <p>Verify that all text is written in both English and Spanish.</p>

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HAZARDOUS WASTE STORAGE AREAS</p> <p>HW.140 Documentation</p> <p>HW.140.1.SP. HWSAs must maintain a hazardous waste log, inspection logs, manifests, and waste analysis/characterization records (FGS-Spain 6.5.a through 6.5.e).</p> <p>HW.140.2.SP. HWSAs must have a written closure plan (FGS-Spain 6.5.f).</p>	<p>Verify that the HWSA maintains a written hazardous waste log that includes the following:</p> <ul style="list-style-type: none"> - name, address, and DODAAC number of the generator - description and hazard class of the waste - number and types of containers - quantity of hazardous waste - date stored - storage location - disposition data, including dates received, sealed, transported, and transporter used. <p>Verify that the hazardous waste log is available to emergency personnel in the event of a fire or a spill and is maintained until closure of the installation.</p> <p>Verify that the HWSA maintains inspection logs for 5 yr.</p> <p>Verify that the HWSA retains manifests of incoming and outgoing hazardous wastes for 5 yr.</p> <p>Verify that the HWSA retains waste analysis/characterization records until 5 yr after closure.</p> <p>Verify that the HWSA has a written closure plan that includes:</p> <ul style="list-style-type: none"> - estimates of the storage capacity of hazardous waste - the steps to be taken to remove or decontaminate all waste residues - an estimate of the expected date of closure. <p>Verify that the installation develops a closure plan prior to opening a new HWSA.</p>

COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HAZARDOUS WASTE STORAGE AREAS</p> <p>HW.150 Closure</p> <p>HW.150.1.SP. At the closure of an HWSA, all hazardous waste and hazardous waste residues must be removed (FGS-Spain 6.7).</p>	<p>Verify that, at the closure of an HWSA, all hazardous waste and hazardous waste residues, including remaining containers, liners, and bases, are removed from the containment system.</p> <p>Verify that the closure is done in a manner that eliminates or minimizes the need for future maintenance or the potential for future releases of hazardous waste.</p> <p>Verify that the HWSA is closed in accordance with the Closure Plan.</p>

COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HW.160 TRANSPORTATION OF HAZARDOUS WASTE</p> <p>HW.160.1.SP. Hazardous waste generators must prepare offsite hazardous waste shipments in accordance with ADR (FGS-Spain 6.1.d.1).</p> <p>HW.160.2.SP. All hazardous waste that leaves the installation must be accompanied by a manifest (FGS-Spain 6.1.d.2).</p>	<p>Verify that offsite hazardous waste shipments are prepared in accordance with ADR as referenced in Section 3, <i>Hazardous Materials Management</i>.</p> <p>(NOTE: This requirement applies when transporting hazardous waste, via military vehicle or commercial transportation, on Spanish public roads and highways.)</p> <p>(NOTE: Standards may include requirements for placarding, marking, containerization, and labeling, among others.)</p> <p>Verify that installations transporting their hazardous wastes by contract ensure that the contracted firm possesses the permits required under Spanish law.</p> <p>Verify that all hazardous waste that leaves the installation is accompanied by a manifest.</p> <p>Verify that Spanish forms are used when practical.</p> <p>Verify that forms prepared by DOD personnel are prepared bilingually in English and Spanish.</p> <p>(NOTE: Forms prepared by a commercial firm under contract to the DOD need be prepared in Spanish only.)</p> <p>Verify that the manifests include:</p> <ul style="list-style-type: none"> - generator's name, address, DODAAC number, and telephone number - transporter's name, address, and telephone number - destination name, address, and telephone number - description of waste - total quantity of waste - date of shipment - date of receipt.

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HAZARDOUS WASTE DISPOSAL</p> <p>HW.170 General</p> <p>HW.170.1.SP. All DOD hazardous waste must normally be disposed of through the Defense Reutilization and Marketing Service (DRMS) (FGS-Spain 6.11.a).</p> <p>HW.170.2.SP. Hazardous waste that cannot be disposed of in Spain must be handled in accordance with specific requirements (FGS-Spain 6.11.b).</p> <p>HW.170.3.SP. Hazardous material that meets the definition of hazardous waste must be disposed of as a hazardous waste in certain circumstances (FGS-Spain 6.11.d).</p>	<p>Verify that the installation normally disposes of its DOD hazardous waste through the DRMS.</p> <p>(NOTE: A decision not to use the DRMS for hazardous waste disposal may be made for best accomplishment of the mission, but the decision should be concurred in by the component chain of command and the Executive Agent (EA) to ensure that installation contracts and disposal criteria are at least as protective as the criteria used by the DRMS.)</p> <p>Verify that, if a hazardous waste cannot be disposed of in Spain in accordance with FGS-Spain, the waste is then either:</p> <ul style="list-style-type: none"> - retrograded to the United States - transhipped to another country for disposal. <p>Verify that the transshipment meets applicable international agreements.</p> <p>Verify that the transshipment has been approved by at least the DOD.</p> <p>(NOTE: The determination of whether particular DOD-generated hazardous waste may be disposed of in Spain will be made by the DOD EA, in coordination with the Director of Defense Logistics Agency (DLA), or other relevant DOD components, and the Chief of the U.S. Diplomatic Mission.)</p> <p>Determine whether the installation has any hazardous materials that meet the definition of hazardous waste.</p> <p>Verify that the installation disposes of such materials as hazardous wastes whenever:</p> <ul style="list-style-type: none"> - the installation is discarding the materials as being no longer useful, or - the materials have failed DRMS reutilization, transfer, or sales cycles.

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HW.170.4.SP. Spanish facilities used by installations to store, treat, or dispose of DOD-generated waste must be approved by the appropriate Spanish authorities as being in compliance with their regulatory requirements (FGS-Spain 6.11.e).</p> <p>HW.170.5.SP. Hazardous wastes that are disposed of as solid wastes must be treated prior to disposal so that they no longer exhibit hazardous characteristics (FGS-Spain 6.11.i.1 through 6.11.i.4).</p>	<p>Determine whether the installation uses Spanish facilities to store, treat, or dispose of DOD-generated waste.</p> <p>Verify that the Spanish facility has a valid permit or authorization for the hazardous wastes that will be handled.</p> <p>Determine whether wastes that are categorized as hazardous on the basis of Appendix 4-1, Section A-1, or on the basis of Appendix 4-2 have been disposed of as solid wastes.</p> <p>Verify that the following approved treatment technologies are used:</p> <ul style="list-style-type: none"> - for organics: <ul style="list-style-type: none"> - incineration - fuel substitution where the units are operated so that destruction of hazardous constituents is efficient, and hazardous emissions are no greater than those produced by incineration - biodegradation - recovery - chemical degradation - for heavy metals: <ul style="list-style-type: none"> - stabilization or fixation - recovery - for reactives: <ul style="list-style-type: none"> - treatments that change the chemical or physical composition of a material so that it no longer exhibits the characteristic of reactivity - for corrosives: <ul style="list-style-type: none"> - neutralization of corrosives to a pH value between 6.0 and 9.0 - recovery - incineration - chemical or electrolytic oxidation - chemical reduction - stabilization.

COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HAZARDOUS WASTE DISPOSAL</p> <p>HW.180 Land Disposal</p> <p>HW.180.1.SP. Installations that dispose of hazardous wastes in landfills must do so only in landfills that meet specific requirements (FGS-Spain 6.11.g).</p>	<p>Determine whether the installation disposes of hazardous wastes in landfills.</p> <p>Verify that there is a reasonable degree of certainty that hazardous constituents will not migrate from the disposal site for as long as the wastes remain hazardous.</p> <p>Verify that hazardous waste is land disposed in Spain only in an authorized toxic and dangerous waste landfill unit.</p> <p>Verify that the land disposal system, at a minimum, has:</p> <ul style="list-style-type: none"> - a liner of natural or man-made materials that restricts the downward or lateral escape of hazardous contents or leachate and has a permeability no greater than 10^{-7} cm/s [3.94×10^{-8} in./s] - a leachate collection system - a groundwater monitoring program capable of determining the facility's impact on the quality of water in the aquifers underlying the facility. <p>(NOTE: The EA may waive these requirements for a particular land disposal site.)</p>

COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>HAZARDOUS WASTE DISPOSAL</p> <p>HW.190 Incinerators</p> <p>HW.190.1.SP. Incinerators used to dispose of hazardous waste must meet specific requirements (FGS-Spain 6.11.h.1 and 6.11.h.2).</p> <p>HW.190.2.SP. Hazardous waste incinerators must meet specific operating standards (FGS-Spain 6.11.h.2.a and 6.11.h.2.b).</p>	<p>(NOTE: Specific requirements for incineration of polychlorinated biphenyl (PCB)-containing wastes are set forth in Section 11, <i>Toxic Substances Management</i>.)</p> <p>(NOTE: These requirements apply to DOD-owned and -operated incinerators that incinerate hazardous waste, as well as to boilers and industrial furnaces that burn hazardous waste for any recycling purposes.)</p> <p>Verify that incinerators used to dispose of hazardous waste are licensed or permitted by the appropriate Spanish authority or approved by the EA.</p> <p>Verify that the incinerator is:</p> <ul style="list-style-type: none"> - designed to include appropriate equipment - operated according to management practices so as to effectively destroy hazardous constituents and control harmful emissions. <p>(NOTE: Such management practices include proper combustion temperature, waste feed rate, combustion gas velocity, and other relevant criteria.)</p> <p>Verify that incinerators achieve either of the following operating standards:</p> <ul style="list-style-type: none"> - the incinerator must: <ul style="list-style-type: none"> - achieve a destruction and removal efficiency of 99.99 percent for the organic hazardous constituents which represent the greatest degree of difficulty of incineration in each waste or mixture of waste - minimize CO in stack exhaust gas - minimize emission of particulate matter - emit no more than 1.8 kg (4 lb) of hydrogen chloride per hour - the incinerator has demonstrated the ability to effectively destroy the organic hazardous constituents that represent the greatest degree of difficulty of incineration in each waste or mixture of waste to be burned. <p>(NOTE: For example, the latter standard may be met by requiring the incinerator to conduct a trial burn, submit a waste feed analysis and a detailed engineering description of the facility, and provide other information that may be required to enable the competent Spanish authority or the EA to conclude that the incinerator will effectively destroy the principal organic hazardous constituents of each waste to be burned.)</p>

Appendix 4-1

Characteristics of Hazardous Wastes and Lists of Hazardous Wastes and Hazardous Materials (FGS-Spain, Appendix A)

A-1 CHARACTERISTICS OF HAZARDOUS WASTE

A. General

1. A waste is a hazardous waste if it exhibits any of the characteristics identified in this section.
2. A hazardous waste that is identified by a characteristic in this section is assigned every USEPA Hazardous Waste Number that is applicable. This number must be used in complying with the notification, record-keeping, and reporting requirements of these alternate standards.

B. Characteristic of Ignitability

1. A waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:
 - a. It is a liquid, other than an aqueous solution, that contains less than 24 percent alcohol by volume and has a flash point less than 60 °C (140 °F), as determined by a Pensky-Martens Closed Cup Tester, using the test method specified in American Society for Testing and Materials (ASTM) Standard D-93-80, or a Setaflash Closed Cup Tester, using the test method specified in ASTM Standard D-3278-78, or as determined by an equivalent test method.
 - b. It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture, or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.
 - c. It is an ignitable, compressed gas as determined by appropriate test methods or the USEPA.
 - d. It is an oxidizer.
2. A waste that exhibits the characteristic of ignitability has the USEPA Hazardous Waste Number of D001.

C. Characteristic of Corrosivity

1. A waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:
 - a. It is aqueous and has a pH less than or equal to 2.0 or greater than or equal to 12.5, as determined by a pH meter.
 - b. It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm or 0.25 in./yr at a test temperature of 55 °C (130 °F) as determined by the test method specified in National Association of Corrosion Engineers (NACE) Standard Technical Manual (TM)-01-69 as standardized in *Test Methods for the Evaluation of Solid Waste, Physical/ Chemical Methods*.
2. A waste that exhibits the characteristic of corrosivity has the USEPA Hazardous Waste Number of D002.

D. Characteristic of Reactivity

1. A waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties:
 - a. It is normally unstable and readily undergoes violent change without detonating.
 - b. It reacts violently with water.
 - c. It forms potentially explosive mixtures with water.
 - d. When mixed with water, it generates toxic gases, vapors, or fumes in a quantity sufficient to present danger to human health or the environment.
 - e. It is a cyanide or sulfide bearing waste that, when exposed to pH conditions between 2.0 and 12.5, can generate toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment.
 - f. It is capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement.
 - g. It is readily capable of detonation, explosive decomposition, or reaction at standard temperature and pressure.
 - h. It is a forbidden explosive.
2. A waste that exhibits the characteristic of reactivity has the USEPA Hazardous Waste Number of D003.

E. Characteristic of Toxicity

1. A waste exhibits the characteristic of toxicity if, the extract from a representative sample of the waste contains any of the contaminants listed in Charts A.1 or A.2 at the concentration equal to or greater than the respective value given in that Appendix. Where the waste contains less than 0.5 percent filterable solids, the waste itself is considered to be the extract for the purpose of this section.
2. A waste that exhibits the characteristic of toxicity has the USEPA Hazardous Waste Number specified in Charts A.1 or A.2 that corresponds to the toxic contaminant causing it to be hazardous.

A-2 LISTS OF HAZARDOUS WASTES

A. General

1. A waste is a hazardous waste if it is listed in this section.
2. The basis for listing the classes or types of wastes listed employed one or more of the following Hazard Codes:

Ignitable Waste	(I)
Corrosive Waste	(C)
Reactive Waste	(R)
Toxicity Characteristic Waste	(E)
Acute Hazardous Waste	(H)
Toxic Waste	(T)

3. Each hazardous waste listed in section A-2 is assigned a USEPA Hazardous Waste Number that precedes the name of the waste. This number must be used in complying with the notification, recordkeeping and reporting requirements of these alternative standards.

B. Hazardous Wastes from Nonspecific Sources

The solid wastes in Chart A.3 are listed hazardous wastes from nonspecific sources.

C. Hazardous Wastes from Specific Sources

The solid wastes listed in Chart A.4, denoted “K” as the first character in the USEPA number are listed hazardous wastes from specific sources.

D. Discarded Commercial Chemical Products, Off-Specification Species, Container Residues, and Spill Residue Thereof

The following materials or items are hazardous wastes if and when they are discarded or intended to be discarded; when they are mixed with waste oil or used oil, or other material and applied to the land for dust suppression or road treatment; when they are otherwise applied to the land in lieu of their original intended use; when they are contained in products that are applied to the land in lieu of their original intended use; or when, in lieu of their original intended use, they are produced for use as (or as a component of) a fuel, distributed for use as a fuel, or burned as a fuel.

1. Any commercial chemical product, or manufacturing chemical intermediate with the generic name listed in Chart A.4, annotated “P” or “U” as the first character in the USEPA waste number.
2. Any off-specification commercial chemical product or manufacturing chemical intermediate that, if it met specifications, would have the generic name listed in Chart A.4, annotated “P” or “U” as the first character in the USEPA waste number.
3. Any residue remaining in a container or in an inner liner removed from a container that has held any commercial chemical product or manufacturing chemical intermediate having the generic name listed in Chart A.4, annotated “P” or “U” as the first character in the USEPA waste number, unless the container is empty.

(NOTE: Unless the residue is being beneficially used or reused, being legitimately recycled or reclaimed, or being accumulated, stored, transported, or treated prior to such use, reuse, recycling or reclamation, the residue should be discarded, and is thus, a hazardous waste. An example of a legitimate reuse of the residue would be where the residue remains in the container, and the container is used to hold the same commercial chemical product or manufacturing chemical intermediate it previously held. An example of the discard of the residue would be where the drum is sent to a drum reconditioner who reconditions the drum but discards the residue.)

4. Any residue or contaminated soil, water or other debris resulting from the cleanup of a spill into or on any land or water of any commercial chemical product or manufacturing chemical intermediate having the generic name listed in Chart A.4, annotated “P” or “U” as the first character in the USEPA waste number, or any residue or contaminated soil, water or other debris resulting from the cleanup of a spill into or on any land or water of any off-specification chemical product and manufacturing chemical intermediate that, if it

me specifications, would have the generic name listed in Chart A.4, annotated “P” or “U” as the first character in the USEPA waste number of this section.

(NOTE: The phrase “commercial chemical product or manufacturing chemical intermediate having the generic name listed in ...” refers to a chemical substance that is manufactured or formulated for commercial or manufacturing use that consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed, and all formulation in which the chemical is the sole active ingredient. It does not refer to a material, such as a manufacturing process waste, that contains any of the substances listed in Chart A.4, annotated “P” or “U” as the first character in the USEPA waste number. Where a manufacturing process waste is deemed to be a hazardous waste because it contains a substance listed in Chart A.4, annotated “P” or “U” as the first character in the USEPA waste number, such waste will be listed in Chart A.3 or will be identified as a hazardous waste by the characteristics set forth in section A-1.)

5. The commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products or manufacturing chemical intermediates referred to in Chart A.4, denoted “P” as the first character in the USEPA waste number, are hereby identified as acute hazardous wastes (H).

(NOTE: For the convenience of the regulated community, the primary hazardous properties of these materials have been indicated by the letters T (Toxicity) and R (Reactivity). Absence of a letter indicates that the compound is listed only for acute toxicity.)

These wastes and their corresponding USEPA Hazardous Waste Numbers are listed in Chart A.4, annotated “P” as the first character in the USEPA waste number.

6. The commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products referred to in Chart A.4 are hereby identified as toxic wastes (T), unless otherwise designated.

(NOTE: For the convenience of the regulated community, the primary hazardous properties of these materials have been indicated by the letter T (Toxicity), R (Reactivity), I (Ignitability), and C (Corrosivity). Absence of a letter indicates that the compound is listed only for toxicity.)

Chart A.1

Maximum Concentration of Contaminants for the Toxicity Characteristics

USEPA HW No.¹	Contaminant	CAS No.²	Regulatory Level (mg/L)
D004	Arsenic	7440-38-2	5.0
D005	Barium	7440-39-3	100.0
D006	Cadmium	7440-43-2	1.0
D007	Chromium	7440-47-3	5.0
D016	2,4-D	94-75-7	10.0
D012	Endrin	72-20-8	0.02
D008	Lead	7439-92-1	5.0
D013	Lindane	58-89-9	0.4
D009	Mercury	7439-97-6	0.2
D014	Methoxychlor	72-43-5	10.0
D010	Selenium	7782-49-2	1.0
D011	Silver	7440-22-4	5.0
D015	Toxaphene	8001-35-2	0.5
D017	2,4,5-TP (Silvex)	93-72-1	1.0

¹ USEPA Hazardous Waste Number.

² Chemical Abstracts Service (CAS) Number.

Chart A.2

Maximum Concentration of Contaminants for Nonwastewater

USEPA HW No. ¹	Contaminant	CAS No. ²	Regulatory Level (mg/kg)
D018	Benzene	71-43-2	36
D019	Carbon tetrachloride	56-23-5	5.6
D020	Chlordane	57-74-9	0.13
D021	Chlorobenzene	108-90-7	5.7
D022	Chloroform	67-66-3	5.6
D023	o-Cresol	95-48-7	5.6
D024	m-Cresol	108-39-4	3.2
D025	P-Cresol	106-44-5	3.2
D026	Cresol		3.2
D027	1,4-Dichlorobenzene	106-46-7	6.2
D028	1,2-Dichloroethane	107-06-2	7.2
D029	1,1-Dichloroethylene	75-35-4	33
D030	2,4-Dinitrotoluene	121-14-2	140
D031	Heptachlor (and its epoxide)	76-44-8	0.066
D032	Hexachlorobenzene	118-74-1	37
D033	Hexachlorobutadiene	87-68-3	28
D034	Hexachloroethane	67-72-1	28
D035	Methyl Ethyl Ketone	78-93-3	36
D036	Nitrobenzene	98-95-3	14
D037	Pentachlorophenol	87-86-5	7.4
D038	Pyridine	110-86-1	16
D039	Tetrachloroethylene	127-18-4	5.6
D040	Trichloroethylene	79-01-6	5.6
D041	2,4,5-Trichlorophenol	95-95-4	37

D042	2,4,6-Trichlorophenol	88-06-2	37
D043	Vinyl Chloride	75-01-4	33

¹ USEPA Hazardous Waste Number.

² CAS Number.

Chart A.3

Listed Hazardous Wastes from Nonspecific Sources

USEPA Waste No. ¹	Hazardous Waste	Hazard Code
F001	The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of 10 percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F002	The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, orthodichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of 10 percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F003	The following spent nonhalogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent nonhalogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above nonhalogenated solvents and a total of 10 percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I)
F004	The following spent nonhalogenated solvents: cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of 10 percent or more (by volume) of one or more of the above nonhalogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F005	The following spent nonhalogenated solvents: Toluene, methyl- ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of 10 percent or more (by volume) of one or more of the above nonhalogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures	(I,T) ²
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.	(T)
F007	Spent cyanide plating bath solutions from electroplating operations.	(R,T)

F008	Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.	(R,T)
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.	(R,T)
F010	Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.	(R,T)
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.	(R,T)
F012	Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process.	(T)
F019	Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusion conversion coating process.	(T)

1. USEPA Hazardous Waste Number

2. (I,T) should be used to specify mixtures containing ignitable and toxic constituents.

Chart A.4

List of Hazardous Wastes/Substances/Materials

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Acenaphthene	83329			100
Acenaphthylene	208968			5000
Acetaldehyde (i)	75070		U001	1000
Acetaldehyde, chloro-	107200		P023	1000
Acetaldehyde, trichloro-	75876		U034	5000
Acetamide, N-(aminothioxomethyl)-	591082		P002	1000
Acetamide, N-(4-ethoxyphenyl)-	62442		U187	100
Acetamide, 2-fluoro-	640197		P057	100
Acetamide, N-9H-fluoren-2-yl-	53963		U005	1
Acetic acid	64197			5000
Acetic acid (2,4-dichlorophenoxy)-	94757		U240	100
Acetic acid, lead(2+) salt	301042		U144	#
Acetic acid, thallium(1+) salt	563688		U214	100
Acetic acid, ethyl ester (I)	141786		U112	5000
Acetic acid, fluoro-, sodium salt	62748		P058	10
Acetic anhydride	108247			5000
Acetone (I)	67641		U002	5000
Acetone cyanohydrin	75865	1000	P069	10
Acetone thiosemicarbazide	1752303	1000/10,000		1
Acetonitrile (I,T)	75058		U003	5000
Acetophenone	98862		U004	5000
2-Acetylaminofluorene	53963		U005	1
Acetyl bromide	506967			5000

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Acetyl chloride (C,R,T)	75365		U006	5000
1-Acetyl-2-thiourea	591082		P002	1000
Acrolein	107028	500	P003	1
Acrylamide	79061	1000/10,000	U007	5000
Acrylic acid (I)	97107		U008	5000
Acrylonitrile	107131	10,000	U009	100
Acrylyl chloride	814686	100		1
Adipic acid	124049			5000
Adiponitrile	111693	1000		1
Aldicarb	116063	100/10,000	P070	1
Aldrin	309002	500/10,000	P004	1
Allyl alcohol	107186	1000	P005	100
Allylamine	107119	500		100
Ally chloride	107051			1000
Aluminum phosphide (R,T)	20859738	500	P005	100
Aluminum sulfate	10043013			5000
5-(Aminomethyl)-3-isoxazolol	2763964		P007	1000
Aminoptenn	54626	500/10,000		1
4-Aminopyndine	504245		P008	1000
Amiton	78535	500		1
Amiton oxalate	3734972	100/10,000		1
Amitrole	61825		U011	10
Ammonia	7664417	500		100
Ammonium acetate	631618			5000
Ammonium benzoate	1863634			5000

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Ammonium bicarbonate	1066337			5000
Ammonium bichromate	7789095			10
Ammonium bifluoride	1341497			100
Ammonium bisulfite	10192300			5000
Ammonium carbamate	1111780			5000
Ammonium carbonate	506876			5000
Ammonium chloride	12125029			5000
Ammonium chromate	778989			10
Ammonium citrate, dibasic	3012655			5000
Ammonium fluoborate	13826830			5000
Ammonium fluoride	12125018			100
Ammonium hydroxide	1336216			1000
Ammonium oxalate	6009707 5972736 14258492			5000
Ammonium picrate (R)	131748		P009	10
Ammonium silicofluoride	16919190			1000
Ammonium sulfamate	7773060			5000
Ammonium sulfide	12135761			100
Ammonium tartrate	14307438 3164292			5000
Ammonium thiocyanate	1762954			5000
Ammonium vanadate	7803556		P119	1000
Amphetamine	300629	1000		1
Amyl acetate iso-Amyl acetate Sec- Amyl acetate tert-Amyl acetate	628637			5000

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Amyl acetate tert-Amyl acetate	123922 626380 625161			
Aniline (I,T)	62533	1000	U012	5000
Aniline, 2,4,6- trimethyl	88051	500		1
Anthracene	120127			5000
Antimony++	7440360			5000
Antimony pentachloride	7647189			1000
Antimony pentafluoride	7783702	500		1
Antimony potassium tartrate	28300745			100
Antimony tribromide	7789619			1000
Antimony trichloride	10025919			1000
Antimony trifluoride	7783564			1000
Antimony trioxide	1309644			1000
Antimycine A	1397940	1000/10,000		1
ANTU	86884	500/10,000		100
Argentate(1-), bis(cyano-C)-, potassium	506616		P099	1
Aroclor 1016	12674112			1
Aroclor 1221	11104282			1
Aroclor 1232	11141165			1
Aroclor 1242	53469219			1
Aroclor 1248	12672296			1
Aroclor 1254	11097691			1
Aroclor 1260	11096825			1
Arsenic++	7440382			1

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Arsenic acid H ₃ AsO ₄	1327522 7778394		P010	1
Arsenic disulfide	1303328			1
Arsenic oxide As ₂ O ₃	1327533		P012	1
Arsenic oxide As ₂ O ₅	1303282		P011	1
Arsenic pentoxide	1303282	100/10,000	P011	1
Arsenic trichloride	7784341			1
Arsenic trioxide	1327533		P012	1
Arsenic trisulfide	1303339			1
Arsenous trichloride	7784341	500		5000
Arsine	7784421	100		1
Arsine, diethyl-	692422		P038	1
Arsinic acid, dimethyl-	75605		U136	1
Arsorous dichloride, phenyl-	696286		P036	1
Asbestos+++	1332214			1
Auramine	492808		U014	100
Azasenne	115028		U015	1
Azindine	151564		P054	1
Azindine, 2-methyl-	75558		P067	1
Azinno[2',3',3,4]pyrrolo[1,2-a] indole-4, 7-dione,6-amino- 8- [(aminocarbonylooxy) methyl]-1,1a,2,8,8a,8b- hexahydro-8a-methoxy-5- methyl-[1aS-(1a-alpha,8- beta, 8a-alpha, 8b-alpha)]-	50077		U010	10
Aziphos-ethyl	2642719	100/10,000		1
Azinphos-methyl	86500	10/10,000		1
Banum cyanide	542621		P013	10

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Benz[1]aceanthrylene, 1,2-dihydro-3-methyl-	56421		U157	10
Benz[c]acridine	225514		U016	100
Benzal chloride	98873	500	U017	5000
Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	23950595		U192	5000
Benz[a]anthracene	56553		U018	10
1,2-Benzathracene	56553		U018	10
Benz[a]anthracene, 7,12-dimethyl-	57976		U094	1
Benzenamine (I,T)	62533		U012	5000
Benzenamine, 3-(Trifluoromethyl)	98168	500		1
Benzenamine, 4,4'-carbonimidoylbis (N,N-dimethyl-	492808		U014	100
Benzenamine, 4-chloro-	106478		P024	1000
Benzenamine 4-chloro-2-methyl- hydrochloride,	3165933		U049	100
Benzenamine, N,N-dimethyl-4-(phenylazo-)	60117		U093	10
Benzenamine, 2-methyl-	95534		U328	100
Benzenamine, 4-methyl-	106490		U353	100
Benzenamine, 4,4'-methylenebis(2-chloro-	101144		U158	10
Benzenamine, 2-methyl-, hydrochloride	636215		U222	100
Benzenamine, 2-methyl-5-nitro-	99558		U181	100
Benzenamine, 4-nitro-	100016		P077	5000
Benzene (I,T)	71432		U109	10
Benzene, 1-(Chloromethyl)-4-Nitro-	100141	500/10,000		1
Benzeneacetic acid, 4-chloro- alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl	510156		U038	1

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
ester				
Benzene, 1-bromo-4-phenoxy-	101553		U030	100
Benzeneearsonic Acid	98055	10/10,000		1
Benzenebutanoic acid, 4-[bis (2-chloroethyl)amino]-	305033		U035	10
Benzene, chloro-	108907		U037	100
Benzene, chloromethyl-	100447		P028	100
Benzenediamin, ar-methyl-	95807 496720 823405		U221	10
1,2-Benzenedicarboxylic acid, dioctyl ester	117840		U107	5000
1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)]-ester	117817		U028	100
1,2-Benzenedicarboxylic acid, dibutyl ester	84742		U069	10
1,2-Benzenedicarboxylic acid, diethyl ester	84662		U088	1000
1,2-Benzenedicarboxylic acid, dimethyl ester	131113		U102	5000
Benzene, 1,2-dichloro-	95501		U070	100
Benzene, 1,3-dichloro-	541731		U071	100
Benzene, 1,4-dichloro-	106467		U072	100
Benzene, 1,1'-(2,2-dichloroethylidene) bis[4-chloro-	72548		U060	1
Benzene, dichloromethyl-	98873		U017	5000
Benzene, 1,3-diisocyanatomethyl- (R,T)	584849 91087		U223	100

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
	264716254			
Benzene, dimethyl (I,T) m-Benzene, dimethyl o-Benzene, dimethyl p- Benzene, dimethyl	1330207 108383 95476 106423		U239	1000
1,3-Benzenediol	108463		U201	5000
1,2-Benzenediol, 4-[1 -hydroxy-2- (me- thylamino)ethyl]- (R)	51434		P042	1000
Benzeneethanamine, alpha, alpha-dimethyl-	122098		P046	5000
Benzene, hexachloro-	118741		U127	10
Benzene, hexahydro- (I)	110827		U056	1000
Benzene, hydroxy-	108952		U188	1000
Benzene, methyl-	108883		U220	1000
Benzene, 2-methyl-1,3-dinitro-	606202		U106	100
Benzene, 1-methyl-2,4-dinitro-	121142		U105	10
Benzene, 1-methylethyl- (I)	98828		U055	5000
Benzene, nitro-	98953		U169	1000
Benzene, pentachloro	608935		U183	10
Benzene, pentachloronitro-	82688		U185	100
Benzenesulfonic acid chloride (C,R)	98099		U020	100
Benzenesulfonyl chloride	98099		U020	100
Benzene, 1,2,4,5-tetrachloro-	95943		U207	5000
Benzenethiol	108985		P014	100
Benzene, 1,1'-(2,2,2-tri- chloro- ethylidene)bis[4-chloro-	50293		U061	1

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Benzene, 1,1'-(2,2,2-trichloro-ethylidene)bis[4-methoxy-	72435		U247	1
Benzene,(trichloromethyl)-	98077		U023	10
Benzene, 1,3,5-trinitro-	99354		U234	10
Benzidine	92875		U021	1
Benzimidazole, 4,5-Dichloro-2-(Trifluormethyl)-	3615212	500/10,000		1
1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide	81072		U202	100
Benzo[a]anthracene	56553		U018	10
Benzo[b]fluoranthene	205992			1
Benzo[k]fluoranthene	207089			5000
Benzo[j,k]fluorene	206440		U120	100
1,3-Benzodioxole, 5-(1-propenyl)-	120581		U141	100
1,3-Benzodioxole, 5-(2-propenyl)-	94597		U203	100
1,3-Benzodioxole, 5-propyl	94586		U090	10
Benzoic acid	65850			5000
Benzonitrile	100470			5000
Benzo[rs]t]pentaphene	189559		U064	10
Benzo[ghi]perylene	191242			5000
2H-1-Benzopyran-2-one, 4-hydroxy-3-oxo-1-phenyl-butyl)-, & salts, when present at concentrations greater than 0.3%	81812		P001	100
Benzo[a]pyrene	50328		U022	1
3,4-Benzopyrene	50328		U022	1
p-Benzoquinone	106514		U197	10
Benzotrichloride (C,R,T)	98077	100	U023	10

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Benzoyl chloride	98884			1000
1,2-Benzphenanthrene	218019		U050	100
Benzyl chloride	100447	500	P028	100
Benzy cyanide	140294	500		1
Beryllium++	7440417		P015	10
Beryllium chloride	7787475			1
Beryllium fluoride	7787497			1
Beryllium nitrate	13597994 7787555			1
alpha-BHC	319846			10
beta-BHC	319857			1
delta-BHC	319868			1
gamma-BHC	58899		U129	1
Bicyclo [2,2,1]Heptane-2- carbonitrile, 5-chloro-6- (((Methyl- amino)Carbonyl)Oxy Imino)-, (1s-(1- alpha, 2-beta, 4-alpha, 5-alpha, 6E))-	15271417	500/10,000		1
2,2'-Bioxirane	1464535		U085	10
(1,1'-Biphenyl)-4,4'diamine	92875		U021	1
(1,1'-Biphenyl)-4,4'diamine, 3,3' dichloro-	91941		U073	1
(1,1'-Biphenyl)-4,4'diamine, 3,3' dimethoxy-	119904		U091	100
(1,1'-Biphenyl)-4,4'diamine, 3,3' dimethyl-	119937		U095	10
Bis(chloromethyl) ketone	534076	10/10,000		1
Bis(2-chloroethyl)ether	111444		U025	10
Bis(2-chloroethoxy)methane	111911		U024	1000

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Bis(2-ethylhexyl)phthalate	117817		U028	100
Bitoscanate	4044659	500/10,000		1
Boron trichloride	10294345	500		1
Boron trifluoride	7637072	500		1
Boron trifluoride compound with methyl ether (1:1)	353424	1000		1
Bromoacetone	598312		P017	1000
Bromadiolone	28772567	100/10,000		1
Bromine	7726956	500		1
Bromoform	75252		U225	100
4-Bromophenyl phenyl ether	101553		U030	100
Brucine	357573		P018	100
1,3-Butadiene, 1,1,2,3,4,4- hexachloro-	87683		U128	1
1-Butanamine, N-butyl-N-nitroso-	924163		U172	1
1-Butanol	71363		U031	5000
2-Butanone	78933		U159	5000
2-Butanone peroxide (R,T)	1338234		U160	10
2-Butanone, 3,3-dimethyl-1- (methylthio)-, O[(methylamno) carbonyl] oxime	3916184		P045	100
2-Butenal	123739 4170303		U053	100
2-Butene, 1,4-dichloro- (I,T)	764410		U074	1
2-Butenoic acid, 2-methyl-, 7[[2, 3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5, 7a-tetrahydro-1H- pyrrolizine-1-yl	303344		U143	10

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
ester, [1S-[1- alpha(Z), 7(2S*,3R*), 7a-alpha]]-				
Butyl acetate iso-Butyl acetate sec- Butyl acetate tert-Butyl acetate	123864 110190 105464 540885			5000
n-Butyl alcohol (I)	71363		U031	5000
Butylamine iso-Butylamine sec- Butylamine tert-Butylamine	109739 78819 513495 13952846 75649			1000
Butyl benzyl phthalate	85687			100
n-Butyl phthalate	84742		U069	10
Butyric acid	107926			5000
iso Butyric acid	79312			
Cacodylic acid	75605		U136	1
Cadmium++2 ⁺	7440439			10
Cadmium acetate	543908			10
Cadmium bromide	7789426			10
Cadmium chloride	10108642			10
Cadmium oxide	1306190	100/10,000		1
Cadmium stearate	2223930	1000/10,000		1
Calcium arsenate	7778441	500/10,000		1
Calcium arsenite	52740166			1

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Calcium carbide	75207			10
Calcium chromate	13765190		U032	10
Calcium cyanide Ca(CN)2	592018		P0221	10
Calcium dodecylbenzenesulfonate	26264062			1000
Calcium hypochlorite	7778543			10
Camphechlor	8001352	500/10,000		1
Camphene, octachloro-	8001352		P123	1
Cantharidin	56257	100/10,000		1
Carbachol chloride	51832	500/10,000		1
Captan	133062			10
Carbamic acid, ethyl ester	51796		U238	100
Carbamic acid, methylnitroso-, ethyl ester	615532		U178	1
Carbamic acid, Methyl-, 0-(((2,4-Dimethyl-1, 3-Dithiolan-2-yl)Methyliene)Amino)-	26419738	100/10,000		1
Carbamic chloride, dimethyl-	79447		U097	1
Carbamodithioic acid, 1,2- ethaneiybis, salts & esters	111546		U114	5000
Carbamothioic acid, bis(1- methylethyl)-, S-(2,3-dichloro-2- propenyl) ester	2303164		U062	100
Carbaryl	63252			100
Carbofuran	1563662	10/10,000		10
Carbon disulfide	75150	10,000	P022	100
Carbon oxyfluoride (R,T)	353504		U033	1000
Carbon tetrachloride	56235		U211	10
Carbonic acid, dithallium(1+)salt	6533739		U215	100

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Carbonic dichloride	75445		P095	10
Carbonic difluoride	353504		U033	1000
Carbonochloridic acid, methyl ester	79221		U156	1000
Carbophenothion	786196	500		1
Chloral	75876		U034	5000
Chlorambucil	305033		U035	10
Chlordane	57749	1000	U036	1
Chlordane, alpha & gamma isomers	57749		U036	1
Chlordane, technical	57749		U036	1
Chlorfenvinfos	470906	500		1
Chlorine	7782505	100		10
Chlormephos	24934916	500		1
Chlormequat chloride	999815	100/10,000		1
Chlornaphazine	494031		U026	100
Chloroacetaldehyde	107200		P023	1000
Chloroacetic acid	79118	100/10,000		1
p-Chloroaniline	106478		P024	1000
Chlorobenzene	108907		U037	100
Chlorobenzilate	510156		U038	10
p-Chloro-m-cresol	59507		U039	5000
Chlorodibromomethane	124481			100
Chloroethane	75003			100
Chloroethanol	107073	500		1
Chlorethyl chlorofomate	627112	1000		1
2-Chloroethyl vinyl ether	110758		U042	1000

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Chloroform	67663	10,000	U044	10
Chloromethyl ether	542881	100		1
Chloromethyl methyl ether	107302	100	U046	10
beta-Chloronaphthalene	91587		U047	5000
2-Chloronaphthalene	91587		U047	5000
Chlorophacinone	3691358	100/10,000		1
o-Chlorophenol (2)	95578		U048	100
4-Chlorophenol phenyl ether	7005723			5000
1-(o-Chlorophenyl)thiourea	5344821		P026	100
3-Chloropropionitrile	542767		P027	1000
Chlorosulfonic acid	7790945			1000
4-Chloro-o-toluidine, hydrochloride	3165933		U049	100
Chlorpyrifos	2921882			1
Chloroxuron	1982474	500/10,000		1
Chlorthiophos	21923239	500		1
Chromic acetate	1066304			1000
Chromic acid	11115745 7738945			10
Chromic acid H ₂ CrO ₄ , calcium salt	13765190		U032	10
Chromic chloride	10025737	1/10,000		1
Chromic sulfate	10101538			1000
Chromium++	7440473			5000
Chromous chloride	10049055			1000
Chrysene	218019		U050	100
Colbalt, ((2,2'-(1,2-ethanediylbis (Nitrilomethylidyne)) Bis(6-fluoro-	62207765	100/10,000		1

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
phenolato))(2-)- N,N',O,O')-,				
Cobaltous bromide	7789437			1000
Colbalt carabonyl	10210681	10/10,000		1
Cobaltous formate	544183			1000
Colbaltous sulfamate	14017415			1000
Coke Oven Emissions	NA			1
Colchicine	64868	10/10,000		1
Copper cyanide	544923		P029	10
Coumaphos	56724	100/10,000		10
Coumatetralyl	5836293	500/10,000		1
Creosote	8001589		U051	1
Cresol(s) m-Cresol o-Cresol p-Cresol	1319773 108394 95487 106445	1000/10,000	U052	1000 1000
Cresylic acid m-Cresol o-Cresol p-Cresol	1319773 108394 95487 106445		U052	1000
Crimidine	535897	100/10,000		1
Crotonaldehyde	123739 4170303	1000 100	U053	100 100
Cumene (I)	98828		U055	5000
Cupric acetate	142712			100
Cupric acetoarsenite	12002038			1

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Cupric chloride	7447394			10
Cuprice nitrae	3251238			100
Cupric oxalate	5893663			100
Cupric sulfate	7758987			10
Cupric sultate, ammoniated	10380297			100
Cupric tartrate	815827			100
Cyanides (soluble salts and com plexes) not otherwise specified	57125		P030	10
Cyanogen	460195		P031	100
Cyanogen bromide	506683	500/10,000	U246	1000
Cyanogen chloride	506774		P033	10
Cyanogen iodide	506785	1000/10,000		1
Cyanophos	2636262	1000		1
Cyanuric fluoride	675149	100		1
2,5-Cyclohexadiene-1,4-dione	106514		U197	10
Cyclohexane (I)	110827		U056	1000
Cyclohexane, 1,2,3,4,5,6-hexachloro, (1- alpha, 2-alpha, 3-beta, 4-alpha, 5-alpha, 6-beta)-	58899		U129	1
Cyclohexanone (I)	108941		Y057	5000
2Cyclohexanone	131895		P034	100
Cycloheximide	66819	100/10,000		1
Cyclohexylamine	108918	10,000		1
1,3-Cyclopentadiene, 1,2,3,4,5,5- hexa- chloro-	77474		U130	10
Cyclophosphamide	50180		U058	10
2,4-D Acid	94757		U240	100

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
2,4-D Ester	94111 94791 94804 1320189 1928387 1928616 1929733 2971382 25168267 53467111			100
2,4-D, salts & esters	94757		U240	100
Daunomycin	20830813		U059	10
Decarborane(14)	17702419	500/10,000		1
Demeton	8065483	500		1
Demeton-S-Methyl	919868	500		1
DDD, 4,4'DDD	72548		U060	1
DDD, 4,4'DDE	72559			1
DDT, 4,4'DDT	50293		U061	1
Diallate	2303164		U062	100
Dialifor	10311849	100/10,000		1
Diazinon	333415			1
Dibenz[a,h]anthracene	53703		U063	1
1,2:5,6-Dibenzanthracene	53703		U063	1
Dibenzo[a,h]anthracene	53703		U063	1
Dibenz[a,i]pyrene	189559		U064	10

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
1,2-Dibromo-3-chloropropane	96128		U066	1
Diborane	19287457	100		1
Dibutyl phthalate	84742		U069	10
Di-n-butyl phthalate	84742		U069	10
Dicamba	1918009			1000
Dichlobenil	119456			100
Dichlone	117806			1
Dichlorobenzene	25321226			100
m-Dichlorobenzene (1,3)	541731		U071	100
o-Dichlorobenzene (1,2)	95501		U070	100
p-Dichlorobenzene (1,4)	106467		U072	100
3,3'-Dichlorobenzidine	91941		U073	1
Dichlorobromomethane	75274			5000
1,4-Dichloro-2-butene (I,T)	764410		U074	1
Dichloroifluoromethane	75718		U075	5000
1,1-Dichloroethane	75343		U076	1000
1,2-Dichloroethane	107062		U077	100
1,1-Dichloroethylene	75354		U078	100
1,2-Dichloroethylene	156605		U079	1000
Dichloroethyl ether	11444	10,000	U025	10
Dichloroisopropyl ether	108601		U027	1000
Dichloromethoxy ethane	111911		U024	1000
Dichloromethyl ether	542881		P016	10
Dichloromethylphenylsilane	149746	1000		1
2,4-Dichlorophenol	120832		U081	100

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
2,6-Dichlorophenol	87650		U082	100
Dichlorophenylarsine	696286		P036	1
Dichloropropane 1,1-Dichloropropane 1,3-Dichloropropane	26638197 78999 142289			1000
1,2-Dichloropropane	78875		U083	1000
Dichloropropane-Dichloropropene (mix- ture)	8003198			100
Dichloropropene 2,3-Dichloropropene	26952238 78886			100
1,3-Dichloropropene	542756		U084	100
2,2-Dichloropropionic acid	75990			5000
Dichlorvos	62737	1000		100
Dicofol	115322			10
Dicrotophos	141662	100		1
Dieldrin	60571		P037	1
1,2:3,4-Diepoxybutane (I,T)	1464535	500	U085	10
Diethyl chlorophosphate	814493	500		1
Diethylamine	109897			100
Diethylarsine	692422		P038	1
Diethylcarbamazine citrate	1642542	100/10,000		1
1,4-Diethylenedioxiide	123911		U108	100
Diethylhexyl phthalate	117817		U028	100
N,n'-Diethylhydrazine	1615801		U086	10
O,O-Diethyl S-methyl dithiophosphate	3288582		U087	5000

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Diethyl-p-nitrophenyl phosphate	311455		P041	100
Diethyl phthalate	84662		P088	1000
O,O-Diethyl O-pyrazinyl phos- phorothioate	297972		P040	100
Diethylstilbestrol	56531		U089	1
Digitoxin	71636	100/10,000		1
Diglycidyl Ether	2238075	1000		1
Digoxin	20830755	10/1000		1
Dihydrosafrole	94586		U090	10
Diisopropylfluorophosphate, 1,2,3,4, 10,10-10-hexa-chloro-1,4,4a,5,8, 8a- hexahydro-(1-alpha, 4-alpha, 4-beta, 5- alpha, 8-alpha,	309002		U004	1
8a-beta)1,4,5,8-Dimethanonaphtha- lene, 1,2,3,4,10,10-hexachloro-1,4, 4a,5,8,8a- hexahydro, (1-alpha, 4-alpha,4a-beta, 5a-beta, 8-beta,	465736		P060	1
8a-beta)-2,7:3,6-Dimethanonaphth [2,3b]oxirene,3,4,5,6,9,9-hexa chloro- 1a,2,2a,3,6,6a,7,7a-octahy- dro-(1a- alph, 2-beta, 2a-alpha, 3-beta, 6-beta	60571		P037	1
6a-alpha, 7beta, 7a-alpha)-2,7:3,6 Di- methanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a, 3,6,6a,7,7a-octa-hydro-, (1a-alpha, 2- beta, 2a-beta, 3-alpha, 6-alpha,	72206		P051	1
6a-beta, 7-beta, 7a-alpha)-Dimethoate	60515		P044	10
3,3'-Dimethoxybenzidine	119904		U091	100
Dimefox	115264	500		1
Dimethoate	60515	500/10,000		10
Dimethyl Phosphorochloridothioate	2524030	500		1
Dimethyl sulfate	77781	500		1

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Dimethyl sulfide	75183	100		1
Dimethylamine (I)	124403		U092	1000
p-Dimethylaminoazobenzene	60117		U093	10
7,12-Dimethylbenz[a]anthracene	57976		U094	1
3,3'Dimethylbenzidine	119937		U095	10
alpha, alpha- Dimethylbenzylhydroperoxide (R)	80159		U096	10
Dimethylcarbamoyl chloride	79447		U097	1
Dimethyldichlorosilane	75785	500		1
1,1-Dimethylhydrazine	57147	1000	U098	1
1,2-Dimethylhydrazine	540738		U099	1
alpha, alph-Dimethylphenethylamine	122098		P046	5000
Dimethyl-p-phenylenediamine	99989	10/10,000		1
2,4-Dimethylphenol	105679		U101	100
Dimethyl phthalate	131113		U102	5000
Dimethyl sulfate	77781		U103	100
Dimetilian	644644	500/10,000		1
Dinitrobenzene (mixed) m- Dinitrobenzene o-Dinitrobenzene p- Dinitrobenzene	25154545 99650 528290 100254			100
4,6-Dinitro-o-cresol and salts	534521	10/10,000	P047	10
Dinitrophenol 2,5-Dinitrophenol 2,6- Dinitrophenol	25550587 329715 573568			10

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
2,4-Dinitrophenol	51285		P048	10
Dinitrotoluene 3,4-Dinitrotoluene	25321146 610399			10
2,4-Dinitrotoluene	121142		U105	10
2,6-Dinitrotoluene	606202		U106	100
Dinoseb	88857	100/10,000	P020	1000
Dinoterb	1420071	500/10,000		1
Di-n-octyl phthalate	117840		U107	5000
1,4-Dioxane	123911		U108	100
Dioxathion	78342	500		1
Diphacinone	82666	10/10,000		1
1,2-Diphenylhydrazine	122667		U109	10
Disphosphoramidate, octamethyl-	152169	100	P085	100
Diphosphoric acid, tetraethyl ester	107493		P111	10
Dipropylamine	142847		U110	5000
Di-n-propylnitrosamine	621647		U111	10
Diquat	85007 2764729			1000
Disulfoton	298044	500	P039	1
Dithiazanine iodine	514738	500/10,000		1
Dithiobiuret	541537	100/10,000	P049	100
Diuron	330541			100
Dodecylbenzenesulfonic acid	27176870			1000
Emetine, Dihydrochloride	316427	1/10,000		1
Endosulfan	115297	10/10,000	P050	1

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
alpha-Endosulfan	959988			1
beta-Endosulfan	33213659			1
Endosulfant sulfate	1031078			1
Endothall	145733		P088	1000
Endothion	2778043	500/10,000		1
Endrin	72208	500/1000	P051	1
Endrin aldehyde	742934			1
Endrin & metabolites	72208		P051	1
Epichlorohydrin	106898	1000	U041	1000
Epinephrine	51434		P042	1000
EPN	2104645	100/10,000		1
Ergocalciferol	50146	1000/10,000		1
Ergotamine tartrate	379793	500/10,000		1
Ethanal	75070		U001	1000
Ethanamine, N-ethyl-N-nitroso-	55185		U174	1
1,2-Ethanediamine, N,N-dimethyl- N'-2-pyridinyl-N'-(2-thienylmethyl)-	91805		U155	5000
Ethane, 1,2-dibromo-	106934		U067	1
Ethane, 1,1-dichloro-	75343		U076	1000
Ethane, 1,2-dichloro-	107062		U077	100
Ethanedinitrile	460195		P031	100
Ethane, hexachloro-	67721		U131	100
Ethane, 1,1'-[methylenebis(oxy)] bis(2-chloro-	111911		U024	1000
Ethane, 1,1'-oxybis-	60297		U117	100
Ethane, 1,1'-oxybis(2-chloro-	111444		U025	10

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Ethane, pentachloro-	76017		U184	10
Ethanesulfonyl chloride, 2-chloro	1622328	500		1
Ethane, 1,1,1,2-tetrachloro-	630206		U208	100
Ethane, 1,1,2,2-tetrachloro-	79345		U209	100
Ethanethioamide	62555		U218	10
Ethane, 1,1,1-trichloro-	71556		U226	1000
Ethane, 1,1,2-trichloro-	79005		U227	100
Ethanimidothioic acid, N- [[[(methylamino) carbonyl]oxy]-, methyl ester	16752775		P066	100
Ethanol, 1,2-Dichloro-, acetate	10140871	1000		1
Ethanol, 2-ethoxy-	110805		U359	1000
Ethanol, 2,2'-(nitrosoimino)bis-	1116547		U173	1
Ethanone, 1-phenyl-	98862		U004	5000
Ethene, chloro-	75014		U043	1
Ethene, 2-chloroethoxy-	110758		U042	1000
Ethene, 1,1-dichloro-	75354		U078	100
Ethene, 1,2-dichloro- (E)	156605		U079	1000
Ethene, tetrachloro-	127184		U210	100
Ethene, trichloro-	79016		U228	100
Ethion	563122	1000		10
Ethoprophos	13194484	1000		1
Ethyl acetate (I)	141786		U112	5000
Ethyl acrylate (I)	140885		U113	1000
Ethylbenzene	100414			1000
Ethylbis(2-Chloroethyl)amine	538078	500		1

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Ethyl carbamate (urethane)	51796		U238	100
Ethyl cyanide	107120		P101	10
Ethylenebisdithiocarbamic acid, salts & esters	111546		U114	5000
Ethylenediamine	107153			5000
Ethylenediamine-tetraacetic acid (EDTA)	60004			5000
Ethylene dibromide	106934		U067	1
Ethylene dichloride	107062		U077	100
Ethylene fluorohydrin	371620	10		1
Ethylene glycol monoethyl ether	110805		U359	1000
Ethylene oxide (I,T)	75218	1000	U115	10
Ethylenediamine	107153	10,000		5000
Ethylenethiourea	96457		U116	10
Ethylenimine	151564	500	P054	1
Ethyl ether (I)	60297		U117	100
Ethylthiocyanate	542905	10,000		1
Ethylidene dichloride	75343		U076	1000
Ethyl methacrylate	97632		U118	1000
Ethyl methanesulfonate	62500		U119	1
Famphur	52857		P097	1000
Fenamiphos	22224926	10/10,000		1
Fenitrothion	122145	500		1
Fensulfothion	115902	500		1
Ferric ammonium citrate	1185575			1000
Ferric ammonium oxalate	2944674			1000

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
	55488874			
Ferric chloride	7705080			100
Ferric fluoride	7783508			1000
Ferric nitrate	10421484			1000
Ferric sulfate	10028225			1000
Ferrous ammonium sulfate	10045893			1000
Ferrous chloride	7758943			100
Ferrous sulfate	7720787 7782630			1000
Fluential	4301502	100/10,000		1
Fluoranthene	206440		U120	100
Fluorene	86737			5000
Fluorine	7782414	500	P056	10
Fluoroacetamide	640197	100/10,000	P057	100
Fluoroacetic acid	144490	10/10,000		1
Fluoroacetic acid, sodium salt	62786		P058	10
Fluoroacetyl chloride	359068	10		1
Fluorouracil	51218	500/10,000		1
Fonofos	944229	500		1
Formaldehyde	50000	500	U122	100
Formaldehyde cyanohydrin	107164	1000		1
Formetanate hydrochloride	23422539	500/10,000		1
Formothion	2540821	100		1
Formparanate	17702577	100/10,000		1
Formic acid (C,T)	64186		U123	5000

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Fosthietan	21548323	500		1
Fuberidazole	3878191	100/10,000		1
Fulminic acid, mercury(2) salt (R,T)	628864		P065	10
Fumaric acid	110178			5000
Furan (I)	110009	500	U124	100, 100
Furan, tetrahydro- (I)	109999		U213	1000
2-Furancarboxaldehyde (I)	98011		U125	5000
2,5-Furandione	108316		U147	5000
Furfural (I)	98011		U125	5000
Furfuran (I)	110009		U124	100
Gallium trichloride	13450903	500/10,000		1
Glucopyranose, 2-deoxy-2- (3-methyl-3-nitrosoureido)-	18883664		U206	1
D-Glucose, 2-deoxy-2- [[(methylnitroso-amino)- carbonyl]amino]-	18883664		U206	1
Glycidylaldehyde	765344		U126	10
Guanidine, N-methyl-N'-nitro- N-nitroso-	70257		U163	10
Guthion	86500			1
Heptachlor	76448		P059	1
Heptachlor epoxide	1024573			1
Hexachlorobenzene	118741		U127	10
Hexachlorobutadiene	87683		U128	1
Hexachlorocyclohexane (gamma isomer)	58899		U129	1
Hexachlorocyclopentadiene	77474	100	U130	10
Hexachloroethane	67721		U131	100

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Hexachlorophene	70304		U132	100
Hexachloropropene	1888717		U243	1000
Hexaethyl tetraphosphate	757584		P062	100
Hexamethylenediamine, N,N'- Dibutyl	4835114	500		1
Hydrazine (R,T)	302012	1000	U133	1
Hydrazine, 1,2-diethyl-	1615801		U086	10
Hydrazine, 1,1-dimethyl-	57147		U098	10
Hydrazine, 1,2-dimethyl-	540738		U099	1
Hydrazine, 1,2-diphenyl-	122667		U109	10
Hydrazine, methyl-	60344		P068	10
Hydrazinecarbothioamide	79196		P116	100
Hydrochloric acid	7647010			5000
Hydrocyanic acid	74908	100	P063	10
Hydrofluoric acid	7664393		U134	100
Hydrogen chloride (gas only)	7647010	500		5000
Hydrogen cyanide	74908		P063	10
Hydrogen fluoride	7664393	100	U134	100
Hydrogen peroxide (Conc > 52%)	7722841	1000		1
Hydrogen selenide	7783075	10		1
Hydrogen sulfide	7783064	500	U135	100
Hydroperoxide, 1-methyl-1-phenylethyl-	80159		U096	10
Hydroquinone	123319	500/10,000		1
2-Imidazoliainethione	96457		U116	10
Indeno(1,2,3-cd)pyrene	193395		U137	100

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Iron, Pentacarbonyl-	13463406	100		1
Isobenzan	297789	100/10,000		1
1,3-Isobenzofurandione	85449		U190	5000
Isobutyronitrile	78820	1000		1
Isobutyl alcohol (I,T)	78831		U140	5000
Isocyanic acid, 3,4-Dichlorophenyl ester	102363	500/10,000		1
Isodrin	465736	100/10,000	P060	1
Isofluorphate	55914	100		100
Isophorone	78591			5000
Isophorone Diisocyanbate	4098719	100		1
Isoprene	78795			100
Isopropanolamine dodecylbenzene sulfonate	42504461			1000
Isopropyl chloroformate	108236	1000		1
Isopropyl formate	625558	500		1
Isopropylmethylpyrazolyl dimethylcarbamate	119380	500		1
Isosafrole	120581		U141	100
3(2H)-Isoxazolone, 5-(aminomethyl)-	2763964		P007	1000
Kepone	143500		U142	1
Lactonitrile	78977	1000		1
Lasiocarpine	303344		U143	10
Lead acetate	301042		U144	#
Lead arsenate	7784409 7645252 10102484			1

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Lead, bis(acetato-O)tetrahydroxytri	1335326		U146	100
Lead chloride	7758954			100
Lead fluoborate	13814965			100
Lead iodide	10101630			100
Lead nitrate	10099748			100
Lead phosphate	7446277		U145	#
Lead stearate	7428480 1072351 52652592 56189094			5000#
Lead subacetate	1335326		U146	100
Lead sulfate	15739807 7446142			100
Lead sulfide	1314870			5000#
Lead thiocyanate	592870			100
Leptophos	21609905	500/10,000		1
Lewisite	541253	10		1
Lindane	58899	1000/10,000	U129	1
Lithium chromate	14307358			10
Lithium hydride	7580678	100		1
Malathion	121755			100
Maleic acid	110167			5000
Maleic anhydride	108316		U147	5000
Maleic hydrazide	123331		U148	5000
Malononitrile	109773	500/10,000	U149	1000

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Manganese, tricarbonyl methylcyclopentadienyl	12108133	100		1
Mechlorethamine	51752	10		1
Melphalan	148823		U150	1
Mephosfolan	950107	500		1
Mercaptodimethur	2032657			10
Mercuric acetate	1600277	500/10,000		1
Mercuric chloride	747947	500/10,000		1
Mercuric cyanide	592041			1
Mercuric nitrate	10045940			10
Mercuric oxide	21908532	500/10,000		1
Mercuric sulfate	7783359			10
Mercuric thiocyanate	592858			10
Mercurous nitrate	10415755 7782867			10
Mercury	7439976		U151	1
Mercury (acetate-O)phenyl-	62384		P092	100
Mercury fulminate	628864		P065	10
Methacrolein diacetate	10476956	1000		1
Methacrylic anhydride	760930	500		1
Methacrylonitrile (I,T)	126987	500	U152	1000
Methacryloyl chloride	920467	100		1
Methacryloyloxyethyl isocyanate	30674807	100		1
Methamidophos	10265926	100/10,000		1
Methanamine, N-methyl-	124403		U092	1000

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Methanamine, N-methyl-N-nitroso-	62759		P082	10
Methane, bromo-	74839		U029	1000
Methane, chloro- (I,T)	74873		U045	100
Methane, chloromethoxy-	107302		U046	10
Methane, dibromo-	74953		U068	1000
Methane, dichloro-	75092		U080	1000
Methane, dichlorodifluoro-	75718		U075	5000
Methane, iodo-	74884		U138	100
Methane, isocyanato-	624839		P064	##
Methane, oxybis(chloro-	542881		P016	10
Methanesulfenyl chloride, trichloro-	594423		P118	100
Methanesulfonyl fluoride	558258	1000		1
Methanesulfonic acid, ethyl ester	62500		U119	1
Methane, tetrachloro-	56235		U211	10
Methane, tetranitro- (R)	509148		P112	10
Methane, tribromo-	75252		U225	100
Methane, trichloro-	67663		U044	10
Methane, trichlorofluoro-	75694		U121	5000
Methanethiol (I,T)	74931		U153	100
6,9-Methano-2,4,3-benzodioxathi- epin, 6,7,8,9,10,10-hexa-chloro- 1,5,5a,6,9,9a-hexahydro-, 3-oxide	115297		P050	1
1,3,4-Metheno-2H-cyclobutal[cd] pen- talen-2-one,1,1a,3,3a,4, 5,5a,5b,6- decachlorocatahydro-	143500		U142	1
4,7-Methano-1H-indene, 1,4,5,6,7,8,8 heptachloro-3a, 4,7,7a-tetrahydro-	76448		P059	1

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8 octachloro-2,3, 3a,4,7,7a-hexahydro-	57749		U036	1
Methanol (I)	67561		U154	5000
Methapyrilene	91805		U155	5000
Methidathion	950378	500/10,000		1
Methiocarb	2032657	500/10,000		10
Methomyl	16752775	500/10,000	P066	100
Methoxychlor	72435		Y247	1
Methoxyethylmercuric acetate	151382	500/10,000		1
Methyl alcohol (I)	67561		U154	5000
Methyl bromide	74839	1000	U029	1000
1-Methylbutadiene (I)	504609		U186	100
Methyl chloride (I,T)	74873		U045	100
Methyl 2-chloroacrylate	80637	500		1
Methyl chlorocarbonate (I,T)	79221		U156	1000
Methyl chloroform	71556		U226	1000
Methyl chloroformate	79221	500	U156	1000
Methyl disulfide	624920	100		1
3-Methylcholanthrene	56495		U157	10
4,4'-Methylenebis(2-chloroaniline)	101144		U158	10
Methylene bromide	74953		U068	1000
Methylene chloride	75092		U080	1000
Methyl ethyl ketone (MEK) (I,T)	78933		U159	5000
Methyl ethyl ketone peroxide (R,T)	1338234		U160	10
Methyl hydrazine	60344	500	P068	10

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Methyl iodide	74884		U138	100
Methyl isobutyl ketone	108101		U161	5000
Methyl isocyanate	624839	500	P064	##
Methyl isothiocyante	556616	500		1
2-Methylactonitrile	75865		P069	10
Methyl mercaptan	74931	500	U153	100
Methyl methacrylate (I,T)	80626		U162	1000
Methyl parathion	298000		P071	100
Methyl phenkaptan	3735237	500		1
Methyl phosphoric dichloride	676971	100		1
4-Methyl-2-pentanone (I)	108101		U161	5000
Methyl thiocyanate	556649	10,000		1
Methylthiouracil	56042		U164	10
Methyl vinyl ketone	78944	10		1
Methylmercuric dicyanamide	502396	500/10,000		1
Methyltrichlorosilane	75796	500		1
Metolcarb	1129415	100/10,000		1
Mevinphos	7786347	500		10
Mexacarbate	315184	500/10,000		1000
Mitomycin C	50077	500/10,000	U010	10
MNNG	70257		U163	10
Monocrotophos	6923224	10/10,000		1
Monoethylamine	75047			100
Monomethylamine	73895			100
Muscimol	2763964	10,000	P007	1000

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Mustard gas	505602	500		1
Naled	300765			10
5,12-Naphthaacenedione, 8-acetyl- 10-[amino-2,3,6-tri-deoxy-alpha- L-lyxo-hexopyranosyl)-7,8,9,10-tetrahydro6,8,11-trihydroxy-1-methoxy-,(8S-cis)-	20830813		U059	10
1-Naphthalenamine	134327		U167	100
2-Naphthalenamine	91598		U169	10
Naphthalenamine, N,N'-bis(2-chloroethyl)-	494031		U026	100
Naphthalene, 2-chloro-	91587		U047	5000
1,4-Naphthalenedione	130154		U166	5000
2,7-Naphthalenedisulfonic acid, 3,3' [(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-dryl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt	72571		U236	10
Naphthenic acid	1338245			100
1,4-Naphthoquinone	130154		U166	5000
alpha-Naphthylamine	134327		U167	100
beta-Naphthylamine	91598		U168	10
alpha-Naphthylthiourea	86884		P072	100
Nickel++	7440020			100
Nickel ammonium sulfate	15699180			100
Nickel carbonyl	13463393	1	P073	10
Nickel carbonyl Ni(CO) ₄ , (T-4)-	13463393		P073	10
Nickel chloride	7718549 37211055			100
Nickel cyanide	557197		P074	10

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Nickel hydroxide	12054487			10
Nickel nitrate	14216752			100
Nickel sulfate	7786814			100
Nicotine & salts	54115	100	P075	100
Nicotine sulfate	65305	100/10,000		1
Nitric acid	7697372	1000		1000
Nitric acid, thallium(1+) salt	10102451		U217	100
Nitric oxide	10102439	100	P076	10
p-Nitroaniline	100016		P077	5000
Nitrobenzene (I,T)	98953	10,000	U169	1000
Nitrocyclohexane	1122607	500		1
Nitrogen dioxide	10102440 10544726	100	P078	10
Nitrogen oxide	10102439		P076	10
Nitroglycenne	55630		P981	10
Nitrophenol (mixed) m-Nitrophenol o- Nitrophenol (2) p-Nitrophenol (4)	25154556 554847 88755 100027		U170	100 100 100 100
2-Nitropropane (I,T)	96469		U171	10
N-Nitrosodi-n-butylamine	924163		U172	10
N-Nitrosodiethanolamine	1116547		U173	1
N-Nitrosodiethylamine	55185		U174	1
N-Nitrosodimethylamine	62759	1000	P082	10
N-Nitrosodiphenylamine	86306			100

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
N-Nitroso-N-ethylurea	759739		U176	1
N-Nitroso-N-methylurea	684935		U177	1
N-Nitroso-N-methylurethane	615532		U178	1
N-Nitrosomethylvinylamine	4549400		P084	10
N-Nitrosopipendine	199754		U179	10
N-Nitrosopyrrolidine	930552		U180	1
Nitrotoluene m-Nitrotoluene o- Nitrotoluene p-Nitrotoluene	1321126 99081 88722 99990			1000
5-Nitro-o-toluidine	99558		U181	100
Norbormide	991424	100/10,000		1
Octamethylpyrophosphoramidate	152169		P085	100
Organorhodium complex (PMN-82-147)	0	10/10,000		1
Osmium tetroxide	20816120		P087	1000
Ouabain	630604	100/10,000		1
7-Oxabicyclo[2,2,1]heptane-s,3- boxylic acid	145733		P088	1000
Oxamyl	23135220	100/10,000		1
1,2-Oxathiolane, 2,2-dioxide	1120714		U193	10
2H-1,3,2-Oxazaphosphorin-2-amine, N,N bis(2-chloroethyl)tetrahydro-, 2- oxide	50180		U058	10
Oxetane, 3,3-bis(chloromethyl)-	78717	500		
Oxirane (I,T)	75218		U115	10
Oxiranecarboxyaldehyde	765344		U126	10

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Oxirane, (chloromethyl)-	106898		U041	100
Oxydisulfoton	2497076	500		1
Ozone	10028156	100		1
Paraformaldehyde	30525894			1000
Paraldehyde	123637		U182	1000
Paraquat	1910425	10/10,000		1
Paraquat methosulfate	2074502	10/10,000		1
Parathion	56382	100	P089	10
Parathion-methyl	298000	100/10,000		100
Paris green	12002038	500/10,000		100
Pentaborane	19624227	500		1
Pentachlorobenzene	608935		U183	10
Pentachlorethane	76017		U184	10
Pentachlorophenol	87865		U242	10
Pentachloronitrobenzene (PCNB)	82688		U185	100
Pentadecylamine	2570265	100/10,000		1
Peracetic acid	79210	500		1
1,3-Pentadiene (I)	504609		U186	100
Perchloroethylene	127184		U210	100
Perchloromethylmercaptan	594423	500		100
Phenacetin	62442		U187	100
Phenanthrene	85018			5000
Phenol	108952	500/10,000	U188	1000
Phenol, 2-chloro-	95578		U048	100
Phenol, 4-chloro-3-methyl-	59507		U039	5000

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Phenol, 2-cyclohexyl-4,6-dinitro-	131895		P034	100
Phenol, 2,4-dichloro	120832		U081	100
Phenol, 2,6-dichloro-	87650		U082	100
Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)	56531		U089	1
Phenol, 2,4-dimethyl-	105679		U101	100
Phenol, 2,4-dinitro-	51285		P048	10
Phenol, methyl- m-Cresol o-Cresol p-Cresol	1319773 108394 95487 106445		U052	1000
Phenol, 2-methyl-4,6-dinitro-	534521		P047	10
Phenol, 2,2'-methylenebis[3,4,6-trichloro-	70304		U132	100
Phenol, 2,2'-thiobis(4,6-dichloro-	97187	100/10,000		1
Phenol, 2,2'-thiobis(4-chloro-6-methyl)-	4418660	10/10,000		1
Phenol, 2-(1-methylpropyl)-4,6-dinitro	88857		P020	1000
Phenol, 3-(1-methylethyl)-, methylcarbamate	64006	500/10,000		1
Phenol, 4-nitro-	100027		U170	100
Phenol, pentachloro-	87865		U242	10
Phenol, 2,3,4,6-tetrachloro-	58902		U212	10
Phenol, 2,4,5-trichloro-	95954		U230	10
Phenol, 2,4,6-trichloro-	88062		U231	10
Phenol, 2,4,6-trinitro-, ammonium salt	131748		P009	10
Phenoxarsine, 10,10'-oxydi-	58366	500/10,000		1

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
L-Phenylalanine, 4-[bis(2-chloroethyl)aminol]	148823		U150	1
Phenyl dichloroarsine	696286	500		1
1,10-(1,2-Phenylene)pyrene	193395		U137	100
Phenylhydrazine hydrochloride	59881	1000/10,000		1
Phenylmercury acetate	62384	500/10,000	P092	100
Phenylsilatrane	2097190	100/10,000		1
Phenylthiourea	103855	100/1000	P093	100
Phorate	298022	10	P094	1010
Phosacetim	4104147	100/10,000		1
Phosfolan	947024	100/10,000		1
Phosgene	75445	10	P095	10
Phosmet	732116	10/10,000		1
Phosphamidon	13171216	100		1
Phosphine	7803512	500		100
Phosphonothioic acid, methyl-,o- ethyl o-(4-(methylthio)phenyl) ester	2703131	500		1
Phosphonothioic acid, methyl-, s-(2-(bis(1- methylethyl)amino) ethyl o-ethyl ester	50782699	100		1
Phosphonothioic acid, methyl-, o-(4-nitrophenyl) o-phenyl ester	2665307	500		1
Phosphoric acid	7664382			5000
Phosphoric acid, diethyl 4-nitrophenyl ester	311455		P041	100
Phosphoric acid, dimethyl 4-(methylthio) phenyl ester	3254635	500		1
Phosphoric acid, lead(2+) salt (2:3)	7446277	500	U145	#

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Phosphorodithioic acid, O,O-diethyl S-[2(ethylthio)ethyl]ester	298044		P039	1
Phosphorodithioic acid, O,O-diethyl S(ethylthio), methyl ester	298022		P094	10
Phosphorodithioic acid, O,O-diethyl S-methyl ester	3288582		U087	5000
Phosphorodithioic acid, O,O-dimethyl S-[2(methyl-amino)-2-oxoethyl] ester	60515		P044	10
Phosphorofluondic acid, bis(1-methylethyl)ester	55914		P043	100
Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	56382		P089	10
Phosphorothioic acid, O,[4[(dimethyl-amino)sulfonyl]phenyl]O,O-dimethyl ester	52857		P097	1000
Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	298000		P071	100
Phosphorus	7723140	100		1
Phosphorus oxychloride	10025873	500		1000
Phosphorous pentachloride	10026138	500		1
Phosphorus pentasulfide (R)	1314803		U189	100
Phosphorus pentoxide	1314563	10		1
Phosphorus trichloride	7719122	1000		1000
Phthalic anhydride	85449		U190	5000
Physostigmine	57476	100/10,000		1
Phosostigmine, salicylate (1:1)	57647	100/10,000		1
2-Picoline	109068		U191	5000
Picotoxin	124878	500/10,000		1
Piperidine	110894	1000		1

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Piperidine, 1-nitroso-	100754		U179	10
Piprotal	5281130	100/10,000		1
Primifos-ethyl	23505411	1000		1
Plumbane, tetraethyl-	78002		P110	10
PCBs (See Aroclor)	1336363			1
Potassium arsenate	7784410			1
Potassium arsenite	10124502	500/10,000		1000
Potassium bichromate	7778509			10
Potassium chromate	7789006			10
Potassium cyanide	151508	100	P098	10
Potassium hydroxide	1310583			1000
Potassium permanganate	7722647			100
Potassium silver cyanide	506516	500	P099	1
Promecarb	2631370	500/10,000		1
Pronamide	23950585		U192	5000
Propanal, 2-methyl-2-(methylthio)-, O- [(methylamino)carbonyl] oxime	116063		P070	1
1-Propanamine (I,T)	107108		U194	5000
1-Propanamine, N-propyl-	142847		U110	5000
1-Propanamine, N-nitroso-N-propyl-	621647		U111	10
Propane, 1,2-dibromo-2-chloro	96128		U066	1
Propane, 2-intro- (I,T)	79469		U171	10
1,3-Propane sultone	1120714		U193	10
Propane 1,2-dichloro-	78875		U083	1000
Propanedinitrile	109773		U149	100

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Propanenitrile	107120		P101	10
Propanenitrile, 2-chloro-	542767		P027	1000
Propanenitrile, 2-hydroxy-2-methyl-	75865		P069	10
Propane, 2,2'-oxybis[2-chloro-	108601		U027	1000
1,2,3-Propanetnol, trinitrate- (R)	55630		P081	10
1-Propanol, 2,3-dibromo-,phosphate (3:1)	126727		U235	10
1-Propanol, 2-methyl- (I,T)	78831		U140	5000
2-Propanone (I)	67641		U002	5000
2-Propanone, 1-bromo-	598312		P017	1000
Propargite	2312358			10
Propargyl alcohol	107197		P102	1000
Propargyl bromide	106967	10		1
2-Propenal	107028		P003	1
2-Propenamide	79061		U007	5000
1-Propene, 1,1,2,3,3,3-hexachloro-	1888717		U243	1000
1-Propene, 1,3-dichloro-	542756		U084	100
2-Propenenitrile	107131		U009	100
2-Propenenitrile, 2-methyl- (I,T)	126987		U152	1000
2-Propenoic acid (I)	79107		U008	5000
2-Prepenoic acid, ethyl ester (I)	140885		U113	1000
2-Prepenoic acid, 2-methyl-, ethyl ester	97632		U118	1000
2-Prepenoic acid, 2-methyl-, methyl es- ter (I,T)	80626		U162	1000
2-Propen-1-ol	107186		P005	100
Propiolactone, beta-	57578	500		1

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Propionic acid	79094			5000
Propionic acid, 2-(2,4,5-trichlorophenoxy)-	93721		U233	100
Propionic anhydride	123626			5000
Propiolactone, beta	57578	500		1
Propionitrile	107120	500		10
Propionitrile, 3-chloro-	542767	1000		1000
Propiophenone, 4-amino	70699	100/10,000		1
n-Propylamine	107108		U194	5000
Propyl chloroformate	109615	500		1
Propylene dichloride	78875		U083	1000
Propylene oxide	75569	10,000		100
1,2-Propylenimine	75558	10,000	P067	1
2-Propyn-1-ol	107197		P102	1000
Prothoate	2275185	100/10,000		1
Pyrene	129000	1000/10,000		5000
Pyrethrins	121299 121211 8003347			1
3,6-Pyridazinedione, 1,3-dihydro-	123331		U148	5000
4-Pyridinamine	504245		P008	1000
Pyridine	110861		U196	1000
Pyridine, 2-methyl-	109068		U191	5000
Pyridine, 2-methyl-5-vinyl-	140761	500		1
Pyridine, 4-amino-	504245	500/10,000		1000

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Pyridine, 4-nitro-, 1-oxide	1124330	500/10,000		1
Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)	54115		P075	100
2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	66751		U237	10
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	56042		U164	10
Pyriminil	53558251	100/10,000		1
Pyrrolidine, 1-nitroso-	930552		U180	1
Quinoline 91225	91225			5000
Reserpine	50555		U200	5000
Resorcinol	106463		U201	5000
Sacchann and salts	81072		U202	100
Salcomine	14167181	500/10,000		1
Sarin	107448	10		1
Satrole	94597		U203	100
Selenious acid	7783008	1000/10,000	U204	10
Selenious acid, dithallium (1+) salt	12039520		P114	1000
Selenium ++	7782492			100
Selenium dioxide	7446084		U204	10
Selenium oxychloride	7791233	500		1
Selenium sulfide (R,T)	7488564		U205	10
Selenourea	630104		P103	1000
Semicarbazide hydrochloride	56417	1000/10,000		1
L-Senne, diazoacetate (ester)	115026		U015	1
Silane, (4-aminobutyl)diethoxyme thyl-	3037727	1000		1

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Silver++	7440224			1000
Silver cyanide	506649		P104	1
Silver nitrate	7761888			1
Silvex (2,4,5-TP)	93721		U233	100
Sodium	7440235			10
Sodium arsenate	7631892	1000/10,000		1
Sodium arsenite	7784465	500/10,000		1
Sodium azide	26628228	500	P105	1000
Sodium bichromate	10588019			10
Sodium bifluoride	1333831			100
Sodium bisulfite	7631905			5000
Sodium Cacodylate	124652	100/10,000		1
Sodium chromate	7775113			10
Sodium cyanide	143339		P106	10
Sodium dodecylbenzenesulfonate	25155300			1000
Sodium fluoride	7681494			1000
Sodium fluoroacetate	62748	10/10,000		10
Sodium hydrosulfide	16721805			5000
Sodium hydroxide	1310732			1000
Sodium hypochlorite	7681529 10022705			1000
Sodium methylate	124414			1000
Sodium nitrite	763200			100
Sodium prentachlorophenate	131522	100/10,000		1
Sodium phosphate, dibasic	7558794			5000

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
	10039324 10140655			
Sodium phosphate, tribasic	7601549 7758294 7785844 10101890 10124568 10361894			5000
Sodium selenate	13410010	100/10,000		1
Sodium selenite	10102188 7782823	100/1000		100
Sodium tellurite	10102202	500/10,000		1
Stannane, acetoxytriphenyl	900958	500/10,000		1
Streptozotocin	18883664		U206	1
Strontium chromate	7789062			10
Strychnidin-1-one, 2,3-dimethoxy-	357573		P018	100
Strychnine, & salts	572494	100/10,000	P018	10
Strychnine, sulfate	60413	100/10,000		1
Styrene	100425			1000
Sulfotep	3689245	500		100
Sulfoxide, 3-chlorophpropyl octyl	3569571	500		1
Sulfur monochloride	12771083			1000
Sulfur dioxide	7446095	500		1
Sulfur phosphide (R)	1314803		U189	100
Sulfur tetrafluoride	7783600	100		1

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Sulfur trioxide	7446119	100		1
Sulfuric acid	7664939 8014957	1000		1000
Sulfuric acid, dithallium (1 ⁺) salt	7446186 10031591		P115	100
Sulfuric acid, dimethyl ester	77781		U103	100
Tabun	77816	10		1
2,4,5-T acid	93765		U232	1000
2,4,5-T amines	2008460 1319728 3813147 6369966 6369977			5000
Tellurium	13494809	500/10,000		1
Tellurium hexafluoride	7783804	100		1
2,4,5-T esters	93798 1928478 25168154 61792072			1000
2,4,5-T salts	13560991			1000
2,4,5-T	93765		U232	1000
TDE	72548		U060	1
TEPP	10749	100		10
Terbufos	13071799	100		1
1,2,4,5-Tetrachlorobenzene	95943		U207	5000

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746016			1
1,1,1,2-Tetrachlorethane	630206		U208	100
1,1,2,2-Tetrachloroethane	79345		U209	100
Tetrachloroethene	127184		U210	100
Tetrachloroethylene	127184		U210	100
2,3,4,6-Tetrachlorophenol	58902		U212	10
Tetraethyl lead	78002	100	P110	10
Tetraethyl pyrophosphate	107493		P111	10
Tetraethyldithiopyrophosphate	3589245		P109	100
Tetraethyltin	597648	100		1
Tetramethyllead	75741	100		1
Tetrahydrofuran (I)	109999		U213	1000
Tetranitromethane (R)	509148	500	P112	10
Tetraphosphoric acid, hexaethyl ester	757584		P062	100
Thallic oxide	1314325		P113	100
Thallium ++	7440280			1000
Thallium acetate	563688		U214	100
Thallium carbonate	6533739		U215	100
Thallium chloride	7791120		U216	100
Thallium nitrate	10102451		U217	100
Thallium oxide	1314325		P113	100
Thallium selenite	12039520		P114	1000
Thallium sulfate	7446186 10031591	100/10,000	P115	100

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Thallos carbonate	6533739	100/10,000		100
Thallos chloride	7791120	100/10,000		100
Thallos malonate	2757188	100/10,000		1
Thallos sulfate	7446186	100/10,000		100
Thioacetamide	62555		U218	10
Thiocarbazide	2231574	1000/10,000		1
Thiodiphosphoric acid, tetraethyl ester	3689245		P109	100
Thiofanox	39196184	100/10,000	P045	100
Thioimidodicarbonic diamide [(H ₂ N)C(S)] 2NH	541537		P049	100
Thiomethanol (I,T)	74931		U153	100
Thionazin	297972	500		100
Thioperoxydicarbonic diamide [(H ₂ N)C(S)] 2S ₂ , tetra-methyl-	137268		U244	10
Thiophenol	108985	500	P104	100
Thiosemicarbazide	79196	100/10,000	P116	100
Thiourea	62566		U219	10
Thiourea, (2-chlorophenyl)-	5344821	100/10,000	P026	100
Thiourea, (2-methylphenyl)-	614788	500/10,000		1
Thiourea, 1-naphthalenyl-	86884		P072	100
Thiourea, phenyl-	103855		P093	100
Thiram	137268		U244	10
Titanium tetrachloride	7550450	100		1
Toluene	108883		U220	1000
Toluenediamine	95807 496720		U221	10

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
	823405 25376458			
Toluene diisocyanate (R,T)	584849 91087 26471625	500 100	U223	100 100
o-Toluidine	95534		U238	100
p-Toluidine	106490		U353	100
o-Toluidine hydrochloride	636215		U222	100
Toxaphene	8001352		P123	1
2,4,5-TP acid	93721		U233	100
2,4,5-TP esters	32534955			100
1H-1,2,4-Triazol-3-amine	61825		U011	10
Trans-1,4-dichlorobutene	110576	500		1
Triamiphos	1031476	500/10,000		1
Triazofos	24017478	500		1
Trichloroacety chloride	76028	500		1
Trichlorfon	52686			100
1,2,4-Trichlorobenzene	120821			100
1,1,1-Trichloroethane	71556		U226	1000
1,1,2-Trichloroethane	79005		U227	100
Trichloroethene	79016		U228	100
Trichloroethylene	79016		U228	100
Trichloroethylsilane	115219	500		1
Trichloronate	327980	500		1
Trichloromethanesulfonyl chloride	594423		P118	100

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Trichloromonofluoromethane 2,3,4- richlorophenol 2,3,5-Trichlorophenol 2,3,6-Trichlorophenol 2,4,5- Trichlorophenol 2,4,6-Trichlorophenol 3,4,5-Trichlorophenol	75694 15950660 933788 933755 95954 88062 609198		U121 U230 U231	5000 10 10
2,4,5-Trichlorophenol	95954		U230	10
2,4,6-Trichlorophenol	88062		I231	10
Trichlorophenylsilane	98135	500		1
Trichloro(chloromethyl)silane	1558254	100		1
Trichloro(dichlorophenyl)silane	27137855	500		1
Triethanolamine dodecylbenzene- sulfonate	27323417			1000
Triethoxysilane	998301	500		1
Triethylamine	121448			5000
Trimethylamine	75503			100
Trimethylchlorosilane	75774	1000		1
Trimethylolpropane phosphite	824113	100/10,000		1
Trimethyltin chloride	1066451	500/10,000		1
1,3,5-Trinitrobenzene (R,T)	99354		U234	10
1,3,5-Trioxane, 2,4,6-trimethyl-	123637		U182	1000
Triphenyltin chloride	639587	500/10,000		1
Tris(2-chloroethyl)amine	555771	100		1
Tris(2,3-dibromopropyl) phosphate	126727		U235	10

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
	36478769			
Urea, N-ethyl-N-nitroso	759739		U176	1
Urea, N-methyl-N-nitroso	684935		U177	1
Valinomycin	2001958	1000/10,000		1
Vanadic acid, ammonium salt	7803556		P119	1000
Vanadic oxide V ₂ O ₅	1314621		P120	1000
Vanadic pentoxide	1314621		P120	1000
Vanadium pentoxide	1314621	100/10,000		1000
Vanadyl sulfate	27774136			1000
Vinyl chloride	75014		U043	1
Vinyl acetate	108054			5000
Vinyl acetate monomer	108054	1000		5000
Vinylamine, N-methyl-N-nitroso-	4549400		P084	10
Vinylidene chloride	75354		U078	100
Warfarin, & salts, when present at concentrations greater than 0.3%	81812	500/10,000	P001	100
Warfarin sodium	129066	100/10,000		1
Xylene (mixed) m-Benzene, dimethyl o-Benzene, dimethyl p-Benzene, dimethyl	1330207 108383 95476 106423		U239	1000
Xylenol	1300716			1000
Xylylene dichloride	28347139	100/10,000		1
Yohimban-16-carboxylic acid, 11,17 dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester (3-beta, 16-beta,17-alpha,18-beta,20-alpha)-	50555		U200	5000

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Zinc	7440666			1000
Zinc acetate	557346			1000
Zinc ammonium chloride	52628258 14639975 14639986			1000
Zinc borate	1332076			1000
Zinc bromide	7699458			1000
Zinc carbonate	3486359			1000
Zinc chloride	7646857			1000
Zinc cyanide	557211		P121	10
Zinc, dichloro(4,4-dimethyl-5((((methylamino)carbonyl oxy)imino)pentaenitrile)-(t-4)-	58270089	100/1000		1
Zinc fluoride	7783495			1000
Zinc formate	557415			1000
Zinc hydrosulfite	7779864			1000
Zinc nitrate	7779886			1000
Zinc phenosulfonate	127822			5000
Zinc phosphide	1314847	500	P122	100
Zinc phosphide Zn ₃ P ₂ ' when present at concentrations greater than 10%	1314847		P122	100
Zinc silicofluoride	16871719			5000
Zinc sulfate	7733020			1000
Zirconium nitrate	13746899			5000
Zirconium potassium fluoride	16923958			1000
Zirconium sulfate	14644612			5000

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Zirconium tetrachloride	10026116			5000
F001			F001	10
The following spent halogenated solvents used in degreasing; all spent solvent mixtures/blends used in degreasing containing, before use, a total of 10 percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.				
a. Tetrachlorethylene	127184		U210	100
b. Trichloroethylene	79016		U228	100
c. Methylene chloride	75092		U080	1000
d. 1,1,1-Trichloroethane	71556		U226	1000
e. Carbon tetrachloride	56235		U211	10
f. Chlorinated fluorocarbons	NA			5000
F002			F002	10
The following spent halogenated solvents: all spent solvent mixtures/blends containing, before use, a total of 10 percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.				
a. Tetrachloroethylene	127184		U210	100
b. Methylene chloride	75092		U080	1000
c. Trichloroethylene	79016		U228	100
d. 1,1,1-Trichloroethane	71556		U226	1000
e. Chlorobenzene	108907		U037	100
f. 1,1,2-Trichloro-1,2,2, trifluoroethane	76131			5000
g. o-Dischlorobenzene	95501		U070	100
h. Trichlorofluoromethane	75694		U121	5000
i. 1,1,2-Trichloroethane	79005		U227	100
F003			F003	100

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
The following spent nonhalogenated solvents and the still bottoms from the recovery of these solvents:				
a. Xylene	1330207	1000		
b. Acetone	67641	5000		
c. Ethyl acetate	141786	5000		
d. Ethylbenzene	100414	1000		
e. Ethyl ether	60297	100		
f. Methyl isobutyl ketone	108101	5000		
g. n-Butyl alcohol	71363	5000		
h. Cyclohexanone	108941	5000		
i. Methanol	67561	5000		
F004			F004	1000
The following spent nonhalogenated solvents and the still bottoms from the recovery of these solvents:				
a. Cresols/Cresylic acid	131773		U052	1000
b. Nitrobenzene	98953		U169	1000
F005			F005	100
The following spent nonhalogenated solvents and the still bottoms from the recovery of these solvents:				
a. Toluene	108883		U220	1000
b. Methyl ethyl ketone	78933		U159	5000
c. Carbon disulfide	75150		P022	100
d. Isobutanol	78831		U140	5000
e. Pyndine	110861		U196	1000
F006			F006	10
Wastewater treatment sludges from electroplating operations except from the following: (1) sulfuric acid anodizing aluminum, (2) tin plating on carbon steel, (3) zinc plating (segregated basis) on carbon steel, (4) aluminum or zinc-aluminum plating on carbon steel, (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel, and (6) chemical etching and milling of aluminum.				
F007			F007	10

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Spent cyanide plating bath solutions from electroplating operations.				
F008			F008	10
Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.				
F009			F009	10
Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.				
F010			F010	10
Quenching bath residues from oil baths from metal heat operations where cyanides are used in the process.				
F011			F011	10
Spent cyanide solution from salt bath pot cleaning from metal heat treating operations.				
F012			F012	10
Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process.				
F019			F019	10
Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive coating process.				
F020			F020	1
Waste (except wastewater and spent carbon from hydrogen chloride purification) from the production of manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of hexachlorophene from highly purified 2,4,5-trichlorophenol.)				
F021			F021	1
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.				
F022			F022	1
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) or tetra-, penta-, or hexachlorobenzenes under alkaline conditions.				
F023			F023	1

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of hexa-chlorophene from highly purified, 2,4,5-tri-chlorophenol.)				
F024			F024	1
Wastes, including but not limited to distillation residues, heavy ends, tars, and reactor cleanout wastes, from the production of chlorinated aliphatic hydrocarbons, having carbon content from one to five, utilizing free radical catalyzed processes. (This listing does not include light ends, spent filters and filter aids, spent desiccants, wastewater, wastewater treatment sludges, spent catalysts, and wastes listed in Section 261.32.)				
F025			F025	1
Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution.				
F026			F026	1
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetrapenta-, or hexachlorobenzene under alkaline conditions.				
F027			F027	1
Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing hexachlorophene synthesized from prepurified 2,4,5-tri-chlorophenol as the sole component.)				
F028			K028	1
Residues resulting from the incineration or thermal treatment of soil contaminated with USEPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027				
K001			K001	1
Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.				
K002			K002	#
Wastewater treatment sludge from the production of chrome yellow and orange pigments.				
K003			K003	#
Wastewater treatment sludge from the production of molybdate orange pigments.				

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
K004			K004	10
Wastewater treatment sludge from the production of zinc yellow pigments.				
K005			K005	#
Wastewater treatment sludge from the production of chrome green pigments.				
K006			K006	10
Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).				
K007			K007	10
Wastewater treatment sludge from the production of iron blue pigments.				
K008			K008	10
Oven residue from the production of chrome oxide green pigments.				
K009			K009	10
Distillation bottoms from the production of acetaldehyde from ethylene.				
K010			K010	10
Distillation side cuts from the production of acetaldehyde from ethylene.				
K011			K011	10
Bottom stream from the wastewater stripper in the production of acrylonitrile.				
K013			K013	10
Bottom stream from the acetonitrile column in the production of acrylonitrile.				
K014			K014	5000
Bottom from the acetonitrile purification column in the production of acrylonitrile.				
K015			K015	10
Still bottoms from the distillation of benzyl chloride.				
K016			K016	1
Heavy ends or distillation residues from the production of carbon tetrachloride.				
K017			K017	10

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Heavy ends (still bottoms) from the purification column in the production of epi-chlorohydrin.				
K018			K018	1
Heavy ends from the fractionation column in ethyl chloride production.				
K019			K019	1
Heavy ends from the distillation of ethylene dichloride in ethylene chloride production.				
K020			K020	1
Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production.				
K021			K021	10
Aqueous spent antimony catalyst waste from fluoromethanes production.				
K022			K022	1
Distillation bottom tars from the production of phenol/acetone from cumene.				
K023			K023	5000
Distillation light ends from the production of ophthalic anhydride from naphthalene.				
K024			K024	5000
Distillation bottoms from the production of phthalic anhydride from naphthalene.				
K025			K025	10
Distillation bottoms from the production of nitrobenzene by the nitration of benzene.				
K026			K026	1000
Stripping still tails from the production of methyl ethyl pyndines.				
K027			K027	10
Centrifuge and distillation residues from toluene diisocyanate production.				
K028			K028	1
Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane.				
K029			K029	1
Waste from the product steam stripper in the production of 1,1,1-trichloroethane.				

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
K030			K030	1
Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene.				
K031			K031	1
By-product salts generated in the production of MSMA and cacodylic acid.				
K032			K032	10
Wastewater treatment sludge from the production of chlordane.				
K033			K033	10
Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane.				
K034			K034	10
Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane.				
K035			K035	1
Wastewater treatment sludges generated in the production of creosote.				
K036			K036	1
Still bottoms from toluene reclamation distillation in the production of disulfoton.				
K037			K037	1
Wastewater treatment sludges from the production of disulfoton.				
K038			K038	10
Wastewater from the washing and stripping of phorate production.				
K039			K039	10
Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate.				
K040			K040	10
Wastewater treatment sludge from the production of phorate.				
K041			K041	1
Wastewater treatment sludge from the production of toxaphene.				
K042			K042	10

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5- T.				
K043			K043	10
2,6-Dichlorophenol waste from the production 2,4-D.				
K044			K044	10
Wastewater treatment sludges from the manufacturing and processing of explosives.				
K045			K045	10
Spent carbon from the treatment of wastewater containing explosives.				
K046			K046	100
Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds.				
K047			K047	10
Pink/red water from TNT operations.				
K048			K048	#
Dissolved air flotation (DAF) float from the petroleum refining industry.				
K049			K049	#
Slop oil emulsion solids from the petroleum refining industry.				
K050			K050	10
Heat exchanger bundle cleaning sludge from the petroleum refining industry.				
K051			K051	#
API separator sludge from the petroleum refining industry.				
K052			K052	10
Tank bottoms (leaded) from the petroleum refining industry.				
K060			K060	1
Ammonia still lime sludge from coking operations.				
K061			K061	#

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Emission control dust/sludge from the primary production of steel in electric furnaces.				
K062			K062	#
Spent pickle liquor generated by steel finishing operations of facilities within the iron and steel industry (Standard Industrial Classification Codes 331 and 332).				
K064			K064	##
Acid plant blowdown slurry/sludge resulting from thickening of blowdown slurry from primary copper production.				
K065			K065	##
Surface impoundment solids contained in and dredged from surface impoundments at primary lead smelting facilities.				
K066			K066	##
Sludge from treatment of process wastewater and/or acid plant blowdown from primary zinc production.				
K069			K069	#
Emission control dust/sludge from secondary lead smelting.				
K071			K071	1
Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used.				
K073			K073	10
Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production.				
K083			K083	100
Distillation bottoms from aniline extraction.				
K084			K084	1
Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.				
K085			K085	10
Distillation or fractionation column bottoms from the production of chlorobenzenes.				
K086			K086	#

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead.				
K087			K087	100
Decanter tank tar sludge from coking operations.				
K088			K088	
Spent potliners from primary aluminum reduction.				
K090			K090	
Emission control dust or sludge from ferrochromiumsilicon production.				
K091			K091	
Emission control dust or sludge from ferrochromium production.				
K093			K093	5000
Distillation light ends from the production of phthalic anhydride from ortho-xylene.				
K094			K094	5000
Distillation bottoms from the production of phthalic anhydride from ortho-xylene.				
K095			K095	100
Distillation bottoms from the production of 1,1,1-trichloroethane.				
K096			K096	100
Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.				
K097			K097	1
Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane.				
K098			K098	1
Untreated process wastewater from the production of toxaphene.				
K099			K099	10
Untreated wastewater from the production of 2,4-D.				
K100			K100	#

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.				
K101			K101	1
Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.				
K102			K102	1
Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.				
K103			K103	100
Process residues from aniline extraction from the production of aniline.				
K104			K104	10
Combined wastewater streams generated from nitrobenzene/aniline production.				
K105			K105	10
Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.				
K106			K106	1
Wastewater treatment sludge from the mercury cell process in chlorine production.				
K107			K107	10
Column bottoms from product separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazines.				
K108			K108	10
Condensed column overhead from product separation and condensed reactor vent gases from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.				
K109			K109	10
Spent filter cartridges from product purification from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.				
K110			K110	10
Condensed column overheads from intermediate separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.				
K111			K111	10

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Product washwaters from the production of dinitrotoluene via nitration of toluene.				
K112			K112	10
Reaction by-product water from the drying column in the production of toluenediamine via hydrogenation of dinitrotoluene.				
K113			K113	10
Condensed liquid light ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.				
K114			K114	10
Vicinalis from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.				
K115			K115	10
Heavy ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.				
K116			K116	10
Organic condensate from the solvent recovery column in the production of toluene diisocyanate via phosgenation of toluenediamine.				
K117			K117	1
Wastewater from the reaction vent gas scrubber in the production of ethylene bromide via bromination of ethene.				
K118			K118	1
Spent absorbent solids from purification of ethylene dibromide in the production of ethylene dibromide.				
K123			K123	10
Process wastewater (including supermates, filtrates, and washwaters) from the production of ethylene bisdithiocarbamic acid and its salts.				
K124			K124	10
Reactor vent scrubber water from the production of ethylene-bisdithiocarbamic acid and its salts.				
K125			K125	10
Filtration, evaporation, and centrifugation solids from the production of ethylene-bisdithiocarbamic acid and its salts.				

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
K126			K126	10
Baghouse dust and floor sweepings in milling and packaging operations from the production or formulation of ethylene-bisdithiocarbamic acid and its salts.				
K131			K131	100
Wastewater from the reactor and spent sulfuric acid from the acid dryer in the production of methyl bromide.				
K132			K132	1000
Spent absorbent and wastewater solids from the production of methyl bromide.				
K136			K136	1
Still bottoms from the purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.				

1. Chemical Abstract Service (CAS) Registry Number.

2. Quantity in storage above which the Executive Agent must be notified (see Section 3, *Hazardous Materials Management*).

3. Reportable Quantity (RQ) release that requires notification (see Section 8, *Petroleum, Oil, and Lubricant (POL) Management*).

++ No reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 100 μm (0.004 in.).

+++ The RQ for asbestos is limited to friable forms only.

1* Indicates that the 1-lb [\cong 0.37 kg] RQ is a statutory RQ.

** Indicates that no RQ is being assigned to the generic or broad class.

Indicates that the RQ is subject to change when the assessment of potential carcinogenicity is completed.

The statutory RQ for this hazardous substance may be adjusted in a future rulemaking; until then, the statutory RQ applies.

Appendix 4-2

Identification and Characterization of Wastes in Spain

(FGS-Spain, Appendix C)

B-1 Scope

This appendix contains information needed to characterize wastes for proper disposal in Spain. Wastes characterized as toxic and dangerous in accordance with this table will be managed in accordance with the standards of this section from the point of generation through final disposal in a facility in Spain.

B-2 Municipal Solid Waste

A. **Municipal Solid Waste.** Municipal solid wastes are wastes generated from the following areas and activities:

1. residential areas
2. commercial and service activities
3. street cleaning and maintenance activities in park and recreational areas
4. abandoning of dead animals, furniture, household equipment and vehicles
5. industrial, agricultural and construction activities and minor household repairs, to the extent that these wastes are not characterized as toxic and dangerous wastes.

B. **Inert Wastes.** Municipal solid wastes resulting from construction and demolition activities are considered to be inert wastes.

B-3 Toxic and Dangerous Waste

Toxic and dangerous wastes are wastes which:

- A. possess one of the hazardous characteristics listed in Chart B.1, and
- B. contain one of the hazardous constituents listed in Chart B.2.

If a waste contains one of the hazardous constituents listed in Chart B.2, it must be considered hazardous until analysis by an approved laboratory has shown that it does not possess one of the characteristics listed in Chart B.1.

Chart B.1	
Characteristics of Hazardous Waste	
Characteristic	Definition
Explosive	Substances or preparations that may explode when exposed to a flame or that are more sensitive to shocks or to friction than di-nitrobenzene.
Oxidizer	Substances and preparations that, in contact with other particularly flammable materials, cause a strongly exothermic reaction.
Easily flammable	Applies to: <ul style="list-style-type: none"> - substances and preparations that, at room temperature, surrounded by air and without any energy input, may heat up and even burst in flames - liquids with a flashpoint < 21 °C [70 °F] - substances and preparations that might easily burst in flames by the brief action of an ignition source and that continue burning or consuming themselves after said flame is removed - gaseous substances and preparations flammable in air at room temperature - substances and preparations that, in contact with water or moist air, give off easily flammable gases in dangerous quantities.
Flammable	Substances and preparations with a flashpoint ≥ 21 °C [70 °F] and ≤ 55 °C [131 °F].
Extremely flammable	Substances and preparations with a flashpoint < 0 °C [32 °F] and ≤ 35 °C [95 °F].
Irritant	Noncorrosive substances and preparations that, by immediate, prolonged, or repeated contact with the skin or mucous membranes, may produce an inflammatory reaction.
Noxious	Substances and preparations that, by inhalation, ingestion, or penetration through the skin, may involve hazards of limited seriousness.
Toxic	Substances and preparations that, by inhalation, ingestion or penetration through the skin, may produce serious, acute or chronic hazards, and even death (including highly toxic substances or preparations).
Carcinogenic	Substances that, by inhalation, ingestion or penetration through the skin, may produce or increase the frequency of cancer.
Corrosive	Substances and preparations that can destroy living tissue on contact.
Infectious	Substances containing viable microorganisms or their toxins, of which it is known or there is good reason to believe that they cause diseases in animals or in man.

Teratogenic	Substances and preparations that, by inhalation, ingestion, or penetration through the skin, may produce damage to the fetus during its intrauterine development.
Mutagenic	Substances and preparations that, by inhalation, ingestion, or penetration through the skin, may induce alterations in cell genetic material.
Reactive with air/water	Substances and preparations that, upon contact with water, air, or an acid, give off a toxic or very toxic gas.
Other substance hazard	Substances that, after their disposal and by any means, may give rise to another substance that possesses one or more of the characteristics listed above.
Ecotoxic	Dangerous for the environment. Waste products that represent immediate or delayed hazards to the environment.

Chart B.2 Substances Which Define Hazardous Wastes
Beryllium, beryllium compounds
Hexavalent chromium compounds
Soluble copper compounds
Arsenic, arsenic compounds
Selenium, selenium compounds
Cadmium, cadmium compounds
Antimony, antimony compounds
Tellurium, tellurium compounds
Mercury, mercury compounds
Thallium, thallium compounds
Lead, lead compounds
Inorganic cyanides
Acidic solutions and acids in solid form
Basic solutions and bases in solid form
Asbestos (powder and fibers)
Metallic carbonyles
Peroxides
Chlorates
Perchlorates
Nitrites
PCB and/or PCT
Pharmaceutical or veterinary compounds
Plague killers and other biocides
Isocyanates
Organic cyanides
Phenols, phenol compounds
Halogenated solvents
Non-halogenated organic solvents
Organo-halogenated compounds, excluding inert polymerized substances and other substances included in this table
Aromatic compounds, polycyclic and heterocyclic organic compounds
Any product from the polychlorated dibenzofurane family
Any product from the polychlorated dibenzo-para-dioxin family

Tar base products originating from refining operations and tarry residues from distillation operations
Used synthetic or mineral oils, including water-oil mixtures and emulsions
Non-identifiable and/or new laboratory chemicals whose effects on the environment are not known

Appendix 4-3

Commercial Chemical Products or Manufacturing Chemical Intermediates Identified as Toxic Wastes (40 CFR 261.33, 8 May 1990)

(NOTE: Primary hazardous properties of these materials are indicated by the letter (t) (toxicity), (r) (reactivity), (i) (ignitability), and (c) (corrosivity); absence of a letter indicates that the compound is listed only for acute toxicity.)

USEPA Hazardous Waste No.	Substance
U001	Acetaldehyde (i)
U034	Acetaldehyde, trichloro-
U187	Acetamide, N-(4-ethoxyphenyl)-
U005	Acetamide, N-9H-fluoren-2-yl-
U240	Acetic acid, (2,4-dichlorophenoxy)-, salts and esters
U112	Acetic acid, ethyl ester (i)
U144	Acetic acid, lead(2+) salt
U214	Acetic acid, thallium(1+) salt
See F027	Acetic acid, (2,4,5-trichlorophenoxy)-
U002	Acetone (i)
U003	Acetonitrile (i,t)
U004	Acetophenone
U005	2-acetylaminoflourene
U006	Acetyl chloride (c, r, t)
U007	Acrylamide
U008	Acrylic acid (i)
U009	Acrylonitrile
U011	Amitrole
U012	Aniline (i, t)
U136	Arsenic acid, dimethyl-
U014	Auramine
U015	Azaserine
U010	Azirino(2,3,3,4(pyrrolo(1,2-a)indole -4,7-dione, 6-amino-8-[(aminocarbonyl) oxy)methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-,

USEPA Hazardous Waste No.	Substance
U157	Benz[j]aceanthrylene, 1,2-dihydro-3- methyl-
U016	Benza[c]ridine
U017	Benzal chloride
U192	Benzamide, 3,5-dichloro-n- (1,1-diethyl-2-propy nyl-
U018	Benz[a]anthracene
U094	1,2-benzanthracene, 7,12-dimethyl-
U012	Benzenamine (i,t)
U014	Benzenamine, 4,4-carbonimidoylbis(N,N- dime thyl-
U049	Benzenamine, 4-chloro-2-methyl-,hydrochloride
U093	Benzenamine, N,N-dimethyl-4- (phenylazo)-
U328	Benzenamine, 2-methyl-
U353	Benzenamine, 4-methyl-
U158	Benzenamine, 4,4-methylenebis(2-chloro-
U222	Benzenamine, 2-methyl-, hydrochloride
U181	Benzenamine, 2,-methyl-5-nitro
U019	Benzene (i, t)
U038	Benzeneacetic acid, 4-chloro-alpha- (4-chlorophe nyl)- alpha-hydroxy, ethyl ester
U030	Benzene, 1-bromo-4-phenoxy-
U035	Benzenebutanoic acid, 4-[bis (2-chloroet hyl)amino]-
U037	Benzene, chloro-
U221	Benzenediamine, ar-methyl-
U028	1,2-benzendicarboxylic acid, [bis(2-ethyl-hexyl)]ester
U069	1,2-benzenedicarboxylic acid, dibutyl ester
U088	1,2-benzenedicarboxylic acid, diethyl ester
U102	1,2-benzendicarboxylic acid, dimethyl ester
U107	1,2-benzenedicarboxylic acid, dioctyl ester
U070	Benzene, 1,2-dichloro-
U071	Benzene, 1,3-dichloro-
U072	Benzene, 1,4-dichloro-
U060	Benzene, 1,1'- (2,2-dichloroethylidene) bis[4-chloro-
U017	Benzene, (dichloromethyl)-
U223	Benzene, 1,3-diisocyanatomethyl- (r,t)

USEPA Hazardous Waste No.	Substance
U239	Benzene, dimethyl-(i,t)
U201	1,3-benzenediol
U127	Benzene, hexachloro-
U056	Benzene, hexahydro- (i)
U220	Benzene, methyl-
U105	Benzene, 1-methyl-2,4-dinitro-
U106	Benzene, 2-methyl-1,3-dinitro-
U055	Benzene, (1-methylethyl)-(i)
U169	Benzene, nitro- (i,t)
U183	Benzene, pentachloro-
U185	Benzene, pentachloronitro-
U020	Benzenesulfonic acid chloride (c,r)
U020	Benzenesulfonyl chloride (c,r)
U207	Benzene, 1,2,4,5-tetrachloro-
U061	Benzene, 1,1'-(2,2,2-trichloroethylidene) bis[4-chloro
U247	Benzene, 1,1'-(2,2,2-trichloroethylidene)[4-methoxy-
U023	Benzene, (trichloromethyl)-
U234	Benzene, 1,3,5-trinitro-
U021	Benzidine
U202	1,2-benzisothiazolin-3-one, 1,1-dioxide and salts
U203	1,3-benzodioxole, 5-(2-propenyl)-
U141	1,3-benzodioxole, 5-(1-propenyl)-
U090	1,3-benzodioxole, 5-propyl-
U064	Benzo[rs]t]pentaphene
U248	2-H-1-benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, and salts, when present at concentrations of 0.3% or less
U022	Benzo[a]pyrene
U197	P-benzoquinone
U023	Benzotrichloride (c,r,t)
U085	2,2-bioxirane (i,t)
U021	(1,1-biphenyl)-4,4-diamine
U073	(1,1-biphenyl)-4,4-diamine, 3,3-dichloro

USEPA Hazardous Waste No.	Substance
U091	(1,1-biphenyl)-4,4-diamine, 3,3- dimethoxy-
U095	(1,1-biphenyl)4,4-diamine, 3,3- dimethyl-
U225	Bromoform
U030	4-bromophenyl phenyl ether
U128	1,3-butadiene, 1,1,2,3,4,4- hexachloro
U172	1-butanamine, N-butyl-N-nitroso-
U031	1-butanol (i)
U159	2-butanone (i,t)
U160	2-butanone peroxide (r,t)
U053	2-butenal
U074	2-butene, 1,4-dichloro- (i,t)
U143	2-butenic acid, 2-methyl-, 7- [(2,3-dihydroxy-2-(1-methoxyethyl) -3-methyl-1-oxobutoxy)methyl] -2,3,5,7s- yrytshyfto-1- pyrrolizin-1-yl ester, [1S- [alpha(Z),7(2S,3R), 7alpha]]-
U031	N-Butyl alcohol (i)
U136	Cacodylic acid
U032	Calcium chromate
U238	Carbamic acid, ethyl ester
U178	Carbamic acid, methylnitroso- ethyl ester
U097	Carbamic chloride, dimethyl-
U114	Carbamodithioic acid, 1,2-ethanediybis-, salts and esters
U062	Carbamothioic acid, bis(1-methylethyl)-S- (2,3-dichloro-2-propenyl) ester
U215	Carbonic acid, dithallium(1+)salt
U033	Carbonic difluoride
U156	Carbonochlorodic acid, methyl ester (i,t)
U033	Carbon oxyfluoride (r,t)
U211	Carbon tetrachloride
U034	Chloral
U035	Chlorambucil
U036	Chlordane, alpha and gamma isomers
U026	Chlomaphazine
U037	Chlorobenzene

USEPA Hazardous Waste No.	Substance
U039	P-chloro-m-cresol
U041	1-chloro-2,3-epoxypropane
U042	2-chloroethyl vinyl ether
U044	Chloroform
U046	Chloromethyl methyl ether
U047	Beta-chloronaphthalene
U048	O-chlorophenol
U049	4-chloro-o-toluidine, hydrochloride
U032	Chromic acid H ₂ CrO ₄ , calcium salt
U050	Chrysene
U051	Creosote
U052	Cresols (cresylic acid)
U053	Crotonaldehyde
U055	Cumene (i)
U246	Cyanogen bromide
U197	2,5-cyclohexadiene-1, 4-dione
U056	Cyclohexane (i)
U129	Cyclohexane 1,2,3,4,5,6-hexachloro-, (1alpha, 2alpha, 3beta, 4alpha, 6beta)-
U057	Cyclohexanone (i)
U130	1,3-cyclopentadiene, 1,2,3,4,5,5- hexachloro-
U058	Cyclophosphamide
U240	2,4-d, salts and esters
U059	Daunomycin
U060	Ddd
U061	Ddt
U062	Diallate
U063	Dibenz[a,h]anthracene
U064	Dibenzo[a,i]pyrene
U066	1,2-dibromo-3-chloropropane
U069	Dibutyl phthalate
U070	O-Dichlorobenzene
U071	M-Dichlorobenzene

USEPA Hazardous Waste No.	Substance
U072	P-Dichlorobenzene
U073	3,3'-dichlorobenzidine
U074	1,4-dichloro-2-butene (i,t)
U075	Dichlorodifluoromethane
U078	1,1-dichloroethylene
U079	1,2-dichloroethylene
U025	Dichloroethyl ether
U027	Dichloroisopropyl ether
U024	Dichloromethoxy ethane
U081	2,4-dichlorophenol
U082	2,6-dichlorophenol
U084	1,3-dichlorpropene
U085	1,2:3,4-diepoxybutane (i, t)
U108	1,4-diethyleneoxide
U028	Diethylhexyl phthalate
U086	N,N-diethylhydrazine
U087	O,O-diethyl-s-methyl dithiophosphate
U088	Diethyl phthalate
U089	Diethylstilbestrol
U090	Dihydrosafrole
U091	3,3'-dimethoxybenzidine
U092	Dimethylamine (i)
U093	Dimethylaminoazobenzene
U094	7,12-dimethylbenz[a]anthracene
U095	3,3-dimethylbenzidine
U096	Alpha,alpha-dimethylbenzylhydroperoxide (r)
U097	Dimethylcarbamoyl chloride
U098	1,1-dimethylhydrazine
U099	1,2-dimethylhydrazine
U101	2,4-dimethylphenol
U102	Dimethyl phthalate
U103	Dimethyl sulfate

USEPA Hazardous Waste No.	Substance
U105	2,4-dinitrotoluene
U106	2,6-dinitrotoluene
U107	Di-n-octyl phthalate
U108	1,4-dioxane
U109	1,2-diphenylhydrazine
U110	Dipropylamine (i)
U111	Di-n-propylnitrosamine
U041	Epichlorhydrin
U001	Ethanal (i)
U174	Ethanamine, N-ethyl-N-nitroso-
U155	1,2-ethanediamine, n,n-dimethyl-n'-2-pyridinyl- n'-(2-thienylmethyl)-
U067	Ethane, 1,2-dibromo-
U076	Ethane, 1,1-dichloro-
U077	Ethane, 1,2-dichloro-
U131	Ethane, hexachloro-
U024	Ethane, 1,1-[methylenebis(oxy)] bis[2-chloro-
U117	Ethane, 1,1-oxybis- (i)
U025	Ethane 1,1-oxybis[2-chloro-
U184	Ethane, pentachloro-
U208	Ethane, 1,1,1,2-tetrachloro-
U209	Ethane, 1,1,2,2-tetrachloro-
U218	Ethanethioamide
U359	Ethane, 1,1,2-trichloro-
U173	Ethanol 2,2'-(nitrosoimino)bis- 2,2'-(nitrosoimino)bis-
U004	Ethanone, 1-phenyl-
U043	Ethene, chloro-
U042	Ethene, (2-chloroethoxy-)
U078	Ethene, 1,1-dichloro-
U079	Ethene, 1,2-dichloro- (e)
U210	Ethene, tetrachloro-
U228	Ethene, trichloro
U112	Ethyl acetate (i)

USEPA Hazardous Waste No.	Substance
U113	Ethyl acrylate (i)
U238	Ethyl carbamate (urethane)
U117	Ethyl ether (i)
U114	Ethylenebisdithiocarbamic acid, salts and esters
U067	Ethylene dibromide
U077	Ethylene dichloride
U359	Ethylene glycol monoethyl ether
U115	Ethylene oxide (i,t)
U116	Ethylenethiourea
U076	Ethylidene dichloride
U118	Ethyl methacrylate
U119	Ethyl methanesulfonate
U120	Fluoranthene
U122	Formaldehyde
U123	Formic acid (c,t)
U124	Furan (i)
U125	2-furancarboxaldehyde (i)
U147	2,5-furandione
U213	Furan, tetrahydro- (i)
U125	Furfural (i)
U124	Furfuran (i)
U206	Glucopyranose, 2-deoxy-2 (3-methyl-3-nitrosoureido)-
U126	Glycidylaldehyde
U163	Guanidine, N-methyl-N'-nitro- N-nitroso-
U127	Hexachlorobenzene
U128	Hexachlorobutadiene
U130	Hexachlorocyclopentadiene
U131	Hexachloroethane
U132	Hexachlorophene
U243	Hexachloropropene
U133	Hydrazine (r,t)
U086	Hydrazine, 1,2-diethyl-

USEPA Hazardous Waste No.	Substance
U098	Hydrazine, 1,1-dimethyl-
U099	Hydrazine, 1,2-dimethyl-
U109	Hydrazine, 1,2-diphenyl-
U134	Hydrofluoric acid (c,t)
U134	Hydrogen fluoride (c,t)
U135	Hydrogen sulfide
U096	Hydroperoxide, 1-methyl-1-phenylethyl- (r)
U116	2-imidazolidinethione
U137	Indeno(1,2,3-cd)pyrene
U190	1,3-isobenzofurandione
U140	Isobutyl alcohol (i,t)
U141	Isosafrole
U142	Kepone
U143	Lasiocarpine
U144	Lead acetate
U146	Lead, bis(acetato-O) tetrahydroxytri-
U145	Lead phosphate
U146	Lead subacetate
U129	Lindane
U163	Mnng
U147	Maleic anhydride
U148	Maleic hydrazide
U149	Malononitrile
U150	Melphalan
U151	Mercury
U152	Methacrylonitrile (i,t)
U092	Methanamine (N-methyl- (i)
U029	Methane, bromo-
U045	Methane, chloro- (i,t)
U046	Methane, chloromethoxy-
U068	Methane, dibromo-
U080	Methane, dichloro-

USEPA Hazardous Waste No.	Substance
U075	Methane, dichlorodifluoro-
U138	Methane, iodo-
U119	Methanesulfonic acid, ethyl ester
U211	Methane, tetrachloro-
U153	Methanethiol (i,t)
U225	Methane, tribromo-
U044	Methane, trichloro-
U121	Methane, trichlorofluoro-
U154	Methanol (i)
U155	Methapyrilene
U142	1,3,4-metheno-2H- cyclobuta[cd]pentalen-2-one-1,1a,3,3a,4,5,5a,5b,6- decachlorooctahydro-
U247	Methoxychlor
U154	Methyl alcohol (i)
U029	Methyl bromide
U186	1-methylbutadiene (i)
U045	Methyl chloride (i,t)
U156	Methyl chlorocarbonate (i,t)
U226	Methyl chloroform
U157	3-methylcholanthrene
U158	4,4-methylenebis-(2-chloroaniline)
U068	Methylene bromide
U080	Methylene chloride
U159	Methyl ethyl ketone (mek) (i,t)
U160	Methyl ethyl ketone peroxide (r,t)
U138	Methyl iodide
U161	Methyl isobutyl ketone (i)
U162	Methyl methacrylate (i,t)
U161	4-methyl-2-pentanone (i)
U164	Methylthiouracil
U010	Mitomycin C
U059	5,12-Naphthacenedione, (Bs(cis)8- acetyl-10-[(3-amino-2,3,6-trideoxy- alpha-L-lyxo-hexopyrano syl)oxyl]- 7-

USEPA Hazardous Waste No.	Substance
	8,9,10-tetrahydro-6,8,11- trihydroxy-1-methoxy-
U167	1-naphthalenamine
U168	2-naphthalenamine
U026	Naphthalenamine, N,N'-bis (2-chloroethyl)-
U165	Naphthalene
U047	Naphthalene, 2-chloro-
U166	1,4-naphthalenedione
U236	2,7-naphthalenedisulfonic acid, 3,3'-[(3,3'-dime thyl-(1,1'-biphenyl)- bis(azo) bis(5-amino-4-hydroxy)-, tetrasodium salt
U166	1,4-Naphthoquinone
U167	Alpha-naphthylamine
U168	Beta-naphthylamine
U217	Nitric acid, thallium(1+) salt (2-chloromethyl)-
U169	Nitrobenzene (i,t)
U170	P-nitrophenol
U171	2-nitropropane (i)
U172	N-nitrosodi-n-butylamine
U173	N-nitrosodiethanolamine
U174	N-nitrosodiethylamine
U176	N-nitroso-n-ethylurea
U177	N-nitroso-n-methylurea
U178	N-nitroso-n-methylurethane
U179	N-nitrosopiperidine
U180	N-nitrosopyrrolidine
U181	5-nitro-o-toluidine
U193	1,2-oxathiolane, 2,2-dioxide
U058	2H-1,3,2-Oxazaphosphorine,2[bis(2- chloroethyl) amino]tetrahydro-, 2-oxide.
U115	Oxirane (i,t)
U126	Oxiranecarboxyaldehyde
U041	Oxirane, 2-(chloromethyl)-
U182	Paraldehyde
U183	Pentachlorobenzene

USEPA Hazardous Waste No.	Substance
U184	Pentachloroethane
U185	Pentachloronitrobenzene
See F027	Pentachlorophenol
U161	Pentanol, 4-methyl-
U186	1,3-pentadiene (i)
U187	Phenacetin
U188	Phenol
U048	Phenol, 2-chloro-
U039	Phenol, 4-chloro-3-methyl-
U081	Phenol, 2,4-dichloro-
U082	Phenol, 2,6-dichloro-
U089	Phenol, 4,4'-(1,2-diethyl- 1,2-ethenediyl)bis-, (e)
U101	Phenol, 2,4-dimethyl-
U052	Phenol, methyl
U132	Phenol, 2,2'-methylenebis [3,4,6-trichloro-
U170	Phenol, 4-nitro-
See F027	Phenol, pentachloro-
See F027	Phenol, 2,3,4,6-tetrachloro-
See F027	Phenol, 2,4,5-trichloro-
See F027	Phenol, 2,4,6-trichloro-
U150	L-phenylalanine, 4- [bis(2-chloro-ethyl)amino]-
U145	Phosphoric acid, lead salt
U087	Phosphorodithioic acid, 0,0-diethyl S-methyl ester
U189	Phosphorus sulfide (r)
U190	Phthalic anhydride
U191	2-picoline
U179	Piperidine, 1-nitroso-
U192	Pronamide
U194	1-propanamine (i,t)
U111	1-propanamine, n-nitroso-n-propyl-
U110	1-propanamine, n-propyl- (i)
U066	Propane, 1,2-dibromo-3-chloro-

USEPA Hazardous Waste No.	Substance
U083	Propane, 1,2-dichloro-
U149	Propanedinitrile
U171	Propane, 2-nitro- (i,t)
U027	Propane, 2,2-oxybis[2-chloro-
U193	1,3-propane sultone
See F027	Propanoic acid, 2-(2,4,5- trichlorophenoxy)-
U235	1-propanol, 2,3-dibromo-, phosphate (3:1)
U140	1-propanol, 2-methyl- (i,t)
U002	2-propanone (i)
U007	2-propenamide
U084	1-propene, 1,3-dichloro-
U243	1-propene, 1,1,2,3,3,3-hexachloro-
U009	2-propenenitrile
U152	2-propanenitrile, 2-methyl- (i,t)
U008	2-propenoic acid (i)
U113	2-propenic acid, ethyl ester (i)
U118	2-propenoic acid, 2-methyl-, ethyl ester
U162	2-propenoic acid, 2-methyl-, methyl ester (i,t)
U194	N-propylamine (i,t)
U083	Propylene dichloride
U148	3,6-pyridazinedione, 1,2-dihydro-
U196	Pyridine
U191	Pyridine, 2-methyl-
U237	2,4(1H,3H)-pyrimidinedione, 5- [bis(2-chloroethyl) amino]-
U164	4(1H)-pyrimidinone, 2,3-dihydro-6-methyl 2-thioxo-
U180	Pyrrolidine, 1-nitroso--
U200	Reserpine
U201	Resorcinol
U202	Saccharin and salts
U203	Safrole
U204	Selenious acid
U204	Selenium dioxide

USEPA Hazardous Waste No.	Substance
U205	Selenium sulfide
U205	Selenium sulfide SeS ₂ (r,t)
U015	L-serine, diazoacetate (ester)
See F027	Silvex (2,4,5-tp)
U206	Streptozotocin
U103	Sulfuric acid, dimethyl ester
U189	Sulfur phosphide (r)
U232	2,4,5-T
U207	1,2,4,5-tetrachlorobenzene
U208	1,1,1,2-tetrachloroethane
U209	1,1,2,2-tetrachloroethane
U210	Tetrachloroethylene
See F027	2,3,4,6-tetrachlorophenol
U213	Tetrahydrofuran (i)
U214	Thallium (i) acetate
U215	Thallium (i) carbonate
U216	Thallium chloride
U216	Thallium chloride TlCl
U217	Thallium (i) nitrate
U218	Thioacetamide
U153	Thiomethanol (i,t)
U244	Thioperoxydicarbonic diamide, tetramethyl-
U219	Thiourea
U244	Thiuram
U220	Toluene
U221	Toluenediamine
U223	Toluene diisocyanate (r,t)
U328	O-toluidine
U353	P-toluidine
U222	O-toluidine hydrochloride
U011	1H-1,2,4-triazol-3-amine
U227	1,1,2-trichloroethane

USEPA Hazardous Waste No.	Substance
U228	Trichloroethylene
U121	Trichloromonofluoromethane
U230	2,4,5-trichlorophenol
U231	2,4,6-trichlorophenol
U234	1,3,5-trinitrobenzene (r,t)
U182	1,3,5-trioxane, 2,4,6-trimethyl-
U235	Tris(2,3-dibromopropyl)phosphate
U236	Trypan blue
U237	Uracil mustard
U176	Urea, n-ethyl-n-nitroso-
U177	Urea, n-methyl-n-nitroso-
U043	Vinyl chloride
U248	Warfarin, when present at concentrations of .3% or less
U239	Xylene (i)
U200	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5- trimethoxy-benzoyl)oxy], methyl ester
U249	Zinc phosphide, when present at concentrations of 10% or less.

Appendix 4-4

Toxicity Characteristics Constituents and Regulatory Levels (40 CFR 261.24)

USEPA HW No.	Constituent	CAS No.	Chronic toxicity Reference Level	Regulatory Level(mg/L)
D004	Arsenic	7440-38-2	0.05	5.0
D005	Barium	7440-39-3	1.0	100.0
D018	Benzene	71-43-2	0.005	0.5
D006	Cadmium	7440-43-9	0.01	1.0
D019	Carbon tetrachloride	56-23-5	0.005	0.5
D020	Chlordane	57-74-9	0.0003	0.03
D021	Chlorobenzene	108-90-7	1	100.0
D022	Chloroform	67-66-3	0.06	6.0
D007	Chromium	7440-47-3	0.05	5.0
D023	o-Cresol	95-48-7	2	200.0 ¹
D024	m-Cresol	108-39-4	2	200.0 ¹
D025	p-Cresol	106-44-5	2	200.0 ¹
D026	Cresol		2	200.0 ¹
D016	2,4-D	94-75-7	0.1	10.0
D027	1,4-Dichlorobenzene	106-46-7	0.075	7.5
D028	1,2-Dichloroethane	107-06-2	0.005	0.5
D029	1,1-Dichloroethylene	75-35-4	0.007	0.7
D030	2,4-Dinitrotoluene	121-14-2	0.0005	0.13 ²
D012	Endrin	72-20-8	0.0002	0.02
D031	Heptachlor (and its hydroxide)	76-44-8	0.00008	0.008
D032	Hexachlorobenzene	118-74-1	0.0002	0.13 ²
D033	Hexachloro-1,3-butadiene	87-68	3	0.005
D034	Hexachloroethane	67-72-1	0.03	3.0
D008	Lead	7439-92-1	0.05	5.0
D013	Lindane	58-89-9	0.004	0.4
D009	Mercury	7439-97-6	0.002	0.2
D014	Methoxychlor	72-43-5	0.1	10.0
D035	Methyl ethyl ketone	78-93-3	2	200.0
D036	Nitrobenzene	98-95-3	0.02	2.0
D037	Pentachlorophenol	87-86-5	1	100.0

USEPA HW No.	Constituent	CAS No.	Chronic toxicity Reference Level	Regulatory Level(mg/L)
D038	Pyridine	110-86-1	0.04	5.0 ²
D010	Selenium	7782-49-2	0.01	1.0
D011	Silver	7440-22-4	0.05	5.0
D039	Tetrachloroethylene	127-18-4	0.007	0.7
D015	Toxaphene	8001-35-2	0.005	0.5
D040	Trichloroethylene	79-01-6	0.005	0.5
D041	2,4,5-Trichlorophenol	95-95-4	4	400.0
D042	2,4,6-Trichlorophenol	88-06-2	0.02	2.0
D017	2,4,5-TP (Silvex)	93-72-1	0.01	1.0
D043	Vinyl chloride	75-01-4	0.002	0.2

¹ If o-, m-, and p-cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used.

² Quantitation limit is greater than the calculated regulatory level. Therefore, the quantitation limit becomes the regulatory level. (Source: Federal Register 55:61, page 11804.)

Appendix 4-5

Hazardous Materials/Hazardous Waste Storage Incompatibility Chart

Substances in bold have detailed example lists on the next page.

If the material contains:	It may not be stored with any of the following:
Acid (pH below 2.0)	Caustics (pH above 12.5) Reactive Metals Alcohol Water Aldehydes Halogenated, Nitrated, or Unsaturated Hydrocarbons Reactive Organic Compounds and Solvents Spent Cyanide and Sulfide Solutions Oxidizers
Caustic (pH above 12.5)	Acid (pH below 2.0) Reactive Metals Alcohol Water Aldehydes Halogenated, Nitrated, or Unsaturated Hydrocarbons Reactive Organic Compounds and Solvents
Reactive Metals	Caustics Acids Alcohol Aldehydes Halogenated, Nitrated, or Unsaturated Hydrocarbons Reactive Organic Compounds and Solvents Oxidizers
Reactive Organic Compounds and Solvents	Caustics Acids Reactive Metals
Spent Cyanide and Sulfide Solutions	Acids
Oxidizers	Acetic or Other Organic Acids Concentrated Mineral Acids Reactive Metals Reactive Organic Compounds and Solvents Ignitable [Flammable/Combustible] Wastes*

* "Ignitable" in this context refers to substances with a flashpoint below 140× °F, and includes:
Combustible substances, with a flashpoint below 140× °F
Flammable substances, with a flashpoint below 100× °F.

Some Deadly Combinations

Acids + Oil or Grease = Fire
Flammable Liquids + Hydrogen Peroxide = Fire/Explosion
Acids + Caustics = Heat/Spattering
Aluminum Powder + Ammonium Nitrate = Explosion
Caustics + Epoxies = Extreme Heat
Sodium Cyanide + Sulfuric Acid = Lethal Hydrogen Cyanide
Chlorine Gas + Acetylene = Explosion
Ammonia + Bleach = Noxious Fumes

In general:

Reactives must be segregated from **Ignitables**

Acids must be segregated from **Caustics**

Corrosives should be segregated from **Flammables**

Oxidizers should be segregated from **EVERYTHING**

Many Corrosives are “Water Reactive”

Most **Organic Reactives** must be segregated from **Inorganic Reactives** (metals)

Ignitables (Flammables/Combustibles)	Corrosives	
	Acids	Caustics
Carburetor Cleaners Engine Cleaners Epoxy, Resins, Adhesives, and Rubber Cements Finishes Fuels Lacquers Paints Paint Thinners Paint Wastes Pesticides that contain Solvents (such as Methyl Alcohol, Ethyl Alcohol, Isopropyl Alcohol, Toluene, Xylene). Petroleum Solvents (Drycleaning Fluid) Solvents: Acetone Benzene Carbon Tetrachloride (Carbon Tet) Ethanol (Ethyl Alcohol) Ethyl Benzene Isopropanol (Isopropyl Alcohol) Kerosene (Fuel Oil #1) Methanol (Wood Alcohol) Methyl Ethyl Ketone (MEK) Petroleum Distillates Tetrahydrofuran (THF) Toluene (Methacide, Methylbenzene, Methylbenzol, Phenylmethane, Toluol, Antisal 1A) White Spirits (White Spirits, Mineral Spirits, Naphtha) Xylene (Xylol) Stains Stripping Agents Varsol Waste Fuels Waste Ink Wax Removers Wood Cleaners	Battery Acids Degreasers and Engine Cleaners Etching Fluids Hydrobromic Acid Hydrochloric Acid (Muriatic Acid) Nitric Acid (<40%) (Aquafortis) Phosphoric Acid Rust Removers Sulfuric Acid (Oil of Vitriol)	Acetylene Sludge Alkaline Battery Acids Alkaline Cleaners Alkaline Degreasers Alkaline Etching Fluids Lime and Water Lime Wastewater Potassium Hydroxide (Caustic Potash) Rust Removers Sodium Hydroxide (Caustic Soda, Soda Lye)

	Reactive Metals	Reactive Organic Compounds and Solutions
	Lithium (Batteries) Aluminum Beryllium Calcium Magnesium Sodium Zinc Powder	Alcohols Aldehydes Chromic Acids (from chrome plating, copper stripping and aluminum anodizing) Cyanides (from electroplating operations) Hypochlorides (from water treatment plants, swimming pools, sanitizing operations) Organic Peroxides (including Hydrogen Peroxide) Perchlorates Permanganates Sulfides
	<p style="text-align: center;">Oxidizers</p> Chlorine Gas Nitric Acid (>40%), aka Red Fuming Nitric Nitrates (Sodium Nitrate, Ammonium Nitrate) Perchlorates Perchloric Acid Peroxides Calcium Hypochlorite (>60%)	

SECTION 5

NATURAL RESOURCES MANAGEMENT

September 2000

A. Applicability of this Section

This section contains standards for required plans and programs needed to ensure proper protection, enhancement, and management of natural resources and any biological species declared endangered or threatened by either the United States or the Spanish government. Biological species include all plants and animals existing on properties under Department of Defense (DOD) control.

B. Source Documents

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapter 13.

C. Key Compliance Requirements

- The installation must have management plans for certain resources, where they exist:
 - land (soil and water)
 - grazing and cropland
 - forest
 - fish and wildlife
 - outdoor recreation.
- Installations located within or in the proximity of a protected area must coordinate with the appropriate Spanish authority in the development of management programs and must comply with any Spanish requirements identified in the course of that process.
- Personnel who manage natural resources must be trained.
- Installations must take reasonable steps to protect and enhance known endangered species and their habitat.
- Installations must emphasize the protection and maintenance of habitats that are favorable to the reproduction and survival of indigenous fish and wildlife.
- Land and vegetation management operations must be consistent with modern conservation and land-use principles.

D. Definitions

- *Action* - all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by DOD installations (FGS-Spain, Chapter 13, Definitions).
- *Adverse Effect* - changes that diminish the quality or significant value of natural resources. For biological resources, adverse effects include overall population fitness (FGS-Spain, Chapter 13, Definitions).
- *Conservation* - wise management and use of natural resources to provide the best public benefits for present and future generations (FGS-Spain, Chapter 13, Definitions).

- *Endangered Species* - any species of flora or fauna, designated by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) or Spain, whose continued existence is, or is likely to be, threatened and is therefore subject to special protection from destruction or adverse modification of associated habitat, including any species of flora or fauna requiring special protection due to certain characteristics such as uniqueness to a particular environment (FGS-Spain, Chapter 13, Definitions).
- *Management Plan* - a document describing natural resources, their quantity and condition, and actions to ensure conservation and good stewardship (FGS-Spain, Chapter 13, Definitions).
- *Natural Resource* - all living and inanimate materials supplied by nature that are of aesthetic, ecological, educational, historical, recreational, scientific, or other value (FGS-Spain, Chapter 13, Definitions).
- *Natural Resources Management* - action taken to protect, manipulate, alter, or manage environmental, human, and biological resources in harmony with each other to meet present and future human needs (FGS-Spain, Chapter 13, Definitions).
- *Protected Area* - a national park, regional natural park, natural reserve, protected marine area, or special landscape as established by Spanish authorities (FGS-Spain, Chapter 13, Definitions).

E. Records To Review

- Documentation of finding of no adverse effect (for construction activities)
- Environmental Analyses
- Land Use Plan
- Fish and Wildlife Plan
- Outdoor Recreation Plan
- Cropland and Grazing Plan
- Forest Management Plan

F. Physical Features To Inspect

- Construction sites
- Site or landmark of historic or archaeological interest
- Facilities constructed in the past 2 yr
- Wildlife containment areas
- Wildlife habitat and land and water resources
- Equipment that could damage wildlife, its habitat, or land and water resources

G. Guidance for Checklist Users

REFER TO CHECKLIST ITEMS:	
Missing Checklist Items/Positive Findings	NR.2.1.SP and NR.2.2.SP
Natural Resources	NR.10.1.SP through NR.10.4.SP
Endangered or Threatened Species	NR.20.1.SP and NR.20.2.SP
Fish and Wildlife	NR.30.1.SP
Grounds Management	NR.40.1.SP and NR.40.2.SP

**COMPLIANCE CATEGORY:
NATURAL RESOURCES MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>NR.2 MISSING CHECKLIST ITEMS/POSITIVE FINDINGS</p> <p>NR.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>NR.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning natural resources management have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

**COMPLIANCE CATEGORY:
NATURAL RESOURCES MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>NR.10 NATURAL RESOURCES</p> <p>NR.10.1.SP. Installations must develop written programs for conserving, managing, and protecting natural resources (FGS-Spain 13.1.a and 13.1.b).</p> <p>NR.10.2.SP. Installations located within or in the proximity of a protected area must coordinate with the appropriate Spanish authority in the development of management programs (FGS-Spain 13.1.c).</p> <p>NR.10.3.SP. Installations located within or in the proximity of a protected area must comply with Spanish requirements that have been imposed for a specific site (FGS-Spain 13.1.c).</p> <p>NR.10.4.SP. Personnel who manage natural resources must be properly trained (FGS-Spain 13.3).</p>	<p>Determine whether the installation has any of the following resources:</p> <ul style="list-style-type: none"> - land (soil and water) - grazing and cropland - forest - fish and wildlife - outdoor recreation. <p>Verify that the installation has management plans for such resources, where they exist.</p> <p>Verify that installation considers Spanish conservation practices in developing its programs.</p> <p>Determine whether the installation is located within or in the proximity of a protected area.</p> <p>Verify that the installation has coordinated with appropriate Spanish authorities in the development of its management programs.</p> <p>Determine whether the installation is located within or in the proximity of a protected area.</p> <p>Verify that the installation complies with any Spanish requirements that have been imposed for a specific site, as identified during coordination with the appropriate Spanish authority in the development of management programs.</p> <p>Verify that personnel who manage natural resources are properly trained.</p>

**COMPLIANCE CATEGORY:
NATURAL RESOURCES MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>NR.20 ENDANGERED OR THREATENED SPECIES</p> <p>NR.20.1.SP. Installations must manage endangered species (FGS-Spain 13.2 and 13.4.a).</p> <p>NR.20.2.SP. Installations must comply with any Spanish requirements described in the regional plans for recovery and conservation of protected species and their habitats (FGS-Spain 13.4.c).</p>	<p>(NOTE: The Executive Agent (EA) maintains a current list of species determined to be threatened or endangered by CITES or Spain. The most recent version of the CITES lists is included as Appendix 5-1. Appendix 5-2 is the <i>Overseas Environmental Baseline Guidance Document's</i> list of Endangered/Threatened Species.)</p> <p>Verify that installation commanders take reasonable steps to protect and enhance known endangered species and their habitat.</p> <p>Verify that, if it is financially and otherwise practical, a survey of endangered species is conducted.</p> <p>Verify that, if it is financially and otherwise practical, the installation supports Spain-initiated surveys.</p> <p>Verify that Spanish officials are normally notified of the discovery of a new endangered species not previously known to be present on the installation.</p> <p>Verify that the installation complies with any Spanish requirements described in the regional plans for recovery and conservation of protected species and their habitats existing on properties under DOD control, as identified during coordination with the appropriate Spanish authority in the development of management programs.</p>

COMPLIANCE CATEGORY: NATURAL RESOURCES MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>NR.30 FISH AND WILDLIFE</p> <p>NR.30.1.SP. Installations must emphasize the maintenance and protection of habitats favorable to the local fish and wildlife (FGS-Spain 13.4.b).</p>	<p>Verify that the installation places emphasis on the maintenance and protection of habitats that are favorable to the reproduction and survival of indigenous fish and wildlife.</p>

**COMPLIANCE CATEGORY:
NATURAL RESOURCES MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>NR.40 GROUNDS MANAGEMENT</p> <p>NR.40.1.SP. Installations must meet specific standards with regard to grounds maintenance (FGS-Spain 13.4.d and 13.4.f).</p> <p>NR.40.2.SP. A protective vegetative cover (or other standard soil erosion/sediment control practices) must be used to control dust or stabilize sites (FGS-Spain 13.4.e).</p>	<p>Verify that installation grounds are maintained to meet designated mission use and assure harmony with the natural landscape.</p> <p>Verify that land and vegetative management activities are consistent with modern conservation and land-use principles.</p> <p>Verify that the installation uses a protective vegetative cover (or other standard soil erosion/sediment control practices) to control dust or stabilize sites.</p>

Appendix 5-1

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

A-1 FUNDAMENTAL PRINCIPLES

- A. Chart A.1 includes all species threatened with extinction which are or may be affected by trade. Trade in specimens of these species must be subject to particularly strict regulation in order not to endanger further their survival and must be authorized only in exceptional circumstances.
- B. Chart A.2 includes:
1. all species which although not now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival
 2. other species which must be subject to regulation in order that trade in specimens of certain species referred to in subparagraph (a) of this paragraph may be brought under effective control.
- C. Chart A.3 includes all species which any Party identifies as being subject to regulation within its jurisdiction for the purposes of preventing or restricting exploitation, and as needing the cooperation of other Parties in the control of trade.
- D. The Parties must not allow trade in specimens of species included in Charts A.1, A.2, and A.3 except in accordance with the provisions of the present Convention.

Charts A.1 and A.2

INTERPRETATION

- A. Species included in these charts are referred to:
1. by the name of the species, or
 2. as being all of the species included in a higher taxon or designated part thereof.
- B. The abbreviation "spp." is used to denote all species of a higher taxon.
- C. Other references to taxa higher than species are for the purposes of information or classification only.
- D. The abbreviation "p.e." is used to denote species that are possibly extinct.
- E. An asterisk (*) placed against the name of a species or higher taxon indicates that one or more geographically separate populations, subspecies or species of that species or taxon are included in Chart A.1 and are excluded from Chart A.2.
- F. Two asterisks (**) placed against the name of a species or higher taxon indicate that one or more geographically separate populations, subspecies or species of that species or taxon are included in Chart A.2 and are excluded from Chart A.1.
- G. The symbol (-) followed by a number placed against the name of a species or higher taxon denotes that designated geographically separate populations, species, groups of species or families of that species or taxon are excluded from the chart concerned as follows:

- 102 Populations of Bhutan, India, Nepal and Pakistan
- 103 Population of China
- 104 Population of Australia
- 105 Population of the United States of America
- 106 Chile: part of the population of Parinacota Province, Ia. Region of Tarapac
Peru: populations of Pampa Galeras National Reserve and Nuclear Zone, Pedegral,
Oscconta and Sawacocha (Province of Lucanas), Sais Picotani (Province of Azangaro),
Sais Tupac Amaru (Province of JunAn), and of Salinas Aguada Blanca National
Reserve (Provinces of Arequipa and Cailloma)
- 107 Populations of Afghanistan, Bhutan, India, Myanmar, Nepal and Pakistan
- 108 Cathartidae
- 109 *Melopsittacus undulatus*, *Nymphicus hollandicus* and *Psittacula krameri*
- 110 Populations of Botswana, Ethiopia, Kenya, Malawi, Mozambique, the United Republic of Tanzania, Zambia and Zimbabwe, and populations of the following countries subject to the specified annual export quotas:

	1992	1993	1994
Madagascar (total):	3100	4100	4400
Ranched specimens	3000	4000	4300
Wild nuisance specimens	100	100	100
Somalia	500	0	0
South Africa	1000	1000	1000
Uganda	2500	2500	2500

Apart from ranched specimens, the United Republic of Tanzania will authorize the export of no more than 100 hunting trophies each year, 400 nuisance animals in 1992, 200 a year in 1993 and 1994 and 100 in 1995 and each following year.

- 111 Populations of Australia and Papua New Guinea, and population of Indonesia subject to specified annual export quotas as follows:

	1992	1993	1994
Total	9700	8500	8500
Ranched/captive-bred specimens	7000	7000	7000
Wild specimens	1500	1500	1500
Skins in stock	1200	0	0

- 112 Population of Indonesia
- 113 Population of Chile
- 114 All species that are not succulent

H. The symbol (+) followed by a number placed against the name of a species or higher taxon denotes that only designated geographically separate populations, subspecies or species of that species or taxon are included in the chart concerned, as follows:

- +201 Population of South America (populations outside South America are not included in the charts)
- +202 Populations of Bhutan, India, Nepal and Pakistan

- +201 Populations of Bhutan, China, Mexico and Mongolia
- +204 Populations of Camaroon and Migeria
- +205 Population of Asia
- +206 Population of India
- +207 Populations of Central and North America
- +208 Population of Australia
- +209 Chile: part of the population of Parinacota Province, Ia. Region of Tarapac
Peru: populations of Pampa Galeras National Reserve and Nuclear Zone, Pedegral,
Oscconta and Sawacocho (Province of Lucanas), Sais Picotani (Province of Azangaro),
Sais Tupac Amaru (Province of JunÀn), and of Salinas Aguada Blanca National
Reserve (Provinces of Arequipa and Cailloma)
- +210 Populations of Afghanistan, Bhutan, India, Myanmar, Nepal and Pakistan
- +211 Population of Mexico
- +212 Populations of Algeria, Burkina Faso, Cameroon, the Central African Republic, Chad, Mali,
Mauritania, Morocco, the Niger, Nigeria, Senegal and the Sudan
- +213 Population of the Sudan. This listing entered into force on 11 July 1992 only, to allow the export
of an existing stock of 8000 skins between 11 June and 11 July 1992, under specific conditions
(skins to be tagged, documented and exported under the supervision of an independent observer)
- +214 Population of Europe, except the area which formerly constituted the Union of Soviet Socialist
Republics
- +215 Population of Indonesia with a zero export quota. Export of captive-bred specimens of a maxi
mum length of 15 cm [≅6 in.] will be limited to 3000 in 1993 and 4000 in 1994 from the opera
tion of P.D. Bintang, Kalbar, Pontianak, West Kalimantan
- +216 All species of New Zealand
- +217 Population of Chile

I. The symbol (=) followed by a number placed against the name of a species or higher taxon denotes that the name of that species or taxon is interpreted as follows:

- =301 Includes family *Tupaïidae*
- =302 Includes generic synonym *Leontideus*
- =303 Includes synonym *Saguinus geoffroyi*
- =304 Includes synonym *Cercopithecus roloway*
- =305 Includes synonym *Colobus badius kirki*
- =306 Includes synonym *Colobus badius rufomitratu*s
- =307 Includes generic synonym *Simias*
- =308 Includes generic synonym *Mandrillus*
- =309 Includes generic synonym *Rhinopithecus*
- =310 Includes synonyms *Bradypus boliviensis* and *Bradypus griseus*
- =311 Includes synonym *Priodontes giganteus*
- =312 Includes synonym *Physeter catodon*
- =313 Includes synonym *Eschrichtius glaucus*
- =314 Includes generic synonym *Eubalaena*
- =315 Includes synonym *Dusicyon fulvipes*
- =316 Also referenced as *Cerdocyon thous*
- =317 Includes generic synonym *Fennecus*
- =318 Also referenced as *Ursus thibetanus*
- =319 Also referenced as *Aonyx microdon* or as *Paraonyx microdon*
- =320 Includes synonyms *Lutra annectens*, *Lutra enudris*, *Lutra incarum* and *Lutra platensis*
- =321 Includes synonym *Eupleres major*
- =322 Also referenced as *Lynx caracal*; includes generic synonym *Caracal*
- =323 Also referenced as *Lynx pardinus* or *Felis lynx pardina*
- =324 Includes synonyms *Equus kiang* and *Equus onager*
- =325 Includes generic synonym *Dama*

- =326 Includes generic synonyms *Axis* and *Hyelaphus*
- =327 Includes synonym *Bos frontalis*
- =328 Includes synonym *Bos grunniens*
- =329 Includes generic synonym *Novibos*
- =330 Includes generic synonym *Anoa*
- =331 Includes synonym *Oryz tao*
- =332 Includes synonym *Ovis aries ophion*
- =333 Also referenced as *Sula abbotti*
- =334 Also referenced as *Ciconia ciconia boyciana*
- =335 Also referenced as *Anas platyrhynchos laysanensis*
- =336 Also referenced as *Aquila heliaca adalberti*
- =337 Also referenced as *Falco peregrinus pelegrinoides*
- =338 Includes synonym *Falco babylonicus*
- =339 Also referenced as *Crax mitu mitu*
- =340 Includes generic synonym *Aburria*
- =341 Formerly included in species *Crossoptilon crossoptilon*
- =342 Formerly included in species *Polyplectron malacense*
- =343 Includes synonym *Rheinardia nigrescens*
- =344 Also referenced as *Tricholimnas sylvestris*
- =345 Also referenced as *Choriotis nigriceps*
- =346 Also referenced as *Houbaropsis bengalensis*
- =347 Also referenced as *Amazona dufresniana rhodocorytha*
- =348 Often traded under the incorrect designation *Ara caninde*
- =348a Also referenced as *Cyanoramphus novaezelandiae cookii*
- =349 Also referenced as *Opopsitta diopthalma coxeni*
- =350 Also referenced as *Geopsittacus occidentalis*
- =351 Formerly included in species *Psephotus chrysopterygius*
- =352 Formerly included in genus *Gallirex*; also referenced as *Tauraco porphyreolophus*
- =353 Formerly included in species *Tauraco corythaix*
- =354 Also referenced as *Otus gurneyi*
- =355 Also referenced as *Ninox novaeseelandiae royana*
- =356 Formerly included in genus *Ramphodon*
- =357 Formerly included in genus *Rhinoplax*
- =357a Also referenced as *Pitta brachyura nympha*
- =358 Also referenced as *Muscicapa ruecki* or as *Niltava ruecki*
- =359 Also referenced as *Meliphaga cassidix*
- =360 Formerly included in genus *Spinus*
- =361 Includes generic synonyms *Nicoria* and *Geomyda (part)*
- =362 Also referenced in genus *Testudo*
- =363 Formerly included in *Podocnemis* spp.
- =364 Includes *Alligatoridae*, *Crocodylidae* and *Gavialidae*
- =365 Formerly included in *Chamaeleo* spp.
- =366 Also referenced as *Constrictor constrictor occidentalis*
- =367 Includes synonym *Pseudoboa cloelia*
- =368 Also referenced as *Hydrodynastes gigas*
- =369 Includes generic synonym *Megalobatrachus*
- =370 *Sensu* D' Abrera
- =371 Also referenced in genus *Dysnomia*
- =372 Includes generic synonym *Proptera*
- =373 Also referenced in genus *Carunculina*
- =374 Includes generic synonym *Micromya*
- =375 Includes generic synonym *Papuina*
- =376 Also referenced as *Podophyllum emodi*
- =377 Also referenced in genus *Echinocactus*
- =378 Also referenced in genus *Escobaria*

- =379 Also referenced as *Lobeira macdougallii* or as *Nopalxochia macdougallii*
- =380 Also referenced as *Echinocereus lindsayi*
- =381 Also referenced as *Wilcoxia schmollii*
- =382 Also referenced as *Solisia pectinata*
- =383 Also referenced as *Backebergia militaris*
- =384 Also referenced in genus *Toumeyia*
- =385 Also referenced in genus *Toumeyia* or in genus *Sclerocactus*
- =386 Also referenced as *Ancistrocactus tobuschii*
- =387 Also referenced in genus *Neolloydia* or in genus *Echinomastus*
- =388 Also referenced in genus *Neolloydia*
- =389 Also referenced as *Saussurea lappa*
- =390 Also referenced as *Engelhardia pterocarpa*
- =391 Includes families *Apostasiaceae* and *Cypripediaceae* as subfamilies *Apostasiodeae* and *Cypripedioideae*
- =392 Also referenced as *Lycaste virginalis* var. *alba*
- =393 Also referenced as *Sarracenia rubra alabamensis*
- =394 Also referenced as *Sarracenia rubra jonesii*
- =395 Includes synonym *Stangeria paradoxa*
- =396 Includes synonym *Welwitschia bainesii*

J. The symbol (°) followed by a number placed against the name of a species or higher taxon is interpreted as follows:

°501 Annual export quotas for live specimens and hunting trophies are granted as follows:

Botswana	5
Namibia	150
Zimbabwe	50

The trade in such specimens is subject to the provisions of Article III of the Convention.

°502 For the exclusive purpose of allowing international trade in cloth made from wool sheared from live vicuñas of the populations included in Chart A.2 (see +209), and of items made thereof. The reverse side of the cloth must bear the logotype adopted by the range states of the species, which are signatories to the Convenio para la Conservación y Manejo de la Vicuña, and the selvages either the words VICU ANDES-CHILE or the words VICU ANDES-PERU, depending on the country of origin.

°503 Fossils are not subject to CITES provisions.

°504 Tissue cultures and flaked seedling cultures are not subject to the provisions of the Convention.

K. In accordance with Article I, paragraph b(iii), of the convention, the symbol (#) followed by a number placed against the name of a species or higher taxon included in Chart A.2 designates parts or derivatives which are specified in relation thereto for the purposes of the Convention as follows:

#1 Designates all parts and derivatives, except:

- a. seeds, spores and pollen (including pollina)
- b. tissue cultures and flaked seedling cultures.

#2 Designates all parts and derivatives, except:

- a. seeds and pollen

- b. tissue cultures and flaked seedling cultures
- c. chemical derivatives.

#3 Designates roots and readily recognizable parts thereof.

#4 Designates all parts and derivatives, except:

- a. seeds and pollen
- b. tissue cultures and flaked seedling cultures
- c. fruits and parts and derivatives thereof of naturalized or artificially propagated plants
- d. separate stem joints (pads) and parts and derivatives thereof of naturalized or artificially propagated plants of the genus *Opuntia* subgenus *Opuntia*.

#5 Designates saw-logs, sawn wood and veneers.

#6 Designates all parts and derivatives, except:

- a. seeds and pollen
- b. tissue cultures and flaked seedling cultures
- c. separate leaves and parts and derivatives thereof of the naturalized or artificially propagated plants of the species *Aloe vera*.

#7 Designates all parts and derivatives, except:

- a. seeds and pollen (including pollina)
- b. tissue cultures and flaked seedling cultures
- c. cut flowers of artificially propagated plants
- c. fruits and parts and derivatives thereof of artificially propagated plants of the genus *Vanilla*.

L. As none of the species or higher taxa of FLORA included in Chart A.1 is annotated to the effect that their hybrids are treated in accordance with the provisions of Chart A.3, this means that artificially propagated hybrids produced from one or more of these species or taxa may be traded with a certificate of artificial propagation, and that seeds and pollen (including pollina), cut flowers, tissue cultures and flaked seedling cultures of these hybrids are not subject to the provisions of the Convention.

	CHART A.1	CHART A.2
FAUNA (Animals)		
<i>MAMMALIA</i> (Mammals)		
<i>MONOTREMATA</i>		
Monotremes		
<i>Tachyglossidae</i> (Echidnas or spiny ant-eaters)		<i>Zaglossus</i> spp.
<i>MARSUPIALIA</i>		
Marsupials		
<i>Dasyuridae</i> (Marsupial mice)	<i>Sminthopsis longicaudata</i> <i>Sminthopsis psammophila</i>	
<i>Thylacinidae</i> (Thylacines)	<i>Thylacinus cynocephalus</i> p.e.	
<i>Peramelidae</i> (Bandicoots)	<i>Chaeropus ecaudatus</i> p.e. <i>Perameles bougainville</i>	
<i>Thylacomyidae</i>	<i>Macrotis lagotis</i> <i>Macrotis leucura</i>	
<i>Phalangeridae</i> (Phalangers and cuscuses)		<i>Phalanger maculatus</i> <i>Phalanger orientalis</i>
<i>Burramyidae</i> (Pygmy possums)		<i>Burramys parvus</i>
<i>Vombatidae</i> (Wombats)	<i>Lasiorbinus krefftii</i>	
<i>Macropodidae</i> (Wallabies and kangaroos)	<i>Bettongia</i> spp. <i>Caloprymnus campestris</i> p.e. <i>Lagorchestes hirsutus</i> <i>Lagostrophus fasciatus</i> <i>Onychogalea fraenata</i> <i>Onychogalea lunata</i>	<i>Dendrolagus bennettianus</i> <i>Dendrolagus inustus</i> <i>Dendrolagus lumholtzi</i> <i>Dendrolagus ursinus</i>
<i>CHIROPTERA</i>		
Bats		
<i>Pteropodidae</i>	<i>Pteropus insularis</i> <i>Pteropus mariannus</i> <i>Pteropus molossinus</i> <i>Pteropus phaeocephalus</i> <i>Pteropus pilosus</i> <i>Pteropus samoensis</i> <i>Pteropus tonganus</i>	<i>Acerodon</i> spp. <i>Pteropus</i> spp. *

	CHART A.1	CHART A.2
	<i>PRIMATES</i> Primates	<i>PRIMATES</i> spp. * =301
<i>Lemuridae</i> (Lemurs)	<i>Lemiridae</i> spp.	
<i>Cheirogaleidae</i>	<i>Cheirogaleidae</i> spp.	
<i>Indriidae</i> (Indris, sifakas and avarhis)	<i>Indriidae</i> spp.	
<i>Daubentoniidae</i> (Ayes-eyes)	<i>Daubentonia madagascarensis</i>	
<i>Callithricidae</i> (Tamarins and marmosets)	<i>Callithrix jacchus aurita</i> <i>Callithrix jacchus flaviceps</i> <i>Leontopithecus</i> spp. =302 <i>Sanguinus leucopus</i> <i>Sanguinus oedipus</i> =303	
<i>Callimiconidae</i>	<i>Callimico goeldii</i>	
<i>Cebidae</i> (New World monkeys)	<i>Alouatta palliata</i> <i>Ateles geoffroyi frontatus</i> <i>Ateles geoffroyi panamensis</i> <i>Brachyteles arachnoides</i> <i>Cacajao</i> spp. <i>Chiropotes albinasus</i> <i>Lagothrix flavicauda</i> <i>Saimiri oerstedii</i>	
<i>Cercopithecidae</i> (Old World monkeys)	<i>Cerocebus galeritus galeritus</i> <i>Ceropithecus diana</i> =304 <i>Colobus pennantii kirki</i> =305 <i>Colobus rufomitratu</i> =306 <i>Macaca silenus</i> <i>Nasalis</i> spp. =307 <i>Papio leucophaeus</i> =308 <i>Papio sphynx</i> =308 <i>Presbytis entellus</i> <i>Presbytis geei</i> <i>Presbytis pileata</i> <i>Presbytis potenziani</i> <i>Pygathrix</i> spp. =309	
<i>Hylobatidae</i> (Gibbons)	<i>Hylobatidae</i> spp.	

	CHART A.1	CHART A.2
<i>Pongidae</i> (Great apes)	<i>Pongidae</i> spp.	
<i>EDENTATA</i> Edentates		
<i>Myrmecophagidae</i> (Ant-eaters)		<i>Myrmecophaga tridactyla</i>
<i>Bradypodidae</i> (Sloths)		<i>Bradypus variegatus</i> =310
<i>Dasypodidae</i> (Armadillos)	<i>Priodontes maximus</i> =311	
<i>PHOLIDOTA</i> (Pangolins or scaly ant-eaters)		
<i>Manidae</i> (Pangolins)	<i>Manis temminckii</i>	<i>Manis crassicaudata</i> <i>Manis javanica</i> <i>Manis pentadactyla</i>
<i>LAGOMORPHA</i> Lagomorphs (Double-toothed rodents)		
<i>Leporidae</i> (Rabbits and hares)	<i>Caprolagus hispidus</i> <i>Romerolagus diazi</i>	
<i>RODENTIA</i> Rodents		
<i>Sciuridae</i> (Squirrels and mar mots)	<i>Cynomys mexicanus</i>	<i>Ratufa</i> spp.
<i>Muridae</i> (Rats and mice)	<i>Leporillus conditor</i> <i>Pseudomys praeconis</i> <i>Xeromys myoides</i> <i>Zyzomys pedunculatus</i>	
<i>Chinchillidae</i> (Chinchillas)	<i>Chinchilla</i> spp +201	
<i>CETACEA</i> Cetaceans (Whales, dolphins and porpoises)		<i>CETACEA</i> spp. *
<i>Platanistidae</i> (River dolphins)	<i>Lipotes vexillifer</i> <i>Platanista</i> spp.	
<i>Ziphiidae</i>	<i>Berardius</i> spp. <i>Hyperoodon</i> spp.	
<i>Physeteridae</i>	<i>Physeter macrocephalus</i> =312	
<i>Delphinidae</i> (Dolphins)	<i>Sotalia</i> spp. <i>Sousa</i> spp.	
<i>Phocoenidae</i>	<i>Neophocaena phocaenoides</i>	

	CHART A.1	CHART A.2
	<i>Phocoena sinus</i>	
<i>Eschrichtidae</i> (Grey whales)	<i>Eschrichtius robustus</i> =313	
<i>Balaenopteridae</i> (Rorquals)	<i>Balaenoptera acutorostrata</i> ** -101 <i>Balaenoptera borealis</i> <i>Balaenoptera edeni</i> <i>Balaenoptera musculus</i> <i>Balaenoptera physalus</i> <i>Megaptera novaeangliae</i>	
<i>Balaenidae</i> (Right whales)	<i>Balaena</i> spp. =314 <i>Caperea marginata</i>	
CARNIVORA Carnivores		
<i>Canidae</i> (Dogs, wolves and foxes)	<i>Canis lupus</i> ** +202 <i>Speothos venaticus</i>	<i>Canis lupus</i> * -102 <i>Chrysocon brachyurus</i> <i>Cuon alpinus</i> <i>Dusicyon culpaeus</i> <i>Dusicyon griseus</i> =315 <i>Dusicyon gymnocerus</i> <i>Dusicyon thous</i> =316 <i>Vulpes cana</i> <i>Vulpes zerda</i> =317
<i>Ursidae</i> (Bears)	<i>Ailuropoda melanoleuca</i> <i>Helarctos malayanus</i> <i>Melursus ursinus</i> <i>Selenarctos thibetanus</i> =318 <i>Tremarctos ornatus</i> <i>Ursus arctos</i> ** +203 <i>Ursus arctos isabellinus</i>	<i>Ursidae</i> spp. *
<i>Procyonidae</i> (Raccoons)		<i>Ailurus fulgens</i>
<i>Mustelidae</i> (Weasels, badgers, skunks, et al.)	<i>Aonyx congica</i> ** +204 =319 <i>Enhydra lutris nereis</i> <i>Lutra felina</i> <i>Lutra longicaudis</i> =320	<i>Conepatus Humboldtii</i> <i>Lutrinae</i> spp. *

	CHART A.1	CHART A.2
	<i>Lutra lutra</i> <i>Lutra provocax</i> <i>Mustella nigripes</i> <i>Pteronura brasiliensis</i>	
Viverridae (Genets, civets, and mongooses)	<i>Prionodon pardicolor</i>	<i>Cryptoprocta ferox</i> <i>Cynogale bennettii</i> <i>Eupleres goudotii</i> =321 <i>Fossa fossa</i> <i>Hemigalus derbyanus</i> <i>Prionodon linsang</i>
Hyaenidae (Hyaenas)	<i>Hyaena brunnea</i>	
Felidae (Cats or felines)	<i>Acionyx jubatus</i> °501 <i>Felis bengalensis bengalensis</i> ** - 103 <i>Felis caracal</i> ** +205 =322 <i>Felis concolor coryi</i> <i>Felis concolor costaricensis</i> <i>Felis concolor cougar</i> <i>Felis geoffroyi</i> <i>Felis jacobita</i> <i>Felis marmorata</i> <i>Felis nigripes</i> <i>Felis paradalis</i> <i>Felis pardina</i> =323 <i>Felis planiceps</i> <i>Felis rubiginosa</i> ** +206 <i>Felis temmincki</i> <i>Felis tigrina</i> <i>Felis wiedii</i> <i>Felis yagouaroundi</i> ** +207 <i>Neofelis nebulosa</i> <i>Panthera leo persica</i> <i>Panthera onca</i> <i>Panthera pardus</i> <i>Panthera tigris</i>	<i>Felidae</i> spp. *

	CHART A.1	CHART A.2
	<i>Panthera uncia</i>	
<i>PINNIPEDIA</i> Seals and walruses		
<i>Otariidae</i> (Eared seals)	<i>Arctocephalus townsendi</i>	<i>Arctocephalus</i> spp. *
<i>Phocidae</i> (True seals)	<i>Monachus</i> spp.	<i>Mirounga leonina</i>
<i>PROBOSCIDEA</i> Proboscideans		
<i>Elephantidae</i> (Elephants)	<i>Elephas maximus</i> <i>Loxodonta africana</i>	
<i>SIRENIA</i> Sea cows		
<i>Dugongidae</i> (Dugongs)	<i>Dugong dugon</i> ** -104	<i>Dugong dugon</i> * +208
<i>Trichedhidae</i> (Manatees)	<i>Trichechus inunguis</i> <i>Trichechud manatus</i>	<i>Trichechus senegalensis</i>
<i>PERISSODACTYLA</i> Odd-toed ungulates		
<i>Equidae</i> (Horses)	<i>Equus africanus</i> <i>Equus grevyi</i> <i>Equus hemionus hemionus</i> <i>Equus hemionus khur</i> <i>Equus przewalskii</i> <i>Equus zebra zebra</i>	<i>Equus hemionus</i> * =324 <i>Equus zebra hartmannae</i>
<i>Tapiridae</i> (Tapirs)	<i>Tapiridae</i> spp. **	<i>Tapirus terrestris</i>
<i>Rhinocerotidae</i> (Rhinoceroses)	<i>Rhinocerotidae</i> spp.	
<i>ARTIODACTYLA</i> Even-toed ungulates		
<i>Suidae</i> (Old World pigs or swine)	<i>Babyrousa babyrussa</i> <i>Sus salvanius</i>	
<i>Tayassuidae</i>	<i>Catagonus wagneri</i>	<i>Tayassuidae</i> spp. * -105
<i>Hippopotamidae</i> (Hippopotamuses)		<i>Choeropsis liberiensis</i>
<i>Camelidae</i> (Camels and lamas)	<i>Vicugna vicugna</i> ** -106	<i>Lama guanicoe</i> <i>Vicugna vicugna</i> * +209 °502
<i>Cervidae</i> (True deer)	<i>Blastocerus dichotomus</i>	<i>Cervus elaphus bactrianus</i>

	CHART A.1	CHART A.2
	<i>Cervus dama mesopotamicus</i> =325 <i>Cervus duvauceli</i> <i>Cervus elaphus hanglu</i> <i>Cervus eldi</i> <i>Cervus porcinus annamiticus</i> =326 <i>Cervus porcinus calamianensis</i> =326 <i>Cervus porcinus kuhli</i> =326 <i>Hippocamelus</i> spp. <i>Moschus spp</i> ** +210 <i>Muntiacus crinifrons</i> <i>Ozotoceros bezoarticus</i>	<i>Moschus</i> spp * -107 <i>Pedu mephistophiles</i>
<i>Bovidae</i> (Cattle, sheep, goats, antelopes, etc.)	<i>Addax nasomaculatus</i> <i>Antilocapra americana</i> +211 <i>Bison bison athabascae</i> <i>Bos gaurus</i> =327 <i>Bos mutus</i> =328 <i>Bos suaveli</i> =329 <i>Bubalus depressicornis</i> =330 <i>Bubalus mindorensis</i> =330 <i>Bubalus quarlesi</i> =330 <i>Capra falconeri</i> <i>Caricornis sumatraensis</i> <i>Cephalophus jentinki</i> <i>Gazella dama</i> <i>Hippotragus niger variani</i> <i>Nemorhaedus goral</i> <i>Oryx dammah</i> =331 <i>Oryx leucoryx</i> <i>Ovis ammon hodgsoni</i> <i>Ovis orientalis ophion</i> =332 <i>Ovis vignei</i> <i>Pantholops hodgsoni</i> <i>Rupicapra rupicapra ornata</i>	<i>Budorcas taxicolor</i> <i>Cephalophus dorsalis</i> <i>Cephalophus monticola</i> <i>Cephalophus ogilbyi</i> <i>Cephalophus sylvicultor</i> <i>Cephalophus zebra</i> <i>Damaliscus dorcas dorcas</i> <i>Kobus leche</i> <i>Ovis ammon</i> * <i>Ovis canadensis</i> +211
AVES (BIRDS)		

	CHART A.1	CHART A.2
<i>STRUTHIONIFORMES</i>		
<i>Struthionidae</i>	<i>Struthio camelus</i> +212	
<i>RHEIFORMES</i> Rheas		
<i>Rheidae</i> (Rheas)	<i>Pterocnemia pennata</i>	<i>Rhea americana</i>
<i>TINAMIFORMES</i> Tinamous		
<i>Tinamidae</i> (Tinamous)		<i>Rhynchotus rufescens maculicollis</i> <i>Rhynchotus rufescens pallescens</i> <i>Rhynchotus rufescens rufescens</i>
<i>SPHENISCIFORMES</i> Penguins		
<i>Spheniscidae</i> (Penguins)	<i>Spheniscus humboldti</i>	<i>Spheniscus demersus</i>
<i>PODICIPEDIFORMES</i> Grebes		
<i>Podicipedidae</i> (Grebes)	<i>Podilymbus gigas</i>	
<i>PROCELLARIIFORMES</i> Tube-nosed swimmers		
<i>Diomedidae</i> (Albatrosses)	<i>Diomedea albatrus</i>	
<i>PELECANIFORMES</i> Pelicans and kin		
<i>Pelecanidae</i> (Pelicans)	<i>Pelecanus crispus</i>	
<i>Sulidae</i> (Boobies and gannets)	<i>Sula abbotti</i> =333	
<i>Fregatidae</i> (Frigate birds)	<i>Fregata andrewsi</i>	
<i>CICONIIFORMES</i> Wading birds (herons and kin)		
<i>Balaenicipitidae</i>		<i>Balaniceps rex</i>
<i>Ciconiidae</i> (Storks)	<i>Ciconia boyciana</i> =334 <i>Jabiru mycteria</i> <i>Mycteria cinerea</i>	<i>Ciconia nigra</i>
<i>Threskiornithidae</i> (Ibises and spoonbills)	<i>Geronticus eremita</i> <i>Nipponia nippon</i>	<i>Eudocimus ruber</i> <i>Geronticus calvus</i>

	CHART A.1	CHART A.2
		<i>Platalea leucorodia</i>
<i>Phoenicopteridae</i> (Flamingos)		<i>Phoenicopteridae</i> spp.
ANSERIFORMES		
Waterfowl		
<i>Anatidae</i> (Ducks, geese and swans)	<i>Anas aucklandica nesiotis</i> <i>Anas laysanensis</i> =335 <i>Anas oustaleti</i> <i>Branta canadensis leucopareia</i> <i>Branta sandvicensis</i> <i>Carina scutulata</i> <i>Rhodonessa caryophyllacea</i> p.e.	<i>Anas aucklandica aucklandica</i> <i>Anas aucklandica chlorotis</i> <i>Anas bernieri</i> <i>Anas formosa</i> <i>Branta ruficollis</i> <i>Coscoroba coscoroba</i> <i>Cygnus melanocorypha</i> <i>Dendrocygna arborea</i> <i>Oxyura leucocephala</i> <i>Sarkidiornis melanotos</i>
FALCONIFORMES		FALCONIFORMES spp. *
Birds of Prey		-108
<i>Cathartidae</i> (New World vultures)	<i>Gymnogyps californianus</i> <i>Vultur gryphus</i>	
<i>Accipitridae</i> (True hawks)	<i>Aquila adalberti</i> =336 <i>Aquila heliaca</i> <i>Chondrohierax uncinatus wilsonii</i> <i>Haliaeetus albicilla</i> <i>Haliaeetus leucocephalus</i> <i>Harpia harpyja</i> <i>Pithecophaga jefferyi</i>	
<i>Falconidae</i> (Falcons and caracaras)	<i>Falco araea</i> <i>Falco jugger</i> <i>Falco newtoni aldabranus</i> <i>Falco pelegrinoides</i> =337 <i>Falco peregrinus</i> =338 <i>Falco punctatus</i> <i>Falco rusticolus</i>	

	CHART A.1	CHART A.2
<i>GALLIFORMES</i>		
Game birds of fowl-like birds		
<i>Megapodiidae</i> (Mound or builders)	<i>Macrocephalon maleo</i>	
<i>Cracidae</i> (Curassows and guans)	<i>Crax blumenbachii</i> <i>Mitu mitu mitu</i> =339 <i>Oreophasis derbianus</i> <i>Penelope albipennis</i> <i>Pipile jacutinga</i> =340 <i>Pipile pipile pipile</i> =340	
<i>Phasianidae</i> (Pheasants, partridges, quails and peacocks)	<i>Catreus wallichii</i> <i>Colinus virginianus ridgwayi</i> <i>Crossoptilon crossoptilon</i> <i>Crossoptilon harmani</i> =341 <i>Crossoptilon mantchuricum</i> <i>Lophophorus</i> spp. <i>Lophura edwardsi</i> <i>Lophura imperialis</i> <i>Lophura swinholi</i> <i>Polyplectron emphanum</i> <i>Rheinardia ocellata</i> =343 <i>Syrmaticus ellioti</i> <i>Syrmaticus humiae</i> <i>Syrmaticus mikado</i> <i>Tetraogallus caspius</i> <i>Tetraogallus tibetanus</i> <i>Tragopan blythii</i> <i>Tragopan caboti</i> <i>Tragopan melanocephalus</i> <i>Tympanuchus cupido attwateri</i>	<i>Argusianus argus</i> <i>Gallus sonneratii</i> <i>Ithaginis cruentus</i> <i>Pavo muticus</i> <i>Polyplectron bicalcaratum</i> <i>Polyplectron germaini</i> <i>Polyplectron malacense</i> <i>Polyplectron schleiermachersi</i> =342
<i>GRUIFORMES</i>		
Cranes, rails and kin		
<i>Turnicidae</i>		<i>Turnix melanogaster</i>
<i>Pedionomidae</i>		<i>Pedionomus torquatus</i>
<i>Gruidae</i> (Cranes)	<i>Grus americana</i>	<i>Gruidae</i> spp. *

	CHART A.1	CHART A.2
	<i>Grus canadensis nesiotes</i> <i>Grus canadensis pulla</i> <i>Grus japonensis</i> <i>Grus leucogeranus</i> <i>Grus monacha</i> <i>Grus nigricollis</i> <i>Grus vipio</i>	
<i>Rallidae</i> (Rails)	<i>Gallirallus sylvestris</i> =344	<i>Gallirallus australis hectori</i>
<i>Rhynochetidae</i> (Kagu)	<i>Rhynochetus jubata</i>	
<i>Otididae</i> (Bustards)	<i>Ardeotis nigriceps</i> =345 <i>Chlamydotis undulata</i> <i>Eupodotis bengalensis</i> =346	<i>Otididae</i> spp. *
CHARADRIIFORMES Waders, gulls and auks		
<i>Scolopacidae</i> (Sandpipers)	<i>Numenius borealis</i> <i>Numenius tenuirostris</i> <i>Tringa guttifer</i>	
<i>Laridae</i> (Gulls and terns)	<i>Larus relictus</i>	
COLUMBIFORMES Pigeons, sandgrouse and dodos		
<i>Columbidae</i> (Pigeons and doves)	<i>Caloenas nicobarica</i> <i>Ducula mindorensis</i>	<i>Gallicolumba luzonica</i> <i>Goura</i> spp.
PSITTACIFORMES Parrots and kin		PSITTACIFORMES spp. * -109
<i>Psittacidae</i> (Parrots)	<i>Amazona arausiaca</i> <i>Amazona barbadensis</i> <i>Amazona brasiliensis</i> <i>Amazona guildingii</i> <i>Amazona imperialis</i> <i>Amazona leucocephala</i> <i>Amazona pretrei</i> <i>Amazona rhodocorytha</i> =347 <i>Amazona tucumana</i> <i>Amazona versicolor</i>	

	CHART A.1	CHART A.2
	<i>Amazona vinacea</i> <i>Amazona vittata</i> <i>Anodorhynchus</i> spp. <i>Ara ambigua</i> <i>Ara glaucogularis</i> =348 <i>Ara macao</i> <i>Ara maracana</i> <i>Ara militaris</i>	
<i>Psittacidae</i> (continued)	<i>Ara rubrogenys</i> <i>Aratinga guarouba</i> <i>Cacatua goffini</i> <i>Cacatua haematuropygia</i> <i>Cacatua moluccensis</i> <i>Cyanopsitta spixii</i> <i>Cyanoramphus auriceps forbesi</i> <i>Cyanoramphus cookii</i> =348a <i>Cyanoramphus novaezelandiae</i> <i>Cyclopsitta diophthalma coxeni</i> =349 <i>Neophema chrysogaster</i> <i>Ognorhynchus icterotis</i> <i>Pezoporus occidentalis</i> p.e. =350 <i>Pezoporus wallicus</i> <i>Pionopsitta pileata</i> <i>Probosciger aterrimus</i> <i>Psephotus chrysopterygius</i> <i>Psephotus dissimilis</i> =351 <i>Psephotus pulcherrimus</i> p.e. <i>Psittacula echo</i> <i>Psittacus erithacus princeps</i> <i>Pyrrhura cruentata</i> <i>Rhynchopsitta</i> spp. <i>Strigops habroptilus</i>	
CUCULIFORMES		
Cuckoos and kin		
<i>Musophagidae</i> (Turacos and plan-		<i>Musophaga porphyreolophus</i>

	CHART A.1	CHART A.2
tain eaters)		=352 <i>Tauraco corythaix</i> <i>Tauraco fischeri</i> =353 <i>Tauraco livingstonii</i> =353 <i>Tauraco persa</i> =353 <i>Tauraco schalowi</i> =353 <i>Tauraco schuettii</i> =353
<i>STRIGIFORMES</i> Owls		<i>STRIGIFORMES</i> spp. *
<i>Tytonidae</i> (Barn owls)	<i>Tyto soumagnei</i>	
<i>Strigidae</i> (Typical owls)	<i>Athene blewitti</i> <i>Mimizuku gurneyi</i> =354 <i>Ninox novaeseelandiae undulata</i> =355 <i>Ninox squamipila natalis</i>	
<i>APODIFORMES</i> Swifts and hummingbirds		
<i>Trochilidae</i> (Hummingbirds)	<i>Glaucis dohrnii</i> =356	<i>Trochilidae</i> spp. *
<i>TROGONIFORMES</i> Trogons		
<i>Trogonidae</i> (Trogons)	<i>Pharomachus mocinno</i>	
<i>CORACIFORMES</i> Kingfishers and kin		
<i>Bucerotidae</i> (Hornbills)	<i>Aceros nipalensis</i> <i>Aceros subruficollis</i> <i>Buceros bicornis</i> <i>Buceros vigil</i> =357	<i>Aceros</i> spp. * <i>Anorrhinus</i> spp. <i>Anthracoceros</i> spp. <i>Buceros</i> spp. *
<i>PICIFORMES</i> Woodpeckers, toucans and kin		
<i>Ramphastidae</i>		<i>Pteroglossus aracari</i> <i>Pteroglossus viridis</i> <i>Pamphastos sulfuratus</i> <i>Ramphastos toco</i> <i>Ramphastos tucanus</i>

	CHART A.1	CHART A.2
		<i>Ramphastos vitellinus</i>
<i>Picidae</i> (Woodpeckers)	<i>Campephilus imperialis</i> <i>Dryocopus javensis richardsi</i>	
<i>PASSERIFORMES</i> Songbirds or perching birds		
<i>Cotingidae</i> (Cotingas)	<i>Cotinga maculata</i> <i>Xipholena atropurpurea</i>	<i>Rupicola</i> spp.
<i>Pittidae</i> (Pittas)	<i>Pitta gurneyi</i> <i>Pitta kochi</i>	<i>Pitta nympha</i> =357a <i>Pitta guajana</i>
<i>Atrichornithidae</i> (Scrub birds)	<i>Atrichornis clamosus</i>	
<i>Hirundinidae</i> (Swallows and martins)	<i>Pseudochelidon sirintarae</i>	
<i>Muscicapidae</i> (Old World fly catchers)	<i>Dasyornis broadbenti litoralis</i> p.e. <i>Dasyornis longirostris</i> <i>Picathartes</i> spp.	<i>Cyornis ruckii</i> =358
<i>Zosteropidae</i> (White-eyes)	<i>Zosterops albogularis</i>	
<i>Meliphagidae</i> (Honeyeaters)	<i>Lichenostomus melanops cassidix</i> =359	
<i>Emberizidae</i> (Cardinals)		<i>Gubernatrix cristata</i> <i>Paroaria capitata</i> <i>Paroaria coronata</i>
<i>Fringillidae</i> (Finches or New World seedeaters)	<i>Carduelis cucullata</i> =360	<i>Carduelis yarrellii</i> =360
<i>Estrildidae</i>		<i>Poephila cincta cincta</i>
<i>Sturnidae</i> (Starlings)	<i>Leucopsar rothschildi</i>	
<i>Paradisaeidae</i> (Birds of para dise)		<i>Paradisaeidae</i> spp.
<i>REPTILIA</i> (REPTILES)		
<i>TESTUDINATA</i> Chelonians, tortoises, terrapins and turtles		
<i>Dermatemydidae</i>		<i>Dermatemys mawii</i>
<i>Emydidae</i> (Freshwater turtles)	<i>Batagur baska</i> <i>Clemmys muhlenbergi</i> <i>Geoclemys hamiltonii</i> <i>Kachuga tecta tecta</i> <i>Melanochelys tricarinata</i> =361 <i>Morenia ocellata</i>	<i>Clemmys insculpta</i>

	CHART A.1	CHART A.2
	<i>Terrapene coahuila</i>	
<i>Testudinidae</i> (Land tortoises)	<i>Geochelone elephantopus</i> =362 <i>Geochelone radiata</i> =362 <i>Geochelone yniphora</i> =362 <i>Gopherus flavomarginatus</i> <i>Psammobates geometricus</i> =362	<i>Testudinidae</i> spp. *
<i>Cheloniidae</i> (Sea turtles)	<i>Cheloniidae</i> spp.	
<i>Dermochelyidae</i> (Leather-back turtles)	<i>Dermochelys coriacea</i>	
<i>Trionychidae</i> (Soft-shelled turtles)	<i>Lissemys punctata punctata</i> <i>Trionyx ater</i> <i>Trionyx gangeticus</i> <i>Trionyx hurum</i> <i>Trionyx nigricans</i>	
<i>Pelomedusidae</i> (Side-necked turtles)		<i>Erymnochelys madagascar iensis</i> =363 <i>Peltocephalus dumeriliana</i> =363 <i>Podocnemis</i> spp.
<i>Chelidae</i> (Snake-necked turtles)	<i>Pseudemydura umbrina</i>	
CROCODYLIA Crocodilians		CROCODYLIA spp. * =364
<i>Alligatoridae</i> (Alligators and caimans)	<i>Alligator sinensis</i> <i>Caiman crocodilus apaporiensis</i> <i>Caiman latirostris</i> <i>Melanosuchus niger</i>	
<i>Crocodylidae</i> (True crocodiles and false gavials)	<i>Crocodylus acutus</i> <i>Crocodylus cataphractus</i> <i>Crocodylusintermedius</i> <i>Crocodylusmoreletii</i> <i>Crocodylus niloticus</i> ** -110 +213 <i>Crocodylus novaeguineae mindo rensis</i> <i>Crocodylus palustris</i> <i>Crocodylus porosus</i> ** -111 <i>Crocodylus rhombifer</i> <i>Crocodylus siamensis</i>	

	CHART A.1	CHART A.2
	<i>Osteolaemus tetraspis</i> <i>Tomistoma schlegelii</i>	
<i>Gavialidae</i> (Gavials)	<i>Gavialis gangeticus</i>	
RHYNCHOCEPHALIA Mesozoic rhynchocephalia		
<i>Sphenodontidae</i> (Tuatara)	<i>Sphenodon punctatus</i>	
SAURIA Lizards		
<i>Gekkonidae</i> (Geckos)		<i>Cyrtodactylus serpensinsula</i> <i>Phelsuma</i> spp.
<i>Agamidae</i> (Agamids)		<i>Uromastyx</i> spp.
<i>Chamaeleonidae</i> (Chameleons)		<i>Bradypodion</i> spp. =365 <i>Chamaeleo</i> spp.
<i>Iguanidae</i> (Iguanids)	<i>Brachylophus</i> spp. <i>Cyclura</i> spp. <i>Sauromalus varius</i>	<i>Amblyrhynchus cristatus</i> <i>Conolophus</i> spp. <i>Iguana</i> spp. <i>Phrynosoma coronatum</i>
<i>Lacertidae</i>	<i>Gallotia simonyi</i>	<i>Podarcis lilfordi</i> <i>Podarcis pityusensis</i>
<i>Cordylidae</i>		<i>Cordylus</i> spp. <i>Pseudocordylus</i> spp.
<i>Teiidae</i> (Teiid lizards)		<i>Cnemidophorus hyperthrus</i> <i>Crocodilurus lacertinus</i> <i>Dracena</i> spp. <i>Tupinambis</i> spp.
<i>Scincidae</i>		<i>Corucia zebrata</i>
<i>Xenosauridae</i>		<i>Shinisaurus crocodilurus</i>
<i>Helodermatidae</i> (Gila monster or bearded lizards)		<i>Heloderma</i> spp.
<i>Varanidae</i> (Monitors)	<i>Varanus bengalensis</i> <i>Varanus flavescens</i> <i>Varanus griseus</i> <i>Varanus komodoensis</i>	

	CHART A.1	CHART A.2
<i>SERPENTES</i>		
Snakes		
<i>Boidae</i> (boas and anacondas)	<i>Acrantophis</i> spp. <i>Boa constrictor occidentalis</i> =366 <i>Bolyeria multocarinata</i> <i>Casarea dussimieri</i> <i>Epicrates inornatus</i> <i>Epicrates monensis</i> <i>Epicrates subflavus</i> <i>Python molurus molurus</i> <i>Sanzinia madagascariensis</i>	<i>Boidae</i> spp. *
<i>Colubridae</i> (Water snakes, grass snakes and tree snakes)		<i>Clelia clelia</i> =367 <i>Cyclagras gigas</i> =368 <i>Elachistodon westermanni</i> <i>Pytas mucosus</i>
<i>Elapidae</i> (Font-fanged snakes)		<i>Hoplocephalus bungaroides</i> <i>Naja naja</i> <i>Ophiophagus hannah</i>
<i>Viperidae</i> (Vipers)	<i>Vipera ursinii</i> +214	<i>Vipera wagneri</i>
<i>AMPHIBIA (AMPHIBIANS)</i>		
<i>CAUDATA</i>		
Tailed amphibians		
<i>Ambystomidae</i> (Mole amphibians)		<i>Ambystoma dumerilii</i> <i>Ambystoma mexicanum</i>
<i>Cryptobranchidae</i> (Giant salamanders)	<i>Andrias</i> spp. =369	
<i>ANURA</i>		
Tail-less amphibians (frogs and toads)		
<i>Bufo</i> (True toads)	<i>Atelopus varius zeteki</i> <i>Bufo superciliaris</i> <i>Nectophrynoides</i> spp.	<i>Bufo retiformis</i>
<i>Myobatrachidae</i>		<i>Rheobatrachus</i> spp.
<i>Dendrobatidae</i>		<i>Dendrobates</i> spp. <i>Phyllobates</i> spp.
<i>Ranidae</i>		<i>Rana hexadactyla</i>

	CHART A.1	CHART A.2
		<i>Rana tigrina</i>
<i>Microhylidae</i>	<i>Dyscophus antongilii</i>	
<i>PISCES (FISH)</i>		
<i>CERATODIFORMES</i>		
<i>Ceratodidae (Ceratodes)</i>		<i>Neoceratodus forsteri</i>
<i>COELACANTHIFORMES</i>		
<i>Coelacanthidae</i>	<i>Latimeria chalumnae</i>	
<i>ACIPENSERIFORMES</i> Sturgeon and paddlefishes		
<i>Acipenseridae (Sturgeons)</i>	<i>Acipenser brevirostrum</i> <i>Acipenser sturio</i>	<i>Acipenser oxyrhynchus</i>
<i>OSTEOGLOSSIFORMES</i> Bony-tongues and kin		
<i>Osteoglossidae (Bony-tongues)</i>	<i>Scleropages formosus</i> ** -112	<i>Arapaima gigas</i> <i>Scleropages formosus</i> * +215
<i>CYPRINIFORMES</i> Carp and carp-like fish		
<i>Cyprinidae (Carp)</i>	<i>Probarbus jullieni</i>	<i>Caecobarbus geertsi</i>
<i>Catostomidae</i>	<i>Chamistes cujus</i>	
<i>SILURIFORMES</i> Catfish		
<i>Schilbeidae (Schilbeid catfish)</i>	<i>Pangasianodon gigas</i>	
<i>PERCIFORMES</i> Perch-like fish		
<i>Sciaenidae (Drumfish or croakers)</i>	<i>Cynoscion macdonaldi</i>	
<i>INSECTA (INSECTS)</i>		
<i>LEPIDOPTERA</i> Butterflies and moths		
<i>Papilionidae (Swallowtails and parnassian)</i>	<i>Ornithoptera alexandrae</i> <i>Papilio chikae</i> <i>Papilio homerus</i> <i>Papilio hospiton</i>	<i>Bhutanitis</i> spp. <i>Ornithoptera</i> spp. =370 <i>Parnassus apollo</i> <i>Teinopalpus</i> spp. <i>Trogonoptera</i> spp. =370

	CHART A.1	CHART A.2
		<i>Troides</i> spp. =370
ARACHNIDA		
ARAENAE		
<i>Theraphosidae</i>		<i>Brachypelma smithi</i>
ANNELIDA		
ARHYNCHOBDELLAE		
<i>Hirudinidae</i> (Leeches)		<i>Hirudo medicinalis</i>
MOLLUSCA (MOLLUSCS)		
VENEROIDA		
<i>Tridacnidae</i> (Giant clams)		<i>Triacnidae</i> spp.
UNIONOIDA		
Naiads or freshwater bivalves		
<i>Unionoidae</i> (Freshwater mussels)	<i>Conradilla caelata</i> <i>Dromus dromas</i> <i>Epioblasma curtisi</i> =371 <i>Epioblasma florentina</i> =371 <i>Epioblasma sampsoni</i> =371 <i>Epioblasma sulcata perobliqua</i> =371 <i>Epioblasma torulosa gubernacu lum</i> =371 <i>Epioblasma torulosa turulosa</i> =371 <i>Epioblasma turgidula</i> =371 <i>Epioblasma walkeri</i> =371 <i>Fusconaia cuneolus</i> <i>Fusconaia edgariana</i> <i>Lampsilis higginsii</i> <i>Lampsilis orbiculata orbiculata</i> <i>Lampsilis satura</i> <i>Lampsilis virescens</i> <i>Plethobasus cicatricosus</i> <i>Plethobasus cooperianus</i> <i>Pleurobema plenum</i> <i>Potamilus capax</i> =372 <i>Quadrula intermedia</i> <i>Quadrula sparsa</i>	<i>Cyprogenia aberti</i> <i>Epioblasma torulosarangiana</i> =371 <i>Fusconaia subrotunda</i> <i>Lampsilis brevicula</i> <i>Lexingtonia dolabelloides</i> <i>Pleurobema clava</i>

	CHART A.1	CHART A.2
	<i>Toxolasma cylindrella</i> =373 <i>Unio nickliniana</i> <i>Unio tampicoensis tecomatensis</i> <i>Villosa trabalis</i> =374	
STYLOMMATOPHORA Land snails		
<i>Achatinellidae</i>	<i>Achatinella</i> spp.	
<i>Camaenidae</i> (American land snails)		<i>Papustyla pulcherrima</i> =375
<i>Paryphantidae</i>		<i>Paryphanta</i> spp. +216
MESOGASTROPODA		
<i>Strombidae</i>		<i>Strombus gigas</i>
ANTHOZOA		
ANTIPATHARIA		ANTIPATHARIA spp.
SCLERACTINIA Stony corals		SCLERACTINA spp. °502
HYDROZOA		
ATHECATA Stony Corals		
<i>Milleporidae</i>		<i>Milleporidae</i> spp. °503
<i>Stylasteridae</i>		<i>Stylasteridae</i> spp. °503
ALCYONARIA		
COENOTHECALIA		COENATHECALIA spp. °503
STOLONIFERA		
<i>Tubiporidae</i> (Organpipe corals)		<i>Tubiporidae</i> spp. °503
FLORA		
AGAVACEAE	<i>Agave arizonica</i> <i>Agave parviflora</i>	<i>Agave victoriae-reginae</i> #1
AMARYLLIDACEAE		<i>Galanthus</i> spp. #1 <i>Sternbergia</i> spp. #1
APOCYNACEAE	<i>Pachypodium baronii</i> <i>Pachypodium brevicaule</i> <i>Pachypodium decaryi</i> <i>Pachypodium namaquanum</i>	<i>Pachypodium</i> spp. * #1 <i>Rauvolfia serpentina</i> #2

	CHART A.1	CHART A.2
ARACEAE Arum family		<i>Alocasia sandariana</i> #1
ARALIACEAE		<i>Panax quinquefolius</i> #3
ARAUCARIACEAE Monkey puzzle family	<i>Araucaria araucana</i> ** +217	<i>Araucaria araucana</i> * -113 #1
ASCLEPIADACEAE		<i>Ceropegia</i> spp. #1 <i>Frerea indica</i> #1
BERBERIDACEAE		<i>Podophyllum hexandrum</i> =376 #2
BROMELIACEAE		<i>Tillandsia harrisii</i> #1 <i>Tillandsia kammii</i> #1 <i>Tillandsia kautskyi</i> #1 <i>Tillandsia mauryana</i> #1 <i>Tillandsia sprengeliana</i> #1 <i>Tillandsia sucrei</i> #1 <i>Tillandsia xerographica</i> #1
BYBLIDACEAE		<i>Byblis</i> spp. #1
CACTACEAE Cactus family	<i>Ariocarpus</i> spp. <i>Astrophytum asterias</i> =377 <i>Aztekium ritteri</i> <i>Coryphanta minima</i> =378 <i>Coryphanta sneedii</i> =378 <i>Coryphanta werdermannii</i> <i>Discocactus</i> spp. <i>Discocactus macdougallii</i> =379 <i>Echinocereus ferreirianus</i> var. <i>lind sayi</i> =380 <i>Echinocereus schmollii</i> =381 <i>Leuchtenbergia principis</i> <i>Mammillaria pectinifera</i> =382 <i>Mammillaria plumosa</i> <i>Mammillaria solisioides</i> <i>Melocactus conoideus</i> <i>Melocactus deinacanthus</i> <i>Melocactus glaucescens</i>	CACTACEAE spp. * #4

	CHART A.1	CHART A.2
	<i>Melocactus paucispinus</i> <i>Obregonia denegrii</i> <i>Pachycereus militaris</i> =383 <i>Pediocactus bradyi</i> =384 <i>Pediocactus despainii</i> <i>Pediocactus knowltonii</i> =384 <i>Pediocactus papyracanthus</i> =385 <i>Pediocactus paradinei</i> <i>Pediocactus peeblesianus</i> =384 <i>Pediocactus sileri</i> <i>Pediocactus winkleri</i> <i>Pelecyphora</i> spp. <i>Scelerocactus brevihamaticus</i> =386 <i>Scelerocactus erectocentrus</i> =387 <i>Scelerocactus glaucus</i> <i>Scelerocactus mariposensis</i> =387 <i>Scelerocactus mesae-verdae</i> <i>Scelerocactus pubispinus</i>	
CACTACEAE (continued)	<i>Scelerocactus wrightiae</i> <i>Strombocactus disciformis</i> <i>Turbinicarpus</i> spp. =388 <i>Uebelmannia</i> spp.	
CARYOCARACEAE		<i>Caryocar costaricense</i> #1
CEPHALOTACEAE		<i>Cephalotus follicularis</i> #1
COMPOSITAE (ASTERACEAE) Composite family	<i>Saussurea costus</i> =389	
CRASSULACEAE	<i>Dudleya stolonifera</i> <i>Dudleya traskiae</i>	
CUPRESSACEAE Cypress family	<i>Fitzroya cupressoides</i> <i>Pilgerodendron uviferum</i>	
CYATHEACEAE		CYATHEACEAE spp. #1
CYCADACEAE	<i>Cycas beddomei</i>	CYCADACEAE spp. * #1
DIAPENSIACEAE		<i>Shortia galacifolia</i> #1

	CHART A.1	CHART A.2
<i>DICKSONIACEAE</i> Dicksonia family		<i>DICKSONIACEAE</i> spp. #1
<i>DIDIEREACEAE</i>		<i>DIDIEREACEAE</i> spp. #1
<i>DIOSCOREACEAE</i> Yams		<i>Dioscorea deltoidea</i> #1
<i>DROSERACEAE</i>		<i>Dionea muscipula</i> #1
<i>ERICACEAE</i>		<i>Kalmia cuneata</i> #1
<i>EUPHORBIACEAE</i> Euphorbias	<i>Euphorbia ambovombensis</i> <i>Euphorbia cylindrifolia</i> <i>Euphorbia decaryi</i> <i>Euphorbia francoisii</i> <i>Euphorbia moratii</i> <i>Euphorbia parvicyathophora</i> <i>Euphorbia primulifolia</i> <i>Euphorbia quartziticola</i> <i>Euphorbia tulearensis</i>	<i>Euphorbia</i> spp. -114 #1
<i>FOUQUIERIACEAE</i>	<i>Fouquieria fasciculata</i> <i>Fouquieria purpusii</i>	<i>Fouquieria columnaris</i> #1
<i>JUGLANDACEAE</i> Walnut, hickory and pecan family		<i>Oreomunnea pterocarpa</i> =390 #1
<i>LEGUMINOSAE (FABACEAE)</i> Laburnum family	<i>Dalbergia nigra</i>	<i>Pericopsis elata</i> #5 <i>Platymiscium pleiostachyum</i> #1
<i>LILIACEAE</i> Lily family	<i>Aloe albida</i> <i>Aloe pillansii</i> <i>Aloe polyphylla</i> <i>Aloe thorncroftii</i> <i>Aloe vossii</i>	<i>Aloe</i> spp. * #6
<i>MELIACEAE</i> Mahogany family		<i>Swietenia humilis</i> #1 <i>Swietenia mahagoni</i> #5
<i>NEPENTHACEAE</i>	<i>Nepenthes khasiana</i> <i>Nepenthes rajah</i>	<i>Nepenthes</i> spp. * #1
<i>ORCHIDACEAE</i> Orchid family	<i>Cattleya skinneri</i> °504 <i>Cattleya trianae</i> °504 <i>Didicicia cunninghamii</i> °504	<i>ORCHIDACEAE</i> spp. * =391 #7

	CHART A.1	CHART A.2
	<i>Laelia jongheana</i> °504 <i>Laelia lobata</i> °504 <i>Lycaste skinneri var alba</i> =392 °504 <i>Paphiopedilum</i> spp. °504 <i>Peristeria elata</i> °504 <i>Phragmipedium</i> spp. °504 <i>Renanthera imschootiana</i> °504 <i>Vanda coerulea</i> °504	
PALMAE (ARECACEAE) Palm family		<i>Chrysalidocarpus decipiens</i> #1 <i>Neodypsis decaryi</i> #1
PINACEAE Pine family	<i>Abies guatemalensis</i>	
PODOCARPACEAE	<i>Podocarpus parlatorei</i>	
PORTULACACEAE Purslane family		<i>Anacampseros</i> spp. #1 <i>Lewisia cotyledon</i> #1 <i>Lewisia maguirei</i> #1 <i>Lewisia serrata</i> #1 <i>Lewisia tweedyi</i> #1
PRIMULACEAE Primose family		<i>Cyclamen</i> spp. #1
PROTEACEAE Protea family	<i>Orothamnus zeyheri</i> <i>Protea odorata</i>	
RUBIACEAE Madder family	<i>Balmea stormiae</i>	
SARRACENIACEAE	<i>Sarracenia alabamensis alabamensis</i> =393 <i>Sarracenia jonesii</i> =394 <i>Sarracenia oreophila</i>	<i>Darlingtonia californica</i> #1 <i>Sarracenia</i> spp. * #1
STANGERIACEAE Cycad family	<i>Stangeria eriopus</i> =395	
THEACEAE		<i>Camellia chrysantha</i> #1
WELWITSCHIACEAE		<i>Welwitschia mirabilis</i> =396 #1
ZAMIACEAE Cycad (palm) family	<i>Ceratozamia</i> spp. <i>Chigua</i> spp.	ZAMIACEAE spp. * #1

	CHART A.1	CHART A.2
	<i>Encephalartos</i> spp. <i>Microcycas calocoma</i>	
ZINGIBERACEAE Ginger family		<i>Hedychium philippinense</i> #1
ZYGOPHYLLACEAE Lignum-vitae family		<i>Guaiacum officinale</i> #1 <i>Guaiacum sanctum</i> #1

Chart A.3

INTERPRETATION

A. References to taxa higher than species are for the purpose of information or classification only.

B. The symbol (=) followed by a number placed against the name of a species denotes that the name of that species is interpreted as follows:

- =397 Includes synonym *Tamunda mexicana*
- =398 Includes synonym *Cabassous gymmurus*
- =399 Includes synonym *Manis longicaudata*
- =400 Includes generic synonym *Coendou*
- =401 Includes generic synonym *Cuniculus*
- =402 Includes synonym *Vulpes vulpes leucopus*
- =403 Includes synonym *Nasua narica*
- =404 Includes synonym *Galictis allamandi*
- =405 Includes synonym *Martes gwatkinsi*
- =406 Includes generic synonym *Viverra*
- =407 Also referenced as *Tragelaphus eurycerus*; includes generic synonym *Taurotragus*
- =408 Formerly included as *Bublaus bubalis* (domesticated form)
- =409 Also referenced as *Ardeola ibis*
- =410 Also referenced as *Egretta alba*
- =411 Also referenced as *Hagedashia hagedash*
- =412 Also referenced as *Lampribus rara*
- =413 Also referenced as *Spatula clypeata*
- =414 Also referenced as *Nyroca nyroca*
- =415 Includes synonym *Dendrocygna fulva*
- =416 Also referenced as *Cairina hartlaubii*
- =417 Also referenced as *Crax pauxi*
- =418 Also referenced as *Arborophila brunneopectus* (in part)
- =419 Also referenced as *Turturoena iriditorques* or as *Columba malherbii* (in part)
- =420 Also referenced as *Nesoenas mayeri*
- =421 Also referenced as *Treron australis* (in part)
- =422 Also referenced as *Calopelia brehmeri*; includes synonym *Calopelia puella*
- =423 Also referenced as *Tympanistria tympanistria*
- =424 Also referenced as *Tchitrea bourbonnensis*
- =424a Also referenced as *Xanthospar flavus*
- =424b Also referenced as *Serinus gularis* (in part)
- =425 Also referenced as *Estrilda subflava* or as *Sporaeginthus subflavus*
- =426 Also referenced as *Lagonostica larvata* (in part)

- =427 Includes generic synonym *Spermestes*
- =428 Also referenced as *Euodice cantans*; includes synonym *Lonchura malabarica*
- =429 Also referenced as *Hypargos nitidulus*
- =430 Also referenced as *Parmoptila woodhousei* (in part)
- =431 Includes synonyms *Pyrenestes frommi* and *Pyrenestes rothschildi*
- =432 Also referenced as *Estrilda bengala*
- =433 Also referenced as *Malimbus rubriceps* or as *Anaplectes melanotis*
- =434 Also referenced as *Coluispasser ardens*
- =435 Also referenced as *Ploceus superciliosus*
- =438 Includes synonym *Ploceus nigriceps*
- =439 Also referenced as *Sitagra luteola*
- =440 Also referenced as *Sitagra melanocephala*
- =441 Also referenced as *Hypochera chalybeata*; includes synonyms *Vidua amauropteryx*, *Vidua centralis*, *Vidua neumanni*, *Vidua okavangoensis* and *Vidua ultramarina*
- =442 Also referenced as *Vidua paradisaea* (in part)
- =443 Also referenced as *Pelusios subniger*
- =444 Formerly included in genus *Natrix*

C. The names of the countries placed against the names of species are those of the Parties submitting these species for inclusion in this appendix.

D. In accordance with Article I, paragraph (b), sub-paragraphs (ii) and (iii), of the Convention, and with Resolutions Conf. 4.24 and Conf. 6.18, the symbol (#) followed by a number placed against the name of a species included in Chart A.3 designates parts or derivatives which are specified in relation thereto for the purposes of the Convention as follows:

- #1 Designates all readily recognizable parts and derivatives, except:
 - a. seeds, spores and pollen (including pollinia)
 - b. tissue cultures and flasks seedling cultures.

	SPECIES	COUNTRY
FAUNA (Animals)		
<i>MAMMALIA</i> (Mammals)		
<i>CHIROPTERA</i>		
Bats		
<i>Phyllostomidae</i>	<i>Vampyrops lineatus</i>	Uruguay
<i>EDENTATA</i>		
Edentates		
<i>Myrmecophagidae</i> (Ant-eaters)	<i>Tamandua tetradactyla</i> =397	Guatemala
<i>Choloepidae</i> (Sloths)	<i>Choloepus hoffmanni</i>	Costa Rica
<i>Dasypodidae</i> (Armadillos)	<i>Cabassous centralis</i>	Costa Rica
	<i>Cabassous tatouay</i> =398	Uruguay
<i>PHOLIDOTA</i>		
(Pangolins or scaly ant-eaters)		
<i>Manidae</i> (Pangolins)	<i>Manis gigantea</i>	Ghana
	<i>Manis tetradactyla</i> =399	Ghana
	<i>Manis tricuspis</i>	Ghana
<i>RODENTIA</i>		
Rodents		
<i>Sciuridae</i> (Squirrels and mar mots)	<i>Epixerus ebii</i>	Ghana
	<i>Marmota caudata</i>	India
	<i>Marmota himalayana</i>	India
	<i>Sciurus deppei</i>	Costa Rica
<i>Anomaluridae</i> (Scaly-tailed squirrels)	<i>Anomalurus beecrofti</i>	Ghana
	<i>Anomalurus derbianus</i>	Ghana
	<i>Anomalurus peli</i>	Ghana
	<i>Idiurus macrotis</i>	Ghana
<i>Hystricidae</i> (Old World porcupines)	<i>Hystrix cristata</i>	Ghana
<i>Erethizontidae</i> (New World porcupines)	<i>Sphiggurus mexicanus</i> =400	Honduras
	<i>Sphiggurus spinosus</i> =400	Uruguay
<i>Agoutidae</i>	<i>Agouti paca</i> =401	Honduras
<i>Dasyproctidae</i>	<i>Dasyprocta punctata</i>	Honduras
<i>CARNIVORA</i>		

	SPECIES	COUNTRY
Carnivores		
<i>Canidae</i> (Dogs, wolves and foxes)	<i>Canis aureus</i> <i>Vulpes bengalensis</i> <i>Vulpes vulpes griffithi</i> <i>Vulpes vulpes montana</i> <i>Vulpes vulpes pusilla</i> =402	India India India India India
<i>Procyonidae</i> (Raccoons)	<i>Bassaricyon gabbii</i> <i>Bassariscus sumichrasti</i> <i>Nasua nasua</i> =403 <i>Nasua nasua solitaria</i> <i>Potos flavus</i>	Costa Rica Costa Rica Honduras Uruguay Honduras
<i>Mustelidae</i> (Weasels, badgers, skunks, et al.)	<i>Eira barbara</i> <i>Galictis vittata</i> =404 <i>Martes flavigula</i> =405 <i>martes foina intermedia</i> <i>Mellivora capensis</i> <i>Mustela altaica</i> <i>Mustela erminea</i> <i>Mustela kathiah</i> <i>Mustela sibirica</i>	Honduras Costa Rica India India Botswana, Ghana India India India India
<i>Viverridae</i> (Genets, civets and mongooses)	<i>Arctictis binturong</i> <i>Civettictis civetta</i> =406 <i>Paguma larvata</i> <i>Paradoxurus hermaphroditus</i> <i>Paradoxurus jerdoni</i> <i>Viverra megaspila</i> <i>Viverra zibetha</i> <i>Viverricula indica</i>	India Botswana India India India India India India
<i>Herpestidae</i>	<i>Herpestes auropunctatus</i> <i>Herpestes edwardsi</i> <i>Herpestes fuscus</i> <i>Herpestes smithii</i> <i>Herpestes urva</i> <i>Herpestes vitticollis</i>	India India India India India India
<i>Protelidae</i> (Hyaenas)	<i>Proteles cristatus</i>	Botswana

	SPECIES	COUNTRY
<i>PINNIPEDIA</i> Seals and walruses		
<i>Odobenidae</i> (Walruses)	<i>Odobenus rosmarus</i>	Canada
<i>ARTIODACTYLA</i> Even-toed ungulates		
<i>Hippopotamidae</i> (Hippopotamuses)	<i>Hippopotamus amphibius</i>	Ghana
<i>Tragulidae</i> (Chevrotains)	<i>Hyemoschus aquaticus</i>	Ghana
<i>Cervidae</i> (True deer)	<i>Cervus elaphus barbarus</i>	Tunisia
	<i>Mazama americana cerasina</i>	Guatemala
	<i>Odocoileus virginianus mayensis</i>	Guatemala
<i>Bovidae</i> (Cattle, sheep, goats, antelopes, etc.)	<i>Antilope cervicapra</i>	Nepal
	<i>Boocercus eurycerus</i> =407	Ghana
	<i>Bubalus arnee</i> =408	Nepal
	<i>Damaliscus lunatus</i>	Ghana
	<i>Gazella cuvieri</i>	Tunisia
	<i>Gazella dorcas</i>	Tunisia
	<i>Gazella leptoceros</i>	Tunisia
	<i>Tetracerus quadricornis</i>	Nepal
	<i>Tragelaphus spekei</i>	Ghana
<i>AVES (BIRDS)</i>		
<i>CICONIIFORMES</i> Wading birds (herons and kin)		
<i>Ardeidae</i> (Herons and bitterns)	<i>Ardea goliath</i>	Ghana
	<i>Bubulcus ibis</i> =409	Ghana
	<i>Casmerodius albus</i> =410	Ghana
	<i>Egretta garzetta</i>	Ghana
<i>Ciconiidae</i> (Storks)	<i>Ephippiorhynchus senegalensis</i>	Ghana
	<i>Leptoptilos crumeniferus</i>	Ghana
<i>Threskiornithidae</i> (Ibises and spoonbills)	<i>Bostrychia hagedash</i> =411	Ghana
	<i>Bostrychia rara</i> =412	Ghana
	<i>Threskiornis aethiopicus</i>	Ghana
<i>ANSERIFORMES</i>		

	SPECIES	COUNTRY
Waterfowl		
<i>Anatidae</i> (Ducks, geese and swans)	<i>Alopochen aegyptiacus</i>	Ghana
	<i>Anas acuta</i>	Ghana
	<i>Anas capensis</i>	Ghana
	<i>Anas clypeata</i> =413	Ghana
	<i>Anas crecca</i>	Ghana
	<i>Anas penelope</i>	Ghana
	<i>Anas querquedula</i>	Ghana
	<i>Aythya nyroca</i> =414	Ghana
	<i>Cairina moschata</i>	Honduras
	<i>Dendrocygna autumnalis</i>	Honduras
	<i>Dendrocygna bicolor</i> =415	Ghana, Honduras
	<i>Dendrocygna vidulata</i>	Ghana
	<i>Nettapus auritus</i>	Ghana
	<i>Plectropterus gambensis</i>	Ghana
<i>Pteronetta hartlaubii</i> =416	Ghana	
<i>FALCONIFORMES</i>		
Birds of Prey		
<i>Cathartidae</i> (New World vultures)	<i>Sarcoramphus papa</i>	Honduras
<i>GALLIFORMES</i>		
Game birds of fowl-like birds		
<i>Cracidae</i> (Curassows and guans)	<i>Crax alberti</i>	Colombia
	<i>Crax daubentoni</i>	Colombia
	<i>Crax globulosa</i>	Colombia
	<i>Crax rubra</i>	Colombia, Costa Rica, Guatemala, Honduras
	<i>Ortalis vetula</i>	Guatemala, Honduras
	<i>Pauxi pauxi</i> =417	Colombia
	<i>Penelope purpurascens</i>	Honduras
	<i>Penelopina nigra</i>	Guatemala
<i>Phasianidae</i> (Pheasants, partridges, quails and peacocks)	<i>Agelastes meleagrides</i>	Ghana
	<i>Agriocharis ocellata</i>	Guatemala
	<i>Arborophila charltonii</i>	Malaysia
	<i>Arborophila orientalis</i> =418	Malaysia
	<i>Caloperdix oculea</i>	Malaysia

	SPECIES	COUNTRY
	<i>Lophura erythrophthalma</i>	Malaysia
	<i>Lophura ignita</i>	Malaysia
	<i>Melanoperdix nigra</i>	Malaysia
	<i>Polyplectron inopinatum</i>	Malaysia
	<i>Rhizathera longirostris</i>	Malaysia
	<i>Rollulus rouloul</i>	Malaysia
	<i>Tragopan satyra</i>	Nepal
CHARADRIIFORMES Waders, gulls and auks		
<i>Burhinidae</i> (Thick-knees)	<i>Burhinus bistriatus</i>	Guatemala
COLUMBIFORMES Pigeons, sandgrouse and dodos		
<i>Columbidae</i> (Pigeons and doves)	<i>Columba guinea</i>	Ghana
	<i>Columba iriditorques</i> =419	Ghana
	<i>Columba livia</i>	Ghana
	<i>Columba mayeri</i> =420	Mauritius
	<i>Columba unicincta</i>	Ghana
	<i>Oena capensis</i>	Ghana
	<i>Streptopelia</i>	Ghana
	<i>decipiens</i>	Ghana
	<i>Streptopelia roseogrisea</i>	Ghana
	<i>Streptopelia semitorquata</i>	Ghana
	<i>Streptopelia senegalensis</i>	Ghana
	<i>Streptopelia turtur</i>	Ghana
	<i>Streptopelia vinacea</i>	Ghana
<i>Columbidae</i> (continued)	<i>Treron calva</i> =421	Ghana
	<i>Treron waalia</i>	Ghana
	<i>Turtur abyssinicus</i>	Ghana
	<i>Turtur afer</i>	Ghana
	<i>Turtur brehmeri</i> =422	Ghana
	<i>Turtur tympanistreria</i> =423	Ghana
PSITTACIFORMES Parrots and kin		
<i>Psittacidae</i> (Parrots)	<i>Psittacula krameri</i>	Ghana
CUCULIFORMES		

	SPECIES	COUNTRY
Cuckoos and kin		
<i>Musophagidae</i> (Turacos and plantain eaters)	<i>Corythaeola cristata</i>	Ghana
	<i>Crinifer piscator</i>	Ghana
	<i>Musophaga violacea</i>	Ghana
	<i>Tauraco macrorhynchus</i>	Ghana
<i>PICIFORMES</i>		
Woodpeckers, toucans and kin		
<i>Capitonidae</i>	<i>Semnornis ramphastinus</i>	Colombia
<i>Ramphastidae</i> (Toucans)	Baillonius bailloni	Argentina
	Pteroglossus castanotis	Argentina
	Ramphastos dicolorus	Argentina
	Selenidera maculirostris	Argentina
<i>PASSERIFORMES</i>		
Songbirds or perching birds		
<i>Cotingidae</i> (Cotingas)	<i>Cephalopterus ornatus</i>	Colombia
	<i>Cephalopterus penduliger</i>	Colombia
<i>Muscicapidae</i> (Old World fly catchers)	<i>Bebornis rodericanus</i>	Mauritius
	<i>Terpsiphone bourbonnensis</i> =424	Mauritius
<i>Icteridae</i> (Icterids)	<i>Agelaius flavus</i> =424a	Uruguay
<i>Fringillidae</i> (Finches or New World seedeaters)	<i>Serinus canicapillus</i> =424b	Ghana
	<i>Serinus leucopygius</i>	Ghana
	<i>Serinus mozambicus</i>	Ghana
<i>Estrildidae</i> (Estrildid finches)	<i>Amadina fasciata</i>	Ghana
	<i>Amandava subflava</i> =425	Ghana
	<i>Estrilda astrild</i>	Ghana
	<i>Estrilda caerulescens</i>	Ghana
	<i>Estrilda melpoda</i>	Ghana
	<i>Estrilda troglodytes</i>	Ghana
	<i>Lagonosticta rara</i>	Ghana
	<i>Lagonosticta rubricata</i>	Ghana
	<i>Lagonosticta rufopicta</i>	Ghana
	<i>Lagonosticta senegala</i>	Ghana
	<i>Lagonosticta vinacea</i> =426	Ghana
	<i>Lonchura bicolor</i> =427	Ghana

	SPECIES	COUNTRY
	<i>Lonchura cantans</i> =428	Ghana
	<i>Lonchura cucullata</i> =427	Ghana
	<i>Lonchura fringilloides</i> =427	Ghana
	<i>Mandingoa nitidula</i> =429	Ghana
	<i>Nesocharis capistrata</i>	Ghana
	<i>Nigrita bicolor</i>	Ghana
	<i>Nigrita canicapilla</i>	Ghana
	<i>Nigrita fusconota</i>	Ghana
	<i>Nigrita luteifrons</i>	Ghana
	<i>Ortygospiza atricollis</i>	Ghana
	<i>Parmoptila rubrifrons</i> =430	Ghana
	<i>Pholidornis ruschiae</i>	Ghana
	<i>Pyrenestes ostrinus</i> =431	Ghana
	<i>Pytilia hypogrammica</i>	Ghana
	<i>Pytilia phoenicoptera</i>	Ghana
	<i>Spermophaga haematina</i>	Ghana
	<i>Uraeginthus bengalus</i> =432	Ghana
<i>Ploceidae</i> (Weaver-birds)	<i>Amblyospiza albifrons</i>	Ghana
	<i>Anaplectes rubriceps</i> =433	Ghana
	<i>Anomalospiza imberbis</i>	Ghana
	<i>Bubalornis albirostris</i>	Ghana
	<i>Euplectes afer</i>	Ghana
	<i>Euplectes ardens</i> =434	Ghana
	<i>Euplectes franciscanus</i> =435	Ghana
	<i>Euplectes hordeaceus</i>	Ghana
	<i>Euplectes macrourus</i> =436	Ghana
	<i>Malimbus cassini</i>	Ghana
	<i>Malimbus malimbicus</i>	Ghana
	<i>Malimbus nitens</i>	Ghana
	<i>Malimbus rubricollis</i>	Ghana
	<i>Malimbus scutatus</i>	Ghana
	<i>Pachyphantes superciliosus</i> =437	Ghana
	<i>Passer griseus</i>	Ghana
	<i>Petronia dentata</i>	Ghana
	<i>Plocepasser superciliosus</i>	Ghana

	SPECIES	COUNTRY
	<i>Ploceus albinucha</i>	Ghana
	<i>Ploceus aurantius</i>	Ghana
	<i>Ploceus cucullatus</i> =438	Ghana
	<i>Ploceus heuglini</i>	Ghana
	<i>Ploceus luteolus</i> =439	Ghana
	<i>Ploceus melanocephalus</i> =440	Ghana
	<i>Ploceus nigerrimus</i>	Ghana
	<i>Ploceus nigricollis</i>	Ghana
	<i>Ploceus pelzelni</i>	Ghana
	<i>Ploceus preussi</i>	Ghana
	<i>Ploceus tricolor</i>	Ghana
	<i>Ploceus vitellinus</i>	Ghana
	<i>Quelea erythrops</i>	Ghana
	<i>Sporopipes frontalis</i>	Ghana
	<i>Vidua chalybeata</i> =441	Ghana
	<i>Vidua interjecta</i>	Ghana
	<i>Vidua larvaticola</i>	Ghana
	<i>Vidua macroura</i>	Ghana
	<i>Vidua orientalis</i> =442	Ghana
	<i>Vidua raricola</i>	Ghana
	<i>Vidua togoensis</i>	Ghana
	<i>Vidua wilsoni</i>	Ghana
<i>Sturnidae</i> (Starlings)	<i>Gracula religiosa</i>	Thailand
REPTILIA (REPTILES)		
TESTUDINATA		
Chelonians, tortoises, terrapins and turtles		
<i>Trionychidae</i> (Soft-shelled turtles)	<i>Trionyx triunguis</i>	Ghana
<i>Pelomedusidae</i> (Side-necked turtles)	<i>Pelomedusa subrufa</i>	Ghana
	<i>Pelusios adansonii</i>	Ghana
	<i>Pelusios castaneus</i>	Ghana
	<i>Pelusios gabonensis</i> =443	Ghana
	<i>Pelusios niger</i>	Ghana
SERPENTES		

	SPECIES	COUNTRY
Snakes		
<i>Colubridae</i> (Water snakes, grass snakes and tree snakes)	<i>Atretium schistosum</i>	India
	<i>Cerberus rhynchops</i>	India
	<i>Xenochrophis piscator</i> =444	India
<i>Elapidae</i> (Font-fanged snakes)	<i>Micrurus diastema</i>	Honduras
	<i>Micrurus nigrocinctus</i>	Honduras
<i>Viperidae</i> (Vipers)	<i>Agkistrodon bilineatus</i>	Honduras
	<i>Bothrops asper</i>	Honduras
	<i>Bothrops nasutus</i>	Honduras
	<i>Bothrops nummifer</i>	Honduras
	<i>Bothrops ophryomegas</i>	Honduras
	<i>Bothrops schlegelii</i>	Honduras
	<i>Crotalus durissus</i>	Honduras
	<i>Vipera russellii</i>	India
FLORA		
<i>GNETACEAE</i>	<i>Gnetum montanum</i> #1	Nepal
<i>MAGNOLIACEAE</i> Magnolia family	<i>Talauma hodgsonii</i> #1	Nepal
<i>PAPAVERACEAE</i> Poppy family	<i>Meconopsis regia</i> #1	Nepal
<i>PODOCARPACEAE</i> Podocarpus family	<i>Podocarpus neriifolius</i> #1	Nepal
<i>TETRACENTRACEAE</i>	<i>Tetracentron sinense</i> #1	Nepal

Appendix 5-2

Endangered/Threatened Species

(Overseas Environmental Baseline Guide Document Tables 13-1 and 13-2)

COMMON NAME	SCIENTIFIC NAME	HISTORIC RANGE
MAMMALS		
Ass, Asian wild (=kulgan, onager)	<i>Equus hemionus</i>	Southwestern and Central Asia
Bandicoot, barred	<i>Perameles bougainville</i>	Australia
Bandicoot, desert	<i>Perameles eremiana</i>	Australia
Bandicoot, lesser rabbit	<i>Perameles leucura</i>	Australia
Bandicoot, pig-footed	<i>Chaeropus ecaudatus</i>	Australia
Bandicoot, rabbit	<i>Macrotus lagotis</i>	Australia
Banteng	<i>Bos javanicus</i> (=banteng)	Southeast Asia
Bat, Mexican long-nosed	<i>Leptonycteris nivalis</i>	Central America
Bat, Sanborn's long-nosed	<i>Leptonycteris sanborni</i> (=yerbabuena)	USA, Mexico, Central America
Cat, Iriomote	<i>Felis (Mayailurus) iriomotensis</i>	Japan (Iriomote Island, Ryuku Islands)
Cat, marbled	<i>Felis marmorata</i>	Southeast Asia
Chamois, Apennine	<i>Rupicapra rupicapra ornata</i>	Spain
Deer, Eld's brow-antlered	<i>Cervus eldi</i>	Southeast Asia
Deer, Philippine	<i>Axis</i> (=Cervus) <i>porcinus calamianensis</i>	Philippines (Calamian Islands)
Deer, Ryukyu sika	<i>Cervus nippon keramae</i>	Japan (Ryukyu Islands)
Dhole (=Asiatic wild dog)	<i>Cuon alpinus</i>	Southeast Asia
Dibbler	<i>Antechinus apicalis</i>	Australia
Dugong	<i>Dugong dugon</i>	Japan
Gibbons	<i>Hylobates</i> spp. (including <i>Nomascus</i>)	Southeast Asia
Goat, wild (=Chiltanmarkhor)	<i>Capra aegagrus</i> (= <i>falconen chiltanensis</i>)	Southwestern Asia
Goral	<i>Nemorhaedus goral</i>	East Asia
Hutia, Cabrera's	<i>Capromys angelcabrerai</i>	Cuba
Hutia, dwarf	<i>Capromys nana</i>	Cuba
Hutia, large eared	<i>Capromys aurtus</i>	Cuba
Hutia, little earth	<i>Capromys sanfelipensis</i>	Cuba
Ibex, Pyrenean	<i>Capra pyrenaicapirenaica</i>	Spain
Kangaroo, eastern gray	<i>Macropus giganteus</i>	Australia

COMMON NAME	SCIENTIFIC NAME	HISTORIC RANGE
Mammals (continued)		
Kangaroo, red	<i>Macropus (Megaleia) rufus</i>	Australia
Kangaroo, Tasmanian forester	<i>Macropus giganteus tasmaniensis</i>	Australia (Tasmania)
Kangaroo, western gray	<i>Macropus fuliginosis</i>	Australia
Leopard	<i>Panthera pardus</i>	Asia
Leopard, clouded	<i>Neofelis nebulosa</i>	Southeast and south-central Asia, Taiwan
Leopard, snow	<i>Panthera uncia</i>	Central Asia
Lion, Asiatic	<i>Panthera leo persica</i>	Turkey
Lynx, Spanish	<i>Felis (=Lynx) pardina</i>	Spain, Portugal
Macaque, Japanese	<i>Macaca fuscata</i>	Japan (Shikoku, Kyushu and Honshu Islands)
Marsupial, eastern jerboa	<i>Antechinomys laniger</i>	Australia
Marsupial-mouse, largelep	<i>Sminthopsis psammophila</i>	Australia
Marsupial-mouse, long-tailed	<i>Sminthopsis longicaudata</i>	Australia
Monkey, red-backed squirrel	<i>Saimiri oerstedii</i>	Panama
Monkey, spider	<i>Ateles geoffroyi panamensis</i>	Panama
Mouse, Australian native	<i>Zyomys (=Notomys) pedunculatus</i>	Australia
Mouse, Australian native	<i>Notomys aquilo</i>	Australia
Mouse, Field's	<i>Pseudomys fieldi</i>	Australia
Mouse, Gould's	<i>Pseudomys gouldii</i>	Australia
Mouse, New Holland	<i>Pseudomys novaehollandiae</i>	Australia
Mouse, Shark Bay	<i>Pseudomys praeconis</i>	Australia
Mouse, Shortridge's	<i>Pseudomys shortridgei</i>	Australia
Mouse, Smoky	<i>Pseudomys fumeus</i>	Australia
Mouse, western	<i>Pseudomys occidentalis</i>	Australia
Native-cat, eastern	<i>Dasyurus viverrinus</i>	Australia
Numbat	<i>Mymecodius fasciatus</i>	Australia
Planigale, little	<i>Plangiale ingrami subtilissima</i> (formerly <i>P. subtilissima</i>)	Australia
Planigale, southern	<i>Plangiale tenuirostris</i>	Australia
Possum, mountain pygmy	<i>Burrhamys parvus</i>	Australia
Possum, scaly-tailed	<i>Wyulda squamicaudata</i>	Australia
Puma, Costa Rican	<i>Felis concolor costaricensis</i>	Panama

COMMON NAME	SCIENTIFIC NAME	HISTORIC RANGE
Mammals (continued)		
Quokka	<i>Setonix brachyurus</i>	Australia
Rabbit, Ryukyu	<i>Pentalagus furnessi</i>	Japan (Ryuku Islands)
Rat, false water	<i>Xeromys myoides</i>	Australia
Rat, stick-nest	<i>Leporillus conditor</i>	Australia
Rat-kangaroo, brush-tailed	<i>Bettongia penicillata</i>	Australia
Rat-kangaroo, Gaimard's	<i>Bettongia gaimardi</i>	Australia
Rat-kangaroo, Lesuer's	<i>Bettongia lesuer</i>	Australia
Rat-kangaroo, plain	<i>Caloprymnus campestris</i>	Australia
Rat-kangaroo, Queensland	<i>Bettongia tropica</i>	Australia
Seledang (=Gaur)	<i>Bos gaurus</i>	Southeast Asia
Serow	<i>Capricornis sumatraensis</i>	East Asia
Solenodon, Cuban	<i>Solenodon (Atopogale) cubanus</i>	Cuba
Tamaraw	<i>Bubalus mindorensis</i>	Philippines
Tarsier, Philippine	<i>Tarsius syrichta</i>	Philippines
Tiger	<i>Panthera tigris</i>	Temperate and tropical Asia
Tiger, Tasmanian(=Thylacine)	<i>Thylacinus cynocephalus</i>	Australia
Wallaby, banded hare	<i>Lagostrophus fasciatus</i>	Australia
Wallaby, brindled nail-tailed	<i>Onychogalea fraenata</i>	Australia
Wallaby, crescent nail-tailed	<i>Onychogalea lunata</i>	Australia
Wallaby, Parma	<i>Macropus parma</i>	Australia
Wallaby, western hare	<i>Lagorchestes hirsutus</i>	Australia
Wallaby, yellow-footed	<i>Petrogale xanthopus</i>	Australia
Wombat, hairy-nosed (=Barnard's and Queensland hairy-nosed)	<i>Lasiorhinus krefftii</i> (formerly <i>L. barnardi</i> and <i>L. gillespiel</i>)	Australia
BIRDS		
Albatross, short-tailed	<i>Diomedea albatrus</i>	Japan
Bristlebird, western	<i>Dasyomis brachypterus longirostris</i>	Australia
Bristlebird, western rufous	<i>Dasyomis broadbenti littoralis</i>	Australia
Caracara, Audobon's crested	<i>Polyborus plancus audubonii</i>	Panama, Cuba
Eagle, Philippine	<i>Pithecophaga jefferyi</i>	Philippines
Falcon, Arctic peregrine	<i>Falco peregrinus tundrius</i>	Central America

COMMON NAME	SCIENTIFIC NAME	HISTORIC RANGE
Birds (continued)		
Falcon, Eurasian peregrine	<i>Falco peregrinus peregrinus</i>	Europe, Eurasia
Goose, Aleutian Canada	<i>Branta canadensis leucopareia</i>	Japan
Grasswren, Eyrean (flycatcher)	<i>Amytomis goyderi</i>	Australia
Greenshank, Nordmann's	<i>Tringa guttifer</i>	Japan
Honeyeater, helmeted	<i>Meliphaga cassidix</i>	Australia
Ibis, Japanese crested	<i>Nipponia nippon</i>	Japan, Korea
Ibis, northern bald	<i>Geronticus eremita</i>	Southern Europe, Southwestern Asia
Kite, Cuba hook-billed	<i>Chondrohierax uncinatus wilsonii</i>	Cuba
Kite, Everglade snail	<i>Rostrhamus sociabilis plumbeus</i>	Cuba
Parakeet, orange-billed	<i>Neopherna chrysogaster</i>	Australia
Parakeet, paradise(=beautiful)	<i>Psephotus pulcherrimus</i>	Australia
Parakeet, scarlet-chested (=splendid)	<i>Neophema splendida</i>	Australia
Parakeet, turquoise	<i>Neophema pulchella</i>	Australia
Parrot, Australian	<i>Geopsittacus occidentalis</i>	Australia
Parrot, Bahaman or Cuban	<i>Amazona leucocephala</i>	West Indies, Bahamas
Parrot, ground	<i>Pezoporus wallicus</i>	Australia
Pheasant, Palawan peacock	<i>Polyplectron emphanum</i>	Philippines
Pigeon, Mindoro zone-tailed	<i>Ducula mindorensis</i>	Philippines
Quetzal, resplendent	<i>Pharomachrus mocinno</i>	Panama
Scrup-bird, noisy	<i>Atrichornis clamosus</i>	Australia
Shama, Cebu black (thrush)	<i>Copsychus niger cebuensis</i>	Philippines
Stork, oriental white	<i>Ciconia ciconia boyciana</i>	Japan, Korea
Wanderer, plain (collared-hemipode)	<i>Pedionomus torquatus</i>	Australia
Warbler (wood), Bachman's	<i>Vermivora bachmanii</i>	Cuba
REPTILES		
Crocodile, Philippine	<i>Crocodylus novaeguineae mindorensis</i>	Philippine Islands
Crocodile, saltwater (=estuarine)	<i>Crocodylus porosus</i>	Southeast Asia
Crocodile, Siamese	<i>Crocodylus siamensis</i>	Southeast Asia
Iguana, Cuban ground	<i>Cyclura nubila nubila</i>	Cuba

COMMON NAME	SCIENTIFIC NAME	HISTORIC RANGE
Reptiles (continued)		
Lizard, Hierro giant	<i>Gallotia simonyi simonyi</i>	Spain (Canary Islands)
Lizard, Ibiza wall	<i>Podarcis pityusensis</i>	Spain (Balearic Islands)
Turtle, short-necked or western swamp	<i>Pseudemadura umbrina</i>	Australia
FISHES		
Ala Balik (trout)	<i>Salmo platycephalus</i>	Turkey
Ayumodoki (loach)	<i>Hymenophysa (=Botia) curta</i>	Japan
Cicek (minnow)	<i>Acanthorutilus handlirschi</i>	Turkey
Nekogigi (catfish)	<i>Coreobagrus ichikawai</i>	Japan
Tango, Miyako (Tokyo bitterling)	<i>Tanakia tanago</i>	Japan
ENDANGERED/THREATENED PLANTS		
Key tree-cactus	<i>Cereus robinii</i>	Cuba
American hart's-tongue fern	<i>Phyllitis scolopendrium</i> var. <i>americana</i> (= <i>P. japonica</i>) (ssp. <i>americana</i>)	Canada (Ontario)
Pitcher's thistle	<i>Cirsium pitcheri</i>	Canada (Ontario)
Lakeside daisy	<i>Hymenoxys acaulis</i> var. <i>glabra</i>	Canada (Ontario)
Houghton's goldenrod	<i>Solidago houghtonii</i>	Canada (Ontario)
Hayun lagu (Guam), Tronkon guafi rota	<i>Serianthes neisonii</i>	Western Pacific Ocean
Dwarf lake iris	<i>Iris facustris</i>	Canada (Ontario)
Small whorled pogonia	<i>Isotria nedeoloides</i>	Canada (Ontario)
Eastern prairie fringed orchid	<i>Platanthera leucophaea</i>	Canada (Ontario, New Brunswick)
Furbish lousewort	<i>Pedicularis furbishiae</i>	Canada (New Brunswick)

SECTION 6
OTHER ENVIRONMENTAL ISSUES

September 2000

A. Applicability of this Section

Environmental Impacts

The topic of this subsection is the environmental impact of major Federal actions in Spain.

Environmental Noise

This subsection contains standards to control environmental noise within installations. It is limited to measures allowing reasonable internal Department of Defense (DOD) planning efforts, and it does not address procedures for operating aircraft or ships, which are outside the scope of DOD Directive 6050.16.

Pollution Prevention

This subsection contains standards for the management of ozone-depleting substances/chemicals (ODS/ODC) and the requirement for a solid waste recycling program.

B. Source Documents

Environmental Impacts

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapter 17.

Environmental Noise

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapter 10.

Pollution Prevention

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapters 2 and 7.

C. Key Compliance Requirements

- Certain major Federal actions must be analyzed for environmental impact.
- Installations with significant noise sources must develop and maintain noise contour maps.
- Installations must maintain records of incompatible buildings and land uses.
- Installations must maintain operational data on noise-producing activities.
- Installations must have procedures to register and resolve noise complaints.
- ODSs must be managed in accordance with requirements that limit the direct release of those substances to the atmosphere.

- Installations must institute recycling programs, where cost-effective.

D. Definitions

- *A-Weighted Sound Level* - calculation of noise exposure that emphasizes sound in the frequency range where most speech information occurs, and thus closely resembles the frequency response of the human ear. Sound measures that are measured on the A-scale are abbreviated dB(A) (FGS-Spain, Chapter 10, Definitions).
- *Categorical Exclusion* - a class of actions, defined and approved in accordance with Executive Order 12114, DOD Directive 6050.7, and service regulations, that normally do not, individually or cumulatively, significantly harm the environment and that require no further environmental review beyond appropriate documentation of the decision to apply the exclusion (FGS-Spain, Chapter 17, Definitions).
- *Day-Night Average Sound Level (L_{dn})* - a measure of installation noise exposure expressed in a single number (“xx L_{dn} ” as in 55 L_{dn}) that is obtained by adding a 10 dB penalty to nighttime sound levels (2200-0700) to account for increased annoyance caused by noise during these hours (FGS-Spain, Chapter 10, Definitions).
- *Decibel (dB)* - the unit of sound pressure symbolically represented as dB. Sound pressure is the amplitude or measure of the difference between atmospheric pressure (with no sound present) and total pressure (with sound present). The decibel scale is a logarithmic scale (FGS-Spain, Chapter 10, Definitions).
- *Environment* - the natural and physical environment, excluding social, economic, and other environments (FGS-Spain, Chapter 17, Definitions).
- *Environmental Assessment* - a concise analysis to assist DOD components in determining whether there is potential for significant environmental impacts associated with the proposed action and whether an environmental impact statement is required (FGS-Spain, Chapter 17, Definitions).
- *Environmental Impact Statement (EIS)* - an analysis of the likely environmental consequences of a proposal for a major Federal action that is to be considered by DOD components in deciding whether to approve the proposal. It includes a review of the affected environment, a description of any adverse environmental effects that cannot be avoided if the proposal is adopted, alternatives to the proposed action (including a no-action alternative), actions taken to avoid environmental harm or otherwise to better the environment, and environmental considerations and actions by the other participating nations, bodies, or organizations (FGS-Spain, Chapter 17, Definitions).
- *Environmental Review* - an analysis of the likely environmental consequences of the action that is to be considered by DOD components in the decision-making process. It includes a review of the affected environment, actions taken to avoid environmental harm or otherwise to better the environment, and environmental considerations and actions by the other participating nations, bodies, or organizations. Environmental reviews are prepared either unilaterally by DOD or in conjunction with another U.S. agency but do not include foreign government participation (FGS-Spain, Chapter 17, Definitions).
- *Environmental Study* - an analysis of the likely environmental consequences of the action that is to be considered by DOD components in the decision-making process. It includes a review of the affected environment, actions taken to avoid environmental harm or otherwise to better the environment, and environmental considerations and actions by the other participating nations, bodies, or organizations. Environmental studies are prepared by the United States in conjunction with one or more foreign nations or by an international body or organization in which the United States is a member or participant (FGS-Spain, Chapter 17, Definitions).
- *Equivalent Level (L_{eq})* - the equivalent steady-state sound that, in a stated period of time, would contain the same acoustic energy as the time-varying sound during the same period (FGS-Spain, Chapter 10, Definitions).
- *Federal Action* - an action that is implemented or funded directly by the U.S. Government. It does not include actions in which the United States participates in an advisory information gathering, representational, or diplo-

matic capacity, nor does it include actions taken by a foreign government in a foreign country in which the United States is a beneficiary of the action or actions in which foreign governments use funds derived indirectly from the United States (FGS-Spain, Chapter 17, Definitions).

- *Foreign Nation* - any geographic area (land, water, airspace) that is under the jurisdiction of one or more foreign governments; any area under military occupation by the United States alone or jointly with any other foreign government; and any area that is the responsibility of an international organization of governments. For the purposes of FGS-Spain, foreign nation includes contiguous zones and exclusive economic zones established consistent with customary international law (FGS-Spain, Chapter 17, Definitions).
- *Major Action* - an action involving substantial expenditures of time, money, or resources, that affects the environment on a large geographic scale or has substantial environmental effects on a more limited geographic area, and that is substantially different or a significant departure from other actions previously analyzed with respect to environmental considerations and approved, with which the action under consideration may be associated. A deployment of units, ships, aircraft, or mobile military equipment that does not involve significant changes to the physical environment and that does not require additional support facilities that would significantly change the physical environment is not a major action for the purposes of the *Other Environmental Issues* protocol (FGS-Spain, Chapter 17, Definitions).
- *Negative Decision* - a record of decision not to prepare an environmental analysis (FGS-Spain, Chapter 17, Definitions).
- *Significant Noise Source* - noise from any source such as mobile and stationary equipment, machines, boiler houses, and ranges which causes an identifiable and disturbing noise emission. This definition does not apply to noise generated by U.S. naval vessels or U.S. military aircraft (FGS-Spain, Chapter 10, Definitions).
- *Sound Exposure Level (SEL)* - a measure of single noise events. It is the level, in decibels, of the time integral of squared A-weighted sound pressure over a given time period or event, with reference to the square of the standard reference sound pressure of 20 micropascals (μPa) and a reference duration of 1 s (FGS-Spain, Chapter 10, Definitions).

E. Records to Review

Environmental Impacts

- Documentation related to environmental impact analysis
- Documentation of finding of no adverse effect (for construction activities)
- Environmental Reviews
- Environmental Studies

Environmental Noise

- Installation Master Plan Document
- Log of complaints from the local community

Pollution Prevention

- None

F. Physical Features to Inspect

Environmental Impacts

- None

Environmental Noise

- Power generators or other noise sources
- Emergency generators
- Test tracks

Pollution Prevention

- Recycling center, if any

G. Guidance for Checklist Users

REFER TO CHECKLIST ITEMS:

Environmental Impacts

Missing Checklist Items/Positive Findings O1.2.1.SP and O1.2.2.SP

Environmental Analyses O1.10.1.SP and O1.10.2.SP

Environmental Noise

Missing Checklist Items/Positive Findings O2.2.1.SP and O2.2.2.SP

Noise Management O2.10.1.SP through O2.10.6.SP

Pollution Prevention (P2)

Missing Checklist Items/Positive Findings O4.2.1.SP and O4.2.2.SP

ODCs O4.10.1.SP

Solid Waste O4.20.1.SP

**COMPLIANCE CATEGORY:
OTHER ENVIRONMENTAL ISSUES
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>ENVIRONMENTAL IMPACTS</p> <p>O1.2 Missing Checklist Items/Positive Findings</p> <p>O1.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>O1.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning management of environmental impacts have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>ENVIRONMENTAL IMPACTS</p> <p>O1.10 Environmental Analyses (EAs)</p> <p>O1.10.1.SP. A service component that is responsible for a proposal must complete the appropriate EAs (FGS-Spain 17.1).</p> <p>O1.10.2.SP. If it is determined that no EA is required, the negative decision must be documented (FGS-Spain 17.3).</p>	<p>Determine whether the installation has sponsored proposals that require EAs.</p> <p>Verify that the installation has completed the EA appropriate to each such proposal.</p> <p>(NOTE: See Appendix 6-1 for a summary of which types of actions require which kinds of analysis.)</p> <p>Verify that, if no environmental analysis is required, a negative decision is completed.</p>

COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>ENVIRONMENTAL NOISE</p> <p>O2.2 Missing Checklist Items/Positive Findings</p> <p>O2.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>O2.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning management of environmental noise have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>ENVIRONMENTAL NOISE</p> <p>O2.10 Noise Management</p> <p>O2.10.1.SP. Installations with significant noise sources must develop and maintain a noise contour map (FGS-Spain 10.1).</p> <p>O2.10.2.SP. Installations must maintain records of incompatible buildings and land uses (FGS-Spain 10.2).</p> <p>O2.10.3.SP. Installations must review installation master plans to ensure that existing facility siting is consistent with an acceptable noise environment (FGS-Spain 10.3).</p> <p>O2.10.4.SP. Installations must maintain operational data on noise producing activities (FGS-Spain 10.5).</p> <p>O2.10.5.SP. Installations must have procedures to register and resolve noise complaints (FGS-Spain 10.6).</p>	<p>(NOTE: FGS-Spain, Chapter 10, does not address procedures for operating aircraft or ships.)</p> <p>Determine whether the installation has significant noise sources.</p> <p>Verify that the installation has developed and maintains a noise contour map limited to the installation.</p> <p>Verify that noise contours for significant noise sources are developed using a computerized program from operational data and the A-weighted Day-Night Average Sound Level (L_{dn}).</p> <p>(NOTE: The noise simulation program used to assess heavy weapons noise is MicroBNOISE. This software was developed and is maintained by the U.S. Army Construction Engineering Research Laboratory (CERL).)</p> <p>(NOTE: Noise level contours are generated using the NOISEMAP 6.1 computer program. This program is maintained by the USAF Armstrong Aerospace Medical Research Laboratory.)</p> <p>Verify that the installation maintains records of incompatible buildings and land uses on the installation.</p> <p>(NOTE: Appendix 6-2 establishes compatible uses and the Noise Level Reduction (NLR) to achieve acceptable indoor noise levels for facilities.)</p> <p>Verify that the installation master plan has been reviewed to ensure that existing facility siting is consistent with an acceptable noise environment.</p> <p>Verify that the installation maintains operational data to facilitate the development of noise level contours in order to conduct studies on compatible land uses within various zones.</p> <p>Verify that the installation has procedures to register and resolve noise complaints.</p>

COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>plaints (FGS-Spain 10.6).</p> <p>O2.10.6.SP. Installations must take specific actions with regard to noise mitigation (FGS-Spain 10.4).</p>	<p>Verify that the installation identifies noise sources that create noise impacts.</p> <p>Verify that the installation investigates possible mitigation measures.</p> <p>Verify that, if practical, the installation programs resources to reduce noise impacts.</p> <p>(NOTE: This checklist item does apply to noise generated by aircraft operations.)</p>

COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>POLLUTION PREVENTION</p> <p>O4.2 Missing Checklist Items/Positive Findings</p> <p>O4.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>O4.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning pollution prevention have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>POLLUTION PREVENTION</p> <p>O4.10 Ozone-Depleting Substances</p> <p>O4.10.1.SP. Installations must meet specific standards during the servicing of equipment that contains CFCs or halons (FGS-Spain 2.7.b and 2.7.c).</p>	<p>Verify that all repairs or service to nontactical vehicle air conditioners use commercially available refrigerant recycling equipment, operated by trained personnel.</p> <p>Verify that, whenever possible, non-ODS chemicals are used for refrigerant.</p> <p>Verify that no activity intentionally vents any Class I or Class II CFC refrigerant (see Appendix 6-3) in the process of maintaining, servicing, repairing, or disposing of an appliance or industrial process refrigeration unit.</p>

COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>POLLUTION PREVENTION</p> <p>O4.20 Solid Waste</p> <p>O4.20.1.SP. DOD installations must institute recycling programs, where cost effective (FGS-Spain 7.10).</p>	<p>Verify that, if cost-effective, the installation has instituted a recycling program.</p> <p>Verify that, to the extent practical, the installation uses existing recycling programs established by the Municipalities.</p>

Appendix 6-1

Environmental Effects Abroad
(FGS-Spain, Table 17-1)

Analyses Of Overseas Actions	
Action	Analyses Required
a. Major DOD actions significantly affecting the environment of the geographic areas outside the jurisdiction of any nation (i.e., outside any economic zone, fishery zone, territorial sea, or other claim established consistent with customary international law). Antarctica is considered outside the jurisdiction of any nation.	Environmental Impact Statement
b. Major DOD actions significantly affecting the environment of a foreign nation that is not participating with the United States and not otherwise involved in the action.	Environmental Review or Environmental Study
c. Major DOD actions significantly affecting the environment of a foreign nation in which the actions provide, to that nation, a product or physical project producing a principal product or an emission or effluent that is prohibited or strictly regulated by Federal law in the United States because its toxic effects on the environment create a serious public health risk.	Environmental Review or Environmental Study
d. Major DOD actions significantly affecting the environment of a foreign nation in which the actions provide, to that nation, a physical project that is prohibited or strictly regulated by Federal law in the United States to protect against radioactive substances.	Environmental Review or Environmental Study
e. Major DOD actions that significantly affect natural or ecological resources of global importance designated for protection by the President or, in the case of such a resource protected by international agreement binding on the United States, by the Secretary of State. Recommendations to the President in such cases will be accompanied by the views of the Council on Environmental Quality and the Secretary of State.	Environmental Impact Statement, Environmental Review, or Environmental Study
f. Major DOD actions affecting only the environment of a participating or otherwise involved foreign nation and that do not involve emissions, effluents that are prohibited or strictly regulated by Federal law in the United States, or resources of global importance that have been designated for protection.	No formal document required.

Appendix 6-2

**Minimum Building Sound Level Requirements
and Acceptable Land Uses
(FGS-Spain, Table 10-1)**

Facility	Outdoor Noise Environment (L_{dn}/L_{eq} in dB(A))				
	85-89	80-84	75-79	70-74	65-69
Family housing	No	No	No	NLR30(4)	NLR25(4)
Bachelor housing	No	No	NLR35(4)	NLR30(4)	NLR25(4)
Transient Lodging - Hotel, Motel, etc.	No	No	NLR35(4)	NLR30(4)	NLR25(4)
*Classrooms, Libraries, Churches	No	No	No	NLR30	NLR25
*Offices and Administration Buildings-Military	NLR40	NLR35	NLR30	NLR25	Yes
*Offices - Business and Professional	No	No	NLR30	NLR25	Yes
Hospitals, Medical Facilities, Nursing Homes (24-h occupancy)	No	No	No	NLR30	NLR25
*Dental Clinic, Medical Dispensaries	NLR40	NLR35	NLR30	NLR25	Yes
*Outdoor Music Shells	No	No	No	No	No
*Commercial and Retail Stores, Exchanges, Movie Theaters, Restaurants and Cafeterias, Banks, Credit Unions, Enlisted Member (EM)/ Officer Clubs	No	No	NLR30	NLR25	Yes
*Flight Line Operations, Maintenance and Training	NLR35(5)	NLR30(5)	Yes	Yes	Yes
*Industrial, Manufacturing and Laboratories	No	NLR35(5)	NLR30(5)	NLR25(5)	
*Outdoor Sports Arenas, Outdoor Spectator Sports	No	No	No	Yes(1)	Yes(1)
*Playgrounds, Active Sport Recreational Areas	No	No	No	Yes	Yes
*Neighborhood Parks	No	No	No	Yes	Yes
*Gymnasiums, Indoor Pools	No	NLR30	NLR25	Yes	Yes
*Outdoor - Frequent Speech Communication	No(2,3)	No	(2,3)	No	No
*Outdoor - Infrequent Speech Communication	No	(2,3)	No	(2,3)	Yes
Livestock Farming, Animal Breeding	No	No	No	Yes	Yes
*Agricultural (except livestock)	Yes(3)	Yes(3)	Yes	Yes	Yes

*For detailed design, the L_{eq} for the appropriate period of usage is the preferred measure of the noise environment.

Yes - Land use compatible with noise environment. No special noise control restriction. Normal construction appropriate.

NLR - Appropriate noise level reduction where indoor activities predominate.

No - Land use not compatible with noise environment, even if special building noise insulation provided.

KEY:

(1) Land use is acceptable, provided special sound reinforcement systems are installed.

(2) Land use may be acceptable, provided special speech communication systems are used.

(3) Land use may be acceptable provided hearing protection devices are worn by personnel. Check applicable hearing damage regulations.

(4) Although it is recognized that local conditions may require residential uses in these areas, this use is strongly discouraged in L_{dn} 70-74 and L_{dn} 75-79 and discouraged in L_{dn} 65-69. The absence of viable development options should be determined. NLR criteria will not eliminate outdoor environment noise problems, and, as a result, site planning and design should include measures to minimize this impact, particularly where the noise is from ground level sources.

(5) The NLR must only be incorporated into the design and construction of portions of these buildings where the public is received, where office areas and noise sensitive work areas exist, or where the normal noise level is low.

Appendix 6-3

Class I and Class II ODSs (FGS-Spain Table 2-1)

HC#	Name
CLASS I Ozone Depleting Chemicals (ODCs)	
CFC-11	Trichlorofluoromethane
CFC-12	Dichlorodifluoromethane
CFC-113	Trichlorotrifluoroethane
CFC-114	Dichlorodifluoroethane
CFC-115	Chloropentafluoroethane
R-500	R-500
R-502	R-502
HALON-1202	Dibromodifluoromethane
HALON-1211	Bromochlorodifluoromethane
HALON-1301	Bromotrifluoromethane
HALON-2402	Dibromotetrafluoroethane
MB	Methyl Bromide
CFC-13	Chlorotrifluoromethane
CFC-111	Pentachlorofluoroethane
CFC-112	Tetrachlorodifluoroethane
CFC-211	Heptachlorofluoropropane
CFC-212	Hexachlorodifluoropropane
CFC-213	Pentachlorotrifluoropropane
CFC-214	Tetrachlorotetrafluoropropane
CFC-215	Trichloropentafluoropropane
CFC-216	Dichlorohexafluoropropane
CFC-217	Chloroheptafluoropropane
Carbon Tetrachloride	Tetrachloromethane
Methyl Chloroform	Trichloroethane (1,1,1 TCA)
CLASS II ODCs	
HCFC-21	Dichlorofluoromethane
HCFC-22	Chlorodifluoromethane
HCFC-31	Chlorofluoromethane
HCFC-121	Tetrachlorofluoroethane

HC#	Name
HCFC-122	Trichlorodifluoroethane
HCFC-123	Dichlorotrifluoroethane
HCFC-124	Chlorotetrafluoroethane
HCFC-131	Trichlorofluoroethane
HCFC-132	Dichlorodifluoroethane
HCFC-133	Chlorotrifluoroethane
HCFC-141	Dichlorofluoroethane
HCFC-142	Chlorodifluoroethane
HCFC-221	Hexachlorofluoropropane
HCFC-222	Pentachlorodifluoropropane
HCFC-223	Tetrachlorotrifluoropropane
HCFC-224	Trichloropentafluoropropane
HCFC-225	Dichloropentafluoropropane
HCFC-226	Chlorohexafluoropropane
HCFC-231	Pentachlorofluoropropane
HCFC-232	Tetrachlorodifluoropropane
HCFC-233	Trichlorotrifluoropropane
HCFC-234	Dichlorotetrafluoropropane
HCFC-235	Chloropentafluoropropane
HCFC-241	Tetrachlorofluoropropane
HCFC-242	Trichlorodifluoropropane
HCFC-243	Dichlorotrifluoropropane
HCFC-244	Chlorotetrafluoropropane
HCFC-251	Trichlorofluoropropane
HCFC-252	Dichlorodifluoropropane
HCFC-253	Chlorotrifluoropropane
HCFC-261	Dichlorofluoropropane
HCFC-262	Chlorodifluoropropane
HCFC-271	Chlorofluoropropane

SECTION 7

PESTICIDE MANAGEMENT

September 2000

A. Applicability of this Section

This section contains standards regulating the use, storage, and handling of pesticides, herbicides, and defoliants at Department of Defense (DOD) installations; it does not address the use of these materials by individuals acting in an unofficial capacity in a residence or garden. The disposal of pesticides, pesticide residue, and empty pesticide containers is covered in Section 4, *Hazardous Waste Management*, and Section 9, *Solid Waste Management*.

B. Source Documents

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapter 11.
- Military Handbook 1028/8A, *Design of Pest Management Facilities*, 1 November 1991, includes basic criteria for planning and designing military pest control facilities.

C. Key Compliance Requirements

- Each installation must implement and maintain a current, written pest management plan.
- Installations must use approved pesticides only.
- Installations must use the least toxic but effective product in their pest management efforts.
- Pesticide applicators must meet certification requirements.
- All pesticide applicators must participate in a medical surveillance program.
- All pest management personnel must be provided with personal protective equipment (PPE).
- Material safety data sheets (MSDSs) must be available at the storage and holding facility.
- Pesticides must be addressed in the installation spill plan.
- Pesticide storage areas must be regularly inspected and secured to prevent unauthorized access.
- Pesticide storage areas must have a readily visible, current inventory of all items in storage.

D. Definitions

- *Certified Pesticide Applicators* - personnel who apply pesticides and who have been authorized to do so by successfully completing a training program, followed by formal certification as specified in FGS-Spain 11.2 (FGS-Spain, Chapter 11, Definitions).
- *Integrated Pest Management (IPM)* - the use of all appropriate technology and management techniques to bring about pest prevention and suppression in a cost-effective and environmentally sound manner (FGS-Spain, Chapter 11, Definitions).

- *Pest* - arthropods, birds, rodents, nematodes, fungi, algae, snails, marine borers, snakes, weeds, undesirable vegetation, and other organisms (except for microorganisms that cause human or animal disease) that adversely affect the well-being of humans or animals, attack real property, supplies, equipment or vegetation, or are otherwise undesirable (FGS-Spain, Chapter 11, Definitions).
- *Pest Management Personnel* - personnel involved with activities that monitor or mitigate pest problems, including personnel that manage a pest management program, carry out pest control work (which includes selecting, mixing, or applying pesticides), monitor pest populations, and coordinate various activities that prevent or mitigate pest problems. This includes active duty, civilian (United States and local nationals), and contract workers directly involved with the program; it does not include persons whose contact with pesticides is limited to transporting, loading, and unloading closed containers (FGS-Spain, Chapter 11, Definitions).
- *Pesticide* - any substance or mixture of substances used to destroy pests, control their activity, or prevent them from causing damage (FGS-Spain, Chapter 11, Definitions).
- *Pesticide Waste* - materials that are subject to pesticide disposal restrictions and should be treated as excess pesticides for purposes of disposal (FGS-Spain, Chapter 11, Definitions):
 1. any pesticide that has been suspended, that does not meet specifications, or that is contaminated, improperly mixed, or otherwise unusable, whether concentrated or diluted
 2. used spill cleanup material
 3. any containers, equipment, or material that are contaminated with pesticides; empty pesticide containers that have been triple rinsed are not considered hazardous waste but are normal solid waste.

E. Records To Review

- Records of pesticides purchased by the facility (purchase orders, inventory)
- Pesticide application records
- Description of the facility's pest control program
- Facility applicator certification and training program
- Pesticide disposal manifests
- Installation Spill Plan
- Inventory of stored pesticides
- Pest Management Plan

F. Physical Features To Inspect

- Pesticide application equipment
- Pesticide storage areas, including storage containers
- Golf course maintenance areas

G. Guidance for Checklist Users

REFER TO CHECKLIST ITEMS:	
Missing Checklist Items/Positive Findings	PM.2.1.SP and PM.2.2.SP
All Installations	PM.10.1.SP through PM.10.2.SP
Pesticide Application	PM.20.1.SP through PM.20.5.SP
Documentation and Notification	PM.30.1.SP
Pest Management Facilities	PM.40.1.SP through PM.40.17.SP
Storing, Mixing, and Preparation of Pesticides	PM.50.1.SP through PM.50.10.SP
Disposal	PM.60.1.SP through PM.60.3.SP

COMPLIANCE CATEGORY: PESTICIDES MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.2 MISSING CHECKLIST ITEMS/POSITIVE FINDINGS</p> <p>PM.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>PM.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning pesticides management have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.10 ALL INSTALLATIONS</p> <p>PM.10.1.SP. Each installation must implement and maintain a current written pest management plan (FGS-Spain 11.1).</p> <p>PM.10.2.SP. Installation pest management plans must meet specific content requirements (FGS-Spain 11.1 and 11.6.e).</p>	<p>Verify that the installation implements and maintains a current written pest management plan.</p> <p>Verify that all installation activities and satellite sites that perform pest control have been included in the plan.</p> <p>Verify that the plan includes mixing and storage requirements at the installation.</p> <p>Verify that the plan includes IPM procedures for preventing pest problems or conditions conducive to pest problems.</p>

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.20 PESTICIDE APPLICATION</p> <p>PM.20.1.SP. Installations must use approved pesticides only (FGS-Spain 11.4).</p> <p>PM.20.2.SP. Installations must use the least toxic but effective product in their pest management efforts (FGS-Spain 11.1).</p> <p>PM.20.3.SP. Pesticide applicators must meet certification requirements (FGS-Spain 11.2).</p> <p>PM.20.4.SP. All pesticide applicators must participate in a medical surveillance program (FGS-Spain 11.3).</p>	<p>Verify that the pesticides that are used at the installation are both:</p> <ul style="list-style-type: none"> - approved for stocking by the Armed Forces Pest Management Board (AFPMB) or approved in writing by the cognizant DOD pest management authority - approved for use in Spain. <p>Verify that, where the use of pesticides is warranted, the installation uses the least toxic but effective product.</p> <p>Verify that pesticide applicators who are U.S. personnel are certified in accordance with DODI 4150.7, <i>DOD Pest Management Program</i> and the <i>DOD Plan for Certification of Applicators of Restricted-Use Pesticides</i>.</p> <p>Verify that pesticide applicators who are local nationals are certified in accordance with both:</p> <ul style="list-style-type: none"> - DODI 4150.7, <i>DOD Pest Management Program</i> and the <i>DOD Plan for Certification of Applicators of Restricted-Use Pesticides</i> - the requirements of the Spanish Ministry of Agriculture, Fishing, and Food or the Spanish Ministry of Health and Consumer Affairs. <p>Verify that all pesticide applicators are included in a medical surveillance program.</p> <p>Verify that the program for pesticide applicators includes:</p> <ul style="list-style-type: none"> - baseline physical examination with a cholinesterase test - annual physical - at a minimum, quarterly physical and cholinesterase test for personnel who work with organophosphates or carbamate pesticides.

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
PM.20.5.SP. All pest management personnel must be provided with PPE (FGS-Spain 11.7).	<p>Verify that all pest management personnel are provided with PPE that is appropriate for the work they perform and the types of pesticides to which they may be exposed.</p> <p>Verify that contractors provide appropriate PPE to their employees.</p> <p>Verify that the equipment indicated by the manufacturer on the pesticide label is used, as a minimum.</p>

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.30 DOCUMENTATION AND NOTIFICATION</p> <p>PM.30.1.SP. Copies of material safety data sheets (MSDSs) for all pesticides must be available at the storage and holding facility (FGS-Spain 11.6.d).</p>	<p>Verify that MSDSs for all pesticides are available at the storage and holding facility.</p>

**COMPLIANCE CATEGORY:
PESTICIDE MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.40 PEST MANAGEMENT FACILITIES</p> <p>PM.40.1.SP. Pesticide management facilities and service vehicles must be provided with spill kits (Military Handbook (MIL-HDBK) 1028/8A, para 3.5.2.2, implementing FGS-Spain 11.6.a and 11.6.b).</p> <p>PM.40.2.SP. Installations must include certain features in pest management facilities (MIL-HDBK 1028/8A, paras 3.1.3, 3.1.4.3, and 3.4.8, implementing FGS-Spain 11.6.a).</p> <p>PM.40.3.SP. Pest management facilities must have security fencing and gates (MIL-HDBK 1028/8A, para 3.4.6, implementing FGS-Spain 11.6.a).</p> <p>PM.40.4.SP. Holding tanks are prohibited in new construction (MIL-HDBK 1028/8A, para 3.5.2.3, implementing FGS-Spain 11.6.a).</p>	<p>(NOTE: "Facility" refers to the actual building or structure in which pesticides are stored and mixed; it does not include fencing that surrounds the building or structure.)</p> <p>Verify that pesticide management facilities and service vehicles are provided with spill kits.</p> <p>Verify that pest management facilities include at least the following:</p> <ul style="list-style-type: none"> - clean areas (office, vestibule and airlock [where appropriate, given weather conditions], and mechanical and electrical spaces) - pesticide handling areas (storage and mixing rooms) - transitional areas (dressing area, shower and locker rooms, toilet, laundry, and cleaning gear room) - an outdoor hardstand and parking apron for vehicles and equipment. <p>Verify that a climb-resistant chain-link fence prevents unauthorized entry.</p> <p>(NOTE: The fence may be omitted if other security measures, such as bars or heavy-gauge wire mesh over the windows, are taken.)</p> <p>Verify that the fence is at least 7 ft (2.13 m) high, without top rail.</p> <p>Verify that the fence fabric is twisted and barbed at the top and bottom.</p> <p>Verify that security gates to the fence are kept locked.</p> <p>Verify that the facility has no drainage to holding tanks.</p>

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.40.5.SP. Pest management facilities must be located in accordance with specific criteria (MIL-HDBK 1028/8A, para 3.4.1 and 3.4.2, implementing FGS-Spain 11.6.a).</p> <p>PM.40.6.SP. Pest management facilities must meet specific standards with regard to accessibility, grading, and parking (MIL-HDBK 1028/8A, para 3.4.3 through 3.4.5, implementing FGS-Spain 11.6.a).</p> <p>[Revised September 2000]</p>	<p>Verify that pest management facilities are located away from congested areas.</p> <p>Verify that new construction results in isolated, single-purpose structures.</p> <p>Verify that pest management facilities are located a minimum of 200 ft (61 m) from surface water, existing wells and cisterns, and 100-yr flood plains.</p> <p>Verify that the facility is located downhill from the above sensitive areas.</p> <p>(NOTE: Diking must be provided if space is limited.)</p> <p>Verify that the facility is not located uphill from potable water sources or continuously occupied structures.</p> <p>(NOTE: Facilities should not be located over aquifers [subsurface potable water supplies], unless the aquifer is adequately protected through containment measures.)</p> <p>Verify that the facility is located at least 100 ft (30.4 m) from other structures.</p> <p>Verify that vehicles carrying supplies or pulling trailer-mounted dispersal equipment have access to the facility.</p> <p>Verify that the facility is accessible to vehicles and pedestrians on at least two sides.</p> <p>(NOTE: “Accessible on at least two sides” means that pedestrians must be able to enter or exit the pesticide management facility from two different sides, and emergency response vehicles must be able to drive up to at least two sides of the facility.)</p> <p>Verify that runoff from fire-fighting is prevented from reaching ponds, lakes, streams, or rivers.</p> <p>(NOTE: Diking, if provided, is recommended for large pest management facilities only.)</p> <p>Verify that there is adequate space to park all pesticide dispersal equipment inside the pest management area, under cover.</p> <p>Verify that the part of the compound used for travel and vehicle parking is covered with gravel or paved.</p> <p>Verify that employee parking, if provided, is located outside the security fence or perimeter.</p>

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.40.7.SP. The arrangement of spaces in pest management facilities must meet specific requirements (MIL-HDBK 1028/8A, para 3.1.3 and 3.1.4.3, implementing FGS-Spain 11.6.a).</p> <p>PM.40.8.SP. Installations must meet specific requirements with regard to the foundations, floor slabs, and floor finishes in pest management facilities (MIL-HDBK 1028/8A, para 3.1.5.1, implementing FGS-Spain 11.6.a).</p>	<p>Verify that arrangement of spaces allows workers to arrive in a clean area, dress for hazardous exposure in the change area, leave through a pesticide area doorway, and retrace that path at the end of the workday.</p> <p>Verify that there is no direct access between the office and the pesticide storage and mixing areas.</p> <p>Verify that doorways are arranged so that no pesticide need be carried through clean areas.</p> <p>Verify that the mixing room is located adjacent to the storage area and the equipment storage area (if indoors).</p> <p>Verify that the mixing room is accessible through the corridor to the shower and locker rooms and the exterior.</p> <p>Verify that there are no floor drains in the interior pesticide areas.</p> <p>Verify that, in areas where pesticides are handled or stored, floors slope (3/100) from sills to the center.</p> <p>Verify that, if the floor does not slope, a 4 in. (102 mm) concrete curb is provided in the pesticide areas.</p> <p>Verify that exterior slabs slope to a sump with a closeable drain located not more than 6 ft (1.829 m) from the outer margin of the washstand.</p> <p>Verify that exterior ramps slope downward from exterior flat (flushed) door sills.</p> <p>(NOTE: The intent of these provisions is to provide containment for at least 110 percent of the capacity of the largest bulk liquid pesticide container anticipated for the facility.)</p> <p>Verify that no utility, heating, or ventilation ducting is located in or below slabs.</p> <p>Verify that pesticide concentrates and finished (formulated) materials are prevented from entering the sanitary or storm sewer systems.</p> <p>Verify that concrete floors are finished with a nonabsorbent nonskid finish.</p> <p>(NOTE: Change rooms and office floors may be tiled.)</p> <p>Verify that the floors in both the storage and mixing areas are covered with non-skid epoxy sealant or are otherwise made impermeable.</p>

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.40.9.SP. Installations must meet specific requirements with regard to the exterior walls of pesticide management facilities (MIL-HDBK 1028/8A, para 3.1.5.2, implementing FGS-Spain 11.6.a).</p> <p>PM.40.10.SP. Installations must meet specific requirements with regard to the doors and windows in pesticide management facilities (MIL-HDBK 1028/8A, para 3.1.5.3, implementing FGS-Spain 11.6.a).</p> <p>PM.40.11.SP. A fire extinguisher must be provided by the door between the storage and mixing areas (MIL-HDBK 1028/8A, para 3.7.1, implementing FGS-Spain 11.6.a).</p>	<p>Verify that exterior walls are constructed of metal, concrete, or masonry.</p> <p>Verify that the interior surfaces of exterior walls are constructed of metal, coated concrete, or masonry.</p> <p>Verify that no porous surface finishes are used.</p> <p>Verify that exterior doors are self-locking and self-closing with weather stripping.</p> <p>Verify that doors have locks that prevent unauthorized entry.</p> <p>Verify that flat (flush) sills are provided for all doors between the mixing and storage areas.</p> <p>Verify that the facility has a 9 x 9 ft (2.74 x 2.74 m) overhead garage door with weather stripping.</p> <p>(NOTE: Higher doors may be necessary to accommodate high-mast equipment.)</p> <p>Verify that, if the garage is separate from the pesticide mixing and storage areas, a flat (flush) sill is provided for the garage doorway.</p> <p>Verify that, if the garage is not separate from the pesticide mixing and storage areas, a ramp to a 4 in. (104 mm) high sill is provided.</p> <p>Verify that there is a slope away from the exterior of the door to prevent rain water from entering the facility.</p> <p>Verify that the pest management facility has nonporous framed windows that are double glazed, where appropriate, with a thermal barrier feature.</p> <p>Verify that, if the facility is not surrounded by a climb-resistant chain link fence and security gates, it has interior security mesh windows.</p> <p>(NOTE: It is permissible to have no windows as an alternative.)</p> <p>Verify that drop ceilings are not used in pesticide areas.</p> <p>Verify that a fire extinguisher is located by the door between the storage and mixing areas.</p>

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.40.12.SP. Drains from pesticide mixing areas must not be connected to septic systems, sanitary sewers, or stormwater systems (MIL-HDBK 1028/8A, para 3.5.2.5, implementing FGS-Spain 11.6.a).</p> <p>PM.40.13.SP. Pesticide management areas must have backflow prevention devices (MIL-HDBK 1028/8A, para 3.5.2.10 and 3.5.2.11, implementing FGS-Spain 11.6.a).</p> <p>PM.40.14.SP. Mixing and storage areas must have a ventilation system separate from that in the rest of the facility (MIL-HDBK 1028/8A, para 3.5.4.2, implementing FGS-Spain 11.6.a).</p> <p>PM.40.15.SP. Mixing sinks must have slotted hood, local exhaust systems (MIL-HDBK 1028/8A, para 3.5.4.2, implementing FGS-Spain 11.6.a).</p>	<p>Verify that no pesticide mixing area is connected to septic systems, sanitary sewers, or stormwater systems.</p> <p>Verify that reduced pressure backflow prevention devices are installed on plumbing that provides a source of water for filling pesticide dispersal equipment tanks.</p> <p>Verify that permanent hose bibs (overhead filling pipes) have a discharge hose and an approved backflow prevention device.</p> <p>(NOTE: The hose bib requirement applies to outdoor washdown areas of medium and large facilities.)</p> <p>Verify that mixing and storage areas have a ventilation system separate from that in the rest of the facility.</p> <p>Verify that the system is provided with a roof-mounted, centrifugal fan system selected for a minimum of six air changes per hour.</p> <p>Verify that fans discharge vertically.</p> <p>Verify that replacement air is heated to 55 °F (13 °C).</p> <p>Verify that the ventilation system has a control switch with a light to indicate ON at the entrance to the pesticide handling areas.</p> <p>Verify that the control switch has a sign that reads as follows:</p> <p style="text-align: center;">VENTILATION SYSTEM SHOULD OPERATE CONTINUOUSLY DO NOT ENTER UNLESS VENTILATION SYSTEM HAS OPERATED FOR AT LEAST 10 MINUTES.</p> <p>Verify that the mixing sink has a slotted hood, local exhaust system.</p>

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
PM.40.16.SP. Outdoor hardstands and parking aprons for vehicles must meet specific standards (MIL-HDBK 1028/8A, para 3.4.8, implementing FGS-Spain 11.6.a).	<p>Verify that the outdoor hardstand and parking apron consists of a concrete pad sufficiently large to park a truck and trailer (at least 15 x 25 ft (4.57 x 7.62 m)).</p> <p>Verify that the hardstand pad slopes (3/100) to a sump fitted with a removable grate cover suitable for the anticipated vehicular traffic load.</p> <p>Verify that the sump is sufficiently large to contain a minimum of 110 percent of the capacity of the largest bulk liquid pesticide container anticipated to be used at the facility.</p> <p>Verify that there is a curb at least 4 in. (102 mm) high at the low edge of the pad to direct liquid into the sump.</p> <p>Verify that, if an industrial sewer is available, a 3 in. (75 mm) sump drain is provided.</p> <p>Verify that, if a connection to an industrial sewer exists, the sump has a ball valve in the sump drain to control discharge.</p> <p>Verify that the valve is located adjacent to the sump in a pit with a grate cover.</p> <p>Verify that the ball valve is normally closed and manually opened.</p> <p>Verify that, if no industrial sewer is available, a small section of removable grate is provided to accommodate a hose for recovering sump contents.</p> <p>Verify that the hardstand area has an elevated hose bib (fill pipe) of 1.5 to 2 in. (38 to 51 mm) diameter.</p> <p>(NOTE: This requirement applies if application equipment with tanks 50 gal (189.9 L) or larger will be used at the facility.)</p> <p>Verify that the hardstand area has an emergency eyewash and a deluge shower with manually operated, delayed-closing valves located adjacent to the mixing site.</p> <p>(NOTE: This requirement does not apply if devices inside the facility are accessible within 10 s from the outdoor mixing site.)</p> <p>(NOTE: The hardstand area may be provided with a canopy roof to protect parked vehicles and equipment and to minimize the accumulation of water.)</p>

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.40.17.SP. Pesticide management facilities must meet specific requirements with regard to signs (MIL-HDBK 1028/8A, para 3.8, implementing FGS-Spain 11.6.a and 11.6.b).</p>	<p>Verify that identification signs are provided in appropriate rooms and buildings and on fences.</p> <p>(NOTE: Signs such as DANGER, POISON, PESTICIDE STORAGE AREA are suggested.)</p> <p>Verify that a NO SMOKING sign is located in pesticide areas.</p> <p>Verify that warning signs are provided on the exterior of the building at each entrance.</p> <p>Verify that building identification information is visible from 100 ft (30.48 m).</p> <p>Verify that a sign is installed over the sink that reads as follows:</p> <p style="text-align: center;">DO NOT DISCHARGE PESTICIDES INTO THE SINK.</p> <p>Verify that a sign is posted at the entrance(s) to toilets that reads:</p> <p style="text-align: center;">WASH HANDS BEFORE USING TOILET.</p> <p>Verify that the hardstand has a sign that reads as follows:</p> <p style="text-align: center;">CLOSE DRAIN WHILE HANDLING PESTICIDES ON HARDSTAND.</p> <p>Verify that a sign is provided near the hardstand's pit valve stating:</p> <p style="text-align: center;">RECOVER PESTICIDE SPILLS USE VALVE TO DRAIN WASHWATER AND RAIN.</p> <p>Verify that, if a flammable liquid storage cabinet is present, a sign is provided that reads as follows:</p> <p style="text-align: center;">FLAMMABLE PESTICIDES.</p> <p>Verify that a list of the types of materials stored is posted on the outside of the storage area.</p> <p>(NOTE: Copies of this list should be given to the installation on-scene hazardous waste coordinator and to the fire department.)</p> <p>Verify that the list includes chemical names and formulations rather than brand names.</p> <p>Verify that a sign is posted at the mixing area that requires the use of protective gloves, aprons and boots, protective eyewear or face shields, coveralls, and an approved pesticide respirator.</p>

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.50 STORAGE, MIXING, AND PREPARATION OF PESTICIDES</p> <p>PM.50.1.SP. Pesticides must be addressed in the installation spill plan (FGS-Spain 11.5).</p> <p>PM.50.2.SP. Labels on pesticides must bear the appropriate use instructions and precautionary messages (FGS-Spain 11.8).</p> <p>PM.50.3.SP. Pesticide storage areas must be regularly inspected and secured to prevent unauthorized access (FGS-Spain 11.6.c and MIL-HDBK 1028/8A, para 3.1.4.1.1, implementing FGS-Spain 11.6.a and 11.6.b).</p> <p>PM.50.4.SP. Pesticide storage areas must have a readily visible, current inventory of all items in storage (FGS-Spain 11.6.c).</p> <p>PM.50.5.SP. Indoor storage areas for pesticides must meet specific requirements (MIL-HDBK 1028/8A, para 3.1.4.1.2, implementing FGS-Spain 11.6.b).</p>	<p>Verify that pesticides are included in the installation spill plan.</p> <p>Verify that labels are clearly visible and bear the appropriate use instructions and precautionary message based on the toxicity category of the pesticide. (NOTE: Examples of precautionary messages include “danger” (peligro), “warning” (atención), or “caution” (precaución).)</p> <p>Verify that the use instructions and precautionary messages are in English and Spanish.</p> <p>Verify that storage areas are inspected regularly and secured to prevent unauthorized access.</p> <p>Verify that the pesticide storage area has a readily visible, current inventory of all items in storage.</p> <p>Verify that the inventory also includes all items awaiting disposal.</p> <p>Verify that pesticides are stored in an area sealed or separated from clean areas, with direct access to the exterior.</p> <p>Verify that pesticides are stored in such a way that:</p> <ul style="list-style-type: none"> - they are off the floor, with all labels visible - they are stored no more than 8-ft (2.44-m) high. <p>Verify that lanes are present to provide effective access and inspection.</p>

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.50.6.SP. Toxic pesticides must be stored in areas with sufficient ventilation and in facilities with adequate PPE (FGS-Spain 11.6.b.2).</p> <p>PM.50.7.SP. Certain chemicals must be stored outside of occupied buildings (MIL-HDBK 1028/8A, para 3.1.4.1.4, implementing FGS-Spain 11.6.b).</p> <p>PM.50.8.SP. Outdoor storage areas for pesticides must meet specific requirements (MIL-HDBK 1028/8A, para 3.1.4.1.4, implementing FGS-Spain 11.6.a and 11.6.b).</p> <p>PM.50.9.SP. Motor vehicles may not be stored in the same areas as pesticides (MIL-HDBK 1028/8A, para 3.1.4.1.3, implementing FGS-Spain 11.6.b).</p>	<p>Verify that pesticides are stored in a dry building in which a temperature is maintained that is above 50 °F (12 °C) and below 100° F (38° C).</p> <p>Verify that pesticides are stored separated from the following areas:</p> <ul style="list-style-type: none"> - mixing areas - shower and locker room - offices - any area where personnel work for prolonged periods. <p>Verify that no pesticide concentrates are stored in a room containing a floor drain of any type.</p> <p>Verify that storage and mixing areas have containment provided either by curbing or sloped floors.</p> <p>Verify that toxic pesticides are located in areas with sufficient ventilation and in facilities with adequate PPE.</p> <p>Verify that all liquid fumigants are stored outside of occupied buildings in hazardous chemical lockers.</p> <p>Verify that toxic or flammable pesticides are stored on the ground floor of unoccupied buildings.</p> <p>Verify that outdoor storage areas for pesticides are:</p> <ul style="list-style-type: none"> - secured and under cover - protected from radiant heating, freezing temperatures, and moisture. <p>Verify that no motor vehicles are stored in the same area as pesticides.</p> <p>(NOTE: Wherever possible, vehicles are to be located outside or in a separate building from the pesticide storage or handling area.)</p> <p>Verify that, when motor vehicles are located under the same roof as the pesticide area, they are separated from the pesticide area by a minimum of 2-h fire rated construction.</p>

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
PM.50.10.SP. Mixing rooms must meet specific requirements (MIL-HDBK 1028/8A, para 3.1.4.2, implementing FGS-Spain 11.6.a).	<p>Verify that mixing rooms have electricity and hot and cold water.</p> <p>Verify that mixing rooms have metal or plastic shelves to hold pesticides off the floor.</p> <p>(NOTE: Plastic is preferred for the pallets, and steel stands are recommended for keeping drums off the floor.)</p> <p>Verify that no wooden pallets are in use.</p> <p>Verify that the work area contains a pesticide-resistant sink equipped with the following:</p> <ul style="list-style-type: none"> - a closeable drain - a contiguous self-draining, drip-proof counter top at least 5-ft (1.524-m) long - sideboards - splash panel on back - an adjacent shelf for holding measuring devices and concentrates.

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PM.60 DISPOSAL</p> <p>PM.60.1.SP. Unless otherwise restricted or canceled, pesticides in excess of installation needs must be redistributed within the supply system or disposed of (FGS-Turkey 11.9.a).</p> <p>PM.60.2.SP. If waste pesticides are generated, the installation must dispose of them in accordance with specific standards (FGS-Spain 11.9).</p> <p>PM.60.3.SP. No concentrated pesticides may be discarded to the sanitary sewer or storm drain (MIL-HDBK 1028/8A, para 3.5.2.1, implementing FGS-Spain 11.6.a and 11.6.b).</p>	<p>Verify that, unless otherwise restricted or canceled, pesticides in excess of installation needs are redistributed within the supply system or disposed of in accordance with the requirements in checklist items PM.60.2.SP and PM.60.3.SP.</p> <p>Verify that the generator determines whether the pesticide wastes are hazardous wastes.</p> <p>Verify that, if the pesticide waste is not a hazardous waste, it is disposed of in accordance with the label instructions, through Defense Reutilization and Marketing Office (DRMO), or in accordance with the requirements of Section 9, <i>Solid Waste Management</i>.</p> <p>Verify that, if the pesticide is a hazardous waste, it is disposed of in accordance with the provisions of Section 4, <i>Hazardous Waste Management</i>.</p> <p>Verify that no concentrated pesticides are discarded to the sanitary sewer or storm drain.</p>

SECTION 8

PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT

September 2000

A. Applicability of this Section

This section contains standards to control and abate pollution resulting from the storage, transport, and distribution of petroleum products. It also contains standards to prevent, control, and report spills of POL, hazardous substances, and hazardous waste. Standards for both aboveground storage tanks (ASTs) and underground storage tanks (USTs) are found in Section 10, *Storage Tank Management*.

B. Source Documents

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapters 6, 9, and 18.

C. Key Compliance Requirements

- The installation must prepare, maintain, and implement a plan that provides for the prevention, control, and reporting of all spills of POL, hazardous substances, and hazardous waste.
- Installations must provide necessary training to ensure the effectiveness of personnel and equipment.
- All pipeline facilities with a construction start date after 1 October 1994 must be designed and constructed to meet specific American Petroleum Institute (API) standards.
- All pipeline facilities carrying POL must be tested and maintained in accordance with recognized API standards.
- Installations must take specific actions and make specific notifications in the event of a spill of POL or hazardous substance.
- Used oil must be collected and stored separately from other hazardous substances.
- Installations must follow specific guidelines when burning used oil for energy recovery.
- Installations that do not possess suitable facilities for the combustion of used oils must, under certain conditions, give such oils to the Spanish consortium for recycling or final disposal.
- Used oils containing greater than 25 ppm of PCBs must be handled and disposed of as hazardous waste.

D. Definitions

- *Hazardous Substance* - any substance having the potential to do serious harm to human health or the environment if spilled or released in a reportable quantity (RQ). A listing of these substances and corresponding RQ is contained in Appendix 4-1, Chart A.4. The term does not include (FGS-Spain, Chapter 18, Definitions):
 1. petroleum, including crude POL or any fraction thereof, that is not otherwise specifically listed or designated as a hazardous substance above
 2. natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

- *Installation On-Scene Coordinator (IOSC)* - the official who coordinates and directs DOD control and cleanup efforts at the scene of POL or hazardous substance or hazardous waste spills due to DOD activities on or near the installation. This official is designated by the Installation Commander (IC) (FGS-Spain, Chapter 18, Definitions).
- *Installation Response Team (IRT)* - a team performing emergency functions as defined and directed by the IOSC (FGS-Spain, Chapter 18, Definitions).
- *Oil* - POL of any kind or in any form, including, but not limited to, petroleum, fuel POL, sludge, POL refuse, and POL mixed with wastes other than dredged spoil (FGS-Spain, Chapter 18, Definitions).
- *Pipeline Facility* - includes new and existing pipes, pipeline rights of way, auxiliary equipment (e.g., valves, manifolds, etc.), and buildings or other facilities used in the transportation of POL (FGS-Spain, Chapter 9, Definitions).
- *POL* - includes, but is not limited to, petroleum and petroleum-based substances comprised of complex blends of hydrocarbons derived from crude oil through processes of separation, conversion, upgrading, and finishing, such as motor fuels, residual fuel oils, lubricants, petroleum solvents, and used oils (FGS-Spain, Chapter 9, Definitions).
- *POL Facility* - an installation with any individual aboveground tank of 2500 L (660 gal) or greater, aggregate aboveground storage of 5000 L (1320 gal) or greater, underground storage tank (UST) storage of greater than 15,900 L (4200 gal) or a pipeline facility (FGS-Spain, Chapter 9, Definitions).
- *Reportable Quantity (RQ)* - a released quantity of POL or quantities of hazardous substances that exceed those identified in this section of the manual or in the RQ column, Appendix 4-1, Chart A.4 (FGS-Spain, Chapter 18, Definitions).
- *Significant Spill* - an uncontained release to the land or water in excess of any of the following quantities (FGS-Spain, Chapter 18, Definitions):
 1. for hazardous waste or hazardous substance identified as a result of inclusion in Table 4-1, Chart A.4, any quantity in excess of the RQ listed therein
 2. for POL or liquid or semi-liquid hazardous material, hazardous waste or hazardous substance, in excess of 416 L (110 gal)
 3. for other solid hazardous material, in excess of 225 kg (500 lb)
 4. for combinations of POL and liquid, semi-liquid and solid hazardous materials, hazardous waste or hazardous substance, in excess of 340 kg (750 lb).
- *Used Oil* - any oil or other waste POL product that has been refined from crude oil, or is a synthetic oil, has been used, and as a result of such use, is contaminated by physical or chemical impurities. Used oil exhibiting the characteristics of reactivity, ignitability, and corrosivity is still considered used oil, unless it has been mixed with other hazardous waste. However, used oil that exhibits the characteristic of toxicity is a hazardous waste and will be managed as such. In addition, used oil mixed with hazardous waste is a hazardous waste and will be managed as such (FGS-Spain, Chapter 6, Definitions).
- *Used Oil Burned for Energy Recovery* - used oil that is burned for energy recovery is termed used oil fuel. It includes any fuel produced from used oil by processing, blending, or other treatment (FGS-Spain, Chapter 6, Definitions).

E. Records To Review

- Records of all spills, leaks, and associated site assessment/cleanup activities (for 3 yr)
- Installation Spill Plan
- Records of spill response training

F. Physical Features To Inspect

- Refueling facilities
- Washrack areas
- Vehicle maintenance areas
- Oil separators
- Oil and hazardous substance sites

G. Guidance for Checklist Users

	REFER TO CHECKLIST ITEMS:
Missing Checklist Items/Positive Findings	PO.2.1.SP and PO.2.2.SP
POL Management	PO.10.1.SP and PO.10.2.SP
Pipelines	PO.20.1.SP and PO.20.2.SP
Discharges/Spills	PO.30.1.SP and PO.30.2.SP
Used POL/Waste POL	PO.40.1.SP through PO.40.5.SP

**COMPLIANCE CATEGORY:
 PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT
 Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PO.2 MISSING CHECKLIST ITEMS/POSITIVE FINDINGS</p> <p>PO.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>PO.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning POL management have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PO.10 POL MANAGEMENT</p> <p>PO.10.1.SP. All DOD installations must prepare, maintain, and implement a plan that provides for the prevention, control, and reporting of all spills of POL, hazardous substances, and hazardous waste (FGS-Spain 9.1 and 18.1 through 18.5).</p>	<p>Verify that the installation has, maintains, and implements a plan that provides for the prevention, control, and reporting of all spills of POL, hazardous substances, and hazardous waste.</p> <p>Verify that the prevention portion of the spill plan includes, at a minimum:</p> <ul style="list-style-type: none"> - name, title, responsibilities, duties, and telephone number of the designated IOSC - general information on the installation, including: <ul style="list-style-type: none"> - name - type or function - location and address - maps of drainage patterns - designated water protection areas - maps showing locations of all storage, handling, and transfer facilities that could produce a significant spill of POL, hazardous substances, or hazardous waste - critical water resources - land uses - possible migration pathways - inventory of all storage, handling, and transfer facilities that could produce a significant spill of POL, hazardous substances, or hazardous waste; for each listing include: <ul style="list-style-type: none"> - prediction of direction and rate of flow - total quantity of POL, hazardous substance, or hazardous waste that could be spilled as a result of major failure - inventory of all POL, hazardous substance, or hazardous waste at storage and handling and transfer facilities - detailed description of countermeasures, including structures and equipment for diversion and containment of spills for each facility listed in the inventory - description of deficiencies in spill prevention and control measures at each listed site, including corrective measures required, procedures to be followed to correct listed deficiencies, and any interim control measures in place - written procedures for: <ul style="list-style-type: none"> - operations to preclude spills of POL, hazardous substance, or hazardous waste - inspections - recordkeeping requirements.

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 Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
	<p>Verify that the control section of the plan (which is considered a contingency plan) contains:</p> <ul style="list-style-type: none"> - specification of the responsibilities, duties, procedures, and resources to be used to contain and cleanup spills - description of immediate response actions - responsibilities, composition, and training requirements of the IRT - procedures for IRT alert and response to include: <ul style="list-style-type: none"> - access to a reliable communications system for timely notification of a POL, hazardous substance, or hazardous waste spill - public affairs involvement - current roster of persons and alternates who must be notified of a spill, including: <ul style="list-style-type: none"> - name - organization mailing address - work and home telephone number - without compromising security, provisions for the notification of the emergency coordinator (EC) after normal working hours - procedure for notifying the IC and appropriate local Spanish authorities in the event of hazard to human health and the environment - assignment of responsibilities for making notifications to emergency services providers - surveillance procedures for early detection of spills - prioritized list of critical water resources to be protected - other resources available through prearranged agreements to cleanup a large spill - cleanup methods, including procedures and techniques used to identify, contain, disperse, reclaim, and remove POL, hazardous substances, or hazardous wastes - disposal procedures for recovered substances, contaminated POL, absorbent material - procedures to be accomplished prior to resumption of operations - description of general safety and fire prevention precautions for spill cleanup actions - public affairs section. <p>Verify that the contingency plan addresses each POL storage and distribution facility specifically.</p>

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Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PO.10.2.SP. Installations must provide necessary training to ensure the effectiveness of personnel and equipment (FGS-Spain 18.5).</p>	<p>Verify that the reporting section of the plan addresses the following:</p> <ul style="list-style-type: none"> - recordkeeping when emergency procedures are implemented - an immediate report to the IOSC of any spill of POL, hazardous substance, or hazardous waste that exceeds the RQ - a written report from the IOSC to the appropriate military department and/or defense agency and the Executive Agent in any of the following circumstances: <ul style="list-style-type: none"> - when the spill cannot be contained within any required berm or secondary containment - when the spill exceeds 416 L (110 gal) of POL - when a water resource has been polluted - when the IOSC has determined that the spill is significant - notification of appropriate authorities. <p>Verify that the spill plan has been updated at least once every 5 yr or when significant changes in operations or facilities occur or a significant spill occurs.</p> <p>Verify that the plan is certified by a competent authority.</p> <p>Verify that the installation provides necessary training to ensure the effectiveness of personnel and equipment.</p>

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PO.20 PIPELINES</p> <p>PO.20.1.SP. All pipeline facilities with a construction start date after 1 October 1994 must be designed and constructed to meet specific API standards (FGS-Spain 9.5).</p> <p>PO.20.2.SP. All pipeline facilities carrying POL must be tested and maintained in accordance with recognized API standards (FGS-Spain 9.4).</p> <p>[Revised September 2000]</p>	<p>Verify that all pipeline facilities with a construction start date after 1 October 1994 are designed and constructed to meet:</p> <ul style="list-style-type: none"> - API 510, <i>Pressure Vessel Inspection Code: Maintenance Inspection, Rating, Repair, and Alteration</i> - American Petroleum Institute Reprint (API RP) 1615, <i>Installation of Underground Petroleum Product Storage Systems</i>. <p>Verify that all pipeline facilities carrying POL are tested and maintained in accordance with recognized API standards.</p> <p>Verify that each pipeline operator handling POL prepares and follows a procedural manual for operations, maintenance, and emergencies.</p> <p>Verify that each new pipeline system and each system in which pipe has been replaced or relocated is hydrostatically tightness tested, in accordance with API RP-1110, <i>Pressure Testing of Liquid Petroleum Pipelines</i>.</p> <p>Verify that the hydrostatic pressure utilized during the test is a minimum of 0.35 kg/cm² applied to the highest point of the system.</p>

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PO.30 DISCHARGES/SPILLS</p> <p>PO.30.1.SP. Installations must take specific actions in the event of POL spills (FGS-Spain 9.6).</p> <p>PO.30.2.SP. Installations must make specific notifications in the event of a spill of POL, hazardous substance, or hazardous waste (FGS-Spain 18.4.b through 18.4.e).</p>	<p>Verify that, in the event of a spill, the installation follows the guidance in its spill plan.</p> <p>Verify that, in the event of a spill, the immediate response involves:</p> <ul style="list-style-type: none"> - stopping the leak at the source - controlling the migration of the spill - notifying the IOSC and other persons who are listed in the spill plan. <p>Verify that follow-up steps include:</p> <ul style="list-style-type: none"> - preventing the migration of released POL into soils and nearby surface waters - continuing the monitoring and mitigation of any fire and safety hazards posed by vapors or free product - determining soil and water cleanup action - beginning free product removal as soon as possible - reporting spills in accordance with FGS requirements. <p>Verify that spills of RQs of POL, hazardous substance, or hazardous waste are reported to the IOSC immediately.</p> <p>Verify that immediate action is taken to eliminate the source and contain the spill.</p> <p>Verify that, when a spill of POL, hazardous substance, or hazardous waste occurs inside the installation and cannot be contained within its boundaries, the following are notified immediately:</p> <ul style="list-style-type: none"> - the appropriate Military Department and/or Defense Agency - the Executive Agent - the appropriate Spanish authorities. <p>Verify that, when a spill of POL, hazardous substance, or hazardous waste threatens a local Spanish drinking water resource, the following are notified immediately:</p> <ul style="list-style-type: none"> - the appropriate Military Department and/or Defense Agency - the Executive Agent - the appropriate Spanish authorities.

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
	<p>Verify that, if a POL spill in excess of the RQ occurs outside of the installation, the person in charge at the scene immediately notifies appropriate Spanish authorities and local fire departments and obtains necessary assistance.</p> <p>Verify that the IOSC immediately notifies the appropriate military department and/or defense agency and the Executive Agent and submits a follow-up report whenever any of the following occurs:</p> <ul style="list-style-type: none"> - a spill occurs inside a DOD installation and cannot be contained within any required berm or secondary containment - a spill exceeds 416 L (110 gal) of POL - a water resource has been polluted - IOSC has determined that the spill is significant.

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>PO.40 USED POL / WASTE POL</p> <p>PO.40.1.SP. Used oils must be collected separately from other hazardous substances (FGS-Spain 6.9.a)</p> <p>PO.40.2.SP. Installations must follow specific guide lines when burning used oil for energy recovery (FGS-Spain 6.9.b).</p> <p>PO.40.3.SP. Installations that do not possess suitable facilities for the combustion of used oils must give such oils to the appropriate Spanish authority under certain conditions (FGS-Spain 6.9.c).</p>	<p>(NOTE: According to FGS-Spain 14.4.c, used oil contaminated with less than 50 ppm polychlorinated biphenyls (PCBs) may either be transferred to an authorized used oil collection company through DRMO or used as a fuel in combustion plants rated at 3 MW or greater, provided such plants meet the requirements of FGS-Spain 6.9.)</p> <p>Verify that the installation collects used oils separately from other hazardous substances.</p> <p>Verify that used oils containing PCBs are not mixed with any other used oils.</p> <p>Verify that used oils burned for energy recovery have a PCB concentration of less than 50 ppm.</p> <p>Verify that used oils are burned only in authorized furnaces or boilers with a thermal capacity of at least 3 MW that are either:</p> <ul style="list-style-type: none"> - industrial furnaces - industrial boilers located at the site of a facility engaged in a manufacturing process where substances are transformed into new products, including the component parts of products, by mechanical or chemical processes - utility boilers used to produce electric power, steam, or heated or cooled air or other gases or fluids. <p>Verify that combustion of used oil for energy recovery is coordinated with the appropriate Spanish authority.</p> <p>(NOTE: Facilities used for the combustion of used oil must meet the applicable air quality standards contained in Section 1, <i>Air Emissions Management</i>.)</p> <p>Determine whether the installation lacks a plant suitable for the proper combustion of used oils.</p> <p>Determine whether the used oils contain PCB at concentrations less than 50 ppm.</p> <p>Verify that the installation gives such used oils to a Spanish firm authorized to handle used oils.</p>

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<p>PO.40.4.SP. Used oils containing greater than 50 ppm of PCBs must be handled and disposed of as hazardous waste (FGS-Spain 6.9.d).</p>	<p>Determine whether used oils contain PCB concentrations greater than 50 ppm.</p> <p>Verify that such used oils are handled in accordance with the requirements of FGS-Spain, Chapter 14.</p> <p>(NOTE: See Section 11, <i>Toxic Substances Management</i>.)</p> <p>Verify that such used oils are disposed of as hazardous waste in authorized disposal facilities.</p> <p>(NOTE: See Section 4, <i>Hazardous Waste Management</i>.)</p>
<p>PO.40.5.SP. Neither used oil nor used oil contaminated with any hazardous waste may be used for dust suppression or road treatment (FGS-Spain 6.9.e).</p>	<p>Verify that the installation does not use used oil or used oil contaminated with hazardous waste for dust suppression or road treatment.</p>

SECTION 9

SOLID WASTE MANAGEMENT

September 2000

A. Applicability of this Section

This section contains standards to ensure that solid wastes are identified, classified, collected, transported, stored, treated, and disposed of safely and in a manner protective of human health and the environment. The standards apply to all solid waste generated at the installation level. Also included here are standards for the management of medical waste at Department of Defense (DOD) medical and dental treatment facilities at the installation level generated in the diagnosis, treatment, or immunization of human beings or animals or in the production or testing of biologicals subject to certain exclusions. The standards for medical waste do not apply to what would otherwise be household waste.

B. Source Documents

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapters 7 and 8.

C. Key Compliance Requirements

- Analytical samples taken to comply with the standards of FGS-Spain must be tested using certain laboratories only.
- Installations must develop and implement a solid waste management strategy.
- DOD solid wastes will be treated, stored, and disposed of in facilities that have been evaluated against the requirements of FGS-Spain 7.13.
- Installations must develop and implement a written solid waste management strategy.
- Open burning must not be used as a method of solid waste disposal, except for the occasional open burning of agricultural and silvicultural wastes.
- Installations must store all solid wastes, and materials separated for recycling, according to specific guidelines.
- Installations must meet specific requirements with regard to the management of scrap vehicles.
- Installations must develop procedures for dealing with yard waste.
- Installation-operated municipal solid waste landfills (MSWLFs) are subject to operational, design, and record-keeping requirements.
- Installations that operate a MSWLF must prepare a written closure plan that meets specific requirements
- Installations must not initiate new or expand existing waste landfill units without approval of the component and only after showing that unique circumstances necessitate a new unit.
- Incinerators used for the disposal of MSW must meet specific design and operational standards.

- Composting facilities located on DOD installations must meet specific design, operating, and recordkeeping standards.
- Installations must coordinate distribution and/or marketing of compost with the Executive Agent and the appropriate Spanish authority.
- Application of compost to land used for agricultural purposes is subject to specific restrictions and standards.
- All personnel who handle infectious medical waste must wear protective apparel or equipment.
- Infectious medical waste must be separated from noninfectious medical waste at the point of origin.
- The installation must have a contingency plan for the treatment or disposal of infectious medical waste should the primary means become inoperable.
- All personnel who handle infectious medical waste must wear protective apparel or equipment.
- Infectious medical waste that cannot be treated onsite must be managed during storage in accordance with specific requirements.
- Incinerators used to dispose of medical waste must meet specific requirements.
- Installations must keep records concerning infectious medical waste.

D. Definitions

- *Agricultural and Silvicultural Waste* - components of solid waste including yard wastes and other similar organic materials derived from gardening, landscaping, forestry, or agricultural activities (FGS-Spain, Chapter 7, Definitions).
- *Biological Waste* - See *Infectious Medical Waste*.
- *Bulky Waste* - large items of solid waste such as household appliances, furniture, large auto parts, trees, branches, stumps, and other oversized wastes whose large size precludes or complicates their handling by normal solid wastes collection, processing, or disposal methods (FGS-Spain, Chapter 7, Definitions).
- *Collection* - the act of consolidating solid wastes (or materials that have been separated for the purpose of recycling) from various locations (FGS-Spain, Chapter 7, Definitions).
- *Commercial Solid Waste* - a component of municipal solid waste (MSW) including wastes generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities (FGS-Spain, Chapter 7, Definitions).
- *Compost* - a product obtained through a biological process of aerobic degradation from organic components of MSW, from natural fermentable organic materials, or from their mixtures with sludges from domestic wastewater treatment plants (FGS-Spain, Chapter 7, Definitions).
- *Construction and Demolition Waste (Inert Waste)* - a component of solid waste including the waste building materials, packaging, and rubble resulting from construction, remodeling, repair, and demolition operations on pavement, houses, commercial buildings, and other structures (FGS-Spain, Chapter 7, Definitions).
- *Cover Material* - material that is used to cover compacted solid wastes in a land disposal site (FGS-Spain, Chapter 7, Definitions).

- *Daily Cover* - soil that is spread and compacted or synthetic material that is placed on the top and side slopes of compacted solid waste at least at the end of each operating day in order to control vectors, fire, moisture, and erosion and to assure an aesthetic appearance (FGS-Spain, Chapter 7, Definitions).
- *Final Cover* - cover material that serves the same function as daily cover but, in addition, may be permanently exposed on the surface (FGS-Spain, Chapter 7, Definitions).
- *Food Waste* - a component of MSW including the organic residues generated by the handling, storage, sale, preparation, cooking, and serving of foods, commonly called garbage (FGS-Spain, Chapter 7, Definitions).
- *Generation* - the act or process of producing solid waste (FGS-Spain, Chapter 7, Definitions).
- *Hazardous Constituent* - a chemical compound that is listed by name in Appendix 3-2 or Appendix 4-1, Chart A.4 or that possesses the characteristics described in Appendix 4-1 (FGS-Spain, Chapter 7, Definitions).
- *Hazardous Wastes* - wastes possessing certain chemical, physical, or biological properties that require particular care in handling and disposal to prevent damage to human health or the environment (FGS-Spain, Chapter 7, Definitions).

(NOTE: See Section 4, *Hazardous Waste Management*.)

- *Human Blood and Blood Products* - see *Infectious Medical Waste*.
- *Industrial Solid Waste* - a component of MSW including the solid waste generated by industrial processes and manufacturing (FGS-Spain, Chapter 7, Definitions).
- *Inert Material Landfill* - a discrete area of land or an excavation, on or off the installation, that receives construction and demolition waste, and that is not a waste pile (FGS-Spain, Chapter 7, Definitions)
- *Infectious Agent* - any organism (such as a virus or a bacterium) that is capable of being communicated by invasion and multiplication in body tissues and capable of causing disease or adverse health impacts in humans (FGS-Spain, Chapter 7, Definitions).
- *Infectious Medical Waste* - waste produced by medical and dental treatment facilities that is specially managed because it has the potential for causing disease in humans and may pose a risk to both individuals or community health if not managed properly, and which includes the following: (FGS-Spain, Chapter 7, Definitions)
 1. Biological waste, including cultures and stocks of etiologic agents which, due to their species, type, virulence, or concentration, are known to cause disease in humans
 2. Pathological waste, including human tissues and organs, amputated limbs or other body parts, fetuses, placentas, and similar tissues from surgery, delivery or autopsy procedures. Animal carcasses, body parts, teeth, blood, and bedding are also included.
 3. Human blood and blood products (including serum, plasma, and other blood components), items contaminated with liquid or semi-liquid blood or blood products and items saturated or dripping with blood or blood products, and items caked with blood or blood products, that are capable of releasing these materials during handling
 4. Potentially infectious materials including human body fluids such as semen, vaginal secretions, cerebrospinal fluid, pericardial fluid, pleural fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids
 5. Sharps, including hypodermic needles, syringes, biopsy needles and other types of needles used to obtain tissue or fluid specimens, needles used to deliver intravenous solutions, scalpel blades, pasteur pipettes, specimen slides, cover slips, glass petri plates, and broken glass potentially contaminated with infectious waste

6. Infectious waste from isolation rooms, but only including those items which were contaminated or likely to be contaminated with infectious agents or pathogens, to include excretion exudates and discarded materials contaminated with blood.
- *Municipal Solid Waste (MSW)* - wastes generated from the following services and activities: (FGS-Spain, Chapter 7, Definitions)
 1. residential areas
 2. commercial and service activities
 3. street cleaning and maintenance activities in park and recreational areas
 4. abandoning of dead animals, furniture, household equipment, and vehicles
 5. industrial, agricultural, and construction activities and minor household repairs, to the extent that these wastes are not characterized as toxic and dangerous wastes

(NOTE: MSW resulting from construction and demolition activities is considered to be inert waste.)

- *Municipal Solid Waste Landfill Unit (MSWLF)* - a discrete area of land or an excavation, on or off the installation, that receives MSW and that is not a land application unit, surface impoundment, injection well, or waste pile (FGS-Spain, Chapter 7, Definitions).
- *Noninfectious Medical Waste* - waste created in medical and dental treatment facilities that has been determined to be incapable of causing disease in humans or which has been treated to render it noninfectious (FGS-Spain, Chapter 8, Definitions).
- *Open Burning* - burning of solid wastes in the open, such as in an open dump or in barrels (FGS-Spain, Chapter 7, Definitions).
- *Pathological Waste* - See *Infectious Medical Waste*.
- *Potentially Infectious Materials* - See *Infectious Medical Waste*.
- *Residential Solid Waste* - a component of MSW including the wastes generated by the normal activities of households, including, but not limited to, food wastes, rubbish, ashes, and bulky wastes (FGS-Spain, Chapter 7, Definitions).
- *Sanitary Landfill* - a land disposal site employing an engineered method of disposing of solid wastes on land in a manner that minimizes environmental hazards by spreading the solid wastes in thin layers, compacting the solid wastes to the smallest practical volume, and applying and compacting cover material at the end of each operating day (FGS-Spain, Chapter 7, Definitions).
- *Scrap Vehicles* - motor vehicles which are the property of the DOD, including personally owned vehicles which have been abandoned or donated to the DOD by U.S. personnel, and which will be disposed of by the DOD or its contractor (FGS-Spain, Chapter 7, Definitions).
- *Sharps* - See *Infectious Medical Waste*.
- *Sludge* - the accumulated semiliquid suspension of settled solids deposited from wastewaters or other fluids in tanks or basins. It does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluent, dissolved materials in irrigation return flows, or other common water pollutants (FGS-Spain, Chapter 7, Definitions).
- *Solid Waste* - garbage, refuse, sludge, and other discarded materials, including solid, semi-solid, liquid, and contained gaseous materials. It does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluent, dissolved materials in irrigation return flows, or other common water pollutants (FGS-Spain, Chapter 7, Definitions).

- *Solid Waste Storage Container* - a receptacle used for the temporary storage of solid waste while awaiting collection (FGS-Spain, Chapter 7, Definitions).
- *Storage* - the interim containment of solid waste after generation and prior to collection for ultimate recovery or disposal (FGS-Spain, Chapter 7, Definitions).
- *Treatment* - the methods specified in Appendix 9-1 to render infectious medical waste noninfectious (FGS-Spain, Chapter 8, Definitions).
- *Vector* - a carrier, usually an arthropod, that is capable of transmitting a pathogen from one organism to another (FGS-Spain, Chapter 7, Definitions).
- *Yard Waste* - a component of MSW including grass and shrubbery clippings, tree limbs, leaves, and similar organic materials commonly generated in residential yard maintenance (also known as green waste) (FGS-Spain, Chapter 7, Definitions).

E. Records To Review

- Record of current nonhazardous solid waste management practices
- Documentation of locations (map) and descriptions of all MSWLFs
- Records of operational history of all active and inactive MSWLFs
- Environmental monitoring procedures or plans
- Records of resource recovery practices, including the sale of materials for the purpose of recycling
- Solid waste removal contracts and inspection records

F. Physical Features To Inspect

- Resource recovery facilities
- Incineration and land disposal facilities (active and inactive)
- Areas where hazardous and nonhazardous wastes are disposed of
- Construction debris areas
- Waste receptacles
- Solid waste vehicle storage and washing areas

G. Guidance for Checklist Users

REFER TO CHECKLIST ITEMS:	
Missing Checklist Items/Positive Findings	SO.2.1.SP and SO.2.2.SP
All Installations	SO.10.1.SP through SO.10.7.SP
Solid Waste Storage and Collection	SO.20.1.SP through SO.20.5.SP
Land Disposal Sites	
Specific Wastes	SO.30.1.SP
Operations	SO.40.1.SP through SO.40.12.SP
Closure and Postclosure	SO.50.1.SP and SO.50.2.SP
New Landfills	SO.60.1.SP through SO.60.3.SP
Incinerators	SO.70.1.SP
Composting Facilities	SO.80.1.SP through SO.80.5.SP
Medical Waste	
General	SO.90.1.SP through SO.90.3.SP
Infectious Medical Waste	SO.100.1.SP through SO.100.11.SP
Disposal	SO.110.1.SP through SO.110.8.SP

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<p>SO.2 MISSING CHECKLIST ITEMS/POSITIVE FINDINGS</p> <p>SO.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>SO.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning solid waste management have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>SO.10 ALL INSTALLATIONS</p> <p>SO.10.1.SP. Analytical samples taken to comply with the standards of FGS-Spain must be tested using certain laboratories only (FGS-Spain 7.19).</p> <p>SO.10.2.SP. Installations must cooperate with Spanish officials, to the extent possible, in the solid waste management planning process (FGS-Spain 7.2).</p> <p>[Revised September 2000]</p> <p>SO.10.3.SP. DOD solid wastes will be treated, stored, and disposed of in facilities that have been evaluated against the requirements of FGS-Spain 7.13 (FGS-Spain 7.1).</p> <p>SO.10.4.SP. Installations must develop and implement a written solid waste management strategy (FGS-Spain 7.3).</p> <p>SO.10.5.SP. Buildings and all other facilities that are constructed, modified, or leased after June 1994 must provide for storage areas that can be easily cleaned and maintained and that allow for safe and efficient collection of solid waste (FGS-Spain 7.7).</p> <p>SO.10.6.SP. Installations must not use open burning as a method of solid waste dis-</p>	<p>Verify that analytical samples are tested using one of the following:</p> <ul style="list-style-type: none"> - overseas DOD laboratories approved by the service component - laboratories authorized by Spanish authorities - Continental U.S. (CONUS) laboratories certified by the U.S. Environmental Protection Agency (USEPA). <p>Verify that, to the extent possible, the installation cooperates with Spanish officials in the solid waste management planning process.</p> <p>Verify that, if the installation disposes of its solid waste in a Spanish facility, that facility has the appropriate Spanish authorizations.</p> <p>Verify that the installation has evaluated the facilities that it uses to treat, store, and/or dispose of DOD solid wastes against the requirements of FGS-Spain 7.13.</p> <p>(NOTE: See checklist item SO.30.1.SP and the checklist items in SO.40.)</p> <p>Verify that the facility is not used if it does not meet the requirements of FGS-Spain 7.13.</p> <p>Verify that the installation has developed and implemented a written strategy for reducing solid waste disposal.</p> <p>(NOTE: This strategy could include recycling, composting, and waste minimization efforts.)</p> <p>Verify that buildings and facilities in the design phase will have appropriate solid waste storage areas.</p> <p>Verify that solid waste is not disposed of by open burning.</p> <p>(NOTE: This prohibition does not apply to the occasional open burning of agri-</p>

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<p>posal (FGS-Spain 7.15).</p> <p>SO.10.7.SP. Certain measures must be implemented when open burning is used for the disposal of agricultural and silvicultural wastes (FGS-Spain 7.15.a).</p>	<p>cultural and silvicultural wastes.)</p> <p>Determine whether open burning is used for the occasional disposal of agricultural and silvicultural wastes.</p> <p>Verify that the following measures are implemented to prevent uncontrolled burning:</p> <ul style="list-style-type: none"> - fire breaks are prepared - sufficient personnel are present to control the fire during burning - the fire is controlled until it has been totally extinguished - burning operations are performed during daylight hours.

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<p>SO.20 SOLID WASTE STORAGE AND COLLECTION</p> <p>SO.20.1.SP. Installations must use solid waste storage containers that meet specific design standards (FGS-Spain 7.8).</p> <p>SO.20.2.SP. Installations must store containers in accordance with specific requirements (FGS-Spain 7.9).</p> <p>SO.20.3.SP. Installations must store all solid wastes, and materials separated for recycling, according to specific guidelines (FGS-Spain 7.4).</p> <p>SO.20.4.SP. Installations must meet specific requirements with regard to the management of bulky wastes (FGS-Spain 7.5).</p>	<p>Verify that storage containers are leakproof, waterproof, and vermin-proof, including sides, seams, and bottoms.</p> <p>Verify that storage containers are durable enough to withstand anticipated usage without rusting, cracking, or deforming in a manner that would impair serviceability.</p> <p>Verify that storage containers have functional lids.</p> <p>Verify that containers are stored on a firm, level, well-drained surface that is large enough to accommodate all of the containers.</p> <p>Verify that the storage area is clean and free of spills.</p> <p>Verify that all solid wastes, and materials separated for recycling, are stored so as not to constitute a fire, health, or safety hazard or provide food or harborage for vectors.</p> <p>Verify that all solid wastes, and materials separated for recycling, are contained or bundled to prevent spillage.</p> <p>Verify that bulky wastes are stored so as not to create an attractive nuisance and to avoid the accumulation of solid waste and water in and around the bulky items by removing all doors from large household appliances and covering the items.</p> <p>Verify that bulky wastes are screened for the presence of hazardous constituents and ozone depleting substances.</p> <p>Verify that readily detachable or removable hazardous constituents are segregated and disposed of properly.</p> <p>Verify that bulky wastes are disposed of in accordance with DODD 4160.21M (<i>Defense Reutilization and Marketing Manual</i>).</p> <p>Verify that bulky wastes that cannot be disposed of through the Defense Reutilization and Marketing Office (DRMO) are disposed of as solid waste in accordance with local Spanish laws and procedures identified in the contract with the municipality or commercial firm for waste collection.</p> <p>Verify that bulky wastes classified as hazardous are disposed of in accordance with the requirements of FGS-Spain, Chapter 6.</p>

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SO.20.5.SP. Installations must meet specific requirements with regard to the management of scrap vehicles (FGS-Spain 7.6).	<p>(NOTE: See Section 4, <i>Hazardous Waste Management</i>.)</p> <p>Verify that scrap vehicles stored temporarily for the purpose of final disposal are properly drained of all hazardous fluids and ozone-depleting substances.</p> <p>Verify that any other hazardous constituents are removed prior to storage.</p> <p>Verify that hazardous materials removed from scrap vehicles are disposed of as hazardous waste in accordance with the requirements of FGS-Spain, Chapter 6.</p> <p>(NOTE: See Section 4, <i>Hazardous Waste Management</i>.)</p> <p>Verify that scrap vehicles are stored in a fenced impound lot in a manner protective of underlying groundwater.</p> <p>Verify that scrap vehicles are disposed of in accordance with DOD policy and procedure.</p>

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<p>LAND DISPOSAL SITES</p> <p>SO.30 Specific Wastes</p> <p>SO.30.1.SP. Installations must develop procedures for dealing with yard waste (FGS-Spain 7.13.f).</p>	<p>(NOTE: The requirements of this section of the manual apply only to those installations that operate a MSWLF.)</p> <p>Verify that the installation has developed procedures for dealing with yard waste that keep it out of MSWLF units to the maximum extent possible (e.g., composting, recycling).</p>

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<p>LAND DISPOSAL SITES</p> <p>SO.40 Operations</p> <p>SO.40.1.SP. Installations must investigate options for composting MSW (FGS-Spain 7.13.d).</p> <p>SO.40.2.SP. Installations must implement programs to detect and prevent the disposal of certain wastes in their MSWLFs (FGS-Spain 7.13.c and 7.13.m).</p> <p>SO.40.3.SP. Installations that operate land disposal sites must develop criteria for unacceptable materials (FGS-Spain 7.13.b).</p> <p>SO.40.4.SP. Installations must use certain standard sanitary landfill techniques as part of their operations (FGS-Spain 7.13.a).</p> <p>SO.40.5.SP. Installations must prohibit open burning at the MSWLF (FGS-Spain 7.13.e).</p>	<p>(NOTE: The requirements of this section of the manual apply only to those installations that operate a MSWLF.)</p> <p>Verify that the installation has investigated options for composting MSW as an alternative to landfilling or treatment prior to landfilling.</p> <p>Verify that the installation has a program that effectively prevents the disposal of hazardous waste, infectious waste, polychlorinated biphenyl (PCB) waste, and other waste determined to be unsuitable for the specific landfill.</p> <p>Verify that the installation prohibits the disposal of bulk or noncontainerized liquids in the MSWLF.</p> <p>Verify that the installation has established criteria for unacceptable wastes based on site-specific factors.</p> <p>(NOTE: Examples of site-specific factors are:</p> <ul style="list-style-type: none"> - hydrology - chemical and biological characteristics of the waste - available alternative disposal methods - environmental and health effects - safety of personnel.) <p>Verify that standard landfill techniques of spreading and compacting solid wastes are used.</p> <p>Verify that daily cover is placed over disposed solid waste at the end of each operating day.</p> <p>Verify that there is no open burning at the MSWLF.</p> <p>(NOTE: Infrequent burning of agricultural wastes, silvicultural wastes, land-clearing debris, diseased trees, or debris from emergency cleanup operations is allowed.)</p>

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<p>SO.40.6.SP. Installations must ensure that methane generated by the MSWLF unit does not exceed 25 percent of the lower explosive limit for methane in facility structures (FGS-Spain 7.13.i).</p>	<p>Verify that methane generated by the MSWLF unit does not exceed 25 percent of the lower explosive limit for methane in facility structures.</p> <p>(NOTE: The lower explosive limit for methane is 5.0 percent by volume.)</p>
<p>SO.40.7.SP. Conditions at the MSWLF must be unfavorable for the harboring, feeding, and breeding of disease vectors (FGS-Spain 7.13.h).</p>	<p>Verify that conditions at the land disposal site are unfavorable for the harboring, feeding, and breeding of disease vectors.</p>
<p>SO.40.8.SP. Land disposal sites must be operated in an aesthetically acceptable manner (FGS-Spain 7.13.j).</p>	<p>Verify that the land disposal site is operated in an aesthetically acceptable manner.</p>
<p>SO.40.9.SP. MSWLFs must be designed and operated in such a way as to protect aquifers by meeting the requirements of FGS-Spain 7.12.e (FGS-Spain 7.13.k).</p>	<p>Verify that the landfill is designed, built, and managed in such a way as to avoid the pollution of surface and underground waters.</p> <p>Verify that the landfill bottom is placed upon a soil layer with a permeability less than or equal to 10^{-7} cm/s [$\cong 4 \times 10^{-8}$ in./s].</p> <p>(NOTE: This permeability limit does not apply to inert material landfills.)</p>
<p>SO.40.10.SP. Installations must control public access to landfill facilities (FGS-Spain 7.13.L).</p>	<p>Verify that public access to landfill facilities is controlled.</p>
<p>SO.40.11.SP. Land disposal sites must be operated in such a way as to protect the health and safety of the personnel associated with the operation (FGS-Spain 7.13.g).</p>	<p>Verify that the land disposal site is operated in such a way as to protect the health and safety of the personnel associated with the operation.</p>
<p>SO.40.12.SP. Operators of land disposal sites must maintain records of their operations (FGS-Spain 7.13.n).</p>	<p>Verify that records on the operations of the landfill are maintained.</p>

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<p>LAND DISPOSAL SITES</p> <p>SO.50 Closure and Postclosure</p> <p>SO.50.1.SP. Installations must take specific actions in the course of closure and postclosure operations (FGS-Spain 7.14.a through 7.14.c).</p> <p>SO.50.2.SP. Installations must prepare a written closure plan that meets specific requirements (FGS-Spain 7.14.d).</p>	<p>(NOTE: The requirements of this section of the manual apply only to those installations that operate a MSWLF.)</p> <p>Verify that a final cover is installed that is designed to minimize infiltration and erosion.</p> <p>Verify that the infiltration layer is made up of a minimum of 46 cm (18 in.) of earthen material, geotextiles, or combination thereof, that have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present or a permeability no greater than 10^{-7} cm/s, whichever is less.</p> <p>Verify that the erosion layer is a minimum of 21 cm (8 in.) of earth material that can sustain native plant growth.</p> <p>Verify that the installation has a written closure plan.</p> <p>Verify that the closure plan is kept as part of the installation's permanent records.</p> <p>Verify that the closure plan includes the following, at a minimum:</p> <ul style="list-style-type: none"> - a description of the monitoring and maintenance activities required to ensure the integrity of the final cover - a survey plot showing the exact site location - a description of planned uses during the postclosure period - the duration of the postclosure period, to be determined in consultation with the appropriate Spanish authority and to be a minimum of 5 yr.

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>LAND DISPOSAL SITES</p> <p>SO.60 New Landfills</p> <p>SO.60.1.SP. Installations must not initiate new or expand existing waste landfill units without approval of the component and only after showing that unique circumstances necessitate a new unit (FGS-Spain 7.11).</p> <p>SO.60.2.SP. The design and operation of new MSWLF units must incorporate certain broad factors (FGS-Spain 7.12.a through 7.12.d).</p> <p>SO.60.3.SP. New MSWLFs must be designed, built, and managed in such a way as to avoid the pollution of surface and underground waters (FGS-Spain 7.12.e).</p>	<p>(NOTE: The requirements of this section of the manual apply only to those installations that operate a MSWLF.)</p> <p>Determine whether the installation is planning to start a new landfill or expand an existing one.</p> <p>Verify that appropriate component approval has been received.</p> <p>Verify that the installation has coordinated with the appropriate Spanish authorities on the initiation of the new landfill and/or the expansion of an existing one.</p> <p>Verify that the following broad factors are taken into account in the design and operation of the new MSWLF:</p> <ul style="list-style-type: none"> - location restrictions in regard to airport safety (i.e., bird hazards), floodplains, wetlands, aquifers, seismic zones, unstable areas, natural resources, and historic and cultural areas - procedures for excluding hazardous waste - cover material criteria (e.g., daily cover) - disease vector control - explosive gas control - air quality standards (e.g., no open burning) - access requirements - liquids restrictions - recordkeeping requirements - inspection program. <p>Verify that the landfill is designed, built, and managed in such a way as to avoid the pollution of surface and underground waters.</p> <p>Verify that the landfill bottom is placed upon a soil layer with a permeability less than or equal to 10^{-7} cm/s [$\cong 4 \times 10^{-8}$ in./s].</p> <p>(NOTE: This permeability limit does not apply to inert material landfills.)</p>

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>SO.70 INCINERATORS</p> <p>SO.70.1.SP. Incinerators used for the disposal of solid waste must meet specific standards (FGS-Spain 7.16.a).</p>	<p>Verify that incinerators used for the disposal of solid waste meet the air quality requirements of FGS-Spain, Chapter 2.</p> <p>(NOTE: See Section 1, <i>Air Emissions Management</i>.)</p> <p>Verify that incinerators used for the disposal of solid waste comply with the following operating standards:</p> <ul style="list-style-type: none"> - a minimum excess O₂ content of 6 percent is maintained at all times - the temperature of combustion gases is maintained at a minimum of 850 °C [1562 °F].

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>SO.80 COMPOSTING FACILITIES</p> <p>SO.80.1.SP. Composting facilities that process sludge from a domestic wastewater treatment plant and are located on DOD installations must meet specific standards (FGS-Spain 7.17).</p>	<p>Verify that a record is maintained for the characteristics of the waste composted, sewage sludge, and other materials (such as nutrient or bulking agents being composted), including the source and volume or weight of the material.</p> <p>Verify that access to the facility is controlled.</p> <p>Verify that all access points are secured when the facility is not in operation.</p> <p>Verify that by-products (including residual materials that can be recycled) are stored to prevent vector intrusion and aesthetic degradation.</p> <p>Verify that materials that are not composted are removed periodically.</p> <p>Verify that runoff water that has come in contact with composted waste, materials stored for composting, or residual waste is diverted to a leachate collection and treatment system.</p> <p>Verify that the temperature and retention time for material being composted is monitored and recorded.</p> <p>Verify that the compost is analyzed periodically for the following:</p> <ul style="list-style-type: none"> - percentage of total solids - volatile solids as a percentage of total solids - organic matter - pH - ammonia - nitrate nitrogen - total phosphorus - cadmium - chromium - copper - lead - nickel - zinc - mercury - PCBs. <p>Verify that compost is produced by a process that further reduces pathogens.</p>

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>SO.80.2.SP. Compost produced at facilities that process sludge from a domestic wastewater treatment plant and are located on DOD installations must meet specific contaminant concentration limits if it is to be marketed or otherwise distributed for agricultural applications, or applied to land used for agricultural purposes on DOD installations (FGS-Spain 7.18.a).</p> <p>SO.80.3.SP. Installations must coordinate distribution and/or marketing of compost with the Executive Agent and the appropriate Spanish authority (FGS-Spain 7.18.c).</p>	<p>(NOTE: Two acceptable methods of production are windrowing and the enclosed vessel method:</p> <ul style="list-style-type: none"> - windrowing consists of an unconfined composting process involving periodic aeration and mixing such that aerobic conditions are maintained during the composting process - enclosed vessel method involves mechanically mixing compost under controlled environmental conditions: <ul style="list-style-type: none"> - the retention time in the vessel must be at least 72 h with the temperature maintained at 55 °C [≅ 131 °F] - a stabilization period of at least 7 days must follow the decomposition period.) <p>Determine whether compost produced at an installation composting facility is to be marketed or otherwise distributed for agricultural applications, or applied to land used for agricultural purposes on DOD installations.</p> <p>Verify that such composts meet the contaminant concentration limits listed in Appendix 9-2.</p> <p>(NOTE: Compost that meets these standards may be distributed or marketed as commercial fertilizer, specialty fertilizer, soil amendment, or plant amendment.)</p> <p>Verify that the installation coordinates distribution and/or marketing of compost with the Executive Agent and the appropriate Spanish authority prior to distribution or marketing.</p>

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>SO.80.4.SP. The receiving soils of land used for agricultural purposes to which compost from the installation is to be applied must meet specific criteria (FGS-Spain 7.18.b).</p>	<p>Verify that the receiving soils of land used for agricultural purposes are periodically analyzed for the following parameters:</p> <ul style="list-style-type: none"> - percentage of total solids - volatile solids as a percentage of total solids - organic matter - pH - total nitrogen - phosphorus - cadmium - chromium - copper - lead - nickel - zinc - mercury. <p>Verify that analysis is made of representative samples that are a composite of 25 samples collected from an area of five hectares at a depth of 25 cm [≅ 10 in.] below the surface.</p> <p>Verify that the receiving soils meet the heavy metal concentration limits in Appendix 9-3.</p> <p>Verify that the compost is not applied:</p> <ul style="list-style-type: none"> - on pastures 3 wk before grazing - on vegetable cultures 10 mo before harvesting.
<p>SO.80.5.SP. Compost that does not meet specific standards must be disposed of as waste (FGS-Spain 7.18.d)</p>	<p>Verify that compost that does not meet both the composition standards contained in Appendix 9-2 is disposed of as waste.</p> <p>Verify that compost that is classified as hazardous is disposed of as hazardous waste.</p> <p>(NOTE: See Section 4, <i>Hazardous Waste Management</i>.)</p> <p>Verify that compost that shows no hazardous characteristics is properly disposed of in accordance with the standards in the <i>Solid Waste Management</i> protocol.</p>

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>MEDICAL WASTE</p> <p>SO.90 General</p> <p>SO.90.1.SP. Radioactive medical waste must be managed in accordance with service directives (FGS-Spain 8.3).</p> <p>SO.90.2.SP.</p> <p>[Deleted September 2000]</p>	<p>Determine whether the installation disposes of radioactive medical waste.</p> <p>Verify that such waste is disposed of in accordance with service directives.</p> <p>This checklist item was duplicated at SO.100.5.SP.</p>

**COMPLIANCE CATEGORY:
SOLID WASTE MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>MEDICAL WASTE</p> <p>SO.100 Infectious Medical Waste</p> <p>SO.100.1.SP. All personnel who handle infectious medical waste must wear protective apparel or equipment (FGS-Spain 8.9).</p> <p>SO.100.2.SP. Infectious medical waste must be separated from noninfectious medical waste at the point of origin (FGS-Spain 8.1).</p> <p>SO.100.3.SP. Mixtures of infectious medical waste and other types of waste must be handled in accordance with specific criteria (FGS-Spain 8.2.a and 8.2.b).</p> <p>SO.100.4.SP. Infectious medical waste must be handled in accordance with specific requirements (FGS-Spain 8.4.a through 8.4.c, and 8.5).</p>	<p>Verify that all personnel who handle infectious medical waste wear protective equipment such as gloves, coveralls, masks, and goggles, sufficient to prevent risk of exposure to infectious agents or pathogens.</p> <p>Verify that infectious medical waste is separated from noninfectious medical waste at the point of origin.</p> <p>Verify that mixtures of infectious medical waste and hazardous wastes are handled as infectious hazardous waste.</p> <p>(NOTE: Priority is given to the hazard that presents the greatest risk.)</p> <p>(NOTE: Mixtures of infectious medical wastes and hazardous wastes are the responsibility of the generating DOD component, not the DRMO.)</p> <p>Verify that mixtures of solid waste and infectious medical waste are handled as infectious medical waste.</p> <p>Verify that infectious medical waste is not compacted unless it has been converted to noninfectious medical waste by treatment.</p> <p>Verify that infectious medical waste is transported and stored in such a way as to minimize human exposure to the extent possible.</p> <p>Verify that infectious medical waste is not placed in chutes or dumbwaiters.</p> <p>Verify that infectious medical waste is segregated, transported, and stored in bags or receptacles that are a minimum of 3 mil [0.003 in.] thick, durable, puncture resistant, and have sufficient burst strength to prevent rupture or leaks during ordinary use.</p> <p>Verify that all bags or receptacles used to segregate, transport, or store infectious medical waste are clearly marked with the universal biohazard symbol and the words BIOHAZARD--RESIDUO DE RIESGO BIOLÓGICO.</p>

**COMPLIANCE CATEGORY:
SOLID WASTE MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>SO.100.5.SP. Infectious medical waste must be treated in accordance with specific standards (FGS-Spain 8.10).</p> <p>SO.100.6.SP. Infectious medical waste that cannot be treated onsite must be managed during storage in accordance with specific requirements (FGS-Spain 8.4.d).</p> <p>SO.100.7.SP. Bags and receptacles that contain infectious medical waste must be placed into rigid or semi-rigid leak proof containers before being transported offsite (FGS-Spain 8.4.e).</p> <p>SO.100.8.SP. Spills of infectious medical waste must be cleaned up in accordance with specific requirements (FGS-Spain 8.13).</p>	<p>Verify that all bags or receptacles used to segregate, transport, or store infectious medical waste include marking that identifies the generator, date of generation, and the contents.</p> <p>Verify that medical waste is treated prior to disposal in accordance with Appendix 9-1.</p> <p>Verify that, if sterilization is required, sterilizers are maintained at a temperature of 121 °C (250 °F) for at least 90 min.</p> <p>Verify that, if sterilization is required, the effectiveness of sterilizers is checked at least weekly using <i>Bacillus stearothermophilus</i> spore strips or an equivalent biological performance test.</p> <p>Verify that, if chemical disinfection is required, such disinfection is conducted using procedures and compounds approved by DOD medical personnel for use on any pathogen or infectious agent suspected to be present in the waste.</p> <p>Verify that infectious medical waste is maintained in a nonputrescent state, using refrigeration as necessary.</p> <p>Verify that storage sites:</p> <ul style="list-style-type: none"> - are specifically designated - are constructed to prevent the entry of insects, rodents, and other pests - do not allow access by unauthorized personnel - marked on the outside with the universal biohazard symbol and the word BIOHAZARD -- RESIDUO DE RIESGO BIOLÓGICO. <p>Verify that bags and receptacles that contain infectious medical waste are placed into rigid or semi-rigid leakproof containers before being transported offsite.</p> <p>Verify that spills of infectious medical waste are cleaned up as soon as possible.</p> <p>Verify that response personnel wear personal protective equipment (PPE) that is sufficient to prevent risk of exposure to infectious agents or pathogens.</p> <p>Verify that spills of blood or body fluids are removed with absorbent material.</p> <p>Verify that such absorbent material is then managed as infectious medical waste.</p>

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>SO.100.9.SP. The handling of pathological waste is subject to specific requirements (FGS-Spain 8.7).</p> <p>SO.100.10.SP. Noninfectious medical waste that is classified as hazardous must be managed as hazardous waste (FGS-Spain 8.2.c).</p> <p>SO.100.11.SP. Sharps must be managed in accordance with specific criteria (FGS-Spain 8.4.a and 8.6).</p>	<p>Verify that surfaces contacted by infectious medical waste are washed with soap and water and chemically decontaminated using procedures and compounds approved by DOD medical personnel for use on any pathogen or infectious agent suspected to be present.</p> <p>Verify that all pathological waste is placed in containers lined with plastic bags that are a minimum of 3 mil [0.003 in.] thick, durable, puncture resistant, and have sufficient burst strength to prevent rupture or leaks during ordinary use.</p> <p>Verify that noninfectious medical waste that is classified as hazardous is managed as hazardous waste. (NOTE: See Section 4, <i>Hazardous Waste Management</i>.)</p> <p>Verify that sharps are discarded into rigid receptacles only.</p> <p>Verify that needles are not clipped, cut, bent, or recapped before disposal.</p> <p>Verify that containers holding sharps are not compacted.</p>

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>MEDICAL WASTE</p> <p>SO.110 Disposal</p> <p>SO.110.1.SP. Installations must develop contingency plans for the treatment or disposal of infectious medical waste (FGS-Spain 8.12).</p> <p>SO.110.2.SP. Medical waste must be disposed of in accordance with certain requirements (FGS-Spain 8.11).</p> <p>SO.110.3.SP. Pathological waste must be either incinerated or buried (FGS-Spain 8.7).</p> <p>SO.110.4.SP. Blood and other liquid infectious wastes must be handled in accordance with specific criteria (FGS-Spain 8.8).</p> <p>SO.110.5.SP. Incinerators used to dispose of medical waste must meet specific requirements (FGS-Spain 8.11.a).</p> <p>SO.110.6.SP. Incinerators that burn more than 50 tons/day [\cong 45 metric tons/day] of medical waste must meet air quality standards (FGS-Spain 8.11.a).</p>	<p>Verify that the installation has a contingency plan for the treatment or disposal of infectious medical waste should the primary means become inoperable.</p> <p>Verify that medical waste is disposed of in accordance with the requirements of Appendix 9-1.</p> <p>Verify that pathological waste is disposed of by incineration or burial only.</p> <p>Verify that suction canister waste from operating rooms is either decanted into a clinical sink or sealed into leakproof containers and incinerated.</p> <p>Verify that bulk blood or blood products are decanted into clinical sinks only.</p> <p>Verify that emptied containers that previously held bulk blood or blood products are managed as infectious medical waste.</p> <p>Verify that such incinerators are designed and operated to maintain a minimum temperature and retention time sufficient to destroy all infectious agents and pathogens.</p> <p>Determine whether the installation has incinerators that burn more than 50 tons/day [\cong 45 metric tons/day] of medical waste.</p> <p>Verify that such incinerators comply with applicable air quality standards in Chapter 2 of FGS-Spain.</p> <p>(NOTE: See Section 1, <i>Air Emissions Management</i>.)</p>

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>SO.110.7.SP. Ash or residue from the incineration of infectious medical waste must be assessed for hazardous characteristics (FGS-Spain 8.11.b).</p> <p>SO.110.8.SP. Installations must keep records concerning infectious medical waste (FGS-Spain 8.14).</p>	<p>Verify that ash or residue from the incineration of infectious medical waste is assessed for hazardous characteristics.</p> <p>Verify that ash that is determined to be hazardous waste is managed as hazardous waste.</p> <p>(NOTE: See Section 4, <i>Hazardous Waste Management</i>.)</p> <p>Verify that all other residue that is not determined to be hazardous is disposed of in a landfill that complies with the standards of the <i>Solid Waste Management</i> protocol.</p> <p>Verify that records concerning infectious medical waste are kept for at least 3 yr after the date of disposal.</p> <p>Verify that such records include the following information:</p> <ul style="list-style-type: none"> - type of waste - amount of waste (by weight or volume) - treatment (if any), including date of treatment - disposition, including date of disposition, and if the waste is transferred to Spanish disposal facilities - receipts acknowledging the above four items.

Appendix 9-1

Treatment and Disposal Methods for Infectious Medical Waste (FGS-Spain, Table 8-1)

Type of Medical Waste	Method of Treatment	Method of Disposal ¹
Biological	Steam sterilization Chemical disinfection Incineration	MSWLF
Pathological ²	Incineration Cremation	MSWLF Burial Cremation
Bulk blood	³	Domestic wastewater treatment plant
Suction canister waste	None	Domestic wastewater treatment plant Incineration
Sharps in sharps containers	Steam sterilization Incineration	MSWLF

¹ Consult the relevant requirements of this section for standards for solid waste landfills.

² Placentas may also be ground and discharged to a domestic wastewater treatment plant that complies with the standards of Section 12, *Wastewater Management*.

³ Bulk blood known to be infectious must be treated by incineration or steam sterilization before disposal.

Appendix 9-2

Contaminant Concentration Limits in Compost (FGS-Spain, Table 7-1)

Parameters	Unit of Measure	Limit values
Cadmium	mg/kg on a dry weight basis	10
Chromium	mg/kg on a dry weight basis	1000
Copper	mg/kg on a dry weight basis	500
Lead	mg/kg on a dry weight basis	500
Mercury	mg/kg on a dry weight basis	5
Nickel	mg/kg on a dry weight basis	100
Zinc	mg/kg on a dry weight basis	1000
PCB	mg/kg on a dry weight basis	1

Appendix 9-3

Heavy Metals Concentration Limits for Receiving Soils (FGS-Spain, Table 7-2)

Parameters	Max. concentration in soil (mg/kg of dry soil)		Max. amount applicable (kg/ha/yr)
	Soils with pH < 7	Soils with pH > 7	
Cadmium	1	3	0.15
Chromium	100	150	3
Mercury	1	1.5	0.1
Nickel	30	112	3
Lead	50	300	15
Copper	50	210	12
Zinc	150	450	30

SECTION 10
STORAGE TANK MANAGEMENT

September 2000

A. Applicability of This Section

This section contains standards for the management of aboveground storage tanks (ASTs) and standards to control and abate pollution resulting from petroleum, oil, and lubricants (POL) and hazardous substances stored in underground storage tanks (USTs). Standards for USTs that contain hazardous wastes are also found in this section.

B. Source Documents

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapters 6, 9, and 19.

C. Key Compliance Requirements

- For all bulk POL ASTs, the secondary means of containment must have sufficient capacity for the entire contents plus sufficient free board to allow for precipitation and expansion of product.
- All installations must maintain a UST inventory and update it biannually.
- All new UST systems must be constructed of materials compatible with the product to be stored.
- All new UST systems must be installed in accordance with manufacturers' specifications.
- New tanks and piping must have corrosion protection and must be fitted with spill and overfill prevention equipment.
- Existing USTs and piping must be properly closed if not needed or be upgraded or replaced to meet new UST standards by 1 October 2004.
- If an existing UST has not been used for 1 yr, all of the product and sludges must be removed and the tank either cleaned and filled with an inert substance or removed.
- Leaking USTs must be removed from service immediately.
- Existing hazardous substance tanks and piping are either upgraded or replaced to meet the requirements for new hazardous substance tanks and piping by 1 January 1999.
- Secondary containment must be in place for tank systems used to store or treat hazardous waste.
- For existing hazardous waste tank systems without proper secondary containment, the installation must make an annual determination as to whether the tank system is leaking or is fit for use..
- When new hazardous waste tank systems or components are installed, Hazardous Waste Storage Area (HWSA) managers must obtain an assessment certifying that the tank system is acceptable.
- HWSA personnel must conduct inspections of hazardous waste tank systems and associated equipment.

- Hazardous waste tank systems or secondary containment systems from which there has been a leak or spill, or that are unfit for use must be immediately removed from service and repaired or closed.
- Before closing a hazardous waste tank system, all waste residues and contaminated containment system components, soils, structures, and equipment must be removed or decontaminated to the greatest extent practicable.

D. Definitions

- *Bulk Storage Tanks* - field-erected tanks constructed aboveground or belowground (FGS-Spain, Chapter 9, Definitions).
- *Hazardous Substance* - any substance having the potential to do serious harm to human health or the environment if spilled or released in a reportable quantity (RQ). A listing of these substances and corresponding RQ is contained in Appendix 4-1, Chart A.4. The term does not include (FGS-Spain, Chapter 18, Definitions):
 1. petroleum, including crude POL or any fraction thereof, that is not otherwise specifically listed or designated as a hazardous substance above
 2. natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).
- *Hazardous Substance UST* - a UST that contains a hazardous substance (but not including hazardous waste as defined in Section 4, *Hazardous Waste Management*) or any mixture of such substances and petroleum, and which is not a petroleum UST (FGS-Spain, Chapter 19, Definitions).
- *Hazardous Waste (HW)* - a solid, semisolid, liquid material, or a contained gas, that has been discarded or is no longer suitable for its intended purpose and that either exhibits a characteristic of a hazardous waste as described in Appendix 4-1, Section A-1 or is listed as a hazardous waste in Appendix 4-1, Chart A.4, or that meets the criteria defining a toxic and dangerous waste under the Spanish system as described in Appendix 4-2 (FGS-Spain, Chapter 6, Definitions).
- *Hazardous Waste Storage Area (HWSA)* - a location on a DOD installation where more than 208 L (55 gal) of hazardous waste or 1 L (1 qt) of acute hazardous waste from any one waste stream is stored prior to shipment for treatment or disposal (FGS-Spain, Chapter 6, Definitions).
- *Hazardous Waste Storage Area Manager* - a person or agency on the installation assigned the operational responsibility for receiving, storing, inspecting, and general management of the installation's HWSA or HWSA program (FGS-Spain, Chapter 6, Definitions).
- *Incompatible Wastes* - wastes that can react together dangerously, giving rise to the formation of notable quantities of heat, or explosive, flammable and/or toxic products (FGS-Spain, Chapter 6, Definitions).
- *New Underground Storage Tank* - any UST installed on or after 1 October 1994 (FGS-Spain, Chapter 19, Definitions).
- *Oil* - POL of any kind or in any form, including, but not limited to, petroleum, fuel POL, sludge, POL refuse, and POL mixed with wastes other than dredged spoil (FGS-Spain, Chapters 9 and 18, Definitions).
- *POL* - includes, but is not limited to, petroleum and petroleum-based substances comprised of complex blends of hydrocarbons derived from crude oil through processes of separation, conversion, upgrading, and finishing, such as motor fuels, residual fuel oils, lubricants, petroleum solvents, and used oils (FGS-Spain, Chapter 9, Definitions).
- *POL Facility* - an installation with any individual aboveground tank of 2500 L (660 gal) or greater, aggregate aboveground storage of 5000 L (1320 gal) or greater, UST storage of greater than 15,900 L (4200 gal) or a pipeline facility (FGS-Spain, Chapter 9, Definitions).

- *Reportable Quantity (RQ)* - a released quantity of POL or quantities of hazardous substances that exceeds those identified in this section of the manual or in the RQ column, Appendix 4-1, Chart A.4 (FGS-Spain, Chapter 18, Definitions).
- *Significant Spill* - an uncontained release to the land or water in excess of any of the following quantities (FGS-Spain, Chapter 18, Definitions):
 1. for hazardous waste or hazardous substance identified as a result of inclusion in Appendix 4-1, Chart A.4, any quantity in excess of the RQ listed therein
 2. for POL or liquid or semi-liquid hazardous material, hazardous waste, or hazardous substance, in excess of 416 L (110 gal)
 3. for other solid hazardous material, in excess of 225 kg (500 lb)
 4. for combinations of POL and liquid, semi-liquid and solid hazardous materials, hazardous waste, or hazardous substance, in excess of 340 kg (750 lb).
- *Storage Tank* - a fixed container designed to store POL (FGS-Spain, Chapter 9, Definitions).
- *Toxic and Dangerous Waste* - wastes that contain, or are suspected of containing, certain toxic or dangerous substances in quantities or concentrations sufficient to pose a risk to human health or the environment (see Appendix 4-2) (FGS-Spain, Chapter 6, Definitions).
- *Treatment* - any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, recover energy or material resources from the waste, or render such waste nonhazardous, or less hazardous; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume (FGS-Spain, Chapter 6, Definitions).
- *Underground Storage Tank (UST)* - any tank, including underground piping connected thereto, larger than 416-420 L (110 gal) that is used to contain POL products or hazardous substances and the volume of which, including the volume of connected pipes, is 10 percent or more beneath the surface of the ground, but does not include (FGS-Spain, Chapters 9 and 19, Definitions):
 1. tanks containing heating oil used for consumptive use on the premises where it is stored
 2. septic tanks
 3. stormwater or wastewater collection systems
 4. flow through process tanks
 5. surface impoundments, pits, ponds, or lagoons
 6. field constructed tanks
 7. hydrant fueling systems
 8. spill containment USTs, if emptied expeditiously.

E. Records To Review

- UST inventory
- Records of all spills, leaks, and associated site assessment/cleanup activities

F. Physical Features To Inspect

- Aboveground storage tanks and dikes
- UST areas

G. Guidance for Checklist Users

REFER TO CHECKLIST ITEMS:	
Missing Checklist Items/Positive Findings	ST.2.1.SP and ST.2.2.SP
ASTs	ST.10.1.SP through ST.10.4.SP
USTs	
General	ST.20.1.SP
New USTs	ST.30.1.SP through ST.30.6.SP
Existing USTs	ST.40.1.SP through ST.40.3.SP
Leaking USTs	ST.50.1.SP
Additional Requirements for Hazardous Sub- stance USTs	ST.60.1.SP and ST.60.2.SP
Hazardous Waste Tank Systems	ST.70.1.SP through ST.70.7.SP

**COMPLIANCE CATEGORY:
STORAGE TANK MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>ST.2 MISSING CHECKLIST ITEMS/POSITIVE FINDINGS</p> <p>ST.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>ST.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning storage tank management have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>ST.10 ASTs</p> <p>ST.10.1.SP. Secondary containment for bulk POL ASTs must meet specific requirements (FGS-Spain 9.2.a and FGS-Spain 9.2.b).</p> <p>ST.10.2.SP. Drainage of stormwater from diked areas around bulk POL ASTs must be controlled by a valve (FGS-Spain 9.2.c).</p> <p>ST.10.3.SP. Specific actions must be taken before draining stormwater from diked areas around bulk POL ASTs (FGS-Spain 9.2.d).</p> <p>ST.10.4.SP. Washwater and sludge resulting from periodic tank cleaning must be tested for hazardous characteristics (FGS-Spain 9.3).</p>	<p>Verify that, for all bulk POL ASTs, the secondary means of containment (dike and basin) has sufficient capacity for the entire contents plus sufficient free board to allow for precipitation and expansion of product.</p> <p>Verify that the permeability of diked areas does not exceed 10^{-7} cm/s [$\cong 4 \times 10^{-8}$ in./s].</p> <p>Verify that drainage of stormwater from diked areas around bulk POL ASTs is controlled by a valve.</p> <p>Verify that such valves are locked closed when not in active use.</p> <p>Verify that such valves are opened to drain stormwater only after all free oil has been removed from diked areas.</p> <p>Verify that, prior to draining stormwater from diked areas, the water is inspected for petroleum sheen.</p> <p>Verify that any sheen is collected with adsorbent material prior to drainage.</p> <p>Verify that the adsorbent material is disposed of according to any hazardous characteristics it exhibits.</p> <p>Verify that tank cleaning wastes (sludges and washwaters) are tested for hazardous characteristics as defined in Appendix 4-1, Chart A-2 and Appendix 4-2.</p> <p>Verify that tank bottom waters that are periodically drained from bulk storage tanks are collected and tested for hazardous characteristics.</p> <p>Verify that wastes that test positive for hazardous characteristics are handled as hazardous waste.</p>

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<p>USTs</p> <p>ST.20 General</p> <p>ST.20.1.SP. Installations must maintain a UST inventory (FGS-Spain 19.1).</p>	<p>Verify that the installation has an inventory of USTs (including hazardous substance USTs).</p>

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<p>USTs</p> <p>ST.30 New USTs</p> <p>ST.30.1.SP. All new UST systems must be constructed of materials compatible with the product to be stored (FGS-Spain 19.2 and 19.4.a).</p> <p>ST.30.2.SP. All new UST systems must be installed in accordance with manufacturers' specifications (FGS-Spain 19.2 and 19.4.a).</p> <p>ST.30.3.SP. All new USTs must have means of secondary containment (FGS-Spain 19.2 and 19.4.a).</p> <p>ST.30.4.SP. New tanks and piping must have corrosion protection (FGS-Spain 19.2.a).</p>	<p>(NOTE: These requirements apply to USTs for POL and to those for hazardous substances.)</p> <p>Determine whether any USTs were installed after 1 October 1994.</p> <p>Verify that such new UST systems are constructed of materials compatible with the product to be stored.</p> <p>Determine whether any USTs were installed after 1 October 1994.</p> <p>Verify that such new UST systems were installed in accordance with manufacturers' specifications.</p> <p>Determine whether any USTs were installed after 1 October 1994.</p> <p>Verify that such USTs include secondary containment.</p> <p>(NOTE: Secondary containment may be achieved by using double-walled tanks and piping, or by using liners or vaults.)</p> <p>Determine whether any USTs have been installed since 1 October 1994.</p> <p>Verify that such new tanks and piping have corrosion protection.</p> <p>(NOTE: This requirement does not apply if the tanks and/or piping are constructed of fiberglass or other noncorrodible materials.)</p> <p>Verify that the corrosion protection system is certified by a competent authority.</p> <p>Verify that persons responsible for maintaining the corrosion protection system are acquainted with the following publications and their contents:</p> <ul style="list-style-type: none"> - American Petroleum Institute Report 1632, <i>Cathodic Protection of Under ground Petroleum Storage Tanks and Piping Systems</i> - National Association of Corrosion Engineers Report 0285-85, 21030, <i>Control of External Corrosion on Metallic-Buried, Partially Buried, or Submerged Liquid Storage Systems.</i> <p>Verify that new tanks and piping are maintained in accordance with the provisions of the documents listed above.</p>

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<p>ST.30.5.SP. New USTs must be fitted with spill and overflow prevention equipment (FGS-Spain 19.2.b).</p> <p>ST.30.6.SP. Leak detection systems on new USTs must meet specific operating requirements (FGS-Spain 19.2.c).</p>	<p>Verify that new USTs have spill and overflow prevention equipment.</p> <p>(NOTE: This equipment is not required if the UST system is filled by transfers of no more than 95 L (25 gal) at one time.)</p> <p>Verify that, where spill and overflow prevention are required, a spill containment box is installed around the fill pipe.</p> <p>Verify that USTs are fitted with one of the following methods of overflow prevention:</p> <ul style="list-style-type: none"> - an automatic shut-off device set at 95 percent of tank capacity - a high level alarm set at 90 percent of tank capacity. <p>Verify that leak detection systems are capable of detecting a 0.75 L (0.2 gal) per hour leak rate or a release of 460 L (150 gal) (or 1 percent tank volume, whichever is greater) within 30 days with a probability of detection of 0.95 and a probability of false alarm of not more than 0.05.</p> <p>Verify that USTs installed after 1 October 1994 are tightness tested during installation and prior to final backfilling under a minimum test pressure of 0.2 kg/cm².</p> <p>Verify that USTs installed after 1 October 1994 use one of the following leak detection methods:</p> <ul style="list-style-type: none"> - automatic tank gauging - vapor monitoring - groundwater monitoring - interstitial monitoring. <p>Verify that new pressurized UST piping is equipped with automatic line leak detectors.</p> <p>Verify that new pressurized UST piping is subject to either an annual tightness test or monthly monitoring.</p> <p>Verify that suction piping is subject either to line tightness tests every 3 yr or to monthly monitoring.</p>

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<p>USTs</p> <p>ST.40 Existing USTs</p> <p>ST.40.1.SP. Existing USTs and piping are subject to closure or upgrading or replacement requirements (FGS-Spain 19.3).</p> <p>ST.40.2.SP. Existing USTs and piping without leak detection must be tightness tested annually and inventoried monthly (FGS-Spain 19.3.a)</p> <p>ST.40.3.SP. Existing USTs that have not been used for 1 yr must either be removed or closed (FGS-Spain 19.3.c).</p>	<p>(NOTE: These requirements apply to USTs for POL and to those for hazardous substances.)</p> <p>Verify that existing USTs and piping are either:</p> <ul style="list-style-type: none"> - properly closed and removed or cleaned and filled with an inert substance if they are unneeded, or - upgraded or replaced to meet the system requirements that apply to new USTs. <p>(NOTE: Installations have until 1 October 2004 to take appropriate action.)</p> <p>(NOTE: Water is not an inert substance.)</p> <p>Verify that existing USTs and piping without leak detection are tightness tested annually.</p> <p>Verify that persons responsible for tightness testing are acquainted with the following publications and their contents:</p> <ul style="list-style-type: none"> - American Petroleum Institute (API) Publication 306, <i>An Engineering Assessment of Volumetric Methods of Leak Detection in Aboveground Storage Tanks</i> - API Publication 307, <i>An Engineering Assessment of Acoustic Methods of Leak Detection in Aboveground Storage Tanks</i> - National Fire Protection Association (NFPA) 329, <i>Recommended Practice for Handling Underground Releases of Flammable and Combustible Liquids</i>. <p>Verify that tightness testing is conducted in accordance with the provisions of the documents listed above.</p> <p>Verify that existing USTs and piping that do not incorporate leak detection are inventoried monthly to determine system tightness.</p> <p>Determine whether there are USTs at the installation that have not been used for 1 yr or more.</p> <p>Verify that all of the product and sludges have been removed from such USTs.</p> <p>Verify that tank wastes are tested for hazardous characteristics.</p>

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	(NOTE: See Section 4, <i>Hazardous Waste Management</i> .) Verify that such USTs have been either closed or removed from service.

COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>USTs</p> <p>ST.50 Leaking USTs</p> <p>ST.50.1.SP. Leaking USTs must be removed from service immediately (FGS-Spain 19.3.b).</p>	<p>(NOTE: These requirements apply to USTs for POL and to those for hazardous substances.)</p> <p>Verify that leaking USTs are removed from service immediately.</p> <p>Verify that contaminated groundwater and/or soil are remediated.</p> <p>Verify that, if the USTs are no longer needed, they are removed from the ground.</p> <p>Verify that, if the USTs are still needed, they are repaired or replaced.</p>

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>USTs</p> <p>ST.60 Additional Requirements for Hazardous Substance USTs</p> <p>ST.60.1.SP. Existing hazardous substance USTs must meet specific standards (FGS-Spain 19.5).</p> <p>ST.60.2.SP. Installations must monitor the interstitial space between the primary and secondary containment of new hazardous substance USTs monthly (FGS-Spain 19.4.b).</p>	<p>Verify that existing hazardous substance tanks and piping are either:</p> <ul style="list-style-type: none"> - properly closed, removed, or cleaned and filled with an inert substance if not needed - being upgraded to meet the requirements for new hazardous substance tanks and piping by 1 January 1999. <p>(NOTE: Water is not an inert substance.)</p> <p>Verify that existing tanks and piping that do not incorporate leak detection are tightness tested annually and inventoried monthly.</p> <p>Verify that the interstitial space for tanks and piping is monitored monthly for liquids or vapors.</p>

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REQUIREMENTS:**

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**ST.70
HAZARDOUS WASTE
TANK SYSTEMS**

ST.70.1.SP. Secondary containment must be in place for tank systems used to store or treat hazardous waste (FGS-Spain 6.8.a and 6.8.d).

ST.70.2.SP. Existing tank systems without proper secondary containment must meet specific standards (FGS-Spain 6.8.b).

(NOTE: This requirement applies to:

- all new tank systems or components, prior to being put into service
- existing tank systems when an annual leak test detects leakage
- tanks systems that store or treat hazardous wastes by 1 January 1999.)

Verify that such tank systems have secondary containment that is:

- designed, installed, and operated to prevent the migration of wastes or accumulated liquid out of the system
- capable of detecting and collecting releases and accumulated liquids until removal is possible
- constructed to include one or more of the following:
 - a liner external to the tank
 - a vault
 - a double-walled tank
- constructed for multiple tanks to contain one third of the total volume of all tanks present or the total volume of the largest tank, whichever is greater.)

(NOTE: The provisions of this checklist item do not apply to:

- tank systems used to store or treat hazardous wastes that contain no free liquids and are situated inside a building with an impermeable floor
- tank systems, including sumps, that serve as part of a secondary containment system to collect or contain releases of hazardous wastes.)

Verify that, for tank systems without proper secondary containment, an annual determination is made as to whether the tank system is leaking or is fit for use.

Verify that the installation obtains, and keeps on file at the HWSA, a written assessment of tank system integrity reviewed and certified by a competent authority.

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>ST.70.3.SP. When new tank systems or components are installed, HWSA managers must obtain an assessment certifying that the tank system is acceptable (FGS-Spain 6.8.c).</p> <p>ST.70.4.SP. Tanks used for hazardous waste treatment or storage must be operated in accordance with specific procedures (FGS-Spain 6.8.e.1).</p> <p>ST.70.5.SP. HWSA personnel must conduct inspections of tank systems and associated equipment (FGS-Spain 6.8.e.2 and 6.8.e.3).</p> <p>ST.70.6.SP. Installations must meet specific requirements with regard to tank systems or secondary containment systems from which there has been a leak or spill, or that are unfit for use (FGS-</p>	<p>Verify that the HWSA manager has received a written assessment that the tank system has sufficient structural integrity and is acceptable for the storage and treatment of hazardous waste.</p> <p>Verify that the assessment indicates:</p> <ul style="list-style-type: none"> - that the foundation, structural support, seams, connections, and pressure controls are adequately designed - that the tank system has sufficient structural strength, compatibility with the waste(s), and corrosion protection to ensure that it will not collapse, rupture, or fail. <p>Verify that the written assessment has been reviewed and certified by a competent authority.</p> <p>Verify that hazardous wastes or treatment reagents are not placed in tanks if they could cause the tank system (including ancillary equipment and containment system) to rupture, leak, corrode, or otherwise fail.</p> <p>Verify that HWSA personnel conduct and log inspections of the following at least once each operating day:</p> <ul style="list-style-type: none"> - aboveground portions of the tank system, to detect corrosion or releases - data gathered from monitoring and leak detection equipment (e.g., pressure and temperature gauges, monitoring wells), to ensure that the tank system is being operated according to its design - the construction materials and the area surrounding the tank, including the secondary containment system, to detect erosion or signs of leakage (wet spots and dead vegetation). <p>Verify that the proper operation of cathodic protection systems is confirmed within 6 mo after initial installation and annually thereafter.</p> <p>Verify that all sources of impressed current are inspected and/or tested every other month.</p> <p>Verify that the HWSA manager documents all tank system inspections in the operating record of the HWSA.</p> <p>Verify that such systems are immediately removed from service and repaired or closed.</p> <p>Verify that the installation also takes the following steps:</p> <ul style="list-style-type: none"> - stops the flow or addition of hazardous wastes to the tank - inspects systems to determine the cause of the release

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<p>Spain 6.8.f).</p> <p>ST.70.7.SP. Installations must follow specific procedures when closing a tank system (FGS-Spain 6.8.g).</p>	<ul style="list-style-type: none"> - contains the visible release and prevents further migration of the leak or spill to soils or surface water - removes and properly disposes of any contamination of the soil and surface water - completes required notifications and reports. <p>Determine whether the installation has closed any tank systems.</p> <p>Verify that all waste residues and contaminated containment system components, soils (to the extent practicable), structures, and equipment have been removed or decontaminated to the greatest extent practicable.</p>

SECTION 11

TOXIC SUBSTANCES MANAGEMENT

September 2000

A. Applicability of this Section

This section contains standards to control and abate threats to human health and the environment from the handling, use, storage, and disposal of polychlorinated biphenyls (PCBs) and polychlorinated terphenyls (PCTs). These standards include specific requirements for most uses of PCBs, including but not limited to transformers, capacitors, heat transfer systems, hydraulic systems, electromagnets, switches and voltage regulators, circuit breakers, reclosers, and cables. In this section the term PCB includes PCT. Also included here are standards to control and abate threats to human health and the environment from asbestos and to manage asbestos during removal and disposal. Lastly, this section contains standards for assessing radon in facilities and mitigating excessive radon levels. The final governing standards for Spain do not address lead-based paint issues.

B. Source Documents

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapters 14, 15, and 16.

C. Key Compliance Requirements

PCBs

- Analytical samples taken to comply with the standards in FGS-Spain must be tested using certain laboratories only.
- PCB items (see definition) and rooms, vaults, or storage rooms that contain them must be prominently marked in English and Spanish in accordance with specific requirements.
- New PCB items must not be purchased.
- Installations must repair or replace leaking PCB items within 48 h or as soon as possible.
- When PCB items are removed from service, they must be marked with the removal date.
- PCB items scheduled for disposal must be tested to determine whether the PCB concentration is above 50 ppm.
- Installations with PCB items must maintain a written inventory of those PCB items.
- All required periodic inspections must be documented at the installation.
- All PCB transformers, including those in storage for reuse, must be registered with the fire department.
- Installations must address PCBs in their spill contingency plans.
- Spills of PCB liquids at concentrations of 50 ppm or greater must be responded to immediately and cleaned up according to specific standards.
- PCB items and waste at concentrations of 50 ppm or greater that are to be stored before disposal must be stored in a facility that will ensure the containment of PCBs.

- Installations that generate PCB waste of 50 ppm or greater PCB must maintain an audit trail for the waste.
- Installations must dispose of PCB items through the DRMO only.
- PCB items or waste with PCB concentrations of 50 ppm or greater must be disposed of in certain ways only.

Asbestos

- Analytical samples taken to comply with the standards in FGS-Spain must be tested using certain laboratories only.
- The installation or use of asbestos products or materials is prohibited.
- Installations must appoint an asbestos program manager.
- Installations must prepare and implement a written asbestos management plan that meets specific minimum requirements.
- The installation must not expose employees, visitors, or contractors to airborne asbestos concentrations above the PEL without appropriate personal protective equipment (PPE).
- Specific work practices must be observed where airborne asbestos fiber concentrations exceed the action limit.
- U.S. personnel whose work exposes them to asbestos concentrations that exceed the action limit must be included in DOD medical and respiratory programs.
- Local nationals whose work exposes them to asbestos concentrations that exceed the action limit must be included in a special Spanish medical program.
- An asbestos work plan that meets specific requirements must be prepared in certain circumstances.
- Installations must remove asbestos-containing material (ACM) when it poses a threat to release airborne asbestos fibers and cannot be reliably repaired or isolated.
- Installations must dispose of ACM in accordance with specific standards.
- Containers of asbestos waste must be properly labeled in English and Spanish.

Radon

- Analytical samples taken to comply with the standards in FGS-Spain must be tested using certain laboratories only.
- Installations must have a Quality Assurance/Quality Control (QA/QC) program to ensure the validity of radon test results.
- The installation must mitigate facilities that have radon levels above 148 Bq/m^3 (4 pCi/L).
- The installation must have a post-mitigation monitoring program to confirm and document the effectiveness of mitigation.

D. Definitions

- *Action Limit* - an airborne concentration of one tenth of an asbestos fiber per cubic centimeter (0.1 f/cc) calculated as an 8-h time-weighted average (Note: This is not an “action level.”) (FGS-Spain, Chapter 15, Definitions).
- *Asbestos* - a generic term used to describe six distinctive varieties of fibrous mineral silicates, including chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any other of these materials that have been chemically treated and/or altered (FGS-Spain, Chapter 15, Definitions).
- *Asbestos-containing Material (ACM)* - any material containing more than 1 percent asbestos by weight (FGS-Spain, Chapter 15, Definitions).
- *Capacitor* - a device for accumulating and holding a charge of electricity and consisting of conducting surfaces separated by a dielectric (FGS-Spain, Chapter 14, Definitions).
- *Detailed Radon Testing* - a comprehensive testing program for radon to accurately quantify levels and determine causes of levels higher than 148 Becquerel per cubic meter (Bq/m^3) or 4 picoCuries per liter (pCi/L) (FGS-Spain, Chapter 16, Definitions).
- *Friable Asbestos* - any ACM that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure (FGS-Spain, Chapter 15, Definitions).
- *In or Near Commercial Buildings* - within the interior of, on the roof of, attached to the exterior wall of, in the parking area serving, or within 30 m [\cong 98 ft] of a nonindustrial, nonsubstation building (FGS-Spain, Chapter 14, Definitions).
- *Incinerator* - an engineered device using controlled flame combustion to thermally degrade PCBs and PCB items. Examples include rotary kilns, liquid injection incinerators, cement kilns, and high temperature boilers (FGS-Spain, Chapter 14, Definitions).
- *Marking* - the marking of PCB items and PCB storage areas and transport vehicles by means of applying a legible mark by painting, fixation of an adhesive label, or by any other method that meets the criteria of FGS-Spain (FGS-Spain, Chapter 14, Definitions).
- *Mitigation* - actions taken to reduce radon levels in facilities having radon levels higher than 148 Bq/m^3 (4 pCi/L) as identified during detailed radon testing (FGS-Spain, Chapter 16, Definitions).
- *PCB Item* - any PCB article, container, manufactured item containing PCB components, or electrical equipment (including but not limited to transformers, capacitors, circuit breakers, reclosers, voltage regulators, switches, electromagnets, cable, electronic equipment, electric motors and pumps, hydraulic machines) that deliberately or unintentionally contains, or has as a part of it, any PCB at a concentration of 50 ppm or greater (FGS-Spain, Chapter 14, Definitions).
- *PCB Waste* - any waste materials that contain or are contaminated with 50 ppm PCB or greater, including fluids, fluorescent light ballasts, rags, soil, and other debris (FGS-Spain, Chapter 14, Definitions).
- *Permissible Exposure Limit (PEL)* - an airborne concentration of 0.2 of an asbestos fiber per cubic centimeter (0.2 f/cc) as an 8-h time-weighted average (FGS-Spain, Chapter 15, Definitions).
- *Post-Mitigation Monitoring* - follow-up radon testing in facilities where mitigation has been completed. The purpose of post-mitigation monitoring is to ensure that mitigation actions were effective in reducing radon levels below 148 Bq/m^3 (4 pCi/L) (FGS-Spain, Chapter 16, Definitions).
- *Radon* - a naturally occurring, odorless, colorless, inert radioactive gas that is formed from the radioactive decay of uranium (FGS-Spain, Chapter 16, Definitions).

- *Radon Screening* - short-term radon testing in a statistically representative sample of selected facilities. The purpose of initial screening is to identify installations having high radon levels (FGS-Spain, Chapter 16, Definitions).
- *Restricted Access Area* - areas where access by unauthorized personnel is controlled by fences, other man-made structures, or naturally occurring barriers such as mountains, cliffs, or rough terrain (FGS-Spain, Chapter 14, Definitions).

E. Records To Review

- Inspection, storage, maintenance, and disposal records for PCBs/PCB items
- PCB Equipment inventory and sampling results
- Asbestos management plan
- Asbestos survey documentation
- Documentation of asbestos sampling and analytical results
- Documentation of preventive measure or action
- Results of air sampling at the conclusion of response action
- Records of asbestos training program
- List of buildings insulated with asbestos or housing ACMs
- Record of demolition or renovation projects completed in the past 5 yr that involve friable asbestos
- Records of radon tests

F. Physical Features To Inspect

- PCB storage areas
- Equipment, fluids, and other items, used or stored at the facility, that contain PCBs
- Pipe, spray-on, duct, and troweled cementitious insulation, and boiler lagging
- Ceiling and floor pipes

G. Guidance for Checklist Users

REFER TO CHECKLIST ITEMS:

PCB Management	
Missing Checklist Items/Positive Findings	T1.2.1.SP and T1.2.2.SP
All Installations	T1.10.1.SP
PCB Items in General	T1.20.1.SP through T1.20.5.SP
PCB Items Other Than Transformers	T1.30.1.SP and T1.30.2.SP
PCB Transformers	T1.40.1.SP through T1.40.6.SP
PCB Inspections	T1.50.1.SP through T1.50.5.SP
PCB Records	T1.60.1.SP and T1.60.2.SP
PCB Spills	T1.70.1.SP and T1.70.2.SP
PCB Storage	T1.80.1.SP through T1.80.5.SP
PCB Disposal	T1.90.1.SP through T1.90.5.SP
Asbestos Management	
Missing Checklist Items/Positive Findings	T2.2.1.SP and T2.2.2.SP
All Installations	T2.10.1.SP
General	T2.20.1.SP through T2.20.3.SP
Personnel Safety	T2.30.1.SP through T2.30.5.SP
Renovation and Demolition	T2.40.1.SP through T2.40.5.SP
Asbestos Disposal	T2.50.1.SP and T2.50.2.SP
Asbestos in Schools	T2.60.1.SP
Radon Management	
Missing Checklist Items/Positive Findings	T3.2.1.SP and T3.2.2.SP
Radon	T3.10.1.SP through T3.10.9.SP

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<p>PCB MANAGEMENT</p> <p>T1.2 Missing Checklist Items/Positive Findings</p> <p>T1.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>T1.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>(NOTE: For the purposes of FGS-Spain, the term PCB includes PCT.)</p> <p>Determine whether any new regulations concerning PCB management have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

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<p>PCB MANAGEMENT</p> <p>T1.10 All Installations</p> <p>T1.10.1.SP. Analytical samples taken to comply with the standards in this protocol must be tested using certain laboratories only (FGS-Spain 14.5).</p>	<p>(NOTE: For the purposes of FGS-Spain, the term PCB includes PCT.)</p> <p>Verify that analytical samples are tested using one of the following:</p> <ul style="list-style-type: none"> - overseas DOD laboratories approved by the service component - laboratories authorized by Spanish authorities - Continental United States (CONUS) laboratories certified by USEPA.

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<p>PCB MANAGEMENT</p> <p>T1.20 PCB Items in General</p> <p>T1.20.1.SP. PCB items (see definition) and rooms, vaults, or storage rooms that contain them must be prominently marked in English and Spanish (FGS-Spain 14.1.d).</p> <p>T1.20.2.SP. New PCB items must not be purchased (FGS-Spain 14.1.i and 14.1.j).</p> <p>T1.20.3.SP. Installations must take specific actions with regard to leaking PCB items (FGS-Spain 14.1.h and 14.2.a.8).</p> <p>T1.20.4.SP. When PCB items are removed from service, they must be marked with the removal date (FGS-Spain 14.2.e).</p> <p>T1.20.5.SP. PCB items scheduled for disposal must be tested to determine whether the PCB concentration is above 50 ppm (FGS-Spain 14.1.e).</p>	<p>(NOTE: For the purposes of FGS-Spain, the term PCB includes PCT.)</p> <p>Verify that PCB items and rooms, vaults, and storage rooms that contain them are prominently marked in English and Spanish.</p> <p>Verify that the marking:</p> <ul style="list-style-type: none"> - identifies the item as containing PCB - warns against improper handling and disposal - provides a phone number in case of spills or if questions arise about disposal. <p>Verify that no PCB items are purchased.</p> <p>(NOTE: PCB items in service may continue in use until the end of their service lifetimes.)</p> <p>Verify that leaking PCB items owned by U.S. Forces are repaired or replaced within 48 h of discovery or as soon as possible.</p> <p>Verify that leaking PCB fluid is containerized for disposal.</p> <p>(NOTE: PCB items owned by Spanish public utility companies will be repaired or replaced by those companies.)</p> <p>Verify that Spanish public utility companies are contacted immediately upon discovery of leakage from one of their PCB items.</p> <p>Verify that any PCB item removed from service is marked with the date on which it was removed from service.</p> <p>Verify that PCB items scheduled for disposal are tested to determine whether the PCB concentration is above 50 ppm.</p>

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<p>PCB MANAGEMENT</p> <p>T1.30 PCB Items Other than Transformers</p> <p>T1.30.1.SP. Installations must service electromagnets, switches, and voltage regulators that may contain PCBs at any concentration, and other in-service PCB items, in accordance with specific standards (FGS-Spain 14.1.j and 14.2.c).</p> <p>T1.30.2.SP. Installations must not use PCB capacitors unless certain conditions are met (FGS-Spain 14.2.b)</p>	<p>(NOTE: For the purposes of FGS-Spain, the term PCB includes PCT.)</p> <p>Verify that PCB-contaminated electric equipment and other PCB items in use are serviced with dielectric fluid that does not contain PCB.</p> <p>Verify that the residual concentration of PCB in the new fluid does not exceed 500 ppm PCB.</p> <p>Verify that the installation does not service any electromagnet, switch, or voltage regulator that contains PCB concentrations of 500 ppm or greater and that requires removal and rework of internal components.</p> <p>Verify that PCB fluid with a concentration of greater than 50 ppm removed during servicing is captured and disposed of properly.</p> <p>(NOTE: The requirements of this checklist item do not apply to electromagnets, switches, or voltage regulators owned by Spanish public utility companies.)</p> <p>Verify that no capacitors that pose an exposure risk to food or feed are in use.</p> <p>Verify that capacitors are located within a restricted-access electrical substation or in a contained and restricted-access indoor installation without public access.</p> <p>Verify that any such restricted-access indoor installation has roof, walls, and floor that are adequate to contain any release of PCB.</p>

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<p>PCB MANAGEMENT</p> <p>T1.40 PCB Transformers</p> <p>T1.40.1.SP. PCB transformers that are in use or in storage for reuse must not be used in any application that poses a risk of contamination to food or feed (FGS-Spain 14.2.a.1).</p> <p>T1.40.2.SP. PCB transformers must be registered with the servicing fire department (FGS-Spain 14.2.a.2).</p> <p>T1.40.3.SP. Certain PCB transformers must be equipped with electrical protection (FGS-Spain 14.2.a.3).</p> <p>T1.40.4.SP. PCB transformers must be serviced properly (FGS-Spain 14.2.a.5).</p>	<p>(NOTE: For the purposes of FGS-Spain, the term PCB includes PCT.)</p> <p>(NOTE: PCB transformers are those transformers that contain PCBs at a concentration of 50 ppm or greater.)</p> <p>Verify that no PCB transformer that is in use or in storage for reuse is used in any application that poses a risk of contamination to food or feed.</p> <p>Verify that PCB transformers, including those in storage for reuse, are registered with the servicing fire department.</p> <p>(NOTE: It would be useful to provide the following information:</p> <ul style="list-style-type: none"> - physical location of PCB transformer(s) - principle constituent of dielectric fluid (i.e., PCBs, mineral oil, silicone oil, etc.) - name and telephone number of a contact person who is knowledgeable of the PCB transformer(s).) <p>Verify that PCB transformers that are used in or near commercial buildings or are located in sidewalk vaults have electrical circuit protection to minimize transformer failure that would result in the release of PCB.</p> <p>Verify that servicing activities are conducted as follows:</p> <ul style="list-style-type: none"> - transformers are serviced with non-PCB containing dielectric fluid - the transformer coil is not removed during servicing - PCB fluid with concentrations of greater than 50 ppm removed during servicing is captured and disposed of properly - used oils with PCB concentrations less than 50 ppm are collected and disposed of properly. <p>(NOTE: These service requirements do not apply to transformers owned by Spanish public utility companies.)</p> <p>(NOTE: See T1.90 for disposal requirements.)</p> <p>Verify that refilled transformers contain a residual PCB concentration of 500 ppm or less.</p>

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<p>T1.40.5.SP. PCB transformers that have been removed and stored for reuse must be returned to their original application and location only (FGS-Spain 14.2.a.4).</p> <p>T1.40.6.SP. Installations must take specific actions if a PCB transformer is involved in a fire (FGS-Spain 14.2.a.7).</p>	<p>Verify that such transformers are returned to their original application and location and are not used at another location.</p> <p>(NOTE: This restriction does not apply if there is no practical alternative to use at another location.)</p> <p>Verify that such alternative use does not exceed 1 yr.</p> <p>Verify that, if a transformer is involved in a fire and subjected to sufficient heat and/or pressure that might result in violent or nonviolent rupture, measures are taken to control water runoff.</p> <p>(NOTE: Blocking floor drains is one way to control water runoff.)</p> <p>Verify that runoff water is tested and treated if required.</p>

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<p>PCB MANAGEMENT</p> <p>T1.50 PCB Inspections</p> <p>T1.50.1.SP. Installations must inspect leaking PCB items that are not repaired or replaced (FGS-Spain 14.1.h and 14.2.a.8).</p> <p>T1.50.2.SP. Installations must inspect certain PCB transformers (FGS-Spain 14.2.a.6).</p> <p>T1.50.3.SP. All nonleaking in-service PCB items must be inspected with the same frequency required for PCB transformers (FGS-Spain 14.2.d).</p> <p>T1.50.4.SP. Storage areas for out-of-service PCB items must be inspected at least monthly (FGS-Spain 14.3.c).</p> <p>T1.50.5.SP. All PCB-related periodic inspections required</p>	<p>(NOTE: For the purposes of FGS-Spain, the term PCB includes PCT.)</p> <p>Verify that leaking PCB items that are not repaired or replaced are inspected daily.</p> <p>Verify that in-service PCB transformers are inspected at least once every 3 mo.</p> <p>Verify that the following are inspected at least every 12 mo:</p> <ul style="list-style-type: none"> - PCB transformers with impervious, undrained secondary containment capacities of 100 percent of dielectric fluid - PCB transformers that have been tested and found to contain less than 60,000 ppm PCB. <p>(NOTE: It would be useful to record the following information as part of each PCB transformer inspection:</p> <ul style="list-style-type: none"> - location of transformer - dates of each visual inspection - date when any leak was discovered - name of person conducting inspection - location and estimate of the quantity of any leaks of dielectric fluid - data and description of any cleanup, containment, or repair performed - results of any daily inspections of transformers with uncorrected active leaks.) <p>Verify that all nonleaking in-service PCB items are inspected every 3 mo or every 12 mo, as appropriate.</p> <p>(NOTE: See checklist item T1.50.2.SP.)</p> <p>Verify that storage areas for out-of-service PCB items are inspected at least monthly.</p> <p>Verify that the installation documents all periodic inspections required by FGS-Spain.</p>

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by FGS-Spain must be documented (FGS-Spain 14.1.g).	

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<p>PCB MANAGEMENT</p> <p>T1.60 PCB Records</p> <p>T1.60.1.SP. Installations with PCB items must maintain a written inventory of those PCB items (FGS-Spain 14.1.e).</p> <p>T1.60.2.SP. Installations must retain records of inspections and maintenance histories for 5 yr after disposal of a transformer (FGS-Spain 14.1.g).</p>	<p>(NOTE: For the purposes of FGS-Spain, the term PCB includes PCT.)</p> <p>(NOTE: No retesting of PCB items for inventory purposes is required to determine PCT concentrations, unless the item has a PCB concentration below 50 ppm.)</p> <p>Verify that the installation maintains a written inventory of PCB items.</p> <p>Verify that the inventory contains a current list, by type, of all PCB items in use, placed into storage for disposal, or disposed of for that year.</p> <p>Verify that a copy of the inventory is provided to the servicing fire department.</p> <p>Determine whether the installation has disposed of any transformers.</p> <p>Verify that records of inspections and maintenance histories are retained for at least 5 yr after the disposal of a transformer.</p>

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<p>PCB MANAGEMENT</p> <p>T1.70 PCB Spills</p> <p>T1.70.1.SP. Installations must address PCBs in their spill plan (FGS-Spain 14.1.a and 14.3.a.5).</p> <p>T1.70.2.SP. Installations must respond to spills or leaks of PCB liquids at concentrations of 50 ppm in accordance with specific criteria (FGS-Spain 14.1.b and 14.1.c).</p>	<p>(NOTE: For the purposes of FGS-Spain, the term PCB includes PCT.)</p> <p>Determine whether the installation has any PCB items.</p> <p>Verify that PCB items are addressed in the spill plan.</p> <p>(NOTE: This requirement also applies to PCB items in temporary storage.)</p> <p>Determine whether PCB storage areas are located where they are at risk from seismic activity, floods, or other natural events.</p> <p>Verify that the installation's spill plan addresses such storage facilities directly.</p> <p>(NOTE: See Section 8, <i>Petroleum, Oil, and Lubricant (POL) Management</i>, for further details on the contents of the spill plan).</p> <p>Verify that the installation responds to spills or leaks of PCB liquids at concentrations of 50 ppm or greater immediately.</p> <p>Verify that spills are contained and absorbed with a suitable absorbent material.</p> <p>Verify that used absorbent and other PCB-contaminated waste are collected, contained, and disposed of properly.</p> <p>Verify that PCB-contaminated surfaces and soil are cleaned up in accordance with the following:</p> <ul style="list-style-type: none"> - surfaces that are located in areas that are subject to public access on a routine basis or which could result in substantial dermal contact by employees are cleaned to 10 µg/100 cm² - surfaces in all other contact areas are cleaned to 100 µg/100 cm². <p>Verify that contaminated soil located in restricted access areas is removed until the soil tests no higher than 25 ppm PCB.</p> <p>Verify that the area is then backfilled with clean soil containing less than 1 ppm PCB.</p>

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	<p>Verify that contaminated soil located in unrestricted access areas is removed to a minimum depth of 25 cm (10 in.) or until the soil tests no higher than 10 ppm PCB, whichever is deeper.</p> <p>Verify that the area is then backfilled with clean soil containing less than 1 ppm PCB.</p>

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<p>PCB MANAGEMENT</p> <p>T1.80 PCB Storage</p> <p>T1.80.1.SP. PCB items and waste at concentrations of 50 ppm or greater must be stored in a facility that will ensure the containment of PCB (FGS-Spain 14.3.a).</p> <p>T1.80.2.SP. PCB items and wastes stored for disposal must be labeled according to the standards in FGS-Spain, Chapter 6 (FGS-Spain 14.3.d).</p> <p>T1.80.3.SP. Installations must not store PCB items or waste together with certain other types of substances</p>	<p>(NOTE: For the purposes of FGS-Spain, the term PCB includes PCT.)</p> <p>Verify that PCB storage areas meet the following requirements:</p> <ul style="list-style-type: none"> - the roof and walls of the building exclude rainfall - a containment berm of at least 15 cm (6 in.) surrounds the entire area in which PCB items or waste are stored. - berming provides effective containment for twice the internal volume of the largest PCB article or 50 percent of the total internal volume of all PCB articles or containers stored, whichever is greater - drains, valves, floor drains, expansion joints, sewer lines, or other openings are constructed to prevent any release from the bermed area - floors are constructed of continuous, smooth, and impervious material. <p>Verify that, as far as possible, new storage areas are located to minimize the risk of release because of seismic activity, floods, or other natural events.</p> <p>Verify that storage of PCB items and waste at concentrations of 50 ppm or greater conforms to the requirements of FGS-Spain, Chapter 6.</p> <p>(NOTE: See the checklist items in HW.110 through HW.150 of Section 4, <i>Hazardous Waste Management</i>.)</p> <p>(NOTE: Findings written against requirements in Section 4, <i>Hazardous Waste Management</i>, should use the criterion and citation of this checklist item and also include the checklist item number and citation from Section 4 in the comments portion of the finding sheet.)</p> <p>Verify that PCB items and wastes are labeled in accordance with the requirements of FGS-Spain, Chapter 6.</p> <p>(NOTE: See checklist item HW.90.1.SP.)</p> <p>(NOTE: Findings written against requirements in Section 4, <i>Hazardous Waste Management</i>, should use the criterion and citation of this checklist item and also include the checklist item number and citation from Section 4 in the comments portion of the finding sheet.)</p> <p>Verify that neither PCB items nor waste are stored together with any of the following:</p> <ul style="list-style-type: none"> - explosives

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<p>(FGS-Spain 14.3.b).</p> <p>T1.80.4.SP. Containers used for the storage of PCB must be as secure as those conforming with the Defense Traffic Management Regulation (FGS-Spain 14.3.f).</p> <p>T1.80.5.SP. The storage period prior to disposal must not exceed 6 mo (FGS-Spain 14.3.e).</p>	<ul style="list-style-type: none"> - flammable substances - corrosive or oxidizing substances - food products. <p>Verify that containers used for the storage of PCB are at least as secure as those that conform to the Defense Traffic Management Regulation.</p> <p>Verify that the period of storage prior to disposal does not exceed 6 mo.</p>

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<p>PCB MANAGEMENT</p> <p>T1.90 PCB Disposal</p> <p>T1.90.1.SP. Installations that generate PCB waste of 50 ppm or greater PCB must maintain an audit trail for the waste (FGS-Spain 14.4.a, 6.1.d.3 and 6.1.d.4).</p> <p>T1.90.2.SP. Disposal of PCB items and wastes must be accomplished through DRMO only (FGS-Spain 14.1.f).</p> <p>T1.90.3.SP. PCB items or waste with PCB concentrations of 50 ppm or greater must be disposed of in certain ways only (FGS-Spain 14.4.b).</p> <p>T1.90.4.SP. Disposal of PCB items or wastes by incineration must be carried out in accordance with specific operating procedures (FGS-Spain 14.4.d).</p>	<p>(NOTE: For the purposes of FGS-Spain, the term PCB includes PCT.)</p> <p>Verify that generators maintain an audit trail of PCB waste of 50 ppm or greater PCB from the point of generation to disposal.</p> <p>Verify that generators using the Defense Reutilization and Marketing Service (DRMS) disposal services have a signed copy of the manifest from the initial DRMS recipient of the waste.</p> <p>Verify that, if a generator uses a hazardous waste management and/or disposal program of a DOD component with a different DOD Activity Address Code (DODAAC) number, it obtains a signed copy of the manifest from the receiving component.</p> <p>Verify that generators maintain waste disposal records for a period of 5 yr.</p> <p>Verify that generators provide data for disposal planning purposes to the appropriate Spanish authorities upon request.</p> <p>Verify that PCB items and wastes are disposed of through DRMO only.</p> <p>Verify that disposal is in accordance with DOD 4160.21-M or FGS-Spain 14.4 (see below).</p> <p>Verify that no used PCB items are sold on the Spanish economy.</p> <p>Verify that PCB items or waste with PCB concentrations of 50 ppm or greater are disposed of in a properly permitted incinerator with at least 99.9999 percent destruction and removal efficiency.</p> <p>(NOTE: No such incinerators are currently available in Spain.)</p> <p>Verify that one of the following procedures is either included in the operating permit for the incinerator or is otherwise followed:</p> <ul style="list-style-type: none"> - combustion gases must be maintained for a 2 s residence time at 1200 °C, ±100°C (2200 °F, ± 212 °F) with an excess of O₂ in the post-combustion chamber and 3 percent excess O₂ in the flue gas - maintenance of the combustion gases for a 1.5 s residence time at 1600 °C, ±100 °C (3050 °F, ± 212 °F) with an excess of O₂ in the post-combustion chamber and 2 percent excess O₂ in the flue gas.

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<p>T1.90.5.SP. Installations must under certain conditions return DOD-generated PCB manufactured in the United States to the CONUS for delivery to a permitted disposal facility (FGS-Spain 14.4.e).</p>	<p>Verify that combustion efficiency is maintained at no less than 99.9 percent.</p> <p>(NOTE: Combustion efficiency is measured by the ratio of the concentration of carbon dioxide to the total concentration of both CO₂ and CO.)</p> <p>Verify that the rate and quantity of PCB that are fed to the combustion system are measured and recorded at regular intervals of not more than 15 min.</p> <p>Verify that the temperature of the incineration process is continuously measured and recorded.</p> <p>Verify that the flow of PCB to the incinerator stops automatically if temperature, O₂, or residence time standards are not met.</p> <p>Verify that sufficient monitoring is conducted to establish that an incinerator to be used for disposal for the first time is operating within the above parameters.</p> <p>Verify that O₂ and CO are monitored continuously during incineration of PCB.</p> <p>Verify that CO₂ is monitored periodically during incineration of PCB.</p> <p>Determine whether disposal of PCB in Spain or in a third country is impossible, is prohibited, or will not be managed in an environmentally sound manner.</p> <p>Verify that, in the above circumstances, the installation returns DOD-generated PCB manufactured in the United States to the CONUS for delivery to a permitted disposal facility.</p>

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<p>ASBESTOS MANAGEMENT</p> <p>T2.2 Missing Checklist Items/Positive Findings</p> <p>T2.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>T2.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning asbestos management have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

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<p>ASBESTOS MANAGEMENT</p> <p>T2.10 All Installations</p> <p>T2.10.1.SP. Analytical samples taken to comply with the standards in this protocol must be tested using certain laboratories only (FGS-Spain 15.9).</p>	<p>Verify that analytical samples are tested using one of the following:</p> <ul style="list-style-type: none"> - overseas DOD laboratories approved by the service component - laboratories authorized by Spanish authorities - CONUS laboratories certified by USEPA.

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<p>ASBESTOS MANAGEMENT</p> <p>T2.20 General</p> <p>T2.20.1.SP. The installation or use of asbestos products or materials is prohibited (FGS-Spain 15.3).</p> <p>T2.20.2.SP. Installations must appoint an asbestos program manager (FGS-Spain 15.1).</p> <p>T2.20.3.SP. Installations must prepare and implement a written asbestos management plan that meets specific minimum requirements (FGS-Spain 15.2).</p>	<p>Verify that no asbestos products or materials are installed or used in structures, equipment, or any other application.</p> <p>(NOTE: This prohibition does not apply if the installation or use of asbestos products or materials is specifically required due to lack of suitable nonasbestos substitute materials or if authorized by U.S. law or DOD regulations.)</p> <p>(NOTE: This prohibition does not require removal of asbestos materials or products that are currently installed.)</p> <p>Verify that the installation has an asbestos program manager who serves as the single point of contact for all asbestos-related activities.</p> <p>Verify that the installation has prepared and implemented a written asbestos management plan.</p> <p>Verify that, at a minimum, the plan addresses the following:</p> <ul style="list-style-type: none"> - a notification and education program to tell workers, tenants, and building occupants where potentially friable ACM is located and how and why to avoid disturbing it - regular surveillance of ACM to note, assess, and document any changes in the ACM's condition - work control/permit systems to control and document activities that might disturb ACM - operations and maintenance (O&M) work practices to avoid or minimize fiber release during activities affecting ACM - work practices where airborne asbestos fiber concentrations exceed the action limit (see checklist item T2.30.4.SP)

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	<ul style="list-style-type: none"> - recordkeeping to document O&M activities related to asbestos identification, management, and abatement, including, but not limited to, the following: <ul style="list-style-type: none"> - characteristics of the work performed and the varieties of asbestos involved - the names of personnel involved - approximate average duration of exposure to airborne asbestos fibers - environmental evaluations performed, including dates and air sampling results - methods of sampling and analysis - measures used to prevent or control release of asbestos fibers - description of the work and the worksite as related to health and safety - medical and respiratory protection programs, as applicable - procedures to inform personnel and third parties performing work in facilities where they are exposed to airborne asbestos fibers of the specific risks they are exposed to and the protective measures being adopted to prevent or minimize exposure - provision of proper personal protective equipment (PPE) to personnel together with instruction regarding its use - training for the asbestos program manager and custodial and maintenance staff as well as any other personnel who are potentially exposed to asbestos fiber concentrations above the action limit - procedures to assess and prioritize identified hazards for abatement. <p>(NOTE: Since an installation cannot know the current status of all ACM in its facility inventory without conducting an asbestos survey, this FGS requirement is understood to necessitate the carrying out of such a survey. If the installation has not conducted a full-blown asbestos survey, a major finding to that effect will be written using this checklist item.)</p>

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**T2.30
Personnel Safety**

T2.30.1.SP. The installation must not expose employees, visitors, or contractors to airborne asbestos concentrations above the action limit without appropriate PPE (FGS-Spain 15.4).

T2.30.2.SP. Installations must meet specific minimum requirements before and during the removal of asbestos (FGS-Spain 15.6.b).

Verify that individuals are not exposed to airborne asbestos concentrations above the action limit unless they wear PPE.

Verify that installations supply, maintain, clean, and replace respiratory protection devices and other PPE as necessary.

Verify that PPE for local national personnel are models approved by the Spanish Department of Labor.

Verify that local national personnel use PPE only on a temporary basis and not more than 4 h per day.

Verify that all workers are trained prior to the removal.

(NOTE: For DOD schools, training must be in accordance with USEPA training requirements for schools in 40 Code of Federal Regulations (CFR) 763, Subpart E.)

Verify that an appropriate work plan is prepared prior to the removal. (See checklist item T2.40.3.SP.)

Verify that monitoring programs are in place to document exposure levels during asbestos removal operations or any other work with asbestos where airborne asbestos fiber concentrations exceed the action limit.

Verify that all workers involved in the removal or any other work with asbestos where airborne asbestos fiber concentrations exceed the action limit use properly fitted respiratory protection and PPE.

Verify that appropriate engineering controls and work practices are used to contain and control asbestos fiber releases for all asbestos removal projects and any other work with asbestos that has the potential to release airborne asbestos fibers in concentrations above the action limit.

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<p>T2.30.3.SP. Specific work practices must be observed where airborne asbestos fiber concentrations exceed the action limit (FGS-Spain 15.2.e).</p>	<p>Verify that the following work practices are observed where airborne asbestos fiber concentrations exceed the action limit.</p> <ul style="list-style-type: none"> - the work area is adequately isolated, and warning signs are posted - workers are provided with protective clothing and proper respirators - asbestos waste is removed from the work area as soon as possible and stored in proper containers that are labeled and leakproof - the work area is continuously cleaned using a high-efficiency particulate air (HEPA) vacuum or other appropriate techniques, if the work is done continually or regularly - personal air sampling is performed every 3 mo and whenever there is a significant change in operations which may result in a change in airborne asbestos fiber concentrations, if the work is done continually or regularly - personal air sampling is performed annually or as required by a medical doctor, if the work is done infrequently - workers are informed of the results of air sampling.
<p>T2.30.4.SP. U.S. personnel whose work exposes them to asbestos concentrations that exceed the action limit must be included in DOD medical and respiratory programs (FGS-Spain 15.2.g.1).</p>	<p>Verify that U.S. personnel whose work exposes them to asbestos concentrations that exceed the action limit are included in DOD medical and respiratory programs.</p>
<p>T2.30.5.SP. Local nationals whose work potentially exposes them to asbestos concentrations that exceed the action limit must be included in a special Spanish medical program (FGS-Spain 15.2.g.2).</p>	<p>Verify that local nationals whose work potentially exposes them to airborne asbestos fibers at concentrations that exceed the action limit are included in a special Spanish medical program.</p> <p>Verify that the program includes:</p> <ul style="list-style-type: none"> - examinations by a medical doctor before exposure - annual medical monitoring - a provision for post-occupational medical monitoring - maintenance of medical records, including absences from work due to illness and accident.

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**T2.40
Renovation and
Demolition**

T2.40.1.SP. Prior to renovation or demolition, the installation must determine whether ACM will be removed or disturbed and must record the determination on the project authorization document (work order) (FGS-Spain 15.5.a).

T2.40.2.SP. A written assessment must be prepared and furnished to the Installation Commander prior to certain actions (FGS-Spain 15.5.b).

T2.40.3.SP. A work plan that meets specific requirements must be prepared in certain circumstances (FGS-Spain 15.5.c).

Verify that, prior to renovation or demolition, the installation determines whether or not ACM will be removed or disturbed.

Verify that the determination is recorded on the project authorization document (work order).

Verify that a written assessment is produced prior to the demolition or renovation of a facility that involves removing or disturbing ACM.

Verify that a copy of the written assessment is kept on file permanently.

Verify that a work plan is prepared prior to any work in which there is a risk that asbestos fibers will be released into the environment, including:

- demolition of buildings containing asbestos
- removal of ACM from buildings, structures, equipment, or facilities
- maintenance and repair work for buildings, facilities, or units.

Verify that the work plan includes the following:

- type of work to be performed
- duration of the work and number of workers anticipated
- manner in which the work will be performed and the specific methods to be used
- measures to be used to limit the generation and dispersion of asbestos fibers into the environment
- procedures to be used to evaluate and monitor the work environment
- type and characteristics of PPE to be used
- characteristics of the equipment to be used to protect and decontaminate personnel directly involved in the work
- measures to be taken to inform potentially exposed personnel of the risks to which they are exposed and the precautions they should take
- procedures for collection and disposal of asbestos waste.

**COMPLIANCE CATEGORY:
TOXIC SUBSTANCES MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>T2.40.4.SP. Installations must remove certain types of ACM prior to any renovation or demolition (FGS-Spain 15.5.d).</p>	<p>Verify that, before renovating or demolishing any facility or any part of a facility in which ACM is found, the installation removes:</p> <ul style="list-style-type: none"> - all friable ACM - ACM with a high degree of probability of becoming friable once disturbed - nonfriable ACM likely to be damaged, to the extent practical.
<p>T2.40.5.SP. Installations must remove ACM when it poses a threat to release airborne asbestos fibers and cannot be reliably repaired or isolated (FGS-Spain 15.6.a).</p>	<p>Verify that asbestos that poses a threat to release airborne asbestos fibers and cannot be reliably repaired or isolated has been removed.</p>

**COMPLIANCE CATEGORY:
TOXIC SUBSTANCES MANAGEMENT
Spain Protocols**

**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
September 2000**

**ASBESTOS
MANAGEMENT**

**T2.50
Asbestos Disposal**

T2.50.1.SP. Installations must dispose of ACM in accordance with specific standards (FGS-Spain 15.7.a and 15.7.c).

Verify that all ACM waste is adequately wetted, sealed in a leakproof container, and disposed of properly.

Verify that, if the waste is classified as hazardous, it is disposed of in accordance with the requirements of FGS-Spain, Chapter 6 (see Section 4, *Hazardous Waste Management*, HW.170 through HW.190).

(NOTE: Nonfriable waste that is not characterized as hazardous waste may be disposed of in a municipal solid waste landfill in accordance with the requirements of FGS-Spain, Chapter 7 (see Section 9, *Solid Waste Management*.)

Verify that permanent records documenting the disposal action and site are maintained.

Verify that transport and disposal of asbestos waste designated as hazardous waste is performed in such a way that:

- asbestos fibers are not released into the atmosphere
- liquids containing asbestos are not spilled.

(NOTE: The requirements for temporary storage, transport, and disposal of hazardous waste in Section 4, *Hazardous Waste Management* apply to friable asbestos and nonfriable asbestos characterized as hazardous waste.)

(NOTE: See the checklist items in manual sections HW.10, HW.40, HW.50, HW.70 through HW.100, and HW.160 through HW.180. See also checklist item HW.30.1.SP.)

(NOTE: Findings written against requirements in Section 4, *Hazardous Waste Management*, should use the criterion and citation of this checklist item and also include the checklist item number and citation from Section 4 in the comments portion of the finding sheet.)

**COMPLIANCE CATEGORY:
TOXIC SUBSTANCES MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>T2.50.2.SP. Containers of asbestos waste must be properly labeled in English and Spanish (FGS-Spain 15.7.b).</p>	<p>Verify that the English language label bears the words:</p> <p align="center">DANGER CONTAINS ASBESTOS FIBERS AVOID CREATING DUST CANCER AND LUNG DISEASE HAZARD.</p> <p>Verify that the Spanish language label:</p> <ul style="list-style-type: none"> - is at least 5 cm [\cong 2 in.] high and 2.5 cm [\cong 1 in.] long - has an upper section that: <ul style="list-style-type: none"> - measures 40 percent of the height of the entire label - bears the letter “a” in white on a black background - has a lower section that bears the following text in black or white on a red background: <p align="center">ATENCIÓN, CONTIENE AMIANTO. Respirar el polvo de amianto para la salud. Seguir las normas de seguridad.</p> <p>(NOTE: If the product contains crocidolite, the words “ATENCIÓN, CONTIENE AMIANTO” will be replaced with the words: ATENCIÓN, CONTIENE CROCIDOLITA/AMIANTO AZUL.)</p>

COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>ASBESTOS MANAGEMENT</p> <p>T2.60 Asbestos in Schools</p> <p>T2.60.1.SP. DOD Schools must meet specific requirements with regard to ACM (FGS-Spain 15.8).</p>	<p>Verify that both friable and nonfriable ACM have been identified in elementary and secondary schools.</p> <p>Verify that all suspect materials that are not confirmed to be ACM have been sampled.</p> <p>Verify that samples are analyzed using appropriate techniques.</p> <p>Verify that an accredited DOD inspector has provided a written analysis of all friable, known, or assumed ACM in school buildings.</p> <p>Verify that appropriate response actions are selected and implemented in a timely manner to protect human health and the environment.</p> <p>Verify that all maintenance and custodial persons who may work in buildings that contain ACM receive awareness training regarding asbestos, its uses and forms, location in school buildings, and recognition of ACM.</p> <p>Verify that each school has an asbestos management plan that includes all leased or owned facilities.</p> <p>Verify that all asbestos-related activities are performed in accordance with USEPA requirements for asbestos in schools (40 CFR 763, Subpart E).</p>

**COMPLIANCE CATEGORY:
TOXIC SUBSTANCES MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>RADON MANAGEMENT</p> <p>T3.2 Missing Checklist Items/Positive Findings</p> <p>T3.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>T3.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning radon have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

**COMPLIANCE CATEGORY:
TOXIC SUBSTANCES MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>RADON MANAGEMENT</p> <p>T3.10 Radon</p> <p>T3.10.1.SP. Analytical samples taken to comply with the standards in this protocol must be tested using certain laboratories only (FGS-Spain 16.9).</p> <p>T3.10.2.SP. Installations must prioritize their facilities for radon assessment and mitigation properly (FGS-Spain 16.1).</p> <p>T3.10.3.SP. Initial screening samples must be collected from facilities in accordance with a specific schedule (FGS-Spain 16.2).</p> <p>T3.10.4.SP. Detailed testing for radon is required if any initial screening sample results indicate a radon concentration greater than 148 Bq/m³ (4 pCi/L) (FGS-Spain 16.3).</p> <p>T3.10.5.SP. Installations must have a quality assurance/quality control (QA/QC) program to ensure the validity of test results (FGS-Spain 16.5).</p> <p>T3.10.6.SP. Installations</p>	<p>Verify that analytical samples are tested using one of the following:</p> <ul style="list-style-type: none"> - overseas DOD laboratories approved by the service component - CONUS laboratories certified by USEPA. <p>Verify that the installation has prioritized its facilities in accordance with the following list:</p> <ul style="list-style-type: none"> - Priority 1: military family housing, day care centers, hospitals, schools, unaccompanied officers/enlisted quarters, confinement facilities, visiting officer/enlisted quarters, and dormitories/barracks - Priority 2: administrative areas having 24-h operations - Priority 3: all other structures routinely occupied over 4 h/day. <p>Verify that the installation has collected initial screening samples in accordance with the following schedule:</p> <ul style="list-style-type: none"> - Priority 1 facilities by 1 October 1994 - Priority 2 and 3 facilities by 1 January 1996. <p>Verify that the samples are collected according to a protocol that yields a statistically representative sample.</p> <p>Verify that, if any initial screening sample shows a radon level greater than 148 Bq/m³ (4 pCi/L), 12-mo radon samples are collected from all Priority 1, 2, and 3 facilities.</p> <p>Verify that the installation has a QA/QC program to ensure the validity of radon test results.</p> <p>Verify that the installation mitigates facilities that have radon levels above 148</p>

**COMPLIANCE CATEGORY:
TOXIC SUBSTANCES MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>must mitigate certain facilities according to a specific schedule (FGS-Spain 16.4).</p> <p>T3.10.7.SP. Installations must have post-mitigation monitoring programs (FGS-Spain 16.7).</p> <p>T3.10.8.SP. Installations must develop an information package on the potential health effects of radon and provide the information along with the test results to facility occupants (FGS-Spain 16.6).</p> <p>T3.10.9.SP. New DOD construction in areas likely to be associated with high radon levels must be designed to minimize radon exposure (FGS-Spain 16.8).</p>	<p>Bq/m³ (4 pCi/L).</p> <p>Verify that the radon mitigation of such facilities proceeds according to the schedule in Appendix 11-1.</p> <p>Verify that the installation has a post-mitigation monitoring program to confirm and document the effectiveness of mitigation actions.</p> <p>Verify that the installation has developed an information packet on radon.</p> <p>Verify that the packet and the radon monitoring results are given to facility occupants upon assignment.</p> <p>Verify that new DOD construction in areas likely to be associated with high radon levels is designed to minimize radon exposure.</p>

Appendix 11-1

Radon Mitigation Schedule
(FGS-Spain, Table 16-1)

Radon Level Bq/m³ (pCi/L)	Mitigation Within:
Greater than 7,400 (200)	1 mo of sample results or move occupants
7,400 (200) or less, but greater than 740	6 mo of sample results
740 or less, but greater than 296	within 4 yr of sample results
296 or less, but greater than 148	within 5 yr of sample results
148 or less	No action required

SECTION 12
WASTEWATER MANAGEMENT

September 2000

A. Applicability of this Section

This section contains standards to control and regulate discharges of wastewaters into surface waters or as irrigation water. It includes, but is not limited to, domestic and industrial wastewater discharges and pollutants from indirect dischargers. It does not address septic tanks or on-site treatment processes unless they discharge to surface waters. The siting of such systems is addressed in Section 13, *Water Quality Management*.

B. Source Documents

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapter 4.

C. Key Compliance Requirements

- Analytical samples taken to comply with the standards in FGS-Spain must be tested using certain laboratories only.
- All sludges produced in the course of wastewater treatment must be disposed of properly in accordance with the requirements of Section 4, *Hazardous Waste Management*, or Section 9, *Solid Waste Management*, as appropriate.
- Each installation must have a system for investigating water pollution complaints from individuals or Spanish authorities.
- Activities or installations that have a significant potential for spills or batch discharges must develop a slug prevention plan.
- All point sources of pollutants introduced into the waters of Spain must meet specific effluent limitations and monitoring requirements.
- Monitoring for conventional and nonconventional pollutants (other than BOD, COD, TSS, and pH) must be preceded by screening; the results of initial screening may trigger additional requirements.
- Installations must not use wastewater for irrigation or otherwise discharge it onto the soil unless certain conditions are met.
- Wastewater discharged into non-Department-of-Defense (non-DOD) DWTPs must comply with specific limits and monitoring requirements.
- New and existing electroplating facilities that directly or indirectly discharge wastewater must meet specific standards.
- Industrial dischargers must monitor effluents quarterly.

D. Definitions

- *4-Day Average* - the arithmetic mean of pollutant parameter values representing operations over any period of four consecutive days (FGS-Spain, Chapter 4, Definitions).
- *7-Day Average* - the arithmetic mean of pollutant parameter values representing operations over any period of seven consecutive days (FGS-Spain, Chapter 4, Definitions).
- *30-Day Average* - the arithmetic mean of pollutant parameter values representing operations over any period of 30 consecutive days (FGS-Spain, Chapter 4, Definitions).
- *BOD₅* - the 5-day measure of the pollutant parameter, biochemical oxygen demand (FGS-Spain, Chapter 4, Definitions).
- *CBOD₅* - the 5-day measure of the pollutant parameter, carbonaceous biochemical oxygen demand, which is exerted by carbonaceous material only (FGS-Spain, Chapter 4, Definitions).
- *COD* - the pollutant parameter, chemical oxygen demand, which measures the oxygen required for oxidation of nearly all organic matter, regardless of its biological activity (FGS-Spain, Chapter 4, Definitions).
- *Conventional Pollutants* - BOD₅, COD, total suspended solids (TSS), settleable solids, oil and grease, fecal coliforms, and pH (FGS-Spain, Chapter 4, Definitions).
- *Daily Discharge* - the discharge of a pollutant measured during a calendar day or any 24-h period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement (e.g., concentration), daily discharge is calculated as the average measurement of the pollutant over the day (FGS-Spain, Chapter 4, Definitions).
- *Direct Discharge* - any introduction of pollutants to surface waters of Spain or onto soil (FGS-Spain, Chapter 4, Definitions).
- *Discharge of a Pollutant* - any addition of any pollutant or combination of pollutants to waters of Spain from any point source (FGS-Spain, Chapter 4, Definitions).
- *Domestic Wastewater Treatment Plant (DWTP)* - any DOD or Spanish facility designed to treat wastewater before its discharge to waters of Spain and in which the majority of such wastewater is made up of domestic sewage (FGS-Spain, Chapter 4, Definitions).
- *Effluent Limitation* - any restriction imposed on quantities, discharge rates, and concentrations of pollutants that are ultimately discharged from point sources (FGS-Spain, Chapter 4, Definitions).
- *Existing Source* - a source that discharges pollutants that was in operation or under construction prior to 1 October 1994 (FGS-Spain, Chapter 4, Definitions).
- *Indirect Discharge* - the introduction of pollutants in process wastewater which flows to a DWTP (FGS-Spain, Chapter 4, Definitions).
- *Industrial Wastewater Treatment Plant (IWTP)* - any DOD facility designed to treat process wastewater before its discharge to waters of Spain other than to a DWTP (FGS-Spain, Chapter 4, Definitions).
- *Maximum Daily Discharge Limitation* - the highest allowable daily discharge (FGS-Spain, Chapter 4, Definitions).

- *New Source* - a facility or system built or significantly modified on or after 1 October 1994 that discharges pollutants (FGS-Spain, Chapter 4, Definitions).
- *Point Source* - any discernible, confined, and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, or rolling stock, but not including vessels, aircraft, or any conveyance that merely collects natural surface flows of precipitation (FGS-Spain, Chapter 4, Definitions).
- *Pollutant* - includes, but is not limited to, the following: dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water (FGS-Spain, Chapter 4, Definitions).
- *Process Wastewater* - any water that, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product (FGS-Spain, Chapter 4, Definitions).
- *Regulated Facility* - a facility for which standards are established in FGS-Spain, Chapter 4, such as DWTP, IWTP, or industrial dischargers (FGS-Spain, Chapter 4, Definitions).
- *Secondary Wastewater Treatment* - conventional biological treatment similar to natural degradation which generally provides a reduction of 90 percent of total suspended solids and organic material (FGS-Spain, Chapter 4, Definitions).
- *Settleable Solids* - a measure of the volume (mL) of material which will settle in 2 h in an Imhoff cone (FGS-Spain, Chapter 4, Definitions).
- *Sludge* - the accumulated semi-liquid suspension of settled solids deposited from wastewaters or other fluids in tanks or basins. It does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluent, dissolved materials in irrigation return flows, or other common water pollutants (FGS-Spain, Chapter 4, Definitions).
- *Substantial Modification* - any functional alteration to an existing environmental control facility, the cost of which exceeds \$1 million, regardless of funding source (FGS-Spain, Chapter 4, Definitions).
- *Total Suspended Solids (TSS)* - the pollutant parameter total filterable suspended solids (FGS-Spain, Chapter 4, Definitions).
- *Total Toxic Organics (TTO)* - the sum of all quantifiable values greater than 0.01 mg/L for the toxic organics in Appendix 12-1 (FGS-Spain, Chapter 4, Definitions).
- *Total Toxic Organics Management Plan* - a plan used to control the use and disposal of the chemicals shown on Appendix 12-1 for operations that discharge or have the potential to discharge to the sanitary sewer system (FGS-Spain, Chapter 4, Definitions).
- *Waters of Spain* - surface waters, including the territorial seas recognized under customary international law, including (FGS-Spain, Chapter 4, Definitions):
 1. all waters that are currently used, were used in the past, or may be susceptible to use in commerce
 2. waters that are or could be used for recreation or other purposes
 3. waters from which fish or shellfish are or could be taken and sold
 4. waters that are used or could be used for industrial purposes by industries
 5. waters including lakes, rivers, and streams (including intermittent streams, sloughs, prairie potholes, or natural ponds)
 6. tributaries of waters identified above.

(NOTE: Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of FGS-Spain, Chapter 4, are not waters of Spain. This exclusion applies only to man-made bodies of water that neither were originally waters of Spain nor resulted from impoundment of waters of Spain.)

E. Records To Review

- Discharge monitoring reports for the past year
- Laboratory records and procedures
- Monthly operating reports for wastewater treatment facilities
- Flow monitoring calibration certification and supporting records
- Ash pond volume certification and supporting records
- Installation Spill Plan
- All records required by the spill plan
- Sewage treatment plant operator certification
- Sewer and storm drain layout
- Oil/water separator inventory
- Installation as-built drawings

F. Physical Features To Inspect

- Discharge outfall pipes
- Wastewater treatment facilities
- Industrial treatment facilities
- Streams, rivers, open waterways
- Floor and sink drains (especially in industrial areas)
- Stormwater collection points (especially in industrial areas)
- Oil storage tanks
- Oil/water separators

G. Guidance for Checklist Users

	REFER TO CHECKLIST ITEMS:
Missing Checklist Items/Positive Findings	WA.2.1.SP and WA.2.2.SP
All Installations	WA.10.1.SP
General	WA.20.1.SP through WA.20.3.SP
Point Source Discharges	WA.30.1.SP through WA.30.7.SP
Discharges to DWTPs	WA.40.1.SP through WA.40.3.SP
Effluent Limitations	WA.50.1.SP through WA.50.4.SP

**COMPLIANCE CATEGORY:
WASTEWATER MANAGEMENT
Spain Protocols**

**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
September 2000**

**WA.2
MISSING CHECKLIST
ITEMS/POSITIVE
FINDINGS**

WA.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).

[Added September 2000]

WA.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).

[Added September 2000]

Determine whether any new regulations concerning wastewater have been issued since the finalization of the manual.

Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.

Verify that the installation is in compliance with all applicable and newly issued regulations.

Determine whether the installation has gone above and beyond simply complying with environmental requirements.

(NOTE: This checklist item is used only to write positive findings.)

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WA.10 ALL INSTALLATIONS</p> <p>WA.10.1.SP. Analytical samples taken to comply with the standards in FGS-Spain must be tested using certain laboratories only (FGS-Spain 4.5).</p>	<p>Verify that analytical samples are tested using one of the following:</p> <ul style="list-style-type: none"> - overseas DOD laboratories approved by the service component - laboratories authorized by Spanish authorities - continental United States (CONUS) laboratories certified by USEPA.

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WA.20 GENERAL</p> <p>WA.20.1.SP. All sludges produced during the treatment of wastewater must be disposed of properly (FGS-Spain 4.4).</p> <p>WA.20.2.SP. Each installation must have a system for investigating water pollution complaints from individuals or Spanish water pollution control authorities (FGS-Spain 4.1.c).</p> <p>WA.20.3.SP. Activities or installations that have a significant potential for spills or batch discharges must develop a slug prevention plan (FGS-Spain 4.2.b.6).</p>	<p>Verify that all sludges produced during the treatment of wastewater are disposed of properly in accordance with the requirements of Section 4, <i>Hazardous Waste Management</i>, or Section 9, <i>Solid Waste Management</i>, as appropriate.</p> <p>Verify that the installation has a system for investigating water pollution complaints from individuals or Spanish water pollution control authorities.</p> <p>Verify that the Executive Agent is involved in the process as appropriate.</p> <p>Verify that the plan contains the following, at a minimum:</p> <ul style="list-style-type: none"> - a description of discharge practices, including nonroutine batch discharges - a description of stored chemicals - a plan for immediately notifying the DWTP of slug discharges and discharges that would violate standards, including procedures for subsequent written notification within 5 days - necessary practices to prevent accidental spills, including: <ul style="list-style-type: none"> - proper inspection and maintenance of storage areas - proper handling and transfer of materials - proper loading and unloading operations - proper control of plant site runoff - proper worker training - proper procedures for building containment structures or equipment - necessary measures to control toxic organic pollutants and solvents - proper procedures and equipment for emergency response and any subsequent plans needed to limit damage to the treatment plant or the environment.

**COMPLIANCE CATEGORY:
WASTEWATER MANAGEMENT
Spain Protocols**

**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
September 2000**

**WA.30
POINT SOURCE
DISCHARGES**

WA.30.1.SP. All point sources of pollutants introduced into the waters of Spain must meet specific effluent limitations and monitoring requirements (FGS-Spain 4.1.a).

Verify that all point sources of pollutants comply with the following effluent limitations:

- BOD₅ (for new point sources):
 - 30-day average does not exceed 30 mg/L
 - 7-day average does not exceed 45 mg/L
- CBOD₅ (when the Executive Agent substitutes it for the parameter BOD₅):
 - 30-day average does not exceed 25 mg/L
 - 7-day average does not exceed 40 mg/L
- BOD₅ (for existing point sources):
 - 30-day average does not exceed 45 mg/L
 - 7-day average does not exceed 65 mg/L
- COD: the maximum acceptable concentration for discharge into surface waters is 500 mg/L
- TSS (for new point sources):
 - 30-day average does not exceed 30 mg/L
 - 7-day average does not exceed 45 mg/L
- TSS (for existing point sources):
 - 30-day average does not exceed 45 mg/L
 - 7-day average does not exceed 65 mg/L
- effluent pH values are maintained between 6.0 and 9.0
- discharges of other conventional and nonconventional pollutants comply with the limits in Appendix 12-2.

(NOTE: Discharge at a new source can be exempted from the pH limit if it is demonstrated that both of the following are the case:

- no inorganic chemicals are added to the waste stream as part of the treatment process
- contributions from industrial sources do not cause the pH of the effluent to be outside the 6.0 to 9.0 range.)

Verify that the installation coordinates with the appropriate Spanish authority to establish compliance with local hydrographic plans.

WA.30.2.SP. All monitoring samples must be collected at the point of final discharge prior to mixing with the receiving water (FGS-Spain 4.1.b).

Verify that all monitoring samples are collected at the point of final discharge prior to mixing with the receiving water.

**COMPLIANCE CATEGORY:
WASTEWATER MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WA.30.3.SP. Certain conventional pollutants must be monitored in accordance with Appendix 12-3 (FGS-Spain 4.1.b.1)</p> <p>WA.30.4.SP. Monitoring for other conventional and non-conventional pollutants must be preceded by screening (FGS-Spain 4.1.b.2.a and 4.1.b.2.b).</p> <p>WA.30.5.SP. Monitoring for other conventional and non-conventional pollutants must continue under certain conditions (FGS-Spain 4.1.b.2.c).</p> <p>WA.30.6.SP. Installations must not use wastewater for irrigation or otherwise discharge it onto the soil unless certain conditions are met (FGS-Spain 4.1.d).</p>	<p>Verify that BOD₅, COD, TSS, and pH are monitored in accordance with Appendix 12-3.</p> <p>Verify that initial screening is conducted for parameters in Appendix 12-2 in order to establish the relevant parameters for future monitoring.</p> <p>(NOTE: Initial screening consists of a single grab sample at the point of final discharge.)</p> <p>Verify that confirmation screening for each parameter that exceeds the limits in initial screening is performed to confirm the presence of that parameter.</p> <p>Verify that confirmation screening consists of a minimum of seven grab samples for analysis over a period of 14 days.</p> <p>Verify that samples are taken on a schedule that varies the sampling time over a 24-h day and the day of the week.</p> <p>Verify that initial screening is performed following operational changes that may result in altered wastewater characteristics, or once every 2 yr, whichever occurs first.</p> <p>Verify that, if confirmation screening indicates elevated levels of any parameter, monitoring for that parameter continues (in accordance with Appendix 12-3) until sustained below-limit levels are demonstrated.</p> <p>Verify that wastewater, subject to secondary treatment, is used for irrigation or otherwise discharged onto the soil only after meeting the following conditions:</p> <ul style="list-style-type: none"> - the wastewater has been screened for pollutants, as described in FGS-Spain 4.1.b (see checklist items WA.30.2.SP through WA.30.5.SP) - the wastewater conforms to the limits in Appendix 12-2 - the wastewater has been disinfected (i.e., is nonpathogenic) - the wastewater is not used in areas frequented by children or for the irrigation of leaf or root crops - the wastewater is applied in a controlled manner so as to prevent erosion - the use of treated and disinfected water ensures that neither the soil, subsoil, aquifers, nor vegetation are degraded - specific discharge requirements are coordinated with the appropriate Spanish authority.

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
WA.30.7.SP. Installations must not discharge onto the soil any liquid that contains specific disallowed substances (FGS-Spain 3.1.c.2).	Verify that the installation does not discharge onto the soil any liquid that contains the substances in Appendix 12-4. (NOTE: This prohibition on discharge does not apply if the criteria of FGS-Spain 4.1.d are met (see checklist item WA.30.6.SP).)

**COMPLIANCE CATEGORY:
WASTEWATER MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WA.40 DISCHARGES TO DWTPs</p> <p>WA.40.1.SP. Wastewater discharged into non-DOD DWTPs must comply with specific limits and monitoring requirements (FGS-Spain 4.2.a).</p> <p>WA.40.2.SP. Installations must not discharge certain materials into a treatment works (FGS-Spain 4.2.b.1, 4.2.b.5, and 4.2.b.7).</p> <p>WA.40.3.SP. Installations must not introduce specific pollutants into a DWTP (FGS-Spain 4.2.b.2, 4.2.b.3, and 4.2.b.4).</p>	<p>Verify that installations coordinate with the local Spanish authorities to establish local DWTP acceptance standards.</p> <p>Verify that wastewater discharged into non-DOD DWTPs complies with the pollutant limits given in Appendix 12-2.</p> <p>Verify that monitoring of pollutants is carried out in accordance with the requirements of FGS-Spain 4.1.b (see checklist items WA.30.2.SP through WA.30.5.SP).</p> <p>(NOTE: The limits given in Appendix 12-2 are not imposed on indirect discharges served by DOD-owned and -operated treatment works.)</p> <p>(NOTE: These and the following effluent limitations apply to all discharges of pollutants to DWTPs and associated collection systems.)</p> <p>Verify that the installation does not discharge any of the following to a DWTP:</p> <ul style="list-style-type: none"> - petroleum oil - nonbiodegradable cutting oil - products of mineral oil origin - any solid or viscous pollutants that may result in obstructions to plant flow - trucked or hauled waste. <p>(NOTE: DWTPs may specify locations at which trucked and hauled waste may be discharged; the prohibition on discharge of such waste does not apply at such locations.)</p> <p>Verify that pollutants that create a fire or explosion hazard in the collection system or treatment facility are not discharged, specifically:</p> <ul style="list-style-type: none"> - wastewater with a closed cup flashpoint of less than 60 °C (140 °F) - liquid waste solutions that contain more than 24 percent alcohol by volume with a flash point less than 60 °C (140 °F) - nonliquid wastes which, under standard temperature and pressure, can cause a fire through friction - ignitable compressed gases - oxidizers, such as peroxide. <p>Verify that no pollutant that has the potential to be structurally corrosive is discharged to the DWTP.</p>

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Spain Protocols	
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	<p>Verify that no wastewater with a pH lower than 5.0 is discharged to the DWTP.</p> <p>(NOTE: This prohibition does not apply if the treatment facilities and collecting systems are designed to handle such wastewater.)</p> <p>Verify that the following types of waste are not discharged:</p> <ul style="list-style-type: none"> - wastes that are normally unstable and readily undergo violent changes without detonating - wastes that react violently with water - wastes that form explosive mixtures with water or form toxic gases or fumes when mixed with water - cyanide or sulfide wastes that can generate potentially harmful toxic fumes, gases, or vapors - wastes capable of detonation or explosive decomposition or reaction at standard temperature and pressure - wastes that contain explosives regulated under FGS-Spain, Chapter 5 - wastes that produce any toxic fumes, vapors, or gases with the potential to cause safety problems or harm to workers.

**COMPLIANCE CATEGORY:
WASTEWATER MANAGEMENT
Spain Protocols**

**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
September 2000**

**WA.50
EFFLUENT
LIMITATIONS**

(NOTE: These limits apply for the wastewater leaving the industry, shop, or IWTP, not to wastewater at the final point of discharge from the installation (except for cadmium).)

(NOTE: Where differences in limitations exist, activities constructed or substantially modified on or after 1 October 1994 will meet the limitations for new activities.)

WA.50.1.SP. New and existing electroplating facilities that directly or indirectly discharge less than 38,000 L/day (10,000 gal/day) must meet specific standards (FGS-Spain 4.3.a.1.h).

Verify that the following standards are met:

Pollutant	Daily Maximum (mg/L)	4-day Average (mg/L)
Cyanide, amenable	5.0	2.7
Lead	0.6	0.4
Cadmium	0.4	---
TTO	4.57	---

Verify that, for cadmium, in addition, the 30-day average does not exceed 0.3 g of cadmium discharged per kilogram of cadmium handled.

(NOTE: See Appendix 12-1 for a list of components of TTOs.)

WA.50.2.SP. New and existing electroplating facilities that directly or indirectly discharge 38,000 L/day (10,000 gal/day) or more must meet specific standards (FGS-Spain 4.3.a.1.i).

Verify that the following standards are met:

Pollutant	Daily Maximum (mg/L)	4-day Average (mg/L)
Cyanide, total	1.9	1.0
Copper	4.5	2.7
Nickel	4.1	2.6
Chrome	7.0	4.0
Zinc	4.2	2.6
Lead	0.6	0.4
Cadmium	0.4	---
Total Metals	10.5	6.8
TTO	2.13	---

Verify that, for cadmium, in addition, the 30-day average does not exceed 0.3 g of cadmium discharged per kilogram of cadmium handled.

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000							
<p>WA.50.3.SP. New and existing facilities that electroplate precious metals and that directly or indirectly discharge 38,000 L/day (10,000 gal/day) or more must meet additional standards (FGS-Spain 4.3.a.1.j).</p> <p>WA.50.4.SP. Industrial dischargers must monitor effluents quarterly (FGS-Spain 4.3.b).</p>	<p>Verify that the following standards are met:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Pollutant</th> <th style="text-align: center;">Daily Maximum (mg/L)</th> <th style="text-align: center;">4-day Average (mg/L)</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Silver</td> <td style="text-align: center;">1.2</td> <td style="text-align: center;">0.7</td> </tr> </tbody> </table> <p>Verify that monitoring is carried out quarterly and that all the appropriate parameters are analyzed.</p> <p>Verify that samples are collected at the point of discharge after treatment but prior to any mixing with the receiving water.</p> <p>(NOTE: Sampling for TTO can be avoided if the commanding officer determines that no discharge of concentrated toxic organics into the wastewaters has occurred and the facility has implemented a TTO management plan.)</p>		Pollutant	Daily Maximum (mg/L)	4-day Average (mg/L)	Silver	1.2	0.7
Pollutant	Daily Maximum (mg/L)	4-day Average (mg/L)						
Silver	1.2	0.7						

Appendix 12-1

Components of Total Toxic Organics (FGS-Spain, Table 4-1)

Volatile Organics
Acrolein (Propenyl)
Acrylonitrile
Methyl chloride (chloromethane)
Methyl bromide (bromomethane)
Vinyl chloride (chloroethylene)
Chloroethane
Methylene chloride (dichloromethane)
1,1-Dichloroethene
1,1-Dichloroethane
1,2-Dichloroethane
1,2-trans-Dichloroethene
Chloroform (trichloromethane)
1,1,1-Trichloroethane
Carbon tetrachloride (tetrachloromethane)
Bromodichloromethane
1,1,2,2-Tetrachloroethane
1,2-Dichloropropane
1,3-Dichloropropylene (1,3-Dichloropropene)
Trichloroethene
Dibromochloromethane
1,1,2-Trichloroethane
Benzene
2-Chloroethyl vinyl ether (mixed)
Bromoform (tribromomethane)
Tetrachloroethene
Toluene
Chlorobenzene
Ethyl benzene

Base/Neutral Extractable Organics
N-nitrosodimethylamine
bis (2-chloroethyl) ether
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
bis (2-chloroisopropyl)-ether
Hexachloroethane
N-nitrosodi-n-propylamine
Nitrobenzene
Isophorone
bis (2-chloroethoxy) methane
1,2,4-trichlorobenzene
Naphthalene
Hexachlorobutadiene
Hexachlorocyclopentadiene
2-Chloronaphthalene
Acenaphthylene
Dimethyl Phthalate
2,6-Dinitrotoluene
Acenaphthene
2,4-Dinitrotoluene
Fluorene
4-Chlorophenyl phenyl ether
Diethyl phthalate
1,2-Diphenylhydrazine
N-nitrosodiphenylamine
4-Bromophenyl phenyl ether
Hexachlorobenzene
Phenanthrene
Anthracene
Di-n-butyl phthalate
Fluoranthene
Pyrene
Benzidine

Butyl benzyl phthalate
1,2-benzoanthracene (benzo (a) anthracene)
Chrysene
3,3-Dichlorobenzidine
bis (2-ethylhexyl) phthalate
Di-n-octyl phthalate
3,4-Benzofluoranthene (benzo (b) fluoranthene)
11,12-Benzofluoranthene (benzo (k) fluoranthene)
Benzo (a) pyrene (3,4-benzopyrene)
Indeno (1,2,3-cd) pyrene (2,3-phenylene pyrene)
1,2,5,6-Dibenzanthracene (dibenzo (a,h) anthracene)
1,12-Benzoperylene (benzo (g,h,i) perylene)
Acid Extractable Organics
2-Chlorophenol
Phenol
2-Nitrophenol
2,4-Dimethylphenol
2,4-Dichlorophenol
4,6-Dinitro-o-cresol
2,4,6-Trichlorophenol
2,4-Dinitrophenol
4-Nitrophenol
p-Chloro-m-cresol
Pentachlorophenol
Pesticides/Polychlorinated biphenyls (PCBs)
Alpha-Endosulfan
Beta-Endosulfan
Endosulfan sulfate
Alpha-BHC
Beta-BHC
Delta-BHC
Gamma-BHC
4,4-DDT
4,4-DDE (p,p-DDX)
4,4-DDD (p,p-TDE)

Aldrin
Chlordane (technical mixture and metabolites)
Dieldrin
Endrin
Endrin aldehyde
Heptachlor
Heptachlor Epoxide (BHC-hexachlorocyclohexane)
Toxaphene
PCB-1242 (Arochlor 1242)
PCB-1254 (Arochlor 1254)
PCB-1221 (Arochlor 1221)
PCB-1232 (Arochlor 1232)
PCB-1248 (Arochlor 1248)
PCB-1260 (Arochlor 1260)
PCB-1216 (Arochlor 1216)
2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

Appendix 12-2

Limits on Pollutant Discharge (Direct and Indirect)
(FGS-Spain, Table 4-2)

Parameter	Discharge Limits (mg/L)	Notes
Settleable solids	2	(A)
Total particulates	absent	--
Temperature °C	3	(B)
Color	not perceptible after 1/40 dilution	(C)
Aluminum	2	(D)
Arsenic	1	(D)
Barium	20	(D)
Boron	10	(D)
Cadmium	0.5/0.4 (K)	(D)
Chrome III	4	(D)
Chrome VI	0.5	(D)
Iron	10	(D)
Manganese	10	(D)
Nickel	10	(D)
Mercury	0.1	(D)
Lead	0.5	(D)
Selenium	0.1	(D)
Tin	10	(D)
Copper	10	(D)
Zinc	20	(D)
Total toxic metals	3	(E)
Chlorides	2000	--
Sulfides as H ₂ S	2	--
Sulfites as SO ₃	2	--
Sulfates as SO ₄ ²⁻	2000	--
Fluorides as F-	12	--
Total phosphorus	20	(F)
Ammonium as NH ₄ ⁺	50	(G)
Nitrite N	20	(G)

Parameter	Discharge Limits (mg/L)	Notes
Cyanide	1	--
Phenols	1	(H)
Aldehydes	2	--
Detergents	6	(I)
Pesticides	0.005	(J)
Oil and grease	40	--

- A. Measured after 2 h in an Imhoff cone in ml/L.
- B. Will not cause a difference of more than 3 °C of receiving water temperature.
- C. Not perceptible after 1:40 dilution through a 10 cm [approx. 4 in.] wedge.
- D. Limit refers to the dissolved elements such as ions and complex forms.
- E. The sum of the fractional proportions of the actual amount of the toxic elements (arsenic, cadmium, chrome VI, nickel, mercury, lead, selenium, copper and zinc) to the maximum allowable amount for those elements must not exceed 3.
- F. If discharging to rivers or reservoirs, the limit should not exceed 0.5 mg/L in order to prevent eutrophication blooms.
- G. Total nitrogen in rivers and reservoirs should not exceed 10 mg/L, expressed as nitrogen.
- H. Expressed as C₆H₅OH.
- I. Expressed as lauryl-sulphate.
- J. For organophosphorous pesticides, the maximum level is 0.1 mg/L.
- K. Applicable to cadmium containing discharges from electroplating operations using cadmium.

Appendix 12-3

Monitoring Requirements (FGS-Spain, Table 4-3)

Discharge Flow (Million Gallons/Day) ^{1,2}	Monitoring Frequency
0.0 - 0.099	Quarterly
0.1 - 0.99	Monthly
1.0 - 4.99	Weekly
> 5.0	Daily

1. For direct discharges through a treatment works, monitoring frequency is based on the design flow capacity of the plant.
2. For direct and indirect discharges without treatment, monitoring frequency is based on the 30-day average actual flow.

Appendix 12-4

Substances Disallowed for Discharged onto Soil (FGS-Spain 3.1.c.2)

Halogenated compounds or substances which produce the same in an aqueous environment
Organophosphorus compounds
Organotin compounds
Substances with carcinogenic, mutagenic or teratogenic properties in an aqueous environment
Mercury and its compounds
Cadmium and its compounds
Mineral oils and hydrocarbons
Floating, suspended or precipitated synthetic substances which may degrade water

SECTION 13
WATER QUALITY MANAGEMENT
September 2000

A. Applicability of this Section

This section contains standards for providing potable water at Department of Defense (DOD) installations.

B. Source Documents

- *Environmental Final Governing Standards--Spain* (FGS-Spain), May 1994, Chapter 3.

C. Key Compliance Requirements

- Analytical samples taken to comply with the standards of FGS-Spain must be tested using certain laboratories only.
- Installations must develop and update as necessary an emergency contingency plan to ensure the provision of potable water despite interruptions from natural disasters and service interruptions.
- Installations must maintain a current map/drawing of the complete potable water system.
- Installations must have a Potable Water System Master Plan that is updated at least every 5 yr.
- DOD water systems must meet specific requirements concerning positive pressure and maintenance practices.
- The installation must establish an effective cross connection control and backflow prevention program.
- Installations must conduct sanitary surveys and vulnerability assessments of the water system.
- Installations must use only lead-free pipe, solder, flux, and fittings when installing or repairing water systems and plumbing systems for drinking water.
- Compliance with water quality standards must be demonstrated by independent testing or validated supplier testing.
- DOD water systems must meet specific MCL and testing requirements for total coliform bacteria.
- DOD water systems must meet specific requirements with regard to physical and chemical parameters and monitoring.
- DOD PWS and NTNC water systems must meet specific standards for lead and copper action levels and reporting requirements when these levels are exceeded.
- DOD PWS must meet specific requirements with regard to synthetic organics.
- DOD water systems must meet specific requirements with regard to TTHMs.
- DOD water systems must meet specific requirements with regard to radionuclides.

- Installations must test DOD PWS filtered waters daily for turbidity and must meet a specific MCL for turbidity.
- Installations must periodically monitor DOD NPWSs for specific parameters.
- Water supplied by a Spanish public supply system must be tested for conformity with specific requirements.
- Specific records must be maintained for DOD water systems.
- DOD installations must use only approved alternative water sources, if the use of alternative sources is necessary.
- Water extraction must be coordinated with Spanish officials.
- Underground injection must be carried out in such a way that underground water resources are protected.
- Water supply aquifers must be protected by suitable placement and construction of wells, siting and maintenance of septic systems, onsite treatment units, and appropriate land use management.

D. Definitions

- *Action Level* - the concentration of a substance in water that determines appropriate treatment for a water system (FGS-Spain, Chapter 3, Definitions).
- *Community Water System (CWS)* - a public water system (PWS) having at least 15 service connections used by year-round residents or that regularly serves at least 25 of the same people over 6 mo per year; compare with PWS (FGS-Spain, Chapter 3, Definitions).
- *Disinfectant* - any oxidant, including but not limited to, chlorine, chlorine dioxide, chloramines, and ozone, intended to kill or inactivate pathogenic microorganisms in water (FGS-Spain, Chapter 3, Definitions).
- *First Draw Sample* - a 1-L [approx. 1-qt] sample of tapwater that has been standing in plumbing at least 6 h and is collected without flushing the tap (FGS-Spain, Chapter 3, Definitions).
- *Groundwater Under the Direct Influence of Surface Water (GWUDISW)* - any water below the surface of the ground with either (FGS-Spain, Chapter 3, Definitions):
 1. significant occurrence of insects or other macro-organisms, algae, or large-diameter pathogens such as *Giardia lamblia*
 2. significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH, that closely correlate to climatological or surface water conditions.

(NOTE: Direct influence must be determined for individual sources.)

- *Lead-free* - a maximum lead content of 0.2 percent for solder and flux, and 8.0 percent for pipes and fittings (FGS-Spain, Chapter 3, Definitions).
- *Lead Service Line* - a service line, made of lead, that connects the water main to the building inlet, and any lead pigtail, gooseneck, or other fitting which is connected to such line (FGS-Spain, Chapter 3, Definitions).
- *Maximum Contaminant Level (MCL)* - the maximum permissible level of a contaminant in water that is delivered to the free-flowing outlet of the ultimate user of a PWS, except for turbidity for which the maximum permissible level is measured after filtration (FGS-Spain, Chapter 3, Definitions).

(NOTE: Contaminants added to the water under circumstances controlled by the user, except those resulting from the corrosion of piping and plumbing caused by water quality, are excluded.)

- *Nonpublic Water System (NPWS)* - a system that is not a PWS (FGS-Spain, Chapter 3, Definitions).
- *Nontransient, Noncommunity Water System (NTNCWS)* - a PWS that is not a community water system and that regularly serves at least 25 of the same persons for more than 6 mo/yr. Examples include a school or a factory with its own water supply (FGS-Spain, Chapter 3, Definitions).
- *Point-of-Entry (POE) Treatment Device* - a treatment device applied to the drinking water entering a structure to reduce contaminants in the drinking water throughout the structure (FGS-Spain, Chapter 3, Definitions).
- *Point-of-Use (POU) Treatment Device* - a treatment device applied to a tap to reduce contaminants in drinking water at that tap (FGS-Spain, Chapter 3, Definitions).
- *Potable Water* - water that has been tested and treated to meet the standards of FGS-Spain, Chapter 3 (FGS-Spain, Chapter 3, Definitions).
- *Potable Water System Master Plan* - a long-range plan of the installation potable water system covering its maintenance, capacity, monitoring program, and treatment requirements (FGS-Spain, Chapter 3, Definitions).
- *Public Water System (PWS)* - a system for providing piped water to the public for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. This term includes (FGS-Spain, Chapter 3, Definitions):
 1. any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system
 2. any collection or pretreatment storage facilities not under such control that are used primarily in connection with such system.

A PWS is either a CWS or a non-community water system.

- *Sanitary Survey* - an onsite review of the water source, facilities, equipment, operation, and maintenance of a PWS to evaluate the technical adequacy of such elements for producing and distributing potable water (FGS-Spain, Chapter 3, Definitions).
- *Total Trihalomethanes (TTHM)* - the sum of the concentration in mg/L of chloroform, bromoform, dibromochloromethane, and bromodichloromethane (FGS-Spain, Chapter 3, Definitions).
- *Underground Injection* - a subsurface emplacement through a bored, drilled, driven, or dug well, where the depth is greater than the largest surface dimension, whenever a principle function of the well is the emplacement of any fluid (FGS-Spain, Chapter 3, Definitions).
- *Vulnerability Assessment* - an evaluation by the DOD which shows that contaminants of concern either have not been used in a watershed area or that the source of water for the system is not susceptible to contamination (FGS-Spain, Chapter 3, Definitions).

(NOTE: Susceptibility is based on prior occurrence, vulnerability assessment results, environmental persistence and transport of the contaminants, and any wellhead protection program results.)

- *Water System* - refers to PWSs and NPWSs, and purchasers who have a distribution system and water storage facilities (FGS-Spain, Chapter 3, Definitions).

E. Records To Review

- Bacterial and chemical analyses of drinking water, including sampling dates and locations, dates of analyses, analytical methods used, and results of analyses
- Monthly operating reports (flow, chlorine residual, etc.)
- Records of planning and construction of injection wells
- Results of injection well monitoring
- Records of facility projects, including any petition for review, that may potentially cause contamination of a sole source aquifer through its recharge zone

F. Physical Features To Inspect

- Drinking water collection, treatment, and distribution facilities
- Onbase laboratory analysis facilities
- Underground injection wells

G. Guidance for Checklist Users

	REFER TO CHECKLIST ITEMS:
Missing Checklist Items/Positive Findings	WQ.2.1.SP and WQ.2.2.SP
All Installations	WQ.10.1.SP and WQ.10.2.SP
General	WQ.20.1.SP through WQ.20.8.SP
Water Quality Standards	WQ.30.1.SP through WQ.30.10.SP
Disinfection and Filtration	WQ.40.1.SP through WQ.40.3.SP
Recordkeeping and Notification	WQ.50.1.SP through WQ.50.3.SP
Alternative Water Supplies	WQ.60.1.SP
Protection of the Water Supply	WQ.70.1.SP through WQ.70.3.SP

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WATER QUALITY MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WQ.2 MISSING CHECKLIST ITEMS/POSITIVE FINDINGS</p> <p>WQ.2.1.SP. Installations are required to comply with all applicable regulatory requirements not contained in this checklist (a finding under this checklist item will have the citation of the applied regulation as a basis of finding).</p> <p>[Added September 2000]</p> <p>WQ.2.2.SP. Installations should go above and beyond environmental statutory and regulatory compliance (MP).</p> <p>[Added September 2000]</p>	<p>Determine whether any new regulations concerning water quality have been issued since the finalization of the manual.</p> <p>Determine whether the installation has activities or facilities that are regulated but not addressed in this checklist.</p> <p>Verify that the installation is in compliance with all applicable and newly issued regulations.</p> <p>Determine whether the installation has gone above and beyond simply complying with environmental requirements.</p> <p>(NOTE: This checklist item is used only to write positive findings.)</p>

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WQ.10 ALL INSTALLATIONS</p> <p>WQ.10.1.SP. Analytical samples taken to comply with the standards of FGS-Spain must be tested using certain laboratories only (FGS-Spain 3.4).</p> <p>WQ.10.2.SP. Installations that use surface water sources must protect them (FGS-Spain 3.1.c.4).</p>	<p>Verify that analytical samples are tested using one of the following:</p> <ul style="list-style-type: none"> - overseas DOD laboratories approved by the service component - laboratories authorized by Spanish authorities - continental United States (CONUS) laboratories certified by USEPA. <p>Verify that surface water sources are protected according to the standards defined in FGS-Spain 3.1.c (see the checklist items in WQ.70), as applicable.</p> <p>Verify that surface water sources are managed so as to prevent hydrological impairment and the entry of stormwater and waste into the supply.</p>

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Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WQ.20 GENERAL</p> <p>WQ.20.1.SP. Installations must develop and update as necessary an emergency contingency plan to ensure the provision of potable water despite interruptions from natural disasters and service interruptions (FGS-Spain 3.1.i).</p> <p>WQ.20.2.SP. Installations must maintain a current map/drawing of the complete potable water system (FGS-Spain 3.1.a).</p> <p>WQ.20.3.SP. Installations must have a Potable Water System Master Plan that is updated at least every 5 yr (FGS-Spain 3.1.b).</p> <p>WQ.20.4.SP. DOD water systems must meet specific requirements concerning positive pressure and maintenance practices (FGS-Spain 3.1.f through 3.1.g).</p>	<p>Verify that the installation has an emergency contingency plan that includes, at a minimum:</p> <ul style="list-style-type: none"> - identification of key personnel - procedures to restore service - procedures to isolate damaged lines - identification of alternative water supplies - installation public notification procedures - a vulnerability assessment. <p>Verify that the plan is updated as necessary.</p> <p>Verify that the installation maintains a current map/drawing of the complete potable water system.</p> <p>Verify that the installation has a Potable Water System Master Plan.</p> <p>Verify that the plan is updated at least every 5 yr.</p> <p>Verify that a continuous positive pressure is maintained in the water distribution system.</p> <p>Verify that the water distribution operation and maintenance practices include:</p> <ul style="list-style-type: none"> - maintenance of a disinfectant residual throughout the water distribution system (except where an effective ultraviolet or ozone disinfectant process is used) - proper repair and replacement of mains procedures (including disinfection and bacteriological testing) - implementation of an effective annual water main flushing program - proper operation and maintenance of storage tanks and reservoirs - maintenance of distribution system components (including hydrants and valves) - use of Spanish O&M technical norms when practical.

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WQ.20.5.SP. Installations must establish an effective cross connection and backflow prevention program (FGS-Spain 3.1.h).</p>	<p>Verify that the installation has an effective cross connection and backflow prevention program.</p>
<p>WQ.20.6.SP. Installations must conduct sanitary surveys of the water system (FGS-Spain 3.1.d).</p>	<p>Verify that sanitary surveys of the water system, including a review of required water quality analyses, are conducted annually and as needed.</p> <p>Verify that off-installation surveys are coordinated with the appropriate Spanish authorities.</p>
<p>WQ.20.7.SP. Installations must conduct vulnerability assessments (FGS-Spain 3.1.m).</p>	<p>Verify that the installation has conducted a vulnerability assessment.</p>
<p>WQ.20.8.SP. Installations must use only lead-free pipe, solder, flux, and fittings when installing or repairing water systems and plumbing systems for drinking water (FGS-Spain 3.1.j).</p>	<p>Verify that only lead-free materials (see definition) are used.</p>

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WQ.30 WATER QUALITY STANDARDS</p> <p>WQ.30.1.SP. Compliance with water quality standards must be demonstrated by independent testing or validated supplier testing (FGS-Spain 3.2).</p> <p>WQ.30.2.SP. DOD water systems must meet specific MCL and testing requirements for total coliform bacteria (FGS-Spain 3.2.a).</p>	<p>(NOTE: These requirements apply regardless of whether the installation produces or purchases water.)</p> <p>Verify that the installation demonstrates compliance with applicable water quality standards by independent testing or validated supplier testing.</p> <p>Verify that PWSs have no more than 5 percent positive samples for the presence of total coliforms per month for a system examining 40 or more samples per month.</p> <p>Verify that PWSs have no more than one positive sample for the presence of total coliforms per month when a system analyzes fewer than 40 samples per month.</p> <p>(NOTE: The MCL for total coliforms is exceeded whenever a routine sample is positive for fecal coliforms or <i>Escherichia coli</i> (<i>E. coli</i>) or when any repeat sample is positive for total coliforms.)</p> <p>Verify that each system has a written, site specific monitoring plan and collects routine samples according to the schedule in Appendix 13-1.</p> <p>Verify that systems with initial samples testing positive for total coliforms collect repeat samples as soon as possible, preferably on the same day.</p> <p>Verify that repeat samples are taken at the same tap as the original sample and that an upstream and a downstream sample are taken in the vicinity of the tap.</p> <p>Verify that any additional required repeat sampling is performed according to local medical or Executive Agent (EA) guidance.</p> <p>Verify that monitoring continues until total coliforms are no longer detected.</p> <p>Verify that, when routine or repeat samples are positive for total coliforms, they are tested for fecal coliforms or <i>E. coli</i>.</p> <p>(NOTE: Fecal-type testing can be foregone on a total coliform positive sample if fecal coliforms or <i>E. coli</i> are assumed to be present.)</p> <p>Verify that, if the system has exceeded the MCL, the installation notifies the EA and personnel (U.S. and local national) no later than the end of the next business day that an acute risk to public health may exist.</p>

**COMPLIANCE CATEGORY:
WATER QUALITY MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WQ.30.3.SP. DOD water systems must meet specific requirements with regard to physical and chemical parameters and monitoring (FGS-Spain 3.2.b).</p> <p>WQ.30.4.SP. Installations that fluoridate their water must meet specific requirements (FGS-Spain, 3.2.c).</p> <p>WQ.30.5.SP. DOD water systems must meet specific standards for lead and copper action levels and reporting requirements when these levels are exceeded (FGS-Spain 3.1.j and 3.2.d).</p>	<p>Verify that the parameters in water distributed to end users do not exceed the limitations in Appendix 13-2.</p> <p>Verify that systems are monitored for parameters at the frequency set in Appendixes 13-3 and 13-4.</p> <p>Verify that, if a system is out of compliance, the EA and installation personnel (U.S. and local national) are notified as soon as possible but no later than 14 days after receipt of test results.</p> <p>(NOTE: Fluoridation of drinking water occurs at the discretion of the Installation Commander (IC) responsible for the PWS.)</p> <p>Verify that the fluoride content of drinking water does not exceed the MCL of 1.5 mg/L given in Appendix 13-2.</p> <p>Verify that fluoride monitoring involves collecting one treated water sample at the entry point to the distribution system annually for surface water systems and once every 3 yr for groundwater systems.</p> <p>Verify that daily monitoring is carried out for systems practicing fluoridation using the criteria in Appendix 13-5.</p> <p>Verify that, if any sample exceeds the MCL, the EA and installation personnel (U.S. and local national) are notified as soon as possible but no later than 14 days after receipt of test results.</p> <p>Verify that the concentration of lead does not exceed 0.015 mg/L.</p> <p>Verify that the concentration of copper does not exceed 1.3 mg/L.</p> <p>(NOTE: Actions such as corrosion control treatment, public education, and removal of lead service lines are triggered if the above lead and copper action levels are exceeded in more than 10 percent of all sampled taps.)</p> <p>Verify that monitoring is carried out in accordance with Appendix 13-6.</p> <p>Verify that sampling sites selected are as outlined in Appendix 13-6.</p> <p>Verify that high risk sampling sites are targeted by conducting a materials evaluation of the distribution system.</p> <p>Verify that, if an action level is exceeded, additional water samples are collected as specified in Appendix 13-6.</p> <p>Verify that optimal corrosion control treatment is pursued.</p>

**COMPLIANCE CATEGORY:
WATER QUALITY MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WQ.30.6.SP. DOD water systems must meet specific requirements with regard to synthetic organics (FGS-Spain 3.2.e).</p> <p>WQ.30.7.SP. DOD water systems must meet specific requirements with regard to TTHMs (FGS-Spain 3.2.f).</p> <p>WQ.30.8.SP. DOD water systems must meet specific requirements with regard to radionuclides (FGS-Spain 3.2.g).</p>	<p>Verify that, if action levels are exceeded after implementation of applicable corrosion control and source water treatment, lead service lines are replaced if it is lead service lines that are causing the excess.</p> <p>Verify that the EA and installation personnel (U.S. and local national) are notified within 14 days when an action level is exceeded.</p> <p>Verify that an education program for installation personnel (U.S. and host nation) is implemented within 60 days.</p> <p>Verify that synthetic organic chemicals in water distributed to people do not exceed the limitations outlined in Appendix 13-2.</p> <p>Verify that systems are monitored for synthetic organics according to the schedule in Appendix 13-7.</p> <p>Verify that, if the system is out of compliance, the EA and installation personnel (U.S. and local national) are notified as soon as possible, but no later than 14 days after the receipt of test results.</p> <p>(NOTE: When the MCLs for synthetic organic chemicals are exceeded, the installation will begin immediate quarterly monitoring and will increase quarterly monitoring if the level of any contaminant is at its detection limit and must continue until the IC determines the system is reliable and consistent, and any necessary remedial measures are implemented.)</p> <p>Verify that PWSs or NTNCWSs that add a disinfectant (oxidant, such as chlorine, chlorine dioxide, chloramines, or ozone) to any part of the treatment process do not exceed an MCL of 0.10 mg/L for TTHMs in drinking water.</p> <p>Verify that systems that add a disinfectant monitor for TTHMs as outlined in Appendix 13-8.</p> <p>Verify that, if the system is out of compliance, the EA and installation personnel (U.S. and local national) are notified as soon as possible, but no later than 14 days after the receipt of the test results, and that remedial measures are undertaken.</p> <p>Verify that PWSs and NTNCWSs meet the MCLs for radionuclides and that monitoring is performed as outlined in Appendix 13-9.</p> <p>Verify that, if the average annual MCL for gross alpha activity, total radium, or gross beta is exceeded, the appropriate Spanish authorities and the public are notified as soon as possible, but no later than 30 days after receipt of the test results.</p> <p>(NOTE: After a violation of an MCL for radionuclides, monitoring will continue (monthly for gross beta, quarterly for gross alpha) until remedial actions are completed and the average annual concentration no longer exceeds the MCL.)</p>

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WQ.30.9.SP. Installations must test DOD PWS filtered waters daily for turbidity and must meet a specific MCL for turbidity (FGS-Spain 3.2.h).</p> <p>WQ.30.10.SP. Installations must periodically monitor DOD NPWSs for specific parameters (FGS-Spain 3.2.i).</p>	<p>Verify that, if any gross beta MCL is exceeded, the major radioactive components are identified.</p> <p>Verify that the installation tests PWS filtered water for turbidity daily.</p> <p>Verify that the monthly average of daily samples does not exceed 1 Nephelometric Turbidity Unit (NTU) in more than 5 percent of the samples.</p> <p>Verify that the average of 2 consecutive days does not exceed 5 NTU.</p> <p>Verify that, if the MCL for turbidity is exceeded, the EA and installation personnel (U.S. and local national) are notified as soon as possible, but no later than 14 days after receipt of test results.</p> <p>Determine whether the installation operates an NPWS.</p> <p>Verify that, as a minimum, the installation monitors for:</p> <ul style="list-style-type: none"> - total coliforms - disinfectant residuals - odor - taste - ammonia - nitrate - pH. <p>Verify that such monitoring occurs at least once every 3 mo.</p>

**COMPLIANCE CATEGORY:
WATER QUALITY MANAGEMENT
Spain Protocols**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WQ.40 DISINFECTION AND FILTRATION</p> <p>WQ.40.1.SP. Water supplied by a Spanish public supply system must be tested for conformity with specific requirements (FGS-Spain 3.1.e.1).</p> <p>WQ.40.2.SP. Installations that use surface water or GWUDISW to produce potable water must conform to certain treatment requirements (FGS-Spain 3.1.e.2 and 3.1.e.4).</p> <p>WQ.40.3.SP. Installations that use a groundwater source as their supply of drinking water must disinfect the supplies (FGS-Spain 3.1.e.3).</p>	<p>Verify that water supplied by a Spanish public supply system is tested for conformity with the requirements of Appendix 13-10.</p> <p>Verify that the water is first assigned to one of the classes established in Appendix 13-11.</p> <p>Verify that the water is treated in accordance with that classification.</p> <p>Verify that, in addition, such waters are treated in accordance with Appendix 13-10.</p> <p>Verify that treatment additive doses do not exceed those listed in Appendix 13-12.</p> <p>Determine whether the installation's water supply is groundwater.</p> <p>Verify that, at a minimum, groundwater supplies are disinfected.</p>

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WQ.50 RECORDKEEPING AND NOTIFICATION REQUIREMENTS</p> <p>WQ.50.1.SP. Specific records must be maintained for DOD water systems (FGS-Spain 3.1.k).</p> <p>WQ.50.2.SP. Installations must document actions taken to correct breaches of water quality criteria (FGS-Spain 3.1.L).</p> <p>WQ.50.3.SP. Required notifications must meet specific content standards (FGS-Spain 3.3).</p>	<p>Verify that records of chemical analyses are kept for not less than 10 yr.</p> <p>Verify that records showing monthly operating reports are maintained for at least 3 yr.</p> <p>Verify that records of bacteriological results are maintained for not less than 5 yr.</p> <p>Verify that the installation documents corrective actions taken to correct breaches of criteria.</p> <p>Verify that such documentation is maintained for at least 3 yr.</p> <p>Verify that the notices required under this checklist are clear and understandable and address the following topics:</p> <ul style="list-style-type: none"> - explanation of the violation - any potential adverse health effects - the population at risk - the steps that the system is taking to correct the violation - the necessity for seeking alternative water supply, if any - any preventive measures the consumer should take until the violation is corrected. <p>(NOTE: The EA coordinates notification of Spanish authorities where off-installation populations are at risk.)</p>

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WQ.60 ALTERNATIVE WATER SUPPLIES</p> <p>WQ.60.1.SP. DOD installations must use only approved alternative water sources, if the use of alternative sources is necessary (FGS-Spain 3.2.j).</p>	<p>Determine whether the installation uses alternative water sources.</p> <p>Verify that alternative water sources have approval from the IC.</p> <p>(NOTE: This requirement includes POE and POU treatment devices, as well as bottled water supplies.)</p>

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Spain Protocols	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS: September 2000
<p>WQ.70 PROTECTION OF THE WATER SUPPLY</p> <p>WQ.70.1.SP. Water extraction must be coordinated with Spanish officials (FGS-Spain 3.1.c.1).</p> <p>WQ.70.2.SP. Underground injection must be carried out in such a way that underground water resources are protected (FGS-Spain 3.1.c.3).</p> <p>WQ.70.3.SP. Installations must protect water supply aquifers from contamination (FGS-Spain 3.1.c.5).</p>	<p>Verify that the extraction of water from surface or ground is coordinated with appropriate Spanish authorities.</p> <p>Verify that waters containing substances in Appendix 13-13 are not injected into aquifers.</p> <p>Verify that waters containing substances in Appendix 13-14 are not injected into deep geological formations.</p> <p>(NOTE: This prohibition does not apply if such injection has been coordinated with the appropriate Spanish authorities.)</p> <p>(NOTE: The reinjection into the same aquifer of well water pumped for civil engineering works may be permitted when coordinated with the appropriate Spanish authorities.)</p> <p>Determine whether the installation is located by a water supply aquifer.</p> <p>Verify that the aquifer is protected by suitable placement and construction of wells, siting and maintenance of septic systems, onsite treatment units, and appropriate land use management.</p> <p>(NOTE: See also checklist item WA.30.7.SP.)</p>

Appendix 13-1

Microbiological Parameter Monitoring Frequency
(FGS-Spain, Table 3-4)

Population Served per Month	Minimum Number of Samples per Month
25 to 10001	2
1001 to 2500	2
2501 to 3300	3
3301 to 4100	4
4101 to 49002	5
4901 to 5800	6
5801 to 6700	7
6701 to 7600	8
7601 to 8500	9
8501 to 12,900	10
12,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30
33,001 to 41,000	40
41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150
320,001 to 450,000	180
450,001 to 600,000	210

-
- 1 A non-community water system using groundwater and serving 1000 or fewer people may monitor once in each calendar quarter during which the system provides water for which a survey conducted within the last 5 yr has shown the system is supplied solely by a protected groundwater source and is free of sanitary defects.
 - 2 Systems serving less than 4900 people that use groundwater and collect samples from different sites may collect all samples on a single day. All other systems must collect samples at regular intervals throughout the month.

Population Served per Month	Minimum Number of Samples per Month
600,001 to 780,000	240
780,001 to 970,000	270
970,001 to 1,230,000	300
1,230,001 to 1,520,000	330
1,520,001 to 1,850,000	360
1,850,001 to 2,270,000	390
2,270,001 to 3,020,000	420
3,020,001 to 3,960,000	450
3,960,001 or more	480

Appendix 13-2

Drinking Water Parameter Limits
(FGS-Spain, Table 3-5)

Parameter	MCL or Maximum Value
Organoleptic Parameters	
Color	20 mg/L (Pt/Co scale)
Odor	2 at 12 °C - 3 at 25 °C (dilution ratio)
Taste	2 at 12 °C - 3 at 25 °C (dilution ratio)
Physical-Chemical Parameters	
Temperature	25 °C
pH	between 6 and 9.5 (not applicable to waters in closed containers)
Sulfates	250 mg/L (as SO ₄)
Magnesium	50 mg/L (as Mg)
Sodium	150 mg/L (as Na)
Aluminum	0.2 mg/L (as Al)
Barium	1 mg/L (as Ba)
Dry residues	1,500 mg/L (at 180 °C)
Asbestos	7 million fibers/L (longer than 10 µm)
Nitrates	10 mg/L (as N)
Nitrites	0.03 mg/L (as N)
Total nitrite and nitrate	10 mg/L (as N)
Ammonia	0.5 mg/L (as NH ₄)
Kjeldahl nitrogen (excluding N from NO ₂ +NO ₃)	1 mg/L
Oxidability	5 mg/L (as O ₂)
Hydrogen sulfide	organoleptically undetectable (as H ₂ S)
Dissolved or emulsified hydrocarbons and mineral oils determined after ether extraction method	0.01 mg/L
Phenols	0.0005 mg/L (as C ₆ H ₅ OH)
Anionic surfactants	0.2 mg/L
Iron	0.2 mg/L (as Fe)
Manganese	0.05 mg/L (as Mn)
Copper	1.3 mg/L (as Cu)

Parameter	MCL or Maximum Value
Zinc	3 mg/L (as Zn)
Phosphorus	5 mg/L (as P ₂ O ₅)
Fluoride	1.5 mg/L (as F)
Silver	0.01 mg/L (as Ag)
Toxic Substances	
Arsenic	0.05 mg/L (as AS)
Cadmium	0.005 mg/L (as Cd)
Cyanides	0.05 mg/L (as CN)
Chromium	0.05 mg/L (as Cr)
Mercury	0.001 mg/L (as Hg)
Nickel	0.05 mg/L (as Ni)
Lead	0.05 mg/L (as Pb)
Antimony	0.01 mg/L (as Sb)
Selenium	(0.01 mg/L (as Se)
Synthetic Organic Chemicals	
1. Insecticides, herbicides, fungicides, persistent organochlorine compounds and organophosphates, including the following:	
Alachlor	0.0001 mg/L
Aldicarb	0.0001 mg/L
Aldicarb sulfone	0.0001 mg/L
Aldicarb sulfoxide	0.0001 mg/L
Atrazine	0.0001 mg/L
Carbofuran	0.0001 mg/L
Chlordane	0.0001 mg/L
2,4-D	0.0001 mg/L
1,2-Dibromo-3-chloropropane (DBCP)	0.0001 mg/L
Endrin	0.0001 mg/L
Ethylene dibromide (EDB)	0.00005 mg/L
Heptachlor	0.0001 mg/L
Heptachlorepoxyde	0.0001 mg/L
Lindane	0.0001 mg/L
Methoxychlor	0.0001 mg/L
Polychlorinated biphenyls (PCBs) (as decachlorobiphenyls)	0.0001 mg/L
Pentachlorophenol	0.0001 mg/L

Parameter	MCL or Maximum Value
Toxaphene	0.0001 mg/L
2,4,5 TP (Silvex)	0.0001 mg/L
2. Volatile Organic Chemicals (VOCs):	
Benzene	0.005 mg/L
Carbon Tetrachloride	0.005 mg/L
O-Dichlorobenzene	0.6 mg/L
Cis-1,2 Dichloroethylene	0.07 mg/L
Trans-1,2 Dichloroethylene	0.1 mg/L
1,1-Dichloroethane	0.007 mg/L
1,1,1-Trichloroethane	0.2 mg/L
1,2-Dichloroethane	0.005 mg/L
1,2-Dichloropropane	0.005 mg/L
Ethylbenzene	0.7 mg/L
Monochlorobenzene	0.1 mg/L
para-Dichlorobenzene	0.075 mg/L
Styrene	0.1 mg/L
Tetrachloroethylene	0.005 mg/L
Trichloroethylene	0.005 mg/L
Toluene	1 mg/L
Vinyl chloride	0.002 mg/L
Xylene (total)	10 mg/L
3. Polycyclic aromatic hydrocarbons (reference substances: Fluoranthene; Benzo-3,4 Fluoranthene; Benzo-11,12 Fluoranthene; Benzo-3,4 Pyrene; Benzo-1,12 Perilene; Indeno (1,2,3-cd) pyrene)	0.0002 mg/L
4. Other organics:	
Acrylamide	treatment technique (1)
Epiphydrochlorin	treatment technique (1)
Minimum Required Concentration for Softened Water (intended for human consumption)	
Total hardness	60 mg/L (as CaCO ₃)
Alkalinity	30 mg/L (as CaCO ₃)

(1) Best available treatment technique relates to polymer addition practices.

Appendix 13-3

**Monitoring Frequency Categories for Drinking Water
Parameters (except those listed elsewhere)
(FGS-Spain, Table 3-6.1)**

Minimum Monitoring	Normal Monitoring	Complete Monitoring
color	temperature	sulfates
odor	nitrite N	magnesium
taste	oxidizability	sodium
pH		aluminum
ammonia		dry residues
nitrate N		Kjedahl N
		hydrogen sulfide
		dissolved and emulsified hydrocarbons
		phenols
		surfactants
		iron
		manganese
		total phosphorus
		fluoride
		arsenic
		cadmium
		cyanide
		chromium
		mercury
		lead
		copper
		nickel
		zinc
		antimony
		selenium
		barium
		silver

Minimum Monitoring	Normal Monitoring	Complete Monitoring
		asbestos*
		total hardness
		alkalinity

* Asbestos will be monitored once in 9 yr unless otherwise indicated by a vulnerability assessment conducted by the PWS.

Appendix 13-4

Annual Monitoring Frequencies
(FGS-Spain, Table 3-6.2)

Population Served	Minimum Monitoring		Normal Monitoring		Complete Monitoring
	Entrance	Network	Entrance	Network	
up to 2000	12	12	(3)	1	1 in 3 years
2001-5000	24	12	(3)	1	1 in 3 years
5001-10,000	52	24	(3)	2	1
10,001-50,000	360	84	(3)	3	1
50,001-100,000	360	120	(3)	6	2
100,001-150,000	360	360	6	12	3
150,001-300,000	360	360	12	12	6
300,001-500,000	360	360	12	24	12
500,001-1,000,000	360	720	30	48	12
morethan 1,000,000	360	12 ¹	30	90	12

¹ per 100,000 inhabitants

NOTES:

1. The asbestos monitoring frequency of once in 9 yr is applicable regardless of population served (see also Appendix 13-3). However, the necessity for analysis is based on a vulnerability assessment conducted by the PWS.
2. Corrosivity will be measured once. PWSs shall be analyzed within 1 yr of the effective date of the Final Governing Standards to determine the corrosivity entering the distribution system.
3. Samples will be taken as follows:
 - a. For nitrite and nitrate: the groundwater baseline requirement is 1 per yr. Monitoring will be increased to at least two samples a quarter if sample shows > 50 percent of MCL. The surface water baseline requirement is 1 per quarter. Monitoring will be increased to at least four samples per quarter if sample shows > 50 percent of MCL.
 - b. For nitrate, the EA may reduce repeat sampling frequency of groundwater systems after 1 yr of <50 percent of MCL. Surface water systems may reduce to an annual sample. For nitrite, the EA may reduce repeat sampling frequency to one sample if 50 percent of MCL, (both groundwater and surface systems).
 - c. For all other parameters - groundwater systems: the baseline requirement is one sample per 3 yr. Take a minimum of one sample at every point to the distribution system which is representative of each well after treatment. If MCL is exceeded, monitoring will be increased to at least two samples a quarter.
 - d. For other parameters - surface water systems: the baseline requirement is 1 per yr. Take at least one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after the treatment. If MCL is exceeded, monitoring will be increased to at least four samples a quarter.

Appendix 13-5

Recommended Fluoride Concentrations at Different Temperatures (FGS-Spain, Table 3-7)

Annual Average of Maximum Daily Air Temperatures (°C)	Control Limits (mg/L)		
	Lower	Optimum	Upper
10 - 12.0	0.9	1.2	1.7
12.1 - 14.6	0.8	1.1	1.5
14.7 - 17.6	0.8	1.0	1.3
17.7 - 21.4	0.7	0.9	1.2
21.5 - 26.2	0.7	0.8	1.0
26.3 - 32.5	0.6	0.7	0.8

Appendix 13-6

**Monitoring Requirements for Lead and Copper Water Quality
Parameters in Affected DOD Systems
(FGS-Spain, Table 3-8)**

Population Served	No. of Sites for Standard Monitoring ^{1,2}	No. of Sites for Reduced Monitoring ³	No. of Sites for Water Quality Parameters ⁴
> 100,000	100	50	25
10,001-100,000	60	30	10
3301-10,000	40	20	3
501-3300	20	10	2
101-500	10	5	1
< 100	5	5	1

1. Monitor every 6 mo for lead and copper.
2. Sampling sites shall be based on a hierarchal approach. For CWSs, priority will be given to: single family residences that contain copper pipe with lead solder installed after 1982, contain lead pipes, or are served by lead service lines; then, structures, including multifamily residences, with the foregoing characteristics; and finally, residences and structures with copper pipe with lead solder installed before 1983. For NTNCWSs, sampling sites will consist of structures that contain copper pipe with lead solder installed after 1982, contain lead pipes, and/or are served by lead service lines. First draw samples will be collected from a cold water kitchen or bathroom tap; nonresidential samples will be taken at an interior tap from which water is typically drawn for consumption.
3. Monitor annually for lead and copper if action levels are met during each of two consecutive 6-mo monitoring periods. Annual sampling will be conducted during the four warmest months of the year.
4. Samples will be representative of water quality throughout the distribution system. Samples will be taken in duplicate for pH, alkalinity, calcium, conductivity or total dissolved solids, and water temperatures to allow a corrosivity determination (via a Langelier saturation index or other appropriate saturation index); additional parameters are orthophosphate when a phosphate inhibitor is used and silica when a silicate inhibitor is used.

Appendix 13-7

Synthetic Organic Chemical Monitoring Requirements
(FGS-Spain, Table 3-9)

Contaminant	Base Requirement ¹		Trigger for more monitoring ⁶	Waivers
	Groundwater	Surface water		
VOCs	Quarterly	Quarterly	> 0.0005	Yes ^{2,3}
Pesticides/PCBs	Quarterly	Quarterly	> Detection limit ⁵	Yes ^{3,4}

¹ Groundwater systems shall take a minimum of one sample at every entry point that is representative of each well after treatment; surface water systems will take a minimum of one sample at every entry point to the distribution system at a point that is representative of each source after treatment.

² Repeat sampling frequency may be reduced to annually after 1 yr of no detection and to every 3 yr after three rounds of no detection.

³ Monitoring frequency may be reduced, if warranted, based on a vulnerability assessment by the PWS.

⁴ Repeat sampling frequency may be reduced after one round of no detection; systems greater than 3300 may be reduced to two samples per year every 3 yr, or systems less than 3300 may be reduced to one sample every 3 yr.

⁵ Increased monitoring requires a minimum of two samples per quarter for groundwater systems and at least four samples per quarter for surface water systems.

(NOTE: Compliance is based on an annual running average for each sample point for systems monitoring quarterly or more frequently. For systems monitoring annually or less frequently, compliance is based on a single sample, unless the DOD EA requests a confirmation sample. A system is out of compliance if any contaminant exceeds the MCL.)

Appendix 13-8

TTHM Monitoring Requirements (FGS-Spain, Table 3-10)

Population Served by System	Number of Samples per Distribution System	Frequency of Samples	Type of Sample
10,000 or more	4	Quarterly	Treated
Less than 10,000	1	Annually	Treated

NOTES:

1. One of the samples must be taken at a location in the distribution system reflecting the maximum residence time of water in the system. The remaining samples shall be taken at representative points in the distribution system. Systems using groundwater sources that add a disinfectant should have one sample analyzed for maximum TTHM potential. Systems that employ surface water sources, in whole or in part, and that add a disinfectant should have one sample analyzed for TTHMs.
2. Compliance is based upon a running yearly average of quarterly samples for systems serving more than 10,000 people. Noncompliance exists if the average exceeds the MCL. For systems serving less than 10,000 people and having a maximum TTHM potential sample exceeding the MCL, a sample for TTHMs shall be analyzed. If the TTHM sample exceeds the MCL, noncompliance results.)

Appendix 13-9

Radionuclide MCLs and Monitoring Requirements (FGS-Spain, Table 3-11)

MCLs Contaminant	MCL, Bq/m ³	(pCi/L)
Gross Alpha ¹	555	(15)
Combined Radium-226 and 228	185	(5)
Gross Beta ²	1,850	(50)
Strontium-90	296	(8)
Tritium	740,000	(20,000)
Radon	11,100	(300)

¹ Gross alpha activity includes radium-226 but excludes radon and uranium.

² Gross beta activity refers to the sum of beta particle and photon activity from manmade radionuclides. If gross beta exceed the MCL, i.e., equivalence to a dose of 4 millirem/yr, the individual components must be determined.

³ MCL for radon is proposed to be effective 1995.

MONITORING REQUIREMENTS

For gross alpha activity and radium-226 and radium-228, systems must be tested once every 4 yr. Testing must be conducted using an annual composite of four consecutive quarterly samples or the average of four samples obtained at quarterly intervals at a representative point in the distribution system.

Gross alpha only may be analyzed if activity is ≤ 185 Bq/m³. Where radium-228 may be present, radium-226 and/or -228 analyses should be performed when activity is > 74 Bq/m³. If the average annual concentration is less than half the MCL, analysis of a single sample may be substituted for the quarterly sampling procedure. A system with two or more sources having different concentrations of radioactivity must monitor source water in addition to water from a free-flowing tap. If the installation introduces a new water source, these contaminants must be monitored within the first year after introduction.

Appendix 13-10

Surface Water Treatment Requirements (FGS-Spain, Table 3-1)

1. Unfiltered Systems
 - a. Systems may use unfiltered water if fecal and total coliform are less than the class A1 values for these parameters in Appendix 13-11. Systems that use unfiltered surface water or groundwater under the direct influence of surface water must analyze the raw water for total coliforms or fecal coliforms at least weekly and for turbidity at least daily for a minimum of 1 yr. Filtration must also be applied if turbidity exceeds 1 NTU.
 - b. Disinfection must achieve at least 99.9 percent inactivation of *Giardia lamblia* cysts and 99.99 percent inactivation of viruses by meeting applicable concentration/time (CT) values.
 - c. Disinfection systems must have redundant components to ensure uninterrupted disinfection during operational periods.
 - d. Daily disinfectant residual monitoring immediately after disinfection is required. Disinfectant residual measurements in the distribution system must be made weekly.
 - e. Water in a distribution system with a heterotrophic bacteria concentration less than or equal to 500/mL, measured as heterotrophic plate count, is considered to have a detectable disinfectant residual.
 - f. If disinfectant residuals are undetected in more than 5 percent of monthly samples for 2 consecutive months, appropriate filtration must be implemented.
2. Filtered Systems
 - a. The turbidity of filtered water must be monitored at least daily.
 - b. The turbidity of filtered water must not exceed 1 NTU in 95 percent of the analyses in a month, with a maximum of 5 NTU.
 - c. Disinfection requirements are identical to those for unfiltered systems.

Appendix 13-11

**Characterization of Surface or GWUDISW To Be Used
for the Production of Drinking Water:
Maximum Values Not To Be Exceeded (unless otherwise noted)
(FGS-Spain, Table 3-2)**

Parameter	Class A1	Class A2	Class A3
pH	(6.5 - 8.5)	(5.9 - 9)	(5.9 - 9)
color (after simple filtration) (mg/L Pt scale)	20	100	200
total suspended solids (TSSs) mg/L suspended solid (SS)	(25)	--	--
temperature (°C)	25	25	25
conductivity (µS/cm at 20 °C)	(1000)	(1000)	(1000)
odor (dilution ratio at 25 °C)	3	10	20
fluorides (mg/L F)	1.5	(1.7)	(1.7)
nitrates* (mg/L NO ₃)	50	50	50
dissolved iron (mg/L Fe)	0.3	2	1 (g)
manganese (mg/L Mn)	(0.05)	(0.1)	(1)
copper (mg/L Cu)	0.05	(0.05)	(1)
zinc (mg/L Zn)	3	5	5
boron (mg/L B)	(1)	(1)	(1)
arsenic (mg/L As)	0.05	0.05	0.1
cadmium (mg/L)	0.005	0.005	0.005
total chromium (mg/L Cr)	0.05	0.05	0.05
lead (mg/L Pb)	0.05	0.05	0.05
selenium (mg/L Se)	0.01	0.01	0.01
mercury (mg/L Hg)	0.001	0.001	0.001
barium (mg/L Ba)	0.1	1	1
cyanide (mg/L Cn)	0.05	0.05	0.05
sulphate** (mg/L SO ₄)	250	250	250
chlorides*** (mg/L Cl)	(200)	(200)	(200)
sulfactants (reacting with methyl blue, mg/L laurylsulphate)	(0.2)	(0.2)	(0.5)
phosphates** (mg/L P ₂ O ₅)	(0.4)	(0.7)	(0.7)
phenols (phenol index, paranitraniline, 4 aminoantipyrine, mg/L C ₆ H ₅ OH)	0.001	0.005	0.1

Parameter	Class A1	Class A2	Class A3
dissolved or emulsified hydrocarbons (after extraction by petroleum ether, mg/L)	0.05	0.2	1
polycyclic aromatic hydrocarbons (mg/L)	0.0002	0.0002	0.001
total pesticides (parathion, BHC, dieldrin, mg/L)	0.001	0.0025	0.005
chemical oxygen demand (COD) (mg/L O ₂)	--	--	(30)
dissolved oxygen saturation rate (% O ₂)	(>70)	(>50)	(>30)
biochemical oxygen demand (BOD) (at 20 °C without nitrification, mg/L oxygen consumed)	(<3)	(<5)	(<7)
Kjedahl nitrogen (except NO ₃ , mg/L N)	(1)	(2)	(3)
ammonia (mg/L NH ₄)	(0.05)	1.5	4
substances extractable with chloroform (mg/L)	(0.1)	(0.2)	(0.5)
total coliform 37 °C (per 100 ml)	(50)	(5000)	(50,000)
fecal coliform (per 100 ml)	(20)	(2000)	(20,000)
fecal streptococci (per 100 ml)	(20)	(2000)	(20,000)
salmonella (per 100 ml)	absent in 5000 mL	absent in 1000 mL	--
REQUIRED TREATMENT			
Class A1	simple physical treatment and disinfection		
Class A2	normal physical and chemical treatment and disinfection (for example, pre-chlorination, coagulation, flocculation, decantation, filtration, disinfection (final chlorination))		
Class A3	intensive physical and chemical treatment, extended treatment and disinfection, (for example, chlorination to break-point, coagulation, flocculation, decantation, filtration, adsorption (activated carbon), disinfection [ozone, final chlorination])		

() = guide values

* = in lakes with slow renewal

** = use other waters if possible

Instructions:

If a water sample parameter does not meet the value of a given class, then the water falls into the next class for treatment purposes.

A water will be assumed to conform to the relevant parameters in a class if samples taken at regular intervals at the same sampling point show that it complies with the value in 90 percent of the samples.

For the 10 percent of the samples which do not comply, the value must not be exceeded by more than 50 percent, except for temperature, pH, dissolved oxygen and microbiological parameters.

Water that does not comply with this table may be used if no other water supply exists. However, water must be treated to achieve the drinking water standards of this section. In this case the appropriate host nation authority must be informed.

Appendix 13-12

Maximum Doses of Treatment Additives
(FGS-Spain, Table 3-3)

Substance	Maximum Dose
Disinfection-Oxidation	
Chlorine	30 mg/L total, for this group
Sodium hypochlorite	
Calcium hypochlorite	
Magnesium hypochlorite	
Sodium chlorite	
Ammonia	0.5 mg/L
Ozone	10 mg/L
Potassium permanganate	2 mg/L
Electrolytic silver	0.05 mg/L total, for this group
Silver sulfate	
Silver chloride	
Silver chloride sodium complex	
Discoloration	
Sulfur dioxide	20 mg/L
Sodium bisulfate	4 mg/L
Sodium metasilfite	3.5 mg/L
Sodium sulfate	7 mg/L
Calcium sulfate	5 mg/L
Correction of pH and/or Mineralization	
Soda lye	100 mg/L
Crystal carbonate	200 mg/L
Acid sodium carbonate	200 mg/L
Sodium chloride	150 mg/L
Quicklime/caustic lime	200 mg/L
Dead lime	200 mg/L
Whiting	300 mg/L
Calcium chloride	120 mg/L
Calcium sulfate	140 mg/L
Magnesium	300 mg/L

Substance	Maximum Dose
Magnesium oxide	80 mg/L
Magnesium hydroxide	80 mg/L
Magnesium carbonate	175 mg/L
Carbon dioxide	50 mg/L
Hydrochloric acid	25 mg/L
Sulfuric acid	30 mg/L
Coagulation and Flocculation	
Filter alum	150 mg/L
Alkaline pink mordant	30 mg/L
Aluminum sulphate polyhydroxychloride	100 mg/L
Aluminum polyhydroxychloride	100 mg/L
Iron sulphate	100 mg/L
Ferric sulphate	200 mg/L
Ferric chlorosulphate	70 mg/L
Ferric chloride	100 mg/L
Potassium, sodium salts and calcium salts of single- and polyphosphorous-acids	5 mg/L (expressed in P ₂ O ₅)

Appendix 13-13

Substances Disallowed for Discharged onto Soil (FGS-Spain 3.1.c.2)

Halogenated compounds or substances which produce the same in an aqueous environment
Organophosphorus compounds
Organotin compounds
Substances with carcinogenic, mutagenic or teratogenic properties in an aqueous environment
Mercury and its compounds
Cadmium and its compounds
Mineral oils and hydrocarbons
Floating, suspended or precipitated synthetic substances which may degrade water

Appendix 13-14

Substances Not Permitted for Injection into Deep Geological Formations (FGS-Spain 3.1.c.3.b)

The following metals, metalloids and their compounds: zinc, copper, nickel, chromium, lead, selenium, arsenic, antimony, molybdenum, titanium, tin, barium, beryllium, boron, uranium, vanadium, cobalt, thallium, tellurium, silver
Biocides and their derivatives not in Appendix 13-12
Substances with a harmful effect on the taste or odor of groundwater and thus render the water unsuitable for human consumption
Persistent or toxic organosilicates or substances which can give rise to the same in an aqueous environment
Inorganic compounds of phosphorous and elemental phosphorous
Fluorides and cyanides
Ammonia and nitrates

Comment Form

Comments and questions regarding the OCAP-Spain can be addressed to:

**David A. Krooks, Ph.D.
e-mail d-krooks@cecer.army.mil
phone 217-373-3432, 1-800-USACERL (ext. 3432), or
FAX 217-373-3430**

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